www.jjtools.co.kr
Made in Korea

제이제이툴스(주)
JJ TOOLS Co.,Ltd.
(구) 장진공구


# Carbide EndMills

High Precision & High Speed Cutting

**Wide range of products**

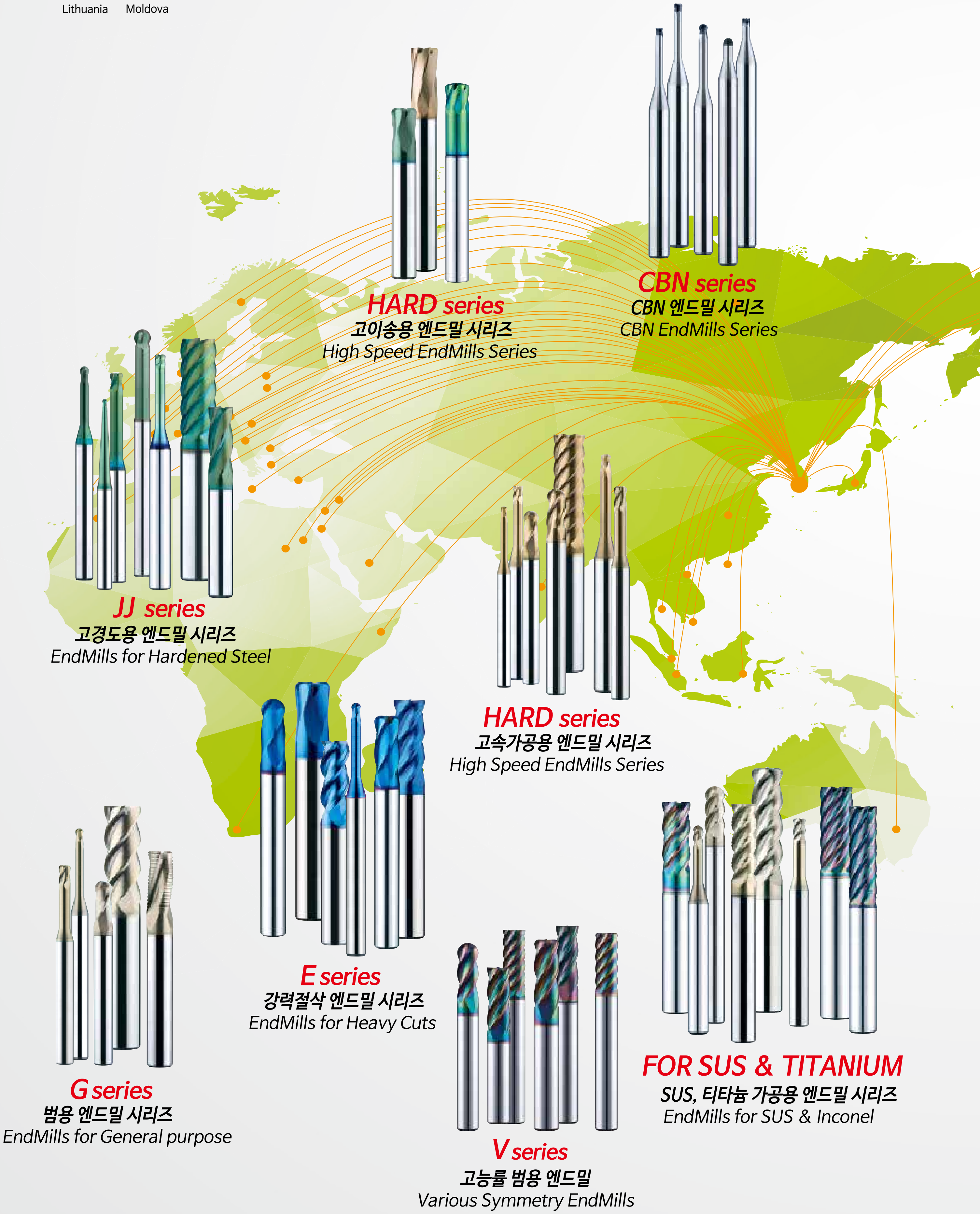
# 18,619

Where Variety Meets Precision. 다양성과 정밀함이 만나는 기술

Italy | Germany | Portugal | France | Austria | Spain | Belgium | Denmark | Poland | Greece | Ireland | Czech | Serbia | United Kingdom

Malaysia | Thailand | Vitetnam | Albania | Singapore | Indonesia | Pillippines | Australia | New Zealand | Egypt | USA | Canada | Argentina | Mexico

Lithuania | Moldova



Hungary Swuden Turkey Slovenia Slovakia Finland Norway Netherlands Ukrane Colombia China Japan India Hong Kong

Brazil Republic of South Africa Lebanon Saudi Arabia Jordan UAE Croatia Morocco Kuwait Israel Latvia Romania Bulgaria Swiss

**FOR GRAPHITE**
흑연가공용 엔드밀 시리즈
EndMills for Graphite

**R-TAC**
R-TAC 코팅 엔드밀 시리즈
R-TAC Coated EndMills Series

**FOR COMPOSITE**
복합소재 가공용 엔드밀 시리즈
EndMills for Composite

**FOR ALUMINUM**
알루미늄 가공용 엔드밀 시리즈
EndMills for Aluminum

## Globally exporting the
# Outstanding quality

세계로 수출하는 명품 엔드밀

# JJTOOLS

지속적인 신제품 개발과 품질 향상으로 고객의 믿음을 이어가겠습니다.

*We are doing our best for customers' productivity improvement via continual efforts for quality innovation and applying the newly qualified technology to the products.*

**Drills**
드릴 시리즈

**Inserts**
인서트 시리즈

**PCD series**
PCD 엔드밀 시리즈

**Thread Mills**
쓰레드밀 시리즈


# The Latest Manufacturing Equipment !

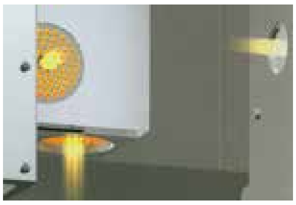
# New Precision Tolerance !

## 최신의 초정밀 장비 !
## 한차원 높은 정밀 공차 !


*JJ TOOLS achieved a big quality improvement on its' standard products line by applying very tight tolerance control as well as the world best class manufacturing equipments with very well qualified engineers.*

*제이제이툴스는 초정밀 공구생산을 위한 세계 최고 수준의 첨단 설비와 우수한 전문 인력을 기반으로 더욱 혁신적인 정밀공차 관리를 함으로써 표준 엔드밀의 제품 수준을 대폭 향상 시켰습니다.*

| ■ Tolerance 공구 오차 (2PHCB) | | |
|---|---|---|
| | 0.1R≦ R ≦1R | ± 0.003mm |
| | 1R< R ≦3R | ± 0.005mm |
| | 3R< R | ± 0.008mm |



# *Various product line up !*

# *18,619 tools in 278 item !*

## *278품목 18,619개의 다양한 제품 라인업 !*

*JJ TOOLS is managing the huge inventories as much as 18,619 products products from CBN to multi purpose WC endmills for customer satisfaction not only for quality but on time delivery. And we have been introducing new products by continual R&D and investment. Excellent quality and dimensional accuracy, outstanding tool life - the passion of JJ TOOLS for delivering the best quality cutting tools to the market will be continued.*


## *Where Variety Meets Precision*

*CBN 엔드밀부터 범용 엔드밀까지 18,619개의 다양한 제품규격을 보유하고 있으며, 지속적인 연구개발 및 투자를 통하여 우수한신 제품을 속속 선보이고 있습니다. 탁월한 절삭력 및 치수 정밀도, 오래가는 공구수명- 앞으로도 최고의 절삭공구를 만들기 위한 제이제이툴스의 열정은 끊임없이 계속됩니다.*

## *당신의 스페셜은 우리의 표준품입니다.*

HRc 52~68

# *JJ series* **for hardened steels**

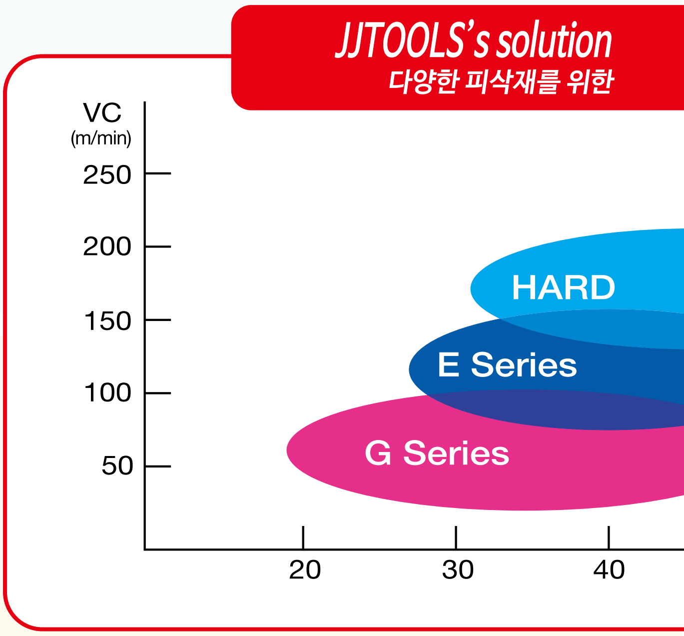
## 고경도재 가공용 JJ 시리즈

**Endmills for pre-hardened and hardened steels(HRc52~68)**

**고경도강(HRc52~68), 프리하든강 계열의 고정밀가공 엔드밀**

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

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




HRc 50~65

# *HARD series* **for high speed cutting**

## 고속가공용 HARD 시리즈

**Endmills for pre-hardened and hardened steels (HRc50~65)**

**고경도강 (HRc50~65), 프리하든강 계열의 고정밀가공 엔드밀**

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

- *고함량 실리콘계 코팅 (Si) 처리하여 내마모성이 우수합니다.*
- *고정밀 공차 적용으로 초정밀 가공에 적합합니다.*
- *날부인선의 조도가 뛰어나 피삭재의 면조도가 우수합니다.*
- *초미립자 초경합금 (0.2㎛)을채택, 고속 절삭 시 뛰어난 성능을 발휘합니다.*

HRc ~52

# E series for heavy cuts

## 강력절삭용 E 시리즈

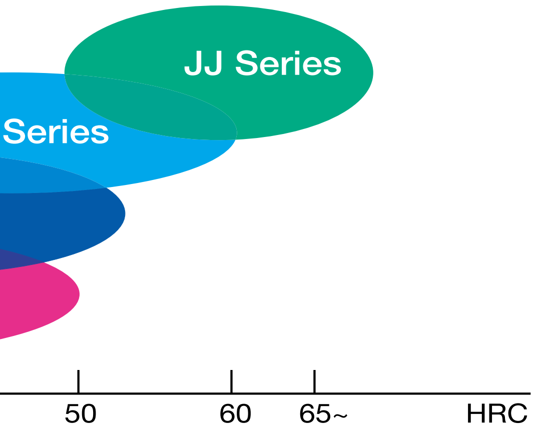
**Endmills for various work materials(~HRc52),pre-hardened steels, carbon steels, mold steels.**

**중저경도강(HRc52이하), 프리하든강계열, 탄소강, 금형강등**

- *Good wear resistance by high quality Si-based PVD coating.*
- *Suitable shape is designed for tooling in wide areas.*
- *Maximize the manufacturing cost saving with low price of products.*
- *Minimize fracturing by high TRS fine(0.5㎛) WC grade.*

- *고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.*
- *넓은 영역의 피삭재 가공에 적합한 형상으로 설계 하였습니다.*
- *경제적인 가격으로 가공 생산비 절감을 극대화합니다.*
- *항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.*

**for various work materials**
JJTOOLS(주)의 솔루션




HRc ~52

# G series for general purpose

## 다양한 피삭가공, 범용 G 시리즈

**Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels.**

**중저경도강(HRc52이하), 프리하든강계열, 탄소강, 금형강등**

- *Optimum for various work materials by JCRO coating.*
- *High precise edge tolerance.*
- *Minimize fracturing by high TRS fine(0.5㎛) WC grade.*

- *JCRO 코팅 처리하여 넓은 영역의 피삭재 가공에 적합합니다.*
- *고정밀 공차 적용으로 초정밀 가공에 적합합니다.*
- *항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.*

***Optimized for precise machining of high hardness work material***

**고경도재의 정밀 정삭가공에 적합한**

# High Abrasion Resistance !

## 탁월한 내마모 품질!

**CBN series**

# CBN EndMills series

## CBN 엔드밀 시리즈

## Optimized mirror face machining for hardened steels (HRc72) !

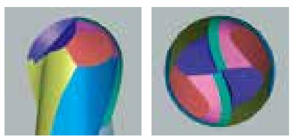
**HRc72 고경도강의 경면 사상 가공에 최적 !**

- *PCBN Endmills for precise finishing (±5㎛) of hardened steels (HRc52~72)*
- *Long tool life by high quality PCBN*

*CBN 시리즈는고함량의 PCBN을 사용하여 탁월한 내마모성과 최적의 인선부 설계로 뛰어난 절삭력 및 경면 조도를 나타내며, 고경도강(HRc72)의 고속 가공시 최고의 성능을 발휘합니다.*

## Various helix design for the best quality !

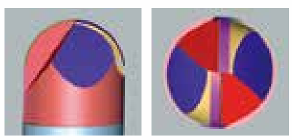
**다양한 인선형상 설계로 최상의 맞춤품질 확보!**



*Helix 30°*

*Optimum for hardened - mold machining*

*열처리 금형가공에 최적*



*Helix 0°*

*Optimum for mirror face machining*

*경면 사상가공에 최적*

# *High speed machining* hardened steels
고경도재 고속가공의

# *Super EndMills !*
절대 강자 !

**More than 2 times performance than corner Insert end mills !**

2배이상의 성능 실현!
경도 HRC65이하 소재의황삭, 중삭가공시

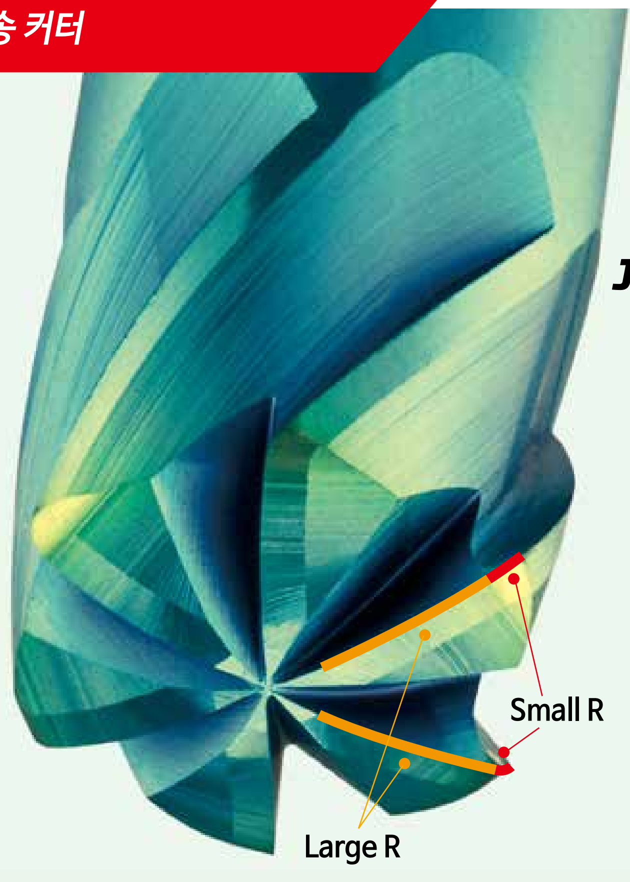
**Guarantee more than 6 times Re-grinding !**

코너R 마모시 6회 이상의 재연삭 가능!

*The best of high speed cutting*
고속・고이송 가공에 최적화된

## Corner Radius Cutters
코너 레디우스커터

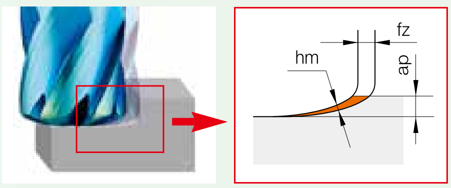
## High SPEED Cutters
고이송 커터




6JJDRC

**Dramatically decreased cutting stress**
절삭 부하를 획기적으로 감소시킨

## JJ Double Corner Radius Cutters
더블 코너 레디우스 커터




Thinner removal chip
더 얇게 제거되는 칩

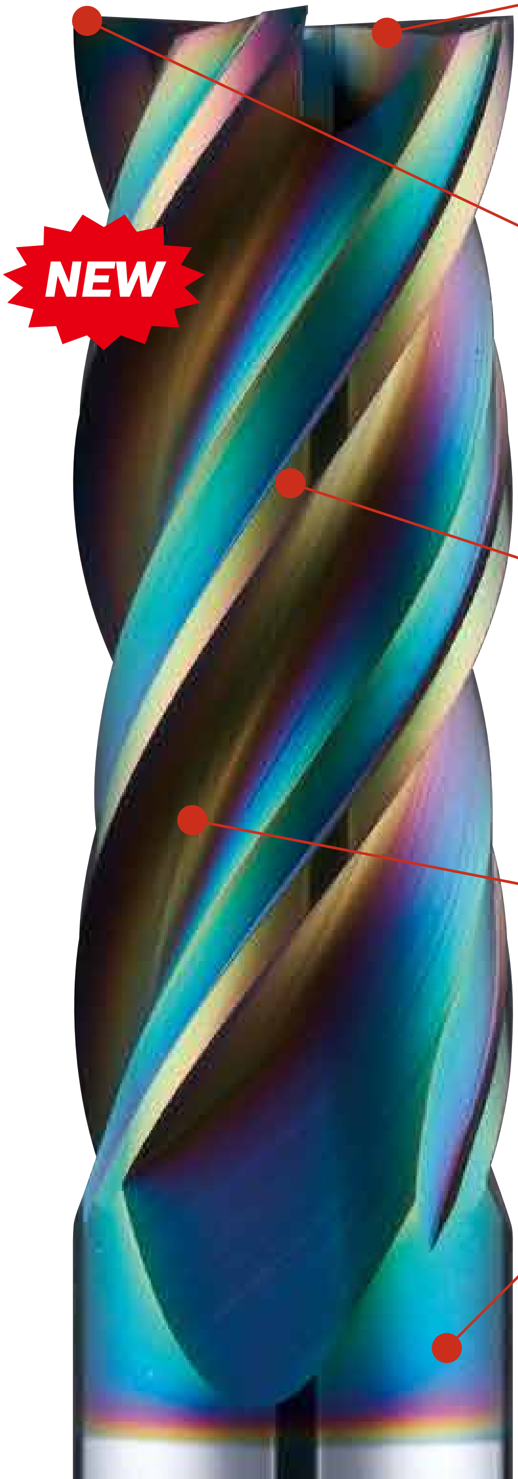
- *Double radius design on the endface makes thinner chip removal and reduce cutting stress than conventional corner radius End mills.*
- *The maximum cutting depth is up to the end of the large R, and the large R minimizes vibration, enabling stable milling.*

- 바닥면의 인선을 더블R로 설계하여 기존 코너R 엔드밀에 비해 공작물 가공시 절삭칩이 얇게 배출되어 절삭 부하를 줄여줍니다.
- 최대 절삭깊이 ap는 큰 반경R이 끝나는 인선부까지 이며, 고이송 절삭시 큰 반경R은 떨림을 최소화하여 안정적 가공을 가능하게 합니다.

# V SERIES

## Strong design for protection against chattering !

**진동을 최소화 및 강력한 채터링 방지 !**




## Unequal pitch design !

**부등분할 날부 설계 !**

*Minimized noise and vibration due to unequal pitch design of bottom flute.*

*부등분할 밑날 적용으로 절삭 시 소음 및 진동을 최소화 하였습니다.*

## Improved flute design for better tool life !

**긴 공구 수명을 위한 향상된 코너 설계 !**

*With shield edge design, breakage of flute end is avoided.*

*실드 엣지를 채택하여 엔드밀 끝날의 급각 파손을 방지 하였습니다.*

## Multiple Helix

**부등리드**

*The unequal lead design enables optimal chip evacuation and faster and more powerful cutting.*

*부등리드 설계로 최적의 칩 배출이 가능하며 더 빠르고 강력한 절삭이 가능합니다.*

## Wide chip pocket for excellent chip emission

**칩 배출이 용이한 넓은 칩 포켓 !**

*Cutting chips are well evacuated.*

*절삭 칩이 원활하게 배출 됩니다.*

## Applied new coating !

**새로운 HR 코팅을 적용 !**

*HR coating restrained buit-up edge to enhance wear resistance of V series*

*HR 코팅을 적용하여 내마모성을 높였으며, 엔드밀 인선부의 구성인선 (built-up edge)을 억제하여 초기 엔드밀 마모를 대폭 개선하였습니다.*


## High speed slotting End mills for dynamic roughing milling !

### 황삭 다이나믹 가공을 위한

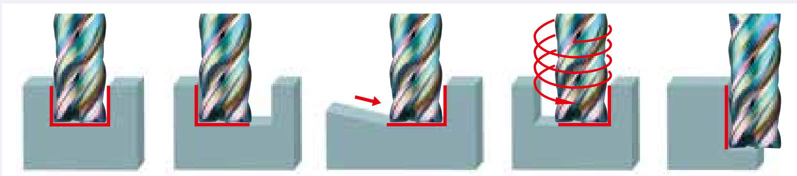
# High Speed Sloting End Mills

### 고속 슬로팅 가공 엔드밀

**4SLE**

- Endmills for finishing and roughing of alloy steel, sus, inconel, mild steels and various hard to cut materials.
- Chip emission is excellent for slotting, and thick double core designed enables continuous machining without chattering.
- HR coating provides wear resistance improvement as well as avoid edge stress in various applications.

- 합금강, SUS계열, 인코넬, 일반구조강 등 다양한 난삭재 정삭, 황삭 가공
- 슬롯팅 가공시 2중의 옆날 홈으로 칩 배출이 우수하며, 두터운 2중의 코어는 흔들림 없는 가공을 구현합니다.
- HR 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.





Optimized chip breaker for deep milling
깊은 가공에 최적화된 칩브레이커

## For high speed roughing milling

### 고속 황삭 가공을 위한

# Trochoidal Milling End Mills

### 트로코이달 가공 엔드밀

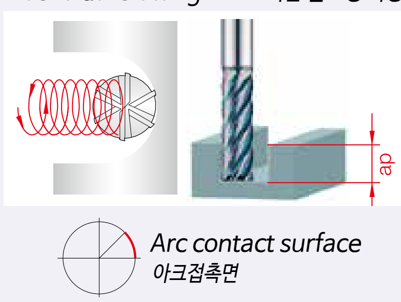
**5&6TROE**

Trochoidal milling is a high-efficiency milling method that utilizes low radial depth of cut and high axial depth of cut for high-speed machining.
It involves having a spiral toolpath to control the radial contact area during machining and maintain a consistent chip thickness. This is a characteristic feature of trochoidal milling.

트로코이달 밀링은 고효율 밀링의 한 방법으로서 낮은 반경 방향 절삭깊이와 높은 축방향 절삭깊이를 사용한 고속가공법입니다. 가공시 반경방향 접촉면적을 적절히 컨트롤하면서 칩 두께를 일정하게 유지하는 것이 특징으로 이를 위해 공구경로가 나선형을 가지게 됩니다.

**Conventional milling** 기존 슬로팅 가공


Trochoidal slotting 트로코이달 슬로팅 가공



**Optimized End Mills Series for High-Speed, High-Feed Semi-Finishing, Roughing Aluminum Machining**

# Aluminum series NEW

## 고이송 중삭 , 황삭의 최적화 된 알루미늄 전용 엔드밀 시리즈

## Adopted Special Edge Design for Maximizing Effective Chip Evacuation !

**특별한 날 부 디자인을 채택, 효과적인 칩 배출 극대화함 !**

*Optimal for High-Speed Machining !*
*Excellent 4-Flute Design for Superior Sidewall Machining !*
*Applying sharp edges and contoured flute design to minimize machining load !*

고이송 가공의 최적! 측벽가공의 탁월한 4날 플루트 적용 !
샤프한 인선과 경면의 플루트 형상을 적용하여 가공 부하를 최소화 !

*Implemented Chip Breaker Type !*
*Maximized Efficient Chip Fragmentation !*
*Applied R-TAC Coating with High Hardness and Thin Thickness to Maintain Sharp Edge and Prolong Tool Life !*

칩 브레이크 타입을 적용! 효과적인 칩의 분쇄를 극대화 !
R-TAC 코팅을 적용하여 샤프한 엣지를 유지하고 공구의 수명을 증가 !

# Ultra fine surface after machining

탁월한 피삭재의 경면조도 !

R-TAC 코팅피막이 우수한 Tetrabond TAC

## Tetrabond TAC Coated End Mills

### R-TAC 코팅 엔드밀

End Mills for Aluminum, Aluminum alloys, copper, copper alloys, CFRP, GFRP, glass/carbon fiber, non-ferrous and non-metallic materials.

알루미늄 및 알루미늄 합금, 동 및 동합금, 강화프라스틱 (CFRP,GFRP), 유리/탄소섬유 등 비철,비금속 피삭재 전용

- *Tetrabond TAC coating provides excellent work surface finish by high hardness and low friction.*
- *High precise edge tolerance.*
- *Minimize fracturing by high TRS fine(0.5㎛) WC grade.*

- *코팅피막에 경도가 높고 마찰계수가 낮은 SUPER TAC코팅을 적용해 내마모성이 우수하며, 피삭재 표면조도가 월등히 우수함*
- *고정밀 공차 적용으로 초정밀가공에 적합*
- *항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화하였습니다.*

# Applied RTAC coating for excellent surface finish !

R-TAC코팅을 통한 업그레이드로 인선부의 고광면 구현!

## End Mills for Aluminum

FOR ALUminum

### AL가공용 엔드밀

Endmills for Aluminum, AL alloys, non-ferrous and non-metallic materials.

알루미늄 및 알루미늄 합금 등 비철,비금속 피삭재 전용

- *Applied fine WC grade for excellent surface finish.*
- *With RTAC coating, the tool life improved more than two times over conventional uncoated endmills.*
- *Various flute length design for covering wide range application.*
- *Minimize built up edge by double edge and deep pocket design.*
- *Minimize fracturing by high TRS fine(0.5㎛) WC grade.*

- *날부 인선을 고광면 설계하여 절삭시 피삭재의 표면조도가 우수합니다.*
- *RTAC코팅 처리하여, 기존 비코팅 엔드밀 대비 2배이상 공구수명이 증가하였습니다.*
- *다양한 날장(S, L, Exl, Etc)선택으로 맞춤 가공이 가능합니다.*
- *2중 인선과 홈포켓의 깊게 설계로 흡착현상을 최소화 하였습니다.*
- *미립자 초경합금 (0.5㎛)을채택, 엔드밀의 파손을 최소화 하였습니다.*

# Strong design for protection against chattering !

강력한 채터링 방지 설계로 진동을 최소화 !

FOR SUS

Excellent Chip Control
칩배출이 뛰어난

## End Mills for SUS

### SUS 가공용 엔드밀

End Mills for alloy steels, SUS, Ti/Ni base alloys, Inconel and hard to cut materials.

SUS계열, Ti/Ni계합금, 인코넬, 합금강 등 난삭재 전용

- 강력한 채터링방지 설계로 엔드밀의 진동을 최소화 하였습니다.
- 깊은 포켓으로 칩배출이 원활하며 피삭재 면조도가 우수
- 42° 헬릭스 형상으로 설계하여 고속, 고이송 가공에 최적
- 항절력이 높은 미립자 초경합금을 채택하여 고이송 작업시 엔드밀의 파손을 최소화 하였습니다.

- Strong design for protection against chattering.
- Excellent work surface finish by deep chip pocket.
- 42°degree helix design for high speed, feed condition.
- Minimize fracturing at high feed by high TRS fine WC grade.

# Applying multi flutes to Minimize damage on edge !

다날 구조 채택으로 인선부 파손 최소화 !

FOR Titanium

## End Mills for TITANIUM

### TITANIUM 가공용 엔드밀

End Mills for alloy steels, SUS, Ti/Ni base alloys, Inconel and hard to cut materials.

티타늄, Ti/Ni계합금, 인코넬, 합금강, SUS계열 등 난삭재 전용

- *HR coating provides wear resistance improvement as well as avoid edge stress in various applications.*
- *Strong design for protection against chattering..*
- *Minimize fracturing at high feed by high TRS fine WC grade.*

- *HR 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.*
- *강력한 채터링방지 설계로 엔드밀의 진동을 최소화 하였습니다.*
- *항절력이 높은 미립자 초경합금을 채택하여, 고이송 작업시 엔드밀의 파손을 최소화 하였습니다.*

# 230º, 270º degree ball shape

230, 270도의 인선으로

# Optimized for wide range 3D machining

광범위한 3D가공에 최적 !

HARD series

## Spherical End Mills for 3D Machining

3D가공용 구형엔드밀

**고경도강(HRc50~65), 프리하든강 계열의 고정밀가공**

Endmills for pre-hardened and hardened steels(HRc50~65)

- *230˚,270˚degree ball shape for wide range 3D machining.*
- *Minimize chattering and fracturing by taper and straight designed flute.*
- *Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.*

- *230, 270도 구형의 인선으로 광범위한 3D 가공에적합*
- *유효장을 직선 및 테이퍼 설계하여 목부파손 및 떨림을 최소화*
- *초미립자 초경합금(0.2㎛)을 채택, 고속절삭시 뛰어난 성능 발휘*

# Leading tools for machining of Composite materials

우주항공 및 자동차 분야의 복합신소재 가공을 선도하는

FOR COMPOSITE

## For Composite Materials

복합소재용 엔드밀

**Endmills for CFRP, GFRP, copper, copper alloys, glass/carbon fiber, non-ferrous and non-metallic materials.**

강화플라스틱(CFRP,GFRP), 동및동합금, 유리/탄소섬유등
비철, 비금속 계열의 다양한 복합소재 전용 엔드밀

- *Outstanding performance in machining of various composite materials.*
- *Excellent wear resistance by applying high hardness coating layer.*
- *Minimize built up edge by low friction diamond coating.*

- *다양한 복합소재 가공영역에 뛰어난 성능을 발휘*
- *코팅피막에 경도가 높아 내마모성이 우수*
  *마찰계수가 낮은 다이아몬드 코팅을 적용하여 흡착현상을 최소화*


# Innovative solution for shortening machining hour !

## 가공시간 단축을 위한 획기적인 제안 !

## 5 Axis Taper Double Ball End Mills

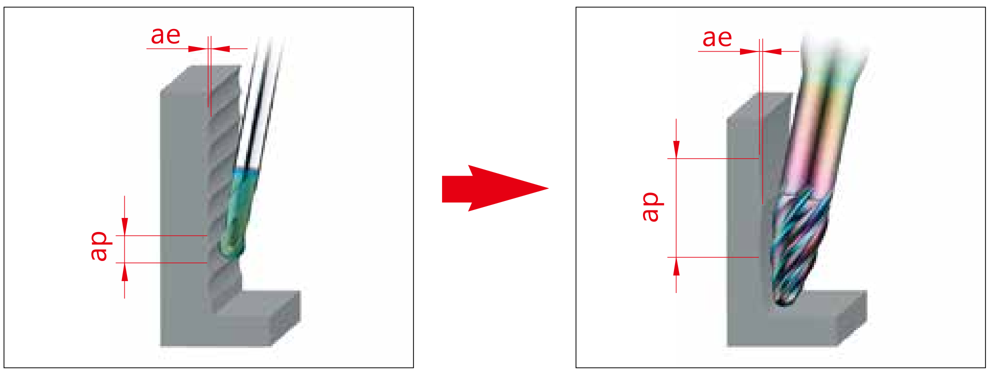
### 5축 테이퍼 더블 볼 엔드밀

**4&6CTDB**

- **Pre-hardened steels, Cast irons, Non-metallic materials**
- HR coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Suitable for special components with 3 axes and 5 axes sector such as impellers, blisks, tire profiles, turbine blades.
- Available for simultaneous machining of roughing and finishing with only one tool.

- **프리하든강, 일반강, 주물, 비철합금가공엔드밀**
- HR 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 공구의 교체없이 밑면과 경사면의 정삭,황삭 가공이 동시에 가능합니다.
- 임펠라, 브리스크, 타이어 프로파일, 터빈날 등3축과 5축의 편측각이 있는 부품 가공에 적합합니다.

**The value of ae is same.　ae의 치수 동일**



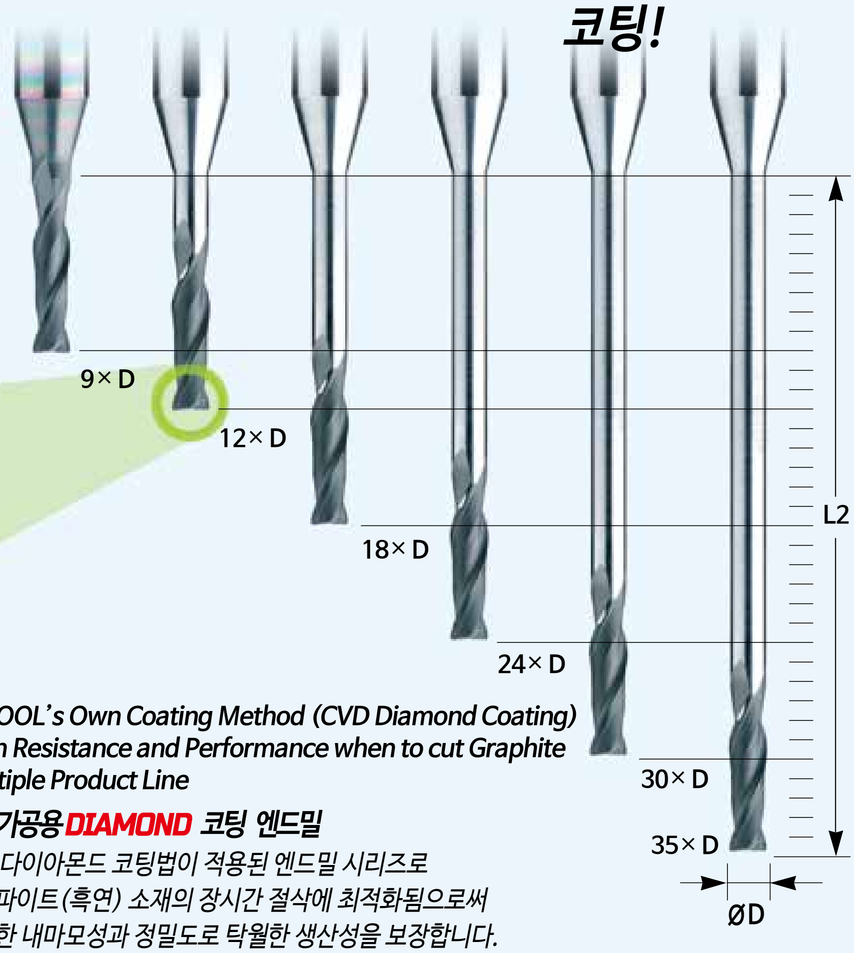

Ball Type　　6CTDB

- The depth (ap) can be processed deeper than the standard ball End mills during 5-axis machining, so the processing time is faster and it has fewer machining bumps, which is the advantage for finishing.
- Applied 4&6 flutes for high speed milling.

- 5축 가공시 일반 볼 엔드밀에 비해 절입깊이(ap)를 깊게 가공할 수 있어 가공시간이 빠르며, 같은 ae 절입시 요철 가공면이 적어 정삭가공에 유리합니다.
- 4&6날을 채택하여 고속가공에 적합합니다.

# High abrasion resistance
탁월한 내마모성의

# DIAMOND Coating
코팅!


**2 D BE**
**3 D BE**
**4 D BE**
**2&3 D EM**
**4&6 D EM**
**2 D CR**
**4 D CR**

*JJ TOOL's Own Coating Method (CVD Diamond Coating)*
*High Resistance and Performance when to cut Graphite*
*Multiple Product Line*

**흑연가공용DIAMOND 코팅 엔드밀**

*CVD다이아몬드 코팅법이 적용된 엔드밀 시리즈로*
*그라파이트(흑연) 소재의 장시간 절삭에 최적화됨으로써*
*우수한 내마모성과 정밀도로 탁월한 생산성을 보장합니다.*

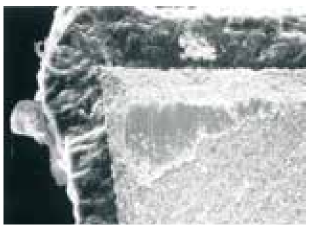
## FOR GRAPHITE

## DIAMOND Coated End Mills for Graphite

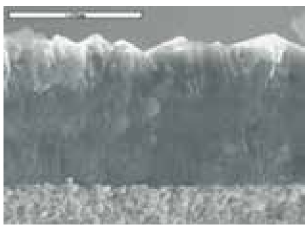
## 다이아몬드 코팅 시리즈

■ SEM Images of Diamond crystal *다이아몬드 결정 SEM 사진*

Diamond surface image
다이아몬드 표면 입자 확대



Diamond cross section image
다이아몬드 단면 확대



Diamond cross section image
다이아몬드 단면 확대

| PROPERTY | CVD Diamond | Mono Diamond | PCD | K10 |
|---|---|---|---|---|
| **열전도율** (W/m•K) Thermal conductivity | ~ 1000 | 2,000 | 560 | 110 |
| **경도** (Gpa) Hardness | 80 ~ 100 | 50 ~ 100 | 50 | 18 |
| **표면조밀도** (MPa•m$^{1/2}$) Toughness | 5 ~ 6 | 3.4 | 8 ~ 9 | 10.5 |
| **인장력** (Gpa) Tensile strengh | 400 ~ 800 | 1,000~3,000 | 1,260 | - |
| **압축강도** (Gpa) Compressive strength | 16.0 | 9.0 | 7.6 | 6.1 |
| **항절력** (Gpa) TRS | 1.3 | 2.9 | 1.2 | 2.4 |

*CVD diamond is a binderless- pure crystal, delivering identical properties of single diamond crystal. JJ TOOLS is applying the latest CVD coating technology which has no residual stress at the interface for extending tool life.*

*CVD 다이아몬드는 바인더(활성계면제)가 없는 순수결정체로서 단결정 다이아몬드와 동일한 특성을 나타내며, 변형없는 코팅의 우수함으로 강력한 절삭력과 공구수명이 향상됩니다.*

FINISHING 초경 정삭용 인서트

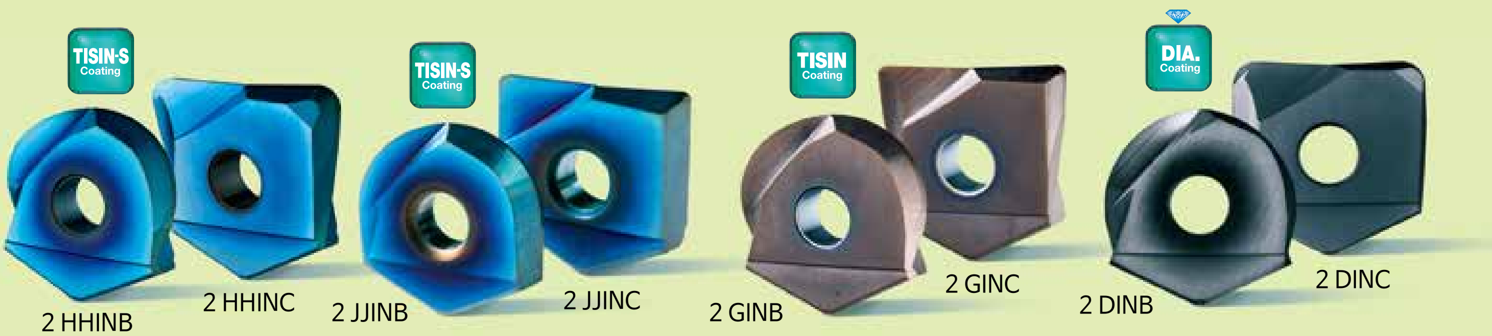
# INSERT

## High quality surface roughness with great clamping precision !

## 높은 체결 정밀도 고품질의 절삭면 구현!

- Ball Inserts for hardened steels (~HRc62), pre-hardened and graphite(DIA Coating) materials.
- Optimum for wear resistance by TISIN-S coating.
- Excellent clamping precision when clamping insert.
- Excellent concentricity when clamping inserts.

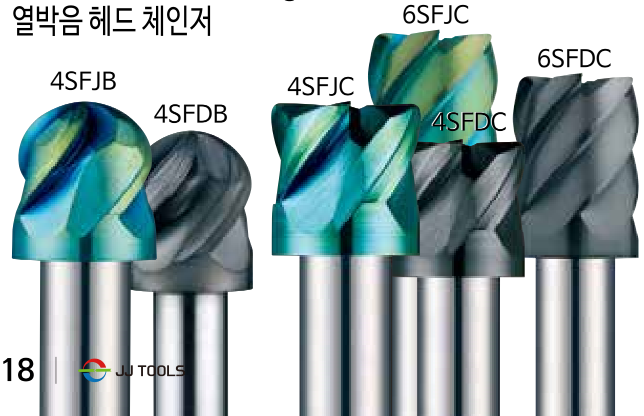
- 고경도강(HRc62이하), 프리하든강 계열의 고정밀 가공인서트, 흑연(DIA코팅)
- TISIN-S 코팅 처리하여 인선부 내마모성이 탁월합니다.
- 인서트 체결시 체결 정밀도가 뛰어납니다.
- 인서트 체결시 동심도가 탁월합니다.




for hardened Steels | for Pre-hardened Steels | for Pre-hardened Steels | for Graphite

## New Products

Shirink-Fit Head Changer
열박음 헤드 체인저




- Shrink fit inserts for hardened steel (HRc52~62), pre-hardened steel, graphite(DIA Coating).
- Excellent holding power and concentricity keeping are available by shrink fitting holder.
- Maximize cutting force by applying the new helix edge design.
- Minimize fracturing by high TRS fine (0.4㎛) WC grade.

- 고경도강(HRc52~62),프리하든강, 흑연(DIA코팅) 계열의고정밀가공 열박음 인서트
- 열박음 홀더 체결시 높은 파지력과 뛰어난 동심도 유지가 가능합니다.
- 헬릭스 형상의 인선부를 설계하여, 절삭력이 향상되었습니다.
- 항절력이 높은 미립자 초경합금(0.4㎛)을채택, 인서트의 파손을 최소화 하였습니다.

# LOW Price HIGH Performance

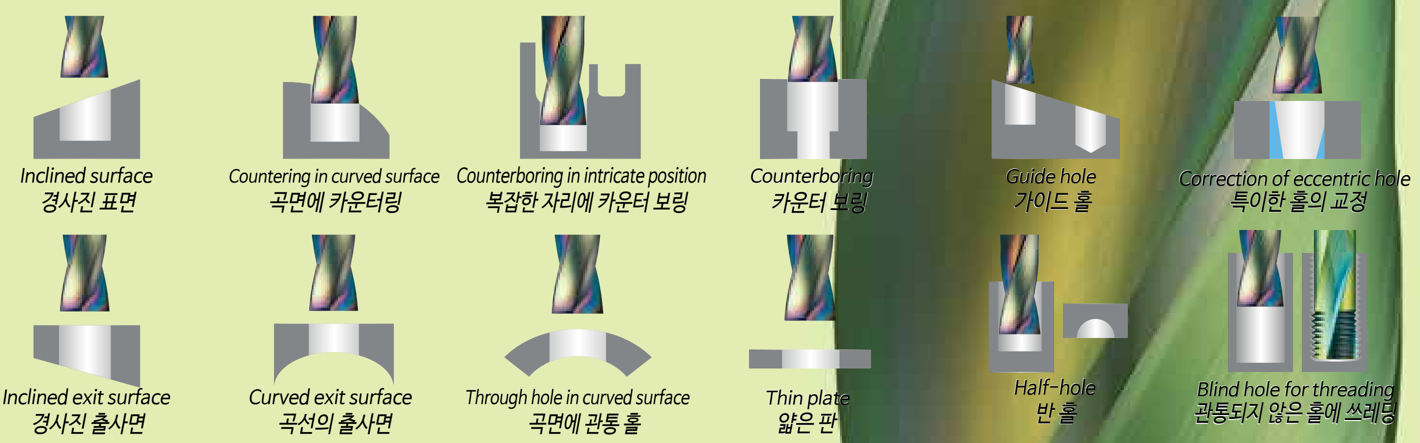
Price Satisfaction, Performance Satisfaction - Multi functional Flat Drill Series

# FLAT DRILL

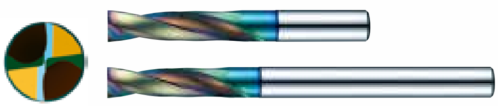
가격만족, 성능만족- 다기능 플랫드릴 시리즈


## Multiple processing is available with one drill !

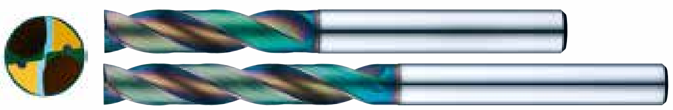
하나의 드릴로 다양한 가공 가능




Helix 20˚, Excellent chip emission !
헬릭스 20˚, 뛰어난 칩 배출력 !



Helix 24~30˚, Coolant hole type !
헬릭스 24~30˚, 오일 홀 타입 적용 !



**Double Satisfaction!**
**Customized carbide drill to be coated for various workpieces**

# 2DUBE DRILL series

NEW

## 두배 만족! 피삭재 맞춤 코팅 전용 드릴

## Enhance Durability !
뛰어난 내구성!

## Reduce Cutting Resistance !
절삭저항 감소 !

### 2DUBES

TISIN + @ Base for a Wide Range of Cutting Conditions
up to HRC 48! Applied HR Coating for Maximizing Tool Lifespan
with Excellent Wear Resistance and Chipping Resistance!
TISIN + @ Base로 HRC 48이하의 광범위한 절삭영역!
우수한 내마모성과 내치핑성으로 공구의 수명을 극대화
시키는 HR코팅 적용!

HR coating

### 2DUBEW

CROSS CUT coating

ALCRN + @ Base for Optimized High-Speed Drilling of SUS and Titanium!
Applied Cross Cut Coating with Exceptional Wear Uniformity
and Heat Resistance through a Unique Nanostructure!
ALCRN + @ Base로 SUS 및 Titanium 등 강력한 고속 드릴링의 최적화!
독특한 나노구조로 균일 마모의 특성과 내열성이 뛰어난 Cross Cut 코팅 적용!

### 2DUBE

### 4DUBE

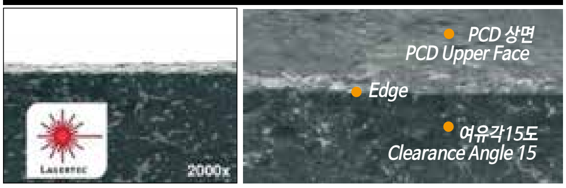
T-CRO coating

ALCRN + @ Base for Minimizing Chip Adhesion with Excellent
Wear Uniformity and High Surface Finish!
Applied TCRO Coating for Outstanding Chip Evacuation
with a Unique Nanostructure!
ALCRN + @ Base로 HRC 28이하의 뛰어난 이형성과 저 마찰로
배출되는 칩의 융착을 최소화!
높은 표면처리로 탁월한 칩 배출의 TCRO 코팅 적용!

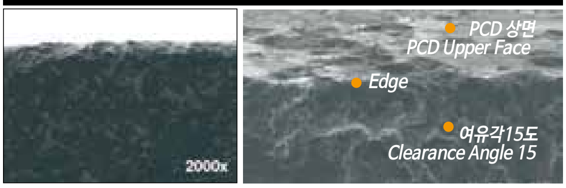
## This will change the meaning of innovation !
## 지금까지의 혁신의 의미를 바꾼다 !

레이저가공한인선부Laser Processed Edge




QXD 와이어가공인선부Wire Cutting Processed




### Advantages of Laser cutting 레이저 가공의 장점

- The sharpness of the edge can be achieved below 5㎛, minimizing damage to the work material during machining, and improve cutting force to maximize machining performance and surface roughness.
- Laser processing can be applied in ㎛ units, and 5-axis machining can produce and process various shapes. Also, it has the best performance with precise R shape.
- Chip breaker processing method can only be produced by laser processing, preventing chip load in advance, and minimizing bad effects on the work materials caused by chip.
- 인선부의 Sharpness를 5㎛이하로 가공이 가능하여, 정밀한 R형상 구현에 최고의 성능을 발휘합니다.
- 피삭재에 가해지는 데미지는 최소화하고 가공성은 극대화 함으로써, 가공물의 조도가 우수합니다.
- 칩 브레이커 가공이 가능하여, 칩 말림을 방지하고 칩으로 인한 악영향을 최소화합니다.

# Laser machining method to achieve ultimate surface roughness
## 최상의표면조도를 위한 레이저 가공

## PCD (Polycrystalline diamond) EndMills series
## PCD 엔드밀 시리즈

**Endmills for Graphite, Aluminum, AL alloy, non-ferrous and non-metallic materials.**

**흑연, 알루미늄 및 알루미늄 합금 등 비철, 비금속 전용**

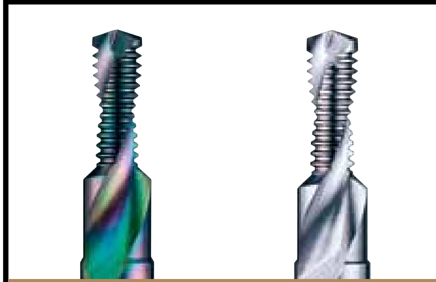
- Using PCD (Polycrystalline Diamond) tool to cut aluminum or copper alloys, the machining accuracy is excellet, and surface roughness such as mirror finishing can be achieved.
- PCD has very high hardness and can also be applied to cutting ceramic or ultra-hard alloy. Also, the thermal conductivity is very high, indicating suitability cutting titanium alloy.

- 알루미늄 합금이나 동 합금 가공시 가공 정밀도가 매우 우수하고, 경면과 같은 표면조도를 얻을 수 있습니다.
- PCD는 경도가 매우 높아 세라믹이나 초경합금의 절삭이 가능하며, 열전도율 또한 우수해 Ti합금 등의 절삭시에도 탁월한 성능을 발휘합니다.

### 4ETM Series

| for Steel | for AL | for SUS |
|---|---|---|
| TISIN-S | R-TAC | HR |

### 2DTM Series



| for Aluminum | |
|---|---|
| R-TAC | Un coated |

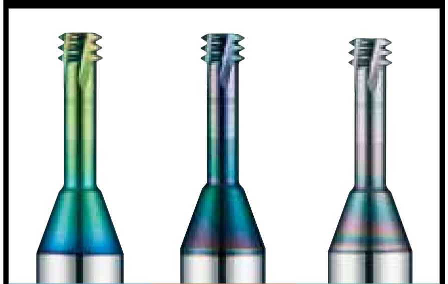
### 4MTM Series

| for Steel | for AL | for SUS |
|---|---|---|
| TISIN-S | R-TAC | HR |

# Lineup optimized for threading suitable for various work materials.

## 다양한 피삭재에 맞춘 나사가공에 최적화된 라인업 !

### 4STM Series

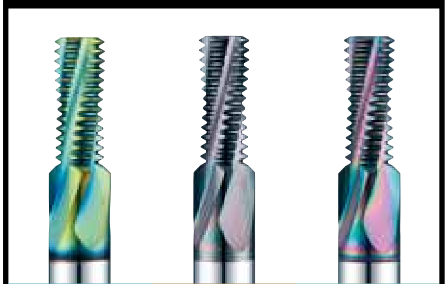


| for Steel | for AL | for SUS |
|---|---|---|
| TISIN-S | R-TAC | HR |

### 4HTM Series

| for Steel | for AL | for SUS |
|---|---|---|
| TISIN-S | R-TAC | HR |

### 4NPTM Series

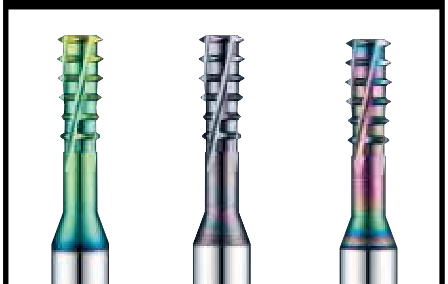


| for Steel | for AL | for SUS |
|---|---|---|
| TISIN-S | R-TAC | HR |

### 4BSTM Series

| for Steel | for AL | for SUS |
|---|---|---|
| TISIN-S | R-TAC | HR |

### 4NKTM Series



| for Steel | for AL | for SUS |
|---|---|---|
| TISIN-S | R-TAC | HR |

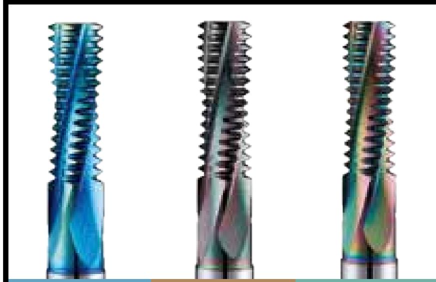
### 4IMTM Series

| for Steel | for AL | for SUS |
|---|---|---|
| TISIN-S | R-TAC | HR |

## 4ETMR Series

| for Steel | for AL | for SUS |
|---|---|---|
| TISIN-S | R-TAC | HR |

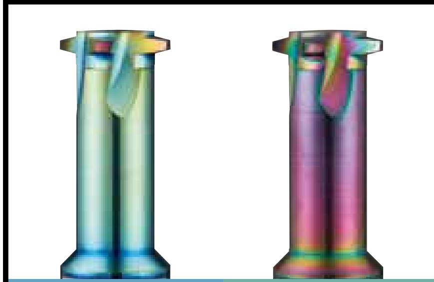
## 4LTM Series



| for Steel | for AL | for SUS |
|---|---|---|
| TISIN-S | R-TAC | HR |

## TRTM Series

New



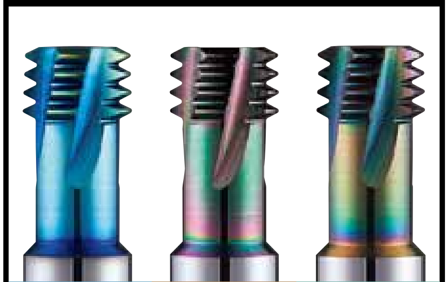
| for Steel | for SUS |
|---|---|
| TISIN-S | HR |

Various Products Lineup !

# THREAD MILLS

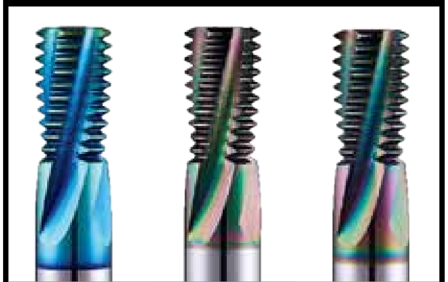
- *High-precision chucking system, which has same or higher level of clamping power as shrink-fit chuck or hydraulic chuck, is recommended for thread milling operations below M6.*
- *M6 이하의 쓰레드밀 작업시 열박음척, 유압척 이상의 고정밀 척킹 시스템을 권장합니다.*

## 4BSP Series



| for Steel | for AL | for SUS |
|---|---|---|
| TISIN-S | R-TAC | HR |

## 4HBSP Series

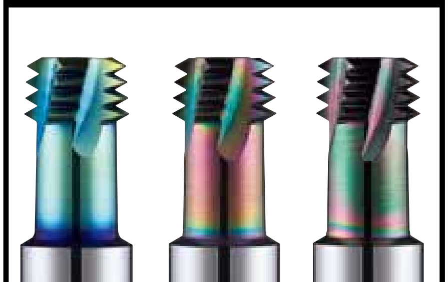


| for Steel | for AL | for SUS |
|---|---|---|
| TISIN-S | R-TAC | HR |

## 4BSPT Series

| for Steel | for AL | for SUS |
|---|---|---|
| TISIN-S | R-TAC | HR |

## 4NPTS Series



| for Steel | for AL | for SUS |
|---|---|---|
| TISIN-S | R-TAC | HR |

# Carbide End Mills INDEX

| 시리즈 SERIES | 제품 IMAGE | 품명 MODEL NO. | 크기 SIZE Ø (mm) | 페이지 PAGE | 분류 TYPE |
|---|---|---|---|---|---|
| CBN series Cubic Boron Nitride | | 2BCBN | 0.2 ~ 6 | 38 | CBN Rib Ball End Mills CBN 리브 볼 |
| | | 2SBCBN | 0.2 ~ 6 | 40 | CBN Straight Rib Ball End Mills CBN 직선날 리브 볼 |
| | | 2ECBN | 0.2 ~ 6 | 41 | CBN Rib End Mills CBN 리브 엔드밀 |
| | | 2CCBN | 0.2 ~ 6 | 43 | CBN Rib Corner Radius CBN 리브 코너 레디우스 |
| | | 2SCCBN | 0.4 ~ 6 | 46 | CBN Straight Rib Corner Radius CBN 직선날 리브 코너 레디우스 |
| | | 4SCCBN | 0.8 ~ 6 | 48 | CBN Straight Rib Corner Radius CBN 직선날 리브 코너 레디우스 |
| JJ series 고경도용 | | 2JJRB | 0.1 ~ 12 | 50 | JJ Rib Ball End Mills 제이제이 리브 볼 |
| | | 3JJRB | 1 ~ 12 | 53 | JJ Rib Ball End Mills 제이제이 리브 볼 |
| | | 2JJTB | 0.2 ~ 12 | 54 | Taper Neck Ball End Mills 제이제이 테이퍼 넥 볼 |
| | | 3JJTBS | 1 ~ 12 | 57 | Taper Neck Ball End Mills 소비자 맞춤 테이퍼 넥 볼 |
| | | 2JJSP | 1 ~ 12 | 58 | End Mills for 3D Cut 230° 3D 230° 가공용 구형 엔드밀 |
| | | 4JJSP | 1 ~ 12 | 59 | End Mills for 3D Cut 230° 3D 230° 가공용 구형 엔드밀 |
| | | 4JJSPM | 1 ~ 12 | 60 | End Mills for 3D Cut 270° 3D 270° 가공용 구형 엔드밀 |
| | | 2JJSB | 0.1 ~ 12 | 61 | JJ Short Length Ball End Mills 제이제이 짧은 길이 볼 |
| | | 2JJB | 0.1 ~ 12 | 62 | JJ Ball End Mills 제이제이 볼 |
| | | 3JJB | 1 ~ 12 | 63 | JJ Ball End Mills 제이제이 볼 |
| | | 4JJSB | 1 ~ 12 | 63 | JJ Short Length Ball End Mills 제이제이 짧은 길이 볼 |
| | | 4JJB | 1 ~ 20 | 64 | JJ Ball End Mills 제이제이 볼 |
| | | 2JJRE | 0.1 ~ 12 | 65 | JJ Rib End Mills 제이제이 리브 엔드밀 |
| | | 4JJRE | 0.5 ~ 12 | 67 | JJ Rib End Mills 제이제이 리브 엔드밀 |
| | | 2JJE | 0.03 ~ 20 | 69 | JJ End Mills 제이제이 엔드밀 |
| | | 4JJE | 0.3 ~ 20 | 70 | JJ End Mills 제이제이 엔드밀 |
| | | 4JJHE | 0.3 ~ 20 | 71 | JJ 45° Helix End Mills 제이제이45° 헬릭스엔드밀 |
| | | 6&8JJHE | 3 ~ 25 | 72 | JJ 45° Helix End Mills 제이제이45° 헬릭스엔드밀 |
| | | 2JJCR | 0.2 ~ 16 | 73 | JJ Rib Corner Radius 제이제이 리브 코너 레디우스 |
| | | 2JJTC | 1 ~ 4 | 77 | Taper Neck Corner Radius 테이퍼 넥 코너 레디우스 |
| | | 4JJCR | 0.5 ~ 12 | 79 | JJ Rib Corner Radius 제이제이 리브 코너 레디우스 |
| | | 6JJCR | 3 ~ 12 | 83 | JJ Rib Corner Radius 제이제이 리브 코너 레디우스 |
| | | 4JJTC | 1 ~ 4 | 85 | Taper Neck Corner Radius 테이퍼 넥 코너 레디우스 |
| | | 2JJC | 0.2 ~ 12 | 86 | JJ Corner Radius 제이제이 코너 레디우스 |
| | | 4JJC | 0.4 ~ 16 | 88 | JJ Corner Radius 제이제이 코너 레디우스 |
| | New | 4JJCRL | 1 ~ 20 | 90 | JJ 45° Helix Corner Radius 제이제이45° 헬릭스 코너 레디우스 |
| | | 6JJCRL | 3 ~ 16 | 91 | JJ 45° Helix Corner Radius 제이제이45° 헬릭스 코너 레디우스 |
| | | 4&6JJRC | 1 ~ 16 | 92 | High Speed Radius Cutters 고이송 코너 레디우스 커터 |
| | | 4&6JJDRC | 1 ~ 12 | 93 | JJ Double Corner Radius 제이제이 더블 코너 레디우스 |
| | | 5JJROU | 6 ~ 20 | 94 | Variable Helix Roughing 가변형 헬릭스 라핑 |
| HARD series 고속 가공용 | | 2HRB | 0.1 ~ 12 | 95 | Rib Ball End Mills 리브 볼 |
| | | 2PHCB | 0.2 ~ 12 | 98 | Ultra Precision Ball End Mills 초정밀 표준 길이 볼 |
| | | 2HSB | 0.1 ~ 12 | 99 | Short Length Ball End Mills 짧은 길이 볼 |
| | | 2HCB | 0.06 ~ 20 | 100 | Standard Length Ball End Mills 표준 길이 볼 |



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★ 최적 Most Suitable / ◎ 적합 Suitable / ○ 가능 Available

| 프리하든강 Pre-hardened Steel | 하든강 Hardened Steel ~ HRC55 | HRC55 ~ 65 | HRC65 ~ | 합금강/공구강 Alloy Steel Tool Steel | 내열 합금강 Heat Resistance Alloy | 티타늄 Titanium | 스테인레스강 Stainless Steel | 알루미늄 Aluminum | 구리 Copper | 탄소강 Carbon Steel | 흑연 Graphite | 복합소재 CFRP GFRP |
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# Carbide End Mills INDEX



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# Carbide End Mills INDEX

| 시리즈 SERIES | 제품 IMAGE | 품명 MODEL NO. | 크기 SIZE Ø (mm) | 페이지 PAGE | 분류 TYPE |
|---|---|---|---|---|---|
| G series 범용 | | 4HCEG | 0.8 ~ 20 | 154 | Standard Length End Mills 표준 길이 엔드밀 |
| | | 4LEMG | 1 ~ 25 | 155 | Long Length End Mills 긴 길이 엔드밀 |
| | | 4HEMG | 1 ~ 20 | 156 | Helix End Mills 45° 헬릭스 엔드밀 45° |
| | | 2CREG | 0.2 ~ 16 | 157 | Rib Corner Radius 리브 코너 레디우스 |
| | | 4CREG | 1 ~ 12 | 160 | Rib Corner Radius 리브 코너 레디우스 |
| | | 2NCRG | 0.4 ~ 12 | 163 | Corner Radius End Mills 코너 레디우스 |
| | | 4NCRG | 1 ~ 16 | 165 | Corner Radius End Mills 코너 레디우스 |
| | | 3&4ROUG | 4 ~ 20 | 167 | Roughing End Mills 라핑 엔드밀 |
| | | 3&4HROUG | 4 ~ 20 | 168 | 45° Helix Fine Pitch Roughing 45° 헬릭스 파인피치형 라핑 |
| New V series 고능률 범용 | | 4VSB | 1 ~ 25 | 169 | Various Symmetry End Mills 고능률 범용 볼 엔드밀 |
| | | 4VSE | 1 ~ 20 | 170 | Various Symmetry End Mills 고능률 범용 엔드밀 |
| | | 6VSE | 3 ~ 20 | 171 | Various Symmetry End Mills 고능률 범용 엔드밀 |
| | | 4SLE | 3 ~ 20 | 172 | High Speed Sloting End Mills 고속 슬로팅 엔드밀 |
| | | 4VCC | 1 ~ 20 | 173 | Various Symmetry C End Mills 고능률 범용 C 엔드밀 |
| | | 5VCC | 6 ~ 20 | 174 | Various Symmetry Corner C End Mills 고능률 범용 코너 C 엔드밀 |
| | | 4VSC | 1 ~ 20 | 175 | Various Symmetry Corner Radius End Mills 고능률 범용 코너 레디우스 엔드밀 |
| | | 6VSC | 6 ~ 20 | 176 | Various Symmetry Corner Radius End Mills 고능률 범용 코너 레디우스 엔드밀 |
| | | 7SUC | 6 ~ 20 | 177 | Non Symmetry Corner Radius 채터링 방지 코너 레디우스 |
| | | 5&6TROE | 6 ~ 20 | 178 | Trochoidal Milling End Mills 트로코이달 가공 엔드밀 |
| | | 3&4VROU | 3 ~ 20 | 179 | Various Roughing End Mills 고능률 라핑 엔드밀 |
| for GRAPHITE 흑연 가공용 | | 2GBE | 0.5 ~ 25 | 180 | Long Shank Ball End Mills 롱 생크 볼 |
| | | 2TGB | 1 ~ 12 | 181 | Taper Neck Ball End Mills 테이퍼 넥 볼 |
| | | 2GEM | 0.5 ~ 20 | 182 | Long Shank End Mills 롱 생크 엔드밀 |
| | | 4GEM | 3 ~ 20 | 183 | Long Shank End Mills 롱 생크 엔드밀 |
| | | 6GEM | 6 ~ 20 | 184 | 45° Helix Long Shank End Mills 45° 헬릭스 롱 생크 엔드밀 |
| | | 2DBE | 0.2 ~ 12 | 185 | Diamond Coated Ball End Mills 다이아몬드 코팅 볼 |
| | | 3DBE | 1 ~ 12 | 187 | Diamond Coated Ball End Mills 다이아몬드 코팅 볼 |
| | | 3TBD | 1 ~ 4 | 188 | Diamond Coated Taper Neck Ball 다이아몬드 코팅 테이퍼 넥 볼 |
| | | 4DBE | 1 ~ 12 | 189 | Diamond Coated Ball End Mills 다이아몬드 코팅 볼 |
| | | 2DEM | 0.2 ~ 12 | 190 | Diamond Coated End Mills 다이아몬드 코팅 엔드밀 |
| | | 3DEM | 1 ~ 12 | 191 | Diamond Coated End Mills 다이아몬드 코팅 엔드밀 |
| | | 4&6DEM | 2 ~ 16 | 192 | Diamond Coated End Mills 다이아몬드 코팅 엔드밀 |
| | | 2DCR | 0.2 ~ 6 | 193 | Diamond Coated Radius 다이아몬드 코팅 코너 레디우스 |
| | | 4DCR | 2 ~ 12 | 195 | Diamond Coated Radius 다이아몬드 코팅 코너 레디우스 |
| for COMPOSITE 복합소재 가공용 | | 2CPB | 0.5 ~ 12 | 196 | Ball End Mills for Composite 복합소재용 볼 |
| | | 8~12CPE | 6 ~ 12 | 196 | Finishing End Mills for Composite 복합소재용 정삭 엔드밀 |
| | | 3&4&6CPR | 6 ~ 12 | 197 | Router for Composite 복합소재용 라우터 |
| | | 6~16CPO | 2 ~ 12 | 197 | Router for Composite 복합소재용 라우터 |
| | | 2DDCA | 2 ~ 12 | 198 | Diamond Coated Drills 복합소재용 다이아몬드 코팅 드릴 |
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| | | 4SUB | 1 ~ 16 | 200 | 45° Helix Ball End Mills 45° 헬릭스 볼 |

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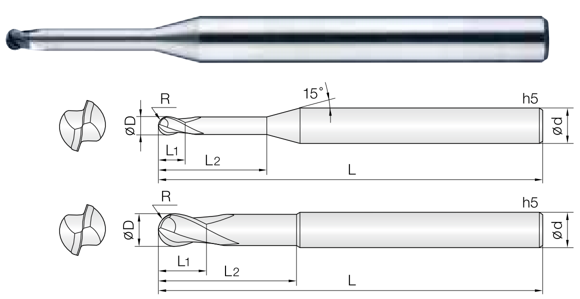
| | | | | | | | ★ | ★ | | | | ◎ |
| ○ | | | ○ | | | ★ | | | ○ | | | |
| ★ | ★ | ★ | ★ | | | | | | ◎ | | | |
| | | | | | | | ★ | ★ | | | | ◎ |
| ◎ | | | ◎ | ◎ | ★ | ★ | | | ◎ | | | |
| ★ | ◎ | ○ | ★ | | | | | | ★ | | | |
| | | | | | | | ★ | ★ | | | | ◎ |
| ○ | | | ○ | ◎ | ★ | ★ | | | ○ | | | |
| ★ | ◎ | ○ | ★ | | | | | | ◎ | | | |
| | | | | | | | ★ | ★ | | | | ◎ |
| ○ | | | ○ | ◎ | ★ | ★ | | | ○ | | | |
| ★ | ○ | | ★ | | | | | | ★ | | | |
| | | | | | | | ★ | ★ | | | | ◎ |
| ○ | | | | | | ★ | | | ○ | | | |
| ★ | ○ | | ★ | | | | | | ★ | | | |
| | | | | | | | ★ | ★ | | | | ◎ |
| ○ | | | | | | ★ | | | ○ | | | |
| | | | | | ★ | ◎ | | | | | | |
| | | | | | ★ | ◎ | | | | | | |

■ EDP. Number and Specifications are can be changed without notification for quality improvement.

# 2BCBN

## CBN, 2 Flutes High Speed Rib Ball End Mills

## 2날 CBN 고속가공용 리브 볼 엔드밀




- **고경도강(HRc50~72)의고정밀(±5㎛) 정삭 가공용 엔드밀**
- 고함량의 PCBN 소재를 적용하여 장시간가공이가능합니다.
- 날부인선의 조도가 뛰어나 경면가공에 적합합니다.
- 다양한 유효장을 적용함으로써 최상의 작업이 가능합니다.
- 오일미스트 사용을 권장하며, RPM 2만~5만 범위의 고속가공을 추천합니다
- C.B.N (Cubic Boron Nitride)

- **PCBN Endmills for precise finishing(±5㎛) of hardened steels (HRc50~72)**
- Long tool life by high content PCBN.
- Excellent surface finish.
- Various flute length for optimum performance.
- Recommend high speed(20,000~50,000RPM) with oil-mist.
- C.B.N (Cubic Boron Nitride)

2 | CBN | R ±0.005 (0.1 ~ 1.25R) | R ±0.007 (1.5 ~ 2R) | R ±0.01 (3R) | 30° Helix Angle | CUTTING DATA (410P)

| D Size | D Tolerance |
|---|---|
| Ø0.2 ~ 6 | +0 ~ -0.01mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2BCBN 002 002 S04 | 0.1R X 0.2 | 0.2 | - | 48 | 4 | |
| 2BCBN 002 004 S04 | 0.1R X 0.2 | 0.4 | - | 48 | 4 | |
| 2BCBN 003 003 S04 | 0.15R X 0.3 | 0.3 | - | 48 | 4 | |
| 2BCBN 003 005 S04 | 0.15R X 0.3 | 0.5 | - | 48 | 4 | |
| 2BCBN 004 003 S04 | 0.2R X 0.4 | 0.3 | - | 48 | 4 | |
| 2BCBN 004 010 S04 | 0.2R X 0.4 | 0.3 | 1 | 48 | 4 | |
| 2BCBN 004 015 S04 | 0.2R X 0.4 | 0.3 | 1.5 | 48 | 4 | |
| 2BCBN 004 020 S04 | 0.2R X 0.4 | 0.3 | 2 | 48 | 4 | |
| 2BCBN 004 030 S04 | 0.2R X 0.4 | 0.3 | 3 | 48 | 4 | |
| 2BCBN 004 040 S04 | 0.2R X 0.4 | 0.3 | 4 | 48 | 4 | |
| 2BCBN 004 050 S04 | 0.2R X 0.4 | 0.3 | 5 | 48 | 4 | |
| 2BCBN 004 060 S04 | 0.2R X 0.4 | 0.3 | 6 | 48 | 4 | |
| 2BCBN 005 004 S04 | 0.25R X 0.5 | 0.4 | - | 48 | 4 | |
| 2BCBN 005 010 S04 | 0.25R X 0.5 | 0.4 | 1 | 48 | 4 | |
| 2BCBN 005 015 S04 | 0.25R X 0.5 | 0.4 | 1.5 | 48 | 4 | |
| 2BCBN 005 020 S04 | 0.25R X 0.5 | 0.4 | 2 | 48 | 4 | |
| 2BCBN 005 030 S04 | 0.25R X 0.5 | 0.4 | 3 | 48 | 4 | |
| 2BCBN 005 040 S04 | 0.25R X 0.5 | 0.4 | 4 | 48 | 4 | |
| 2BCBN 005 050 S04 | 0.25R X 0.5 | 0.4 | 5 | 48 | 4 | |
| 2BCBN 005 060 S04 | 0.25R X 0.5 | 0.4 | 6 | 48 | 4 | |
| 2BCBN 005 080 S04 | 0.25R X 0.5 | 0.4 | 8 | 48 | 4 | |
| 2BCBN 006 005 S04 | 0.3R X 0.6 | 0.5 | - | 48 | 4 | |
| 2BCBN 006 010 S04 | 0.3R X 0.6 | 0.5 | 1 | 48 | 4 | |
| 2BCBN 006 015 S04 | 0.3R X 0.6 | 0.5 | 1.5 | 48 | 4 | |
| 2BCBN 006 020 S04 | 0.3R X 0.6 | 0.5 | 2 | 48 | 4 | |
| 2BCBN 006 030 S04 | 0.3R X 0.6 | 0.5 | 3 | 48 | 4 | |
| 2BCBN 006 040 S04 | 0.3R X 0.6 | 0.5 | 4 | 48 | 4 | |
| 2BCBN 006 050 S04 | 0.3R X 0.6 | 0.5 | 5 | 48 | 4 | |
| 2BCBN 006 060 S04 | 0.3R X 0.6 | 0.5 | 6 | 48 | 4 | |
| 2BCBN 006 080 S04 | 0.3R X 0.6 | 0.5 | 8 | 48 | 4 | |
| 2BCBN 006 100 S04 | 0.3R X 0.6 | 0.5 | 10 | 48 | 4 | |
| 2BCBN 007 005 S04 | 0.35R X 0.7 | 0.5 | - | 48 | 4 | |
| 2BCBN 007 010 S04 | 0.35R X 0.7 | 0.5 | 1 | 48 | 4 | |
| 2BCBN 007 020 S04 | 0.35R X 0.7 | 0.5 | 2 | 48 | 4 | |
| 2BCBN 007 040 S04 | 0.35R X 0.7 | 0.5 | 4 | 48 | 4 | |
| 2BCBN 008 006 S04 | 0.4R X 0.8 | 0.6 | - | 48 | 4 | |
| 2BCBN 008 010 S04 | 0.4R X 0.8 | 0.6 | 1 | 48 | 4 | |
| 2BCBN 008 020 S04 | 0.4R X 0.8 | 0.6 | 2 | 48 | 4 | |
| 2BCBN 008 040 S04 | 0.4R X 0.8 | 0.6 | 4 | 48 | 4 | |
| 2BCBN 008 060 S04 | 0.4R X 0.8 | 0.6 | 6 | 48 | 4 | |
| 2BCBN 008 080 S04 | 0.4R X 0.8 | 0.6 | 8 | 48 | 4 | |
| 2BCBN 008 100 S04 | 0.4R X 0.8 | 0.6 | 10 | 48 | 4 | |
| 2BCBN 009 006 S04 | 0.45R X 0.9 | 0.6 | - | 48 | 4 | |
| 2BCBN 009 010 S04 | 0.45R X 0.9 | 0.6 | 1 | 48 | 4 | |
| 2BCBN 009 020 S04 | 0.45R X 0.9 | 0.6 | 2 | 48 | 4 | |
| 2BCBN 009 040 S04 | 0.45R X 0.9 | 0.6 | 4 | 48 | 4 | |
| 2BCBN 010 007 S04 | 0.5R X 1 | 0.7 | - | 48 | 4 | |
| 2BCBN 010 015 S04 | 0.5R X 1 | 0.7 | 1.5 | 48 | 4 | |
| 2BCBN 010 025 S04 | 0.5R X 1 | 0.7 | 2.5 | 48 | 4 | |
| 2BCBN 010 040 S04 | 0.5R X 1 | 0.7 | 4 | 48 | 4 | |

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2BCBN 010 050 S04 | 0.5R X 1 | 0.7 | 5 | 48 | 4 | |
| 2BCBN 010 060 S04 | 0.5R X 1 | 0.7 | 6 | 48 | 4 | |
| 2BCBN 010 080 S04 | 0.5R X 1 | 0.7 | 8 | 48 | 4 | |
| 2BCBN 010 100 S04 | 0.5R X 1 | 0.7 | 10 | 48 | 4 | |
| 2BCBN 010 120 S04 | 0.5R X 1 | 0.7 | 12 | 48 | 4 | |
| 2BCBN 010 160 S04 | 0.5R X 1 | 0.7 | 16 | 48 | 4 | |
| 2BCBN 012 008 S04 | 0.6R X 1.2 | 0.8 | - | 48 | 4 | |
| 2BCBN 012 020 S04 | 0.6R X 1.2 | 0.8 | 2 | 48 | 4 | |
| 2BCBN 012 040 S04 | 0.6R X 1.2 | 0.8 | 4 | 48 | 4 | |
| 2BCBN 012 060 S04 | 0.6R X 1.2 | 0.8 | 6 | 48 | 4 | |
| 2BCBN 012 080 S04 | 0.6R X 1.2 | 0.8 | 8 | 48 | 4 | |
| 2BCBN 012 100 S04 | 0.6R X 1.2 | 0.8 | 10 | 48 | 4 | |
| 2BCBN 012 120 S04 | 0.6R X 1.2 | 0.8 | 12 | 48 | 4 | |
| 2BCBN 012 160 S04 | 0.6R X 1.2 | 0.8 | 16 | 48 | 4 | |
| 2BCBN 015 010 S04 | 0.75R X 1.5 | 1 | - | 48 | 4 | |
| 2BCBN 015 020 S04 | 0.75R X 1.5 | 1 | 2 | 48 | 4 | |
| 2BCBN 015 040 S04 | 0.75R X 1.5 | 1 | 4 | 48 | 4 | |
| 2BCBN 015 060 S04 | 0.75R X 1.5 | 1 | 6 | 48 | 4 | |
| 2BCBN 015 080 S04 | 0.75R X 1.5 | 1 | 8 | 48 | 4 | |
| 2BCBN 015 100 S04 | 0.75R X 1.5 | 1 | 10 | 48 | 4 | |
| 2BCBN 015 120 S04 | 0.75R X 1.5 | 1 | 12 | 48 | 4 | |
| 2BCBN 015 140 S04 | 0.75R X 1.5 | 1 | 14 | 48 | 4 | |
| 2BCBN 015 160 S04 | 0.75R X 1.5 | 1 | 16 | 48 | 4 | |
| 2BCBN 015 180 S04 | 0.75R X 1.5 | 1 | 18 | 48 | 4 | |
| 2BCBN 020 012 S04 | 1R X 2 | 1.2 | - | 50 | 4 | |
| 2BCBN 020 030 S04 | 1R X 2 | 1.2 | 3 | 50 | 4 | |
| 2BCBN 020 040 S04 | 1R X 2 | 1.2 | 4 | 50 | 4 | |
| 2BCBN 020 060 S04 | 1R X 2 | 1.2 | 6 | 50 | 4 | |
| 2BCBN 020 080 S04 | 1R X 2 | 1.2 | 8 | 50 | 4 | |
| 2BCBN 020 100 S04 | 1R X 2 | 1.2 | 10 | 50 | 4 | |
| 2BCBN 020 120 S04 | 1R X 2 | 1.2 | 12 | 50 | 4 | |
| 2BCBN 020 140 S04 | 1R X 2 | 1.2 | 14 | 50 | 4 | |
| 2BCBN 020 160 S04 | 1R X 2 | 1.2 | 16 | 50 | 4 | |
| 2BCBN 020 180 S04 | 1R X 2 | 1.2 | 18 | 50 | 4 | |
| 2BCBN 025 016 S06 | 1.25R X 2.5 | 1.6 | - | 66 | 6 | |
| 2BCBN 025 030 S06 | 1.25R X 2.5 | 1.6 | 3 | 66 | 6 | |
| 2BCBN 025 060 S06 | 1.25R X 2.5 | 1.6 | 6 | 66 | 6 | |
| 2BCBN 025 100 S06 | 1.25R X 2.5 | 1.6 | 10 | 66 | 6 | |
| 2BCBN 025 160 S06 | 1.25R X 2.5 | 1.6 | 16 | 66 | 6 | |
| 2BCBN 025 200 S06 | 1.25R X 2.5 | 1.6 | 20 | 66 | 6 | |
| 2BCBN 030 018 S06 | 1.5R X 3 | 1.8 | - | 66 | 6 | |
| 2BCBN 030 030 S06 | 1.5R X 3 | 1.8 | 3 | 66 | 6 | |
| 2BCBN 030 060 S06 | 1.5R X 3 | 1.8 | 6 | 66 | 6 | |
| 2BCBN 030 080 S06 | 1.5R X 3 | 1.8 | 8 | 66 | 6 | |
| 2BCBN 030 100 S06 | 1.5R X 3 | 1.8 | 10 | 66 | 6 | |
| 2BCBN 030 120 S06 | 1.5R X 3 | 1.8 | 12 | 66 | 6 | |
| 2BCBN 030 160 S06 | 1.5R X 3 | 1.8 | 16 | 66 | 6 | |
| 2BCBN 030 200 S06 | 1.5R X 3 | 1.8 | 20 | 66 | 6 | |
| 2BCBN 040 024 S06 | 2R X 4 | 2.4 | - | 66 | 6 | |
| 2BCBN 040 040 S06 | 2R X 4 | 2.4 | 4 | 66 | 6 | |

# 2BCBN

## CBN, 2 Flutes High Speed Rib Ball End Mills

## 2날 CBN 고속가공용 리브 볼 엔드밀

단위 : mm

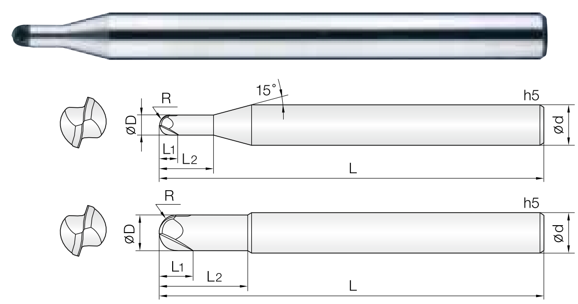
| Order Number | 날경<br>Diameter<br>R × D | 날장<br>Length of cut<br>L1 | 유효장<br>Effective Length<br>L2 | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d | 비고 |
|---|---|---|---|---|---|---|
| 2BCBN 040 060 S06 | 2R X 4 | 2.4 | 6 | 66 | 6 | |
| 2BCBN 040 080 S06 | 2R X 4 | 2.4 | 8 | 66 | 6 | |
| 2BCBN 040 100 S06 | 2R X 4 | 2.4 | 10 | 66 | 6 | |
| 2BCBN 040 120 S06 | 2R X 4 | 2.4 | 12 | 66 | 6 | |
| 2BCBN 040 160 S06 | 2R X 4 | 2.4 | 16 | 66 | 6 | |
| 2BCBN 040 200 S06 | 2R X 4 | 2.4 | 20 | 66 | 6 | |
| 2BCBN 060 035 S06 | 3R X 6 | 3.5 | – | 83 | 6 | |
| 2BCBN 060 100 S06 | 3R X 6 | 3.5 | 10 | 83 | 6 | |
| 2BCBN 060 200 S06 | 3R X 6 | 3.5 | 20 | 83 | 6 | |


| Order Number | 날경<br>Diameter<br>R × D | 날장<br>Length of cut<br>L1 | 유효장<br>Effective Length<br>L2 | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d | 비고 |
|---|---|---|---|---|---|---|

# 2SBCBN

*CBN, 2 Flutes High Speed Rib Ball End Mills*

## 2날 CBN 고속가공용 직선날 리브 볼 엔드밀




- **고경도강(HRc50~72)의고정밀(±5㎛) 정삭 가공용 엔드밀**
- 고함량의 PCBN 소재를 적용하여 장시간 가공이가능합니다.
- 날부 스트레이트 설계로 보다 높은 경면 사상가공에 적합합니다.
- 날부인선의 조도가 뛰어나 경면가공에 적합합니다.
- 오일미스트 사용을 권장하며, RPM 2만~5만 범위의 고속가공을 추천합니다.
- C.B.N (Cubic Boron Nitride)

- **PCBN Endmills for precise finishing(±5㎛) of hardened steels (HRc50~72)**
- Long tool life by high content PCBN.
- The edge straight design is suitable for higher slope terrain machining.
- Excellent surface finish.
- Recommend high speed(20,000~50,000RPM) with oil-mist.
- C.B.N (Cubic Boron Nitride)

| 2 | CBN | R ±0.005 | R ±0.007 | R ±0.01 | 0° Helix Angle | CUTTING DATA |
|---|---|---|---|---|---|---|
| | | 0.1 ~ 1.25R | 1.5 ~ 2R | 3R | | 410P |

| D Size | D Tolerance |
|---|---|
| Ø0.2 ~ 6 | +0 ~ -0.01mm |

단위 : mm

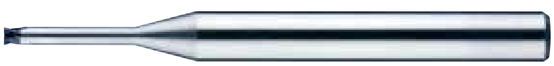
| Order Number | 날경 Diameter R×D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2SBCBN 002 002 S04 | 0.1R X 0.2 | 0.2 | - | 48 | 4 | |
| 2SBCBN 002 004 S04 | 0.1R X 0.2 | 0.4 | - | 48 | 4 | |
| 2SBCBN 003 003 S04 | 0.15R X 0.3 | 0.3 | - | 48 | 4 | |
| 2SBCBN 003 005 S04 | 0.15R X 0.3 | 0.5 | - | 48 | 4 | |
| 2SBCBN 004 003 S04 | 0.2R X 0.4 | 0.3 | - | 48 | 4 | |
| 2SBCBN 004 010 S04 | 0.2R X 0.4 | 0.3 | 1 | 48 | 4 | |
| 2SBCBN 004 015 S04 | 0.2R X 0.4 | 0.3 | 1.5 | 48 | 4 | |
| 2SBCBN 005 004 S04 | 0.25R X 0.5 | 0.4 | - | 48 | 4 | |
| 2SBCBN 005 010 S04 | 0.25R X 0.5 | 0.4 | 1 | 48 | 4 | |
| 2SBCBN 005 015 S04 | 0.25R X 0.5 | 0.4 | 1.5 | 48 | 4 | |
| 2SBCBN 005 020 S04 | 0.25R X 0.5 | 0.4 | 2 | 48 | 4 | |
| 2SBCBN 006 005 S04 | 0.3R X 0.6 | 0.5 | - | 48 | 4 | |
| 2SBCBN 006 010 S04 | 0.3R X 0.6 | 0.5 | 1 | 48 | 4 | |
| 2SBCBN 006 015 S04 | 0.3R X 0.6 | 0.5 | 1.5 | 48 | 4 | |
| 2SBCBN 006 020 S04 | 0.3R X 0.6 | 0.5 | 2 | 48 | 4 | |
| 2SBCBN 006 030 S04 | 0.3R X 0.6 | 0.5 | 3 | 48 | 4 | |
| 2SBCBN 006 040 S04 | 0.3R X 0.6 | 0.5 | 4 | 48 | 4 | |
| 2SBCBN 007 005 S04 | 0.35R X 0.7 | 0.5 | - | 48 | 4 | |
| 2SBCBN 007 010 S04 | 0.35R X 0.7 | 0.5 | 1 | 48 | 4 | |
| 2SBCBN 007 020 S04 | 0.35R X 0.7 | 0.5 | 2 | 48 | 4 | |
| 2SBCBN 008 006 S04 | 0.4R X 0.8 | 0.6 | - | 48 | 4 | |
| 2SBCBN 008 010 S04 | 0.4R X 0.8 | 0.6 | 1 | 48 | 4 | |
| 2SBCBN 008 020 S04 | 0.4R X 0.8 | 0.6 | 2 | 48 | 4 | |
| 2SBCBN 008 030 S04 | 0.4R X 0.8 | 0.6 | 3 | 48 | 4 | |
| 2SBCBN 008 040 S04 | 0.4R X 0.8 | 0.6 | 4 | 48 | 4 | |
| 2SBCBN 009 006 S04 | 0.45R X 0.9 | 0.6 | - | 48 | 4 | |
| 2SBCBN 009 010 S04 | 0.45R X 0.9 | 0.6 | 1 | 48 | 4 | |
| 2SBCBN 009 020 S04 | 0.45R X 0.9 | 0.6 | 2 | 48 | 4 | |
| 2SBCBN 010 007 S04 | 0.5R X 1 | 0.7 | - | 48 | 4 | |
| 2SBCBN 010 015 S04 | 0.5R X 1 | 0.7 | 1.5 | 48 | 4 | |
| 2SBCBN 010 025 S04 | 0.5R X 1 | 0.7 | 2.5 | 48 | 4 | |
| 2SBCBN 010 040 S04 | 0.5R X 1 | 0.7 | 4 | 48 | 4 | |
| 2SBCBN 010 050 S04 | 0.5R X 1 | 0.7 | 5 | 48 | 4 | |
| 2SBCBN 010 060 S04 | 0.5R X 1 | 0.7 | 6 | 48 | 4 | |
| 2SBCBN 012 008 S04 | 0.6R X 1.2 | 0.8 | - | 48 | 4 | |
| 2SBCBN 012 020 S04 | 0.6R X 1.2 | 0.8 | 2 | 48 | 4 | |
| 2SBCBN 012 040 S04 | 0.6R X 1.2 | 0.8 | 4 | 48 | 4 | |
| 2SBCBN 015 010 S04 | 0.75R X 1.5 | 1 | - | 48 | 4 | |
| 2SBCBN 015 020 S04 | 0.75R X 1.5 | 1 | 2 | 48 | 4 | |
| 2SBCBN 015 040 S04 | 0.75R X 1.5 | 1 | 4 | 48 | 4 | |
| 2SBCBN 015 060 S04 | 0.75R X 1.5 | 1 | 6 | 48 | 4 | |
| 2SBCBN 015 080 S04 | 0.75R X 1.5 | 1 | 8 | 48 | 4 | |
| 2SBCBN 015 100 S04 | 0.75R X 1.5 | 1 | 10 | 48 | 4 | |
| 2SBCBN 020 012 S04 | 1R X 2 | 1.2 | - | 50 | 4 | |
| 2SBCBN 020 030 S04 | 1R X 2 | 1.2 | 3 | 50 | 4 | |
| 2SBCBN 020 040 S04 | 1R X 2 | 1.2 | 4 | 50 | 4 | |
| 2SBCBN 020 060 S04 | 1R X 2 | 1.2 | 6 | 50 | 4 | |
| 2SBCBN 020 080 S04 | 1R X 2 | 1.2 | 8 | 50 | 4 | |
| 2SBCBN 020 100 S04 | 1R X 2 | 1.2 | 10 | 50 | 4 | |
| 2SBCBN 020 120 S04 | 1R X 2 | 1.2 | 12 | 50 | 4 | |

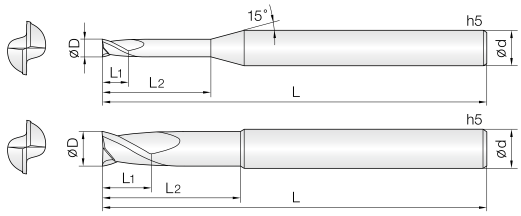
| Order Number | 날경 Diameter R×D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2SBCBN 025 016 S06 | 1.25R X 2.5 | 1.6 | - | 66 | 6 | |
| 2SBCBN 025 030 S06 | 1.25R X 2.5 | 1.6 | 3 | 66 | 6 | |
| 2SBCBN 025 060 S06 | 1.25R X 2.5 | 1.6 | 6 | 66 | 6 | |
| 2SBCBN 030 018 S06 | 1.5R X 3 | 1.8 | - | 66 | 6 | |
| 2SBCBN 030 030 S06 | 1.5R X 3 | 1.8 | 3 | 66 | 6 | |
| 2SBCBN 030 060 S06 | 1.5R X 3 | 1.8 | 6 | 66 | 6 | |
| 2SBCBN 030 080 S06 | 1.5R X 3 | 1.8 | 8 | 66 | 6 | |
| 2SBCBN 030 100 S06 | 1.5R X 3 | 1.8 | 10 | 66 | 6 | |
| 2SBCBN 030 120 S06 | 1.5R X 3 | 1.8 | 12 | 66 | 6 | |
| 2SBCBN 030 160 S06 | 1.5R X 3 | 1.8 | 16 | 66 | 6 | |
| 2SBCBN 030 200 S06 | 1.5R X 3 | 1.8 | 20 | 66 | 6 | |
| 2SBCBN 040 024 S06 | 2R X 4 | 2.4 | - | 66 | 6 | |
| 2SBCBN 040 040 S06 | 2R X 4 | 2.4 | 4 | 66 | 6 | |
| 2SBCBN 040 060 S06 | 2R X 4 | 2.4 | 6 | 66 | 6 | |
| 2SBCBN 040 080 S06 | 2R X 4 | 2.4 | 8 | 66 | 6 | |
| 2SBCBN 040 100 S06 | 2R X 4 | 2.4 | 10 | 66 | 6 | |
| 2SBCBN 040 120 S06 | 2R X 4 | 2.4 | 12 | 66 | 6 | |
| 2SBCBN 040 160 S06 | 2R X 4 | 2.4 | 16 | 66 | 6 | |
| 2SBCBN 040 200 S06 | 2R X 4 | 2.4 | 20 | 66 | 6 | |
| 2SBCBN 060 035 S06 | 3R X 6 | 3.5 | - | 83 | 6 | |
| 2SBCBN 060 100 S06 | 3R X 6 | 3.5 | 10 | 83 | 6 | |

# 2ECBN

## CBN, 2 Flutes High Speed Rib End Mills

## 2날 CBN 고속가공용 리브 엔드밀






- **고경도강(HRc50~72)의고정밀(±5㎛) 정삭 가공용 엔드밀**
- 고함량의 PCBN 소재를 적용하여 장시간 가공이 가능합니다.
- 다양한 유효장을 적용함으로써 최상의 작업이 가능합니다.
- 오일미스트 사용을 권장하며, RPM 2만~5만 범위의 고속가공을 추천합니다.
- C.B.N (Cubic Boron Nitride)

- **PCBN Endmills for precise finishing(±5㎛) of hardened steels (HRc50~72)**
- Long tool life by high content PCBN.
- Excellent surface finish.
- Various flute length for optimum performance.
- Recommend high speed(20,000~50,000RPM) with oil-mist.
- C.B.N (Cubic Boron Nitride)

2 | CBN | 30° Helix Angle | Shield Edge | CUTTING DATA 411P

| D Size | D Tolerance |
|---|---|
| Ø0.2 ~ 6 | +0 ~ -0.01mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2ECBN 002 002 S04 | 0.2 | 0.2 | - | 48 | 4 | |
| 2ECBN 002 004 S04 | 0.2 | 0.4 | - | 48 | 4 | |
| 2ECBN 003 003 S04 | 0.3 | 0.3 | - | 48 | 4 | |
| 2ECBN 003 005 S04 | 0.3 | 0.5 | - | 48 | 4 | |
| 2ECBN 004 003 S04 | 0.4 | 0.3 | - | 48 | 4 | |
| 2ECBN 004 010 S04 | 0.4 | 0.3 | 1 | 48 | 4 | |
| 2ECBN 004 015 S04 | 0.4 | 0.3 | 1.5 | 48 | 4 | |
| 2ECBN 004 020 S04 | 0.4 | 0.3 | 2 | 48 | 4 | |
| 2ECBN 004 030 S04 | 0.4 | 0.3 | 3 | 48 | 4 | |
| 2ECBN 004 040 S04 | 0.4 | 0.3 | 4 | 48 | 4 | |
| 2ECBN 004 050 S04 | 0.4 | 0.3 | 5 | 48 | 4 | |
| 2ECBN 004 060 S04 | 0.4 | 0.3 | 6 | 48 | 4 | |
| 2ECBN 005 004 S04 | 0.5 | 0.4 | - | 48 | 4 | |
| 2ECBN 005 010 S04 | 0.5 | 0.4 | 1 | 48 | 4 | |
| 2ECBN 005 015 S04 | 0.5 | 0.4 | 1.5 | 48 | 4 | |
| 2ECBN 005 020 S04 | 0.5 | 0.4 | 2 | 48 | 4 | |
| 2ECBN 005 030 S04 | 0.5 | 0.4 | 3 | 48 | 4 | |
| 2ECBN 005 040 S04 | 0.5 | 0.4 | 4 | 48 | 4 | |
| 2ECBN 005 050 S04 | 0.5 | 0.4 | 5 | 48 | 4 | |
| 2ECBN 005 060 S04 | 0.5 | 0.4 | 6 | 48 | 4 | |
| 2ECBN 005 080 S04 | 0.5 | 0.4 | 8 | 48 | 4 | |
| 2ECBN 006 005 S04 | 0.6 | 0.5 | - | 48 | 4 | |
| 2ECBN 006 010 S04 | 0.6 | 0.5 | 1 | 48 | 4 | |
| 2ECBN 006 015 S04 | 0.6 | 0.5 | 1.5 | 48 | 4 | |
| 2ECBN 006 020 S04 | 0.6 | 0.5 | 2 | 48 | 4 | |
| 2ECBN 006 030 S04 | 0.6 | 0.5 | 3 | 48 | 4 | |
| 2ECBN 006 040 S04 | 0.6 | 0.5 | 4 | 48 | 4 | |
| 2ECBN 006 060 S04 | 0.6 | 0.5 | 6 | 48 | 4 | |
| 2ECBN 006 080 S04 | 0.6 | 0.5 | 8 | 48 | 4 | |
| 2ECBN 006 100 S04 | 0.6 | 0.5 | 10 | 48 | 4 | |
| 2ECBN 007 005 S04 | 0.7 | 0.5 | - | 48 | 4 | |
| 2ECBN 007 015 S04 | 0.7 | 0.5 | 1.5 | 48 | 4 | |
| 2ECBN 007 025 S04 | 0.7 | 0.5 | 2.5 | 48 | 4 | |
| 2ECBN 007 040 S04 | 0.7 | 0.5 | 4 | 48 | 4 | |
| 2ECBN 007 060 S04 | 0.7 | 0.5 | 6 | 48 | 4 | |
| 2ECBN 008 006 S04 | 0.8 | 0.6 | - | 48 | 4 | |
| 2ECBN 008 015 S04 | 0.8 | 0.6 | 1.5 | 48 | 4 | |
| 2ECBN 008 025 S04 | 0.8 | 0.6 | 2.5 | 48 | 4 | |
| 2ECBN 008 040 S04 | 0.8 | 0.6 | 4 | 48 | 4 | |
| 2ECBN 008 060 S04 | 0.8 | 0.6 | 6 | 48 | 4 | |
| 2ECBN 008 080 S04 | 0.8 | 0.6 | 8 | 48 | 4 | |
| 2ECBN 008 100 S04 | 0.8 | 0.6 | 10 | 48 | 4 | |
| 2ECBN 009 006 S04 | 0.9 | 0.6 | - | 48 | 4 | |
| 2ECBN 009 015 S04 | 0.9 | 0.6 | 1.5 | 48 | 4 | |
| 2ECBN 009 025 S04 | 0.9 | 0.6 | 2.5 | 48 | 4 | |
| 2ECBN 009 040 S04 | 0.9 | 0.6 | 4 | 48 | 4 | |
| 2ECBN 009 060 S04 | 0.9 | 0.6 | 6 | 48 | 4 | |
| 2ECBN 009 080 S04 | 0.9 | 0.6 | 8 | 48 | 4 | |
| 2ECBN 009 100 S04 | 0.9 | 0.6 | 10 | 48 | 4 | |
| 2ECBN 010 007 S04 | 1 | 0.7 | - | 48 | 4 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2ECBN 010 015 S04 | 1 | 0.7 | 1.5 | 48 | 4 | |
| 2ECBN 010 025 S04 | 1 | 0.7 | 2.5 | 48 | 4 | |
| 2ECBN 010 040 S04 | 1 | 0.7 | 4 | 48 | 4 | |
| 2ECBN 010 050 S04 | 1 | 0.7 | 5 | 48 | 4 | |
| 2ECBN 010 060 S04 | 1 | 0.7 | 6 | 48 | 4 | |
| 2ECBN 010 080 S04 | 1 | 0.7 | 8 | 48 | 4 | |
| 2ECBN 010 100 S04 | 1 | 0.7 | 10 | 48 | 4 | |
| 2ECBN 010 120 S04 | 1 | 0.7 | 12 | 48 | 4 | |
| 2ECBN 010 140 S04 | 1 | 0.7 | 14 | 48 | 4 | |
| 2ECBN 010 160 S04 | 1 | 0.7 | 16 | 48 | 4 | |
| 2ECBN 012 007 S04 | 1.2 | 0.7 | - | 48 | 4 | |
| 2ECBN 012 015 S04 | 1.2 | 0.7 | 1.5 | 48 | 4 | |
| 2ECBN 012 030 S04 | 1.2 | 0.7 | 3 | 48 | 4 | |
| 2ECBN 012 040 S04 | 1.2 | 0.7 | 4 | 48 | 4 | |
| 2ECBN 012 060 S04 | 1.2 | 0.7 | 6 | 48 | 4 | |
| 2ECBN 012 080 S04 | 1.2 | 0.7 | 8 | 48 | 4 | |
| 2ECBN 012 100 S04 | 1.2 | 0.7 | 10 | 48 | 4 | |
| 2ECBN 012 120 S04 | 1.2 | 0.7 | 12 | 48 | 4 | |
| 2ECBN 012 160 S04 | 1.2 | 0.7 | 16 | 48 | 4 | |
| 2ECBN 015 008 S04 | 1.5 | 0.8 | - | 48 | 4 | |
| 2ECBN 015 015 S04 | 1.5 | 0.8 | 1.5 | 48 | 4 | |
| 2ECBN 015 030 S04 | 1.5 | 0.8 | 3 | 48 | 4 | |
| 2ECBN 015 060 S04 | 1.5 | 0.8 | 6 | 48 | 4 | |
| 2ECBN 015 080 S04 | 1.5 | 0.8 | 8 | 48 | 4 | |
| 2ECBN 015 100 S04 | 1.5 | 0.8 | 10 | 48 | 4 | |
| 2ECBN 015 120 S04 | 1.5 | 0.8 | 12 | 48 | 4 | |
| 2ECBN 015 140 S04 | 1.5 | 0.8 | 14 | 48 | 4 | |
| 2ECBN 015 160 S04 | 1.5 | 0.8 | 16 | 48 | 4 | |
| 2ECBN 015 180 S04 | 1.5 | 0.8 | 18 | 48 | 4 | |
| 2ECBN 020 009 S04 | 2 | 0.9 | - | 50 | 4 | |
| 2ECBN 020 020 S04 | 2 | 0.9 | 2 | 50 | 4 | |
| 2ECBN 020 030 S04 | 2 | 0.9 | 3 | 50 | 4 | |
| 2ECBN 020 060 S04 | 2 | 0.9 | 6 | 50 | 4 | |
| 2ECBN 020 080 S04 | 2 | 0.9 | 8 | 50 | 4 | |
| 2ECBN 020 100 S04 | 2 | 0.9 | 10 | 50 | 4 | |
| 2ECBN 020 120 S04 | 2 | 0.9 | 12 | 50 | 4 | |
| 2ECBN 020 140 S04 | 2 | 0.9 | 14 | 50 | 4 | |
| 2ECBN 020 160 S04 | 2 | 0.9 | 16 | 50 | 4 | |
| 2ECBN 020 180 S04 | 2 | 0.9 | 18 | 50 | 4 | |
| 2ECBN 025 012 S06 | 2.5 | 1.2 | - | 66 | 6 | |
| 2ECBN 025 030 S06 | 2.5 | 1.2 | 3 | 66 | 6 | |
| 2ECBN 025 060 S06 | 2.5 | 1.2 | 6 | 66 | 6 | |
| 2ECBN 025 100 S06 | 2.5 | 1.2 | 10 | 66 | 6 | |
| 2ECBN 025 160 S06 | 2.5 | 1.2 | 16 | 66 | 6 | |
| 2ECBN 025 200 S06 | 2.5 | 1.2 | 20 | 66 | 6 | |
| 2ECBN 030 012 S06 | 3 | 1.2 | - | 66 | 6 | |
| 2ECBN 030 030 S06 | 3 | 1.2 | 3 | 66 | 6 | |
| 2ECBN 030 060 S06 | 3 | 1.2 | 6 | 66 | 6 | |
| 2ECBN 030 080 S06 | 3 | 1.2 | 8 | 66 | 6 | |
| 2ECBN 030 100 S06 | 3 | 1.2 | 10 | 66 | 6 | |

# 2ECBN

## CBN, 2 Flutes High Speed Rib End Mills

## 2날 CBN 고속가공용 리브 엔드밀

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2ECBN 030 120 S06 | 3 | 1.2 | 12 | 66 | 6 | |
| 2ECBN 030 160 S06 | 3 | 1.2 | 16 | 66 | 6 | |
| 2ECBN 030 200 S06 | 3 | 1.2 | 20 | 66 | 6 | |
| 2ECBN 040 015 S06 | 4 | 1.5 | - | 66 | 6 | |
| 2ECBN 040 030 S06 | 4 | 1.5 | 3 | 66 | 6 | |
| 2ECBN 040 060 S06 | 4 | 1.5 | 6 | 66 | 6 | |
| 2ECBN 040 080 S06 | 4 | 1.5 | 8 | 66 | 6 | |
| 2ECBN 040 100 S06 | 4 | 1.5 | 10 | 66 | 6 | |
| 2ECBN 040 120 S06 | 4 | 1.5 | 12 | 66 | 6 | |
| 2ECBN 040 160 S06 | 4 | 1.5 | 16 | 66 | 6 | |
| 2ECBN 040 200 S06 | 4 | 1.5 | 20 | 66 | 6 | |
| 2ECBN 060 030 S06 | 6 | 3 | - | 83 | 6 | |
| 2ECBN 060 100 S06 | 6 | 3 | 10 | 83 | 6 | |
| 2ECBN 060 200 S06 | 6 | 3 | 20 | 83 | 6 | |

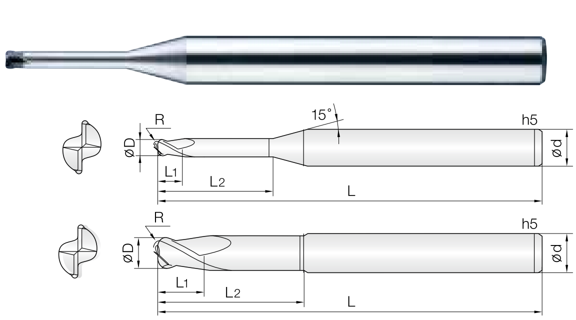
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

# 2CCBN

## CBN, 2 Flutes High Speed Rib Corner Radius End Mills

## 2날 CBN 고속가공용 리브 코너 레디우스 엔드밀






- **고경도강(HRc50~72)의고정밀(±5㎛) 정삭 가공용 엔드밀**
- 고함량의 PCBN 소재를 적용하여 장시간 가공이 가능합니다.
- 날부인선의 조도가 뛰어나 경면가공에 적합 합니다.
- 다양한 유효장을 적용함으로써 최상의 작업이 가능합니다.
- 오일미스트 사용을 권장하며, RPM 2만~5만 범위의 고속가공을 추천합니다.
- C.B.N (Cubic Boron Nitride)

- **PCBN Endmills for precise finishing(±5㎛) of hardened steel (HRc50~72)**
- Long tool life by high content PCBN.
- Excellent surface finish.
- Various flute length for optimum performance.
- Recommend high speed(20,000~50,000RPM) with oil-mist.
- C.B.N (Cubic Boron Nitride)

2 | CBN | R ±0.005 | 30° Helix Angle | CUTTING DATA

R0.02 ~ 1 | 411P

| D Size | D Tolerance |
|---|---|
| Ø0.2 ~ 6 | +0 ~ -0.01mm |

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CCBN 002 0002 002 | 0.2 X R0.02 | 0.2 | - | 48 | 4 | |
| 2CCBN 002 0002 004 | 0.2 X R0.02 | 0.4 | - | 48 | 4 | |
| 2CCBN 002 0005 002 | 0.2 X R0.05 | 0.2 | - | 48 | 4 | |
| 2CCBN 002 0005 004 | 0.2 X R0.05 | 0.4 | - | 48 | 4 | |
| 2CCBN 003 0002 003 | 0.3 X R0.02 | 0.3 | - | 48 | 4 | |
| 2CCBN 003 0002 005 | 0.3 X R0.02 | 0.5 | - | 48 | 4 | |
| 2CCBN 003 0005 003 | 0.3 X R0.05 | 0.3 | - | 48 | 4 | |
| 2CCBN 003 0005 005 | 0.3 X R0.05 | 0.5 | - | 48 | 4 | |
| 2CCBN 004 0002 003 | 0.4 X R0.02 | 0.3 | - | 48 | 4 | |
| 2CCBN 004 0002 015 | 0.4 X R0.02 | 0.3 | 1.5 | 48 | 4 | |
| 2CCBN 004 0002 020 | 0.4 X R0.02 | 0.3 | 2 | 48 | 4 | |
| 2CCBN 004 0005 003 | 0.4 X R0.05 | 0.3 | - | 48 | 4 | |
| 2CCBN 004 0005 015 | 0.4 X R0.05 | 0.3 | 1.5 | 48 | 4 | |
| 2CCBN 004 0005 020 | 0.4 X R0.05 | 0.3 | 2 | 48 | 4 | |
| 2CCBN 004 001 003 | 0.4 X R0.1 | 0.3 | - | 48 | 4 | |
| 2CCBN 004 001 015 | 0.4 X R0.1 | 0.3 | 1.5 | 48 | 4 | |
| 2CCBN 004 001 020 | 0.4 X R0.1 | 0.3 | 2 | 48 | 4 | |
| 2CCBN 005 0005 004 | 0.5 X R0.05 | 0.4 | - | 48 | 4 | |
| 2CCBN 005 0005 015 | 0.5 X R0.05 | 0.4 | 1.5 | 48 | 4 | |
| 2CCBN 005 0005 020 | 0.5 X R0.05 | 0.4 | 2 | 48 | 4 | |
| 2CCBN 005 0005 030 | 0.5 X R0.05 | 0.4 | 3 | 48 | 4 | |
| 2CCBN 005 0005 040 | 0.5 X R0.05 | 0.4 | 4 | 48 | 4 | |
| 2CCBN 005 0005 050 | 0.5 X R0.05 | 0.4 | 5 | 48 | 4 | |
| 2CCBN 005 001 004 | 0.5 X R0.1 | 0.4 | - | 48 | 4 | |
| 2CCBN 005 001 015 | 0.5 X R0.1 | 0.4 | 1.5 | 48 | 4 | |
| 2CCBN 005 001 020 | 0.5 X R0.1 | 0.4 | 2 | 48 | 4 | |
| 2CCBN 005 001 030 | 0.5 X R0.1 | 0.4 | 3 | 48 | 4 | |
| 2CCBN 005 001 040 | 0.5 X R0.1 | 0.4 | 4 | 48 | 4 | |
| 2CCBN 005 001 050 | 0.5 X R0.1 | 0.4 | 5 | 48 | 4 | |
| 2CCBN 006 0005 005 | 0.6 X R0.05 | 0.5 | - | 48 | 4 | |
| 2CCBN 006 0005 020 | 0.6 X R0.05 | 0.5 | 2 | 48 | 4 | |
| 2CCBN 006 0005 030 | 0.6 X R0.05 | 0.5 | 3 | 48 | 4 | |
| 2CCBN 006 0005 040 | 0.6 X R0.05 | 0.5 | 4 | 48 | 4 | |
| 2CCBN 006 0005 060 | 0.6 X R0.05 | 0.5 | 6 | 48 | 4 | |
| 2CCBN 006 001 005 | 0.6 X R0.1 | 0.5 | - | 48 | 4 | |
| 2CCBN 006 001 020 | 0.6 X R0.1 | 0.5 | 2 | 48 | 4 | |
| 2CCBN 006 001 030 | 0.6 X R0.1 | 0.5 | 3 | 48 | 4 | |
| 2CCBN 006 001 040 | 0.6 X R0.1 | 0.5 | 4 | 48 | 4 | |
| 2CCBN 006 001 060 | 0.6 X R0.1 | 0.5 | 6 | 48 | 4 | |
| 2CCBN 007 001 005 | 0.7 X R0.1 | 0.5 | - | 48 | 4 | |
| 2CCBN 007 001 025 | 0.7 X R0.1 | 0.5 | 2.5 | 48 | 4 | |
| 2CCBN 007 001 040 | 0.7 X R0.1 | 0.5 | 4 | 48 | 4 | |
| 2CCBN 007 001 060 | 0.7 X R0.1 | 0.5 | 6 | 48 | 4 | |
| 2CCBN 008 001 006 | 0.8 X R0.1 | 0.6 | - | 48 | 4 | |
| 2CCBN 008 001 025 | 0.8 X R0.1 | 0.6 | 2.5 | 48 | 4 | |
| 2CCBN 008 001 040 | 0.8 X R0.1 | 0.6 | 4 | 48 | 4 | |
| 2CCBN 008 001 060 | 0.8 X R0.1 | 0.6 | 6 | 48 | 4 | |
| 2CCBN 008 002 006 | 0.8 X R0.2 | 0.6 | - | 48 | 4 | |
| 2CCBN 008 002 025 | 0.8 X R0.2 | 0.6 | 2.5 | 48 | 4 | |
| 2CCBN 008 002 040 | 0.8 X R0.2 | 0.6 | 4 | 48 | 4 | |

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CCBN 008 002 060 | 0.8 X R0.2 | 0.6 | 6 | 48 | 4 | |
| 2CCBN 010 0002 007 | 1 X R0.02 | 0.7 | - | 48 | 4 | |
| 2CCBN 010 0002 015 | 1 X R0.02 | 0.7 | 1.5 | 48 | 4 | |
| 2CCBN 010 0002 025 | 1 X R0.02 | 0.7 | 2.5 | 48 | 4 | |
| 2CCBN 010 0002 040 | 1 X R0.02 | 0.7 | 4 | 48 | 4 | |
| 2CCBN 010 0002 060 | 1 X R0.02 | 0.7 | 6 | 48 | 4 | |
| 2CCBN 010 0002 080 | 1 X R0.02 | 0.7 | 8 | 48 | 4 | |
| 2CCBN 010 0002 100 | 1 X R0.02 | 0.7 | 10 | 48 | 4 | |
| 2CCBN 010 0005 007 | 1 X R0.05 | 0.7 | - | 48 | 4 | |
| 2CCBN 010 0005 015 | 1 X R0.05 | 0.7 | 1.5 | 48 | 4 | |
| 2CCBN 010 0005 025 | 1 X R0.05 | 0.7 | 2.5 | 48 | 4 | |
| 2CCBN 010 0005 040 | 1 X R0.05 | 0.7 | 4 | 48 | 4 | |
| 2CCBN 010 0005 060 | 1 X R0.05 | 0.7 | 6 | 48 | 4 | |
| 2CCBN 010 0005 080 | 1 X R0.05 | 0.7 | 8 | 48 | 4 | |
| 2CCBN 010 0005 100 | 1 X R0.05 | 0.7 | 10 | 48 | 4 | |
| 2CCBN 010 001 007 | 1 X R0.1 | 0.7 | - | 48 | 4 | |
| 2CCBN 010 001 015 | 1 X R0.1 | 0.7 | 1.5 | 48 | 4 | |
| 2CCBN 010 001 025 | 1 X R0.1 | 0.7 | 2.5 | 48 | 4 | |
| 2CCBN 010 001 040 | 1 X R0.1 | 0.7 | 4 | 48 | 4 | |
| 2CCBN 010 001 060 | 1 X R0.1 | 0.7 | 6 | 48 | 4 | |
| 2CCBN 010 001 080 | 1 X R0.1 | 0.7 | 8 | 48 | 4 | |
| 2CCBN 010 001 100 | 1 X R0.1 | 0.7 | 10 | 48 | 4 | |
| 2CCBN 010 002 007 | 1 X R0.2 | 0.7 | - | 48 | 4 | |
| 2CCBN 010 002 015 | 1 X R0.2 | 0.7 | 1.5 | 48 | 4 | |
| 2CCBN 010 002 025 | 1 X R0.2 | 0.7 | 2.5 | 48 | 4 | |
| 2CCBN 010 002 040 | 1 X R0.2 | 0.7 | 4 | 48 | 4 | |
| 2CCBN 010 002 060 | 1 X R0.2 | 0.7 | 6 | 48 | 4 | |
| 2CCBN 010 002 080 | 1 X R0.2 | 0.7 | 8 | 48 | 4 | |
| 2CCBN 010 002 100 | 1 X R0.2 | 0.7 | 10 | 48 | 4 | |
| 2CCBN 010 003 007 | 1 X R0.3 | 0.7 | - | 48 | 4 | |
| 2CCBN 010 003 015 | 1 X R0.3 | 0.7 | 1.5 | 48 | 4 | |
| 2CCBN 010 003 025 | 1 X R0.3 | 0.7 | 2.5 | 48 | 4 | |
| 2CCBN 010 003 040 | 1 X R0.3 | 0.7 | 4 | 48 | 4 | |
| 2CCBN 010 003 060 | 1 X R0.3 | 0.7 | 6 | 48 | 4 | |
| 2CCBN 010 003 080 | 1 X R0.3 | 0.7 | 8 | 48 | 4 | |
| 2CCBN 010 003 100 | 1 X R0.3 | 0.7 | 10 | 48 | 4 | |
| 2CCBN 012 001 007 | 1.2 X R0.1 | 0.7 | - | 48 | 4 | |
| 2CCBN 012 001 015 | 1.2 X R0.1 | 0.7 | 1.5 | 48 | 4 | |
| 2CCBN 012 001 030 | 1.2 X R0.1 | 0.7 | 3 | 48 | 4 | |
| 2CCBN 012 001 040 | 1.2 X R0.1 | 0.7 | 4 | 48 | 4 | |
| 2CCBN 012 001 060 | 1.2 X R0.1 | 0.7 | 6 | 48 | 4 | |
| 2CCBN 012 001 080 | 1.2 X R0.1 | 0.7 | 8 | 48 | 4 | |
| 2CCBN 012 001 100 | 1.2 X R0.1 | 0.7 | 10 | 48 | 4 | |
| 2CCBN 012 002 007 | 1.2 X R0.2 | 0.7 | - | 48 | 4 | |
| 2CCBN 012 002 015 | 1.2 X R0.2 | 0.7 | 1.5 | 48 | 4 | |
| 2CCBN 012 002 030 | 1.2 X R0.2 | 0.7 | 3 | 48 | 4 | |
| 2CCBN 012 002 040 | 1.2 X R0.2 | 0.7 | 4 | 48 | 4 | |
| 2CCBN 012 002 060 | 1.2 X R0.2 | 0.7 | 6 | 48 | 4 | |
| 2CCBN 012 002 080 | 1.2 X R0.2 | 0.7 | 8 | 48 | 4 | |
| 2CCBN 012 002 100 | 1.2 X R0.2 | 0.7 | 10 | 48 | 4 | |

# 2CCBN

## CBN, 2 Flutes High Speed Rib Corner Radius End Mills

## 2날 CBN 고속가공용 리브 코너 레디우스 엔드밀

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CCBN 012 003 007 | 1.2 X R0.3 | 0.7 | - | 48 | 4 | |
| 2CCBN 012 003 015 | 1.2 X R0.3 | 0.7 | 1.5 | 48 | 4 | |
| 2CCBN 012 003 030 | 1.2 X R0.3 | 0.7 | 3 | 48 | 4 | |
| 2CCBN 012 003 040 | 1.2 X R0.3 | 0.7 | 4 | 48 | 4 | |
| 2CCBN 012 003 060 | 1.2 X R0.3 | 0.7 | 6 | 48 | 4 | |
| 2CCBN 012 003 080 | 1.2 X R0.3 | 0.7 | 8 | 48 | 4 | |
| 2CCBN 012 003 100 | 1.2 X R0.3 | 0.7 | 10 | 48 | 4 | |
| 2CCBN 015 0002 008 | 1.5 X R0.02 | 0.8 | - | 48 | 4 | |
| 2CCBN 015 0002 015 | 1.5 X R0.02 | 0.8 | 1.5 | 48 | 4 | |
| 2CCBN 015 0002 030 | 1.5 X R0.02 | 0.8 | 3 | 48 | 4 | |
| 2CCBN 015 0002 040 | 1.5 X R0.02 | 0.8 | 4 | 48 | 4 | |
| 2CCBN 015 0002 060 | 1.5 X R0.02 | 0.8 | 6 | 48 | 4 | |
| 2CCBN 015 0002 080 | 1.5 X R0.02 | 0.8 | 8 | 48 | 4 | |
| 2CCBN 015 0002 100 | 1.5 X R0.02 | 0.8 | 10 | 48 | 4 | |
| 2CCBN 015 0005 008 | 1.5 X R0.05 | 0.8 | - | 48 | 4 | |
| 2CCBN 015 0005 015 | 1.5 X R0.05 | 0.8 | 1.5 | 48 | 4 | |
| 2CCBN 015 0005 030 | 1.5 X R0.05 | 0.8 | 3 | 48 | 4 | |
| 2CCBN 015 0005 040 | 1.5 X R0.05 | 0.8 | 4 | 48 | 4 | |
| 2CCBN 015 0005 060 | 1.5 X R0.05 | 0.8 | 6 | 48 | 4 | |
| 2CCBN 015 0005 080 | 1.5 X R0.05 | 0.8 | 8 | 48 | 4 | |
| 2CCBN 015 0005 100 | 1.5 X R0.05 | 0.8 | 10 | 48 | 4 | |
| 2CCBN 015 001 008 | 1.5 X R0.1 | 0.8 | - | 48 | 4 | |
| 2CCBN 015 001 015 | 1.5 X R0.1 | 0.8 | 1.5 | 48 | 4 | |
| 2CCBN 015 001 030 | 1.5 X R0.1 | 0.8 | 3 | 48 | 4 | |
| 2CCBN 015 001 040 | 1.5 X R0.1 | 0.8 | 4 | 48 | 4 | |
| 2CCBN 015 001 060 | 1.5 X R0.1 | 0.8 | 6 | 48 | 4 | |
| 2CCBN 015 001 080 | 1.5 X R0.1 | 0.8 | 8 | 48 | 4 | |
| 2CCBN 015 001 100 | 1.5 X R0.1 | 0.8 | 10 | 48 | 4 | |
| 2CCBN 015 002 008 | 1.5 X R0.2 | 0.8 | - | 48 | 4 | |
| 2CCBN 015 002 015 | 1.5 X R0.2 | 0.8 | 1.5 | 48 | 4 | |
| 2CCBN 015 002 030 | 1.5 X R0.2 | 0.8 | 3 | 48 | 4 | |
| 2CCBN 015 002 040 | 1.5 X R0.2 | 0.8 | 4 | 48 | 4 | |
| 2CCBN 015 002 060 | 1.5 X R0.2 | 0.8 | 6 | 48 | 4 | |
| 2CCBN 015 002 080 | 1.5 X R0.2 | 0.8 | 8 | 48 | 4 | |
| 2CCBN 015 002 100 | 1.5 X R0.2 | 0.8 | 10 | 48 | 4 | |
| 2CCBN 015 003 008 | 1.5 X R0.3 | 0.8 | - | 48 | 4 | |
| 2CCBN 015 003 015 | 1.5 X R0.3 | 0.8 | 1.5 | 48 | 4 | |
| 2CCBN 015 003 030 | 1.5 X R0.3 | 0.8 | 3 | 48 | 4 | |
| 2CCBN 015 003 040 | 1.5 X R0.3 | 0.8 | 4 | 48 | 4 | |
| 2CCBN 015 003 060 | 1.5 X R0.3 | 0.8 | 6 | 48 | 4 | |
| 2CCBN 015 003 080 | 1.5 X R0.3 | 0.8 | 8 | 48 | 4 | |
| 2CCBN 015 003 100 | 1.5 X R0.3 | 0.8 | 10 | 48 | 4 | |
| 2CCBN 020 0002 009 | 2 X R0.02 | 0.9 | - | 50 | 4 | |
| 2CCBN 020 0002 020 | 2 X R0.02 | 0.9 | 2 | 50 | 4 | |
| 2CCBN 020 0002 030 | 2 X R0.02 | 0.9 | 3 | 50 | 4 | |
| 2CCBN 020 0002 060 | 2 X R0.02 | 0.9 | 6 | 50 | 4 | |
| 2CCBN 020 0002 080 | 2 X R0.02 | 0.9 | 8 | 50 | 4 | |
| 2CCBN 020 0002 100 | 2 X R0.02 | 0.9 | 10 | 50 | 4 | |
| 2CCBN 020 0005 009 | 2 X R0.05 | 0.9 | - | 50 | 4 | |
| 2CCBN 020 0005 020 | 2 X R0.05 | 0.9 | 2 | 50 | 4 | |
| 2CCBN 020 0005 030 | 2 X R0.05 | 0.9 | 3 | 50 | 4 | |
| 2CCBN 020 0005 060 | 2 X R0.05 | 0.9 | 6 | 50 | 4 | |
| 2CCBN 020 0005 080 | 2 X R0.05 | 0.9 | 8 | 50 | 4 | |
| 2CCBN 020 0005 100 | 2 X R0.05 | 0.9 | 10 | 50 | 4 | |
| 2CCBN 020 001 009 | 2 X R0.1 | 0.9 | - | 50 | 4 | |
| 2CCBN 020 001 020 | 2 X R0.1 | 0.9 | 2 | 50 | 4 | |
| 2CCBN 020 001 030 | 2 X R0.1 | 0.9 | 3 | 50 | 4 | |
| 2CCBN 020 001 060 | 2 X R0.1 | 0.9 | 6 | 50 | 4 | |
| 2CCBN 020 001 080 | 2 X R0.1 | 0.9 | 8 | 50 | 4 | |
| 2CCBN 020 001 100 | 2 X R0.1 | 0.9 | 10 | 50 | 4 | |
| 2CCBN 020 002 009 | 2 X R0.2 | 0.9 | - | 50 | 4 | |
| 2CCBN 020 002 020 | 2 X R0.2 | 0.9 | 2 | 50 | 4 | |
| 2CCBN 020 002 030 | 2 X R0.2 | 0.9 | 3 | 50 | 4 | |
| 2CCBN 020 002 060 | 2 X R0.2 | 0.9 | 6 | 50 | 4 | |

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CCBN 020 002 080 | 2 X R0.2 | 0.9 | 8 | 50 | 4 | |
| 2CCBN 020 002 100 | 2 X R0.2 | 0.9 | 10 | 50 | 4 | |
| 2CCBN 020 003 009 | 2 X R0.3 | 0.9 | - | 50 | 4 | |
| 2CCBN 020 003 020 | 2 X R0.3 | 0.9 | 2 | 50 | 4 | |
| 2CCBN 020 003 030 | 2 X R0.3 | 0.9 | 3 | 50 | 4 | |
| 2CCBN 020 003 060 | 2 X R0.3 | 0.9 | 6 | 50 | 4 | |
| 2CCBN 020 003 080 | 2 X R0.3 | 0.9 | 8 | 50 | 4 | |
| 2CCBN 020 003 100 | 2 X R0.3 | 0.9 | 10 | 50 | 4 | |
| 2CCBN 020 005 009 | 2 X R0.5 | 0.9 | - | 50 | 4 | |
| 2CCBN 020 005 020 | 2 X R0.5 | 0.9 | 2 | 50 | 4 | |
| 2CCBN 020 005 030 | 2 X R0.5 | 0.9 | 3 | 50 | 4 | |
| 2CCBN 020 005 060 | 2 X R0.5 | 0.9 | 6 | 50 | 4 | |
| 2CCBN 020 005 080 | 2 X R0.5 | 0.9 | 8 | 50 | 4 | |
| 2CCBN 020 005 100 | 2 X R0.5 | 0.9 | 10 | 50 | 4 | |
| 2CCBN 025 001 012 | 2.5 X R0.1 | 1.2 | - | 66 | 6 | |
| 2CCBN 025 001 030 | 2.5 X R0.1 | 1.2 | 3 | 66 | 6 | |
| 2CCBN 025 001 060 | 2.5 X R0.1 | 1.2 | 6 | 66 | 6 | |
| 2CCBN 025 001 100 | 2.5 X R0.1 | 1.2 | 10 | 66 | 6 | |
| 2CCBN 025 002 012 | 2.5 X R0.2 | 1.2 | - | 66 | 6 | |
| 2CCBN 025 002 030 | 2.5 X R0.2 | 1.2 | 3 | 66 | 6 | |
| 2CCBN 025 002 060 | 2.5 X R0.2 | 1.2 | 6 | 66 | 6 | |
| 2CCBN 025 002 100 | 2.5 X R0.2 | 1.2 | 10 | 66 | 6 | |
| 2CCBN 025 003 012 | 2.5 X R0.3 | 1.2 | - | 66 | 6 | |
| 2CCBN 025 003 030 | 2.5 X R0.3 | 1.2 | 3 | 66 | 6 | |
| 2CCBN 025 003 060 | 2.5 X R0.3 | 1.2 | 6 | 66 | 6 | |
| 2CCBN 025 003 100 | 2.5 X R0.3 | 1.2 | 10 | 66 | 6 | |
| 2CCBN 030 001 012 | 3 X R0.1 | 1.2 | - | 66 | 6 | |
| 2CCBN 030 001 030 | 3 X R0.1 | 1.2 | 3 | 66 | 6 | |
| 2CCBN 030 001 060 | 3 X R0.1 | 1.2 | 6 | 66 | 6 | |
| 2CCBN 030 001 100 | 3 X R0.1 | 1.2 | 10 | 66 | 6 | |
| 2CCBN 030 001 160 | 3 X R0.1 | 1.2 | 16 | 66 | 6 | |
| 2CCBN 030 001 200 | 3 X R0.1 | 1.2 | 20 | 66 | 6 | |
| 2CCBN 030 002 012 | 3 X R0.2 | 1.2 | - | 66 | 6 | |
| 2CCBN 030 002 030 | 3 X R0.2 | 1.2 | 3 | 66 | 6 | |
| 2CCBN 030 002 060 | 3 X R0.2 | 1.2 | 6 | 66 | 6 | |
| 2CCBN 030 002 100 | 3 X R0.2 | 1.2 | 10 | 66 | 6 | |
| 2CCBN 030 002 160 | 3 X R0.2 | 1.2 | 16 | 66 | 6 | |
| 2CCBN 030 002 200 | 3 X R0.2 | 1.2 | 20 | 66 | 6 | |
| 2CCBN 030 003 012 | 3 X R0.3 | 1.2 | - | 66 | 6 | |
| 2CCBN 030 003 030 | 3 X R0.3 | 1.2 | 3 | 66 | 6 | |
| 2CCBN 030 003 060 | 3 X R0.3 | 1.2 | 6 | 66 | 6 | |
| 2CCBN 030 003 100 | 3 X R0.3 | 1.2 | 10 | 66 | 6 | |
| 2CCBN 030 003 160 | 3 X R0.3 | 1.2 | 16 | 66 | 6 | |
| 2CCBN 030 003 200 | 3 X R0.3 | 1.2 | 20 | 66 | 6 | |
| 2CCBN 030 005 012 | 3 X R0.5 | 1.2 | - | 66 | 6 | |
| 2CCBN 030 005 030 | 3 X R0.5 | 1.2 | 3 | 66 | 6 | |
| 2CCBN 030 005 060 | 3 X R0.5 | 1.2 | 6 | 66 | 6 | |
| 2CCBN 030 005 100 | 3 X R0.5 | 1.2 | 10 | 66 | 6 | |
| 2CCBN 030 005 160 | 3 X R0.5 | 1.2 | 16 | 66 | 6 | |
| 2CCBN 030 005 200 | 3 X R0.5 | 1.2 | 20 | 66 | 6 | |
| 2CCBN 030 010 012 | 3 X R1 | 1.2 | - | 66 | 6 | |
| 2CCBN 030 010 030 | 3 X R1 | 1.2 | 3 | 66 | 6 | |
| 2CCBN 030 010 060 | 3 X R1 | 1.2 | 6 | 66 | 6 | |
| 2CCBN 030 010 100 | 3 X R1 | 1.2 | 10 | 66 | 6 | |
| 2CCBN 030 010 160 | 3 X R1 | 1.2 | 16 | 66 | 6 | |
| 2CCBN 030 010 200 | 3 X R1 | 1.2 | 20 | 66 | 6 | |
| 2CCBN 040 001 015 | 4 X R0.1 | 1.5 | - | 66 | 6 | |
| 2CCBN 040 001 030 | 4 X R0.1 | 1.5 | 3 | 66 | 6 | |
| 2CCBN 040 001 060 | 4 X R0.1 | 1.5 | 6 | 66 | 6 | |
| 2CCBN 040 001 100 | 4 X R0.1 | 1.5 | 10 | 66 | 6 | |
| 2CCBN 040 001 160 | 4 X R0.1 | 1.5 | 16 | 66 | 6 | |
| 2CCBN 040 002 015 | 4 X R0.2 | 1.5 | - | 66 | 6 | |
| 2CCBN 040 002 030 | 4 X R0.2 | 1.5 | 3 | 66 | 6 | |
| 2CCBN 040 002 060 | 4 X R0.2 | 1.5 | 6 | 66 | 6 | |

# 2CCBN

CBN, 2 Flutes High Speed Rib Corner Radius End Mills

## 2날 CBN 고속가공용 리브 코너 레디우스 엔드밀

CBN series

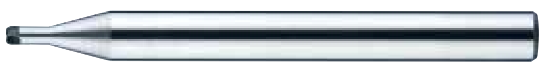
단위 : mm

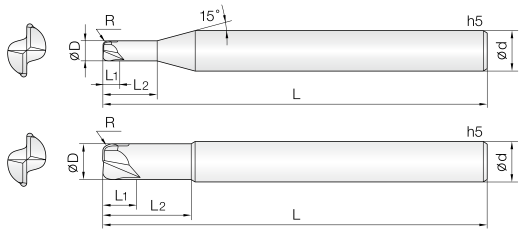
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CCBN 040 002 100 | 4 X R0.2 | 1.5 | 10 | 66 | 6 | |
| 2CCBN 040 002 160 | 4 X R0.2 | 1.5 | 16 | 66 | 6 | |
| 2CCBN 040 003 015 | 4 X R0.3 | 1.5 | - | 66 | 6 | |
| 2CCBN 040 003 030 | 4 X R0.3 | 1.5 | 3 | 66 | 6 | |
| 2CCBN 040 003 060 | 4 X R0.3 | 1.5 | 6 | 66 | 6 | |
| 2CCBN 040 003 100 | 4 X R0.3 | 1.5 | 10 | 66 | 6 | |
| 2CCBN 040 003 160 | 4 X R0.3 | 1.5 | 16 | 66 | 6 | |
| 2CCBN 040 005 015 | 4 X R0.5 | 1.5 | - | 66 | 6 | |
| 2CCBN 040 005 030 | 4 X R0.5 | 1.5 | 3 | 66 | 6 | |
| 2CCBN 040 005 060 | 4 X R0.5 | 1.5 | 6 | 66 | 6 | |
| 2CCBN 040 005 100 | 4 X R0.5 | 1.5 | 10 | 66 | 6 | |
| 2CCBN 040 005 160 | 4 X R0.5 | 1.5 | 16 | 66 | 6 | |
| 2CCBN 040 010 015 | 4 X R1 | 1.5 | - | 66 | 6 | |
| 2CCBN 040 010 030 | 4 X R1 | 1.5 | 3 | 66 | 6 | |
| 2CCBN 040 010 060 | 4 X R1 | 1.5 | 6 | 66 | 6 | |
| 2CCBN 040 010 100 | 4 X R1 | 1.5 | 10 | 66 | 6 | |
| 2CCBN 040 010 160 | 4 X R1 | 1.5 | 16 | 66 | 6 | |
| 2CCBN 060 003 030 | 6 X R0.3 | 3 | - | 83 | 6 | |
| 2CCBN 060 003 150 | 6 X R0.3 | 3 | 15 | 83 | 6 | |
| 2CCBN 060 005 030 | 6 X R0.5 | 3 | - | 83 | 6 | |
| 2CCBN 060 005 150 | 6 X R0.5 | 3 | 15 | 83 | 6 | |
| 2CCBN 060 010 030 | 6 X R1 | 3 | - | 83 | 6 | |
| 2CCBN 060 010 150 | 6 X R1 | 3 | 15 | 83 | 6 | |

# 2SCCBN

## CBN, 2 Flutes High Speed Straight Rib Corner Radius End Mills

## 2날 CBN 고속가공용 직선날 리브 코너 레디우스 엔드밀






- **고경도강(HRc50~72)의고정밀(±5㎛) 정삭 가공용 엔드밀**
- 고함량의 PCBN 소재를 적용하여 장시간 가공이가능합니다.
- 날부 스트레이트 타입 형상으로 치핑을 더욱 최소화 하였습니다.
- 날부인선의 조도가 뛰어나 경면가공에 적합 합니다.
- 다양한 유효장을 적용함으로써 최상의 작업이 가능합니다.
- 오일미스트 사용을 권장하며, RPM 2만~5만 범위의 고속가공을 추천합니다.
- C.B.N (Cubic Boron Nitride)

- **PCBN Endmills for precise finishing(±5㎛) of hardened steels (HRc50~72)**
- Long tool life by high content PCBN.
- Straight type Design for Minimizing edge chipping.
- Excellent surface finish.
- Various flute length for optimum performance.
- Recommend high speed(20,000~50,000RPM) with oil-mist.
- C.B.N (Cubic Boron Nitride)

2 | CBN | R ±0.005 | 0° Helix Angle | CUTTING DATA

R0.02 ~ 1 | 412P

| D Size | D Tolerance |
|---|---|
| Ø0.4 ~ 6 | +0 ~ -0.01mm |

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| New 2SCCBN 004 0002 003 | 0.4 X R0.02 | 0.3 | - | 48 | 4 | |
| 2SCCBN 004 0002 015 | 0.4 X R0.02 | 0.3 | 1.5 | 48 | 4 | |
| New 2SCCBN 004 0005 003 | 0.4 X R0.05 | 0.3 | - | 48 | 4 | |
| 2SCCBN 004 0005 015 | 0.4 X R0.05 | 0.3 | 1.5 | 48 | 4 | |
| New 2SCCBN 004 001 003 | 0.4 X R0.1 | 0.3 | - | 48 | 4 | |
| 2SCCBN 004 001 015 | 0.4 X R0.1 | 0.3 | 1.5 | 48 | 4 | |
| New 2SCCBN 005 0005 004 | 0.5 X R0.05 | 0.4 | - | 48 | 4 | |
| 2SCCBN 005 0005 015 | 0.5 X R0.05 | 0.4 | 1.5 | 48 | 4 | |
| New 2SCCBN 005 001 004 | 0.5 X R0.1 | 0.4 | - | 48 | 4 | |
| 2SCCBN 005 001 015 | 0.5 X R0.1 | 0.4 | 1.5 | 48 | 4 | |
| New 2SCCBN 006 0005 005 | 0.6 X R0.05 | 0.5 | - | 48 | 4 | |
| 2SCCBN 006 0005 020 | 0.6 X R0.05 | 0.5 | 2 | 48 | 4 | |
| New 2SCCBN 006 001 005 | 0.6 X R0.1 | 0.5 | - | 48 | 4 | |
| 2SCCBN 006 001 020 | 0.6 X R0.1 | 0.5 | 2 | 48 | 4 | |
| New 2SCCBN 008 001 006 | 0.8 X R0.1 | 0.6 | - | 48 | 4 | |
| 2SCCBN 008 001 020 | 0.8 X R0.1 | 0.6 | 2 | 48 | 4 | |
| New 2SCCBN 008 002 006 | 0.8 X R0.2 | 0.6 | - | 48 | 4 | |
| 2SCCBN 008 002 020 | 0.8 X R0.2 | 0.6 | 2 | 48 | 4 | |
| New 2SCCBN 010 0002 007 | 1 X R0.02 | 0.7 | - | 48 | 4 | |
| 2SCCBN 010 0002 025 | 1 X R0.02 | 0.7 | 2.5 | 48 | 4 | |
| 2SCCBN 010 0002 040 | 1 X R0.02 | 0.7 | 4 | 48 | 4 | |
| New 2SCCBN 010 0005 007 | 1 X R0.05 | 0.7 | - | 48 | 4 | |
| 2SCCBN 010 0005 025 | 1 X R0.05 | 0.7 | 2.5 | 48 | 4 | |
| 2SCCBN 010 0005 040 | 1 X R0.05 | 0.7 | 4 | 48 | 4 | |
| New 2SCCBN 010 001 007 | 1 X R0.1 | 0.7 | - | 48 | 4 | |
| 2SCCBN 010 001 025 | 1 X R0.1 | 0.7 | 2.5 | 48 | 4 | |
| 2SCCBN 010 001 040 | 1 X R0.1 | 0.7 | 4 | 48 | 4 | |
| New 2SCCBN 010 002 007 | 1 X R0.2 | 0.7 | - | 48 | 4 | |
| 2SCCBN 010 002 025 | 1 X R0.2 | 0.7 | 2.5 | 48 | 4 | |
| 2SCCBN 010 002 040 | 1 X R0.2 | 0.7 | 4 | 48 | 4 | |
| New 2SCCBN 010 003 007 | 1 X R0.3 | 0.7 | - | 48 | 4 | |
| 2SCCBN 010 003 025 | 1 X R0.3 | 0.7 | 2.5 | 48 | 4 | |
| 2SCCBN 010 003 040 | 1 X R0.3 | 0.7 | 4 | 48 | 4 | |
| New 2SCCBN 015 0002 008 | 1.5 X R0.02 | 0.8 | - | 48 | 4 | |
| 2SCCBN 015 0002 030 | 1.5 X R0.02 | 0.8 | 3 | 48 | 4 | |
| 2SCCBN 015 0002 040 | 1.5 X R0.02 | 0.8 | 4 | 48 | 4 | |
| New 2SCCBN 015 0005 008 | 1.5 X R0.05 | 0.8 | - | 48 | 4 | |
| 2SCCBN 015 0005 030 | 1.5 X R0.05 | 0.8 | 3 | 48 | 4 | |
| 2SCCBN 015 0005 040 | 1.5 X R0.05 | 0.8 | 4 | 48 | 4 | |
| New 2SCCBN 015 001 008 | 1.5 X R0.1 | 0.8 | - | 48 | 4 | |
| 2SCCBN 015 001 030 | 1.5 X R0.1 | 0.8 | 3 | 48 | 4 | |
| 2SCCBN 015 001 040 | 1.5 X R0.1 | 0.8 | 4 | 48 | 4 | |
| New 2SCCBN 015 002 008 | 1.5 X R0.2 | 0.8 | - | 48 | 4 | |
| 2SCCBN 015 002 030 | 1.5 X R0.2 | 0.8 | 3 | 48 | 4 | |
| 2SCCBN 015 002 040 | 1.5 X R0.2 | 0.8 | 4 | 48 | 4 | |
| New 2SCCBN 015 003 008 | 1.5 X R0.3 | 0.8 | - | 48 | 4 | |
| 2SCCBN 015 003 030 | 1.5 X R0.3 | 0.8 | 3 | 48 | 4 | |
| 2SCCBN 015 003 040 | 1.5 X R0.3 | 0.8 | 4 | 48 | 4 | |
| New 2SCCBN 020 0002 009 | 2 X R0.02 | 0.9 | - | 50 | 4 | |
| 2SCCBN 020 0002 030 | 2 X R0.02 | 0.9 | 3 | 50 | 4 | |

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2SCCBN 020 0002 060 | 2 X R0.02 | 0.9 | 6 | 50 | 4 | |
| New 2SCCBN 020 0005 009 | 2 X R0.05 | 0.9 | - | 50 | 4 | |
| 2SCCBN 020 0005 030 | 2 X R0.05 | 0.9 | 3 | 50 | 4 | |
| 2SCCBN 020 0005 060 | 2 X R0.05 | 0.9 | 6 | 50 | 4 | |
| New 2SCCBN 020 001 009 | 2 X R0.1 | 0.9 | - | 50 | 4 | |
| 2SCCBN 020 001 030 | 2 X R0.1 | 0.9 | 3 | 50 | 4 | |
| 2SCCBN 020 001 060 | 2 X R0.1 | 0.9 | 6 | 50 | 4 | |
| New 2SCCBN 020 002 009 | 2 X R0.2 | 0.9 | - | 50 | 4 | |
| 2SCCBN 020 002 030 | 2 X R0.2 | 0.9 | 3 | 50 | 4 | |
| 2SCCBN 020 002 060 | 2 X R0.2 | 0.9 | 6 | 50 | 4 | |
| New 2SCCBN 020 003 009 | 2 X R0.3 | 0.9 | - | 50 | 4 | |
| 2SCCBN 020 003 030 | 2 X R0.3 | 0.9 | 3 | 50 | 4 | |
| 2SCCBN 020 003 060 | 2 X R0.3 | 0.9 | 6 | 50 | 4 | |
| New 2SCCBN 020 005 009 | 2 X R0.5 | 0.9 | - | 50 | 4 | |
| 2SCCBN 020 005 030 | 2 X R0.5 | 0.9 | 3 | 50 | 4 | |
| 2SCCBN 020 005 060 | 2 X R0.5 | 0.9 | 6 | 50 | 4 | |
| New 2SCCBN 025 001 012 | 2.5 X R0.1 | 1.2 | - | 66 | 6 | |
| 2SCCBN 025 001 060 | 2.5 X R0.1 | 1.2 | 6 | 66 | 6 | |
| New 2SCCBN 025 002 012 | 2.5 X R0.2 | 1.2 | - | 66 | 6 | |
| 2SCCBN 025 002 060 | 2.5 X R0.2 | 1.2 | 6 | 66 | 6 | |
| New 2SCCBN 025 003 012 | 2.5 X R0.3 | 1.2 | - | 66 | 6 | |
| 2SCCBN 025 003 060 | 2.5 X R0.3 | 1.2 | 6 | 66 | 6 | |
| New 2SCCBN 030 001 012 | 3 X R0.1 | 1.2 | - | 66 | 6 | |
| 2SCCBN 030 001 060 | 3 X R0.1 | 1.2 | 6 | 66 | 6 | |
| 2SCCBN 030 001 100 | 3 X R0.1 | 1.2 | 10 | 66 | 6 | |
| New 2SCCBN 030 002 012 | 3 X R0.2 | 1.2 | - | 66 | 6 | |
| 2SCCBN 030 002 060 | 3 X R0.2 | 1.2 | 6 | 66 | 6 | |
| 2SCCBN 030 002 100 | 3 X R0.2 | 1.2 | 10 | 66 | 6 | |
| New 2SCCBN 030 003 012 | 3 X R0.3 | 1.2 | - | 66 | 6 | |
| 2SCCBN 030 003 060 | 3 X R0.3 | 1.2 | 6 | 66 | 6 | |
| 2SCCBN 030 003 100 | 3 X R0.3 | 1.2 | 10 | 66 | 6 | |
| New 2SCCBN 030 005 012 | 3 X R0.5 | 1.2 | - | 66 | 6 | |
| 2SCCBN 030 005 060 | 3 X R0.5 | 1.2 | 6 | 66 | 6 | |
| 2SCCBN 030 005 100 | 3 X R0.5 | 1.2 | 10 | 66 | 6 | |
| 2SCCBN 030 005 160 | 3 X R0.5 | 1.2 | 16 | 66 | 6 | |
| New 2SCCBN 030 010 012 | 3 X R1 | 1.2 | - | 66 | 6 | |
| 2SCCBN 030 010 060 | 3 X R1 | 1.2 | 6 | 66 | 6 | |
| 2SCCBN 030 010 100 | 3 X R1 | 1.2 | 10 | 66 | 6 | |
| 2SCCBN 030 010 160 | 3 X R1 | 1.2 | 16 | 66 | 6 | |
| New 2SCCBN 040 001 015 | 4 X R0.1 | 1.5 | - | 66 | 6 | |
| 2SCCBN 040 001 060 | 4 X R0.1 | 1.5 | 6 | 66 | 6 | |
| 2SCCBN 040 001 100 | 4 X R0.1 | 1.5 | 10 | 66 | 6 | |
| 2SCCBN 040 001 160 | 4 X R0.1 | 1.5 | 16 | 66 | 6 | |
| New 2SCCBN 040 002 015 | 4 X R0.2 | 1.5 | - | 66 | 6 | |
| 2SCCBN 040 002 060 | 4 X R0.2 | 1.5 | 6 | 66 | 6 | |
| 2SCCBN 040 002 100 | 4 X R0.2 | 1.5 | 10 | 66 | 6 | |
| 2SCCBN 040 002 160 | 4 X R0.2 | 1.5 | 16 | 66 | 6 | |
| New 2SCCBN 040 003 015 | 4 X R0.3 | 1.5 | - | 66 | 6 | |
| 2SCCBN 040 003 060 | 4 X R0.3 | 1.5 | 6 | 66 | 6 | |
| 2SCCBN 040 003 100 | 4 X R0.3 | 1.5 | 10 | 66 | 6 | |

# 2SCCBN

## CBN, 2 Flutes High Speed Straight Rib Corner Radius End Mills

## 2날 CBN 고속가공용 직선날 리브 코너 레디우스 엔드밀

단위 : mm

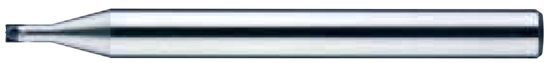
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2SCCBN 040 003 160 | 4 X R0.3 | 1.5 | 16 | 66 | 6 | |
| New 2SCCBN 040 005 015 | 4 X R0.5 | 1.5 | - | 66 | 6 | |
| 2SCCBN 040 005 060 | 4 X R0.5 | 1.5 | 6 | 66 | 6 | |
| 2SCCBN 040 005 100 | 4 X R0.5 | 1.5 | 10 | 66 | 6 | |
| 2SCCBN 040 005 160 | 4 X R0.5 | 1.5 | 16 | 66 | 6 | |
| New 2SCCBN 040 010 015 | 4 X R1 | 1.5 | - | 66 | 6 | |
| 2SCCBN 040 010 060 | 4 X R1 | 1.5 | 6 | 66 | 6 | |
| 2SCCBN 040 010 100 | 4 X R1 | 1.5 | 10 | 66 | 6 | |
| 2SCCBN 040 010 160 | 4 X R1 | 1.5 | 16 | 66 | 6 | |
| 2SCCBN 060 003 030 | 6 X R0.3 | 3 | - | 83 | 6 | |
| 2SCCBN 060 003 150 | 6 X R0.3 | 3 | 15 | 83 | 6 | |
| 2SCCBN 060 005 030 | 6 X R0.5 | 3 | - | 83 | 6 | |
| 2SCCBN 060 005 150 | 6 X R0.5 | 3 | 15 | 83 | 6 | |
| 2SCCBN 060 010 030 | 6 X R1 | 3 | - | 83 | 6 | |
| 2SCCBN 060 010 150 | 6 X R1 | 3 | 15 | 83 | 6 | |

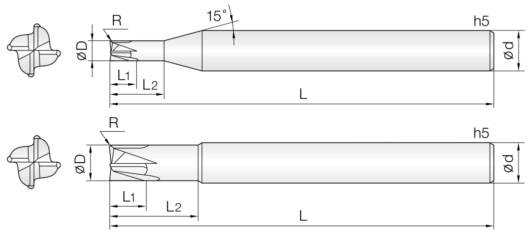
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

# 4SCCBN

## CBN, 4 Flutes High Speed Straight Rib Corner Radius End Mills

## 4날 CBN 고속가공용 직선날 리브 코너 레디우스 엔드밀






- **고경도강(HRc50~72)의고정밀(±5㎛) 정삭 가공용 엔드밀**
- 고함량의 PCBN 소재를 적용하여 장시간가공이가능합니다.
- 날부 스트레이트 타입 형상으로 치핑을 더욱 최소화 하였습니다.
- 날부인선의 조도가 뛰어나 경면가공에 적합합니다.
- 오일미스트 사용을 권장하며, RPM 2만~5만 범위의 고속가공을 추천합니다
- C.B.N (Cubic Boron Nitride)

- **PCBN Endmills for precise finishing(±5㎛) of hardened steels (HRc50~72)**
- Long tool life by high content PCBN.
- Straight type Design for Minimizing edge chipping.
- Excellent surface finish.
- Recommend high speed(20,000~50,000RPM) with oil-mist.
- C.B.N (Cubic Boron Nitride)

4 | CBN | R ±0.005 | 0° Helix Angle | CUTTING DATA

R0.1 ~ 1 | 412P

| D Size | D Tolerance |
|---|---|
| Ø0.8 ~ 6 | +0 ~ -0.01mm |

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| New 4SCCBN 008 001 006 | 0.8 X R0.1 | 0.6 | – | 48 | 4 | |
| 4SCCBN 008 001 025 | 0.8 X R0.1 | 0.6 | 2.5 | 48 | 4 | |
| New 4SCCBN 008 002 006 | 0.8 X R0.2 | 0.6 | – | 48 | 4 | |
| 4SCCBN 008 002 025 | 0.8 X R0.2 | 0.6 | 2.5 | 48 | 4 | |
| New 4SCCBN 010 0002 007 | 1 X R0.02 | 0.7 | – | 48 | 4 | |
| 4SCCBN 010 0002 025 | 1 X R0.02 | 0.7 | 2.5 | 48 | 4 | |
| 4SCCBN 010 0002 040 | 1 X R0.02 | 0.7 | 4 | 48 | 4 | |
| New 4SCCBN 010 0005 007 | 1 X R0.05 | 0.7 | – | 48 | 4 | |
| 4SCCBN 010 0005 025 | 1 X R0.05 | 0.7 | 2.5 | 48 | 4 | |
| 4SCCBN 010 0005 040 | 1 X R0.05 | 0.7 | 4 | 48 | 4 | |
| New 4SCCBN 010 001 007 | 1 X R0.1 | 0.7 | – | 48 | 4 | |
| 4SCCBN 010 001 025 | 1 X R0.1 | 0.7 | 2.5 | 48 | 4 | |
| 4SCCBN 010 001 040 | 1 X R0.1 | 0.7 | 4 | 48 | 4 | |
| New 4SCCBN 010 002 007 | 1 X R0.2 | 0.7 | – | 48 | 4 | |
| 4SCCBN 010 002 025 | 1 X R0.2 | 0.7 | 2.5 | 48 | 4 | |
| 4SCCBN 010 002 040 | 1 X R0.2 | 0.7 | 4 | 48 | 4 | |
| New 4SCCBN 010 003 007 | 1 X R0.3 | 0.7 | – | 48 | 4 | |
| 4SCCBN 010 003 025 | 1 X R0.3 | 0.7 | 2.5 | 48 | 4 | |
| 4SCCBN 010 003 040 | 1 X R0.3 | 0.7 | 4 | 48 | 4 | |
| New 4SCCBN 015 0002 008 | 1.5 X R0.02 | 0.8 | – | 48 | 4 | |
| 4SCCBN 015 0002 030 | 1.5 X R0.02 | 0.8 | 3 | 48 | 4 | |
| 4SCCBN 015 0002 040 | 1.5 X R0.02 | 0.8 | 4 | 48 | 4 | |
| New 4SCCBN 015 0005 008 | 1.5 X R0.05 | 0.8 | – | 48 | 4 | |
| 4SCCBN 015 0005 030 | 1.5 X R0.05 | 0.8 | 3 | 48 | 4 | |
| 4SCCBN 015 0005 040 | 1.5 X R0.05 | 0.8 | 4 | 48 | 4 | |
| New 4SCCBN 015 001 008 | 1.5 X R0.1 | 0.8 | – | 48 | 4 | |
| 4SCCBN 015 001 030 | 1.5 X R0.1 | 0.8 | 3 | 48 | 4 | |
| 4SCCBN 015 001 040 | 1.5 X R0.1 | 0.8 | 4 | 48 | 4 | |
| New 4SCCBN 015 002 008 | 1.5 X R0.2 | 0.8 | – | 48 | 4 | |
| 4SCCBN 015 002 030 | 1.5 X R0.2 | 0.8 | 3 | 48 | 4 | |
| 4SCCBN 015 002 040 | 1.5 X R0.2 | 0.8 | 4 | 48 | 4 | |
| New 4SCCBN 015 003 008 | 1.5 X R0.3 | 0.8 | – | 48 | 4 | |
| 4SCCBN 015 003 030 | 1.5 X R0.3 | 0.8 | 3 | 48 | 4 | |
| 4SCCBN 015 003 040 | 1.5 X R0.3 | 0.8 | 4 | 48 | 4 | |
| New 4SCCBN 020 0002 009 | 2 X R0.02 | 0.9 | – | 50 | 4 | |
| 4SCCBN 020 0002 030 | 2 X R0.02 | 0.9 | 3 | 50 | 4 | |
| 4SCCBN 020 0002 040 | 2 X R0.02 | 0.9 | 4 | 50 | 4 | |
| 4SCCBN 020 0002 060 | 2 X R0.02 | 0.9 | 6 | 50 | 4 | |
| New 4SCCBN 020 0005 009 | 2 X R0.05 | 0.9 | – | 50 | 4 | |
| 4SCCBN 020 0005 030 | 2 X R0.05 | 0.9 | 3 | 50 | 4 | |
| 4SCCBN 020 0005 040 | 2 X R0.05 | 0.9 | 4 | 50 | 4 | |
| 4SCCBN 020 0005 060 | 2 X R0.05 | 0.9 | 6 | 50 | 4 | |
| New 4SCCBN 020 001 009 | 2 X R0.1 | 0.9 | – | 50 | 4 | |
| 4SCCBN 020 001 030 | 2 X R0.1 | 0.9 | 3 | 50 | 4 | |
| 4SCCBN 020 001 040 | 2 X R0.1 | 0.9 | 4 | 50 | 4 | |
| 4SCCBN 020 001 060 | 2 X R0.1 | 0.9 | 6 | 50 | 4 | |
| New 4SCCBN 020 002 009 | 2 X R0.2 | 0.9 | – | 50 | 4 | |
| 4SCCBN 020 002 030 | 2 X R0.2 | 0.9 | 3 | 50 | 4 | |
| 4SCCBN 020 002 040 | 2 X R0.2 | 0.9 | 4 | 50 | 4 | |
| 4SCCBN 020 002 060 | 2 X R0.2 | 0.9 | 6 | 50 | 4 | |

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| New 4SCCBN 020 003 009 | 2 X R0.3 | 0.9 | – | 50 | 4 | |
| 4SCCBN 020 003 030 | 2 X R0.3 | 0.9 | 3 | 50 | 4 | |
| 4SCCBN 020 003 040 | 2 X R0.3 | 0.9 | 4 | 50 | 4 | |
| 4SCCBN 020 003 060 | 2 X R0.3 | 0.9 | 6 | 50 | 4 | |
| New 4SCCBN 020 005 009 | 2 X R0.5 | 0.9 | – | 50 | 4 | |
| 4SCCBN 020 005 030 | 2 X R0.5 | 0.9 | 3 | 50 | 4 | |
| 4SCCBN 020 005 040 | 2 X R0.5 | 0.9 | 4 | 50 | 4 | |
| 4SCCBN 020 005 060 | 2 X R0.5 | 0.9 | 6 | 50 | 4 | |
| New 4SCCBN 025 001 012 | 2.5 X R0.1 | 1.2 | – | 66 | 6 | |
| 4SCCBN 025 001 060 | 2.5 X R0.1 | 1.2 | 6 | 66 | 6 | |
| New 4SCCBN 025 002 012 | 2.5 X R0.2 | 1.2 | – | 66 | 6 | |
| 4SCCBN 025 002 060 | 2.5 X R0.2 | 1.2 | 6 | 66 | 6 | |
| New 4SCCBN 025 003 012 | 2.5 X R0.3 | 1.2 | – | 66 | 6 | |
| 4SCCBN 025 003 060 | 2.5 X R0.3 | 1.2 | 6 | 66 | 6 | |
| New 4SCCBN 030 001 012 | 3 X R0.1 | 1.2 | – | 66 | 6 | |
| 4SCCBN 030 001 060 | 3 X R0.1 | 1.2 | 6 | 66 | 6 | |
| 4SCCBN 030 001 100 | 3 X R0.1 | 1.2 | 10 | 66 | 6 | |
| New 4SCCBN 030 002 012 | 3 X R0.2 | 1.2 | – | 66 | 6 | |
| 4SCCBN 030 002 060 | 3 X R0.2 | 1.2 | 6 | 66 | 6 | |
| 4SCCBN 030 002 100 | 3 X R0.2 | 1.2 | 10 | 66 | 6 | |
| New 4SCCBN 030 003 012 | 3 X R0.3 | 1.2 | – | 66 | 6 | |
| 4SCCBN 030 003 060 | 3 X R0.3 | 1.2 | 6 | 66 | 6 | |
| 4SCCBN 030 003 100 | 3 X R0.3 | 1.2 | 10 | 66 | 6 | |
| New 4SCCBN 030 005 012 | 3 X R0.5 | 1.2 | – | 66 | 6 | |
| 4SCCBN 030 005 060 | 3 X R0.5 | 1.2 | 6 | 66 | 6 | |
| 4SCCBN 030 005 100 | 3 X R0.5 | 1.2 | 10 | 66 | 6 | |
| 4SCCBN 030 005 160 | 3 X R0.5 | 1.2 | 16 | 66 | 6 | |
| New 4SCCBN 030 010 012 | 3 X R1 | 1.2 | – | 66 | 6 | |
| 4SCCBN 030 010 060 | 3 X R1 | 1.2 | 6 | 66 | 6 | |
| 4SCCBN 030 010 100 | 3 X R1 | 1.2 | 10 | 66 | 6 | |
| 4SCCBN 030 010 160 | 3 X R1 | 1.2 | 16 | 66 | 6 | |
| New 4SCCBN 040 001 015 | 4 X R0.1 | 1.5 | – | 66 | 6 | |
| 4SCCBN 040 001 060 | 4 X R0.1 | 1.5 | 6 | 66 | 6 | |
| 4SCCBN 040 001 100 | 4 X R0.1 | 1.5 | 10 | 66 | 6 | |
| 4SCCBN 040 001 160 | 4 X R0.1 | 1.5 | 16 | 66 | 6 | |
| New 4SCCBN 040 002 015 | 4 X R0.2 | 1.5 | – | 66 | 6 | |
| 4SCCBN 040 002 060 | 4 X R0.2 | 1.5 | 6 | 66 | 6 | |
| 4SCCBN 040 002 100 | 4 X R0.2 | 1.5 | 10 | 66 | 6 | |
| 4SCCBN 040 002 160 | 4 X R0.2 | 1.5 | 16 | 66 | 6 | |
| New 4SCCBN 040 003 015 | 4 X R0.3 | 1.5 | – | 66 | 6 | |
| 4SCCBN 040 003 060 | 4 X R0.3 | 1.5 | 6 | 66 | 6 | |
| 4SCCBN 040 003 100 | 4 X R0.3 | 1.5 | 10 | 66 | 6 | |
| 4SCCBN 040 003 160 | 4 X R0.3 | 1.5 | 16 | 66 | 6 | |
| New 4SCCBN 040 005 015 | 4 X R0.5 | 1.5 | – | 66 | 6 | |
| 4SCCBN 040 005 060 | 4 X R0.5 | 1.5 | 6 | 66 | 6 | |
| 4SCCBN 040 005 100 | 4 X R0.5 | 1.5 | 10 | 66 | 6 | |
| 4SCCBN 040 005 160 | 4 X R0.5 | 1.5 | 16 | 66 | 6 | |
| New 4SCCBN 040 010 015 | 4 X R1 | 1.5 | – | 66 | 6 | |
| 4SCCBN 040 010 060 | 4 X R1 | 1.5 | 6 | 66 | 6 | |
| 4SCCBN 040 010 100 | 4 X R1 | 1.5 | 10 | 66 | 6 | |

# 4SCCBN

## CBN, 4 Flutes High Speed Straight Rib Corner Radius End Mills

## 4날 CBN 고속가공용 직선날 리브 코너 레디우스 엔드밀

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4SCCBN 040 010 160 | 4 X R1 | 1.5 | 16 | 66 | 6 | |
| 4SCCBN 060 003 030 | 6 X R0.3 | 3 | - | 83 | 6 | |
| 4SCCBN 060 003 150 | 6 X R0.3 | 3 | 15 | 83 | 6 | |
| 4SCCBN 060 005 030 | 6 X R0.5 | 3 | - | 83 | 6 | |
| 4SCCBN 060 005 150 | 6 X R0.5 | 3 | 15 | 83 | 6 | |
| 4SCCBN 060 010 030 | 6 X R1 | 3 | - | 83 | 6 | |
| 4SCCBN 060 010 150 | 6 X R1 | 3 | 15 | 83 | 6 | |

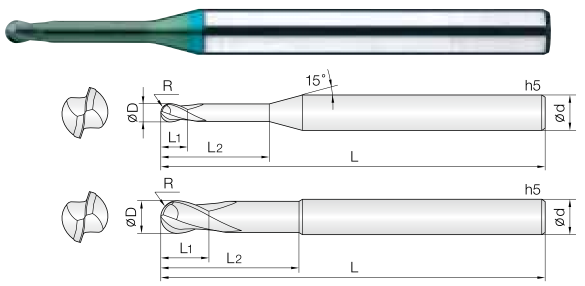
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

# 2JJRB

## 2 Flutes JJ Rib Ball End Mills for Hardened Steels

## 2날 고경도재 가공용 제이제이 리브 볼 엔드밀

JJ series




- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 날부인선의 조도가 뛰어나 피삭재의 면조도가 우수합니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Excellent surface finish.
- Very nice work surface finish.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

2 | UWC 초미립자 | TISIN-S Coating | R ±0.005 (0.05 ~ 2.5R) | R ±0.01 (3 ~ 6R) | 30° Helix Angle | CUTTING DATA 413P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.1 ~ 0.15 | +0 ~ -0.005mm |
| | Ø0.2 ~ 12 | +0 ~ -0.01mm |
| ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2JJRB 001 003 S04 | 0.05R X 0.1 | 0.15 | 0.3 | 40 | 4 | |
| 2JJRB 001 005 S04 | 0.05R X 0.1 | 0.15 | 0.5 | 40 | 4 | |
| 2JJRB 0015 003 S04 | 0.075R X 0.15 | 0.15 | 0.3 | 40 | 4 | |
| 2JJRB 0015 005 S04 | 0.075R X 0.15 | 0.15 | 0.5 | 40 | 4 | |
| 2JJRB 0015 010 S04 | 0.075R X 0.15 | 0.15 | 1 | 40 | 4 | |
| 2JJRB 002 005 S04 | 0.1R X 0.2 | 0.2 | 0.5 | 40 | 4 | |
| 2JJRB 002 010 S04 | 0.1R X 0.2 | 0.2 | 1 | 40 | 4 | |
| 2JJRB 002 015 S04 | 0.1R X 0.2 | 0.2 | 1.5 | 40 | 4 | |
| 2JJRB 002 020 S04 | 0.1R X 0.2 | 0.2 | 2 | 40 | 4 | |
| 2JJRB 002 025 S04 | 0.1R X 0.2 | 0.2 | 2.5 | 40 | 4 | |
| 2JJRB 002 030 S04 | 0.1R X 0.2 | 0.2 | 3 | 40 | 4 | |
| 2JJRB 0025 005 S04 | 0.125R X 0.25 | 0.25 | 0.5 | 40 | 4 | |
| 2JJRB 0025 010 S04 | 0.125R X 0.25 | 0.25 | 1 | 40 | 4 | |
| 2JJRB 0025 015 S04 | 0.125R X 0.25 | 0.25 | 1.5 | 40 | 4 | |
| 2JJRB 0025 020 S04 | 0.125R X 0.25 | 0.25 | 2 | 40 | 4 | |
| 2JJRB 0025 025 S04 | 0.125R X 0.25 | 0.25 | 2.5 | 40 | 4 | |
| 2JJRB 0025 030 S04 | 0.125R X 0.25 | 0.25 | 3 | 40 | 4 | |
| 2JJRB 003 010 S04 | 0.15R X 0.3 | 0.3 | 1 | 40 | 4 | |
| 2JJRB 003 015 S04 | 0.15R X 0.3 | 0.3 | 1.5 | 40 | 4 | |
| 2JJRB 003 020 S04 | 0.15R X 0.3 | 0.3 | 2 | 40 | 4 | |
| 2JJRB 003 025 S04 | 0.15R X 0.3 | 0.3 | 2.5 | 40 | 4 | |
| 2JJRB 003 030 S04 | 0.15R X 0.3 | 0.3 | 3 | 40 | 4 | |
| 2JJRB 003 035 S04 | 0.15R X 0.3 | 0.3 | 3.5 | 40 | 4 | |
| 2JJRB 003 040 S04 | 0.15R X 0.3 | 0.3 | 4 | 40 | 4 | |
| 2JJRB 003 050 S04 | 0.15R X 0.3 | 0.3 | 5 | 40 | 4 | |
| 2JJRB 004 010 S04 | 0.2R X 0.4 | 0.4 | 1 | 40 | 4 | |
| 2JJRB 004 015 S04 | 0.2R X 0.4 | 0.4 | 1.5 | 40 | 4 | |
| 2JJRB 004 020 S04 | 0.2R X 0.4 | 0.4 | 2 | 40 | 4 | |
| 2JJRB 004 025 S04 | 0.2R X 0.4 | 0.4 | 2.5 | 40 | 4 | |
| 2JJRB 004 030 S04 | 0.2R X 0.4 | 0.4 | 3 | 40 | 4 | |
| 2JJRB 004 035 S04 | 0.2R X 0.4 | 0.4 | 3.5 | 40 | 4 | |
| 2JJRB 004 040 S04 | 0.2R X 0.4 | 0.4 | 4 | 40 | 4 | |
| 2JJRB 004 045 S04 | 0.2R X 0.4 | 0.4 | 4.5 | 40 | 4 | |
| 2JJRB 004 050 S04 | 0.2R X 0.4 | 0.4 | 5 | 40 | 4 | |
| 2JJRB 004 060 S04 | 0.2R X 0.4 | 0.4 | 6 | 40 | 4 | |
| 2JJRB 004 080 S04 | 0.2R X 0.4 | 0.4 | 8 | 40 | 4 | |
| 2JJRB 005 010 S04 | 0.25R X 0.5 | 0.5 | 1 | 45 | 4 | |
| 2JJRB 005 010 S06 | 0.25R X 0.5 | 0.5 | 1 | 50 | 6 | |
| 2JJRB 005 015 S04 | 0.25R X 0.5 | 0.5 | 1.5 | 45 | 4 | |
| 2JJRB 005 020 S04 | 0.25R X 0.5 | 0.5 | 2 | 45 | 4 | |
| 2JJRB 005 020 S06 | 0.25R X 0.5 | 0.5 | 2 | 50 | 6 | |
| 2JJRB 005 025 S04 | 0.25R X 0.5 | 0.5 | 2.5 | 45 | 4 | |
| 2JJRB 005 030 S04 | 0.25R X 0.5 | 0.5 | 3 | 45 | 4 | |
| 2JJRB 005 030 S06 | 0.25R X 0.5 | 0.5 | 3 | 50 | 6 | |
| 2JJRB 005 035 S04 | 0.25R X 0.5 | 0.5 | 3.5 | 45 | 4 | |
| 2JJRB 005 040 S04 | 0.25R X 0.5 | 0.5 | 4 | 45 | 4 | |
| 2JJRB 005 040 S06 | 0.25R X 0.5 | 0.5 | 4 | 50 | 6 | |
| 2JJRB 005 045 S04 | 0.25R X 0.5 | 0.5 | 4.5 | 45 | 4 | |
| 2JJRB 005 050 S04 | 0.25R X 0.5 | 0.5 | 5 | 45 | 4 | |
| 2JJRB 005 050 S06 | 0.25R X 0.5 | 0.5 | 5 | 50 | 6 | |

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2JJRB 005 060 S04 | 0.25R X 0.5 | 0.5 | 6 | 45 | 4 | |
| 2JJRB 005 060 S06 | 0.25R X 0.5 | 0.5 | 6 | 50 | 6 | |
| 2JJRB 005 080 S04 | 0.25R X 0.5 | 0.5 | 8 | 45 | 4 | |
| 2JJRB 005 100 S04 | 0.25R X 0.5 | 0.5 | 10 | 45 | 4 | |
| 2JJRB 005 120 S04 | 0.25R X 0.5 | 0.5 | 12 | 45 | 4 | |
| 2JJRB 006 010 S04 | 0.3R X 0.6 | 0.6 | 1 | 45 | 4 | |
| 2JJRB 006 010 S06 | 0.3R X 0.6 | 0.6 | 1 | 50 | 6 | |
| 2JJRB 006 020 S04 | 0.3R X 0.6 | 0.6 | 2 | 45 | 4 | |
| 2JJRB 006 020 S06 | 0.3R X 0.6 | 0.6 | 2 | 50 | 6 | |
| 2JJRB 006 030 S04 | 0.3R X 0.6 | 0.6 | 3 | 45 | 4 | |
| 2JJRB 006 030 S06 | 0.3R X 0.6 | 0.6 | 3 | 50 | 6 | |
| 2JJRB 006 040 S04 | 0.3R X 0.6 | 0.6 | 4 | 45 | 4 | |
| 2JJRB 006 040 S06 | 0.3R X 0.6 | 0.6 | 4 | 50 | 6 | |
| 2JJRB 006 050 S04 | 0.3R X 0.6 | 0.6 | 5 | 45 | 4 | |
| 2JJRB 006 050 S06 | 0.3R X 0.6 | 0.6 | 5 | 50 | 6 | |
| 2JJRB 006 060 S04 | 0.3R X 0.6 | 0.6 | 6 | 45 | 4 | |
| 2JJRB 006 060 S06 | 0.3R X 0.6 | 0.6 | 6 | 50 | 6 | |
| 2JJRB 006 080 S04 | 0.3R X 0.6 | 0.6 | 8 | 45 | 4 | |
| 2JJRB 006 080 S06 | 0.3R X 0.6 | 0.6 | 8 | 50 | 6 | |
| 2JJRB 006 100 S04 | 0.3R X 0.6 | 0.6 | 10 | 45 | 4 | |
| 2JJRB 006 120 S04 | 0.3R X 0.6 | 0.6 | 12 | 45 | 4 | |
| 2JJRB 006 140 S04 | 0.3R X 0.6 | 0.6 | 14 | 45 | 4 | |
| 2JJRB 007 020 S04 | 0.35R X 0.7 | 0.7 | 2 | 45 | 4 | |
| 2JJRB 007 040 S04 | 0.35R X 0.7 | 0.7 | 4 | 45 | 4 | |
| 2JJRB 007 060 S04 | 0.35R X 0.7 | 0.7 | 6 | 45 | 4 | |
| 2JJRB 007 080 S04 | 0.35R X 0.7 | 0.7 | 8 | 45 | 4 | |
| 2JJRB 007 100 S04 | 0.35R X 0.7 | 0.7 | 10 | 45 | 4 | |
| 2JJRB 007 120 S04 | 0.35R X 0.7 | 0.7 | 12 | 45 | 4 | |
| 2JJRB 008 020 S04 | 0.4R X 0.8 | 0.8 | 2 | 45 | 4 | |
| 2JJRB 008 020 S06 | 0.4R X 0.8 | 0.8 | 2 | 50 | 6 | |
| 2JJRB 008 030 S04 | 0.4R X 0.8 | 0.8 | 3 | 45 | 4 | |
| 2JJRB 008 030 S06 | 0.4R X 0.8 | 0.8 | 3 | 50 | 6 | |
| 2JJRB 008 040 S04 | 0.4R X 0.8 | 0.8 | 4 | 45 | 4 | |
| 2JJRB 008 040 S06 | 0.4R X 0.8 | 0.8 | 4 | 50 | 6 | |
| 2JJRB 008 050 S04 | 0.4R X 0.8 | 0.8 | 5 | 45 | 4 | |
| 2JJRB 008 050 S06 | 0.4R X 0.8 | 0.8 | 5 | 50 | 6 | |
| 2JJRB 008 060 S04 | 0.4R X 0.8 | 0.8 | 6 | 45 | 4 | |
| 2JJRB 008 060 S06 | 0.4R X 0.8 | 0.8 | 6 | 50 | 6 | |
| 2JJRB 008 080 S04 | 0.4R X 0.8 | 0.8 | 8 | 45 | 4 | |
| 2JJRB 008 080 S06 | 0.4R X 0.8 | 0.8 | 8 | 50 | 6 | |
| 2JJRB 008 100 S04 | 0.4R X 0.8 | 0.8 | 10 | 45 | 4 | |
| 2JJRB 008 120 S04 | 0.4R X 0.8 | 0.8 | 12 | 45 | 4 | |
| 2JJRB 009 040 S04 | 0.45R X 0.9 | 0.9 | 4 | 45 | 4 | |
| 2JJRB 009 060 S04 | 0.45R X 0.9 | 0.9 | 6 | 45 | 4 | |
| 2JJRB 009 080 S04 | 0.45R X 0.9 | 0.9 | 8 | 45 | 4 | |
| 2JJRB 009 100 S04 | 0.45R X 0.9 | 0.9 | 10 | 50 | 4 | |
| 2JJRB 009 120 S04 | 0.45R X 0.9 | 0.9 | 12 | 50 | 4 | |
| 2JJRB 010 020 S04 | 0.5R X 1 | 1 | 2 | 45 | 4 | |
| 2JJRB 010 020 S06 | 0.5R X 1 | 1 | 2 | 50 | 6 | |
| 2JJRB 010 030 S04 | 0.5R X 1 | 1 | 3 | 45 | 4 | |

# 2JJRB

## 2 Flutes JJ Rib Ball End Mills for Hardened Steels

## 2날 고경도재 가공용 제이제이 리브 볼 엔드밀

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2JJRB 010 030 S06 | 0.5R X 1 | 1 | 3 | 50 | 6 | |
| 2JJRB 010 040 S04 | 0.5R X 1 | 1 | 4 | 45 | 4 | |
| 2JJRB 010 040 S06 | 0.5R X 1 | 1 | 4 | 50 | 6 | |
| 2JJRB 010 050 S04 | 0.5R X 1 | 1 | 5 | 45 | 4 | |
| 2JJRB 010 050 S06 | 0.5R X 1 | 1 | 5 | 50 | 6 | |
| 2JJRB 010 060 S04 | 0.5R X 1 | 1 | 6 | 45 | 4 | |
| 2JJRB 010 060 S06 | 0.5R X 1 | 1 | 6 | 50 | 6 | |
| 2JJRB 010 080 S04 | 0.5R X 1 | 1 | 8 | 45 | 4 | |
| 2JJRB 010 080 S06 | 0.5R X 1 | 1 | 8 | 50 | 6 | |
| 2JJRB 010 100 S04 | 0.5R X 1 | 1 | 10 | 50 | 4 | |
| 2JJRB 010 100 S06 | 0.5R X 1 | 1 | 10 | 50 | 6 | |
| 2JJRB 010 120 S04 | 0.5R X 1 | 1 | 12 | 50 | 4 | |
| 2JJRB 010 120 S06 | 0.5R X 1 | 1 | 12 | 50 | 6 | |
| 2JJRB 010 140 S04 | 0.5R X 1 | 1 | 14 | 50 | 4 | |
| 2JJRB 010 160 S04 | 0.5R X 1 | 1 | 16 | 50 | 4 | |
| 2JJRB 010 180 S04 | 0.5R X 1 | 1 | 18 | 50 | 4 | |
| 2JJRB 010 200 S04 | 0.5R X 1 | 1 | 20 | 50 | 4 | |
| 2JJRB 010 220 S04 | 0.5R X 1 | 1 | 22 | 60 | 4 | |
| 2JJRB 010 250 S04 | 0.5R X 1 | 1 | 25 | 60 | 4 | |
| 2JJRB 012 040 S04 | 0.6R X 1.2 | 1.2 | 4 | 45 | 4 | |
| 2JJRB 012 040 S06 | 0.6R X 1.2 | 1.2 | 4 | 50 | 6 | |
| 2JJRB 012 060 S04 | 0.6R X 1.2 | 1.2 | 6 | 45 | 4 | |
| 2JJRB 012 060 S06 | 0.6R X 1.2 | 1.2 | 6 | 50 | 6 | |
| 2JJRB 012 080 S04 | 0.6R X 1.2 | 1.2 | 8 | 45 | 4 | |
| 2JJRB 012 080 S06 | 0.6R X 1.2 | 1.2 | 8 | 50 | 6 | |
| 2JJRB 012 100 S04 | 0.6R X 1.2 | 1.2 | 10 | 50 | 4 | |
| 2JJRB 012 100 S06 | 0.6R X 1.2 | 1.2 | 10 | 50 | 6 | |
| 2JJRB 012 120 S04 | 0.6R X 1.2 | 1.2 | 12 | 50 | 4 | |
| 2JJRB 012 120 S06 | 0.6R X 1.2 | 1.2 | 12 | 50 | 6 | |
| 2JJRB 012 160 S04 | 0.6R X 1.2 | 1.2 | 16 | 50 | 4 | |
| 2JJRB 012 200 S04 | 0.6R X 1.2 | 1.2 | 20 | 50 | 4 | |
| 2JJRB 012 240 S04 | 0.6R X 1.2 | 1.2 | 24 | 60 | 4 | |
| 2JJRB 014 060 S04 | 0.7R X 1.4 | 1.4 | 6 | 45 | 4 | |
| 2JJRB 014 080 S04 | 0.7R X 1.4 | 1.4 | 8 | 45 | 4 | |
| 2JJRB 014 120 S04 | 0.7R X 1.4 | 1.4 | 12 | 50 | 4 | |
| 2JJRB 014 160 S04 | 0.7R X 1.4 | 1.4 | 16 | 50 | 4 | |
| 2JJRB 015 030 S04 | 0.75R X 1.5 | 1.5 | 3 | 45 | 4 | |
| 2JJRB 015 030 S06 | 0.75R X 1.5 | 1.5 | 3 | 50 | 6 | |
| 2JJRB 015 040 S04 | 0.75R X 1.5 | 1.5 | 4 | 45 | 4 | |
| 2JJRB 015 040 S06 | 0.75R X 1.5 | 1.5 | 4 | 50 | 6 | |
| 2JJRB 015 060 S04 | 0.75R X 1.5 | 1.5 | 6 | 45 | 4 | |
| 2JJRB 015 060 S06 | 0.75R X 1.5 | 1.5 | 6 | 50 | 6 | |
| 2JJRB 015 080 S04 | 0.75R X 1.5 | 1.5 | 8 | 45 | 4 | |
| 2JJRB 015 080 S06 | 0.75R X 1.5 | 1.5 | 8 | 50 | 6 | |
| 2JJRB 015 100 S04 | 0.75R X 1.5 | 1.5 | 10 | 50 | 4 | |
| 2JJRB 015 100 S06 | 0.75R X 1.5 | 1.5 | 10 | 50 | 6 | |
| 2JJRB 015 120 S04 | 0.75R X 1.5 | 1.5 | 12 | 50 | 4 | |
| 2JJRB 015 120 S06 | 0.75R X 1.5 | 1.5 | 12 | 50 | 6 | |
| 2JJRB 015 140 S04 | 0.75R X 1.5 | 1.5 | 14 | 50 | 4 | |
| 2JJRB 015 140 S06 | 0.75R X 1.5 | 1.5 | 14 | 50 | 6 | |

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2JJRB 015 160 S04 | 0.75R X 1.5 | 1.5 | 16 | 50 | 4 | |
| 2JJRB 015 160 S06 | 0.75R X 1.5 | 1.5 | 16 | 60 | 6 | |
| 2JJRB 015 180 S04 | 0.75R X 1.5 | 1.5 | 18 | 50 | 4 | |
| 2JJRB 015 200 S04 | 0.75R X 1.5 | 1.5 | 20 | 50 | 4 | |
| 2JJRB 015 220 S04 | 0.75R X 1.5 | 1.5 | 22 | 60 | 4 | |
| 2JJRB 015 250 S04 | 0.75R X 1.5 | 1.5 | 25 | 60 | 4 | |
| 2JJRB 015 300 S04 | 0.75R X 1.5 | 1.5 | 30 | 70 | 4 | |
| 2JJRB 016 060 S04 | 0.8R X 1.6 | 1.6 | 6 | 45 | 4 | |
| 2JJRB 016 080 S04 | 0.8R X 1.6 | 1.6 | 8 | 45 | 4 | |
| 2JJRB 016 120 S04 | 0.8R X 1.6 | 1.6 | 12 | 50 | 4 | |
| 2JJRB 016 160 S04 | 0.8R X 1.6 | 1.6 | 16 | 50 | 4 | |
| 2JJRB 016 200 S04 | 0.8R X 1.6 | 1.6 | 20 | 50 | 4 | |
| 2JJRB 018 060 S04 | 0.9R X 1.8 | 1.8 | 6 | 45 | 4 | |
| 2JJRB 018 080 S04 | 0.9R X 1.8 | 1.8 | 8 | 45 | 4 | |
| 2JJRB 018 120 S04 | 0.9R X 1.8 | 1.8 | 12 | 50 | 4 | |
| 2JJRB 018 160 S04 | 0.9R X 1.8 | 1.8 | 16 | 50 | 4 | |
| 2JJRB 018 200 S04 | 0.9R X 1.8 | 1.8 | 20 | 50 | 4 | |
| 2JJRB 020 040 S04 | 1R X 2 | 2 | 4 | 45 | 4 | |
| 2JJRB 020 040 S06 | 1R X 2 | 2 | 4 | 50 | 6 | |
| 2JJRB 020 060 S04 | 1R X 2 | 2 | 6 | 45 | 4 | |
| 2JJRB 020 060 S06 | 1R X 2 | 2 | 6 | 50 | 6 | |
| 2JJRB 020 080 S04 | 1R X 2 | 2 | 8 | 45 | 4 | |
| 2JJRB 020 080 S06 | 1R X 2 | 2 | 8 | 50 | 6 | |
| 2JJRB 020 100 S04 | 1R X 2 | 2 | 10 | 50 | 4 | |
| 2JJRB 020 100 S06 | 1R X 2 | 2 | 10 | 50 | 6 | |
| 2JJRB 020 120 S04 | 1R X 2 | 2 | 12 | 50 | 4 | |
| 2JJRB 020 120 S06 | 1R X 2 | 2 | 12 | 50 | 6 | |
| 2JJRB 020 140 S04 | 1R X 2 | 2 | 14 | 50 | 4 | |
| 2JJRB 020 140 S06 | 1R X 2 | 2 | 14 | 50 | 6 | |
| 2JJRB 020 160 S04 | 1R X 2 | 2 | 16 | 50 | 4 | |
| 2JJRB 020 160 S06 | 1R X 2 | 2 | 16 | 60 | 6 | |
| 2JJRB 020 180 S04 | 1R X 2 | 2 | 18 | 50 | 4 | |
| 2JJRB 020 180 S06 | 1R X 2 | 2 | 18 | 60 | 6 | |
| 2JJRB 020 200 S04 | 1R X 2 | 2 | 20 | 50 | 4 | |
| 2JJRB 020 200 S06 | 1R X 2 | 2 | 20 | 60 | 6 | |
| 2JJRB 020 220 S04 | 1R X 2 | 2 | 22 | 60 | 4 | |
| 2JJRB 020 250 S04 | 1R X 2 | 2 | 25 | 60 | 4 | |
| 2JJRB 020 300 S04 | 1R X 2 | 2 | 30 | 60 | 4 | |
| 2JJRB 025 080 S04 | 1.25R X 2.5 | 2.5 | 8 | 45 | 4 | |
| 2JJRB 025 080 S06 | 1.25R X 2.5 | 2.5 | 8 | 50 | 6 | |
| 2JJRB 025 100 S04 | 1.25R X 2.5 | 2.5 | 10 | 50 | 4 | |
| 2JJRB 025 100 S06 | 1.25R X 2.5 | 2.5 | 10 | 50 | 6 | |
| 2JJRB 025 120 S04 | 1.25R X 2.5 | 2.5 | 12 | 50 | 4 | |
| 2JJRB 025 120 S06 | 1.25R X 2.5 | 2.5 | 12 | 50 | 6 | |
| 2JJRB 025 160 S04 | 1.25R X 2.5 | 2.5 | 16 | 50 | 4 | |
| 2JJRB 025 160 S06 | 1.25R X 2.5 | 2.5 | 16 | 60 | 6 | |
| 2JJRB 025 200 S04 | 1.25R X 2.5 | 2.5 | 20 | 60 | 4 | |
| 2JJRB 025 200 S06 | 1.25R X 2.5 | 2.5 | 20 | 60 | 6 | |
| 2JJRB 025 250 S04 | 1.25R X 2.5 | 2.5 | 25 | 60 | 4 | |
| 2JJRB 025 300 S04 | 1.25R X 2.5 | 2.5 | 30 | 70 | 4 | |

# 2JJRB

## 2 Flutes JJ Rib Ball End Mills for Hardened Steels

## 2날 고경도재 가공용 제이제이 리브 볼 엔드밀

단위 : mm

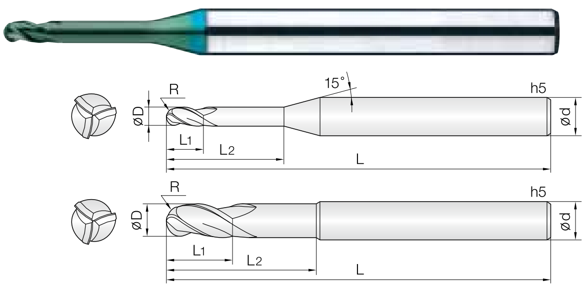
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2JJRB 030 060 S06 | 1.5R X 3 | 3 | 6 | 50 | 6 | |
| 2JJRB 030 080 S06 | 1.5R X 3 | 3 | 8 | 50 | 6 | |
| 2JJRB 030 100 S06 | 1.5R X 3 | 3 | 10 | 50 | 6 | |
| 2JJRB 030 120 S06 | 1.5R X 3 | 3 | 12 | 50 | 6 | |
| 2JJRB 030 160 S06 | 1.5R X 3 | 3 | 16 | 60 | 6 | |
| 2JJRB 030 200 S06 | 1.5R X 3 | 3 | 20 | 60 | 6 | |
| 2JJRB 030 250 S06 | 1.5R X 3 | 3 | 25 | 65 | 6 | |
| 2JJRB 030 300 S06 | 1.5R X 3 | 3 | 30 | 70 | 6 | |
| 2JJRB 030 350 S06 | 1.5R X 3 | 3 | 35 | 75 | 6 | |
| 2JJRB 030 400 S06 | 1.5R X 3 | 3 | 40 | 80 | 6 | |
| 2JJRB 030 450 S06 | 1.5R X 3 | 3 | 45 | 90 | 6 | |
| 2JJRB 030 500 S06 | 1.5R X 3 | 3 | 50 | 100 | 6 | |
| 2JJRB 035 100 S06 | 1.75R X 3.5 | 3.5 | 10 | 50 | 6 | |
| 2JJRB 035 150 S06 | 1.75R X 3.5 | 3.5 | 15 | 60 | 6 | |
| 2JJRB 035 200 S06 | 1.75R X 3.5 | 3.5 | 20 | 60 | 6 | |
| 2JJRB 035 250 S06 | 1.75R X 3.5 | 3.5 | 25 | 65 | 6 | |
| 2JJRB 035 300 S06 | 1.75R X 3.5 | 3.5 | 30 | 70 | 6 | |
| 2JJRB 035 350 S06 | 1.75R X 3.5 | 3.5 | 35 | 75 | 6 | |
| 2JJRB 035 400 S06 | 1.75R X 3.5 | 3.5 | 40 | 80 | 6 | |
| 2JJRB 040 080 S06 | 2R X 4 | 4 | 8 | 50 | 6 | |
| 2JJRB 040 100 S06 | 2R X 4 | 4 | 10 | 50 | 6 | |
| 2JJRB 040 120 S06 | 2R X 4 | 4 | 12 | 50 | 6 | |
| 2JJRB 040 160 S06 | 2R X 4 | 4 | 16 | 60 | 6 | |
| 2JJRB 040 200 S06 | 2R X 4 | 4 | 20 | 60 | 6 | |
| 2JJRB 040 250 S06 | 2R X 4 | 4 | 25 | 65 | 6 | |
| 2JJRB 040 300 S06 | 2R X 4 | 4 | 30 | 70 | 6 | |
| 2JJRB 040 350 S06 | 2R X 4 | 4 | 35 | 75 | 6 | |
| 2JJRB 040 400 S06 | 2R X 4 | 4 | 40 | 80 | 6 | |
| 2JJRB 040 450 S06 | 2R X 4 | 4 | 45 | 90 | 6 | |
| 2JJRB 040 500 S06 | 2R X 4 | 4 | 50 | 100 | 6 | |
| 2JJRB 050 160 S06 | 2.5R X 5 | 6 | 16 | 60 | 6 | |
| 2JJRB 050 200 S06 | 2.5R X 5 | 6 | 20 | 60 | 6 | |
| 2JJRB 050 250 S06 | 2.5R X 5 | 6 | 25 | 70 | 6 | |
| 2JJRB 050 300 S06 | 2.5R X 5 | 6 | 30 | 75 | 6 | |
| 2JJRB 050 400 S06 | 2.5R X 5 | 6 | 40 | 80 | 6 | |
| 2JJRB 050 450 S06 | 2.5R X 5 | 6 | 45 | 90 | 6 | |
| 2JJRB 050 500 S06 | 2.5R X 5 | 6 | 50 | 100 | 6 | |
| 2JJRB 060 150 S06 | 3R X 6 | 10 | 15 | 55 | 6 | |
| 2JJRB 060 300 100 | 3R X 6 | 10 | 30 | 100 | 6 | |
| 2JJRB 060 500 120 | 3R X 6 | 10 | 50 | 120 | 6 | |
| 2JJRB 080 250 060 | 4R X 8 | 12 | 25 | 60 | 8 | |
| 2JJRB 080 300 100 | 4R X 8 | 12 | 30 | 100 | 8 | |
| 2JJRB 080 600 120 | 4R X 8 | 12 | 60 | 120 | 8 | |
| 2JJRB 100 300 070 | 5R X 10 | 16 | 30 | 70 | 10 | |
| 2JJRB 100 450 100 | 5R X 10 | 16 | 45 | 100 | 10 | |
| 2JJRB 100 600 130 | 5R X 10 | 16 | 60 | 130 | 10 | |
| 2JJRB 120 300 075 | 6R X 12 | 18 | 30 | 75 | 12 | |
| 2JJRB 120 500 110 | 6R X 12 | 18 | 50 | 110 | 12 | |
| 2JJRB 120 600 130 | 6R X 12 | 18 | 60 | 130 | 12 | |

# 3JJRB

## 3 Flutes JJ Rib Ball End Mills for Hardened Steels

## 3날 고경도재 가공용 제이제이 리브 볼 엔드밀






- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 날부인선의 조도가 뛰어나 피삭재의 면조도가 우수합니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Excellent surface finish.
- Very nice work surface finish.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

3 | UWC 초미립자 | TISIN-S Coating | R ±0.005 (0.5 ~ 2.5R) | R ±0.01 (3~ 6R) | 30° Helix Angle | CUTTING DATA (415P)

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø1 ~ 12 | +0 ~ -0.01mm | ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 3JJRB 010 040 S04 | 0.5R X 1 | 1.2 | 4 | 50 | 4 | |
| 3JJRB 010 060 S04 | 0.5R X 1 | 1.2 | 6 | 50 | 4 | |
| 3JJRB 010 080 S04 | 0.5R X 1 | 1.2 | 8 | 50 | 4 | |
| 3JJRB 010 100 S04 | 0.5R X 1 | 1.2 | 10 | 50 | 4 | |
| 3JJRB 010 120 S04 | 0.5R X 1 | 1.2 | 12 | 50 | 4 | |
| 3JJRB 010 160 S04 | 0.5R X 1 | 1.2 | 16 | 50 | 4 | |
| 3JJRB 015 060 S04 | 0.75R X 1.5 | 1.8 | 6 | 50 | 4 | |
| 3JJRB 015 080 S04 | 0.75R X 1.5 | 1.8 | 8 | 50 | 4 | |
| 3JJRB 015 100 S04 | 0.75R X 1.5 | 1.8 | 10 | 50 | 4 | |
| 3JJRB 015 120 S04 | 0.75R X 1.5 | 1.8 | 12 | 50 | 4 | |
| 3JJRB 015 160 S04 | 0.75R X 1.5 | 1.8 | 16 | 50 | 4 | |
| 3JJRB 015 200 S04 | 0.75R X 1.5 | 1.8 | 20 | 60 | 4 | |
| 3JJRB 020 080 S04 | 1R X 2 | 2.4 | 8 | 50 | 4 | |
| 3JJRB 020 100 S04 | 1R X 2 | 2.4 | 10 | 50 | 4 | |
| 3JJRB 020 120 S04 | 1R X 2 | 2.4 | 12 | 50 | 4 | |
| 3JJRB 020 160 S04 | 1R X 2 | 2.4 | 16 | 50 | 4 | |
| 3JJRB 020 200 S04 | 1R X 2 | 2.4 | 20 | 60 | 4 | |
| 3JJRB 020 250 S04 | 1R X 2 | 2.4 | 25 | 70 | 4 | |
| 3JJRB 025 080 S04 | 1.25R X 2.5 | 3 | 8 | 50 | 4 | |
| 3JJRB 025 100 S04 | 1.25R X 2.5 | 3 | 10 | 50 | 4 | |
| 3JJRB 025 120 S04 | 1.25R X 2.5 | 3 | 12 | 50 | 4 | |
| 3JJRB 025 160 S04 | 1.25R X 2.5 | 3 | 16 | 50 | 4 | |
| 3JJRB 025 200 S04 | 1.25R X 2.5 | 3 | 20 | 60 | 4 | |
| 3JJRB 025 250 S04 | 1.25R X 2.5 | 3 | 25 | 70 | 4 | |
| 3JJRB 030 120 S06 | 1.5R X 3 | 3.6 | 12 | 60 | 6 | |
| 3JJRB 030 160 S06 | 1.5R X 3 | 3.6 | 16 | 60 | 6 | |
| 3JJRB 030 200 S06 | 1.5R X 3 | 3.6 | 20 | 65 | 6 | |
| 3JJRB 030 250 S06 | 1.5R X 3 | 3.6 | 25 | 70 | 6 | |
| 3JJRB 030 300 S06 | 1.5R X 3 | 3.6 | 30 | 75 | 6 | |
| 3JJRB 030 400 S06 | 1.5R X 3 | 3.6 | 40 | 90 | 6 | |
| 3JJRB 030 500 S06 | 1.5R X 3 | 3.6 | 50 | 100 | 6 | |
| 3JJRB 040 160 S06 | 2R X 4 | 4.8 | 16 | 60 | 6 | |
| 3JJRB 040 200 S06 | 2R X 4 | 4.8 | 20 | 65 | 6 | |
| 3JJRB 040 250 S06 | 2R X 4 | 4.8 | 25 | 70 | 6 | |
| 3JJRB 040 300 S06 | 2R X 4 | 4.8 | 30 | 75 | 6 | |
| 3JJRB 040 400 S06 | 2R X 4 | 4.8 | 40 | 90 | 6 | |
| 3JJRB 040 500 S06 | 2R X 4 | 4.8 | 50 | 100 | 6 | |
| 3JJRB 040 600 S06 | 2R X 4 | 4.8 | 60 | 110 | 6 | |
| 3JJRB 050 300 S06 | 2.5R X 5 | 6 | 30 | 75 | 6 | |
| 3JJRB 050 400 S06 | 2.5R X 5 | 6 | 40 | 90 | 6 | |
| 3JJRB 050 500 S06 | 2.5R X 5 | 6 | 50 | 100 | 6 | |
| 3JJRB 050 600 S06 | 2.5R X 5 | 6 | 60 | 110 | 6 | |
| 3JJRB 060 200 060 | 3R X 6 | 9 | 20 | 60 | 6 | |
| 3JJRB 060 300 090 | 3R X 6 | 9 | 30 | 90 | 6 | |
| 3JJRB 080 250 060 | 4R X 8 | 12 | 25 | 60 | 8 | |
| 3JJRB 080 400 100 | 4R X 8 | 12 | 40 | 100 | 8 | |
| 3JJRB 100 300 070 | 5R X 10 | 15 | 30 | 70 | 10 | |
| 3JJRB 100 500 110 | 5R X 10 | 15 | 50 | 110 | 10 | |
| 3JJRB 120 350 075 | 6R X 12 | 18 | 35 | 75 | 12 | |
| 3JJRB 120 600 110 | 6R X 12 | 18 | 60 | 110 | 12 | |

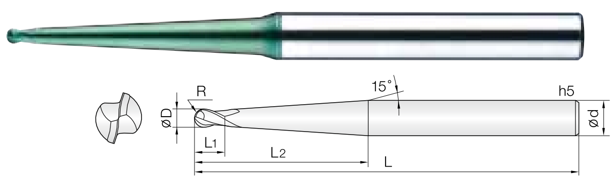
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

# 2JJTB

## 2 Flutes JJ Taper Neck Ball End Mill for Hardened Steels

## 2날 고경도재 가공용 제이제이 테이퍼 넥 볼 엔드밀

JJ series




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

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

2 | UWC 초미립자 | TISIN-S Coating | R ±0.005 (0.1 ~ 2.5R) | R ±0.01 (3 ~ 6R) | 30° Helix Angle | CUTTING DATA 416P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.2 ~ 12 | +0 ~ -0.01mm |

단위 : mm

| Order Number | 날경 Diameter R×D | 각도 Angle θ | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|
| 2JJTB 002 003 015 | 0.1R X 0.2 | 0°30 | 0.2 | 1.5 | 40 | 4 | |
| 2JJTB 002 003 020 | 0.1R X 0.2 | 0°30 | 0.2 | 2 | 40 | 4 | |
| 2JJTB 002 010 015 | 0.1R X 0.2 | 1° | 0.2 | 1.5 | 40 | 4 | |
| 2JJTB 002 010 020 | 0.1R X 0.2 | 1° | 0.2 | 2 | 40 | 4 | |
| 2JJTB 002 010 025 | 0.1R X 0.2 | 1° | 0.2 | 2.5 | 40 | 4 | |
| 2JJTB 002 013 015 | 0.1R X 0.2 | 1°30 | 0.2 | 1.5 | 40 | 4 | |
| 2JJTB 002 013 020 | 0.1R X 0.2 | 1°30 | 0.2 | 2 | 40 | 4 | |
| 2JJTB 002 013 025 | 0.1R X 0.2 | 1°30 | 0.2 | 2.5 | 40 | 4 | |
| 2JJTB 002 020 015 | 0.1R X 0.2 | 2° | 0.2 | 1.5 | 40 | 4 | |
| 2JJTB 002 020 020 | 0.1R X 0.2 | 2° | 0.2 | 2 | 40 | 4 | |
| 2JJTB 002 020 025 | 0.1R X 0.2 | 2° | 0.2 | 2.5 | 40 | 4 | |
| 2JJTB 002 030 015 | 0.1R X 0.2 | 3° | 0.2 | 1.5 | 40 | 4 | |
| 2JJTB 002 030 020 | 0.1R X 0.2 | 3° | 0.2 | 2 | 40 | 4 | |
| 2JJTB 002 030 025 | 0.1R X 0.2 | 3° | 0.2 | 2.5 | 40 | 4 | |
| 2JJTB 002 030 030 | 0.1R X 0.2 | 3° | 0.2 | 3 | 45 | 4 | |
| 2JJTB 002 050 020 | 0.1R X 0.2 | 5° | 0.2 | 2 | 40 | 4 | |
| 2JJTB 002 050 030 | 0.1R X 0.2 | 5° | 0.2 | 3 | 45 | 4 | |
| 2JJTB 003 003 030 | 0.15R X 0.3 | 0°30 | 0.3 | 3 | 40 | 4 | |
| 2JJTB 003 010 020 | 0.15R X 0.3 | 1° | 0.3 | 2 | 40 | 4 | |
| 2JJTB 003 010 030 | 0.15R X 0.3 | 1° | 0.3 | 3 | 40 | 4 | |
| 2JJTB 003 010 040 | 0.15R X 0.3 | 1° | 0.3 | 4 | 40 | 4 | |
| 2JJTB 003 010 050 | 0.15R X 0.3 | 1° | 0.3 | 5 | 40 | 4 | |
| 2JJTB 003 013 020 | 0.15R X 0.3 | 1°30 | 0.3 | 2 | 40 | 4 | |
| 2JJTB 003 013 030 | 0.15R X 0.3 | 1°30 | 0.3 | 3 | 40 | 4 | |
| 2JJTB 003 013 040 | 0.15R X 0.3 | 1°30 | 0.3 | 4 | 40 | 4 | |
| 2JJTB 003 013 050 | 0.15R X 0.3 | 1°30 | 0.3 | 5 | 40 | 4 | |
| 2JJTB 003 020 020 | 0.15R X 0.3 | 2° | 0.3 | 2 | 40 | 4 | |
| 2JJTB 003 020 030 | 0.15R X 0.3 | 2° | 0.3 | 3 | 40 | 4 | |
| 2JJTB 003 020 040 | 0.15R X 0.3 | 2° | 0.3 | 4 | 40 | 4 | |
| 2JJTB 003 020 050 | 0.15R X 0.3 | 2° | 0.3 | 5 | 40 | 4 | |
| 2JJTB 003 020 060 | 0.15R X 0.3 | 2° | 0.3 | 6 | 45 | 4 | |
| 2JJTB 003 030 020 | 0.15R X 0.3 | 3° | 0.3 | 2 | 40 | 4 | |
| 2JJTB 003 030 030 | 0.15R X 0.3 | 3° | 0.3 | 3 | 40 | 4 | |
| 2JJTB 003 030 040 | 0.15R X 0.3 | 3° | 0.3 | 4 | 40 | 4 | |
| 2JJTB 003 030 050 | 0.15R X 0.3 | 3° | 0.3 | 5 | 40 | 4 | |
| 2JJTB 003 030 060 | 0.15R X 0.3 | 3° | 0.3 | 6 | 45 | 4 | |
| 2JJTB 003 050 050 | 0.15R X 0.3 | 5° | 0.3 | 5 | 40 | 4 | |
| 2JJTB 003 050 080 | 0.15R X 0.3 | 5° | 0.3 | 8 | 45 | 4 | |
| 2JJTB 004 003 020 | 0.2R X 0.4 | 0°30 | 0.4 | 2 | 40 | 4 | |
| 2JJTB 004 003 030 | 0.2R X 0.4 | 0°30 | 0.4 | 3 | 40 | 4 | |
| 2JJTB 004 003 040 | 0.2R X 0.4 | 0°30 | 0.4 | 4 | 40 | 4 | |
| 2JJTB 004 003 050 | 0.2R X 0.4 | 0°30 | 0.4 | 5 | 40 | 4 | |
| 2JJTB 004 003 060 | 0.2R X 0.4 | 0°30 | 0.4 | 6 | 40 | 4 | |
| 2JJTB 004 010 020 | 0.2R X 0.4 | 1° | 0.4 | 2 | 40 | 4 | |
| 2JJTB 004 010 030 | 0.2R X 0.4 | 1° | 0.4 | 3 | 40 | 4 | |
| 2JJTB 004 010 040 | 0.2R X 0.4 | 1° | 0.4 | 4 | 40 | 4 | |
| 2JJTB 004 010 050 | 0.2R X 0.4 | 1° | 0.4 | 5 | 40 | 4 | |
| 2JJTB 004 010 060 | 0.2R X 0.4 | 1° | 0.4 | 6 | 40 | 4 | |
| 2JJTB 004 010 080 | 0.2R X 0.4 | 1° | 0.4 | 8 | 45 | 4 | |
| 2JJTB 004 013 020 | 0.2R X 0.4 | 1°30 | 0.4 | 2 | 40 | 4 | |

| Order Number | 날경 Diameter R×D | 각도 Angle θ | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|
| 2JJTB 004 013 030 | 0.2R X 0.4 | 1°30 | 0.4 | 3 | 40 | 4 | |
| 2JJTB 004 013 040 | 0.2R X 0.4 | 1°30 | 0.4 | 4 | 40 | 4 | |
| 2JJTB 004 013 050 | 0.2R X 0.4 | 1°30 | 0.4 | 5 | 40 | 4 | |
| 2JJTB 004 013 060 | 0.2R X 0.4 | 1°30 | 0.4 | 6 | 40 | 4 | |
| 2JJTB 004 013 080 | 0.2R X 0.4 | 1°30 | 0.4 | 8 | 45 | 4 | |
| 2JJTB 004 020 020 | 0.2R X 0.4 | 2° | 0.4 | 2 | 40 | 4 | |
| 2JJTB 004 020 030 | 0.2R X 0.4 | 2° | 0.4 | 3 | 40 | 4 | |
| 2JJTB 004 020 040 | 0.2R X 0.4 | 2° | 0.4 | 4 | 40 | 4 | |
| 2JJTB 004 020 050 | 0.2R X 0.4 | 2° | 0.4 | 5 | 40 | 4 | |
| 2JJTB 004 020 060 | 0.2R X 0.4 | 2° | 0.4 | 6 | 40 | 4 | |
| 2JJTB 004 020 080 | 0.2R X 0.4 | 2° | 0.4 | 8 | 45 | 4 | |
| 2JJTB 004 020 100 | 0.2R X 0.4 | 2° | 0.4 | 10 | 45 | 4 | |
| 2JJTB 004 030 040 | 0.2R X 0.4 | 3° | 0.4 | 4 | 45 | 4 | |
| 2JJTB 004 030 060 | 0.2R X 0.4 | 3° | 0.4 | 6 | 45 | 4 | |
| 2JJTB 004 030 080 | 0.2R X 0.4 | 3° | 0.4 | 8 | 45 | 4 | |
| 2JJTB 004 030 100 | 0.2R X 0.4 | 3° | 0.4 | 10 | 45 | 4 | |
| 2JJTB 004 050 060 | 0.2R X 0.4 | 5° | 0.4 | 6 | 45 | 4 | |
| 2JJTB 004 050 080 | 0.2R X 0.4 | 5° | 0.4 | 8 | 45 | 4 | |
| 2JJTB 004 050 100 | 0.2R X 0.4 | 5° | 0.4 | 10 | 45 | 4 | |
| 2JJTB 005 003 040 | 0.25R X 0.5 | 0°30 | 0.5 | 4 | 45 | 4 | |
| 2JJTB 005 003 060 | 0.25R X 0.5 | 0°30 | 0.5 | 6 | 45 | 4 | |
| 2JJTB 005 010 040 | 0.25R X 0.5 | 1° | 0.5 | 4 | 45 | 4 | |
| 2JJTB 005 010 060 | 0.25R X 0.5 | 1° | 0.5 | 6 | 45 | 4 | |
| 2JJTB 005 010 080 | 0.25R X 0.5 | 1° | 0.5 | 8 | 45 | 4 | |
| 2JJTB 005 010 100 | 0.25R X 0.5 | 1° | 0.5 | 10 | 45 | 4 | |
| 2JJTB 005 013 040 | 0.25R X 0.5 | 1°30 | 0.5 | 4 | 45 | 4 | |
| 2JJTB 005 013 060 | 0.25R X 0.5 | 1°30 | 0.5 | 6 | 45 | 4 | |
| 2JJTB 005 013 080 | 0.25R X 0.5 | 1°30 | 0.5 | 8 | 45 | 4 | |
| 2JJTB 005 013 100 | 0.25R X 0.5 | 1°30 | 0.5 | 10 | 45 | 4 | |
| 2JJTB 005 020 040 | 0.25R X 0.5 | 2° | 0.5 | 4 | 45 | 4 | |
| 2JJTB 005 020 060 | 0.25R X 0.5 | 2° | 0.5 | 6 | 45 | 4 | |
| 2JJTB 005 020 080 | 0.25R X 0.5 | 2° | 0.5 | 8 | 45 | 4 | |
| 2JJTB 005 020 100 | 0.25R X 0.5 | 2° | 0.5 | 10 | 45 | 4 | |
| 2JJTB 005 030 080 | 0.25R X 0.5 | 3° | 0.5 | 8 | 45 | 4 | |
| 2JJTB 005 030 120 | 0.25R X 0.5 | 3° | 0.5 | 12 | 50 | 4 | |
| 2JJTB 005 030 160 | 0.25R X 0.5 | 3° | 0.5 | 16 | 60 | 4 | |
| 2JJTB 005 030 200 | 0.25R X 0.5 | 3° | 0.5 | 20 | 60 | 4 | |
| 2JJTB 005 050 100 | 0.25R X 0.5 | 5° | 0.5 | 10 | 50 | 4 | |
| 2JJTB 005 050 150 | 0.25R X 0.5 | 5° | 0.5 | 15 | 60 | 4 | |
| 2JJTB 005 050 200 | 0.25R X 0.5 | 5° | 0.5 | 20 | 60 | 4 | |
| 2JJTB 006 003 040 | 0.3R X 0.6 | 0°30 | 0.6 | 4 | 45 | 4 | |
| 2JJTB 006 003 060 | 0.3R X 0.6 | 0°30 | 0.6 | 6 | 45 | 4 | |
| 2JJTB 006 003 080 | 0.3R X 0.6 | 0°30 | 0.6 | 8 | 45 | 4 | |
| 2JJTB 006 010 040 | 0.3R X 0.6 | 1° | 0.6 | 4 | 45 | 4 | |
| 2JJTB 006 010 060 | 0.3R X 0.6 | 1° | 0.6 | 6 | 45 | 4 | |
| 2JJTB 006 010 080 | 0.3R X 0.6 | 1° | 0.6 | 8 | 45 | 4 | |
| 2JJTB 006 010 100 | 0.3R X 0.6 | 1° | 0.6 | 10 | 45 | 4 | |
| 2JJTB 006 010 120 | 0.3R X 0.6 | 1° | 0.6 | 12 | 50 | 4 | |
| 2JJTB 006 010 150 | 0.3R X 0.6 | 1° | 0.6 | 15 | 50 | 4 | |
| 2JJTB 006 010 200 | 0.3R X 0.6 | 1° | 0.6 | 20 | 60 | 4 | |

# 2JJTB

## 2 Flutes JJ Taper Neck Ball End Mills for Hardened Steels

## 2날 고경도재 가공용 제이제이 테이퍼 넥 볼 엔드밀



단위 : mm

| Order Number | 날경 Diameter R × D | 각도 Angle θ | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|
| 2JJTB 006 013 040 | 0.3R X 0.6 | 1°30 | 0.6 | 4 | 45 | 4 | |
| 2JJTB 006 013 060 | 0.3R X 0.6 | 1°30 | 0.6 | 6 | 45 | 4 | |
| 2JJTB 006 013 080 | 0.3R X 0.6 | 1°30 | 0.6 | 8 | 45 | 4 | |
| 2JJTB 006 013 100 | 0.3R X 0.6 | 1°30 | 0.6 | 10 | 45 | 4 | |
| 2JJTB 006 013 120 | 0.3R X 0.6 | 1°30 | 0.6 | 12 | 50 | 4 | |
| 2JJTB 006 013 150 | 0.3R X 0.6 | 1°30 | 0.6 | 15 | 50 | 4 | |
| 2JJTB 006 013 200 | 0.3R X 0.6 | 1°30 | 0.6 | 20 | 60 | 4 | |
| 2JJTB 006 020 060 | 0.3R X 0.6 | 2° | 0.6 | 6 | 45 | 4 | |
| 2JJTB 006 020 080 | 0.3R X 0.6 | 2° | 0.6 | 8 | 45 | 4 | |
| 2JJTB 006 020 100 | 0.3R X 0.6 | 2° | 0.6 | 10 | 45 | 4 | |
| 2JJTB 006 020 150 | 0.3R X 0.6 | 2° | 0.6 | 15 | 50 | 4 | |
| 2JJTB 006 020 200 | 0.3R X 0.6 | 2° | 0.6 | 20 | 60 | 4 | |
| 2JJTB 006 030 130 | 0.3R X 0.6 | 3° | 0.6 | 13 | 50 | 4 | |
| 2JJTB 006 030 160 | 0.3R X 0.6 | 3° | 0.6 | 16 | 60 | 4 | |
| 2JJTB 006 030 200 | 0.3R X 0.6 | 3° | 0.6 | 20 | 60 | 4 | |
| 2JJTB 006 050 100 | 0.3R X 0.6 | 5° | 0.6 | 10 | 50 | 4 | |
| 2JJTB 006 050 150 | 0.3R X 0.6 | 5° | 0.6 | 15 | 60 | 4 | |
| 2JJTB 006 050 200 | 0.3R X 0.6 | 5° | 0.6 | 20 | 60 | 4 | |
| 2JJTB 008 003 040 | 0.4R X 0.8 | 0°30 | 0.8 | 4 | 45 | 4 | |
| 2JJTB 008 003 060 | 0.4R X 0.8 | 0°30 | 0.8 | 6 | 45 | 4 | |
| 2JJTB 008 003 080 | 0.4R X 0.8 | 0°30 | 0.8 | 8 | 45 | 4 | |
| 2JJTB 008 003 100 | 0.4R X 0.8 | 0°30 | 0.8 | 10 | 45 | 4 | |
| 2JJTB 008 003 120 | 0.4R X 0.8 | 0°30 | 0.8 | 12 | 50 | 4 | |
| 2JJTB 008 003 150 | 0.4R X 0.8 | 0°30 | 0.8 | 15 | 50 | 4 | |
| 2JJTB 008 003 200 | 0.4R X 0.8 | 0°30 | 0.8 | 20 | 60 | 4 | |
| 2JJTB 008 003 250 | 0.4R X 0.8 | 0°30 | 0.8 | 25 | 70 | 4 | |
| 2JJTB 008 010 040 | 0.4R X 0.8 | 1° | 0.8 | 4 | 45 | 4 | |
| 2JJTB 008 010 060 | 0.4R X 0.8 | 1° | 0.8 | 6 | 45 | 4 | |
| 2JJTB 008 010 080 | 0.4R X 0.8 | 1° | 0.8 | 8 | 45 | 4 | |
| 2JJTB 008 010 100 | 0.4R X 0.8 | 1° | 0.8 | 10 | 45 | 4 | |
| 2JJTB 008 010 120 | 0.4R X 0.8 | 1° | 0.8 | 12 | 50 | 4 | |
| 2JJTB 008 010 160 | 0.4R X 0.8 | 1° | 0.8 | 16 | 50 | 4 | |
| 2JJTB 008 010 200 | 0.4R X 0.8 | 1° | 0.8 | 20 | 60 | 4 | |
| 2JJTB 008 010 250 | 0.4R X 0.8 | 1° | 0.8 | 25 | 70 | 4 | |
| 2JJTB 008 013 040 | 0.4R X 0.8 | 1°30 | 0.8 | 4 | 45 | 4 | |
| 2JJTB 008 013 060 | 0.4R X 0.8 | 1°30 | 0.8 | 6 | 45 | 4 | |
| 2JJTB 008 013 080 | 0.4R X 0.8 | 1°30 | 0.8 | 8 | 45 | 4 | |
| 2JJTB 008 013 100 | 0.4R X 0.8 | 1°30 | 0.8 | 10 | 45 | 4 | |
| 2JJTB 008 013 120 | 0.4R X 0.8 | 1°30 | 0.8 | 12 | 50 | 4 | |
| 2JJTB 008 013 160 | 0.4R X 0.8 | 1°30 | 0.8 | 16 | 50 | 4 | |
| 2JJTB 008 013 200 | 0.4R X 0.8 | 1°30 | 0.8 | 20 | 60 | 4 | |
| 2JJTB 008 013 250 | 0.4R X 0.8 | 1°30 | 0.8 | 25 | 70 | 4 | |
| 2JJTB 008 020 080 | 0.4R X 0.8 | 2° | 0.8 | 8 | 50 | 4 | |
| 2JJTB 008 020 100 | 0.4R X 0.8 | 2° | 0.8 | 10 | 50 | 4 | |
| 2JJTB 008 020 120 | 0.4R X 0.8 | 2° | 0.8 | 12 | 50 | 4 | |
| 2JJTB 008 020 160 | 0.4R X 0.8 | 2° | 0.8 | 16 | 50 | 4 | |
| 2JJTB 008 020 200 | 0.4R X 0.8 | 2° | 0.8 | 20 | 60 | 4 | |
| 2JJTB 008 020 250 | 0.4R X 0.8 | 2° | 0.8 | 25 | 70 | 4 | |
| 2JJTB 008 030 080 | 0.4R X 0.8 | 3° | 0.8 | 8 | 50 | 4 | |
| 2JJTB 008 030 120 | 0.4R X 0.8 | 3° | 0.8 | 12 | 50 | 4 | |
| 2JJTB 008 030 160 | 0.4R X 0.8 | 3° | 0.8 | 16 | 50 | 4 | |
| 2JJTB 008 030 200 | 0.4R X 0.8 | 3° | 0.8 | 20 | 60 | 4 | |
| 2JJTB 008 030 250 | 0.4R X 0.8 | 3° | 0.8 | 25 | 70 | 4 | |
| 2JJTB 008 050 240 | 0.4R X 0.8 | 5° | 0.8 | 24 | 60 | 6 | |
| 2JJTB 010 003 060 | 0.5R X 1 | 0°30 | 1 | 6 | 50 | 4 | |
| 2JJTB 010 003 080 | 0.5R X 1 | 0°30 | 1 | 8 | 50 | 4 | |
| 2JJTB 010 003 100 | 0.5R X 1 | 0°30 | 1 | 10 | 50 | 4 | |
| 2JJTB 010 003 150 | 0.5R X 1 | 0°30 | 1 | 15 | 50 | 4 | |
| 2JJTB 010 003 200 | 0.5R X 1 | 0°30 | 1 | 20 | 60 | 4 | |
| 2JJTB 010 003 250 | 0.5R X 1 | 0°30 | 1 | 25 | 60 | 4 | |
| 2JJTB 010 003 300 | 0.5R X 1 | 0°30 | 1 | 30 | 70 | 4 | |
| 2JJTB 010 010 060 | 0.5R X 1 | 1° | 1 | 6 | 50 | 4 | |
| 2JJTB 010 010 080 | 0.5R X 1 | 1° | 1 | 8 | 50 | 4 | |
| 2JJTB 010 010 100 | 0.5R X 1 | 1° | 1 | 10 | 50 | 4 | |

| Order Number | 날경 Diameter R × D | 각도 Angle θ | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|
| 2JJTB 010 010 150 | 0.5R X 1 | 1° | 1 | 15 | 50 | 4 | |
| 2JJTB 010 010 200 | 0.5R X 1 | 1° | 1 | 20 | 50 | 4 | |
| 2JJTB 010 010 250 | 0.5R X 1 | 1° | 1 | 25 | 60 | 4 | |
| 2JJTB 010 010 300 | 0.5R X 1 | 1° | 1 | 30 | 70 | 4 | |
| 2JJTB 010 010 350 | 0.5R X 1 | 1° | 1 | 35 | 75 | 4 | |
| 2JJTB 010 013 060 | 0.5R X 1 | 1°30 | 1 | 6 | 50 | 4 | |
| 2JJTB 010 013 080 | 0.5R X 1 | 1°30 | 1 | 8 | 50 | 4 | |
| 2JJTB 010 013 100 | 0.5R X 1 | 1°30 | 1 | 10 | 50 | 4 | |
| 2JJTB 010 013 150 | 0.5R X 1 | 1°30 | 1 | 15 | 50 | 4 | |
| 2JJTB 010 013 200 | 0.5R X 1 | 1°30 | 1 | 20 | 50 | 4 | |
| 2JJTB 010 013 250 | 0.5R X 1 | 1°30 | 1 | 25 | 60 | 4 | |
| 2JJTB 010 013 300 | 0.5R X 1 | 1°30 | 1 | 30 | 70 | 4 | |
| 2JJTB 010 013 350 | 0.5R X 1 | 1°30 | 1 | 35 | 80 | 4 | |
| 2JJTB 010 013 400 | 0.5R X 1 | 1°30 | 1 | 40 | 80 | 4 | |
| 2JJTB 010 020 150 | 0.5R X 1 | 2° | 1 | 15 | 50 | 4 | |
| 2JJTB 010 020 20 0 | 0.5R X 1 | 2° | 1 | 20 | 50 | 4 | |
| 2JJTB 010 020 250 | 0.5R X 1 | 2° | 1 | 25 | 60 | 4 | |
| 2JJTB 010 020 300 | 0.5R X 1 | 2° | 1 | 30 | 70 | 4 | |
| 2JJTB 010 020 400 | 0.5R X 1 | 2° | 1 | 40 | 80 | 4 | |
| 2JJTB 010 030 200 | 0.5R X 1 | 3° | 1 | 20 | 50 | 4 | |
| 2JJTB 010 030 300 | 0.5R X 1 | 3° | 1 | 30 | 70 | 6 | |
| 2JJTB 010 030 400 | 0.5R X 1 | 3° | 1 | 40 | 80 | 6 | |
| 2JJTB 010 030 500 | 0.5R X 1 | 3° | 1 | 50 | 90 | 6 | |
| 2JJTB 010 050 230 | 0.5R X 1 | 5° | 1 | 23 | 60 | 6 | |
| 2JJTB 012 003 080 | 0.6R X 1.2 | 0°30 | 1.2 | 8 | 50 | 4 | |
| 2JJTB 012 003 120 | 0.6R X 1.2 | 0°30 | 1.2 | 12 | 50 | 4 | |
| 2JJTB 012 003 180 | 0.6R X 1.2 | 0°30 | 1.2 | 18 | 50 | 4 | |
| 2JJTB 012 003 240 | 0.6R X 1.2 | 0°30 | 1.2 | 24 | 60 | 4 | |
| 2JJTB 012 010 080 | 0.6R X 1.2 | 1° | 1.2 | 8 | 50 | 4 | |
| 2JJTB 012 010 120 | 0.6R X 1.2 | 1° | 1.2 | 12 | 50 | 4 | |
| 2JJTB 012 010 180 | 0.6R X 1.2 | 1° | 1.2 | 18 | 50 | 4 | |
| 2JJTB 012 010 240 | 0.6R X 1.2 | 1° | 1.2 | 24 | 60 | 4 | |
| 2JJTB 012 013 080 | 0.6R X 1.2 | 1°30 | 1.2 | 8 | 50 | 4 | |
| 2JJTB 012 013 120 | 0.6R X 1.2 | 1°30 | 1.2 | 12 | 50 | 4 | |
| 2JJTB 012 013 180 | 0.6R X 1.2 | 1°30 | 1.2 | 18 | 50 | 4 | |
| 2JJTB 012 013 240 | 0.6R X 1.2 | 1°30 | 1.2 | 24 | 60 | 4 | |
| 2JJTB 012 020 080 | 0.6R X 1.2 | 2° | 1.2 | 8 | 50 | 4 | |
| 2JJTB 012 020 120 | 0.6R X 1.2 | 2° | 1.2 | 12 | 50 | 4 | |
| 2JJTB 012 020 180 | 0.6R X 1.2 | 2° | 1.2 | 18 | 50 | 4 | |
| 2JJTB 012 020 240 | 0.6R X 1.2 | 2° | 1.2 | 24 | 60 | 4 | |
| 2JJTB 015 003 080 | 0.75R X 1.5 | 0°30 | 1.5 | 8 | 50 | 4 | |
| 2JJTB 015 003 100 | 0.75R X 1.5 | 0°30 | 1.5 | 10 | 50 | 4 | |
| 2JJTB 015 003 120 | 0.75R X 1.5 | 0°30 | 1.5 | 12 | 50 | 4 | |
| 2JJTB 015 003 150 | 0.75R X 1.5 | 0°30 | 1.5 | 15 | 50 | 4 | |
| 2JJTB 015 003 200 | 0.75R X 1.5 | 0°30 | 1.5 | 20 | 60 | 4 | |
| 2JJTB 015 003 300 | 0.75R X 1.5 | 0°30 | 1.5 | 30 | 70 | 4 | |
| 2JJTB 015 003 400 | 0.75R X 1.5 | 0°30 | 1.5 | 40 | 80 | 4 | |
| 2JJTB 015 010 080 | 0.75R X 1.5 | 1° | 1.5 | 8 | 50 | 4 | |
| 2JJTB 015 010 100 | 0.75R X 1.5 | 1° | 1.5 | 10 | 50 | 4 | |
| 2JJTB 015 010 120 | 0.75R X 1.5 | 1° | 1.5 | 12 | 50 | 4 | |
| 2JJTB 015 010 150 | 0.75R X 1.5 | 1° | 1.5 | 15 | 50 | 4 | |
| 2JJTB 015 010 200 | 0.75R X 1.5 | 1° | 1.5 | 20 | 60 | 4 | |
| 2JJTB 015 010 250 | 0.75R X 1.5 | 1° | 1.5 | 25 | 60 | 4 | |
| 2JJTB 015 010 300 | 0.75R X 1.5 | 1° | 1.5 | 30 | 70 | 4 | |
| 2JJTB 015 010 400 | 0.75R X 1.5 | 1° | 1.5 | 40 | 80 | 4 | |
| 2JJTB 015 010 500 | 0.75R X 1.5 | 1° | 1.5 | 50 | 90 | 4 | |
| 2JJTB 015 013 080 | 0.75R X 1.5 | 1°30 | 1.5 | 8 | 50 | 4 | |
| 2JJTB 015 013 100 | 0.75R X 1.5 | 1°30 | 1.5 | 10 | 50 | 4 | |
| 2JJTB 015 013 120 | 0.75R X 1.5 | 1°30 | 1.5 | 12 | 50 | 4 | |
| 2JJTB 015 013 150 | 0.75R X 1.5 | 1°30 | 1.5 | 15 | 50 | 4 | |
| 2JJTB 015 013 200 | 0.75R X 1.5 | 1°30 | 1.5 | 20 | 60 | 4 | |
| 2JJTB 015 013 250 | 0.75R X 1.5 | 1°30 | 1.5 | 25 | 60 | 4 | |
| 2JJTB 015 013 300 | 0.75R X 1.5 | 1°30 | 1.5 | 30 | 70 | 4 | |
| 2JJTB 015 013 400 | 0.75R X 1.5 | 1°30 | 1.5 | 40 | 80 | 4 | |

# 2JJTB

## 2 Flutes JJ Taper Neck Ball End Mills for Hardened Steels

## 2날 고경도재 가공용 제이제이 테이퍼 넥 볼 엔드밀



단위 : mm

| Order Number | 날경 Diameter R × D | 각도 Angle θ | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|
| 2JJTB 015 013 500 | 0.75R X 1.5 | 1°30 | 1.5 | 50 | 90 | 4 | |
| 2JJTB 015 020 100 | 0.75R X 1.5 | 2° | 1.5 | 10 | 50 | 4 | |
| 2JJTB 015 020 150 | 0.75R X 1.5 | 2° | 1.5 | 15 | 50 | 4 | |
| 2JJTB 015 020 200 | 0.75R X 1.5 | 2° | 1.5 | 20 | 60 | 4 | |
| 2JJTB 015 020 300 | 0.75R X 1.5 | 2° | 1.5 | 30 | 70 | 4 | |
| 2JJTB 015 020 400 | 0.75R X 1.5 | 2° | 1.5 | 40 | 80 | 6 | |
| 2JJTB 015 020 500 | 0.75R X 1.5 | 2° | 1.5 | 50 | 90 | 6 | |
| 2JJTB 015 030 420 | 0.75R X 1.5 | 3° | 1.5 | 42 | 80 | 6 | |
| 2JJTB 015 050 250 | 0.75R X 1.5 | 5° | 1.5 | 25 | 70 | 6 | |
| 2JJTB 020 003 080 | 1R X 2 | 0°30 | 2 | 8 | 50 | 4 | |
| 2JJTB 020 003 120 | 1R X 2 | 0°30 | 2 | 12 | 50 | 4 | |
| 2JJTB 020 003 160 | 1R X 2 | 0°30 | 2 | 16 | 50 | 4 | |
| 2JJTB 020 003 200 | 1R X 2 | 0°30 | 2 | 20 | 60 | 4 | |
| 2JJTB 020 003 300 | 1R X 2 | 0°30 | 2 | 30 | 70 | 4 | |
| 2JJTB 020 003 400 | 1R X 2 | 0°30 | 2 | 40 | 80 | 4 | |
| 2JJTB 020 003 500 | 1R X 2 | 0°30 | 2 | 50 | 90 | 4 | |
| 2JJTB 020 010 080 | 1R X 2 | 1° | 2 | 8 | 50 | 4 | |
| 2JJTB 020 010 120 | 1R X 2 | 1° | 2 | 12 | 50 | 4 | |
| 2JJTB 020 010 160 | 1R X 2 | 1° | 2 | 16 | 50 | 4 | |
| 2JJTB 020 010 200 | 1R X 2 | 1° | 2 | 20 | 60 | 4 | |
| 2JJTB 020 010 250 | 1R X 2 | 1° | 2 | 25 | 60 | 4 | |
| 2JJTB 020 010 300 | 1R X 2 | 1° | 2 | 30 | 70 | 4 | |
| 2JJTB 020 010 350 | 1R X 2 | 1° | 2 | 35 | 75 | 4 | |
| 2JJTB 020 010 400 | 1R X 2 | 1° | 2 | 40 | 80 | 4 | |
| 2JJTB 020 010 500 | 1R X 2 | 1° | 2 | 50 | 90 | 4 | |
| 2JJTB 020 010 600 | 1R X 2 | 1° | 2 | 60 | 100 | 6 | |
| 2JJTB 020 013 080 | 1R X 2 | 1°30 | 2 | 8 | 50 | 4 | |
| 2JJTB 020 013 120 | 1R X 2 | 1°30 | 2 | 12 | 50 | 4 | |
| 2JJTB 020 013 160 | 1R X 2 | 1°30 | 2 | 16 | 50 | 4 | |
| 2JJTB 020 013 200 | 1R X 2 | 1°30 | 2 | 20 | 60 | 4 | |
| 2JJTB 020 013 250 | 1R X 2 | 1°30 | 2 | 25 | 60 | 4 | |
| 2JJTB 020 013 300 | 1R X 2 | 1°30 | 2 | 30 | 70 | 4 | |
| 2JJTB 020 013 350 | 1R X 2 | 1°30 | 2 | 35 | 75 | 6 | |
| 2JJTB 020 013 400 | 1R X 2 | 1°30 | 2 | 40 | 80 | 6 | |
| 2JJTB 020 013 500 | 1R X 2 | 1°30 | 2 | 50 | 90 | 6 | |
| 2JJTB 020 013 600 | 1R X 2 | 1°30 | 2 | 60 | 100 | 6 | |
| 2JJTB 020 020 300 | 1R X 2 | 2° | 2 | 30 | 70 | 6 | |
| 2JJTB 020 020 400 | 1R X 2 | 2° | 2 | 40 | 80 | 6 | |
| 2JJTB 020 020 500 | 1R X 2 | 2° | 2 | 50 | 90 | 6 | |
| 2JJTB 020 030 300 | 1R X 2 | 3° | 2 | 30 | 70 | 6 | |
| 2JJTB 020 030 400 | 1R X 2 | 3° | 2 | 40 | 80 | 6 | |
| 2JJTB 020 030 500 | 1R X 2 | 3° | 2 | 50 | 90 | 8 | |
| 2JJTB 020 050 250 | 1R X 2 | 5° | 2 | 25 | 60 | 6 | |
| 2JJTB 020 050 380 | 1R X 2 | 5° | 2 | 38 | 80 | 8 | |
| 2JJTB 030 003 160 | 1.5R X 3 | 0°30 | 3 | 16 | 60 | 6 | |
| 2JJTB 030 003 200 | 1.5R X 3 | 0°30 | 3 | 20 | 65 | 6 | |
| 2JJTB 030 003 300 | 1.5R X 3 | 0°30 | 3 | 30 | 70 | 6 | |
| 2JJTB 030 003 400 | 1.5R X 3 | 0°30 | 3 | 40 | 80 | 6 | |
| 2JJTB 030 003 500 | 1.5R X 3 | 0°30 | 3 | 50 | 90 | 6 | |
| 2JJTB 030 003 600 | 1.5R X 3 | 0°30 | 3 | 60 | 100 | 6 | |
| 2JJTB 030 010 160 | 1.5R X 3 | 1° | 3 | 16 | 60 | 6 | |
| 2JJTB 030 010 200 | 1.5R X 3 | 1° | 3 | 20 | 65 | 6 | |
| 2JJTB 030 010 300 | 1.5R X 3 | 1° | 3 | 30 | 70 | 6 | |
| 2JJTB 030 010 400 | 1.5R X 3 | 1° | 3 | 40 | 80 | 6 | |
| 2JJTB 030 010 500 | 1.5R X 3 | 1° | 3 | 50 | 90 | 6 | |
| 2JJTB 030 010 600 | 1.5R X 3 | 1° | 3 | 60 | 100 | 6 | |
| 2JJTB 030 010 700 | 1.5R X 3 | 1° | 3 | 70 | 110 | 6 | |
| 2JJTB 030 013 160 | 1.5R X 3 | 1°30 | 3 | 16 | 60 | 6 | |
| 2JJTB 030 013 200 | 1.5R X 3 | 1°30 | 3 | 20 | 65 | 6 | |
| 2JJTB 030 013 300 | 1.5R X 3 | 1°30 | 3 | 30 | 70 | 6 | |
| 2JJTB 030 013 400 | 1.5R X 3 | 1°30 | 3 | 40 | 80 | 6 | |
| 2JJTB 030 013 500 | 1.5R X 3 | 1°30 | 3 | 50 | 90 | 6 | |
| 2JJTB 030 013 600 | 1.5R X 3 | 1°30 | 3 | 60 | 100 | 6 | |
| 2JJTB 030 013 700 | 1.5R X 3 | 1°30 | 3 | 70 | 120 | 8 | |

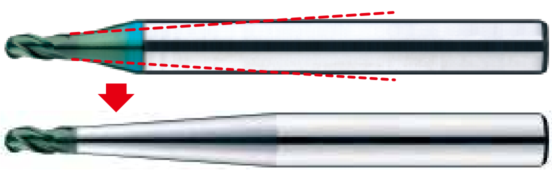
| Order Number | 날경 Diameter R × D | 각도 Angle θ | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|
| 2JJTB 030 020 160 | 1.5R X 3 | 2° | 3 | 16 | 60 | 6 | |
| 2JJTB 030 020 200 | 1.5R X 3 | 2° | 3 | 20 | 65 | 6 | |
| 2JJTB 030 020 300 | 1.5R X 3 | 2° | 3 | 30 | 70 | 6 | |
| 2JJTB 030 020 480 | 1.5R X 3 | 2° | 3 | 48 | 90 | 6 | |
| 2JJTB 030 020 600 | 1.5R X 3 | 2° | 3 | 60 | 110 | 8 | |
| 2JJTB 030 020 700 | 1.5R X 3 | 2° | 3 | 70 | 120 | 8 | |
| 2JJTB 030 030 300 | 1.5R X 3 | 3° | 3 | 30 | 70 | 6 | |
| 2JJTB 030 030 500 | 1.5R X 3 | 3° | 3 | 50 | 90 | 8 | |
| 2JJTB 030 030 700 | 1.5R X 3 | 3° | 3 | 70 | 120 | 10 | |
| 2JJTB 030 050 330 | 1.5R X 3 | 5° | 3 | 33 | 90 | 8 | |
| 2JJTB 040 003 600 | 2R X 4 | 0°30 | 4 | 60 | 100 | 6 | |
| 2JJTB 040 003 700 | 2R X 4 | 0°30 | 4 | 70 | 110 | 6 | |
| 2JJTB 040 003 900 | 2R X 4 | 0°30 | 4 | 90 | 130 | 6 | |
| 2JJTB 040 010 500 | 2R X 4 | 1° | 4 | 50 | 90 | 6 | |
| 2JJTB 040 010 600 | 2R X 4 | 1° | 4 | 60 | 100 | 6 | |
| 2JJTB 040 010 700 | 2R X 4 | 1° | 4 | 70 | 120 | 8 | |
| 2JJTB 040 010 900 | 2R X 4 | 1° | 4 | 90 | 150 | 8 | |
| 2JJTB 040 013 450 | 2R X 4 | 1°30 | 4 | 45 | 90 | 6 | |
| 2JJTB 040 013 600 | 2R X 4 | 1°30 | 4 | 60 | 110 | 8 | |
| 2JJTB 040 013 700 | 2R X 4 | 1°30 | 4 | 70 | 120 | 8 | |
| 2JJTB 040 030 250 | 2R X 4 | 3° | 4 | 25 | 70 | 6 | |
| 2JJTB 040 030 420 | 2R X 4 | 3° | 4 | 42 | 100 | 8 | |
| 2JJTB 040 050 290 | 2R X 4 | 5° | 4 | 29 | 90 | 8 | |
| 2JJTB 050 010 400 | 2.5R X 5 | 1° | 5 | 40 | 90 | 8 | |
| 2JJTB 050 010 600 | 2.5R X 5 | 1° | 5 | 60 | 110 | 8 | |
| 2JJTB 050 010 900 | 2.5R X 5 | 1° | 5 | 90 | 150 | 8 | |
| 2JJTB 050 013 400 | 2.5R X 5 | 1°30 | 5 | 40 | 90 | 8 | |
| 2JJTB 050 013 600 | 2.5R X 5 | 1°30 | 5 | 60 | 110 | 8 | |
| 2JJTB 050 013 900 | 2.5R X 5 | 1°30 | 5 | 90 | 150 | 10 | |
| 2JJTB 050 030 400 | 2.5R X 5 | 3° | 5 | 40 | 90 | 8 | |
| 2JJTB 060 010 400 | 3R X 6 | 1° | 9 | 40 | 90 | 8 | |
| 2JJTB 060 010 500 | 3R X 6 | 1° | 9 | 50 | 100 | 8 | |
| 2JJTB 060 010 600 | 3R X 6 | 1° | 9 | 60 | 110 | 8 | |
| 2JJTB 060 010 700 | 3R X 6 | 1° | 9 | 70 | 120 | 10 | |
| 2JJTB 060 010 800 | 3R X 6 | 1° | 9 | 80 | 130 | 10 | |
| 2JJTB 060 010 1000 | 3R X 6 | 1° | 9 | 100 | 150 | 10 | |
| 2JJTB 060 013 490 | 3R X 6 | 1°30 | 9 | 49 | 110 | 8 | |
| 2JJTB 060 013 850 | 3R X 6 | 1°30 | 9 | 85 | 150 | 10 | |
| 2JJTB 060 020 600 | 3R X 6 | 2° | 9 | 60 | 110 | 10 | |
| 2JJTB 060 020 900 | 3R X 6 | 2° | 9 | 90 | 150 | 12 | |
| 2JJTB 060 030 290 | 3R X 6 | 3° | 9 | 29 | 90 | 8 | |
| 2JJTB 060 050 320 | 3R X 6 | 5° | 9 | 32 | 110 | 10 | |
| 2JJTB 080 010 500 | 4R X 8 | 1° | 12 | 50 | 100 | 10 | |
| 2JJTB 080 010 600 | 4R X 8 | 1° | 12 | 60 | 110 | 10 | |
| 2JJTB 080 010 800 | 4R X 8 | 1° | 12 | 80 | 130 | 12 | |
| 2JJTB 080 010 1000 | 4R X 8 | 1° | 12 | 100 | 150 | 12 | |
| 2JJTB 080 013 520 | 4R X 8 | 1°30 | 12 | 52 | 110 | 10 | |
| 2JJTB 080 013 890 | 4R X 8 | 1°30 | 12 | 89 | 150 | 12 | |
| 2JJTB 080 030 330 | 4R X 8 | 3° | 12 | 33 | 100 | 10 | |
| 2JJTB 100 010 600 | 5R X 10 | 1° | 18 | 60 | 110 | 12 | |
| 2JJTB 100 010 750 | 5R X 10 | 1° | 18 | 75 | 130 | 12 | |
| 2JJTB 100 013 540 | 5R X 10 | 1°30 | 18 | 54 | 130 | 12 | |
| 2JJTB 100 030 370 | 5R X 10 | 3° | 18 | 37 | 110 | 12 | |
| 2JJTB 120 013 850 | 6R X 12 | 1°30 | 22 | 85 | 160 | 16 | |
| 2JJTB 120 030 630 | 6R X 12 | 3° | 22 | 63 | 130 | 16 | |

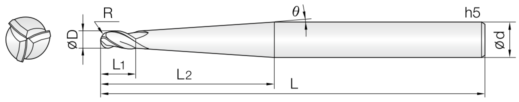
# 3JJTBS

*3 Flutes JJ Taper Neck Ball End Mills for Hardened Steels (Tailor made)*

## 3날 고경도재 가공용 제이제이 테이퍼 넥 볼 엔드밀(소비자 주문형)








- 고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀
- 깊은 홈 가공이 빈번해진 추세에 맞춰, 고객 요구에 발빠르게 대응하는 맞춤제작 방식입니다. (최고 2일안에 납품가능)
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 고객주문에 맞춰, 자사 재고품의 각도 및 유효길이를 재조정 가공합니다.
- 초미립자 초경합금(0.2㎛)을 채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- Endmills for pre-hardened and hardened steels(HRc52~68)
- Tailor-made special tools production for deep hole machining
- Suitable for ultra-precision machining by applying ultra-precision tolerances.
- With our STD stock the angle and effective length will be re-adjusted upon cutomers' required order spec
- Adoped ultra-fine grain cemented carbide (0.2㎛) and shows excellent performance during high-speed cutting.

3 | UWC 초미립자 | TISIN-S Coating | R ±0.005 (0.5 ~ 2.5R) | R ±0.01 (3 ~ 6R) | 30° Helix Angle | CUTTING DATA (417P)

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 12 | +0 ~ -0.01mm |

단위 : mm

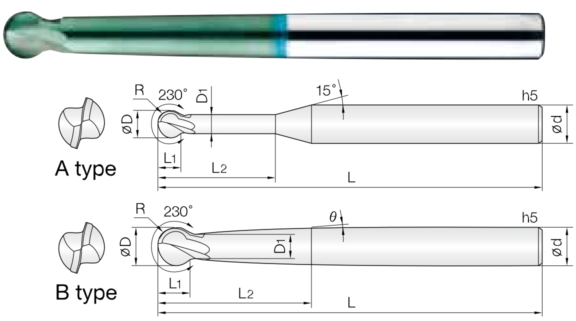
| Order Number | 날경 Diameter R × D | 각도 Angle θ | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|
| 3JJTBS 010 060 S04 | 0.5R X 1 | 필요한 각도 직접 요청 Kindly request the desired angle | 1 | 필요한 유효장 직접 요청 Kindly request the desired effective length | 60 | 4 | |
| 3JJTBS 010 080 S04 | 0.5R X 1 | | 1 | | 80 | 4 | |
| 3JJTBS 010 090 S06 | 0.5R X 1 | | 1 | | 90 | 6 | |
| 3JJTBS 015 060 S04 | 0.75R X 1.5 | | 1.5 | | 60 | 4 | |
| 3JJTBS 015 080 S04 | 0.75R X 1.5 | | 1.5 | | 80 | 4 | |
| 3JJTBS 015 090 S06 | 0.75R X 1.5 | | 1.5 | | 90 | 6 | |
| 3JJTBS 020 070 S04 | 1R X 2 | | 2 | | 70 | 4 | |
| 3JJTBS 020 090 S04 | 1R X 2 | | 2 | | 90 | 4 | |
| 3JJTBS 020 090 S06 | 1R X 2 | | 2 | | 90 | 6 | |
| 3JJTBS 030 080 S06 | 1.5R X 3 | | 3 | | 80 | 6 | |
| 3JJTBS 030 100 S06 | 1.5R X 3 | | 3 | | 100 | 6 | |
| 3JJTBS 030 110 S08 | 1.5R X 3 | | 3 | | 110 | 8 | |
| 3JJTBS 040 080 S06 | 2R X 4 | | 5 | | 80 | 6 | |
| 3JJTBS 040 110 S06 | 2R X 4 | | 5 | | 110 | 6 | |
| 3JJTBS 040 120 S08 | 2R X 4 | | 5 | | 120 | 8 | |
| 3JJTBS 050 090 S08 | 2.5R X 5 | | 7 | | 90 | 8 | |
| 3JJTBS 050 120 S08 | 2.5R X 5 | | 7 | | 120 | 8 | |
| 3JJTBS 060 110 S08 | 3R X 6 | | 9 | | 110 | 8 | |
| 3JJTBS 060 150 S10 | 3R X 6 | | 9 | | 150 | 10 | |
| 3JJTBS 080 120 S10 | 4R X 8 | | 12 | | 120 | 10 | |
| 3JJTBS 080 160 S12 | 4R X 8 | | 12 | | 160 | 12 | |
| 3JJTBS 100 120 S12 | 5R X 10 | | 15 | | 120 | 12 | |
| 3JJTBS 100 160 S12 | 5R X 10 | | 15 | | 160 | 12 | |
| 3JJTBS 120 160 S16 | 6R X 12 | | 18 | | 160 | 16 | |
| 3JJTBS 120 200 S16 | 6R X 12 | | 18 | | 200 | 16 | |

# 2JJSP

## 2 Flutes JJ Spherical End Mills for 3D Cut 230˚

## 2날 제이제이 3D 230도 가공용 구형 엔드밀






- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 230도 구형의 인선으로 광범위한 3D 가공이 가능합니다.
- 유효장을 테이퍼 설계하여 깊은 홈 작업시 목부 파손 및 떨림을 최소화 하였습니다
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- 230˚degree ball shape for wide range 3D machining.
- Minimize chattering and fracturing by taper designed flute.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

2 | UWC 초미립자 | TISIN-S Coating | R ±0.005 | R ±0.01 | 15° Helix Angle | CUTTING DATA

0.25 ~ 2.5R | 3 ~ 6R | 419P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø0.5 ~ 12 | +0 ~ -0.01mm | ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |

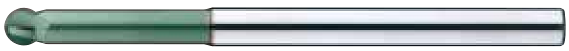
단위 : mm

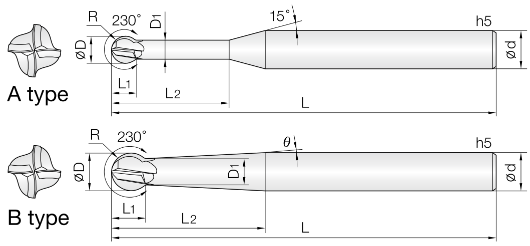
| Order Number | 날경 Diameter R × D | 목경 Neck Diameter D1 | 날장 Length of cut L1 | 유효장 Effective Length L2 | 각도 Angle θ | 전장 Overall Length L | 타입 Type | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|---|---|
| New 2JJSP 005 010 S06 | 0.25R X 0.5 | 0.43 | 0.36 | 1 | 0˚ | 55 | A | 6 | |
| New 2JJSP 005 015 S06 | 0.25R X 0.5 | 0.43 | 0.36 | 1.5 | 0˚ | 55 | A | 6 | |
| New 2JJSP 005 020 S06 | 0.25R X 0.5 | 0.43 | 0.36 | 2 | 0˚ | 55 | A | 6 | |
| New 2JJSP 006 010 S06 | 0.3R X 0.6 | 0.52 | 0.43 | 1 | 0˚ | 55 | A | 6 | |
| New 2JJSP 006 020 S06 | 0.3R X 0.6 | 0.52 | 0.43 | 2 | 0˚ | 55 | A | 6 | |
| New 2JJSP 006 030 S06 | 0.3R X 0.6 | 0.52 | 0.43 | 3 | 0˚ | 55 | A | 6 | |
| New 2JJSP 008 020 S06 | 0.4R X 0.8 | 0.71 | 0.57 | 2 | 0˚ | 55 | A | 6 | |
| New 2JJSP 008 030 S06 | 0.4R X 0.8 | 0.71 | 0.57 | 3 | 0˚ | 55 | A | 6 | |
| New 2JJSP 008 040 S06 | 0.4R X 0.8 | 0.71 | 0.57 | 4 | 0˚ | 55 | A | 6 | |
| 2JJSP 010 040 S06 | 0.5R X 1 | 0.91 | 0.7 | 4 | 0˚ | 60 | A | 6 | |
| 2JJSP 010 060 S06 | 0.5R X 1 | 0.91 | 0.7 | 6 | 0˚ | 60 | A | 6 | |
| 2JJSP 010 013 200 | 0.5R X 1 | 0.91 | 0.7 | 20 | 1˚30 | 80 | B | 6 | |
| 2JJSP 015 060 S06 | 0.75R X 1.5 | 1.36 | 1 | 6 | 0˚ | 60 | A | 6 | |
| 2JJSP 015 080 S06 | 0.75R X 1.5 | 1.36 | 1 | 8 | 0˚ | 60 | A | 6 | |
| 2JJSP 015 013 200 | 0.75R X 1.5 | 1.36 | 1 | 20 | 1˚30 | 80 | B | 6 | |
| 2JJSP 020 060 S06 | 1R X 2 | 1.8 | 1.4 | 6 | 0˚ | 60 | A | 6 | |
| 2JJSP 020 100 S06 | 1R X 2 | 1.8 | 1.4 | 10 | 0˚ | 60 | A | 6 | |
| 2JJSP 020 013 200 | 1R X 2 | 1.8 | 1.4 | 20 | 1˚30 | 80 | B | 6 | |
| 2JJSP 030 100 S06 | 1.5R X 3 | 2.7 | 2.1 | 10 | 0˚ | 70 | A | 6 | |
| 2JJSP 030 150 S06 | 1.5R X 3 | 2.7 | 2.1 | 15 | 0˚ | 70 | A | 6 | |
| 2JJSP 030 013 300 | 1.5R X 3 | 2.7 | 2.1 | 30 | 1˚30 | 80 | B | 6 | |
| 2JJSP 040 120 S06 | 2R X 4 | 3.6 | 2.8 | 12 | 0˚ | 70 | A | 6 | |
| 2JJSP 040 200 S06 | 2R X 4 | 3.6 | 2.8 | 20 | 0˚ | 70 | A | 6 | |
| 2JJSP 040 030 250 | 2R X 4 | 3.6 | 2.8 | 25 | 3˚ | 80 | B | 6 | |
| 2JJSP 050 010 400 | 2.5R X 5 | 4.5 | 3.5 | 40 | 1˚ | 90 | B | 6 | |
| 2JJSP 060 150 S06 | 3R X 6 | 5.4 | 4.2 | 15 | 0˚ | 90 | A | 6 | |
| 2JJSP 060 300 S06 | 3R X 6 | 5.4 | 4.2 | 30 | 0˚ | 90 | A | 6 | |
| 2JJSP 060 010 210 | 3R X 6 | 5.4 | 4.2 | 21 | 1˚ | 100 | B | 6 | |
| 2JJSP 080 010 280 | 4R X 8 | 7.2 | 5.7 | 28 | 1˚ | 100 | B | 8 | |
| 2JJSP 100 010 350 | 5R X 10 | 9 | 7.1 | 35 | 1˚ | 110 | B | 10 | |
| 2JJSP 120 010 420 | 6R X 12 | 10.8 | 8.5 | 42 | 1˚ | 120 | B | 12 | |

# 4JJSP

## 4 Flutes JJ Spherical End Mills for 3D Cut 230°

## 4날 제이제이 3D 230도 가공용 구형 엔드밀






- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 230도 구형의 인선으로 광범위한 3D 가공이 가능합니다.
- 유효장을 테이퍼 설계하여 깊은 홈 작업시 목부 파손 및 떨림을 최소화 하였습니다
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- 230˚degree ball shape for wide range 3D machining.
- Minimize chattering and fracturing by taper designed flute.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.


0.5 ~ 2.5R | 3 ~ 6R | 420P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø1 ~ 12 | +0 ~ -0.01mm | ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

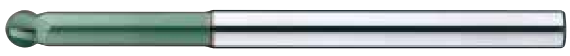
| Order Number | 날경 Diameter R × D | 목경 Neck Diameter D1 | 날장 Length of cut L1 | 유효장 Effective Length L2 | 각도 Angle θ | 전장 Overall Length L | 타입 Type | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|---|---|
| 4JJSP 010 040 S06 | 0.5R X 1 | 0.91 | 0.7 | 4 | 0° | 60 | A | 6 | |
| 4JJSP 010 060 S06 | 0.5R X 1 | 0.91 | 0.7 | 6 | 0° | 60 | A | 6 | |
| 4JJSP 010 013 200 | 0.5R X 1 | 0.91 | 0.7 | 20 | 1°30 | 80 | B | 6 | |
| 4JJSP 015 060 S06 | 0.75R X 1.5 | 1.36 | 1 | 6 | 0° | 60 | A | 6 | |
| 4JJSP 015 080 S06 | 0.75R X 1.5 | 1.36 | 1 | 8 | 0° | 60 | A | 6 | |
| 4JJSP 015 013 200 | 0.75R X 1.5 | 1.36 | 1 | 20 | 1°30 | 80 | B | 6 | |
| 4JJSP 020 060 S06 | 1R X 2 | 1.8 | 1.4 | 6 | 0° | 60 | A | 6 | |
| 4JJSP 020 100 S06 | 1R X 2 | 1.8 | 1.4 | 10 | 0° | 60 | A | 6 | |
| 4JJSP 020 013 200 | 1R X 2 | 1.8 | 1.4 | 20 | 1°30 | 80 | B | 6 | |
| 4JJSP 030 100 S06 | 1.5R X 3 | 2.7 | 2.1 | 10 | 0° | 70 | A | 6 | |
| 4JJSP 030 150 S06 | 1.5R X 3 | 2.7 | 2.1 | 15 | 0° | 70 | A | 6 | |
| 4JJSP 030 013 300 | 1.5R X 3 | 2.7 | 2.1 | 30 | 1°30 | 80 | B | 6 | |
| 4JJSP 040 120 S06 | 2R X 4 | 3.6 | 2.8 | 12 | 0° | 70 | A | 6 | |
| 4JJSP 040 200 S06 | 2R X 4 | 3.6 | 2.8 | 20 | 0° | 70 | A | 6 | |
| 4JJSP 040 030 250 | 2R X 4 | 3.6 | 2.8 | 25 | 3° | 80 | B | 6 | |
| 4JJSP 050 010 400 | 2.5R X 5 | 4.5 | 3.5 | 40 | 1° | 90 | B | 6 | |
| 4JJSP 060 150 S06 | 3R X 6 | 5.4 | 4.2 | 15 | 0° | 90 | A | 6 | |
| 4JJSP 060 300 S06 | 3R X 6 | 5.4 | 4.2 | 30 | 0° | 90 | A | 6 | |
| 4JJSP 060 010 210 | 3R X 6 | 5.4 | 4.2 | 21 | 1° | 100 | B | 6 | |
| 4JJSP 080 010 280 | 4R X 8 | 7.2 | 5.7 | 28 | 1° | 100 | B | 8 | |
| 4JJSP 100 010 350 | 5R X 10 | 9 | 7.1 | 35 | 1° | 110 | B | 10 | |
| 4JJSP 120 010 420 | 6R X 12 | 10.8 | 8.5 | 42 | 1° | 120 | B | 12 | |

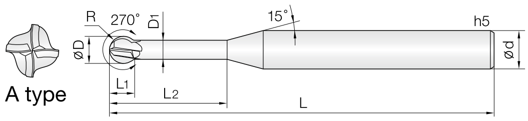
# 4JJSPM

## 4 Flutes JJ Spherical End Mills for 3D Cut 270°

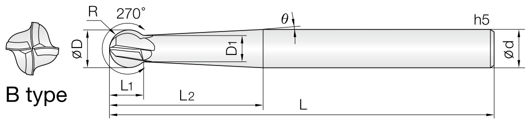
## 4날 제이제이 3D 270도 가공용 구형 엔드밀








A type




B type

- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 270도 구형의 인선으로 광범위한 3D 가공이 가능합니다.
- 유효장을 테이퍼 설계하여 깊은 홈 작업시 목부 파손 및 떨림을 최소화 하였습니다
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- 270˚degree ball shape for wide range 3D machining.
- Minimize chattering and fracturing by taper designed flute.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

4 | UWC 초미립자 | TISIN-S Coating | R ±0.005 0.5 ~ 2.5R | R ±0.01 3 ~ 6R | 15° Helix Angle | CUTTING DATA 420P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 12 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

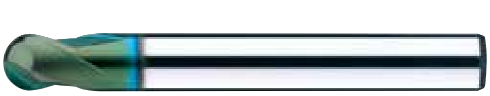
| Order Number | 날경 Diameter R × D | 목경 Neck Diameter D1 | 날장 Length of cut L1 | 유효장 Effective Length L2 | 각도 Angle θ | 전장 Overall Length L | 타입 Type | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|---|---|
| 4JJSPM 010 040 S06 | 0.5R X 1 | 0.7 | 0.8 | 4 | 0° | 60 | A | 6 | |
| 4JJSPM 010 060 S06 | 0.5R X 1 | 0.7 | 0.8 | 6 | 0° | 60 | A | 6 | |
| 4JJSPM 010 013 200 | 0.5R X 1 | 0.7 | 0.8 | 20 | 1°30 | 80 | B | 6 | |
| 4JJSPM 015 060 S06 | 0.75R X 1.5 | 1 | 1.2 | 6 | 0° | 60 | A | 6 | |
| 4JJSPM 015 080 S06 | 0.75R X 1.5 | 1 | 1.2 | 8 | 0° | 60 | A | 6 | |
| 4JJSPM 015 013 200 | 0.75R X 1.5 | 1 | 1.2 | 20 | 1°30 | 80 | B | 6 | |
| 4JJSPM 020 060 S06 | 1R X 2 | 1.4 | 1.7 | 6 | 0° | 60 | A | 6 | |
| 4JJSPM 020 100 S06 | 1R X 2 | 1.4 | 1.7 | 10 | 0° | 60 | A | 6 | |
| 4JJSPM 020 013 200 | 1R X 2 | 1.4 | 1.7 | 20 | 1°30 | 80 | B | 6 | |
| 4JJSPM 030 100 S06 | 1.5R X 3 | 2.1 | 2.5 | 10 | 0° | 70 | A | 6 | |
| 4JJSPM 030 150 S06 | 1.5R X 3 | 2.1 | 2.5 | 15 | 0° | 70 | A | 6 | |
| 4JJSPM 030 013 300 | 1.5R X 3 | 2.1 | 2.5 | 30 | 1°30 | 80 | B | 6 | |
| 4JJSPM 040120 S06 | 2R X 4 | 2.8 | 3.4 | 12 | 0° | 70 | A | 6 | |
| 4JJSPM 040 200 S06 | 2R X 4 | 2.8 | 3.4 | 20 | 0° | 70 | A | 6 | |
| 4JJSPM 040 030 250 | 2R X 4 | 2.8 | 3.4 | 25 | 3° | 80 | B | 6 | |
| 4JJSPM 050 010 400 | 2.5R X 5 | 3.5 | 4.2 | 40 | 1° | 90 | B | 6 | |
| 4JJSPM 060 150 S06 | 3R X 6 | 4.2 | 5.1 | 15 | 0° | 90 | A | 6 | |
| 4JJSPM 060 300 S06 | 3R X 6 | 4.2 | 5.1 | 30 | 0° | 90 | A | 6 | |
| 4JJSPM 060 010 210 | 3R X 6 | 4.2 | 5.1 | 21 | 1° | 100 | B | 6 | |
| 4JJSPM 080 010 280 | 4R X 8 | 5.6 | 6.8 | 28 | 1° | 100 | B | 8 | |
| 4JJSPM 100 010 350 | 5R X 10 | 7 | 8.5 | 35 | 1° | 110 | B | 10 | |
| 4JJSPM 120 010 420 | 6R X 12 | 8.5 | 10 | 42 | 1° | 120 | B | 12 | |

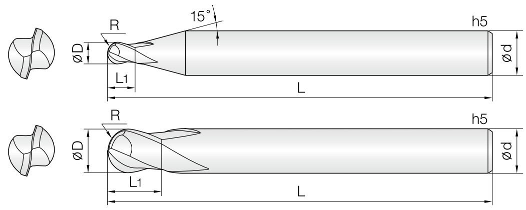
# 2JJSB

## 2 Flutes JJ Short Length Ball End Mills for Hardened Steels

## 2날 고경도재 가공용 제이제이 짧은 길이 볼 엔드밀








- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 짧은 전장을 채택하여 열박음척 사용이 용이합니다.
- 날부인선의 조도가 뛰어나 피삭재의 면조도가 우수합니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Short overall length for easy use with shiringking chuck.
- Very nice work surface finish.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

2 | UWC 초미립자 | TISIN-S Coating | R ±0.005 (0.05 ~ 2.5R) | R ±0.01 (3 ~ 6R) | 30° Helix Angle | CUTTING DATA 420P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.1 ~ 0.15 | +0 ~ -0.005mm |
| | Ø0.2 ~ 12 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

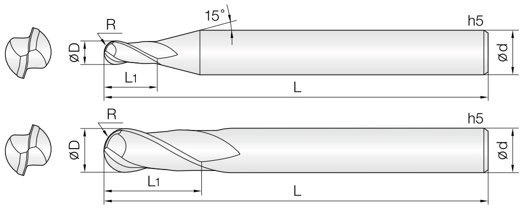
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2JJSB 001 001 S04 | 0.05R X 0.1 | 0.1 | 40 | 4 | |
| 2JJSB 001 0015 S04 | 0.05R X 0.1 | 0.15 | 40 | 4 | |
| 2JJSB 0015 0015 S04 | 0.075R X 0.15 | 0.15 | 40 | 4 | |
| 2JJSB 0015 002 S04 | 0.075R X 0.15 | 0.2 | 40 | 4 | |
| 2JJSB 002 002 S04 | 0.1R X 0.2 | 0.2 | 40 | 4 | |
| 2JJSB 002 003 S04 | 0.1R X 0.2 | 0.3 | 40 | 4 | |
| 2JJSB 003 003 S04 | 0.15R X 0.3 | 0.3 | 40 | 4 | |
| 2JJSB 003 0045 S04 | 0.15R X 0.3 | 0.45 | 40 | 4 | |
| 2JJSB 004 004 S04 | 0.2R X 0.4 | 0.4 | 40 | 4 | |
| 2JJSB 004 006 S04 | 0.2R X 0.4 | 0.6 | 40 | 4 | |
| 2JJSB 005 005 S04 | 0.25R X 0.5 | 0.5 | 40 | 4 | |
| 2JJSB 005 0075 S04 | 0.25R X 0.5 | 0.75 | 40 | 4 | |
| 2JJSB 006 006 S04 | 0.3R X 0.6 | 0.6 | 40 | 4 | |
| 2JJSB 006 009 S04 | 0.3R X 0.6 | 0.9 | 40 | 4 | |
| 2JJSB 007 007 S04 | 0.35R X 0.7 | 0.7 | 40 | 4 | |
| 2JJSB 007 010 S04 | 0.35R X 0.7 | 1 | 40 | 4 | |
| 2JJSB 008 008 S04 | 0.4R X 0.8 | 0.8 | 40 | 4 | |
| 2JJSB 008 012 S04 | 0.4R X 0.8 | 1.2 | 40 | 4 | |
| 2JJSB 009 009 S04 | 0.45R X 0.9 | 0.9 | 40 | 4 | |
| 2JJSB 009 013 S04 | 0.45R X 0.9 | 1.3 | 40 | 4 | |
| 2JJSB 010 010 S04 | 0.5R X 1 | 1 | 40 | 4 | |
| 2JJSB 010 010 S06 | 0.5R X 1 | 1 | 40 | 6 | |
| 2JJSB 010 015 S04 | 0.5R X 1 | 1.5 | 40 | 4 | |
| 2JJSB 010 015 S06 | 0.5R X 1 | 1.5 | 40 | 6 | |
| 2JJSB 012 012 S04 | 0.6R X 1.2 | 1.2 | 40 | 4 | |
| 2JJSB 015 015 S04 | 0.75R X 1.5 | 1.5 | 40 | 4 | |
| 2JJSB 015 015 S06 | 0.75R X 1.5 | 1.5 | 40 | 6 | |
| 2JJSB 015 023 S04 | 0.75R X 1.5 | 2.3 | 40 | 4 | |
| 2JJSB 015 023 S06 | 0.75R X 1.5 | 2.3 | 40 | 6 | |
| 2JJSB 020 020 S04 | 1R X 2 | 2 | 45 | 4 | |
| 2JJSB 020 020 S06 | 1R X 2 | 2 | 45 | 6 | |
| 2JJSB 020 030 S04 | 1R X 2 | 3 | 45 | 4 | |
| 2JJSB 020 030 S06 | 1R X 2 | 3 | 45 | 6 | |
| 2JJSB 025 025 S06 | 1.25R X 2.5 | 2.5 | 45 | 6 | |
| 2JJSB 030 030 S04 | 1.5R X 3 | 3 | 45 | 4 | |
| 2JJSB 030 030 S06 | 1.5R X 3 | 3 | 45 | 6 | |
| 2JJSB 030 045 S04 | 1.5R X 3 | 4.5 | 45 | 4 | |
| 2JJSB 030 045 S06 | 1.5R X 3 | 4.5 | 45 | 6 | |
| 2JJSB 040 040 S04 | 2R X 4 | 4 | 45 | 4 | |
| 2JJSB 040 040 S06 | 2R X 4 | 4 | 45 | 6 | |
| 2JJSB 040 060 S04 | 2R X 4 | 6 | 45 | 4 | |
| 2JJSB 040 060 S06 | 2R X 4 | 6 | 45 | 6 | |
| 2JJSB 050 050 S06 | 2.5R X 5 | 5 | 50 | 6 | |
| 2JJSB 050 075 S06 | 2.5R X 5 | 7.5 | 50 | 6 | |
| 2JJSB 060 060 050 | 3R X 6 | 6 | 50 | 6 | |
| 2JJSB 060 080 055 | 3R X 6 | 8 | 55 | 6 | |
| 2JJSB 080 080 050 | 4R X 8 | 8 | 50 | 8 | |
| 2JJSB 080 110 060 | 4R X 8 | 11 | 60 | 8 | |
| 2JJSB 100 100 060 | 5R X 10 | 10 | 60 | 10 | |
| 2JJSB 100 130 070 | 5R X 10 | 13 | 70 | 10 | |
| 2JJSB 120 120 060 | 6R X 12 | 12 | 60 | 12 | |
| 2JJSB 120 150 070 | 6R X 12 | 15 | 70 | 12 | |

# 2JJB

## *2 Flutes JJ Ball End Mills for Hardened Steels*

## 2날 고경도재 가공용 제이제이 볼 엔드밀






- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 날부인선의 조도가 뛰어나 피삭재의 면조도가 우수합니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Excellent surface finish.
- Very nice work surface finish.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

2 | UWC 초미립자 | TISIN-S Coating | R ±0.005 (0.05 ~ 2.75R) | R ±0.01 (3 ~ 6R) | R ±0.015 (7R) | 30° Helix Angle | CUTTING DATA 420P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.1 ~ 0.15 | +0 ~ -0.005mm |
| | Ø0.2 ~ 14 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø3 ~ 12 | -0.005 ~ -0.015mm |
| | Ø14 | -0.01 ~ -0.02mm |

단위 : mm

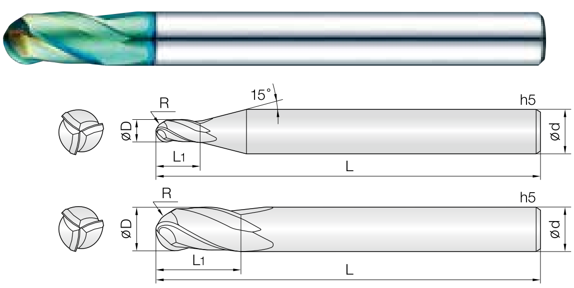
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2JJB 001 002 S04 | 0.05R X 0.1 | 0.2 | 40 | 4 | |
| 2JJB 0015 003 S04 | 0.075RX 0.15 | 0.3 | 40 | 4 | |
| 2JJB 002 004 S04 | 0.1R X 0.2 | 0.4 | 40 | 4 | |
| 2JJB 003 006 S04 | 0.15R X 0.3 | 0.6 | 40 | 4 | |
| 2JJB 004 008 S04 | 0.2R X 0.4 | 0.8 | 40 | 4 | |
| 2JJB 005 010 S04 | 0.25R X 0.5 | 1 | 45 | 4 | |
| 2JJB 006 012 S04 | 0.3R X 0.6 | 1.2 | 45 | 4 | |
| 2JJB 007 015 S04 | 0.35R X 0.7 | 1.5 | 45 | 4 | |
| 2JJB 008 020 S04 | 0.4R X 0.8 | 2 | 45 | 4 | |
| 2JJB 009 020 S04 | 0.45R X 0.9 | 2 | 45 | 4 | |
| 2JJB 010 025 S03 | 0.5R X 1 | 2.5 | 50 | 3 | |
| 2JJB 010 025 S04 | 0.5R X 1 | 2.5 | 50 | 4 | |
| 2JJB 010 025 S06 | 0.5R X 1 | 2.5 | 50 | 6 | |
| 2JJB 010 025 070 | 0.5R X 1 | 2.5 | 70 | 6 | |
| 2JJB 012 030 S03 | 0.6R X 1.2 | 3 | 50 | 3 | |
| 2JJB 012 030 S04 | 0.6R X 1.2 | 3 | 50 | 4 | |
| 2JJB 015 040 S03 | 0.75R X 1.5 | 4 | 50 | 3 | |
| 2JJB 015 040 S04 | 0.75R X 1.5 | 4 | 50 | 4 | |
| 2JJB 015 040 S06 | 0.75R X 1.5 | 4 | 50 | 6 | |
| 2JJB 015 040 070 | 0.75R X 1.5 | 4 | 70 | 6 | |
| 2JJB 020 050 S03 | 1R X 2 | 5 | 50 | 3 | |
| 2JJB 020 050 S04 | 1R X 2 | 5 | 50 | 4 | |
| 2JJB 020 050 S06 | 1R X 2 | 5 | 50 | 6 | |
| 2JJB 020 050 075 | 1R X 2 | 5 | 75 | 6 | |
| 2JJB 025 060 S03 | 1.25R X 2.5 | 6 | 50 | 3 | |
| 2JJB 025 060 S04 | 1.25R X 2.5 | 6 | 50 | 4 | |
| 2JJB 025 060 S06 | 1.25R X 2.5 | 6 | 75 | 6 | |
| 2JJB 030 080 S03 | 1.5R X 3 | 8 | 50 | 3 | |
| 2JJB 030 080 S04 | 1.5R X 3 | 8 | 50 | 4 | |
| 2JJB 030 080 S06 | 1.5R X 3 | 8 | 60 | 6 | |
| 2JJB 030 080 080 | 1.5R X 3 | 8 | 80 | 6 | |
| 2JJB 035 080 S06 | 1.75R X 3.5 | 8 | 60 | 6 | |
| 2JJB 040 080 S04 | 2R X 4 | 8 | 60 | 4 | |
| 2JJB 040 080 080 | 2R X 4 | 8 | 80 | 4 | |
| 2JJB 040 080 S06 | 2R X 4 | 8 | 70 | 6 | |
| 2JJB 040 080 090 | 2R X 4 | 8 | 90 | 6 | |
| 2JJB 045 080 S06 | 2.25R X 4.5 | 8 | 70 | 6 | |
| 2JJB 050 100 S06 | 2.5R X 5 | 10 | 75 | 6 | |
| 2JJB 055 100 S06 | 2.75R X 5.5 | 10 | 75 | 6 | |
| 2JJB 060 100 060 | 3R X 6 | 10 | 60 | 6 | |
| 2JJB 060 120 080 | 3R X 6 | 12 | 80 | 6 | |
| 2JJB 060 120 090 | 3R X 6 | 12 | 90 | 6 | |
| 2JJB 070 140 S08 | 3.5R X 7 | 14 | 80 | 8 | |
| 2JJB 080 120 060 | 4R X 8 | 12 | 60 | 8 | |
| 2JJB 080 140 090 | 4R X 8 | 14 | 90 | 8 | |
| 2JJB 080 140 100 | 4R X 8 | 14 | 100 | 8 | |
| 2JJB 100 150 070 | 5R X 10 | 15 | 70 | 10 | |
| 2JJB 100 180 100 | 5R X 10 | 18 | 100 | 10 | |
| 2JJB 120 180 075 | 6R X 12 | 18 | 75 | 12 | |
| 2JJB 120 220 110 | 6R X 12 | 22 | 110 | 12 | |

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2JJB 140 240 110 | 7R X 14 | 24 | 110 | 14 | |

# 3JJB

## 3 Flutes JJ Ball End Mills for Hardened Steels

## 3날 고경도재 가공용 제이제이 볼 엔드밀




- 고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 3날 볼타입 적용으로 고속, 고이송 작업이 가능합니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- Endmills for pre-hardened and hardened steels(HRc52~68)
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Three flutes ball edge design for high speed, feed condition.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

3 | UWC 초미립자 | TISIN-S Coating | R ±0.005 0.5 ~ 2.5R | R ±0.01 3 ~ 6R | 30° Helix Angle | CUTTING DATA 420P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø1 ~ 12 | +0 ~ -0.01mm | ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

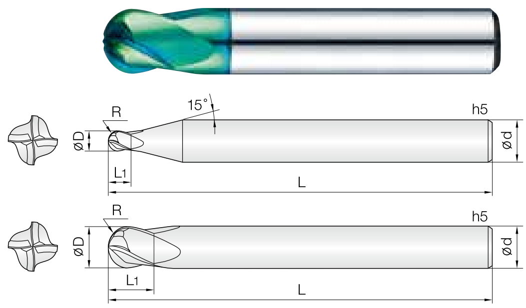
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 3JJB 010 025 S04 | 0.5R X 1 | 2.5 | 50 | 4 | |
| 3JJB 012 030 S04 | 0.6R X 1.2 | 3 | 50 | 4 | |
| 3JJB 015 040 S04 | 0.75R X 1.5 | 4 | 50 | 4 | |
| 3JJB 020 050 S06 | 1R X 2 | 5 | 50 | 6 | |
| 3JJB 030 080 S06 | 1.5R X 3 | 8 | 65 | 6 | |
| 3JJB 040 080 S04 | 2R X 4 | 8 | 60 | 4 | |
| 3JJB 040 080 S06 | 2R X 4 | 8 | 70 | 6 | |
| 3JJB 050 100 S06 | 2.5R X 5 | 10 | 75 | 6 | |

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 3JJB 060 120 S06 | 3R X 6 | 12 | 80 | 6 | |
| 3JJB 060 120 120 | 3R X 6 | 12 | 120 | 6 | |
| 3JJB 080 140 S08 | 4R X 8 | 14 | 90 | 8 | |
| 3JJB 080 140 150 | 4R X 8 | 14 | 150 | 8 | |
| 3JJB 100 180 S10 | 5R X 10 | 18 | 100 | 10 | |
| 3JJB 100 180 150 | 5R X 10 | 18 | 150 | 10 | |
| 3JJB 120 220 S12 | 6R X 12 | 22 | 110 | 12 | |
| 3JJB 120 220 150 | 6R X 12 | 22 | 150 | 12 | |

# 4JJSB

## 4 Flutes JJ Short Length Ball End Mills for Hardened Steels

## 4날 고경도재 가공용 제이제이 짧은 길이 볼 엔드밀




- 고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 짧은 전장을 채택하여 열박음척 사용이 용이합니다.
- 4날 볼타입 적용으로 고속, 고이송 작업이 가능합니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- Endmills for pre-hardened and hardened steels(HRc52~68)
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Short overall length for easy use with shiringking chuck.
- Four flutes ball edge design for high speed, feed condition.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

4 | UWC 초미립자 | TISIN-S Coating | R ±0.005 0.5 ~ 2.5R | R ±0.01 3 ~ 6R | 30° Helix Angle | CUTTING DATA 420P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø1 ~ 12 | +0 ~ -0.01mm | ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

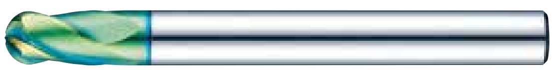
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4JJSB 010 012 S04 | 0.5R X 1 | 1.2 | 40 | 4 | |
| 4JJSB 012 015 S04 | 0.6R X 1.2 | 1.5 | 40 | 4 | |
| 4JJSB 015 018 S04 | 0.75R X 1.5 | 1.8 | 40 | 4 | |
| 4JJSB 020 024 S04 | 1R X 2 | 2.4 | 40 | 4 | |
| 4JJSB 025 030 S04 | 1.25R X 2.5 | 3 | 45 | 4 | |
| 4JJSB 030 036 S06 | 1.5R X 3 | 3.6 | 45 | 6 | |
| 4JJSB 040 050 S04 | 2R X 4 | 5 | 45 | 4 | |
| 4JJSB 040 050 S06 | 2R X 4 | 5 | 45 | 6 | |
| 4JJSB 050 060 S06 | 2.5R X 5 | 6 | 50 | 6 | |
| 4JJSB 060 070 S06 | 3R X 6 | 7 | 50 | 6 | |
| 4JJSB 060 070 060 | 3R X 6 | 7 | 60 | 6 | |
| 4JJSB 080 080 S08 | 4R X 8 | 8 | 60 | 8 | |
| 4JJSB 100 100 S10 | 5R X 10 | 10 | 60 | 10 | |
| 4JJSB 120 120 S12 | 6R X 12 | 12 | 75 | 12 | |

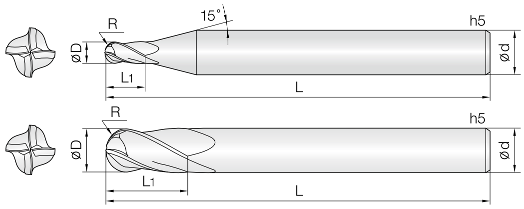
# 4JJB

*4 Flutes JJ Ball End Mills for Hardened Steels*

## 4날 고경도재 가공용 제이제이 볼 엔드밀








- 고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 4날 볼타입 적용으로 고속, 고이송 작업이 가능합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- Endmill for pre-hardened and hardened steels(HRc52~68)
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Four flutes ball edge design for high speed, feed condition.
- Minimizing fracturing by high TRS fine (0.5㎛) WC grade.

4 | WC 미립자 | TISIN-S Coating | R ±0.005 0.5 ~ 2.5R | R ±0.01 3 ~ 6R | R ±0.015 7 ~ 10R | 30° Helix Angle | CUTTING DATA 420P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 20 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |
| | Ø14 ~ 20 | -0.01 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4JJB 010 025 S06 | 0.5R X 1 | 2.5 | 50 | 6 | |
| 4JJB 010 025 080 | 0.5R X 1 | 2.5 | 80 | 6 | |
| 4JJB 012 030 S06 | 0.6R X 1.2 | 3 | 50 | 6 | |
| 4JJB 015 040 S06 | 0.75R X 1.5 | 4 | 50 | 6 | |
| 4JJB 015 040 080 | 0.75R X 1.5 | 4 | 80 | 6 | |
| 4JJB 020 050 S06 | 1R X 2 | 5 | 50 | 6 | |
| 4JJB 020 050 080 | 1R X 2 | 5 | 80 | 6 | |
| 4JJB 025 070 S06 | 1.25R X 2.5 | 7 | 50 | 6 | |
| 4JJB 025 070 080 | 1.25R X 2.5 | 7 | 80 | 6 | |
| 4JJB 030 080 S06 | 1.5R X 3 | 8 | 60 | 6 | |
| 4JJB 030 080 090 | 1.5R X 3 | 8 | 90 | 6 | |
| 4JJB 040 080 S04 | 2R X 4 | 8 | 60 | 4 | |
| 4JJB 040 080 090 | 2R X 4 | 8 | 90 | 4 | |
| 4JJB 040 080 S06 | 2R X 4 | 8 | 70 | 6 | |
| 4JJB 040 080 100 | 2R X 4 | 8 | 100 | 6 | |
| 4JJB 050 100 S06 | 2.5R X 5 | 10 | 80 | 6 | |
| 4JJB 050 100 110 | 2.5R X 5 | 10 | 110 | 6 | |
| 4JJB 060 120 S06 | 3R X 6 | 12 | 90 | 6 | |
| 4JJB 060 120 110 | 3R X 6 | 12 | 110 | 6 | |
| 4JJB 080 140 S08 | 4R X 8 | 14 | 100 | 8 | |
| 4JJB 080 140 150 | 4R X 8 | 14 | 150 | 8 | |
| 4JJB 100 180 S10 | 5R X 10 | 18 | 100 | 10 | |
| 4JJB 100 180 150 | 5R X 10 | 18 | 150 | 10 | |
| 4JJB 120 220 S12 | 6R X 12 | 22 | 110 | 12 | |
| 4JJB 120 220 150 | 6R X 12 | 22 | 150 | 12 | |
| 4JJB 140 240 110 | 7R X 14 | 24 | 110 | 14 | |
| 4JJB 160 300 S16 | 8R X 16 | 30 | 130 | 16 | |
| 4JJB 160 300 160 | 8R X 16 | 30 | 160 | 16 | |
| 4JJB 200 400 S20 | 10R X 20 | 40 | 160 | 20 | |
| 4JJB 200 400 200 | 10R X 20 | 40 | 200 | 20 | |

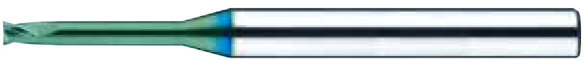
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

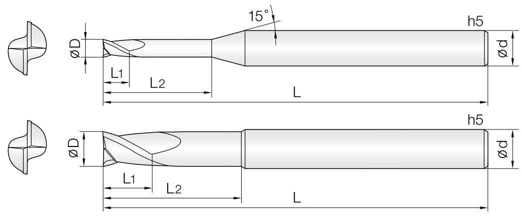
# 2JJRE

## 2 Flutes JJ Rib End Mills for Hardened Steel

## 2날 고경도재 가공용 제이제이 리브 엔드밀

JJ series






- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Reinforced edge design for preventing edge chipping.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

2 | UWC 초미립자 | TISIN-S Coating | 30° Helix Angle | Shield Edge | CUTTING DATA 421P

| Condition | D Size | D Tolerance |
|---|---|---|
| øD ≠ ød | ø0.1 ~ 0.15 | +0 ~ -0.005mm |
| | ø0.2 ~ 6 | +0 ~ -0.01mm |
| | ø8 ~ 12 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| øD = ød | ø6 | -0.005 ~ -0.015mm |
| | ø8 ~ 12 | -0.01 ~ -0.025mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2JJRE 001 003 S04 | 0.1 | 0.15 | 0.3 | 40 | 4 | |
| 2JJRE 001 005 S04 | 0.1 | 0.15 | 0.5 | 40 | 4 | |
| 2JJRE 0015 003 S04 | 0.15 | 0.15 | 0.3 | 40 | 4 | |
| 2JJRE 0015 005 S04 | 0.15 | 0.15 | 0.5 | 40 | 4 | |
| 2JJRE 0015 0075 S04 | 0.15 | 0.15 | 0.75 | 40 | 4 | |
| 2JJRE 0015 010 S04 | 0.15 | 0.15 | 1 | 40 | 4 | |
| 2JJRE 002 005 S04 | 0.2 | 0.2 | 0.5 | 40 | 4 | |
| 2JJRE 002 010 S04 | 0.2 | 0.2 | 1 | 40 | 4 | |
| 2JJRE 002 015 S04 | 0.2 | 0.2 | 1.5 | 40 | 4 | |
| 2JJRE 002 020 S04 | 0.2 | 0.2 | 2 | 40 | 4 | |
| 2JJRE 002 025 S04 | 0.2 | 0.2 | 2.5 | 40 | 4 | |
| 2JJRE 002 030 S04 | 0.2 | 0.2 | 3 | 40 | 4 | |
| 2JJRE 0025 005 S04 | 0.25 | 0.25 | 0.5 | 40 | 4 | |
| 2JJRE 0025 010 S04 | 0.25 | 0.25 | 1 | 40 | 4 | |
| 2JJRE 0025 015 S04 | 0.25 | 0.25 | 1.5 | 40 | 4 | |
| 2JJRE 0025 020 S04 | 0.25 | 0.25 | 2 | 40 | 4 | |
| 2JJRE 0025 025 S04 | 0.25 | 0.25 | 2.5 | 40 | 4 | |
| 2JJRE 0025 030 S04 | 0.25 | 0.25 | 3 | 40 | 4 | |
| 2JJRE 003 010 S04 | 0.3 | 0.3 | 1 | 40 | 4 | |
| 2JJRE 003 015 S04 | 0.3 | 0.3 | 1.5 | 40 | 4 | |
| 2JJRE 003 020 S04 | 0.3 | 0.3 | 2 | 40 | 4 | |
| 2JJRE 003 025 S04 | 0.3 | 0.3 | 2.5 | 40 | 4 | |
| 2JJRE 003 030 S04 | 0.3 | 0.3 | 3 | 40 | 4 | |
| 2JJRE 003 035 S04 | 0.3 | 0.3 | 3.5 | 40 | 4 | |
| 2JJRE 003 040 S04 | 0.3 | 0.3 | 4 | 40 | 4 | |
| 2JJRE 003 050 S04 | 0.3 | 0.3 | 5 | 40 | 4 | |
| 2JJRE 003 060 S04 | 0.3 | 0.3 | 6 | 40 | 4 | |
| 2JJRE 003 070 S04 | 0.3 | 0.3 | 7 | 40 | 4 | |
| 2JJRE 003 080 S04 | 0.3 | 0.3 | 8 | 40 | 4 | |
| 2JJRE 004 010 S04 | 0.4 | 0.4 | 1 | 40 | 4 | |
| 2JJRE 004 015 S04 | 0.4 | 0.4 | 1.5 | 40 | 4 | |
| 2JJRE 004 020 S04 | 0.4 | 0.4 | 2 | 40 | 4 | |
| 2JJRE 004 025 S04 | 0.4 | 0.4 | 2.5 | 40 | 4 | |
| 2JJRE 004 030 S04 | 0.4 | 0.4 | 3 | 40 | 4 | |
| 2JJRE 004 035 S04 | 0.4 | 0.4 | 3.5 | 40 | 4 | |
| 2JJRE 004 040 S04 | 0.4 | 0.4 | 4 | 40 | 4 | |
| 2JJRE 004 050 S04 | 0.4 | 0.4 | 5 | 40 | 4 | |
| 2JJRE 004 060 S04 | 0.4 | 0.4 | 6 | 40 | 4 | |
| 2JJRE 004 080 S04 | 0.4 | 0.4 | 8 | 40 | 4 | |
| 2JJRE 004 100 S04 | 0.4 | 0.4 | 10 | 45 | 4 | |
| 2JJRE 004 120 S04 | 0.4 | 0.4 | 12 | 45 | 4 | |
| 2JJRE 005 010 S04 | 0.5 | 0.5 | 1 | 40 | 4 | |
| 2JJRE 005 020 S04 | 0.5 | 0.5 | 2 | 40 | 4 | |
| 2JJRE 005 030 S04 | 0.5 | 0.5 | 3 | 40 | 4 | |
| 2JJRE 005 040 S04 | 0.5 | 0.5 | 4 | 40 | 4 | |
| 2JJRE 005 050 S04 | 0.5 | 0.5 | 5 | 40 | 4 | |
| 2JJRE 005 060 S04 | 0.5 | 0.5 | 6 | 40 | 4 | |
| 2JJRE 005 080 S04 | 0.5 | 0.5 | 8 | 45 | 4 | |
| 2JJRE 005 100 S04 | 0.5 | 0.5 | 10 | 45 | 4 | |
| 2JJRE 005 120 S04 | 0.5 | 0.5 | 12 | 45 | 4 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2JJRE 005 140 S04 | 0.5 | 0.5 | 14 | 45 | 4 | |
| 2JJRE 005 160 S04 | 0.5 | 0.5 | 16 | 45 | 4 | |
| 2JJRE 006 010 S04 | 0.6 | 0.6 | 1 | 40 | 4 | |
| 2JJRE 006 020 S04 | 0.6 | 0.6 | 2 | 40 | 4 | |
| 2JJRE 006 030 S04 | 0.6 | 0.6 | 3 | 40 | 4 | |
| 2JJRE 006 040 S04 | 0.6 | 0.6 | 4 | 40 | 4 | |
| 2JJRE 006 050 S04 | 0.6 | 0.6 | 5 | 40 | 4 | |
| 2JJRE 006 060 S04 | 0.6 | 0.6 | 6 | 40 | 4 | |
| 2JJRE 006 080 S04 | 0.6 | 0.6 | 8 | 45 | 4 | |
| 2JJRE 006 100 S04 | 0.6 | 0.6 | 10 | 45 | 4 | |
| 2JJRE 006 120 S04 | 0.6 | 0.6 | 12 | 45 | 4 | |
| 2JJRE 006 140 S04 | 0.6 | 0.6 | 14 | 45 | 4 | |
| 2JJRE 006 160 S04 | 0.6 | 0.6 | 16 | 45 | 4 | |
| 2JJRE 006 180 S04 | 0.6 | 0.6 | 18 | 50 | 4 | |
| 2JJRE 007 020 S04 | 0.7 | 0.7 | 2 | 40 | 4 | |
| 2JJRE 007 040 S04 | 0.7 | 0.7 | 4 | 40 | 4 | |
| 2JJRE 007 060 S04 | 0.7 | 0.7 | 6 | 40 | 4 | |
| 2JJRE 007 080 S04 | 0.7 | 0.7 | 8 | 45 | 4 | |
| 2JJRE 007 100 S04 | 0.7 | 0.7 | 10 | 45 | 4 | |
| 2JJRE 007 120 S04 | 0.7 | 0.7 | 12 | 45 | 4 | |
| 2JJRE 007 140 S04 | 0.7 | 0.7 | 14 | 45 | 4 | |
| 2JJRE 007 160 S04 | 0.7 | 0.7 | 16 | 45 | 4 | |
| 2JJRE 008 010 S04 | 0.8 | 0.8 | 1 | 40 | 4 | |
| 2JJRE 008 020 S04 | 0.8 | 0.8 | 2 | 40 | 4 | |
| 2JJRE 008 030 S04 | 0.8 | 0.8 | 3 | 40 | 4 | |
| 2JJRE 008 040 S04 | 0.8 | 0.8 | 4 | 40 | 4 | |
| 2JJRE 008 050 S04 | 0.8 | 0.8 | 5 | 40 | 4 | |
| 2JJRE 008 060 S04 | 0.8 | 0.8 | 6 | 40 | 4 | |
| 2JJRE 008 080 S04 | 0.8 | 0.8 | 8 | 45 | 4 | |
| 2JJRE 008 100 S04 | 0.8 | 0.8 | 10 | 45 | 4 | |
| 2JJRE 008 120 S04 | 0.8 | 0.8 | 12 | 45 | 4 | |
| 2JJRE 008 140 S04 | 0.8 | 0.8 | 14 | 45 | 4 | |
| 2JJRE 008 160 S04 | 0.8 | 0.8 | 16 | 45 | 4 | |
| 2JJRE 008 180 S04 | 0.8 | 0.8 | 18 | 50 | 4 | |
| 2JJRE 008 200 S04 | 0.8 | 0.8 | 20 | 50 | 4 | |
| 2JJRE 009 040 S04 | 0.9 | 0.9 | 4 | 40 | 4 | |
| 2JJRE 009 060 S04 | 0.9 | 0.9 | 6 | 40 | 4 | |
| 2JJRE 009 080 S04 | 0.9 | 0.9 | 8 | 45 | 4 | |
| 2JJRE 009 100 S04 | 0.9 | 0.9 | 10 | 45 | 4 | |
| 2JJRE 010 020 S04 | 1 | 1 | 2 | 45 | 4 | |
| 2JJRE 010 030 S04 | 1 | 1 | 3 | 45 | 4 | |
| 2JJRE 010 040 S04 | 1 | 1 | 4 | 45 | 4 | |
| 2JJRE 010 050 S04 | 1 | 1 | 5 | 45 | 4 | |
| 2JJRE 010 060 S04 | 1 | 1 | 6 | 45 | 4 | |
| 2JJRE 010 080 S04 | 1 | 1 | 8 | 45 | 4 | |
| 2JJRE 010 100 S04 | 1 | 1 | 10 | 45 | 4 | |
| 2JJRE 010 120 S04 | 1 | 1 | 12 | 50 | 4 | |
| 2JJRE 010 140 S04 | 1 | 1 | 14 | 50 | 4 | |
| 2JJRE 010 160 S04 | 1 | 1 | 16 | 50 | 4 | |
| 2JJRE 010 180 S04 | 1 | 1 | 18 | 50 | 4 | |

# 2JJRE

## 2 Flutes JJ Rib End Mills for Hardened Steels

## 2날 고경도재 가공용 제이제이 리브 엔드밀

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2JJRE 010 200 S04 | 1 | 1 | 20 | 50 | 4 | |
| 2JJRE 010 220 S04 | 1 | 1 | 22 | 60 | 4 | |
| 2JJRE 010 250 S04 | 1 | 1 | 25 | 60 | 4 | |
| 2JJRE 010 300 S04 | 1 | 1 | 30 | 70 | 4 | |
| 2JJRE 012 040 S04 | 1.2 | 1.2 | 4 | 45 | 4 | |
| 2JJRE 012 060 S04 | 1.2 | 1.2 | 6 | 45 | 4 | |
| 2JJRE 012 080 S04 | 1.2 | 1.2 | 8 | 45 | 4 | |
| 2JJRE 012 100 S04 | 1.2 | 1.2 | 10 | 45 | 4 | |
| 2JJRE 012 120 S04 | 1.2 | 1.2 | 12 | 50 | 4 | |
| 2JJRE 012 160 S04 | 1.2 | 1.2 | 16 | 50 | 4 | |
| 2JJRE 012 200 S04 | 1.2 | 1.2 | 20 | 50 | 4 | |
| 2JJRE 012 250 S04 | 1.2 | 1.2 | 25 | 60 | 4 | |
| 2JJRE 014 080 S04 | 1.4 | 1.4 | 8 | 45 | 4 | |
| 2JJRE 014 100 S04 | 1.4 | 1.4 | 10 | 45 | 4 | |
| 2JJRE 014 140 S04 | 1.4 | 1.4 | 14 | 50 | 4 | |
| 2JJRE 014 160 S04 | 1.4 | 1.4 | 16 | 50 | 4 | |
| 2JJRE 014 200 S04 | 1.4 | 1.4 | 20 | 50 | 4 | |
| 2JJRE 014 220 S04 | 1.4 | 1.4 | 22 | 60 | 4 | |
| 2JJRE 015 040 S04 | 1.5 | 1.5 | 4 | 45 | 4 | |
| 2JJRE 015 060 S04 | 1.5 | 1.5 | 6 | 45 | 4 | |
| 2JJRE 015 080 S04 | 1.5 | 1.5 | 8 | 45 | 4 | |
| 2JJRE 015 100 S04 | 1.5 | 1.5 | 10 | 50 | 4 | |
| 2JJRE 015 120 S04 | 1.5 | 1.5 | 12 | 50 | 4 | |
| 2JJRE 015 140 S04 | 1.5 | 1.5 | 14 | 50 | 4 | |
| 2JJRE 015 160 S04 | 1.5 | 1.5 | 16 | 50 | 4 | |
| 2JJRE 015 180 S04 | 1.5 | 1.5 | 18 | 50 | 4 | |
| 2JJRE 015 200 S04 | 1.5 | 1.5 | 20 | 50 | 4 | |
| 2JJRE 015 220 S04 | 1.5 | 1.5 | 22 | 60 | 4 | |
| 2JJRE 015 250 S04 | 1.5 | 1.5 | 25 | 60 | 4 | |
| 2JJRE 015 350 S04 | 1.5 | 1.5 | 35 | 70 | 4 | |
| 2JJRE 015 400 S04 | 1.5 | 1.5 | 40 | 80 | 4 | |
| 2JJRE 016 060 S04 | 1.6 | 1.6 | 6 | 45 | 4 | |
| 2JJRE 016 100 S04 | 1.6 | 1.6 | 10 | 50 | 4 | |
| 2JJRE 016 140 S04 | 1.6 | 1.6 | 14 | 50 | 4 | |
| 2JJRE 016 180 S04 | 1.6 | 1.6 | 18 | 50 | 4 | |
| 2JJRE 016 200 S04 | 1.6 | 1.6 | 20 | 50 | 4 | |
| 2JJRE 018 100 S04 | 1.8 | 1.8 | 10 | 50 | 4 | |
| 2JJRE 018 120 S04 | 1.8 | 1.8 | 12 | 50 | 4 | |
| 2JJRE 018 140 S04 | 1.8 | 1.8 | 14 | 50 | 4 | |
| 2JJRE 018 160 S04 | 1.8 | 1.8 | 16 | 50 | 4 | |
| 2JJRE 018 180 S04 | 1.8 | 1.8 | 18 | 50 | 4 | |
| 2JJRE 018 200 S04 | 1.8 | 1.8 | 20 | 50 | 4 | |
| 2JJRE 018 250 S04 | 1.8 | 1.8 | 25 | 60 | 4 | |
| 2JJRE 020 060 S04 | 2 | 2 | 6 | 45 | 4 | |
| 2JJRE 020 080 S04 | 2 | 2 | 8 | 45 | 4 | |
| 2JJRE 020 100 S04 | 2 | 2 | 10 | 50 | 4 | |
| 2JJRE 020 120 S04 | 2 | 2 | 12 | 50 | 4 | |
| 2JJRE 020 140 S04 | 2 | 2 | 14 | 50 | 4 | |
| 2JJRE 020 160 S04 | 2 | 2 | 16 | 50 | 4 | |
| 2JJRE 020 180 S04 | 2 | 2 | 18 | 50 | 4 | |
| 2JJRE 020 200 S04 | 2 | 2 | 20 | 50 | 4 | |
| 2JJRE 020 220 S04 | 2 | 2 | 22 | 60 | 4 | |
| 2JJRE 020 250 S04 | 2 | 2 | 25 | 60 | 4 | |
| 2JJRE 020 300 S04 | 2 | 2 | 30 | 60 | 4 | |
| 2JJRE 020 350 S04 | 2 | 2 | 35 | 70 | 4 | |
| 2JJRE 020 400 S04 | 2 | 2 | 40 | 80 | 4 | |
| 2JJRE 020 450 S04 | 2 | 2 | 45 | 90 | 4 | |
| 2JJRE 020 500 S04 | 2 | 2 | 50 | 90 | 4 | |
| 2JJRE 025 100 S04 | 2.5 | 2.5 | 10 | 50 | 4 | |
| 2JJRE 025 120 S04 | 2.5 | 2.5 | 12 | 50 | 4 | |
| 2JJRE 025 160 S04 | 2.5 | 2.5 | 16 | 50 | 4 | |
| 2JJRE 025 200 S04 | 2.5 | 2.5 | 20 | 50 | 4 | |
| 2JJRE 025 250 S04 | 2.5 | 2.5 | 25 | 60 | 4 | |
| 2JJRE 025 300 S04 | 2.5 | 2.5 | 30 | 70 | 4 | |

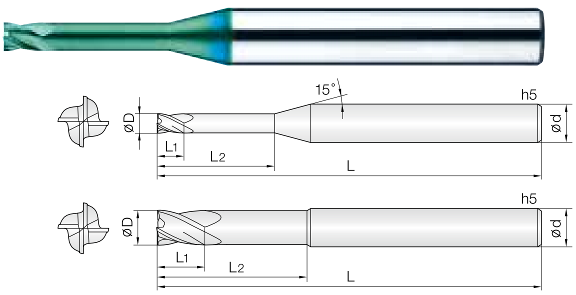
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2JJRE 025 350 S04 | 2.5 | 2.5 | 35 | 70 | 4 | |
| 2JJRE 025 400 S04 | 2.5 | 2.5 | 40 | 80 | 4 | |
| 2JJRE 025 450 S04 | 2.5 | 2.5 | 45 | 90 | 4 | |
| 2JJRE 025 500 S04 | 2.5 | 2.5 | 50 | 90 | 4 | |
| 2JJRE 030 060 S06 | 3 | 3 | 6 | 45 | 6 | |
| 2JJRE 030 080 S06 | 3 | 3 | 8 | 45 | 6 | |
| 2JJRE 030 100 S06 | 3 | 3 | 10 | 50 | 6 | |
| 2JJRE 030 120 S06 | 3 | 3 | 12 | 50 | 6 | |
| 2JJRE 030 160 S06 | 3 | 3 | 16 | 55 | 6 | |
| 2JJRE 030 200 S06 | 3 | 3 | 20 | 60 | 6 | |
| 2JJRE 030 250 S06 | 3 | 3 | 25 | 65 | 6 | |
| 2JJRE 030 300 S06 | 3 | 3 | 30 | 70 | 6 | |
| 2JJRE 030 350 S06 | 3 | 3 | 35 | 75 | 6 | |
| 2JJRE 030 400 S06 | 3 | 3 | 40 | 80 | 6 | |
| 2JJRE 030 450 S06 | 3 | 3 | 45 | 90 | 6 | |
| 2JJRE 030 500 S06 | 3 | 3 | 50 | 100 | 6 | |
| 2JJRE 030 600 S06 | 3 | 3 | 60 | 100 | 6 | |
| 2JJRE 035 120 S06 | 3.5 | 3.5 | 12 | 50 | 6 | |
| 2JJRE 035 160 S06 | 3.5 | 3.5 | 16 | 55 | 6 | |
| 2JJRE 035 200 S06 | 3.5 | 3.5 | 20 | 60 | 6 | |
| 2JJRE 035 250 S06 | 3.5 | 3.5 | 25 | 65 | 6 | |
| 2JJRE 035 300 S06 | 3.5 | 3.5 | 30 | 70 | 6 | |
| 2JJRE 035 350 S06 | 3.5 | 3.5 | 35 | 75 | 6 | |
| 2JJRE 035 400 S06 | 3.5 | 3.5 | 40 | 80 | 6 | |
| 2JJRE 040 080 S06 | 4 | 4 | 8 | 50 | 6 | |
| 2JJRE 040 100 S06 | 4 | 4 | 10 | 50 | 6 | |
| 2JJRE 040 120 S06 | 4 | 4 | 12 | 50 | 6 | |
| 2JJRE 040 160 S06 | 4 | 4 | 16 | 55 | 6 | |
| 2JJRE 040 200 S06 | 4 | 4 | 20 | 60 | 6 | |
| 2JJRE 040 250 S06 | 4 | 4 | 25 | 65 | 6 | |
| 2JJRE 040 300 S06 | 4 | 4 | 30 | 70 | 6 | |
| 2JJRE 040 350 S06 | 4 | 4 | 35 | 75 | 6 | |
| 2JJRE 040 400 S06 | 4 | 4 | 40 | 80 | 6 | |
| 2JJRE 040 450 S06 | 4 | 4 | 45 | 90 | 6 | |
| 2JJRE 040 500 S06 | 4 | 4 | 50 | 100 | 6 | |
| 2JJRE 040 600 S06 | 4 | 4 | 60 | 100 | 6 | |
| 2JJRE 045 120 S06 | 4.5 | 4.5 | 12 | 50 | 6 | |
| 2JJRE 045 160 S06 | 4.5 | 4.5 | 16 | 55 | 6 | |
| 2JJRE 045 200 S06 | 4.5 | 4.5 | 20 | 60 | 6 | |
| 2JJRE 045 250 S06 | 4.5 | 4.5 | 25 | 65 | 6 | |
| 2JJRE 045 300 S06 | 4.5 | 4.5 | 30 | 70 | 6 | |
| 2JJRE 045 400 S06 | 4.5 | 4.5 | 40 | 80 | 6 | |
| 2JJRE 050 160 S06 | 5 | 6 | 16 | 60 | 6 | |
| 2JJRE 050 200 S06 | 5 | 6 | 20 | 60 | 6 | |
| 2JJRE 050 250 S06 | 5 | 6 | 25 | 65 | 6 | |
| 2JJRE 050 300 S06 | 5 | 6 | 30 | 70 | 6 | |
| 2JJRE 050 350 S06 | 5 | 6 | 35 | 75 | 6 | |
| 2JJRE 050 400 S06 | 5 | 6 | 40 | 80 | 6 | |
| 2JJRE 050 500 S06 | 5 | 6 | 50 | 100 | 6 | |
| 2JJRE 050 600 S06 | 5 | 6 | 60 | 100 | 6 | |
| 2JJRE 060 200 S06 | 6 | 10 | 20 | 60 | 6 | |
| 2JJRE 060 300 S06 | 6 | 10 | 30 | 75 | 6 | |
| 2JJRE 060 400 S06 | 6 | 10 | 40 | 80 | 6 | |
| 2JJRE 060 500 S06 | 6 | 10 | 50 | 90 | 6 | |
| 2JJRE 060 600 S06 | 6 | 10 | 60 | 110 | 6 | |
| 2JJRE 080 300 S08 | 8 | 12 | 30 | 80 | 8 | |
| 2JJRE 080 500 S08 | 8 | 12 | 50 | 100 | 8 | |
| 2JJRE 100 400 S10 | 10 | 15 | 40 | 90 | 10 | |
| 2JJRE 100 600 S10 | 10 | 15 | 60 | 110 | 10 | |
| 2JJRE 120 500 S12 | 12 | 18 | 50 | 100 | 12 | |
| 2JJRE 120 700 S12 | 12 | 18 | 70 | 120 | 12 | |

# 4JJRE

## 4 Flutes JJ Rib End Mills for Hardened Steels

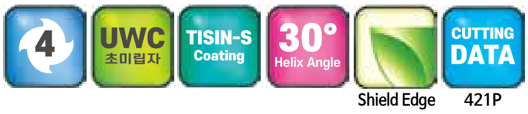
## 4날 고경도재 가공용 제이제이 리브 엔드밀






- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Reinforced edge design for preventing edge chipping.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.




| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.5 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 12 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4JJRE 005 010 S04 | 0.5 | 0.5 | 1 | 40 | 4 | |
| 4JJRE 005 020 S04 | 0.5 | 0.5 | 2 | 40 | 4 | |
| 4JJRE 005 030 S04 | 0.5 | 0.5 | 3 | 45 | 4 | |
| 4JJRE 005 040 S04 | 0.5 | 0.5 | 4 | 45 | 4 | |
| 4JJRE 005 050 S04 | 0.5 | 0.5 | 5 | 45 | 4 | |
| 4JJRE 005 060 S04 | 0.5 | 0.5 | 6 | 45 | 4 | |
| 4JJRE 005 080 S04 | 0.5 | 0.5 | 8 | 45 | 4 | |
| 4JJRE 005 100 S04 | 0.5 | 0.5 | 10 | 50 | 4 | |
| 4JJRE 006 010 S04 | 0.6 | 0.6 | 1 | 45 | 4 | |
| 4JJRE 006 020 S04 | 0.6 | 0.6 | 2 | 45 | 4 | |
| 4JJRE 006 030 S04 | 0.6 | 0.6 | 3 | 45 | 4 | |
| 4JJRE 006 040 S04 | 0.6 | 0.6 | 4 | 45 | 4 | |
| 4JJRE 006 050 S04 | 0.6 | 0.6 | 5 | 45 | 4 | |
| 4JJRE 006 060 S04 | 0.6 | 0.6 | 6 | 45 | 4 | |
| 4JJRE 006 080 S04 | 0.6 | 0.6 | 8 | 45 | 4 | |
| 4JJRE 006 100 S04 | 0.6 | 0.6 | 10 | 50 | 4 | |
| 4JJRE 006 120 S04 | 0.6 | 0.6 | 12 | 50 | 4 | |
| 4JJRE 007 020 S04 | 0.7 | 0.7 | 2 | 45 | 4 | |
| 4JJRE 007 040 S04 | 0.7 | 0.7 | 4 | 45 | 4 | |
| 4JJRE 007 060 S04 | 0.7 | 0.7 | 6 | 45 | 4 | |
| 4JJRE 007 080 S04 | 0.7 | 0.7 | 8 | 45 | 4 | |
| 4JJRE 007 100 S04 | 0.7 | 0.7 | 10 | 50 | 4 | |
| 4JJRE 008 010 S04 | 0.8 | 0.8 | 1 | 40 | 4 | |
| 4JJRE 008 020 S04 | 0.8 | 0.8 | 2 | 40 | 4 | |
| 4JJRE 008 030 S04 | 0.8 | 0.8 | 3 | 40 | 4 | |
| 4JJRE 008 040 S04 | 0.8 | 0.8 | 4 | 40 | 4 | |
| 4JJRE 008 050 S04 | 0.8 | 0.8 | 5 | 40 | 4 | |
| 4JJRE 008 060 S04 | 0.8 | 0.8 | 6 | 40 | 4 | |
| 4JJRE 008 080 S04 | 0.8 | 0.8 | 8 | 40 | 4 | |
| 4JJRE 008 100 S04 | 0.8 | 0.8 | 10 | 50 | 4 | |
| 4JJRE 008 120 S04 | 0.8 | 0.8 | 12 | 50 | 4 | |
| 4JJRE 008 160 S04 | 0.8 | 0.8 | 16 | 50 | 4 | |
| 4JJRE 010 020 S04 | 1 | 1 | 2 | 45 | 4 | |
| 4JJRE 010 030 S04 | 1 | 1 | 3 | 45 | 4 | |
| 4JJRE 010 040 S04 | 1 | 1 | 4 | 45 | 4 | |
| 4JJRE 010 060 S04 | 1 | 1 | 6 | 45 | 4 | |
| 4JJRE 010 080 S04 | 1 | 1 | 8 | 45 | 4 | |
| 4JJRE 010 100 S04 | 1 | 1 | 10 | 50 | 4 | |
| 4JJRE 010 120 S04 | 1 | 1 | 12 | 50 | 4 | |
| 4JJRE 010 140 S04 | 1 | 1 | 14 | 50 | 4 | |
| 4JJRE 010 160 S04 | 1 | 1 | 16 | 50 | 4 | |
| 4JJRE 010 180 S04 | 1 | 1 | 18 | 60 | 4 | |
| 4JJRE 010 200 S04 | 1 | 1 | 20 | 60 | 4 | |
| 4JJRE 012 040 S04 | 1.2 | 1.2 | 4 | 45 | 4 | |
| 4JJRE 012 060 S04 | 1.2 | 1.2 | 6 | 45 | 4 | |
| 4JJRE 012 080 S04 | 1.2 | 1.2 | 8 | 45 | 4 | |
| 4JJRE 012 100 S04 | 1.2 | 1.2 | 10 | 50 | 4 | |
| 4JJRE 012 120 S04 | 1.2 | 1.2 | 12 | 50 | 4 | |
| 4JJRE 012 160 S04 | 1.2 | 1.2 | 16 | 50 | 4 | |
| 4JJRE 012 180 S04 | 1.2 | 1.2 | 18 | 60 | 4 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4JJRE 012 200 S04 | 1.2 | 1.2 | 20 | 60 | 4 | |
| 4JJRE 014 060 S04 | 1.4 | 1.4 | 6 | 45 | 4 | |
| 4JJRE 014 080 S04 | 1.4 | 1.4 | 8 | 45 | 4 | |
| 4JJRE 014 100 S04 | 1.4 | 1.4 | 10 | 50 | 4 | |
| 4JJRE 014 120 S04 | 1.4 | 1.4 | 12 | 50 | 4 | |
| 4JJRE 014 140 S04 | 1.4 | 1.4 | 14 | 50 | 4 | |
| 4JJRE 014 160 S04 | 1.4 | 1.4 | 16 | 50 | 4 | |
| 4JJRE 015 040 S04 | 1.5 | 1.5 | 4 | 45 | 4 | |
| 4JJRE 015 060 S04 | 1.5 | 1.5 | 6 | 45 | 4 | |
| 4JJRE 015 080 S04 | 1.5 | 1.5 | 8 | 45 | 4 | |
| 4JJRE 015 100 S04 | 1.5 | 1.5 | 10 | 50 | 4 | |
| 4JJRE 015 120 S04 | 1.5 | 1.5 | 12 | 50 | 4 | |
| 4JJRE 015 160 S04 | 1.5 | 1.5 | 16 | 50 | 4 | |
| 4JJRE 015 180 S04 | 1.5 | 1.5 | 18 | 60 | 4 | |
| 4JJRE 015 200 S04 | 1.5 | 1.5 | 20 | 60 | 4 | |
| 4JJRE 015 250 S04 | 1.5 | 1.5 | 25 | 60 | 4 | |
| 4JJRE 015 300 S04 | 1.5 | 1.5 | 30 | 70 | 4 | |
| 4JJRE 016 060 S04 | 1.6 | 1.6 | 6 | 45 | 4 | |
| 4JJRE 016 080 S04 | 1.6 | 1.6 | 8 | 45 | 4 | |
| 4JJRE 016 100 S04 | 1.6 | 1.6 | 10 | 50 | 4 | |
| 4JJRE 016 120 S04 | 1.6 | 1.6 | 12 | 50 | 4 | |
| 4JJRE 016 140 S04 | 1.6 | 1.6 | 14 | 50 | 4 | |
| 4JJRE 016 160 S04 | 1.6 | 1.6 | 16 | 50 | 4 | |
| 4JJRE 016 180 S04 | 1.6 | 1.6 | 18 | 60 | 4 | |
| 4JJRE 016 200 S04 | 1.6 | 1.6 | 20 | 60 | 4 | |
| 4JJRE 016 250 S04 | 1.6 | 1.6 | 25 | 70 | 4 | |
| 4JJRE 018 060 S04 | 1.8 | 1.8 | 6 | 45 | 4 | |
| 4JJRE 018 080 S04 | 1.8 | 1.8 | 8 | 45 | 4 | |
| 4JJRE 018 100 S04 | 1.8 | 1.8 | 10 | 50 | 4 | |
| 4JJRE 018 120 S04 | 1.8 | 1.8 | 12 | 50 | 4 | |
| 4JJRE 018 160 S04 | 1.8 | 1.8 | 16 | 50 | 4 | |
| 4JJRE 018 200 S04 | 1.8 | 1.8 | 20 | 60 | 4 | |
| 4JJRE 018 250 S04 | 1.8 | 1.8 | 25 | 70 | 4 | |
| 4JJRE 020 040 S04 | 2 | 2 | 4 | 45 | 4 | |
| 4JJRE 020 060 S04 | 2 | 2 | 6 | 45 | 4 | |
| 4JJRE 020 080 S04 | 2 | 2 | 8 | 45 | 4 | |
| 4JJRE 020 100 S04 | 2 | 2 | 10 | 50 | 4 | |
| 4JJRE 020 120 S04 | 2 | 2 | 12 | 50 | 4 | |
| 4JJRE 020 140 S04 | 2 | 2 | 14 | 50 | 4 | |
| 4JJRE 020 160 S04 | 2 | 2 | 16 | 50 | 4 | |
| 4JJRE 020 180 S04 | 2 | 2 | 18 | 50 | 4 | |
| 4JJRE 020 200 S04 | 2 | 2 | 20 | 50 | 4 | |
| 4JJRE 020 220 S04 | 2 | 2 | 22 | 60 | 4 | |
| 4JJRE 020 250 S04 | 2 | 2 | 25 | 60 | 4 | |
| 4JJRE 020 300 S04 | 2 | 2 | 30 | 70 | 4 | |
| 4JJRE 025 100 S04 | 2.5 | 2.5 | 10 | 50 | 4 | |
| 4JJRE 025 120 S04 | 2.5 | 2.5 | 12 | 50 | 4 | |
| 4JJRE 025 160 S04 | 2.5 | 2.5 | 16 | 50 | 4 | |
| 4JJRE 025 200 S04 | 2.5 | 2.5 | 20 | 50 | 4 | |
| 4JJRE 025 250 S04 | 2.5 | 2.5 | 25 | 60 | 4 | |

# 4JJRE

## 4 Flutes JJ Rib End Mills for Hardened Steels

## 4날 고경도재 가공용 제이제이 리브 엔드밀

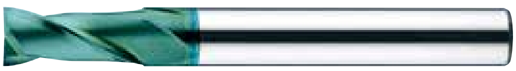
단위 : mm

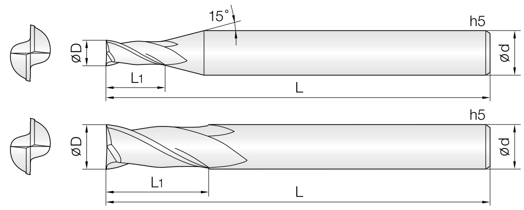
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4JJRE 025 300 S04 | 2.5 | 2.5 | 30 | 70 | 4 | |
| 4JJRE 030 060 S06 | 3 | 3 | 6 | 45 | 6 | |
| 4JJRE 030 080 S06 | 3 | 3 | 8 | 45 | 6 | |
| 4JJRE 030 100 S06 | 3 | 3 | 10 | 50 | 6 | |
| 4JJRE 030 120 S06 | 3 | 3 | 12 | 50 | 6 | |
| 4JJRE 030160 S06 | 3 | 3 | 16 | 55 | 6 | |
| 4JJRE 030 200 S06 | 3 | 3 | 20 | 60 | 6 | |
| 4JJRE 030 250 S06 | 3 | 3 | 25 | 65 | 6 | |
| 4JJRE 030 300 S06 | 3 | 3 | 30 | 70 | 6 | |
| 4JJRE 030 350 S06 | 3 | 3 | 35 | 75 | 6 | |
| 4JJRE 030 400 S06 | 3 | 3 | 40 | 80 | 6 | |
| 4JJRE 030 450 S06 | 3 | 3 | 45 | 90 | 6 | |
| 4JJRE 030 500 S06 | 3 | 3 | 50 | 100 | 6 | |
| 4JJRE 030 600 S06 | 3 | 3 | 60 | 110 | 6 | |
| 4JJRE 035 120 S06 | 3.5 | 3.5 | 12 | 50 | 6 | |
| 4JJRE 035 160 S06 | 3.5 | 3.5 | 16 | 55 | 6 | |
| 4JJRE 035 200 S06 | 3.5 | 3.5 | 20 | 60 | 6 | |
| 4JJRE 035 250 S06 | 3.5 | 3.5 | 25 | 65 | 6 | |
| 4JJRE 035 300 S06 | 3.5 | 3.5 | 30 | 70 | 6 | |
| 4JJRE 035 350 S06 | 3.5 | 3.5 | 35 | 75 | 6 | |
| 4JJRE 035 400 S06 | 3.5 | 3.5 | 40 | 80 | 6 | |
| 4JJRE 040 060 S06 | 4 | 4 | 6 | 50 | 6 | |
| 4JJRE 040 080 S06 | 4 | 4 | 8 | 50 | 6 | |
| 4JJRE 040 100 S06 | 4 | 4 | 10 | 50 | 6 | |
| 4JJRE 040 120 S06 | 4 | 4 | 12 | 50 | 6 | |
| 4JJRE 040 160 S06 | 4 | 4 | 16 | 55 | 6 | |
| 4JJRE 040 200 S06 | 4 | 4 | 20 | 60 | 6 | |
| 4JJRE 040 250 S06 | 4 | 4 | 25 | 65 | 6 | |
| 4JJRE 040 300 S06 | 4 | 4 | 30 | 70 | 6 | |
| 4JJRE 040 400 S06 | 4 | 4 | 40 | 80 | 6 | |
| 4JJRE 040 450 S06 | 4 | 4 | 45 | 90 | 6 | |
| 4JJRE 040 500 S06 | 4 | 4 | 50 | 100 | 6 | |
| 4JJRE 040 600 S06 | 4 | 4 | 60 | 110 | 6 | |
| 4JJRE 045 120 S06 | 4.5 | 4.5 | 12 | 50 | 6 | |
| 4JJRE 045 160 S06 | 4.5 | 4.5 | 16 | 55 | 6 | |
| 4JJRE 045 200 S06 | 4.5 | 4.5 | 20 | 60 | 6 | |
| 4JJRE 045 250 S06 | 4.5 | 4.5 | 25 | 65 | 6 | |
| 4JJRE 045 300 S06 | 4.5 | 4.5 | 30 | 70 | 6 | |
| 4JJRE 045 400 S06 | 4.5 | 4.5 | 40 | 80 | 6 | |
| 4JJRE 050 160 S06 | 5 | 5 | 16 | 60 | 6 | |
| 4JJRE 050 200 S06 | 5 | 5 | 20 | 60 | 6 | |
| 4JJRE 050 250 S06 | 5 | 5 | 25 | 65 | 6 | |
| 4JJRE 050 300 S06 | 5 | 5 | 30 | 70 | 6 | |
| 4JJRE 050 400 S06 | 5 | 5 | 40 | 80 | 6 | |
| 4JJRE 050 500 S06 | 5 | 5 | 50 | 100 | 6 | |
| 4JJRE 050 600 S06 | 5 | 5 | 60 | 110 | 6 | |
| 4JJRE 060 200 S06 | 6 | 6 | 20 | 60 | 6 | |
| 4JJRE 060 300 S06 | 6 | 6 | 30 | 75 | 6 | |
| 4JJRE 060 400 S06 | 6 | 6 | 40 | 80 | 6 | |
| 4JJRE 060 500 S06 | 6 | 6 | 50 | 90 | 6 | |
| 4JJRE 060 600 S06 | 6 | 6 | 60 | 100 | 6 | |
| 4JJRE 080 250 S08 | 8 | 12 | 25 | 65 | 8 | |
| 4JJRE 080 400 S08 | 8 | 12 | 40 | 100 | 8 | |
| 4JJRE 080 500 S08 | 8 | 12 | 50 | 110 | 8 | |
| 4JJRE 100 300 S10 | 10 | 15 | 30 | 70 | 10 | |
| 4JJRE 100 500 S10 | 10 | 15 | 50 | 100 | 10 | |
| 4JJRE 100 600 S10 | 10 | 15 | 60 | 120 | 10 | |
| 4JJRE 120 400 S12 | 12 | 18 | 40 | 80 | 12 | |
| 4JJRE 120 600 S12 | 12 | 18 | 60 | 110 | 12 | |
| 4JJRE 120 700 S12 | 12 | 18 | 70 | 130 | 12 | |

# 2JJE 2 Flutes JJ End Mills for Hardened Steels

## 2날 고경도재 가공용 제이제이 엔드밀

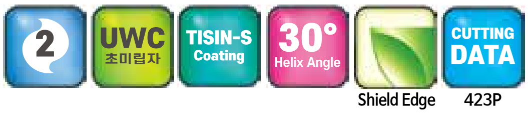







- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 국내최초 날경 0.03mm 제품부터 생산합니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Reinforced edge design for preventing edge chipping.
- Produce down to 0.03mm in diameter endmills at the first time in Korea.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.




| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø0.03 ~ 0.15 | +0 ~ -0.005mm | ØD = Ød | Ø3 ~ 6 | -0.005 ~ -0.015mm |
| | Ø0.2 ~ 6 | +0 ~ -0.01mm | | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø6.5 ~ 20 | +0 ~ -0.015mm | | Ø14 ~ 20 | -0.015 ~ -0.03mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2JJE 0003 00045 S04 | 0.03 | 0.045 | 40 | 4 | |
| 2JJE 0004 0006 S04 | 0.04 | 0.06 | 40 | 4 | |
| 2JJE 0005 0008 S04 | 0.05 | 0.08 | 40 | 4 | |
| 2JJE 0006 001 S04 | 0.06 | 0.1 | 40 | 4 | |
| 2JJE 0007 0012 S04 | 0.07 | 0.12 | 40 | 4 | |
| 2JJE 0008 0015 S04 | 0.08 | 0.15 | 40 | 4 | |
| 2JJE 0009 0017 S04 | 0.09 | 0.17 | 40 | 4 | |
| 2JJE 001 002 S04 | 0.1 | 0.2 | 40 | 4 | |
| 2JJE 0015 003 S04 | 0.15 | 0.3 | 40 | 4 | |
| 2JJE 002 004 S04 | 0.2 | 0.4 | 40 | 4 | |
| 2JJE 0025 005 S04 | 0.25 | 0.5 | 40 | 4 | |
| 2JJE 003 006 S04 | 0.3 | 0.6 | 40 | 4 | |
| 2JJE 0035 007 S04 | 0.35 | 0.7 | 40 | 4 | |
| 2JJE 004 008 S04 | 0.4 | 0.8 | 40 | 4 | |
| 2JJE 0045 009 S04 | 0.45 | 0.9 | 40 | 4 | |
| 2JJE 005 010 S04 | 0.5 | 1 | 40 | 4 | |
| 2JJE 0055 011 S04 | 0.55 | 1.1 | 40 | 4 | |
| 2JJE 006 012 S04 | 0.6 | 1.2 | 40 | 4 | |
| 2JJE 0065 013 S04 | 0.65 | 1.3 | 40 | 4 | |
| 2JJE 007 014 S04 | 0.7 | 1.4 | 40 | 4 | |
| 2JJE 0075 015 S04 | 0.75 | 1.5 | 40 | 4 | |
| 2JJE 008 016 S04 | 0.8 | 1.6 | 40 | 4 | |
| 2JJE 0085 017 S04 | 0.85 | 1.7 | 40 | 4 | |
| 2JJE 009 020 S04 | 0.9 | 2 | 40 | 4 | |
| 2JJE 0095 020 S04 | 0.95 | 2 | 40 | 4 | |
| 2JJE 010 025 S03 | 1 | 2.5 | 40 | 3 | |
| 2JJE 010 025 S04 | 1 | 2.5 | 40 | 4 | |
| 2JJE 010 025 S06 | 1 | 2.5 | 40 | 6 | |
| 2JJE 011 027 S04 | 1.1 | 2.7 | 40 | 4 | |
| 2JJE 012 030 S03 | 1.2 | 3 | 40 | 3 | |
| 2JJE 012 030 S04 | 1.2 | 3 | 40 | 4 | |
| 2JJE 013 032 S04 | 1.3 | 3.2 | 40 | 4 | |
| 2JJE 014 035 S04 | 1.4 | 3.5 | 40 | 4 | |
| 2JJE 015 040 S03 | 1.5 | 4 | 40 | 3 | |
| 2JJE 015 040 S04 | 1.5 | 4 | 40 | 4 | |
| 2JJE 015 040 S06 | 1.5 | 4 | 40 | 6 | |
| 2JJE 016 040 S04 | 1.6 | 4 | 40 | 4 | |
| 2JJE 017 042 S04 | 1.7 | 4.2 | 40 | 4 | |
| 2JJE 018 045 S04 | 1.8 | 4.5 | 40 | 4 | |
| 2JJE 019 050 S04 | 1.9 | 5 | 40 | 4 | |
| 2JJE 020 060 S03 | 2 | 6 | 40 | 3 | |
| 2JJE 020 060 S04 | 2 | 6 | 40 | 4 | |
| 2JJE 020 060 S06 | 2 | 6 | 40 | 6 | |
| 2JJE 021 060 S04 | 2.1 | 6 | 40 | 4 | |
| 2JJE 022 060 S04 | 2.2 | 6 | 40 | 4 | |
| 2JJE 023 060 S04 | 2.3 | 6 | 40 | 4 | |
| 2JJE 024 080 S04 | 2.4 | 8 | 45 | 4 | |
| 2JJE 025 080 S03 | 2.5 | 8 | 45 | 3 | |
| 2JJE 025 080 S04 | 2.5 | 8 | 45 | 4 | |
| 2JJE 025 080 S06 | 2.5 | 8 | 45 | 6 | |

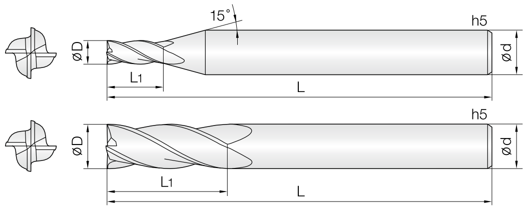
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2JJE 026 080 S04 | 2.6 | 8 | 45 | 4 | |
| 2JJE 027 080 S04 | 2.7 | 8 | 45 | 4 | |
| 2JJE 028 080 S04 | 2.8 | 8 | 45 | 4 | |
| 2JJE 029 080 S04 | 2.9 | 8 | 45 | 4 | |
| 2JJE 030 080 S03 | 3 | 8 | 50 | 3 | |
| 2JJE 030 080 S04 | 3 | 8 | 45 | 4 | |
| 2JJE 030 080 S06 | 3 | 8 | 45 | 6 | |
| 2JJE 035 100 S06 | 3.5 | 10 | 45 | 6 | |
| 2JJE 040 100 S04 | 4 | 10 | 45 | 4 | |
| 2JJE 040 110 S06 | 4 | 11 | 45 | 6 | |
| 2JJE 045 110 S06 | 4.5 | 11 | 45 | 6 | |
| 2JJE 050 130 S06 | 5 | 13 | 50 | 6 | |
| 2JJE 055 130 S06 | 5.5 | 13 | 50 | 6 | |
| 2JJE 060 130 S06 | 6 | 13 | 50 | 6 | |
| 2JJE 065 160 S08 | 6.5 | 16 | 60 | 8 | |
| 2JJE 070 160 S08 | 7 | 16 | 60 | 8 | |
| 2JJE 075 160 S08 | 7.5 | 16 | 60 | 8 | |
| 2JJE 080 190 S08 | 8 | 19 | 60 | 8 | |
| 2JJE 085 190 S10 | 8.5 | 19 | 70 | 10 | |
| 2JJE 090 190 S10 | 9 | 19 | 70 | 10 | |
| 2JJE 095 190 S10 | 9.5 | 19 | 70 | 10 | |
| 2JJE 100 220 S10 | 10 | 22 | 70 | 10 | |
| 2JJE 105 220 S12 | 10.5 | 22 | 75 | 12 | |
| 2JJE 110 220 S12 | 11 | 22 | 75 | 12 | |
| 2JJE 115 220 S12 | 11.5 | 22 | 75 | 12 | |
| 2JJE 120 260 S12 | 12 | 26 | 75 | 12 | |
| 2JJE 140 260 S14 | 14 | 26 | 80 | 14 | |
| 2JJE 140 260 S16 | 14 | 26 | 90 | 16 | |
| 2JJE 160 350 S16 | 16 | 35 | 100 | 16 | |
| 2JJE 180 350 S18 | 18 | 35 | 100 | 18 | |
| 2JJE 200 400 S20 | 20 | 40 | 100 | 20 | |

# 4JJE

## 4 Flutes JJ End Mills for Hardened Steels

## 4날 고경도재 가공용 제이제이 엔드밀






- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Reinforced edge design for preventing edge chipping.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

4 | UWC 초미립자 | TISIN-S Coating | 30° Helix Angle | Shield Edge | CUTTING DATA 422P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.3 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø3 ~ 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 20 | -0.015 ~ -0.03mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4JJE 003 006 S04 | 0.3 | 0.6 | 40 | 4 | |
| 4JJE 004 008 S04 | 0.4 | 0.8 | 40 | 4 | |
| 4JJE 005 010 S04 | 0.5 | 1 | 40 | 4 | |
| 4JJE 006 012 S04 | 0.6 | 1.2 | 40 | 4 | |
| 4JJE 007 014 S04 | 0.7 | 1.4 | 40 | 4 | |
| 4JJE 008 016 S04 | 0.8 | 1.6 | 40 | 4 | |
| 4JJE 009 018 S04 | 0.9 | 1.8 | 40 | 4 | |
| 4JJE 010 025 S03 | 1 | 2.5 | 40 | 3 | |
| 4JJE 010 025 S04 | 1 | 2.5 | 40 | 4 | |
| 4JJE 010 025 S06 | 1 | 2.5 | 40 | 6 | |
| 4JJE 012 030 S03 | 1.2 | 3 | 40 | 3 | |
| 4JJE 012 030 S04 | 1.2 | 3 | 40 | 4 | |
| 4JJE 015 040 S03 | 1.5 | 4 | 40 | 3 | |
| 4JJE 015 040 S04 | 1.5 | 4 | 40 | 4 | |
| 4JJE 015 040 S06 | 1.5 | 4 | 40 | 6 | |
| 4JJE 020 060 S03 | 2 | 6 | 40 | 3 | |
| 4JJE 020 060 S04 | 2 | 6 | 40 | 4 | |
| 4JJE 020 060 S06 | 2 | 6 | 40 | 6 | |
| 4JJE 025 080 S03 | 2.5 | 8 | 45 | 3 | |
| 4JJE 025 080 S04 | 2.5 | 8 | 45 | 4 | |
| 4JJE 025 080 S06 | 2.5 | 8 | 45 | 6 | |
| 4JJE 030 080 S03 | 3 | 8 | 50 | 3 | |
| 4JJE 030 080 S04 | 3 | 8 | 45 | 4 | |
| 4JJE 030 080 S06 | 3 | 8 | 45 | 6 | |
| 4JJE 035 100 S06 | 3.5 | 10 | 45 | 6 | |
| 4JJE 040 110 S04 | 4 | 11 | 45 | 4 | |
| 4JJE 040 110 S06 | 4 | 11 | 45 | 6 | |
| 4JJE 045 110 S06 | 4.5 | 11 | 45 | 6 | |
| 4JJE 050 130 S06 | 5 | 13 | 50 | 6 | |
| 4JJE 055 130 S06 | 5.5 | 13 | 50 | 6 | |
| 4JJE 060 130 S06 | 6 | 13 | 50 | 6 | |
| 4JJE 080 190 S08 | 8 | 19 | 60 | 8 | |
| 4JJE 100 220 S10 | 10 | 22 | 70 | 10 | |
| 4JJE 120 260 S12 | 12 | 26 | 75 | 12 | |
| 4JJE 140 300 S14 | 14 | 30 | 90 | 14 | |
| 4JJE 160 350 S16 | 16 | 35 | 100 | 16 | |
| 4JJE 200 400 S20 | 20 | 40 | 100 | 20 | |

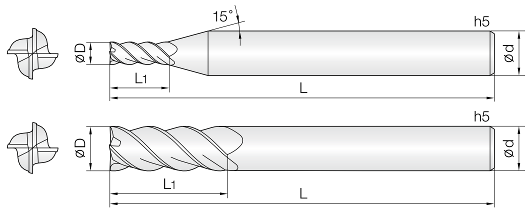
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 4JJHE

## 4 Flutes JJ 45° Helix End Mills for Hardened Steel

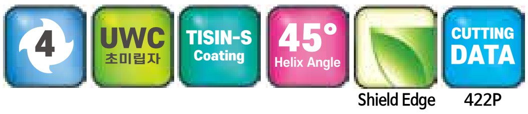
## 4날 고경도재 가공용 제이제이 45° 헬릭스 엔드밀






- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 국내최초 날경 0.03mm 제품부터 생산합니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Reinforced edge design for preventing edge chipping.
- Produce down to 0.03mm in diameter endmills at the first time in Korea.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.




| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.3 ~ 6 | +0 ~ -0.01mm |
| | Ø7 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 20 | -0.015 ~ -0.03mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| New 4JJHE 003 006 S04 | 0.3 | 0.6 | 40 | 4 | |
| New 4JJHE 004 008 S04 | 0.4 | 0.8 | 40 | 4 | |
| New 4JJHE 005 008 S04 | 0.5 | 0.8 | 40 | 4 | |
| New 4JJHE 005 010 S04 | 0.5 | 1 | 40 | 4 | |
| New 4JJHE 006 009 S04 | 0.6 | 0.9 | 40 | 4 | |
| New 4JJHE 006 012 S04 | 0.6 | 1.2 | 40 | 4 | |
| New 4JJHE 008 012 S04 | 0.8 | 1.2 | 40 | 4 | |
| New 4JJHE 008 020 S04 | 0.8 | 2 | 40 | 4 | |
| New 4JJHE 010 015 S04 | 1 | 1.5 | 40 | 4 | |
| 4JJHE 010 015 S06 | 1 | 1.5 | 40 | 6 | |
| New 4JJHE 010 025 S04 | 1 | 2.5 | 40 | 4 | |
| 4JJHE 010 025 S06 | 1 | 2.5 | 40 | 6 | |
| New 4JJHE 010 035 S04 | 1 | 3.5 | 40 | 4 | |
| 4JJHE 010 035 S06 | 1 | 3.5 | 40 | 6 | |
| 4JJHE 010 050 S06 | 1 | 5 | 45 | 6 | |
| New 4JJHE 015 040 S04 | 1.5 | 4 | 40 | 4 | |
| 4JJHE 015 040 S06 | 1.5 | 4 | 40 | 6 | |
| New 4JJHE 015 060 S04 | 1.5 | 6 | 40 | 4 | |
| 4JJHE 015 060 S06 | 1.5 | 6 | 40 | 6 | |
| 4JJHE 015 080 S06 | 1.5 | 8 | 40 | 6 | |
| New 4JJHE 020 030 S04 | 2 | 3 | 40 | 4 | |
| 4JJHE 020 030 S06 | 2 | 3 | 40 | 6 | |
| New 4JJHE 020 050 S04 | 2 | 5 | 40 | 4 | |
| 4JJHE 020 050 S06 | 2 | 5 | 40 | 6 | |
| 4JJHE 020 080 S06 | 2 | 8 | 40 | 6 | |
| 4JJHE 020 100 S06 | 2 | 10 | 45 | 6 | |
| New 4JJHE 025 060 S04 | 2.5 | 6 | 45 | 4 | |
| 4JJHE 025 060 S06 | 2.5 | 6 | 45 | 6 | |
| New 4JJHE 025 080 S04 | 2.5 | 8 | 45 | 4 | |
| 4JJHE 025 080 S06 | 2.5 | 8 | 45 | 6 | |
| 4JJHE 025 100 S06 | 2.5 | 10 | 50 | 6 | |
| New 4JJHE 030 060 S04 | 3 | 6 | 45 | 4 | |
| 4JJHE 030 060 S06 | 3 | 6 | 45 | 6 | |
| New 4JJHE 030 080 S04 | 3 | 8 | 45 | 4 | |
| 4JJHE 030 080 S06 | 3 | 8 | 45 | 6 | |
| 4JJHE 030 120 S06 | 3 | 12 | 50 | 6 | |
| 4JJHE 030 150 S06 | 3 | 15 | 50 | 6 | |
| 4JJHE 035 080 S06 | 3.5 | 8 | 45 | 6 | |
| 4JJHE 040 080 S06 | 4 | 8 | 45 | 6 | |
| 4JJHE 040 110 S06 | 4 | 11 | 45 | 6 | |
| 4JJHE 040 150 S06 | 4 | 15 | 55 | 6 | |
| 4JJHE 040 200 S06 | 4 | 20 | 60 | 6 | |
| 4JJHE 045 110 S06 | 4.5 | 11 | 50 | 6 | |
| 4JJHE 050 100 S06 | 5 | 10 | 50 | 6 | |
| 4JJHE 050 130 S06 | 5 | 13 | 50 | 6 | |
| 4JJHE 050 200 S06 | 5 | 20 | 60 | 6 | |
| 4JJHE 050 250 S06 | 5 | 25 | 70 | 6 | |
| 4JJHE 050 300 S06 | 5 | 30 | 75 | 6 | |
| 4JJHE 060 130 S06 | 6 | 13 | 50 | 6 | |
| 4JJHE 060 150 S06 | 6 | 15 | 55 | 6 | |

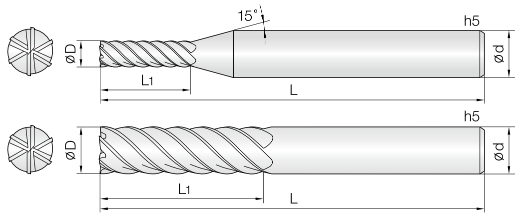
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4JJHE 060 200 S06 | 6 | 20 | 60 | 6 | |
| 4JJHE 060 250 S06 | 6 | 25 | 70 | 6 | |
| 4JJHE 060 300 S06 | 6 | 30 | 75 | 6 | |
| 4JJHE 070 160 S08 | 7 | 16 | 60 | 8 | |
| 4JJHE 080 200 S08 | 8 | 20 | 60 | 8 | |
| 4JJHE 080 250 S08 | 8 | 25 | 70 | 8 | |
| 4JJHE 080 300 S08 | 8 | 30 | 80 | 8 | |
| 4JJHE 080 400 S08 | 8 | 40 | 90 | 8 | |
| 4JJHE 090 220 S10 | 9 | 22 | 70 | 10 | |
| 4JJHE 100 220 S10 | 10 | 22 | 70 | 10 | |
| 4JJHE 100 300 S10 | 10 | 30 | 80 | 10 | |
| 4JJHE 100 400 S10 | 10 | 40 | 90 | 10 | |
| 4JJHE 100 500 S10 | 10 | 50 | 100 | 10 | |
| 4JJHE 120 260 S12 | 12 | 26 | 75 | 12 | |
| 4JJHE 120 350 S12 | 12 | 35 | 90 | 12 | |
| 4JJHE 120 500 S12 | 12 | 50 | 100 | 12 | |
| 4JJHE 120 600 S12 | 12 | 60 | 110 | 12 | |
| 4JJHE 140 350 S14 | 14 | 35 | 90 | 14 | |
| 4JJHE 140 550 S14 | 14 | 55 | 110 | 14 | |
| 4JJHE 160 350 S16 | 16 | 35 | 90 | 16 | |
| 4JJHE 160 500 S16 | 16 | 50 | 110 | 16 | |
| 4JJHE 160 700 S16 | 16 | 70 | 130 | 16 | |
| 4JJHE 180 380 S18 | 18 | 38 | 100 | 18 | |
| 4JJHE 200 400 S20 | 20 | 40 | 100 | 20 | |
| 4JJHE 200 550 S20 | 20 | 55 | 120 | 20 | |
| 4JJHE 200 750 S20 | 20 | 75 | 150 | 20 | |

# 6&8JJHE

## 6&8 Flutes JJ 45° Helix End Mills for Hardened Steels

## 6&8날 고경도재 가공용 제이제이 45° 헬릭스 엔드밀






- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 국내최초 날경 0.03mm 제품부터 생산합니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Reinforced edge design for preventing edge chipping.
- Produce down to 0.03mm in diameter endmills at the first time in Korea.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.


| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø3 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 25 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 25 | -0.015 ~ -0.03mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 6JJHE 030 100 S06 | 3 | 10 | 50 | 6 | |
| 6JJHE 030 150 S06 | 3 | 15 | 50 | 6 | |
| 6JJHE 030 200 S06 | 3 | 20 | 60 | 6 | |
| 6JJHE 040 120 S06 | 4 | 12 | 50 | 6 | |
| 6JJHE 040 160 S06 | 4 | 16 | 50 | 6 | |
| 6JJHE 040 200 S06 | 4 | 20 | 60 | 6 | |
| 6JJHE 050 150 S06 | 5 | 15 | 50 | 6 | |
| 6JJHE 050 200 S06 | 5 | 20 | 60 | 6 | |
| 6JJHE 050 250 S06 | 5 | 25 | 60 | 6 | |
| 6JJHE 060 150 S06 | 6 | 15 | 50 | 6 | |
| 6JJHE 060 200 S06 | 6 | 20 | 60 | 6 | |
| 6JJHE 060 250 S06 | 6 | 25 | 65 | 6 | |
| 6JJHE 060 300 S06 | 6 | 30 | 70 | 6 | |
| 6JJHE 060 350 S06 | 6 | 35 | 75 | 6 | |
| 6JJHE 060 400 S06 | 6 | 40 | 80 | 6 | |
| 6JJHE 080 200 S08 | 8 | 20 | 60 | 8 | |
| 6JJHE 080 250 S08 | 8 | 25 | 65 | 8 | |
| 6JJHE 080 300 S08 | 8 | 30 | 75 | 8 | |
| 6JJHE 080 350 S08 | 8 | 35 | 80 | 8 | |
| 6JJHE 080 400 S08 | 8 | 40 | 90 | 8 | |
| 6JJHE 080 450 S08 | 8 | 45 | 100 | 8 | |
| 6JJHE 080 500 S08 | 8 | 50 | 100 | 8 | |
| 6JJHE 100 250 S10 | 10 | 25 | 70 | 10 | |
| 6JJHE 100 350 S10 | 10 | 35 | 90 | 10 | |
| 6JJHE 100 450 S10 | 10 | 45 | 100 | 10 | |
| 6JJHE 100 500 S10 | 10 | 50 | 100 | 10 | |
| 6JJHE 100 600 S10 | 10 | 60 | 110 | 10 | |
| 6JJHE 120 300 S12 | 12 | 30 | 80 | 12 | |
| 6JJHE 120 400 S12 | 12 | 40 | 90 | 12 | |
| 6JJHE 120 500 S12 | 12 | 50 | 100 | 12 | |
| 6JJHE 120 600 S12 | 12 | 60 | 110 | 12 | |
| 6JJHE 120 700 S12 | 12 | 70 | 120 | 12 | |
| 6JJHE 140 350 S14 | 14 | 35 | 90 | 14 | |
| 6JJHE 140 550 S14 | 14 | 55 | 110 | 14 | |
| 6JJHE 140 750 S14 | 14 | 75 | 150 | 14 | |
| 6JJHE 160 350 S16 | 16 | 35 | 90 | 16 | |
| 6JJHE 160 500 S16 | 16 | 50 | 110 | 16 | |
| 6JJHE 160 650 S16 | 16 | 65 | 120 | 16 | |
| 6JJHE 160 800 S16 | 16 | 80 | 150 | 16 | |
| 6JJHE 160 900 S16 | 16 | 90 | 160 | 16 | |
| 6JJHE 160 1000 S16 | 16 | 100 | 160 | 16 | |
| 6JJHE 180 400 S18 | 18 | 40 | 100 | 18 | |
| 6JJHE 180 650 S18 | 18 | 65 | 120 | 18 | |
| 6JJHE 200 450 S20 | 20 | 45 | 100 | 20 | |
| 6JJHE 200 600 S20 | 20 | 60 | 120 | 20 | |
| 6JJHE 200 800 S20 | 20 | 80 | 150 | 20 | |
| 6JJHE 200 900 S20 | 20 | 90 | 160 | 20 | |
| 6JJHE 200 1000 S20 | 20 | 100 | 160 | 20 | |
| 6JJHE 200 1100 S20 | 20 | 110 | 170 | 20 | |
| 6JJHE 200 1200 S20 | 20 | 120 | 180 | 20 | |

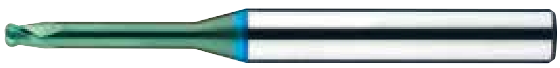
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 8JJHE 250 1000 S25 | 25 | 100 | 160 | 25 | |
| 8JJHE 250 1300 S25 | 25 | 130 | 200 | 25 | |

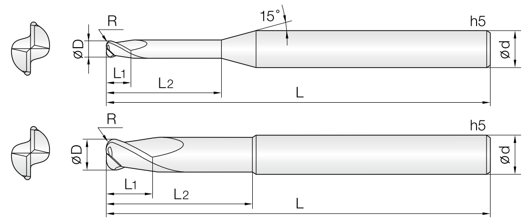
# 2JJCR

## 2 Flutes JJ Rib Corner Radius End Mills for Hardened Steels

## 2날 고경도재 가공용 제이제이 리브 코너 레디우스 엔드밀








- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 코너R 형상을 날부치핑이 적도록 설계하였습니다.
- 다양한 코너R과 유효장으로 맞춤 가공이 가능합니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

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

2 | UWC 초미립자 | TISIN-S Coating | R ±0.005 | R ±0.01 | R ±0.015 | 30° Helix Angle | CUTTING DATA

R0.2 ~ 0.5 | R1 ~ 1.5 | R2 ~ 3 | 424P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.2 ~ 16 | +0 ~ -0.01mm |

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

단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2JJCR 002 0002 005 | 0.2 X R0.02 | 0.2 | 0.5 | 40 | 4 | |
| 2JJCR 002 0002 010 | 0.2 X R0.02 | 0.2 | 1 | 40 | 4 | |
| 2JJCR 002 0002 015 | 0.2 X R0.02 | 0.2 | 1.5 | 40 | 4 | |
| 2JJCR 002 0005 005 | 0.2 X R0.05 | 0.2 | 0.5 | 40 | 4 | |
| 2JJCR 002 0005 010 | 0.2 X R0.05 | 0.2 | 1 | 40 | 4 | |
| 2JJCR 002 0005 015 | 0.2 X R0.05 | 0.2 | 1.5 | 40 | 4 | |
| 2JJCR 003 0002 010 | 0.3 X R0.02 | 0.3 | 1 | 40 | 4 | |
| 2JJCR 003 0002 020 | 0.3 X R0.02 | 0.3 | 2 | 40 | 4 | |
| 2JJCR 003 0002 030 | 0.3 X R0.02 | 0.3 | 3 | 40 | 4 | |
| 2JJCR 003 0005 010 | 0.3 X R0.05 | 0.3 | 1 | 40 | 4 | |
| 2JJCR 003 0005 020 | 0.3 X R0.05 | 0.3 | 2 | 40 | 4 | |
| 2JJCR 003 0005 030 | 0.3 X R0.05 | 0.3 | 3 | 40 | 4 | |
| 2JJCR 004 0002 010 | 0.4 X R0.02 | 0.4 | 1 | 40 | 4 | |
| 2JJCR 004 0002 020 | 0.4 X R0.02 | 0.4 | 2 | 40 | 4 | |
| 2JJCR 004 0002 030 | 0.4 X R0.02 | 0.4 | 3 | 40 | 4 | |
| 2JJCR 004 0002 040 | 0.4 X R0.02 | 0.4 | 4 | 40 | 4 | |
| 2JJCR 004 0005 010 | 0.4 X R0.05 | 0.4 | 1 | 40 | 4 | |
| 2JJCR 004 0005 020 | 0.4 X R0.05 | 0.4 | 2 | 40 | 4 | |
| 2JJCR 004 0005 030 | 0.4 X R0.05 | 0.4 | 3 | 40 | 4 | |
| 2JJCR 004 0005 040 | 0.4 X R0.05 | 0.4 | 4 | 40 | 4 | |
| 2JJCR 004 001 010 | 0.4 X R0.1 | 0.4 | 1 | 40 | 4 | |
| 2JJCR 004 001 015 | 0.4 X R0.1 | 0.4 | 1.5 | 40 | 4 | |
| 2JJCR 004 001 020 | 0.4 X R0.1 | 0.4 | 2 | 40 | 4 | |
| 2JJCR 004 001 030 | 0.4 X R0.1 | 0.4 | 3 | 40 | 4 | |
| 2JJCR 004 001 040 | 0.4 X R0.1 | 0.4 | 4 | 40 | 4 | |
| 2JJCR 005 0002 010 | 0.5 X R0.02 | 0.5 | 1 | 45 | 4 | |
| 2JJCR 005 0002 015 | 0.5 X R0.02 | 0.5 | 1.5 | 45 | 4 | |
| 2JJCR 005 0002 020 | 0.5 X R0.02 | 0.5 | 2 | 45 | 4 | |
| 2JJCR 005 0002 025 | 0.5 X R0.02 | 0.5 | 2.5 | 45 | 4 | |
| 2JJCR 005 0002 030 | 0.5 X R0.02 | 0.5 | 3 | 45 | 4 | |
| 2JJCR 005 0002 040 | 0.5 X R0.02 | 0.5 | 4 | 45 | 4 | |
| 2JJCR 005 0002 050 | 0.5 X R0.02 | 0.5 | 5 | 45 | 4 | |
| 2JJCR 005 0002 060 | 0.5 X R0.02 | 0.5 | 6 | 45 | 4 | |
| 2JJCR 005 0002 080 | 0.5 X R0.02 | 0.5 | 8 | 45 | 4 | |
| 2JJCR 005 0002 100 | 0.5 X R0.02 | 0.5 | 10 | 45 | 4 | |
| 2JJCR 005 0005 010 | 0.5 X R0.05 | 0.5 | 1 | 45 | 4 | |
| 2JJCR 005 0005 015 | 0.5 X R0.05 | 0.5 | 1.5 | 45 | 4 | |
| 2JJCR 005 0005 020 | 0.5 X R0.05 | 0.5 | 2 | 45 | 4 | |
| 2JJCR 005 0005 025 | 0.5 X R0.05 | 0.5 | 2.5 | 45 | 4 | |
| 2JJCR 005 0005 030 | 0.5 X R0.05 | 0.5 | 3 | 45 | 4 | |
| 2JJCR 005 0005 040 | 0.5 X R0.05 | 0.5 | 4 | 45 | 4 | |
| 2JJCR 005 0005 050 | 0.5 X R0.05 | 0.5 | 5 | 45 | 4 | |
| 2JJCR 005 0005 060 | 0.5 X R0.05 | 0.5 | 6 | 45 | 4 | |
| 2JJCR 005 0005 080 | 0.5 X R0.05 | 0.5 | 8 | 45 | 4 | |
| 2JJCR 005 0005 100 | 0.5 X R0.05 | 0.5 | 10 | 45 | 4 | |
| 2JJCR 005 001 010 | 0.5 X R0.1 | 0.5 | 1 | 45 | 4 | |
| 2JJCR 005 001 015 | 0.5 X R0.1 | 0.5 | 1.5 | 45 | 4 | |
| 2JJCR 005 001 020 | 0.5 X R0.1 | 0.5 | 2 | 45 | 4 | |
| 2JJCR 005 001 025 | 0.5 X R0.1 | 0.5 | 2.5 | 45 | 4 | |
| 2JJCR 005 001 030 | 0.5 X R0.1 | 0.5 | 3 | 45 | 4 | |

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2JJCR 005 001 040 | 0.5 X R0.1 | 0.5 | 4 | 45 | 4 | |
| 2JJCR 005 001 050 | 0.5 X R0.1 | 0.5 | 5 | 45 | 4 | |
| 2JJCR 005 001 060 | 0.5 X R0.1 | 0.5 | 6 | 45 | 4 | |
| 2JJCR 005 001 080 | 0.5 X R0.1 | 0.5 | 8 | 45 | 4 | |
| 2JJCR 005 001 100 | 0.5 X R0.1 | 0.5 | 10 | 45 | 4 | |
| 2JJCR 006 0002 020 | 0.6 X R0.02 | 0.6 | 2 | 45 | 4 | |
| 2JJCR 006 0002 030 | 0.6 X R0.02 | 0.6 | 3 | 45 | 4 | |
| 2JJCR 006 0002 040 | 0.6 X R0.02 | 0.6 | 4 | 45 | 4 | |
| 2JJCR 006 0002 060 | 0.6 X R0.02 | 0.6 | 6 | 45 | 4 | |
| 2JJCR 006 0002 080 | 0.6 X R0.02 | 0.6 | 8 | 45 | 4 | |
| 2JJCR 0060002 100 | 0.6 X R0.02 | 0.6 | 10 | 45 | 4 | |
| 2JJCR 0060002 120 | 0.6 X R0.02 | 0.6 | 12 | 50 | 4 | |
| 2JJCR 006 0005 020 | 0.6 X R0.05 | 0.6 | 2 | 45 | 4 | |
| 2JJCR 006 0005 030 | 0.6 X R0.05 | 0.6 | 3 | 45 | 4 | |
| 2JJCR 006 0005 040 | 0.6 X R0.05 | 0.6 | 4 | 45 | 4 | |
| 2JJCR 006 0005 060 | 0.6 X R0.05 | 0.6 | 6 | 45 | 4 | |
| 2JJCR 006 0005 080 | 0.6 X R0.05 | 0.6 | 8 | 45 | 4 | |
| 2JJCR 0060005 100 | 0.6 X R0.05 | 0.6 | 10 | 45 | 4 | |
| 2JJCR 0060005 120 | 0.6 X R0.05 | 0.6 | 12 | 50 | 4 | |
| 2JJCR 006 001 020 | 0.6 X R0.1 | 0.6 | 2 | 45 | 4 | |
| 2JJCR 006 001 030 | 0.6 X R0.1 | 0.6 | 3 | 45 | 4 | |
| 2JJCR 006 001 040 | 0.6 X R0.1 | 0.6 | 4 | 45 | 4 | |
| 2JJCR 006 001 060 | 0.6 X R0.1 | 0.6 | 6 | 45 | 4 | |
| 2JJCR 006 001 080 | 0.6 X R0.1 | 0.6 | 8 | 45 | 4 | |
| 2JJCR 006001 100 | 0.6 X R0.1 | 0.6 | 10 | 45 | 4 | |
| 2JJCR 006001 120 | 0.6 X R0.1 | 0.6 | 12 | 50 | 4 | |
| 2JJCR 007 001 020 | 0.7 X R0.1 | 0.7 | 2 | 45 | 4 | |
| 2JJCR 007 001 040 | 0.7 X R0.1 | 0.7 | 4 | 45 | 4 | |
| 2JJCR 007 001 060 | 0.7 X R0.1 | 0.7 | 6 | 45 | 4 | |
| 2JJCR 007 001 080 | 0.7 X R0.1 | 0.7 | 8 | 45 | 4 | |
| 2JJCR 007 001 100 | 0.7 X R0.1 | 0.7 | 10 | 45 | 4 | |
| 2JJCR 008 0002 020 | 0.8 X R0.02 | 0.8 | 2 | 45 | 4 | |
| 2JJCR 008 0002 040 | 0.8 X R0.02 | 0.8 | 4 | 45 | 4 | |
| 2JJCR 008 0002 060 | 0.8 X R0.02 | 0.8 | 6 | 45 | 4 | |
| 2JJCR 008 0002 080 | 0.8 X R0.02 | 0.8 | 8 | 45 | 4 | |
| 2JJCR 008 0002 100 | 0.8 X R0.02 | 0.8 | 10 | 45 | 4 | |
| 2JJCR 008 0002 120 | 0.8 X R0.02 | 0.8 | 12 | 50 | 4 | |
| 2JJCR 008 0005 020 | 0.8 X R0.05 | 0.8 | 2 | 45 | 4 | |
| 2JJCR 008 0005 040 | 0.8 X R0.05 | 0.8 | 4 | 45 | 4 | |
| 2JJCR 008 0005 060 | 0.8 X R0.05 | 0.8 | 6 | 45 | 4 | |
| 2JJCR 008 0005 080 | 0.8 X R0.05 | 0.8 | 8 | 45 | 4 | |
| 2JJCR 008 0005 100 | 0.8 X R0.05 | 0.8 | 10 | 45 | 4 | |
| 2JJCR 008 0005 120 | 0.8 X R0.05 | 0.8 | 12 | 50 | 4 | |
| 2JJCR 008 001 020 | 0.8 X R0.1 | 0.8 | 2 | 45 | 4 | |
| 2JJCR 008 001 040 | 0.8 X R0.1 | 0.8 | 4 | 45 | 4 | |
| 2JJCR 008 001 060 | 0.8 X R0.1 | 0.8 | 6 | 45 | 4 | |
| 2JJCR 008 001 080 | 0.8 X R0.1 | 0.8 | 8 | 45 | 4 | |
| 2JJCR 008 001 100 | 0.8 X R0.1 | 0.8 | 10 | 45 | 4 | |
| 2JJCR 008 001 120 | 0.8 X R0.1 | 0.8 | 12 | 50 | 4 | |
| 2JJCR 008 002 020 | 0.8 X R0.2 | 0.8 | 2 | 45 | 4 | |

# 2JJCR

## 2 Flutes JJ Rib Corner Radius End Mills for Hardened Steels

## 2날 고경도재 가공용 제이제이 리브 코너 레디우스 엔드밀

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2JJCR 008 002 040 | 0.8 X R0.2 | 0.8 | 4 | 45 | 4 | |
| 2JJCR 008 002 060 | 0.8 X R0.2 | 0.8 | 6 | 45 | 4 | |
| 2JJCR 008 002 080 | 0.8 X R0.2 | 0.8 | 8 | 45 | 4 | |
| 2JJCR 008 002 100 | 0.8 X R0.2 | 0.8 | 10 | 45 | 4 | |
| 2JJCR 008 002 120 | 0.8 X R0.2 | 0.8 | 12 | 50 | 4 | |
| 2JJCR 010 0002 040 | 1 X R0.02 | 1 | 4 | 45 | 4 | |
| 2JJCR 010 0002 060 | 1 X R0.02 | 1 | 6 | 45 | 4 | |
| 2JJCR 010 0002 080 | 1 X R0.02 | 1 | 8 | 45 | 4 | |
| 2JJCR 010 0002 100 | 1 X R0.02 | 1 | 10 | 50 | 4 | |
| 2JJCR 010 0002 120 | 1 X R0.02 | 1 | 12 | 50 | 4 | |
| 2JJCR 010 0002 140 | 1 X R0.02 | 1 | 14 | 50 | 4 | |
| 2JJCR 010 0002 160 | 1 X R0.02 | 1 | 16 | 50 | 4 | |
| 2JJCR 010 0002 200 | 1 X R0.02 | 1 | 20 | 50 | 4 | |
| 2JJCR 010 0005 040 | 1 X R0.05 | 1 | 4 | 45 | 4 | |
| 2JJCR 010 0005 060 | 1 X R0.05 | 1 | 6 | 45 | 4 | |
| 2JJCR 010 0005 080 | 1 X R0.05 | 1 | 8 | 45 | 4 | |
| 2JJCR 010 0005 100 | 1 X R0.05 | 1 | 10 | 50 | 4 | |
| 2JJCR 010 0005 120 | 1 X R0.05 | 1 | 12 | 50 | 4 | |
| 2JJCR 010 0005 140 | 1 X R0.05 | 1 | 14 | 50 | 4 | |
| 2JJCR 010 0005 160 | 1 X R0.05 | 1 | 16 | 50 | 4 | |
| 2JJCR 010 0005 200 | 1 X R0.05 | 1 | 20 | 50 | 4 | |
| 2JJCR 010 001 040 | 1 X R0.1 | 1 | 4 | 45 | 4 | |
| 2JJCR 010 001 060 | 1 X R0.1 | 1 | 6 | 45 | 4 | |
| 2JJCR 010 001 080 | 1 X R0.1 | 1 | 8 | 45 | 4 | |
| 2JJCR 010 001 100 | 1 X R0.1 | 1 | 10 | 50 | 4 | |
| 2JJCR 010 001 120 | 1 X R0.1 | 1 | 12 | 50 | 4 | |
| 2JJCR 010 001 140 | 1 X R0.1 | 1 | 14 | 50 | 4 | |
| 2JJCR 010 001 160 | 1 X R0.1 | 1 | 16 | 50 | 4 | |
| 2JJCR 010 001 200 | 1 X R0.1 | 1 | 20 | 50 | 4 | |
| 2JJCR 010 002 040 | 1 X R0.2 | 1 | 4 | 45 | 4 | |
| 2JJCR 010 002 060 | 1 X R0.2 | 1 | 6 | 45 | 4 | |
| 2JJCR 010 002 080 | 1 X R0.2 | 1 | 8 | 45 | 4 | |
| 2JJCR 010 002 100 | 1 X R0.2 | 1 | 10 | 50 | 4 | |
| 2JJCR 010 002 120 | 1 X R0.2 | 1 | 12 | 50 | 4 | |
| 2JJCR 010 002 140 | 1 X R0.2 | 1 | 14 | 50 | 4 | |
| 2JJCR 010 002 160 | 1 X R0.2 | 1 | 16 | 50 | 4 | |
| 2JJCR 010 002 200 | 1 X R0.2 | 1 | 20 | 50 | 4 | |
| 2JJCR 010 003 040 | 1 X R0.3 | 1 | 4 | 45 | 4 | |
| 2JJCR 010 003 060 | 1 X R0.3 | 1 | 6 | 45 | 4 | |
| 2JJCR 010 003 080 | 1 X R0.3 | 1 | 8 | 45 | 4 | |
| 2JJCR 010 003 100 | 1 X R0.3 | 1 | 10 | 50 | 4 | |
| 2JJCR 010 003 120 | 1 X R0.3 | 1 | 12 | 50 | 4 | |
| 2JJCR 010 003 140 | 1 X R0.3 | 1 | 14 | 50 | 4 | |
| 2JJCR 010 003 160 | 1 X R0.3 | 1 | 16 | 50 | 4 | |
| 2JJCR 010 003 200 | 1 X R0.3 | 1 | 20 | 50 | 4 | |
| 2JJCR 012 0002 040 | 1.2 X R0.02 | 1.2 | 4 | 45 | 4 | |
| 2JJCR 012 0002 060 | 1.2 X R0.02 | 1.2 | 6 | 45 | 4 | |
| 2JJCR 012 0002 080 | 1.2 X R0.02 | 1.2 | 8 | 45 | 4 | |
| 2JJCR 012 0002 100 | 1.2 X R0.02 | 1.2 | 10 | 50 | 4 | |
| 2JJCR 012 0002 120 | 1.2 X R0.02 | 1.2 | 12 | 50 | 4 | |
| 2JJCR 012 0002 140 | 1.2 X R0.02 | 1.2 | 14 | 50 | 4 | |
| 2JJCR 012 0002 160 | 1.2 X R0.02 | 1.2 | 16 | 50 | 4 | |
| 2JJCR 012 0002 200 | 1.2 X R0.02 | 1.2 | 20 | 50 | 4 | |
| 2JJCR 012 0005 040 | 1.2 X R0.05 | 1.2 | 4 | 45 | 4 | |
| 2JJCR 012 0005 060 | 1.2 X R0.05 | 1.2 | 6 | 45 | 4 | |
| 2JJCR 012 0005 080 | 1.2 X R0.05 | 1.2 | 8 | 45 | 4 | |
| 2JJCR 012 0005 100 | 1.2 X R0.05 | 1.2 | 10 | 50 | 4 | |
| 2JJCR 012 0005 120 | 1.2 X R0.05 | 1.2 | 12 | 50 | 4 | |
| 2JJCR 012 0005 140 | 1.2 X R0.05 | 1.2 | 14 | 50 | 4 | |
| 2JJCR 012 0005 160 | 1.2 X R0.05 | 1.2 | 16 | 50 | 4 | |
| 2JJCR 012 0005 200 | 1.2 X R0.05 | 1.2 | 20 | 50 | 4 | |
| 2JJCR 012 001 040 | 1.2 X R0.1 | 1.2 | 4 | 45 | 4 | |
| 2JJCR 012 001 060 | 1.2 X R0.1 | 1.2 | 6 | 45 | 4 | |
| 2JJCR 012 001 080 | 1.2 X R0.1 | 1.2 | 8 | 45 | 4 | |

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2JJCR 012 001 100 | 1.2 X R0.1 | 1.2 | 10 | 50 | 4 | |
| 2JJCR 012 001 120 | 1.2 X R0.1 | 1.2 | 12 | 50 | 4 | |
| 2JJCR 012 001 140 | 1.2 X R0.1 | 1.2 | 14 | 50 | 4 | |
| 2JJCR 012 001 160 | 1.2 X R0.1 | 1.2 | 16 | 50 | 4 | |
| 2JJCR 012 001 200 | 1.2 X R0.1 | 1.2 | 20 | 50 | 4 | |
| 2JJCR 012 002 040 | 1.2 X R0.2 | 1.2 | 4 | 45 | 4 | |
| 2JJCR 012 002 060 | 1.2 X R0.2 | 1.2 | 6 | 45 | 4 | |
| 2JJCR 012 002 080 | 1.2 X R0.2 | 1.2 | 8 | 45 | 4 | |
| 2JJCR 012 002 100 | 1.2 X R0.2 | 1.2 | 10 | 50 | 4 | |
| 2JJCR 012 002 120 | 1.2 X R0.2 | 1.2 | 12 | 50 | 4 | |
| 2JJCR 012 002 140 | 1.2 X R0.2 | 1.2 | 14 | 50 | 4 | |
| 2JJCR 012 002 160 | 1.2 X R0.2 | 1.2 | 16 | 50 | 4 | |
| 2JJCR 012 002 200 | 1.2 X R0.2 | 1.2 | 20 | 50 | 4 | |
| 2JJCR 012 003 040 | 1.2 X R0.3 | 1.2 | 4 | 45 | 4 | |
| 2JJCR 012 003 060 | 1.2 X R0.3 | 1.2 | 6 | 45 | 4 | |
| 2JJCR 012 003 080 | 1.2 X R0.3 | 1.2 | 8 | 45 | 4 | |
| 2JJCR 012 003 100 | 1.2 X R0.3 | 1.2 | 10 | 50 | 4 | |
| 2JJCR 012 003 120 | 1.2 X R0.3 | 1.2 | 12 | 50 | 4 | |
| 2JJCR 012 003 140 | 1.2 X R0.3 | 1.2 | 14 | 50 | 4 | |
| 2JJCR 012 003 160 | 1.2 X R0.3 | 1.2 | 16 | 50 | 4 | |
| 2JJCR 012 003 200 | 1.2 X R0.3 | 1.2 | 20 | 50 | 4 | |
| 2JJCR 015 0002 040 | 1.5 X R0.02 | 1.5 | 4 | 45 | 4 | |
| 2JJCR 015 0002 060 | 1.5 X R0.02 | 1.5 | 6 | 45 | 4 | |
| 2JJCR 015 0002 080 | 1.5 X R0.02 | 1.5 | 8 | 45 | 4 | |
| 2JJCR 015 0002 100 | 1.5 X R0.02 | 1.5 | 10 | 50 | 4 | |
| 2JJCR 015 0002 120 | 1.5 X R0.02 | 1.5 | 12 | 50 | 4 | |
| 2JJCR 015 0002 140 | 1.5 X R0.02 | 1.5 | 14 | 50 | 4 | |
| 2JJCR 015 0002 160 | 1.5 X R0.02 | 1.5 | 16 | 50 | 4 | |
| 2JJCR 015 0002 200 | 1.5 X R0.02 | 1.5 | 20 | 50 | 4 | |
| 2JJCR 015 0005 040 | 1.5 X R0.05 | 1.5 | 4 | 45 | 4 | |
| 2JJCR 015 0005 060 | 1.5 X R0.05 | 1.5 | 6 | 45 | 4 | |
| 2JJCR 015 0005 080 | 1.5 X R0.05 | 1.5 | 8 | 45 | 4 | |
| 2JJCR 015 0005 100 | 1.5 X R0.05 | 1.5 | 10 | 50 | 4 | |
| 2JJCR 015 0005 120 | 1.5 X R0.05 | 1.5 | 12 | 50 | 4 | |
| 2JJCR 015 0005 140 | 1.5 X R0.05 | 1.5 | 14 | 50 | 4 | |
| 2JJCR 015 0005 160 | 1.5 X R0.05 | 1.5 | 16 | 50 | 4 | |
| 2JJCR 015 0005 200 | 1.5 X R0.05 | 1.5 | 20 | 50 | 4 | |
| 2JJCR 015 001 040 | 1.5 X R0.1 | 1.5 | 4 | 45 | 4 | |
| 2JJCR 015 001 060 | 1.5 X R0.1 | 1.5 | 6 | 45 | 4 | |
| 2JJCR 015 001 080 | 1.5 X R0.1 | 1.5 | 8 | 45 | 4 | |
| 2JJCR 015 001 100 | 1.5 X R0.1 | 1.5 | 10 | 50 | 4 | |
| 2JJCR 015 001 120 | 1.5 X R0.1 | 1.5 | 12 | 50 | 4 | |
| 2JJCR 015 001 140 | 1.5 X R0.1 | 1.5 | 14 | 50 | 4 | |
| 2JJCR 015 001 160 | 1.5 X R0.1 | 1.5 | 16 | 50 | 4 | |
| 2JJCR 015 001 200 | 1.5 X R0.1 | 1.5 | 20 | 50 | 4 | |
| 2JJCR 015 002 040 | 1.5 X R0.2 | 1.5 | 4 | 45 | 4 | |
| 2JJCR 015 002 060 | 1.5 X R0.2 | 1.5 | 6 | 45 | 4 | |
| 2JJCR 015 002 080 | 1.5 X R0.2 | 1.5 | 8 | 45 | 4 | |
| 2JJCR 015 002 100 | 1.5 X R0.2 | 1.5 | 10 | 50 | 4 | |
| 2JJCR 015 002 120 | 1.5 X R0.2 | 1.5 | 12 | 50 | 4 | |
| 2JJCR 015 002 140 | 1.5 X R0.2 | 1.5 | 14 | 50 | 4 | |
| 2JJCR 015 002 160 | 1.5 X R0.2 | 1.5 | 16 | 50 | 4 | |
| 2JJCR 015 002 200 | 1.5 X R0.2 | 1.5 | 20 | 50 | 4 | |
| 2JJCR 015 003 040 | 1.5 X R0.3 | 1.5 | 4 | 45 | 4 | |
| 2JJCR 015 003 060 | 1.5 X R0.3 | 1.5 | 6 | 45 | 4 | |
| 2JJCR 015 003 080 | 1.5 X R0.3 | 1.5 | 8 | 45 | 4 | |
| 2JJCR 015 003 100 | 1.5 X R0.3 | 1.5 | 10 | 50 | 4 | |
| 2JJCR 015 003 120 | 1.5 X R0.3 | 1.5 | 12 | 50 | 4 | |
| 2JJCR 015 003 140 | 1.5 X R0.3 | 1.5 | 14 | 50 | 4 | |
| 2JJCR 015 003 160 | 1.5 X R0.3 | 1.5 | 16 | 50 | 4 | |
| 2JJCR 015 003 200 | 1.5 X R0.3 | 1.5 | 20 | 50 | 4 | |
| 2JJCR 015 005 040 | 1.5 X R0.5 | 1.5 | 4 | 45 | 4 | |
| 2JJCR 015 005 060 | 1.5 X R0.5 | 1.5 | 6 | 45 | 4 | |
| 2JJCR 015 005 080 | 1.5 X R0.5 | 1.5 | 8 | 45 | 4 | |

# 2JJCR

## 2 Flutes JJ Rib Corner Radius End Mills for Hardened Steels

## 2날 고경도재 가공용 제이제이 리브 코너 레디우스 엔드밀



단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2JJCR 015 005 100 | 1.5 X R0.5 | 1.5 | 10 | 50 | 4 | |
| 2JJCR 015 005 120 | 1.5 X R0.5 | 1.5 | 12 | 50 | 4 | |
| 2JJCR 015 005 140 | 1.5 X R0.5 | 1.5 | 14 | 50 | 4 | |
| 2JJCR 015 005 160 | 1.5 X R0.5 | 1.5 | 16 | 50 | 4 | |
| 2JJCR 015 005 200 | 1.5 X R0.5 | 1.5 | 20 | 50 | 4 | |
| 2JJCR 020 0002 060 | 2 X R0.02 | 2 | 6 | 45 | 4 | |
| 2JJCR 020 0002 080 | 2 X R0.02 | 2 | 8 | 45 | 4 | |
| 2JJCR 020 0002 100 | 2 X R0.02 | 2 | 10 | 50 | 4 | |
| 2JJCR 020 0002 120 | 2 X R0.02 | 2 | 12 | 50 | 4 | |
| 2JJCR 020 0002 140 | 2 X R0.02 | 2 | 14 | 50 | 4 | |
| 2JJCR 020 0002 160 | 2 X R0.02 | 2 | 16 | 50 | 4 | |
| 2JJCR 020 0002 200 | 2 X R0.02 | 2 | 20 | 50 | 4 | |
| 2JJCR 020 0002 250 | 2 X R0.02 | 2 | 25 | 60 | 4 | |
| 2JJCR 020 0005 060 | 2 X R0.05 | 2 | 6 | 45 | 4 | |
| 2JJCR 020 0005 080 | 2 X R0.05 | 2 | 8 | 45 | 4 | |
| 2JJCR 020 0005 100 | 2 X R0.05 | 2 | 10 | 50 | 4 | |
| 2JJCR 020 0005 120 | 2 X R0.05 | 2 | 12 | 50 | 4 | |
| 2JJCR 020 0005 140 | 2 X R0.05 | 2 | 14 | 50 | 4 | |
| 2JJCR 020 0005 160 | 2 X R0.05 | 2 | 16 | 50 | 4 | |
| 2JJCR 020 0005 200 | 2 X R0.05 | 2 | 20 | 50 | 4 | |
| 2JJCR 020 0005 250 | 2 X R0.05 | 2 | 25 | 60 | 4 | |
| 2JJCR 020 001 060 | 2 X R0.1 | 2 | 6 | 45 | 4 | |
| 2JJCR 020 001 080 | 2 X R0.1 | 2 | 8 | 45 | 4 | |
| 2JJCR 020 001 100 | 2 X R0.1 | 2 | 10 | 50 | 4 | |
| 2JJCR 020 001 120 | 2 X R0.1 | 2 | 12 | 50 | 4 | |
| 2JJCR 020 001 140 | 2 X R0.1 | 2 | 14 | 50 | 4 | |
| 2JJCR 020 001 160 | 2 X R0.1 | 2 | 16 | 50 | 4 | |
| 2JJCR 020 001 200 | 2 X R0.1 | 2 | 20 | 50 | 4 | |
| 2JJCR 020 001 250 | 2 X R0.1 | 2 | 25 | 60 | 4 | |
| 2JJCR 020 001 300 | 2 X R0.1 | 2 | 30 | 70 | 4 | |
| 2JJCR 020 002 060 | 2 X R0.2 | 2 | 6 | 45 | 4 | |
| 2JJCR 020 002 080 | 2 X R0.2 | 2 | 8 | 45 | 4 | |
| 2JJCR 020 002 100 | 2 X R0.2 | 2 | 10 | 50 | 4 | |
| 2JJCR 020 002 120 | 2 X R0.2 | 2 | 12 | 50 | 4 | |
| 2JJCR 020 002 140 | 2 X R0.2 | 2 | 14 | 50 | 4 | |
| 2JJCR 020 002 160 | 2 X R0.2 | 2 | 16 | 50 | 4 | |
| 2JJCR 020 002 200 | 2 X R0.2 | 2 | 20 | 50 | 4 | |
| 2JJCR 020 002 250 | 2 X R0.2 | 2 | 25 | 60 | 4 | |
| 2JJCR 020 002 300 | 2 X R0.2 | 2 | 30 | 70 | 4 | |
| 2JJCR 020 003 060 | 2 X R0.3 | 2 | 6 | 45 | 4 | |
| 2JJCR 020 003 080 | 2 X R0.3 | 2 | 8 | 45 | 4 | |
| 2JJCR 020 003 100 | 2 X R0.3 | 2 | 10 | 50 | 4 | |
| 2JJCR 020 003 120 | 2 X R0.3 | 2 | 12 | 50 | 4 | |
| 2JJCR 020 003 140 | 2 X R0.3 | 2 | 14 | 50 | 4 | |
| 2JJCR 020 003 160 | 2 X R0.3 | 2 | 16 | 50 | 4 | |
| 2JJCR 020 003 200 | 2 X R0.3 | 2 | 20 | 50 | 4 | |
| 2JJCR 020 003 250 | 2 X R0.3 | 2 | 25 | 60 | 4 | |
| 2JJCR 020 003 300 | 2 X R0.3 | 2 | 30 | 70 | 4 | |
| 2JJCR 020 005 060 | 2 X R0.5 | 2 | 6 | 45 | 4 | |
| 2JJCR 020 005 080 | 2 X R0.5 | 2 | 8 | 45 | 4 | |
| 2JJCR 020 005 100 | 2 X R0.5 | 2 | 10 | 50 | 4 | |
| 2JJCR 020 005 120 | 2 X R0.5 | 2 | 12 | 50 | 4 | |
| 2JJCR 020 005 140 | 2 X R0.5 | 2 | 14 | 50 | 4 | |
| 2JJCR 020 005 160 | 2 X R0.5 | 2 | 16 | 50 | 4 | |
| 2JJCR 020 005 200 | 2 X R0.5 | 2 | 20 | 50 | 4 | |
| 2JJCR 020 005 250 | 2 X R0.5 | 2 | 25 | 60 | 4 | |
| 2JJCR 020 005 300 | 2 X R0.5 | 2 | 30 | 70 | 4 | |
| 2JJCR 025 001 100 | 2.5 X R0.1 | 2.5 | 10 | 50 | 4 | |
| 2JJCR 025 001 160 | 2.5 X R0.1 | 2.5 | 16 | 50 | 4 | |
| 2JJCR 025 001 200 | 2.5 X R0.1 | 2.5 | 20 | 50 | 4 | |
| 2JJCR 025 001 250 | 2.5 X R0.1 | 2.5 | 25 | 60 | 4 | |
| 2JJCR 025 001 300 | 2.5 X R0.1 | 2.5 | 30 | 70 | 4 | |
| 2JJCR 025 002 100 | 2.5 X R0.2 | 2.5 | 10 | 50 | 4 | |
| 2JJCR 025 002 160 | 2.5 X R0.2 | 2.5 | 16 | 50 | 4 | |

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2JJCR 025 002 200 | 2.5 X R0.2 | 2.5 | 20 | 50 | 4 | |
| 2JJCR 025 003 100 | 2.5 X R0.3 | 2.5 | 10 | 50 | 4 | |
| 2JJCR 025 003 160 | 2.5 X R0.3 | 2.5 | 16 | 50 | 4 | |
| 2JJCR 025 003 200 | 2.5 X R0.3 | 2.5 | 20 | 50 | 4 | |
| 2JJCR 025 005 100 | 2.5 X R0.5 | 2.5 | 10 | 50 | 4 | |
| 2JJCR 025 005 160 | 2.5 X R0.5 | 2.5 | 16 | 50 | 4 | |
| 2JJCR 025 005 200 | 2.5 X R0.5 | 2.5 | 20 | 50 | 4 | |
| 2JJCR 030 001 100 | 3 X R0.1 | 3 | 10 | 50 | 6 | |
| 2JJCR 030 001 120 | 3 X R0.1 | 3 | 12 | 50 | 6 | |
| 2JJCR 030 001 160 | 3 X R0.1 | 3 | 16 | 55 | 6 | |
| 2JJCR 030 001 200 | 3 X R0.1 | 3 | 20 | 60 | 6 | |
| 2JJCR 030 001 250 | 3 X R0.1 | 3 | 25 | 65 | 6 | |
| 2JJCR 030 001 300 | 3 X R0.1 | 3 | 30 | 70 | 6 | |
| 2JJCR 030 001 350 | 3 X R0.1 | 3 | 35 | 75 | 6 | |
| 2JJCR 030 001 400 | 3 X R0.1 | 3 | 40 | 80 | 6 | |
| 2JJCR 030 002 100 | 3 X R0.2 | 3 | 10 | 50 | 6 | |
| 2JJCR 030 002 120 | 3 X R0.2 | 3 | 12 | 50 | 6 | |
| 2JJCR 030 002 160 | 3 X R0.2 | 3 | 16 | 55 | 6 | |
| 2JJCR 030 002 200 | 3 X R0.2 | 3 | 20 | 60 | 6 | |
| 2JJCR 030 002 250 | 3 X R0.2 | 3 | 25 | 65 | 6 | |
| 2JJCR 030 002 300 | 3 X R0.2 | 3 | 30 | 70 | 6 | |
| 2JJCR 030 002 350 | 3 X R0.2 | 3 | 35 | 75 | 6 | |
| 2JJCR 030 002 400 | 3 X R0.2 | 3 | 40 | 80 | 6 | |
| 2JJCR 030 003 100 | 3 X R0.3 | 3 | 10 | 50 | 6 | |
| 2JJCR 030 003 120 | 3 X R0.3 | 3 | 12 | 50 | 6 | |
| 2JJCR 030 003 160 | 3 X R0.3 | 3 | 16 | 55 | 6 | |
| 2JJCR 030 003 200 | 3 X R0.3 | 3 | 20 | 60 | 6 | |
| 2JJCR 030 003 250 | 3 X R0.3 | 3 | 25 | 65 | 6 | |
| 2JJCR 030 003 300 | 3 X R0.3 | 3 | 30 | 70 | 6 | |
| 2JJCR 030 003 350 | 3 X R0.3 | 3 | 35 | 75 | 6 | |
| 2JJCR 030 003 400 | 3 X R0.3 | 3 | 40 | 80 | 6 | |
| 2JJCR 030 005 100 | 3 X R0.5 | 3 | 10 | 50 | 6 | |
| 2JJCR 030 005 120 | 3 X R0.5 | 3 | 12 | 50 | 6 | |
| 2JJCR 030 005 160 | 3 X R0.5 | 3 | 16 | 55 | 6 | |
| 2JJCR 030 005 200 | 3 X R0.5 | 3 | 20 | 60 | 6 | |
| 2JJCR 030 005 250 | 3 X R0.5 | 3 | 25 | 65 | 6 | |
| 2JJCR 030 005 300 | 3 X R0.5 | 3 | 30 | 70 | 6 | |
| 2JJCR 030 005 350 | 3 X R0.5 | 3 | 35 | 75 | 6 | |
| 2JJCR 030 005 400 | 3 X R0.5 | 3 | 40 | 80 | 6 | |
| 2JJCR 030 010 100 | 3 X R1 | 3 | 10 | 50 | 6 | |
| 2JJCR 030 010 120 | 3 X R1 | 3 | 12 | 50 | 6 | |
| 2JJCR 030 010 160 | 3 X R1 | 3 | 16 | 55 | 6 | |
| 2JJCR 030 010 200 | 3 X R1 | 3 | 20 | 60 | 6 | |
| 2JJCR 030 010 250 | 3 X R1 | 3 | 25 | 65 | 6 | |
| 2JJCR 030 010 300 | 3 X R1 | 3 | 30 | 70 | 6 | |
| 2JJCR 030 010 350 | 3 X R1 | 3 | 35 | 75 | 6 | |
| 2JJCR 030 010 400 | 3 X R1 | 3 | 40 | 80 | 6 | |
| 2JJCR 040 001 120 | 4 X R0.1 | 4 | 12 | 50 | 6 | |
| 2JJCR 040 001 160 | 4 X R0.1 | 4 | 16 | 55 | 6 | |
| 2JJCR 040 001 200 | 4 X R0.1 | 4 | 20 | 60 | 6 | |
| 2JJCR 040 001 250 | 4 X R0.1 | 4 | 25 | 65 | 6 | |
| 2JJCR 040 001 300 | 4 X R0.1 | 4 | 30 | 70 | 6 | |
| 2JJCR 040 001 350 | 4 X R0.1 | 4 | 35 | 75 | 6 | |
| 2JJCR 040 001 400 | 4 X R0.1 | 4 | 40 | 80 | 6 | |
| 2JJCR 040 002 120 | 4 X R0.2 | 4 | 12 | 50 | 6 | |
| 2JJCR 040 002 160 | 4 X R0.2 | 4 | 16 | 55 | 6 | |
| 2JJCR 040 002 200 | 4 X R0.2 | 4 | 20 | 60 | 6 | |
| 2JJCR 040 002 250 | 4 X R0.2 | 4 | 25 | 65 | 6 | |
| 2JJCR 040 002 300 | 4 X R0.2 | 4 | 30 | 70 | 6 | |
| 2JJCR 040 002 350 | 4 X R0.2 | 4 | 35 | 75 | 6 | |
| 2JJCR 040 002 400 | 4 X R0.2 | 4 | 40 | 80 | 6 | |
| 2JJCR 040 003 120 | 4 X R0.3 | 4 | 12 | 50 | 6 | |
| 2JJCR 040 003 160 | 4 X R0.3 | 4 | 16 | 55 | 6 | |
| 2JJCR 040 003 200 | 4 X R0.3 | 4 | 20 | 60 | 6 | |

단위 : mm

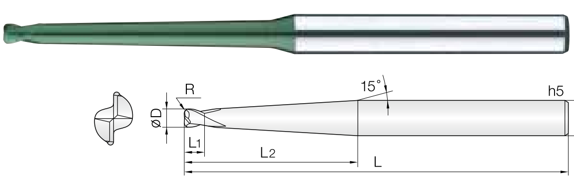
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2JJCR 040 003 250 | 4 X R0.3 | 4 | 25 | 65 | 6 | |
| 2JJCR 040 003 300 | 4 X R0.3 | 4 | 30 | 70 | 6 | |
| 2JJCR 040 003 350 | 4 X R0.3 | 4 | 35 | 75 | 6 | |
| 2JJCR 040 003 400 | 4 X R0.3 | 4 | 40 | 80 | 6 | |
| 2JJCR 040 005 120 | 4 X R0.5 | 4 | 12 | 50 | 6 | |
| 2JJCR 040 005 160 | 4 X R0.5 | 4 | 16 | 55 | 6 | |
| 2JJCR 040 005 200 | 4 X R0.5 | 4 | 20 | 60 | 6 | |
| 2JJCR 040 005 250 | 4 X R0.5 | 4 | 25 | 65 | 6 | |
| 2JJCR 040 005 300 | 4 X R0.5 | 4 | 30 | 70 | 6 | |
| 2JJCR 040 005 350 | 4 X R0.5 | 4 | 35 | 75 | 6 | |
| 2JJCR 040 005 400 | 4 X R0.5 | 4 | 40 | 80 | 6 | |
| 2JJCR 040 010 120 | 4 X R1 | 4 | 12 | 50 | 6 | |
| 2JJCR 040 010 160 | 4 X R1 | 4 | 16 | 55 | 6 | |
| 2JJCR 040 010 200 | 4 X R1 | 4 | 20 | 60 | 6 | |
| 2JJCR 040 010 250 | 4 X R1 | 4 | 25 | 65 | 6 | |
| 2JJCR 040 010 300 | 4 X R1 | 4 | 30 | 70 | 6 | |
| 2JJCR 040 010 350 | 4 X R1 | 4 | 35 | 75 | 6 | |
| 2JJCR 040 010 400 | 4 X R1 | 4 | 40 | 80 | 6 | |
| 2JJCR 050 002 150 | 5 X R0.2 | 6 | 15 | 60 | 6 | |
| 2JJCR 050 002 250 | 5 X R0.2 | 6 | 25 | 70 | 6 | |
| 2JJCR 050 002 300 | 5 X R0.2 | 6 | 30 | 70 | 6 | |
| 2JJCR 050 002 400 | 5 X R0.2 | 6 | 40 | 80 | 6 | |
| 2JJCR 050 005 150 | 5 X R0.5 | 6 | 15 | 60 | 6 | |
| 2JJCR 050 005 250 | 5 X R0.5 | 6 | 25 | 70 | 6 | |
| 2JJCR 050 005 300 | 5 X R0.5 | 6 | 30 | 70 | 6 | |
| 2JJCR 050 005 400 | 5 X R0.5 | 6 | 40 | 80 | 6 | |
| 2JJCR 050 010 150 | 5 X R1 | 6 | 15 | 60 | 6 | |
| 2JJCR 050 010 250 | 5 X R1 | 6 | 25 | 70 | 6 | |
| 2JJCR 050 010 300 | 5 X R1 | 6 | 30 | 70 | 6 | |
| 2JJCR 050 010 400 | 5 X R1 | 6 | 40 | 80 | 6 | |
| 2JJCR 060 001 200 | 6 X R0.1 | 7 | 20 | 60 | 6 | |
| 2JJCR 060 001 400 | 6 X R0.1 | 7 | 40 | 80 | 6 | |
| 2JJCR 060 002 200 | 6 X R0.2 | 7 | 20 | 60 | 6 | |
| 2JJCR 060 002 400 | 6 X R0.2 | 7 | 40 | 80 | 6 | |
| 2JJCR 060 003 200 | 6 X R0.3 | 7 | 20 | 60 | 6 | |
| 2JJCR 060 003 400 | 6 X R0.3 | 7 | 40 | 80 | 6 | |
| 2JJCR 060 005 200 | 6 X R0.5 | 7 | 20 | 60 | 6 | |
| 2JJCR 060 005 400 | 6 X R0.5 | 7 | 40 | 80 | 6 | |
| 2JJCR 060 010 200 | 6 X R1 | 7 | 20 | 60 | 6 | |
| 2JJCR 060 010 400 | 6 X R1 | 7 | 40 | 80 | 6 | |
| 2JJCR 060 015 200 | 6 X R1.5 | 7 | 20 | 60 | 6 | |
| 2JJCR 060 015 400 | 6 X R1.5 | 7 | 40 | 80 | 6 | |
| 2JJCR 080 002 220 | 8 X R0.2 | 9 | 22 | 65 | 8 | |
| 2JJCR 080 003 220 | 8 X R0.3 | 9 | 22 | 65 | 8 | |
| 2JJCR 080 005 220 | 8 X R0.5 | 9 | 22 | 65 | 8 | |
| 2JJCR 080 010 220 | 8 X R1 | 9 | 22 | 65 | 8 | |
| 2JJCR 080 015 220 | 8 X R1.5 | 9 | 22 | 65 | 8 | |
| 2JJCR 100 002 240 | 10 X R0.2 | 11 | 24 | 70 | 10 | |
| 2JJCR 100 003 240 | 10 X R0.3 | 11 | 24 | 70 | 10 | |
| 2JJCR 100 005 240 | 10 X R0.5 | 11 | 24 | 70 | 10 | |
| 2JJCR 100 010 240 | 10 X R1 | 11 | 24 | 70 | 10 | |
| 2JJCR 100 015 240 | 10 X R1.5 | 11 | 24 | 70 | 10 | |
| 2JJCR 100 020 240 | 10 X R2 | 11 | 24 | 70 | 10 | |
| 2JJCR 120 002 260 | 12 X R0.2 | 13 | 26 | 80 | 12 | |
| 2JJCR 120 003 260 | 12 X R0.3 | 13 | 26 | 80 | 12 | |
| 2JJCR 120 005 260 | 12 X R0.5 | 13 | 26 | 80 | 12 | |
| 2JJCR 120 010 260 | 12 X R1 | 13 | 26 | 80 | 12 | |
| 2JJCR 120 015 260 | 12 X R1.5 | 13 | 26 | 80 | 12 | |
| 2JJCR 120 020 260 | 12 X R2 | 13 | 26 | 80 | 12 | |
| 2JJCR 120 030 260 | 12 X R3 | 13 | 26 | 80 | 12 | |
| 2JJCR 160 005 110 | 16 X R0.5 | 20 | 35 | 110 | 16 | |
| 2JJCR 160 010 110 | 16 X R1 | 20 | 35 | 110 | 16 | |

# 2JJTC

## 2 Flutes JJ Taper Neck Corner Radius End Mills for Hardened Steels

## 2날 고경도재 가공용 제이제이 테이퍼 넥 코너 레디우스 엔드밀






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

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

2 | UWC 초미립자 | TISIN-S Coating | R ±0.005 R0.1 ~ 0.5 | R ±0.01 R1 | 30° Helix Angle | CUTTING DATA 424P

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

단위 : mm

| Order Number | 날경 Diameter D×R | 각도 Angle θ | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|
| 2JJTC 010 001 0601 | 1 X R0.1 | 1° | 1 | 6 | 50 | 4 | |
| 2JJTC 010 001 1001 | 1 X R0.1 | 1° | 1 | 10 | 50 | 4 | |
| 2JJTC 010 001 1501 | 1 X R0.1 | 1° | 1 | 15 | 50 | 4 | |
| 2JJTC 010 001 2001 | 1 X R0.1 | 1° | 1 | 20 | 60 | 4 | |
| 2JJTC 010 001 2501 | 1 X R0.1 | 1° | 1 | 25 | 60 | 4 | |
| 2JJTC 010 001 3001 | 1 X R0.1 | 1° | 1 | 30 | 70 | 4 | |
| 2JJTC 010 001 3501 | 1 X R0.1 | 1° | 1 | 35 | 75 | 4 | |
| 2JJTC 010 002 0601 | 1 X R0.2 | 1° | 1 | 6 | 50 | 4 | |
| 2JJTC 010 002 1001 | 1 X R0.2 | 1° | 1 | 10 | 50 | 4 | |
| 2JJTC 010 002 1501 | 1 X R0.2 | 1° | 1 | 15 | 50 | 4 | |
| 2JJTC 010 002 2001 | 1 X R0.2 | 1° | 1 | 20 | 60 | 4 | |
| 2JJTC010 002 2501 | 1 X R0.2 | 1° | 1 | 25 | 60 | 4 | |
| 2JJTC 010 002 3001 | 1 X R0.2 | 1° | 1 | 30 | 70 | 4 | |
| 2JJTC 010 002 3501 | 1 X R0.2 | 1° | 1 | 35 | 75 | 4 | |
| 2JJTC 010 003 0601 | 1 X R0.3 | 1° | 1 | 6 | 50 | 4 | |
| 2JJTC 010 003 1001 | 1 X R0.3 | 1° | 1 | 10 | 50 | 4 | |
| 2JJTC 010 003 1501 | 1 X R0.3 | 1° | 1 | 15 | 50 | 4 | |
| 2JJTC 010 003 2001 | 1 X R0.3 | 1° | 1 | 20 | 60 | 4 | |
| 2JJTC 010 003 2501 | 1 X R0.3 | 1° | 1 | 25 | 60 | 4 | |
| 2JJTC 010 003 3001 | 1 X R0.3 | 1° | 1 | 30 | 70 | 4 | |
| 2JJTC 010 003 3501 | 1 X R0.3 | 1° | 1 | 35 | 75 | 4 | |
| 2JJTC 015 002 1001 | 1.5 X R0.2 | 1° | 1.5 | 10 | 50 | 4 | |
| 2JJTC 015 002 1501 | 1.5 X R0.2 | 1° | 1.5 | 15 | 50 | 4 | |
| 2JJTC 015 002 2001 | 1.5 X R0.2 | 1° | 1.5 | 20 | 60 | 4 | |
| 2JJTC 015 002 2501 | 1.5 X R0.2 | 1° | 1.5 | 25 | 60 | 4 | |
| 2JJTC 015 002 3001 | 1.5 X R0.2 | 1° | 1.5 | 30 | 70 | 4 | |
| 2JJTC 015 002 3501 | 1.5 X R0.2 | 1° | 1.5 | 35 | 75 | 4 | |
| 2JJTC 015 003 1001 | 1.5 X R0.3 | 1° | 1.5 | 10 | 50 | 4 | |
| 2JJTC 015 003 1501 | 1.5 X R0.3 | 1° | 1.5 | 15 | 50 | 4 | |
| 2JJTC 015 003 2001 | 1.5 X R0.3 | 1° | 1.5 | 20 | 60 | 4 | |
| 2JJTC 015 003 2501 | 1.5 X R0.3 | 1° | 1.5 | 25 | 60 | 4 | |
| 2JJTC 015 003 3001 | 1.5 X R0.3 | 1° | 1.5 | 30 | 70 | 4 | |
| 2JJTC 015 003 3501 | 1.5 X R0.3 | 1° | 1.5 | 35 | 75 | 4 | |
| 2JJTC 015 005 1001 | 1.5 X R0.5 | 1° | 1.5 | 10 | 50 | 4 | |
| 2JJTC 015 005 1501 | 1.5 X R0.5 | 1° | 1.5 | 15 | 50 | 4 | |
| 2JJTC 015 005 2001 | 1.5 X R0.5 | 1° | 1.5 | 20 | 60 | 4 | |
| 2JJTC 015 005 2501 | 1.5 X R0.5 | 1° | 1.5 | 25 | 60 | 4 | |
| 2JJTC 015 005 3001 | 1.5 X R0.5 | 1° | 1.5 | 30 | 70 | 4 | |
| 2JJTC 015 005 3501 | 1.5 X R0.5 | 1° | 1.5 | 35 | 75 | 4 | |
| 2JJTC 020 002 1201 | 2 X R0.2 | 1° | 2 | 12 | 50 | 4 | |
| 2JJTC 020 002 1601 | 2 X R0.2 | 1° | 2 | 16 | 50 | 4 | |
| 2JJTC 020 002 2001 | 2 X R0.2 | 1° | 2 | 20 | 60 | 4 | |
| 2JJTC 020 002 2501 | 2 X R0.2 | 1° | 2 | 25 | 60 | 4 | |
| 2JJTC 020 002 3001 | 2 X R0.2 | 1° | 2 | 30 | 70 | 4 | |
| 2JJTC 020 002 3501 | 2 X R0.2 | 1° | 2 | 35 | 75 | 4 | |
| 2JJTC 020 002 4001 | 2 X R0.2 | 1° | 2 | 40 | 80 | 4 | |
| 2JJTC 020 002 5001 | 2 X R0.2 | 1° | 2 | 50 | 90 | 4 | |
| 2JJTC 020 003 1201 | 2 X R0.3 | 1° | 2 | 12 | 50 | 4 | |
| 2JJTC 020 003 1601 | 2 X R0.3 | 1° | 2 | 16 | 50 | 4 | |
| 2JJTC 020 003 2001 | 2 X R0.3 | 1° | 2 | 20 | 60 | 4 | |
| 2JJTC 020 003 2501 | 2 X R0.3 | 1° | 2 | 25 | 60 | 4 | |
| 2JJTC 020 003 3001 | 2 X R0.3 | 1° | 2 | 30 | 70 | 4 | |
| 2JJTC 020 003 3501 | 2 X R0.3 | 1° | 2 | 35 | 75 | 4 | |
| 2JJTC 020 003 4001 | 2 X R0.3 | 1° | 2 | 40 | 80 | 4 | |
| 2JJTC 020 003 5001 | 2 X R0.3 | 1° | 2 | 50 | 90 | 4 | |
| 2JJTC 020 005 1201 | 2 X R0.5 | 1° | 2 | 12 | 50 | 4 | |
| 2JJTC 020 005 1601 | 2 X R0.5 | 1° | 2 | 16 | 50 | 4 | |
| 2JJTC 020 005 2001 | 2 X R0.5 | 1° | 2 | 20 | 60 | 4 | |
| 2JJTC 020 005 2501 | 2 X R0.5 | 1° | 2 | 25 | 60 | 4 | |
| 2JJTC 020 005 3001 | 2 X R0.5 | 1° | 2 | 30 | 70 | 4 | |
| 2JJTC 020 005 3501 | 2 X R0.5 | 1° | 2 | 35 | 75 | 4 | |
| 2JJTC 020 005 4001 | 2 X R0.5 | 1° | 2 | 40 | 80 | 4 | |
| 2JJTC 020 005 5001 | 2 X R0.5 | 1° | 2 | 50 | 90 | 4 | |
| 2JJTC 030 002 2001 | 3 X R0.2 | 1° | 3 | 20 | 60 | 6 | |
| 2JJTC 030 002 3001 | 3 X R0.2 | 1° | 3 | 30 | 70 | 6 | |
| 2JJTC 030 002 4001 | 3 X R0.2 | 1° | 3 | 40 | 80 | 6 | |
| 2JJTC 030 002 5001 | 3 X R0.2 | 1° | 3 | 50 | 90 | 6 | |
| 2JJTC 030 002 6001 | 3 X R0.2 | 1° | 3 | 60 | 100 | 6 | |
| 2JJTC 030 003 2001 | 3 X R0.3 | 1° | 3 | 20 | 60 | 6 | |
| 2JJTC 030 003 3001 | 3 X R0.3 | 1° | 3 | 30 | 70 | 6 | |
| 2JJTC 030 003 4001 | 3 X R0.3 | 1° | 3 | 40 | 80 | 6 | |
| 2JJTC 030 003 5001 | 3 X R0.3 | 1° | 3 | 50 | 90 | 6 | |
| 2JJTC 030 003 6001 | 3 X R0.3 | 1° | 3 | 60 | 100 | 6 | |
| 2JJTC 030 005 2001 | 3 X R0.5 | 1° | 3 | 20 | 60 | 6 | |
| 2JJTC 030 005 3001 | 3 X R0.5 | 1° | 3 | 30 | 70 | 6 | |
| 2JJTC 030 005 4001 | 3 X R0.5 | 1° | 3 | 40 | 80 | 6 | |
| 2JJTC 030 005 5001 | 3 X R0.5 | 1° | 3 | 50 | 90 | 6 | |
| 2JJTC 030 005 6001 | 3 X R0.5 | 1° | 3 | 60 | 100 | 6 | |
| 2JJTC 030 010 2001 | 3 X R1 | 1° | 3 | 20 | 60 | 6 | |
| 2JJTC 030 010 3001 | 3 X R1 | 1° | 3 | 30 | 70 | 6 | |
| 2JJTC 030 010 4001 | 3 X R1 | 1° | 3 | 40 | 80 | 6 | |
| 2JJTC 030 010 5001 | 3 X R1 | 1° | 3 | 50 | 90 | 6 | |
| 2JJTC 030 010 6001 | 3 X R1 | 1° | 3 | 60 | 100 | 6 | |
| 2JJTC 040 002 2001 | 4 X R0.2 | 1° | 4 | 20 | 60 | 6 | |
| 2JJTC 040 002 3001 | 4 X R0.2 | 1° | 4 | 30 | 70 | 6 | |
| 2JJTC 040 002 4001 | 4 X R0.2 | 1° | 4 | 40 | 80 | 6 | |
| 2JJTC 040 002 5001 | 4 X R0.2 | 1° | 4 | 50 | 90 | 6 | |
| 2JJTC 040 002 6001 | 4 X R0.2 | 1° | 4 | 60 | 100 | 6 | |
| 2JJTC 040 003 2001 | 4 X R0.3 | 1° | 4 | 20 | 60 | 6 | |
| 2JJTC 040 003 3001 | 4 X R0.3 | 1° | 4 | 30 | 70 | 6 | |
| 2JJTC 040 003 4001 | 4 X R0.3 | 1° | 4 | 40 | 80 | 6 | |
| 2JJTC 040 003 5001 | 4 X R0.3 | 1° | 4 | 50 | 90 | 6 | |
| 2JJTC 040 003 6001 | 4 X R0.3 | 1° | 4 | 60 | 100 | 6 | |
| 2JJTC 040 005 2001 | 4 X R0.5 | 1° | 4 | 20 | 60 | 6 | |
| 2JJTC 040 005 3001 | 4 X R0.5 | 1° | 4 | 30 | 70 | 6 | |
| 2JJTC 040 005 4001 | 4 X R0.5 | 1° | 4 | 40 | 80 | 6 | |
| 2JJTC 040 005 5001 | 4 X R0.5 | 1° | 4 | 50 | 90 | 6 | |
| 2JJTC 040 005 6001 | 4 X R0.5 | 1° | 4 | 60 | 100 | 6 | |
| 2JJTC 040 010 2001 | 4 X R1 | 1° | 4 | 20 | 60 | 6 | |
| 2JJTC 040 010 3001 | 4 X R1 | 1° | 4 | 30 | 70 | 6 | |

단위 : mm

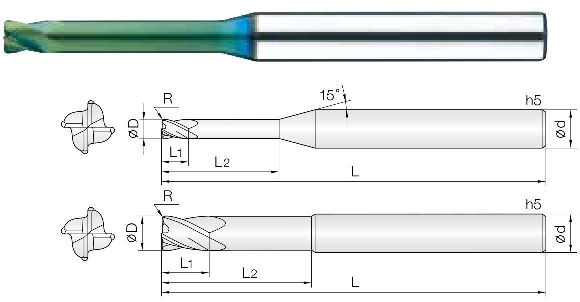
| Order Number | 날경 Diameter D×R | 각도 Angle θ | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|
| 2JJTC 040 010 4001 | 4 X R1 | 1˚ | 4 | 40 | 80 | 6 | |
| 2JJTC 040 010 5001 | 4 X R1 | 1˚ | 4 | 50 | 90 | 6 | |
| 2JJTC 040 010 6001 | 4 X R1 | 1˚ | 4 | 60 | 100 | 6 | |

# 4JJCR

## 4 Flutes JJ Rib Corner Radius End Mills for Hardened Steels

## 4날 고경도재 가공용 제이제이 리브 코너 레디우스 엔드밀






- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 코너R 형상을 날부치핑이 적도록 설계하였습니다.
- 다양한 코너R과 유효장으로 맞춤 가공이 가능합니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

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

4 | UWC 초미립자 | TISIN-S Coating | R ±0.005 | R ±0.01 | R ±0.015 | 30° Helix Angle | CUTTING DATA

R0.02 ~ 0.5 | R1 ~ 1.5 | R2 ~ 3 | 425P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.5 ~ 12 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4JJCR 005 0005 020 | 0.5 X R0.05 | 0.5 | 2 | 45 | 4 | |
| 4JJCR 005 0005 040 | 0.5 X R0.05 | 0.5 | 4 | 45 | 4 | |
| 4JJCR 005 0005 060 | 0.5 X R0.05 | 0.5 | 6 | 45 | 4 | |
| 4JJCR 005 0005 080 | 0.5 X R0.05 | 0.5 | 8 | 45 | 4 | |
| 4JJCR 005 001 020 | 0.5 X R0.1 | 0.5 | 2 | 45 | 4 | |
| 4JJCR 005 001 040 | 0.5 X R0.1 | 0.5 | 4 | 45 | 4 | |
| 4JJCR 005 001 060 | 0.5 X R0.1 | 0.5 | 6 | 45 | 4 | |
| 4JJCR 005 001 080 | 0.5 X R0.1 | 0.5 | 8 | 45 | 4 | |
| 4JJCR 006 0005 020 | 0.6 X R0.05 | 0.6 | 2 | 45 | 4 | |
| 4JJCR 006 0005 040 | 0.6 X R0.05 | 0.6 | 4 | 45 | 4 | |
| 4JJCR 006 0005 060 | 0.6 X R0.05 | 0.6 | 6 | 45 | 4 | |
| 4JJCR 006 0005 080 | 0.6 X R0.05 | 0.6 | 8 | 45 | 4 | |
| 4JJCR 006 001 020 | 0.6 X R0.1 | 0.6 | 2 | 45 | 4 | |
| 4JJCR 006 001 040 | 0.6 X R0.1 | 0.6 | 4 | 45 | 4 | |
| 4JJCR 006 001 060 | 0.6 X R0.1 | 0.6 | 6 | 45 | 4 | |
| 4JJCR 006 001 080 | 0.6 X R0.1 | 0.6 | 8 | 45 | 4 | |
| 4JJCR 007 0005 020 | 0.7 X R0.05 | 0.7 | 2 | 45 | 4 | |
| 4JJCR 007 0005 040 | 0.7 X R0.05 | 0.7 | 4 | 45 | 4 | |
| 4JJCR 007 0005 060 | 0.7 X R0.05 | 0.7 | 6 | 45 | 4 | |
| 4JJCR 007 0005 080 | 0.7 X R0.05 | 0.7 | 8 | 45 | 4 | |
| 4JJCR 007 001 020 | 0.7 X R0.1 | 0.7 | 2 | 45 | 4 | |
| 4JJCR 007 001 040 | 0.7 X R0.1 | 0.7 | 4 | 45 | 4 | |
| 4JJCR 007 001 060 | 0.7 X R0.1 | 0.7 | 6 | 45 | 4 | |
| 4JJCR 007 001 080 | 0.7 X R0.1 | 0.7 | 8 | 45 | 4 | |
| 4JJCR 008 0002 020 | 0.8 X R0.02 | 0.8 | 2 | 45 | 4 | |
| 4JJCR 008 0002 040 | 0.8 X R0.02 | 0.8 | 4 | 45 | 4 | |
| 4JJCR 008 0002 060 | 0.8 X R0.02 | 0.8 | 6 | 45 | 4 | |
| 4JJCR 008 0002 080 | 0.8 X R0.02 | 0.8 | 8 | 45 | 4 | |
| 4JJCR 008 0002 100 | 0.8 X R0.02 | 0.8 | 10 | 45 | 4 | |
| 4JJCR 008 0002 120 | 0.8 X R0.02 | 0.8 | 12 | 50 | 4 | |
| 4JJCR 008 0005 020 | 0.8 X R0.05 | 0.8 | 2 | 45 | 4 | |
| 4JJCR 008 0005 040 | 0.8 X R0.05 | 0.8 | 4 | 45 | 4 | |
| 4JJCR 008 0005 060 | 0.8 X R0.05 | 0.8 | 6 | 45 | 4 | |
| 4JJCR 008 0005 080 | 0.8 X R0.05 | 0.8 | 8 | 45 | 4 | |
| 4JJCR 008 0005 100 | 0.8 X R0.05 | 0.8 | 10 | 45 | 4 | |
| 4JJCR 008 0005 120 | 0.8 X R0.05 | 0.8 | 12 | 50 | 4 | |
| 4JJCR 008 001 020 | 0.8 X R0.1 | 0.8 | 2 | 45 | 4 | |
| 4JJCR 008 001 040 | 0.8 X R0.1 | 0.8 | 4 | 45 | 4 | |
| 4JJCR 008 001 060 | 0.8 X R0.1 | 0.8 | 6 | 45 | 4 | |
| 4JJCR 008 001 080 | 0.8 X R0.1 | 0.8 | 8 | 45 | 4 | |
| 4JJCR 008 001 100 | 0.8 X R0.1 | 0.8 | 10 | 45 | 4 | |
| 4JJCR 008 001 120 | 0.8 X R0.1 | 0.8 | 12 | 50 | 4 | |
| 4JJCR 010 0002 040 | 1 X R0.02 | 1 | 4 | 45 | 4 | |
| 4JJCR 010 0002 060 | 1 X R0.02 | 1 | 6 | 45 | 4 | |
| 4JJCR 010 0002 080 | 1 X R0.02 | 1 | 8 | 45 | 4 | |
| 4JJCR 010 0002 100 | 1 X R0.02 | 1 | 10 | 50 | 4 | |
| 4JJCR 010 0002 120 | 1 X R0.02 | 1 | 12 | 50 | 4 | |
| 4JJCR 010 0002 140 | 1 X R0.02 | 1 | 14 | 50 | 4 | |
| 4JJCR 010 0002 160 | 1 X R0.02 | 1 | 16 | 50 | 4 | |
| 4JJCR 010 0002 200 | 1 X R0.02 | 1 | 20 | 50 | 4 | |

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4JJCR 010 0005 040 | 1 X R0.05 | 1 | 4 | 45 | 4 | |
| 4JJCR 010 0005 060 | 1 X R0.05 | 1 | 6 | 45 | 4 | |
| 4JJCR 010 0005 080 | 1 X R0.05 | 1 | 8 | 45 | 4 | |
| 4JJCR 010 0005 100 | 1 X R0.05 | 1 | 10 | 50 | 4 | |
| 4JJCR 010 0005 120 | 1 X R0.05 | 1 | 12 | 50 | 4 | |
| 4JJCR 010 0005 140 | 1 X R0.05 | 1 | 14 | 50 | 4 | |
| 4JJCR 010 0005 160 | 1 X R0.05 | 1 | 16 | 50 | 4 | |
| 4JJCR 010 0005 200 | 1 X R0.05 | 1 | 20 | 50 | 4 | |
| 4JJCR 010 001 040 | 1 X R0.1 | 1 | 4 | 45 | 4 | |
| 4JJCR 010 001 060 | 1 X R0.1 | 1 | 6 | 45 | 4 | |
| 4JJCR 010 001 080 | 1 X R0.1 | 1 | 8 | 45 | 4 | |
| 4JJCR 010 001 100 | 1 X R0.1 | 1 | 10 | 50 | 4 | |
| 4JJCR 010 001 120 | 1 X R0.1 | 1 | 12 | 50 | 4 | |
| 4JJCR 010 001 140 | 1 X R0.1 | 1 | 14 | 50 | 4 | |
| 4JJCR 010 001 160 | 1 X R0.1 | 1 | 16 | 50 | 4 | |
| 4JJCR 010 001 200 | 1 X R0.1 | 1 | 20 | 50 | 4 | |
| 4JJCR 010 002 040 | 1 X R0.2 | 1 | 4 | 45 | 4 | |
| 4JJCR 010 002 060 | 1 X R0.2 | 1 | 6 | 45 | 4 | |
| 4JJCR 010 002 080 | 1 X R0.2 | 1 | 8 | 45 | 4 | |
| 4JJCR 010 002 100 | 1 X R0.2 | 1 | 10 | 50 | 4 | |
| 4JJCR 010 002 120 | 1 X R0.2 | 1 | 12 | 50 | 4 | |
| 4JJCR 010 002 140 | 1 X R0.2 | 1 | 14 | 50 | 4 | |
| 4JJCR 010 002 160 | 1 X R0.2 | 1 | 16 | 50 | 4 | |
| 4JJCR 010 002 200 | 1 X R0.2 | 1 | 20 | 50 | 4 | |
| 4JJCR 010 003 040 | 1 X R0.3 | 1 | 4 | 45 | 4 | |
| 4JJCR 010 003 060 | 1 X R0.3 | 1 | 6 | 45 | 4 | |
| 4JJCR 010 003 080 | 1 X R0.3 | 1 | 8 | 45 | 4 | |
| 4JJCR 010 003 100 | 1 X R0.3 | 1 | 10 | 50 | 4 | |
| 4JJCR 010 003 120 | 1 X R0.3 | 1 | 12 | 50 | 4 | |
| 4JJCR 010 003 140 | 1 X R0.3 | 1 | 14 | 50 | 4 | |
| 4JJCR 010 003 160 | 1 X R0.3 | 1 | 16 | 50 | 4 | |
| 4JJCR 010 003 200 | 1 X R0.3 | 1 | 20 | 50 | 4 | |
| 4JJCR 012 0002 040 | 1.2 X R0.02 | 1.2 | 4 | 45 | 4 | |
| 4JJCR 012 0002 060 | 1.2 X R0.02 | 1.2 | 6 | 45 | 4 | |
| 4JJCR 012 0002 080 | 1.2 X R0.02 | 1.2 | 8 | 45 | 4 | |
| 4JJCR 012 0002 100 | 1.2 X R0.02 | 1.2 | 10 | 50 | 4 | |
| 4JJCR 012 0002 120 | 1.2 X R0.02 | 1.2 | 12 | 50 | 4 | |
| 4JJCR 012 0002 140 | 1.2 X R0.02 | 1.2 | 14 | 50 | 4 | |
| 4JJCR 012 0002 160 | 1.2 X R0.02 | 1.2 | 16 | 50 | 4 | |
| 4JJCR 012 0002 200 | 1.2 X R0.02 | 1.2 | 20 | 50 | 4 | |
| 4JJCR 012 0005 040 | 1.2 X R0.05 | 1.2 | 4 | 45 | 4 | |
| 4JJCR 012 0005 060 | 1.2 X R0.05 | 1.2 | 6 | 45 | 4 | |
| 4JJCR 012 0005 080 | 1.2 X R0.05 | 1.2 | 8 | 45 | 4 | |
| 4JJCR 012 0005 100 | 1.2 X R0.05 | 1.2 | 10 | 50 | 4 | |
| 4JJCR 012 0005 120 | 1.2 X R0.05 | 1.2 | 12 | 50 | 4 | |
| 4JJCR 012 0005 140 | 1.2 X R0.05 | 1.2 | 14 | 50 | 4 | |
| 4JJCR 012 0005 160 | 1.2 X R0.05 | 1.2 | 16 | 50 | 4 | |
| 4JJCR 012 0005 200 | 1.2 X R0.05 | 1.2 | 20 | 50 | 4 | |
| 4JJCR 012 001 040 | 1.2 X R0.1 | 1.2 | 4 | 45 | 4 | |
| 4JJCR 012 001 060 | 1.2 X R0.1 | 1.2 | 6 | 45 | 4 | |

# 4JJCR

4 Flutes JJ Rib Corner Radius End Mills for Hardened Steels

## 4날 고경도재 가공용 제이제이 리브 코너 레디우스 엔드밀

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4JJCR 012 001 080 | 1.2 X R0.1 | 1.2 | 8 | 45 | 4 | |
| 4JJCR 012 001 100 | 1.2 X R0.1 | 1.2 | 10 | 50 | 4 | |
| 4JJCR 012 001 120 | 1.2 X R0.1 | 1.2 | 12 | 50 | 4 | |
| 4JJCR 012 001 140 | 1.2 X R0.1 | 1.2 | 14 | 50 | 4 | |
| 4JJCR 012 001 160 | 1.2 X R0.1 | 1.2 | 16 | 50 | 4 | |
| 4JJCR 012 001 200 | 1.2 X R0.1 | 1.2 | 20 | 50 | 4 | |
| 4JJCR 012 002 040 | 1.2 X R0.2 | 1.2 | 4 | 45 | 4 | |
| 4JJCR 012 002 060 | 1.2 X R0.2 | 1.2 | 6 | 45 | 4 | |
| 4JJCR 012 002 080 | 1.2 X R0.2 | 1.2 | 8 | 45 | 4 | |
| 4JJCR 012 002 100 | 1.2 X R0.2 | 1.2 | 10 | 50 | 4 | |
| 4JJCR 012 002 120 | 1.2 X R0.2 | 1.2 | 12 | 50 | 4 | |
| 4JJCR 012 002 140 | 1.2 X R0.2 | 1.2 | 14 | 50 | 4 | |
| 4JJCR 012 002 160 | 1.2 X R0.2 | 1.2 | 16 | 50 | 4 | |
| 4JJCR 012 002 200 | 1.2 X R0.2 | 1.2 | 20 | 50 | 4 | |
| 4JJCR 012 003 040 | 1.2 X R0.3 | 1.2 | 4 | 45 | 4 | |
| 4JJCR 012 003 060 | 1.2 X R0.3 | 1.2 | 6 | 45 | 4 | |
| 4JJCR 012 003 080 | 1.2 X R0.3 | 1.2 | 8 | 45 | 4 | |
| 4JJCR 012 003 100 | 1.2 X R0.3 | 1.2 | 10 | 50 | 4 | |
| 4JJCR 012 003 120 | 1.2 X R0.3 | 1.2 | 12 | 50 | 4 | |
| 4JJCR 015 0002 060 | 1.5 X R0.02 | 1.5 | 6 | 45 | 4 | |
| 4JJCR 015 0002 080 | 1.5 X R0.02 | 1.5 | 8 | 45 | 4 | |
| 4JJCR 015 0002 100 | 1.5 X R0.02 | 1.5 | 10 | 50 | 4 | |
| 4JJCR 015 0002 120 | 1.5 X R0.02 | 1.5 | 12 | 50 | 4 | |
| 4JJCR 015 0002 140 | 1.5 X R0.02 | 1.5 | 14 | 50 | 4 | |
| 4JJCR 015 0002 160 | 1.5 X R0.02 | 1.5 | 16 | 50 | 4 | |
| 4JJCR 015 0002 200 | 1.5 X R0.02 | 1.5 | 20 | 50 | 4 | |
| 4JJCR 015 0002 220 | 1.5 X R0.02 | 1.5 | 22 | 60 | 4 | |
| 4JJCR 015 0005 060 | 1.5 X R0.05 | 1.5 | 6 | 45 | 4 | |
| 4JJCR 015 0005 080 | 1.5 X R0.05 | 1.5 | 8 | 45 | 4 | |
| 4JJCR 015 0005 100 | 1.5 X R0.05 | 1.5 | 10 | 50 | 4 | |
| 4JJCR 015 0005 120 | 1.5 X R0.05 | 1.5 | 12 | 50 | 4 | |
| 4JJCR 015 0005 140 | 1.5 X R0.05 | 1.5 | 14 | 50 | 4 | |
| 4JJCR 015 0005 160 | 1.5 X R0.05 | 1.5 | 16 | 50 | 4 | |
| 4JJCR 015 0005 200 | 1.5 X R0.05 | 1.5 | 20 | 50 | 4 | |
| 4JJCR 015 0005 220 | 1.5 X R0.05 | 1.5 | 22 | 60 | 4 | |
| 4JJCR 015 001 060 | 1.5 X R0.1 | 1.5 | 6 | 45 | 4 | |
| 4JJCR 015 001 080 | 1.5 X R0.1 | 1.5 | 8 | 45 | 4 | |
| 4JJCR 015 001 100 | 1.5 X R0.1 | 1.5 | 10 | 50 | 4 | |
| 4JJCR 015 001 120 | 1.5 X R0.1 | 1.5 | 12 | 50 | 4 | |
| 4JJCR 015 001 140 | 1.5 X R0.1 | 1.5 | 14 | 50 | 4 | |
| 4JJCR 015 001 160 | 1.5 X R0.1 | 1.5 | 16 | 50 | 4 | |
| 4JJCR 015 001 200 | 1.5 X R0.1 | 1.5 | 20 | 50 | 4 | |
| 4JJCR 015 001 220 | 1.5 X R0.1 | 1.5 | 22 | 60 | 4 | |
| 4JJCR 015 002 060 | 1.5 X R0.2 | 1.5 | 6 | 45 | 4 | |
| 4JJCR 015 002 080 | 1.5 X R0.2 | 1.5 | 8 | 45 | 4 | |
| 4JJCR 015 002 100 | 1.5 X R0.2 | 1.5 | 10 | 50 | 4 | |
| 4JJCR 015 002 120 | 1.5 X R0.2 | 1.5 | 12 | 50 | 4 | |
| 4JJCR 015 002 140 | 1.5 X R0.2 | 1.5 | 14 | 50 | 4 | |
| 4JJCR 015 002 160 | 1.5 X R0.2 | 1.5 | 16 | 50 | 4 | |
| 4JJCR 015 002 200 | 1.5 X R0.2 | 1.5 | 20 | 50 | 4 | |
| 4JJCR 015 002 220 | 1.5 X R0.2 | 1.5 | 22 | 60 | 4 | |
| 4JJCR 015 002 250 | 1.5 X R0.2 | 1.5 | 25 | 60 | 4 | |
| 4JJCR 015 003 060 | 1.5 X R0.3 | 1.5 | 6 | 45 | 4 | |
| 4JJCR 015 003 080 | 1.5 X R0.3 | 1.5 | 8 | 45 | 4 | |
| 4JJCR 015 003 100 | 1.5 X R0.3 | 1.5 | 10 | 50 | 4 | |
| 4JJCR 015 003 120 | 1.5 X R0.3 | 1.5 | 12 | 50 | 4 | |
| 4JJCR 015 003 140 | 1.5 X R0.3 | 1.5 | 14 | 50 | 4 | |
| 4JJCR 015 003 160 | 1.5 X R0.3 | 1.5 | 16 | 50 | 4 | |
| 4JJCR 015 003 200 | 1.5 X R0.3 | 1.5 | 20 | 50 | 4 | |
| 4JJCR 015 003 220 | 1.5 X R0.3 | 1.5 | 22 | 60 | 4 | |
| 4JJCR 015 003 250 | 1.5 X R0.3 | 1.5 | 25 | 60 | 4 | |
| 4JJCR 015 005 060 | 1.5 X R0.5 | 1.5 | 6 | 45 | 4 | |
| 4JJCR 015 005 080 | 1.5 X R0.5 | 1.5 | 8 | 45 | 4 | |
| 4JJCR 015 005 100 | 1.5 X R0.5 | 1.5 | 10 | 50 | 4 | |

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4JJCR 015 005 120 | 1.5 X R0.5 | 1.5 | 12 | 50 | 4 | |
| 4JJCR 015 005 140 | 1.5 X R0.5 | 1.5 | 14 | 50 | 4 | |
| 4JJCR 015 005 160 | 1.5 X R0.5 | 1.5 | 16 | 50 | 4 | |
| 4JJCR 015 005 200 | 1.5 X R0.5 | 1.5 | 20 | 50 | 4 | |
| 4JJCR 015 005 220 | 1.5 X R0.5 | 1.5 | 22 | 60 | 4 | |
| 4JJCR 015 005 250 | 1.5 X R0.5 | 1.5 | 25 | 60 | 4 | |
| 4JJCR 020 0002 060 | 2 X R0.02 | 2 | 6 | 45 | 4 | |
| 4JJCR 020 0002 080 | 2 X R0.02 | 2 | 8 | 45 | 4 | |
| 4JJCR 020 0002 100 | 2 X R0.02 | 2 | 10 | 50 | 4 | |
| 4JJCR 020 0002 120 | 2 X R0.02 | 2 | 12 | 50 | 4 | |
| 4JJCR 020 0002 140 | 2 X R0.02 | 2 | 14 | 50 | 4 | |
| 4JJCR 020 0002 160 | 2 X R0.02 | 2 | 16 | 50 | 4 | |
| 4JJCR 020 0002 200 | 2 X R0.02 | 2 | 20 | 50 | 4 | |
| 4JJCR 020 0002 250 | 2 X R0.02 | 2 | 25 | 60 | 4 | |
| 4JJCR 020 0002 300 | 2 X R0.02 | 2 | 30 | 70 | 4 | |
| 4JJCR 020 0005 060 | 2 X R0.05 | 2 | 6 | 45 | 4 | |
| 4JJCR 020 0005 080 | 2 X R0.05 | 2 | 8 | 45 | 4 | |
| 4JJCR 020 0005 100 | 2 X R0.05 | 2 | 10 | 50 | 4 | |
| 4JJCR 020 0005 120 | 2 X R0.05 | 2 | 12 | 50 | 4 | |
| 4JJCR 020 0005 140 | 2 X R0.05 | 2 | 14 | 50 | 4 | |
| 4JJCR 020 0005 160 | 2 X R0.05 | 2 | 16 | 50 | 4 | |
| 4JJCR 020 0005 200 | 2 X R0.05 | 2 | 20 | 50 | 4 | |
| 4JJCR 020 0005 250 | 2 X R0.05 | 2 | 25 | 60 | 4 | |
| 4JJCR 020 0005 300 | 2 X R0.05 | 2 | 30 | 70 | 4 | |
| 4JJCR 020 001 060 | 2 X R0.1 | 2 | 6 | 45 | 4 | |
| 4JJCR 020 001 080 | 2 X R0.1 | 2 | 8 | 45 | 4 | |
| 4JJCR 020 001 100 | 2 X R0.1 | 2 | 10 | 50 | 4 | |
| 4JJCR 020 001 120 | 2 X R0.1 | 2 | 12 | 50 | 4 | |
| 4JJCR 020 001 140 | 2 X R0.1 | 2 | 14 | 50 | 4 | |
| 4JJCR 020 001 160 | 2 X R0.1 | 2 | 16 | 50 | 4 | |
| 4JJCR 020 001 200 | 2 X R0.1 | 2 | 20 | 50 | 4 | |
| 4JJCR 020 001 250 | 2 X R0.1 | 2 | 25 | 60 | 4 | |
| 4JJCR 020 001 300 | 2 X R0.1 | 2 | 30 | 70 | 4 | |
| 4JJCR 020 002 060 | 2 X R0.2 | 2 | 6 | 45 | 4 | |
| 4JJCR 020 002 080 | 2 X R0.2 | 2 | 8 | 45 | 4 | |
| 4JJCR 020 002 100 | 2 X R0.2 | 2 | 10 | 50 | 4 | |
| 4JJCR 020 002 120 | 2 X R0.2 | 2 | 12 | 50 | 4 | |
| 4JJCR 020 002 140 | 2 X R0.2 | 2 | 14 | 50 | 4 | |
| 4JJCR 020 002 160 | 2 X R0.2 | 2 | 16 | 50 | 4 | |
| 4JJCR 020 002 200 | 2 X R0.2 | 2 | 20 | 50 | 4 | |
| 4JJCR 020 002 250 | 2 X R0.2 | 2 | 25 | 60 | 4 | |
| 4JJCR 020 002 300 | 2 X R0.2 | 2 | 30 | 70 | 4 | |
| 4JJCR 020 003 060 | 2 X R0.3 | 2 | 6 | 45 | 4 | |
| 4JJCR 020 003 080 | 2 X R0.3 | 2 | 8 | 45 | 4 | |
| 4JJCR 020 003 100 | 2 X R0.3 | 2 | 10 | 50 | 4 | |
| 4JJCR 020 003 120 | 2 X R0.3 | 2 | 12 | 50 | 4 | |
| 4JJCR 020 003 140 | 2 X R0.3 | 2 | 14 | 50 | 4 | |
| 4JJCR 020 003 160 | 2 X R0.3 | 2 | 16 | 50 | 4 | |
| 4JJCR 020 003 200 | 2 X R0.3 | 2 | 20 | 50 | 4 | |
| 4JJCR 020 003 250 | 2 X R0.3 | 2 | 25 | 60 | 4 | |
| 4JJCR 020 003 300 | 2 X R0.3 | 2 | 30 | 70 | 4 | |
| 4JJCR 020 005 060 | 2 X R0.5 | 2 | 6 | 45 | 4 | |
| 4JJCR 020 005 080 | 2 X R0.5 | 2 | 8 | 45 | 4 | |
| 4JJCR 020 005 100 | 2 X R0.5 | 2 | 10 | 50 | 4 | |
| 4JJCR 020 005 120 | 2 X R0.5 | 2 | 12 | 50 | 4 | |
| 4JJCR 020 005 140 | 2 X R0.5 | 2 | 14 | 50 | 4 | |
| 4JJCR 020 005 160 | 2 X R0.5 | 2 | 16 | 50 | 4 | |
| 4JJCR 020 005 200 | 2 X R0.5 | 2 | 20 | 50 | 4 | |
| 4JJCR 020 005 250 | 2 X R0.5 | 2 | 25 | 60 | 4 | |
| 4JJCR 020 005 300 | 2 X R0.5 | 2 | 30 | 70 | 4 | |
| 4JJCR 025 001 100 | 2.5 X R0.1 | 2.5 | 10 | 50 | 4 | |
| 4JJCR 025 001 160 | 2.5 X R0.1 | 2.5 | 16 | 50 | 4 | |
| 4JJCR 025 001 200 | 2.5 X R0.1 | 2.5 | 20 | 50 | 4 | |
| 4JJCR 025 001 250 | 2.5 X R0.1 | 2.5 | 25 | 60 | 4 | |

# 4JJCR

## 4 Flutes JJ Rib Corner Radius End Mills for Hardened Steels

## 4날 고경도재 가공용 제이제이 리브 코너 레디우스 엔드밀



단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4JJCR 025 001 300 | 2.5 X R0.1 | 2.5 | 30 | 70 | 4 | |
| 4JJCR 025 002 100 | 2.5 X R0.2 | 2.5 | 10 | 50 | 4 | |
| 4JJCR 025 002 160 | 2.5 X R0.2 | 2.5 | 16 | 50 | 4 | |
| 4JJCR 025 002 200 | 2.5 X R0.2 | 2.5 | 20 | 50 | 4 | |
| 4JJCR 025 002 250 | 2.5 X R0.2 | 2.5 | 25 | 60 | 4 | |
| 4JJCR 025 002 300 | 2.5 X R0.2 | 2.5 | 30 | 70 | 4 | |
| 4JJCR 025 003 100 | 2.5 X R0.3 | 2.5 | 10 | 50 | 4 | |
| 4JJCR 025 003 160 | 2.5 X R0.3 | 2.5 | 16 | 50 | 4 | |
| 4JJCR 025 003 200 | 2.5 X R0.3 | 2.5 | 20 | 50 | 4 | |
| 4JJCR 025 003 250 | 2.5 X R0.3 | 2.5 | 25 | 60 | 4 | |
| 4JJCR 025 003 300 | 2.5 X R0.3 | 2.5 | 30 | 70 | 4 | |
| 4JJCR 025 005 100 | 2.5 X R0.5 | 2.5 | 10 | 50 | 4 | |
| 4JJCR 025 005 160 | 2.5 X R0.5 | 2.5 | 16 | 50 | 4 | |
| 4JJCR 025 005 200 | 2.5 X R0.5 | 2.5 | 20 | 50 | 4 | |
| 4JJCR 025 005 250 | 2.5 X R0.5 | 2.5 | 25 | 60 | 4 | |
| 4JJCR 025 005 300 | 2.5 X R0.5 | 2.5 | 30 | 70 | 4 | |
| 4JJCR 030 001 100 | 3 X R0.1 | 3 | 10 | 50 | 6 | |
| 4JJCR 030 001 120 | 3 X R0.1 | 3 | 12 | 50 | 6 | |
| 4JJCR 030 001 160 | 3 X R0.1 | 3 | 16 | 55 | 6 | |
| 4JJCR 030 001 200 | 3 X R0.1 | 3 | 20 | 60 | 6 | |
| 4JJCR 030 001 250 | 3 X R0.1 | 3 | 25 | 65 | 6 | |
| 4JJCR 030 001 300 | 3 X R0.1 | 3 | 30 | 70 | 6 | |
| 4JJCR 030 001 350 | 3 X R0.1 | 3 | 35 | 75 | 6 | |
| 4JJCR 030 001 400 | 3 X R0.1 | 3 | 40 | 80 | 6 | |
| 4JJCR 030 001 450 | 3 X R0.1 | 3 | 45 | 90 | 6 | |
| 4JJCR 030 002 100 | 3 X R0.2 | 3 | 10 | 50 | 6 | |
| 4JJCR 030 002 120 | 3 X R0.2 | 3 | 12 | 50 | 6 | |
| 4JJCR 030 002 160 | 3 X R0.2 | 3 | 16 | 55 | 6 | |
| 4JJCR 030 002 200 | 3 X R0.2 | 3 | 20 | 60 | 6 | |
| 4JJCR 030 002 250 | 3 X R0.2 | 3 | 25 | 65 | 6 | |
| 4JJCR 030 002 300 | 3 X R0.2 | 3 | 30 | 70 | 6 | |
| 4JJCR 030 002 350 | 3 X R0.2 | 3 | 35 | 75 | 6 | |
| 4JJCR 030 002 400 | 3 X R0.2 | 3 | 40 | 80 | 6 | |
| 4JJCR 030 002 450 | 3 X R0.2 | 3 | 45 | 90 | 6 | |
| 4JJCR 030 003 100 | 3 X R0.3 | 3 | 10 | 50 | 6 | |
| 4JJCR 030 003 120 | 3 X R0.3 | 3 | 12 | 50 | 6 | |
| 4JJCR 030 003 160 | 3 X R0.3 | 3 | 16 | 55 | 6 | |
| 4JJCR 030 003 200 | 3 X R0.3 | 3 | 20 | 60 | 6 | |
| 4JJCR 030 003 250 | 3 X R0.3 | 3 | 25 | 65 | 6 | |
| 4JJCR 030 003 300 | 3 X R0.3 | 3 | 30 | 70 | 6 | |
| 4JJCR 030 003 350 | 3 X R0.3 | 3 | 35 | 75 | 6 | |
| 4JJCR 030 003 400 | 3 X R0.3 | 3 | 40 | 80 | 6 | |
| 4JJCR 030 003 450 | 3 X R0.3 | 3 | 45 | 90 | 6 | |
| 4JJCR 030 005 100 | 3 X R0.5 | 3 | 10 | 50 | 6 | |
| 4JJCR 030 005 120 | 3 X R0.5 | 3 | 12 | 50 | 6 | |
| 4JJCR 030 005 160 | 3 X R0.5 | 3 | 16 | 55 | 6 | |
| 4JJCR 030 005 200 | 3 X R0.5 | 3 | 20 | 60 | 6 | |
| 4JJCR 030 005 250 | 3 X R0.5 | 3 | 25 | 65 | 6 | |
| 4JJCR 030 005 300 | 3 X R0.5 | 3 | 30 | 70 | 6 | |
| 4JJCR 030 005 350 | 3 X R0.5 | 3 | 35 | 75 | 6 | |
| 4JJCR 030 005 400 | 3 X R0.5 | 3 | 40 | 80 | 6 | |
| 4JJCR 030 005 450 | 3 X R0.5 | 3 | 45 | 90 | 6 | |
| 4JJCR 030 005 500 | 3 X R0.5 | 3 | 50 | 100 | 6 | |
| 4JJCR 030 010 100 | 3 X R1 | 3 | 10 | 50 | 6 | |
| 4JJCR 030 010 120 | 3 X R1 | 3 | 12 | 50 | 6 | |
| 4JJCR 030 010 160 | 3 X R1 | 3 | 16 | 55 | 6 | |
| 4JJCR 030 010 200 | 3 X R1 | 3 | 20 | 60 | 6 | |
| 4JJCR 030 010 250 | 3 X R1 | 3 | 25 | 65 | 6 | |
| 4JJCR 030 010 300 | 3 X R1 | 3 | 30 | 70 | 6 | |
| 4JJCR 030 010 350 | 3 X R1 | 3 | 35 | 75 | 6 | |
| 4JJCR 030 010 400 | 3 X R1 | 3 | 40 | 80 | 6 | |
| 4JJCR 030 010 450 | 3 X R1 | 3 | 45 | 90 | 6 | |
| 4JJCR 030 010 500 | 3 X R1 | 3 | 50 | 100 | 6 | |
| 4JJCR 040 001 130 | 4 X R0.1 | 4 | 13 | 55 | 6 | |
| 4JJCR 040 001 160 | 4 X R0.1 | 4 | 16 | 55 | 6 | |
| 4JJCR 040 001 200 | 4 X R0.1 | 4 | 20 | 60 | 6 | |
| 4JJCR 040 001 250 | 4 X R0.1 | 4 | 25 | 65 | 6 | |
| 4JJCR 040 001 300 | 4 X R0.1 | 4 | 30 | 70 | 6 | |
| 4JJCR 040 001 350 | 4 X R0.1 | 4 | 35 | 75 | 6 | |
| 4JJCR 040 001 400 | 4 X R0.1 | 4 | 40 | 80 | 6 | |
| 4JJCR 040 002 130 | 4 X R0.2 | 4 | 13 | 55 | 6 | |
| 4JJCR 040 002 160 | 4 X R0.2 | 4 | 16 | 55 | 6 | |
| 4JJCR 040 002 200 | 4 X R0.2 | 4 | 20 | 60 | 6 | |
| 4JJCR 040 002 250 | 4 X R0.2 | 4 | 25 | 65 | 6 | |
| 4JJCR 040 002 300 | 4 X R0.2 | 4 | 30 | 70 | 6 | |
| 4JJCR 040 002 350 | 4 X R0.2 | 4 | 35 | 75 | 6 | |
| 4JJCR 040 002 400 | 4 X R0.2 | 4 | 40 | 80 | 6 | |
| 4JJCR 040 002 450 | 4 X R0.2 | 4 | 45 | 90 | 6 | |
| 4JJCR 040 002 500 | 4 X R0.2 | 4 | 50 | 100 | 6 | |
| 4JJCR 040 003 130 | 4 X R0.3 | 4 | 13 | 55 | 6 | |
| 4JJCR 040 003 160 | 4 X R0.3 | 4 | 16 | 55 | 6 | |
| 4JJCR 040 003 200 | 4 X R0.3 | 4 | 20 | 60 | 6 | |
| 4JJCR 040 003 250 | 4 X R0.3 | 4 | 25 | 65 | 6 | |
| 4JJCR 040 003 300 | 4 X R0.3 | 4 | 30 | 70 | 6 | |
| 4JJCR 040 003 350 | 4 X R0.3 | 4 | 35 | 75 | 6 | |
| 4JJCR 040 003 400 | 4 X R0.3 | 4 | 40 | 80 | 6 | |
| 4JJCR 040 003 450 | 4 X R0.3 | 4 | 45 | 90 | 6 | |
| 4JJCR 040 003 500 | 4 X R0.3 | 4 | 50 | 100 | 6 | |
| 4JJCR 040 005 130 | 4 X R0.5 | 4 | 13 | 55 | 6 | |
| 4JJCR 040 005 160 | 4 X R0.5 | 4 | 16 | 55 | 6 | |
| 4JJCR 040 005 200 | 4 X R0.5 | 4 | 20 | 60 | 6 | |
| 4JJCR 040 005 250 | 4 X R0.5 | 4 | 25 | 65 | 6 | |
| 4JJCR 040 005 300 | 4 X R0.5 | 4 | 30 | 70 | 6 | |
| 4JJCR 040 005 350 | 4 X R0.5 | 4 | 35 | 75 | 6 | |
| 4JJCR 040 005 400 | 4 X R0.5 | 4 | 40 | 80 | 6 | |
| 4JJCR 040 005 450 | 4 X R0.5 | 4 | 45 | 90 | 6 | |
| 4JJCR 040 005 500 | 4 X R0.5 | 4 | 50 | 100 | 6 | |
| 4JJCR 040 005 550 | 4 X R0.5 | 4 | 55 | 100 | 6 | |
| 4JJCR 040 010 130 | 4 X R1 | 4 | 13 | 55 | 6 | |
| 4JJCR 040 010 160 | 4 X R1 | 4 | 16 | 55 | 6 | |
| 4JJCR 040 010 200 | 4 X R1 | 4 | 20 | 60 | 6 | |
| 4JJCR 040 010 250 | 4 X R1 | 4 | 25 | 65 | 6 | |
| 4JJCR 040 010 300 | 4 X R1 | 4 | 30 | 70 | 6 | |
| 4JJCR 040 010 350 | 4 X R1 | 4 | 35 | 75 | 6 | |
| 4JJCR 040 010 400 | 4 X R1 | 4 | 40 | 80 | 6 | |
| 4JJCR 040 010 450 | 4 X R1 | 4 | 45 | 90 | 6 | |
| 4JJCR 040 010 500 | 4 X R1 | 4 | 50 | 100 | 6 | |
| 4JJCR 040 010 550 | 4 X R1 | 4 | 55 | 100 | 6 | |
| 4JJCR 050 001 160 | 5 X R0.1 | 5 | 16 | 60 | 6 | |
| 4JJCR 050 001 300 | 5 X R0.1 | 5 | 30 | 70 | 6 | |
| 4JJCR 050 001 400 | 5 X R0.1 | 5 | 40 | 80 | 6 | |
| 4JJCR 050 002 160 | 5 X R0.2 | 5 | 16 | 60 | 6 | |
| 4JJCR 050 002 300 | 5 X R0.2 | 5 | 30 | 70 | 6 | |
| 4JJCR 050 002 400 | 5 X R0.2 | 5 | 40 | 80 | 6 | |
| 4JJCR 050 003 160 | 5 X R0.3 | 5 | 16 | 60 | 6 | |
| 4JJCR 050 003 300 | 5 X R0.3 | 5 | 30 | 70 | 6 | |
| 4JJCR 050 003 400 | 5 X R0.3 | 5 | 40 | 80 | 6 | |
| 4JJCR 050 005 160 | 5 X R0.5 | 5 | 16 | 60 | 6 | |
| 4JJCR 050 005 300 | 5 X R0.5 | 5 | 30 | 70 | 6 | |
| 4JJCR 050 005 400 | 5 X R0.5 | 5 | 40 | 80 | 6 | |
| 4JJCR 050 005 500 | 5 X R0.5 | 5 | 50 | 100 | 6 | |
| 4JJCR 050 005 600 | 5 X R0.5 | 5 | 60 | 110 | 6 | |
| 4JJCR 050 010 160 | 5 X R1 | 5 | 16 | 60 | 6 | |
| 4JJCR 050 010 300 | 5 X R1 | 5 | 30 | 70 | 6 | |
| 4JJCR 050 010 400 | 5 X R1 | 5 | 40 | 80 | 6 | |
| 4JJCR 050 010 500 | 5 X R1 | 5 | 50 | 100 | 6 | |
| 4JJCR 050 010 600 | 5 X R1 | 5 | 60 | 110 | 6 | |
| 4JJCR 060 001 200 | 6 X R0.1 | 7 | 20 | 60 | 6 | |

# 4날 고경도재 가공용 제이제이 리브 코너 레디우스 엔드밀



단위 : mm

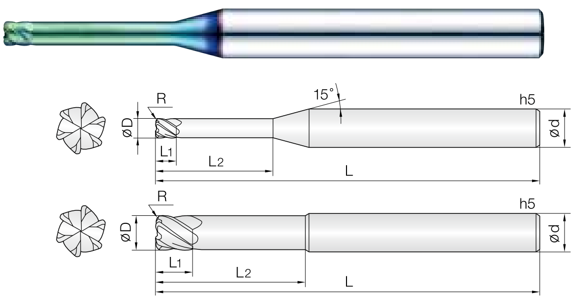
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4JJCR 060 001 400 | 6 X R0.1 | 7 | 40 | 80 | 6 | |
| 4JJCR 060 001 500 | 6 X R0.1 | 7 | 50 | 100 | 6 | |
| 4JJCR 060 002 200 | 6 X R0.2 | 7 | 20 | 60 | 6 | |
| 4JJCR 060 002 400 | 6 X R0.2 | 7 | 40 | 80 | 6 | |
| 4JJCR 060 002 500 | 6 X R0.2 | 7 | 50 | 100 | 6 | |
| 4JJCR 060 003 200 | 6 X R0.3 | 7 | 20 | 60 | 6 | |
| 4JJCR 060 003 400 | 6 X R0.3 | 7 | 40 | 80 | 6 | |
| 4JJCR 060 003 500 | 6 X R0.3 | 7 | 50 | 100 | 6 | |
| 4JJCR 060 005 200 | 6 X R0.5 | 7 | 20 | 60 | 6 | |
| 4JJCR 060 005 400 | 6 X R0.5 | 7 | 40 | 80 | 6 | |
| 4JJCR 060 005 500 | 6 X R0.5 | 7 | 50 | 100 | 6 | |
| 4JJCR 060 005 600 | 6 X R0.5 | 7 | 60 | 110 | 6 | |
| 4JJCR 060 010 200 | 6 X R1 | 7 | 20 | 60 | 6 | |
| 4JJCR 060 010 400 | 6 X R1 | 7 | 40 | 80 | 6 | |
| 4JJCR 060 010 500 | 6 X R1 | 7 | 50 | 100 | 6 | |
| 4JJCR 060 010 600 | 6 X R1 | 7 | 60 | 110 | 6 | |
| 4JJCR 060 015 200 | 6 X R1.5 | 7 | 20 | 60 | 6 | |
| 4JJCR 060 015 400 | 6 X R1.5 | 7 | 40 | 80 | 6 | |
| 4JJCR 060 015 500 | 6 X R1.5 | 7 | 50 | 100 | 6 | |
| 4JJCR 060 020 300 | 6 X R2 | 7 | 30 | 70 | 6 | |
| 4JJCR 060 020 400 | 6 X R2 | 7 | 40 | 80 | 6 | |
| 4JJCR 060 020 500 | 6 X R2 | 7 | 50 | 100 | 6 | |
| 4JJCR 080 002 220 | 8 X R0.2 | 9 | 22 | 65 | 8 | |
| 4JJCR 080 002 400 | 8 X R0.2 | 9 | 40 | 100 | 8 | |
| 4JJCR 080 003 220 | 8 X R0.3 | 9 | 22 | 65 | 8 | |
| 4JJCR 080 003 400 | 8 X R0.3 | 9 | 40 | 100 | 8 | |
| 4JJCR 080 005 220 | 8 X R0.5 | 9 | 22 | 65 | 8 | |
| 4JJCR 080 005 400 | 8 X R0.5 | 9 | 40 | 100 | 8 | |
| 4JJCR 080 005 500 | 8 X R0.5 | 9 | 50 | 120 | 8 | |
| 4JJCR 080 005 600 | 8 X R0.5 | 9 | 60 | 120 | 8 | |
| 4JJCR 080 010 220 | 8 X R1 | 9 | 22 | 65 | 8 | |
| 4JJCR 080 010 400 | 8 X R1 | 9 | 40 | 100 | 8 | |
| 4JJCR 080 010 500 | 8 X R1 | 9 | 50 | 120 | 8 | |
| 4JJCR 080 010 600 | 8 X R1 | 9 | 60 | 120 | 8 | |
| 4JJCR 080 015 220 | 8 X R1.5 | 9 | 22 | 65 | 8 | |
| 4JJCR 080 015 400 | 8 X R1.5 | 9 | 40 | 100 | 8 | |
| 4JJCR 080 020 220 | 8 X R2 | 9 | 22 | 65 | 8 | |
| 4JJCR 080 020 400 | 8 X R2 | 9 | 40 | 100 | 8 | |
| 4JJCR 080 020 500 | 8 X R2 | 9 | 50 | 120 | 8 | |
| 4JJCR 100 002 240 | 10 X R0.2 | 11 | 24 | 70 | 10 | |
| 4JJCR 100 002 400 | 10 X R0.2 | 11 | 40 | 100 | 10 | |
| 4JJCR 100 003 240 | 10 X R0.3 | 11 | 24 | 70 | 10 | |
| 4JJCR 100 003 400 | 10 X R0.3 | 11 | 40 | 100 | 10 | |
| 4JJCR 100 005 240 | 10 X R0.5 | 11 | 24 | 70 | 10 | |
| 4JJCR 100 005 400 | 10 X R0.5 | 11 | 40 | 100 | 10 | |
| 4JJCR 100 005 500 | 10 X R0.5 | 11 | 50 | 120 | 10 | |
| 4JJCR 100 005 600 | 10 X R0.5 | 11 | 60 | 120 | 10 | |
| 4JJCR 100 010 240 | 10 X R1 | 11 | 24 | 70 | 10 | |
| 4JJCR 100 010 400 | 10 X R1 | 11 | 40 | 100 | 10 | |
| 4JJCR 100 010 500 | 10 X R1 | 11 | 50 | 120 | 10 | |
| 4JJCR 100 010 600 | 10 X R1 | 11 | 60 | 120 | 10 | |
| 4JJCR 100 015 240 | 10 X R1.5 | 11 | 24 | 70 | 10 | |
| 4JJCR 100 015 400 | 10 X R1.5 | 11 | 40 | 100 | 10 | |
| 4JJCR 100 020 240 | 10 X R2 | 11 | 24 | 70 | 10 | |
| 4JJCR 100 020 400 | 10 X R2 | 11 | 40 | 100 | 10 | |
| 4JJCR 100 020 500 | 10 X R2 | 11 | 50 | 120 | 10 | |
| 4JJCR 100 025 240 | 10 X R2.5 | 11 | 24 | 70 | 10 | |
| 4JJCR 120 003 260 | 12 X R0.3 | 13 | 26 | 80 | 12 | |
| 4JJCR 120 005 260 | 12 X R0.5 | 13 | 26 | 80 | 12 | |
| 4JJCR 120 005 400 | 12 X R0.5 | 13 | 40 | 110 | 12 | |
| 4JJCR 120 005 600 | 12 X R0.5 | 13 | 60 | 130 | 12 | |
| 4JJCR 120 010 260 | 12 X R1 | 13 | 26 | 80 | 12 | |
| 4JJCR 120 010 400 | 12 X R1 | 13 | 40 | 110 | 12 | |
| 4JJCR 120 010 600 | 12 X R1 | 13 | 60 | 130 | 12 | |
| 4JJCR 120 015 260 | 12 X R1.5 | 13 | 26 | 80 | 12 | |
| 4JJCR 120 020 260 | 12 X R2 | 13 | 26 | 80 | 12 | |
| 4JJCR 120 020 400 | 12 X R2 | 13 | 40 | 110 | 12 | |
| 4JJCR 120 030 260 | 12 X R3 | 13 | 26 | 80 | 12 | |

# 6JJCR

*6 Flutes JJ Rib Corner Radius End Mills for Hardened Steels*

## 6날 고경도재 가공용 제이제이 리브 코너 레디우스 엔드밀






- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 코너R 형상을 날부치핑이 적도록 설계하였습니다.
- 다양한 코너R과 유효장으로 맞춤 가공이 가능합니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

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

6 | UWC 초미립자 | TISIN-S Coating | R ±0.005 | R ±0.01 | 38° Helix Angle | CUTTING DATA

R0.1 ~ 0.5 | R1 | 425P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø3 ~ 12 | +0 ~ -0.01mm | ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 6JJCR 030 001 120 | 3 X R0.1 | 3 | 12 | 55 | 6 | |
| 6JJCR 030 001 160 | 3 X R0.1 | 3 | 16 | 60 | 6 | |
| 6JJCR 030 001 200 | 3 X R0.1 | 3 | 20 | 65 | 6 | |
| 6JJCR 030 001 250 | 3 X R0.1 | 3 | 25 | 70 | 6 | |
| 6JJCR 030 001 300 | 3 X R0.1 | 3 | 30 | 75 | 6 | |
| 6JJCR 030 002 120 | 3 X R0.2 | 3 | 12 | 55 | 6 | |
| 6JJCR 030 002 160 | 3 X R0.2 | 3 | 16 | 60 | 6 | |
| 6JJCR 030 002 200 | 3 X R0.2 | 3 | 20 | 65 | 6 | |
| 6JJCR 030 002 250 | 3 X R0.2 | 3 | 25 | 70 | 6 | |
| 6JJCR 030 002 300 | 3 X R0.2 | 3 | 30 | 75 | 6 | |
| 6JJCR 030 003 120 | 3 X R0.3 | 3 | 12 | 55 | 6 | |
| 6JJCR 030 003 160 | 3 X R0.3 | 3 | 16 | 60 | 6 | |
| 6JJCR 030 003 200 | 3 X R0.3 | 3 | 20 | 65 | 6 | |
| 6JJCR 030 003 250 | 3 X R0.3 | 3 | 25 | 70 | 6 | |
| 6JJCR 030 003 300 | 3 X R0.3 | 3 | 30 | 75 | 6 | |
| 6JJCR 030 005 120 | 3 X R0.5 | 3 | 12 | 55 | 6 | |
| 6JJCR 030 005 160 | 3 X R0.5 | 3 | 16 | 60 | 6 | |
| 6JJCR 030 005 200 | 3 X R0.5 | 3 | 20 | 65 | 6 | |
| 6JJCR 030 005 250 | 3 X R0.5 | 3 | 25 | 70 | 6 | |
| 6JJCR 030 005 300 | 3 X R0.5 | 3 | 30 | 75 | 6 | |
| 6JJCR 030 010 120 | 3 X R1 | 3 | 12 | 55 | 6 | |
| 6JJCR 030 010 160 | 3 X R1 | 3 | 16 | 60 | 6 | |
| 6JJCR 030 010 200 | 3 X R1 | 3 | 20 | 65 | 6 | |
| 6JJCR 030 010 250 | 3 X R1 | 3 | 25 | 70 | 6 | |
| 6JJCR 030 010 300 | 3 X R1 | 3 | 30 | 75 | 6 | |
| 6JJCR 040 001 120 | 4 X R0.1 | 4 | 12 | 55 | 6 | |
| 6JJCR 040 001 160 | 4 X R0.1 | 4 | 16 | 60 | 6 | |
| 6JJCR 040 001 200 | 4 X R0.1 | 4 | 20 | 65 | 6 | |
| 6JJCR 040 001 250 | 4 X R0.1 | 4 | 25 | 70 | 6 | |
| 6JJCR 040 001 300 | 4 X R0.1 | 4 | 30 | 75 | 6 | |
| 6JJCR 040 002 120 | 4 X R0.2 | 4 | 12 | 55 | 6 | |
| 6JJCR 040 002 160 | 4 X R0.2 | 4 | 16 | 60 | 6 | |
| 6JJCR 040 002 200 | 4 X R0.2 | 4 | 20 | 65 | 6 | |
| 6JJCR 040 002 250 | 4 X R0.2 | 4 | 25 | 70 | 6 | |
| 6JJCR 040 002 300 | 4 X R0.2 | 4 | 30 | 75 | 6 | |
| 6JJCR 040 003 120 | 4 X R0.3 | 4 | 12 | 55 | 6 | |
| 6JJCR 040 003 160 | 4 X R0.3 | 4 | 16 | 60 | 6 | |
| 6JJCR 040 003 200 | 4 X R0.3 | 4 | 20 | 65 | 6 | |
| 6JJCR 040 003 250 | 4 X R0.3 | 4 | 25 | 70 | 6 | |
| 6JJCR 040 003 300 | 4 X R0.3 | 4 | 30 | 75 | 6 | |
| 6JJCR 040 005 120 | 4 X R0.5 | 4 | 12 | 55 | 6 | |
| 6JJCR 040 005 160 | 4 X R0.5 | 4 | 16 | 60 | 6 | |
| 6JJCR 040 005 200 | 4 X R0.5 | 4 | 20 | 65 | 6 | |
| 6JJCR 040 005 250 | 4 X R0.5 | 4 | 25 | 70 | 6 | |
| 6JJCR 040 005 300 | 4 X R0.5 | 4 | 30 | 75 | 6 | |
| 6JJCR 040 010 120 | 4 X R1 | 4 | 12 | 55 | 6 | |
| 6JJCR 040 010 160 | 4 X R1 | 4 | 16 | 60 | 6 | |
| 6JJCR 040 010 200 | 4 X R1 | 4 | 20 | 65 | 6 | |
| 6JJCR 040 010 250 | 4 X R1 | 4 | 25 | 70 | 6 | |
| 6JJCR 040 010 300 | 4 X R1 | 4 | 30 | 75 | 6 | |

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 6JJCR 050 001 160 | 5 X R0.1 | 5 | 16 | 60 | 6 | |
| 6JJCR 050 001 200 | 5 X R0.1 | 5 | 20 | 65 | 6 | |
| 6JJCR 050 001 300 | 5 X R0.1 | 5 | 30 | 75 | 6 | |
| 6JJCR 050 002 160 | 5 X R0.2 | 5 | 16 | 60 | 6 | |
| 6JJCR 050 002 200 | 5 X R0.2 | 5 | 20 | 65 | 6 | |
| 6JJCR 050 002 300 | 5 X R0.2 | 5 | 30 | 75 | 6 | |
| 6JJCR 050 003 160 | 5 X R0.3 | 5 | 16 | 60 | 6 | |
| 6JJCR 050 003 200 | 5 X R0.3 | 5 | 20 | 65 | 6 | |
| 6JJCR 050 003 300 | 5 X R0.3 | 5 | 30 | 75 | 6 | |
| 6JJCR 050 005 160 | 5 X R0.5 | 5 | 16 | 60 | 6 | |
| 6JJCR 050 005 200 | 5 X R0.5 | 5 | 20 | 65 | 6 | |
| 6JJCR 050 005 300 | 5 X R0.5 | 5 | 30 | 75 | 6 | |
| 6JJCR 050 010 160 | 5 X R1 | 5 | 16 | 60 | 6 | |
| 6JJCR 050 010 200 | 5 X R1 | 5 | 20 | 65 | 6 | |
| 6JJCR 050 010 300 | 5 X R1 | 5 | 30 | 75 | 6 | |
| 6JJCR 060 001 210 | 6 X R0.1 | 6 | 21 | 60 | 6 | |
| 6JJCR 060 001 310 | 6 X R0.1 | 6 | 31 | 70 | 6 | |
| 6JJCR 060 001 410 | 6 X R0.1 | 6 | 41 | 80 | 6 | |
| 6JJCR 060 002 210 | 6 X R0.2 | 6 | 21 | 60 | 6 | |
| 6JJCR 060 002 310 | 6 X R0.2 | 6 | 31 | 70 | 6 | |
| 6JJCR 060 002 410 | 6 X R0.2 | 6 | 41 | 80 | 6 | |
| 6JJCR 060 003 210 | 6 X R0.3 | 6 | 21 | 60 | 6 | |
| 6JJCR 060 003 310 | 6 X R0.3 | 6 | 31 | 70 | 6 | |
| 6JJCR 060 003 410 | 6 X R0.3 | 6 | 41 | 80 | 6 | |
| 6JJCR 060 005 210 | 6 X R0.5 | 6 | 21 | 60 | 6 | |
| 6JJCR 060 005 310 | 6 X R0.5 | 6 | 31 | 70 | 6 | |
| 6JJCR 060 005 410 | 6 X R0.5 | 6 | 41 | 80 | 6 | |
| 6JJCR 060 010 210 | 6 X R1 | 6 | 21 | 60 | 6 | |
| 6JJCR 060 010 310 | 6 X R1 | 6 | 31 | 70 | 6 | |
| 6JJCR 060 010 410 | 6 X R1 | 6 | 41 | 80 | 6 | |
| 6JJCR 080 003 260 | 8 X R0.3 | 8 | 26 | 70 | 8 | |
| 6JJCR 080 003 360 | 8 X R0.3 | 8 | 36 | 80 | 8 | |
| 6JJCR 080 003 460 | 8 X R0.3 | 8 | 46 | 90 | 8 | |
| 6JJCR 080 005 260 | 8 X R0.5 | 8 | 26 | 70 | 8 | |
| 6JJCR 080 005 360 | 8 X R0.5 | 8 | 36 | 80 | 8 | |
| 6JJCR 080 005 460 | 8 X R0.5 | 8 | 46 | 90 | 8 | |
| 6JJCR 080 010 260 | 8 X R1 | 8 | 26 | 70 | 8 | |
| 6JJCR 080 010 360 | 8 X R1 | 8 | 36 | 80 | 8 | |
| 6JJCR 080 010 460 | 8 X R1 | 8 | 46 | 90 | 8 | |
| 6JJCR 100 003 310 | 10 X R0.3 | 10 | 31 | 80 | 10 | |
| 6JJCR 100 003 410 | 10 X R0.3 | 10 | 41 | 90 | 10 | |
| 6JJCR 100 003 510 | 10 X R0.3 | 10 | 51 | 100 | 10 | |
| 6JJCR 100 005 310 | 10 X R0.5 | 10 | 31 | 80 | 10 | |
| 6JJCR 100 005 410 | 10 X R0.5 | 10 | 41 | 90 | 10 | |
| 6JJCR 100 005 510 | 10 X R0.5 | 10 | 51 | 100 | 10 | |
| 6JJCR 100 010 310 | 10 X R1 | 10 | 31 | 80 | 10 | |
| 6JJCR 100 010 410 | 10 X R1 | 10 | 41 | 90 | 10 | |
| 6JJCR 100 010 510 | 10 X R1 | 10 | 51 | 100 | 10 | |
| 6JJCR 120 003 360 | 12 X R0.3 | 12 | 36 | 90 | 12 | |
| 6JJCR 120 003 460 | 12 X R0.3 | 12 | 46 | 100 | 12 | |

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 6JJCR 120 003 560 | 12 X R0.3 | 12 | 56 | 110 | 12 | |
| 6JJCR 120 005 360 | 12 X R0.5 | 12 | 36 | 90 | 12 | |
| 6JJCR 120 005 460 | 12 X R0.5 | 12 | 46 | 100 | 12 | |
| 6JJCR 120 005 560 | 12 X R0.5 | 12 | 56 | 110 | 12 | |
| 6JJCR 120 010 360 | 12 X R1 | 12 | 36 | 90 | 12 | |
| 6JJCR 120 010 460 | 12 X R1 | 12 | 46 | 100 | 12 | |
| 6JJCR 120 010 560 | 12 X R1 | 12 | 56 | 110 | 12 | |

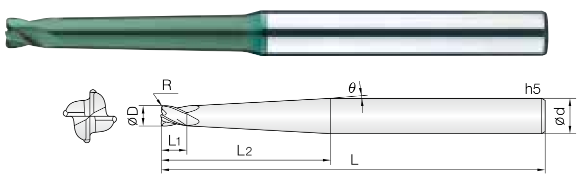
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

# 4JJTC

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

## 4날 고경도재 가공용 제이제이 테이퍼 넥 코너 레디우스 엔드밀






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

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

4 | UWC 초미립자 | TISIN-S Coating | R ±0.005 | 30° Helix Angle | CUTTING DATA

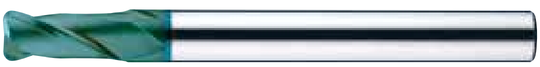
R0.1 ~ 0.5 | 425P

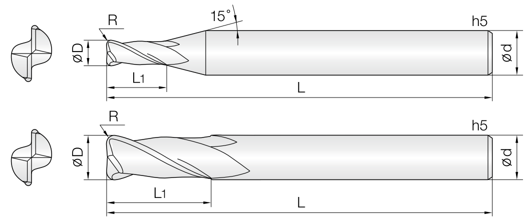
| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 4 | +0 ~ -0.01mm |

단위 : mm

| Order Number | 날경 Diameter D×R | 각도 Angle θ | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|
| 4JJTC 010 001 0601 | 1 X R0.1 | 1° | 1 | 6 | 50 | 4 | |
| 4JJTC 010 001 1001 | 1 X R0.1 | 1° | 1 | 10 | 50 | 4 | |
| 4JJTC 010 001 1501 | 1 X R0.1 | 1° | 1 | 15 | 50 | 4 | |
| 4JJTC 010 001 2001 | 1 X R0.1 | 1° | 1 | 20 | 60 | 4 | |
| 4JJTC 010 001 2501 | 1 X R0.1 | 1° | 1 | 25 | 60 | 4 | |
| 4JJTC 010 001 3001 | 1 X R0.1 | 1° | 1 | 30 | 70 | 4 | |
| 4JJTC 010 001 3501 | 1 X R0.1 | 1° | 1 | 35 | 75 | 4 | |
| 4JJTC 010 002 0601 | 1 X R0.2 | 1° | 1 | 6 | 50 | 4 | |
| 4JJTC 010 002 1001 | 1 X R0.2 | 1° | 1 | 10 | 50 | 4 | |
| 4JJTC 010 002 1501 | 1 X R0.2 | 1° | 1 | 15 | 50 | 4 | |
| 4JJTC 010 002 2001 | 1 X R0.2 | 1° | 1 | 20 | 60 | 4 | |
| 4JJTC 010 002 2501 | 1 X R0.2 | 1° | 1 | 25 | 60 | 4 | |
| 4JJTC 010 002 3001 | 1 X R0.2 | 1° | 1 | 30 | 70 | 4 | |
| 4JJTC 010 002 3501 | 1 X R0.2 | 1° | 1 | 35 | 75 | 4 | |
| 4JJTC 010 003 1001 | 1 X R0.3 | 1° | 1 | 10 | 50 | 4 | |
| 4JJTC 010 003 1501 | 1 X R0.3 | 1° | 1 | 15 | 50 | 4 | |
| 4JJTC 010 003 2001 | 1 X R0.3 | 1° | 1 | 20 | 60 | 4 | |
| 4JJTC 010 003 2501 | 1 X R0.3 | 1° | 1 | 25 | 60 | 4 | |
| 4JJTC 015 002 1001 | 1.5 X R0.2 | 1° | 1.5 | 10 | 50 | 4 | |
| 4JJTC 015 002 1501 | 1.5 X R0.2 | 1° | 1.5 | 15 | 50 | 4 | |
| 4JJTC 015 002 2001 | 1.5 X R0.2 | 1° | 1.5 | 20 | 60 | 4 | |
| 4JJTC 015 002 2501 | 1.5 X R0.2 | 1° | 1.5 | 25 | 60 | 4 | |
| 4JJTC 015 002 3001 | 1.5 X R0.2 | 1° | 1.5 | 30 | 70 | 4 | |
| 4JJTC 015 002 3501 | 1.5 X R0.2 | 1° | 1.5 | 35 | 75 | 4 | |
| 4JJTC 015 003 1501 | 1.5 X R0.3 | 1° | 1.5 | 15 | 50 | 4 | |
| 4JJTC 015 003 2001 | 1.5 X R0.3 | 1° | 1.5 | 20 | 60 | 4 | |
| 4JJTC 015 003 2501 | 1.5 X R0.3 | 1° | 1.5 | 25 | 60 | 4 | |
| 4JJTC 015 005 1001 | 1.5 X R0.5 | 1° | 1.5 | 10 | 50 | 4 | |
| 4JJTC 015 005 1501 | 1.5 X R0.5 | 1° | 1.5 | 15 | 50 | 4 | |
| 4JJTC 015 005 2001 | 1.5 X R0.5 | 1° | 1.5 | 20 | 60 | 4 | |
| 4JJTC 015 005 2501 | 1.5 X R0.5 | 1° | 1.5 | 25 | 60 | 4 | |
| 4JJTC 015 005 3001 | 1.5 X R0.5 | 1° | 1.5 | 30 | 70 | 4 | |
| 4JJTC 015 005 3501 | 1.5 X R0.5 | 1° | 1.5 | 35 | 75 | 4 | |
| 4JJTC 020 002 1201 | 2 X R0.2 | 1° | 2 | 12 | 50 | 4 | |
| 4JJTC 020 002 1601 | 2 X R0.2 | 1° | 2 | 16 | 50 | 4 | |
| 4JJTC 020 002 2001 | 2 X R0.2 | 1° | 2 | 20 | 60 | 4 | |
| 4JJTC 020 002 2501 | 2 X R0.2 | 1° | 2 | 25 | 60 | 4 | |
| 4JJTC 020 002 3001 | 2 X R0.2 | 1° | 2 | 30 | 70 | 4 | |
| 4JJTC 020 002 3501 | 2 X R0.2 | 1° | 2 | 35 | 75 | 4 | |
| 4JJTC 020 002 4001 | 2 X R0.2 | 1° | 2 | 40 | 80 | 4 | |
| 4JJTC 020 002 5001 | 2 X R0.2 | 1° | 2 | 50 | 90 | 4 | |
| 4JJTC 020 003 2001 | 2 X R0.3 | 1° | 2 | 20 | 60 | 4 | |
| 4JJTC 020 003 3001 | 2 X R0.3 | 1° | 2 | 30 | 70 | 4 | |
| 4JJTC 020 003 4001 | 2 X R0.3 | 1° | 2 | 40 | 80 | 4 | |
| 4JJTC 020 005 1201 | 2 X R0.5 | 1° | 2 | 12 | 50 | 4 | |
| 4JJTC 020 005 1601 | 2 X R0.5 | 1° | 2 | 16 | 50 | 4 | |
| 4JJTC 020 005 2001 | 2 X R0.5 | 1° | 2 | 20 | 60 | 4 | |
| 4JJTC 020 005 2501 | 2 X R0.5 | 1° | 2 | 25 | 60 | 4 | |
| 4JJTC 020 005 3001 | 2 X R0.5 | 1° | 2 | 30 | 70 | 4 | |
| 4JJTC 020 005 3501 | 2 X R0.5 | 1° | 2 | 35 | 75 | 4 | |
| 4JJTC 020 005 4001 | 2 X R0.5 | 1° | 2 | 40 | 80 | 4 | |
| 4JJTC 020 005 5001 | 2 X R0.5 | 1° | 2 | 50 | 90 | 4 | |
| 4JJTC 030 002 2001 | 3 X R0.2 | 1° | 3 | 20 | 60 | 6 | |
| 4JJTC 030 002 3001 | 3 X R0.2 | 1° | 3 | 30 | 70 | 6 | |
| 4JJTC 030 002 4001 | 3 X R0.2 | 1° | 3 | 40 | 80 | 6 | |
| 4JJTC 030 002 5001 | 3 X R0.2 | 1° | 3 | 50 | 90 | 6 | |
| 4JJTC 030 002 6001 | 3 X R0.2 | 1° | 3 | 60 | 100 | 6 | |
| 4JJTC 030 003 4001 | 3 X R0.3 | 1° | 3 | 40 | 80 | 6 | |
| 4JJTC 030 003 5001 | 3 X R0.3 | 1° | 3 | 50 | 90 | 6 | |
| 4JJTC 030 003 6001 | 3 X R0.3 | 1° | 3 | 60 | 100 | 6 | |
| 4JJTC 030 005 2001 | 3 X R0.5 | 1° | 3 | 20 | 60 | 6 | |
| 4JJTC 030 005 3001 | 3 X R0.5 | 1° | 3 | 30 | 70 | 6 | |
| 4JJTC 030 005 4001 | 3 X R0.5 | 1° | 3 | 40 | 80 | 6 | |
| 4JJTC 030 005 5001 | 3 X R0.5 | 1° | 3 | 50 | 90 | 6 | |
| 4JJTC 030 005 6001 | 3 X R0.5 | 1° | 3 | 60 | 100 | 6 | |
| 4JJTC 040 002 2001 | 4 X R0.2 | 1° | 4 | 20 | 60 | 6 | |
| 4JJTC 040 002 3001 | 4 X R0.2 | 1° | 4 | 30 | 70 | 6 | |
| 4JJTC 040 002 4001 | 4 X R0.2 | 1° | 4 | 40 | 80 | 6 | |
| 4JJTC 040 002 5001 | 4 X R0.2 | 1° | 4 | 50 | 90 | 6 | |
| 4JJTC 040 002 6001 | 4 X R0.2 | 1° | 4 | 60 | 100 | 6 | |
| 4JJTC 040 003 4001 | 4 X R0.3 | 1° | 4 | 40 | 80 | 6 | |
| 4JJTC 040 003 5001 | 4 X R0.3 | 1° | 4 | 50 | 90 | 6 | |
| 4JJTC 040 003 6001 | 4 X R0.3 | 1° | 4 | 60 | 100 | 6 | |
| 4JJTC 040 005 2001 | 4 X R0.5 | 1° | 4 | 20 | 60 | 6 | |
| 4JJTC 040 005 3001 | 4 X R0.5 | 1° | 4 | 30 | 70 | 6 | |
| 4JJTC 040 005 4001 | 4 X R0.5 | 1° | 4 | 40 | 80 | 6 | |
| 4JJTC 040 005 5001 | 4 X R0.5 | 1° | 4 | 50 | 90 | 6 | |
| 4JJTC 040 005 6001 | 4 X R0.5 | 1° | 4 | 60 | 100 | 6 | |

# 2JJC
## 2 Flutes JJ Corner Radius End Mills for Hardened Steels
## 2날 고경도재 가공용 제이제이 코너 레디우스 엔드밀






- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 코너R 형상을 날부치핑이 적도록 설계하였습니다.
- 다양한 코너R과 전장으로 맞춤 가공이 가능합니다.
- 초미립자 초경합금(0.2㎛)을 채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- Various corner R and overall length for wide range application.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

2 | UWC 초미립자 | TISIN-S Coating | R ±0.005 | R ±0.01 | R ±0.015 | 30° Helix Angle | CUTTING DATA

R0.02 ~ 0.5 | R1 ~ 1.5 | R2 ~ 5 | 426P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.2 ~ 14 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |
| | Ø14 | -0.01 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2JJC 002 0002 S04 | 0.2 X R0.02 | 0.4 | 45 | 4 | |
| 2JJC 002 0005 S04 | 0.2 X R0.05 | 0.4 | 45 | 4 | |
| 2JJC 003 0002 S04 | 0.3 X R0.02 | 0.6 | 45 | 4 | |
| 2JJC 003 0005 S04 | 0.3 X R0.05 | 0.6 | 45 | 4 | |
| 2JJC 003 001 S04 | 0.3 X R0.1 | 0.6 | 45 | 4 | |
| 2JJC 004 0002 S04 | 0.4 X R0.02 | 0.8 | 45 | 4 | |
| 2JJC 004 0005 S04 | 0.4 X R0.05 | 0.8 | 45 | 4 | |
| 2JJC 004 001 S04 | 0.4 X R0.1 | 0.8 | 45 | 4 | |
| 2JJC 005 0002 S04 | 0.5 X R0.02 | 1 | 45 | 4 | |
| 2JJC 005 0005 S04 | 0.5 X R0.05 | 1 | 45 | 4 | |
| 2JJC 005 001 S04 | 0.5 X R0.1 | 1 | 45 | 4 | |
| 2JJC 006 0002 S04 | 0.6 X R0.02 | 1.2 | 45 | 4 | |
| 2JJC 006 0005 S04 | 0.6 X R0.05 | 1.2 | 45 | 4 | |
| 2JJC 006 001 S04 | 0.6 X R0.1 | 1.2 | 45 | 4 | |
| 2JJC 006 002 S04 | 0.6 X R0.2 | 1.2 | 45 | 4 | |
| 2JJC 007 0005 S04 | 0.7 X R0.05 | 1.4 | 45 | 4 | |
| 2JJC 007 001 S04 | 0.7 X R0.1 | 1.4 | 45 | 4 | |
| 2JJC 007 002 S04 | 0.7 X R0.2 | 1.4 | 45 | 4 | |
| 2JJC 008 0002 S04 | 0.8 X R0.02 | 1.6 | 45 | 4 | |
| 2JJC 008 0005 S04 | 0.8 X R0.05 | 1.6 | 45 | 4 | |
| 2JJC 008 001 S04 | 0.8 X R0.1 | 1.6 | 45 | 4 | |
| 2JJC 008 002 S04 | 0.8 X R0.2 | 1.6 | 45 | 4 | |
| 2JJC 009 0005 S04 | 0.9 X R0.05 | 1.8 | 45 | 4 | |
| 2JJC 009 001 S04 | 0.9 X R0.1 | 1.8 | 45 | 4 | |
| 2JJC 010 0002 S04 | 1 X R0.02 | 2.5 | 45 | 4 | |
| 2JJC 010 0005 S04 | 1 X R0.05 | 2.5 | 45 | 4 | |
| 2JJC 010 001 S04 | 1 X R0.1 | 2.5 | 45 | 4 | |
| 2JJC 010 002 S04 | 1 X R0.2 | 2.5 | 45 | 4 | |
| 2JJC 010 003 S04 | 1 X R0.3 | 2.5 | 45 | 4 | |
| 2JJC 012 0002 S04 | 1.2 X R0.02 | 3.2 | 45 | 4 | |
| 2JJC 012 0005 S04 | 1.2 X R0.05 | 3.2 | 45 | 4 | |
| 2JJC 012 001 S04 | 1.2 X R0.1 | 3.2 | 45 | 4 | |
| 2JJC 012 002 S04 | 1.2 X R0.2 | 3.2 | 45 | 4 | |
| 2JJC 012 003 S04 | 1.2 X R0.3 | 3.2 | 45 | 4 | |
| 2JJC 015 0002 S04 | 1.5 X R0.02 | 4 | 45 | 4 | |
| 2JJC 015 0005 S04 | 1.5 X R0.05 | 4 | 45 | 4 | |
| 2JJC 015 001 S04 | 1.5 X R0.1 | 4 | 45 | 4 | |
| 2JJC 015 002 S04 | 1.5 X R0.2 | 4 | 45 | 4 | |
| 2JJC 015 003 S04 | 1.5 X R0.3 | 4 | 45 | 4 | |
| 2JJC 015 005 S04 | 1.5 X R0.5 | 4 | 45 | 4 | |
| 2JJC 020 0002 S04 | 2 X R0.02 | 6 | 45 | 4 | |
| 2JJC 020 0005 S04 | 2 X R0.05 | 6 | 45 | 4 | |
| 2JJC 020 001 S04 | 2 X R0.1 | 6 | 45 | 4 | |
| 2JJC 020 002 S04 | 2 X R0.2 | 6 | 45 | 4 | |
| 2JJC 020 003 S04 | 2 X R0.3 | 6 | 45 | 4 | |
| 2JJC 020 005 S04 | 2 X R0.5 | 6 | 45 | 4 | |
| 2JJC 025 001 S04 | 2.5 X R0.1 | 6 | 50 | 4 | |
| 2JJC 025 002 S04 | 2.5 X R0.2 | 6 | 50 | 4 | |
| 2JJC 025 003 S04 | 2.5 X R0.3 | 6 | 50 | 4 | |
| 2JJC 025 005 S04 | 2.5 X R0.5 | 6 | 50 | 4 | |

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2JJC 030 001 S06 | 3 X R0.1 | 8 | 60 | 6 | |
| 2JJC 030 002 S06 | 3 X R0.2 | 8 | 60 | 6 | |
| 2JJC 030 003 S06 | 3 X R0.3 | 8 | 60 | 6 | |
| 2JJC 030 005 S06 | 3 X R0.5 | 8 | 60 | 6 | |
| 2JJC 030 010 S06 | 3 X R1 | 8 | 60 | 6 | |
| 2JJC 040 001 S04 | 4 X R0.1 | 9 | 60 | 4 | |
| 2JJC 040 001 S06 | 4 X R0.1 | 10 | 70 | 6 | |
| 2JJC 040 002 S04 | 4 X R0.2 | 9 | 60 | 4 | |
| 2JJC 040 002 S06 | 4 X R0.2 | 10 | 70 | 6 | |
| 2JJC 040 003 S04 | 4 X R0.3 | 9 | 60 | 4 | |
| 2JJC 040 003 S06 | 4 X R0.3 | 10 | 70 | 6 | |
| 2JJC 040 005 S04 | 4 X R0.5 | 9 | 60 | 4 | |
| 2JJC 040 005 S06 | 4 X R0.5 | 10 | 70 | 6 | |
| 2JJC 040 010 S04 | 4 X R1 | 9 | 60 | 4 | |
| 2JJC 040 010 S06 | 4 X R1 | 10 | 70 | 6 | |
| 2JJC 050 001 S06 | 5 X R0.1 | 13 | 75 | 6 | |
| 2JJC 050 002 S06 | 5 X R0.2 | 13 | 75 | 6 | |
| 2JJC 050 003 S06 | 5 X R0.3 | 13 | 75 | 6 | |
| 2JJC 050 005 S06 | 5 X R0.5 | 13 | 75 | 6 | |
| 2JJC 050 010 S06 | 5 X R1 | 13 | 75 | 6 | |
| 2JJC 060 001 060 | 6 X R0.1 | 11 | 60 | 6 | |
| 2JJC 060 001 090 | 6 X R0.1 | 13 | 90 | 6 | |
| 2JJC 060 002 060 | 6 X R0.2 | 11 | 60 | 6 | |
| 2JJC 060 002 090 | 6 X R0.2 | 13 | 90 | 6 | |
| 2JJC 060 003 060 | 6 X R0.3 | 11 | 60 | 6 | |
| 2JJC 060 003 090 | 6 X R0.3 | 13 | 90 | 6 | |
| 2JJC 060 005 060 | 6 X R0.5 | 11 | 60 | 6 | |
| 2JJC 060 005 090 | 6 X R0.5 | 13 | 90 | 6 | |
| 2JJC 060 005 110 | 6 X R0.5 | 13 | 110 | 6 | |
| 2JJC 060 010 060 | 6 X R1 | 11 | 60 | 6 | |
| 2JJC 060 010 090 | 6 X R1 | 13 | 90 | 6 | |
| 2JJC 060 010 110 | 6 X R1 | 13 | 110 | 6 | |
| 2JJC 060 015 060 | 6 X R1.5 | 11 | 60 | 6 | |
| 2JJC 060 015 090 | 6 X R1.5 | 13 | 90 | 6 | |
| 2JJC 060 020 060 | 6 X R2 | 11 | 60 | 6 | |
| 2JJC 060 020 090 | 6 X R2 | 13 | 90 | 6 | |
| 2JJC 060 025 090 | 6 X R2.5 | 13 | 90 | 6 | |
| 2JJC 080 001 070 | 8 X R0.1 | 16 | 70 | 8 | |
| 2JJC 080 001 100 | 8 X R0.1 | 19 | 100 | 8 | |
| 2JJC 080 002 070 | 8 X R0.2 | 16 | 70 | 8 | |
| 2JJC 080 002 100 | 8 X R0.2 | 19 | 100 | 8 | |
| 2JJC 080 003 070 | 8 X R0.3 | 16 | 70 | 8 | |
| 2JJC 080 003 100 | 8 X R0.3 | 19 | 100 | 8 | |
| 2JJC 080 005 070 | 8 X R0.5 | 16 | 70 | 8 | |
| 2JJC 080 005 100 | 8 X R0.5 | 19 | 100 | 8 | |
| 2JJC 080 005 120 | 8 X R0.5 | 19 | 120 | 8 | |
| 2JJC 080 010 070 | 8 X R1 | 16 | 70 | 8 | |
| 2JJC 080 010 100 | 8 X R1 | 19 | 100 | 8 | |
| 2JJC 080 010 120 | 8 X R1 | 19 | 120 | 8 | |
| 2JJC 080 015 070 | 8 X R1.5 | 16 | 70 | 8 | |

# 2JJC

## 2 Flutes JJ Corner Radius End Mills for Hardened Steels

## 2날 고경도재 가공용 제이제이 코너 레디우스 엔드밀



단위 : mm

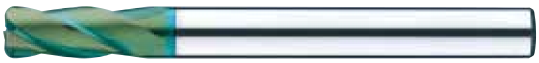
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2JJC 080 015 100 | 8 X R1.5 | 19 | 100 | 8 | |
| 2JJC 080 020 070 | 8 X R2 | 16 | 70 | 8 | |
| 2JJC 080 020 100 | 8 X R2 | 19 | 100 | 8 | |
| 2JJC 080 025 100 | 8 X R2.5 | 19 | 100 | 8 | |
| 2JJC 080 030 100 | 8 X R3 | 19 | 100 | 8 | |
| 2JJC 080 035 100 | 8 X R3.5 | 19 | 100 | 8 | |
| 2JJC 100 001 075 | 10 X R0.1 | 19 | 75 | 10 | |
| 2JJC 100 001 100 | 10 X R0.1 | 22 | 100 | 10 | |
| 2JJC 100 002 075 | 10 X R0.2 | 19 | 75 | 10 | |
| 2JJC 100 002 100 | 10 X R0.2 | 22 | 100 | 10 | |
| 2JJC 100 003 075 | 10 X R0.3 | 19 | 75 | 10 | |
| 2JJC 100 003 100 | 10 X R0.3 | 22 | 100 | 10 | |
| 2JJC 100 005 075 | 10 X R0.5 | 19 | 75 | 10 | |
| 2JJC 100 005 100 | 10 X R0.5 | 22 | 100 | 10 | |
| 2JJC 100 005 120 | 10 X R0.5 | 22 | 120 | 10 | |
| 2JJC 100 010 075 | 10 X R1 | 19 | 75 | 10 | |
| 2JJC 100 010 100 | 10 X R1 | 22 | 100 | 10 | |
| 2JJC 100 010 120 | 10 X R1 | 22 | 120 | 10 | |
| 2JJC 100 015 075 | 10 X R1.5 | 19 | 75 | 10 | |
| 2JJC 100 015 100 | 10 X R1.5 | 22 | 100 | 10 | |
| 2JJC 100 020 075 | 10 X R2 | 19 | 75 | 10 | |
| 2JJC 100 020 100 | 10 X R2 | 22 | 100 | 10 | |
| 2JJC 100 025 100 | 10 X R2.5 | 22 | 100 | 10 | |
| 2JJC 100 030 100 | 10 X R3 | 22 | 100 | 10 | |
| 2JJC 100 040 100 | 10 X R4 | 22 | 100 | 10 | |
| 2JJC 120 001 080 | 12 X R0.1 | 22 | 80 | 12 | |
| 2JJC 120 001 110 | 12 X R0.1 | 26 | 110 | 12 | |
| 2JJC 120 002 080 | 12 X R0.2 | 22 | 80 | 12 | |
| 2JJC 120 002 110 | 12 X R0.2 | 26 | 110 | 12 | |
| 2JJC 120 003 080 | 12 X R0.3 | 22 | 80 | 12 | |
| 2JJC 120 003 110 | 12 X R0.3 | 26 | 110 | 12 | |
| 2JJC 120 005 080 | 12 X R0.5 | 22 | 80 | 12 | |
| 2JJC 120 005 110 | 12 X R0.5 | 26 | 110 | 12 | |
| 2JJC 120 005 130 | 12 X R0.5 | 26 | 130 | 12 | |
| 2JJC 120 010 080 | 12 X R1 | 22 | 80 | 12 | |
| 2JJC 120 010 110 | 12 X R1 | 26 | 110 | 12 | |
| 2JJC 120 010 130 | 12 X R1 | 26 | 130 | 12 | |
| 2JJC 120 015 080 | 12 X R1.5 | 22 | 80 | 12 | |
| 2JJC 120 015 110 | 12 X R1.5 | 26 | 110 | 12 | |
| 2JJC 120 020 080 | 12 X R2 | 22 | 80 | 12 | |
| 2JJC 120 020 110 | 12 X R2 | 26 | 110 | 12 | |
| 2JJC 120 020 130 | 12 X R2 | 26 | 130 | 12 | |
| 2JJC 120 025 110 | 12 X R2.5 | 26 | 110 | 12 | |
| 2JJC 120 030 110 | 12 X R3 | 26 | 110 | 12 | |
| 2JJC 120 040 110 | 12 X R4 | 26 | 110 | 12 | |
| 2JJC 120 050 110 | 12 X R5 | 26 | 110 | 12 | |
| 2JJC 140 005 110 | 14 X R0.5 | 30 | 110 | 14 | |
| 2JJC 140 010 110 | 14 X R1 | 30 | 110 | 14 | |
| 2JJC 140 020 110 | 14 X R2 | 30 | 110 | 14 | |

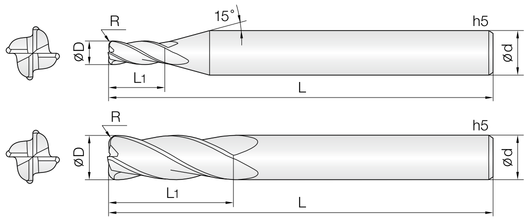
# 4JJC

## 4 Flutes JJ Corner Radius End Mills for Hardened Steels

## 4날 고경도재 가공용 제이제이 코너 레디우스 엔드밀








- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 코너R 형상을 날부치핑이 적도록 설계하였습니다.
- 다양한 코너R과 전장으로 맞춤 가공이 가능합니다.
- 초미립자 초경합금(0.2㎛)을 채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels (HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- Various corner R and overall length for wide range application.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

4 | UWC 초미립자 | TISIN-S Coating | R ±0.005 R0.05 ~ 0.5 | R ±0.01 R1 ~ 1.5 | R ±0.015 R2 ~ 3 | 30° Helix Angle | CUTTING DATA 427P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.4 ~ 16 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø3 ~ 12 | -0.005 ~ -0.015mm |
| | Ø14 ~ 16 | -0.01 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| New 4JJC 004 0005 S04 | 0.4 X R0.05 | 0.8 | 45 | 4 | |
| 4JJC 005 0005 S04 | 0.5 X R0.05 | 1 | 45 | 4 | |
| 4JJC 005 001 S04 | 0.5 X R0.1 | 1 | 45 | 4 | |
| 4JJC 006 0005 S04 | 0.6 X R0.05 | 1.2 | 45 | 4 | |
| 4JJC 006 001 S04 | 0.6 X R0.1 | 1.2 | 45 | 4 | |
| 4JJC 007 0005 S04 | 0.7 X R0.05 | 1.4 | 45 | 4 | |
| 4JJC 007 001 S04 | 0.7 X R0.1 | 1.4 | 45 | 4 | |
| 4JJC 008 0005 S04 | 0.8 X R0.05 | 1.6 | 45 | 4 | |
| 4JJC 008 001 S04 | 0.8 X R0.1 | 1.6 | 45 | 4 | |
| 4JJC 009 0005 S04 | 0.9 X R0.05 | 1.8 | 45 | 4 | |
| 4JJC 009 001 S04 | 0.9 X R0.1 | 1.8 | 45 | 4 | |
| 4JJC 010 0005 S04 | 1 X R0.05 | 2.5 | 45 | 4 | |
| 4JJC 010 001 S04 | 1 X R0.1 | 2.5 | 45 | 4 | |
| 4JJC 010 002 S04 | 1 X R0.2 | 2.5 | 45 | 4 | |
| 4JJC 010 003 S04 | 1 X R0.3 | 2.5 | 45 | 4 | |
| 4JJC 015 0005 S04 | 1.5 X R0.05 | 4 | 45 | 4 | |
| 4JJC 015 001 S04 | 1.5 X R0.1 | 4 | 45 | 4 | |
| 4JJC 015 002 S04 | 1.5 X R0.2 | 4 | 45 | 4 | |
| 4JJC 015 003 S04 | 1.5 X R0.3 | 4 | 45 | 4 | |
| 4JJC 015 005 S04 | 1.5 X R0.5 | 4 | 45 | 4 | |
| 4JJC 020 0005 S04 | 2 X R0.05 | 6 | 45 | 4 | |
| 4JJC 020 001 S04 | 2 X R0.1 | 6 | 45 | 4 | |
| 4JJC 020 002 S04 | 2 X R0.2 | 6 | 45 | 4 | |
| 4JJC 020 003 S04 | 2 X R0.3 | 6 | 45 | 4 | |
| 4JJC 020 005 S04 | 2 X R0.5 | 6 | 45 | 4 | |
| 4JJC 025 001 S04 | 2.5 X R0.1 | 6 | 50 | 4 | |
| 4JJC 025 002 S04 | 2.5 X R0.2 | 6 | 50 | 4 | |
| 4JJC 025 003 S04 | 2.5 X R0.3 | 6 | 50 | 4 | |
| 4JJC 025 005 S04 | 2.5 X R0.5 | 6 | 50 | 4 | |
| 4JJC 030 001 S03 | 3 X R0.1 | 8 | 60 | 3 | |
| New 4JJC 030 001 S04 | 3 X R0.1 | 8 | 60 | 4 | |
| 4JJC 030 001 S06 | 3 X R0.1 | 8 | 60 | 6 | |
| 4JJC 030 002 S03 | 3 X R0.2 | 8 | 60 | 3 | |
| New 4JJC 030 002 S04 | 3 X R0.2 | 8 | 60 | 4 | |
| 4JJC 030 002 S06 | 3 X R0.2 | 8 | 60 | 6 | |
| 4JJC 030 003 S03 | 3 X R0.3 | 8 | 60 | 3 | |
| New 4JJC 030 003 S04 | 3 X R0.3 | 8 | 60 | 4 | |
| 4JJC 030 003 S06 | 3 X R0.3 | 8 | 60 | 6 | |
| 4JJC 030 005 S03 | 3 X R0.5 | 8 | 60 | 3 | |
| New 4JJC 030 005 S04 | 3 X R0.5 | 8 | 60 | 4 | |
| 4JJC 030 005 S06 | 3 X R0.5 | 8 | 60 | 6 | |
| 4JJC 030 010 S03 | 3 X R1 | 8 | 60 | 3 | |
| New 4JJC 030 010 S04 | 3 X R1 | 8 | 60 | 4 | |
| 4JJC 030 010 S06 | 3 X R1 | 8 | 60 | 6 | |
| 4JJC 035 001 S06 | 3.5 X R0.1 | 9 | 70 | 6 | |
| 4JJC 035 002 S06 | 3.5 X R0.2 | 9 | 70 | 6 | |
| 4JJC 035 003 S06 | 3.5 X R0.3 | 9 | 70 | 6 | |
| 4JJC 035 005 S06 | 3.5 X R0.5 | 9 | 70 | 6 | |
| 4JJC 035 010 S06 | 3.5 X R1 | 9 | 70 | 6 | |
| 4JJC 040 001 S04 | 4 X R0.1 | 9 | 60 | 4 | |

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4JJC 040 001 S06 | 4 X R0.1 | 10 | 70 | 6 | |
| 4JJC 040 002 S04 | 4 X R0.2 | 9 | 60 | 4 | |
| 4JJC 040 002 S06 | 4 X R0.2 | 10 | 70 | 6 | |
| 4JJC 040 003 S04 | 4 X R0.3 | 9 | 60 | 4 | |
| 4JJC 040 003 S06 | 4 X R0.3 | 10 | 70 | 6 | |
| 4JJC 040 005 S04 | 4 X R0.5 | 9 | 60 | 4 | |
| 4JJC 040 005 S06 | 4 X R0.5 | 10 | 70 | 6 | |
| 4JJC 040 010 S04 | 4 X R1 | 9 | 60 | 4 | |
| 4JJC 040 010 S06 | 4 X R1 | 10 | 70 | 6 | |
| 4JJC 045 002 S06 | 4.5 X R0.2 | 11 | 75 | 6 | |
| 4JJC 045 003 S06 | 4.5 X R0.3 | 11 | 75 | 6 | |
| 4JJC 045 005 S06 | 4.5 X R0.5 | 11 | 75 | 6 | |
| 4JJC 045 010 S06 | 4.5 X R1 | 11 | 75 | 6 | |
| 4JJC 050 001 S06 | 5 X R0.1 | 13 | 75 | 6 | |
| 4JJC 050 002 S06 | 5 X R0.2 | 13 | 75 | 6 | |
| 4JJC 050 003 S06 | 5 X R0.3 | 13 | 75 | 6 | |
| 4JJC 050 005 S06 | 5 X R0.5 | 13 | 75 | 6 | |
| 4JJC 050 010 S06 | 5 X R1 | 13 | 75 | 6 | |
| 4JJC 060 0005 055 | 6 X R0.05 | 11 | 55 | 6 | |
| 4JJC 060 0005 080 | 6 X R0.05 | 13 | 80 | 6 | |
| 4JJC 060 001 055 | 6 X R0.1 | 11 | 55 | 6 | |
| 4JJC 060 001 080 | 6 X R0.1 | 13 | 80 | 6 | |
| 4JJC 060 002 055 | 6 X R0.2 | 11 | 55 | 6 | |
| 4JJC 060 002 080 | 6 X R0.2 | 13 | 80 | 6 | |
| 4JJC 060 002 100 | 6 X R0.2 | 13 | 100 | 6 | |
| 4JJC 060 002 120 | 6 X R0.2 | 13 | 120 | 6 | |
| 4JJC 060 003 055 | 6 X R0.3 | 11 | 55 | 6 | |
| 4JJC 060 003 080 | 6 X R0.3 | 13 | 80 | 6 | |
| 4JJC 060 003 100 | 6 X R0.3 | 13 | 100 | 6 | |
| 4JJC 060 003 120 | 6 X R0.3 | 13 | 120 | 6 | |
| 4JJC 060 005 055 | 6 X R0.5 | 11 | 55 | 6 | |
| 4JJC 060 005 080 | 6 X R0.5 | 13 | 80 | 6 | |
| 4JJC 060 005 100 | 6 X R0.5 | 13 | 100 | 6 | |
| 4JJC 060 005 120 | 6 X R0.5 | 13 | 120 | 6 | |
| 4JJC 060 010 055 | 6 X R1 | 11 | 55 | 6 | |
| 4JJC 060 010 080 | 6 X R1 | 13 | 80 | 6 | |
| 4JJC 060 010 100 | 6 X R1 | 13 | 100 | 6 | |
| 4JJC 060 010 120 | 6 X R1 | 13 | 120 | 6 | |
| 4JJC 060 015 055 | 6 X R1.5 | 11 | 55 | 6 | |
| 4JJC 060 015 080 | 6 X R1.5 | 13 | 80 | 6 | |
| 4JJC 060 020 055 | 6 X R2 | 11 | 55 | 6 | |
| 4JJC 060 020 080 | 6 X R2 | 13 | 80 | 6 | |
| 4JJC 070 002 S08 | 7 X R0.2 | 16 | 80 | 8 | |
| 4JJC 070 003 S08 | 7 X R0.3 | 16 | 80 | 8 | |
| 4JJC 070 005 S08 | 7 X R0.5 | 16 | 80 | 8 | |
| 4JJC 070 010 S08 | 7 X R1 | 16 | 80 | 8 | |
| 4JJC 080 001 060 | 8 X R0.1 | 16 | 60 | 8 | |
| 4JJC 080 001 090 | 8 X R0.1 | 19 | 90 | 8 | |
| 4JJC 080 002 060 | 8 X R0.2 | 16 | 60 | 8 | |
| 4JJC 080 002 090 | 8 X R0.2 | 19 | 90 | 8 | |

# 4날 고경도재 가공용 제이제이 코너 레디우스 엔드밀



단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4JJC 080 003 060 | 8 X R0.3 | 16 | 60 | 8 | |
| 4JJC 080 003 090 | 8 X R0.3 | 19 | 90 | 8 | |
| 4JJC 080 005 060 | 8 X R0.5 | 16 | 60 | 8 | |
| 4JJC 080 005 090 | 8 X R0.5 | 19 | 90 | 8 | |
| 4JJC 080 005 110 | 8 X R0.5 | 19 | 110 | 8 | |
| 4JJC 080 005 150 | 8 X R0.5 | 19 | 150 | 8 | |
| 4JJC 080 010 060 | 8 X R1 | 16 | 60 | 8 | |
| 4JJC 080 010 090 | 8 X R1 | 19 | 90 | 8 | |
| 4JJC 080 010 110 | 8 X R1 | 19 | 110 | 8 | |
| 4JJC 080 010 150 | 8 X R1 | 19 | 150 | 8 | |
| 4JJC 080 015 060 | 8 X R1.5 | 16 | 60 | 8 | |
| 4JJC 080 015 090 | 8 X R1.5 | 19 | 90 | 8 | |
| 4JJC 080 020 060 | 8 X R2 | 16 | 60 | 8 | |
| 4JJC 080 020 090 | 8 X R2 | 19 | 90 | 8 | |
| 4JJC 090 002 S10 | 9 X R0.2 | 20 | 90 | 10 | |
| 4JJC 090 003 S10 | 9 X R0.3 | 20 | 90 | 10 | |
| 4JJC 090 005 S10 | 9 X R0.5 | 20 | 90 | 10 | |
| 4JJC 090 010 S10 | 9 X R1 | 20 | 90 | 10 | |
| 4JJC 100 001 070 | 10 X R0.1 | 19 | 70 | 10 | |
| 4JJC 100 001 100 | 10 X R0.1 | 22 | 100 | 10 | |
| 4JJC 100 002 070 | 10 X R0.2 | 19 | 70 | 10 | |
| 4JJC 100 002 100 | 10 X R0.2 | 22 | 100 | 10 | |
| 4JJC 100 003 070 | 10 X R0.3 | 19 | 70 | 10 | |
| 4JJC 100 003 100 | 10 X R0.3 | 22 | 100 | 10 | |
| 4JJC 100 005 070 | 10 X R0.5 | 19 | 70 | 10 | |
| 4JJC 100 005 100 | 10 X R0.5 | 22 | 100 | 10 | |
| 4JJC 100 005 120 | 10 X R0.5 | 22 | 120 | 10 | |
| 4JJC 100 005 150 | 10 X R0.5 | 22 | 150 | 10 | |
| 4JJC 100 010 070 | 10 X R1 | 19 | 70 | 10 | |
| 4JJC 100 010 100 | 10 X R1 | 22 | 100 | 10 | |
| 4JJC 100 010 120 | 10 X R1 | 22 | 120 | 10 | |
| 4JJC 100 010 150 | 10 X R1 | 22 | 150 | 10 | |
| 4JJC 100 015 070 | 10 X R1.5 | 19 | 70 | 10 | |
| 4JJC 100 015 100 | 10 X R1.5 | 22 | 100 | 10 | |
| 4JJC 100 020 070 | 10 X R2 | 19 | 70 | 10 | |
| 4JJC 100 020 100 | 10 X R2 | 22 | 100 | 10 | |
| 4JJC 100 020 120 | 10 X R2 | 22 | 120 | 10 | |
| 4JJC 100 020 150 | 10 X R2 | 22 | 150 | 10 | |
| 4JJC 100 025 070 | 10 X R2.5 | 19 | 70 | 10 | |
| 4JJC 100 025 100 | 10 X R2.5 | 22 | 100 | 10 | |
| 4JJC 110 003 S12 | 11 X R0.3 | 24 | 100 | 12 | |
| 4JJC 110 005 S12 | 11 X R0.5 | 24 | 100 | 12 | |
| 4JJC 110 010 S12 | 11 X R1 | 24 | 100 | 12 | |
| 4JJC 120 001 075 | 12 X R0.1 | 22 | 75 | 12 | |
| 4JJC 120 001 110 | 12 X R0.1 | 26 | 110 | 12 | |
| 4JJC 120 002 075 | 12 X R0.2 | 22 | 75 | 12 | |
| 4JJC 120 002 110 | 12 X R0.2 | 26 | 110 | 12 | |
| 4JJC 120 003 075 | 12 X R0.3 | 22 | 75 | 12 | |
| 4JJC 120 003 110 | 12 X R0.3 | 26 | 110 | 12 | |
| 4JJC 120 005 075 | 12 X R0.5 | 22 | 75 | 12 | |
| 4JJC 120 005 110 | 12 X R0.5 | 26 | 110 | 12 | |
| 4JJC 120 005 130 | 12 X R0.5 | 26 | 130 | 12 | |
| 4JJC 120 005 160 | 12 X R0.5 | 26 | 160 | 12 | |
| 4JJC 120 010 075 | 12 X R1 | 22 | 75 | 12 | |
| 4JJC 120 010 110 | 12 X R1 | 26 | 110 | 12 | |
| 4JJC 120 010 130 | 12 X R1 | 26 | 130 | 12 | |
| 4JJC 120 010 160 | 12 X R1 | 26 | 160 | 12 | |
| 4JJC 120 015 075 | 12 X R1.5 | 22 | 75 | 12 | |
| 4JJC 120 015 110 | 12 X R1.5 | 26 | 110 | 12 | |
| 4JJC 120 020 075 | 12 X R2 | 22 | 75 | 12 | |
| 4JJC 120 020 110 | 12 X R2 | 26 | 110 | 12 | |
| 4JJC 120 020 130 | 12 X R2 | 26 | 130 | 12 | |
| 4JJC 120 020 160 | 12 X R2 | 26 | 160 | 12 | |
| 4JJC 120 025 075 | 12 X R2.5 | 22 | 75 | 12 | |
| 4JJC 120 025 110 | 12 X R2.5 | 26 | 110 | 12 | |
| 4JJC 120 030 075 | 12 X R3 | 22 | 75 | 12 | |
| 4JJC 120 030 110 | 12 X R3 | 26 | 110 | 12 | |
| 4JJC 140 005 110 | 14 X R0.5 | 30 | 110 | 14 | |
| 4JJC 140 010 110 | 14 X R1 | 30 | 110 | 14 | |
| 4JJC 140 020 110 | 14 X R2 | 30 | 110 | 14 | |
| 4JJC 160 005 110 | 16 X R0.5 | 32 | 110 | 16 | |
| 4JJC 160 005 160 | 16 X R0.5 | 32 | 160 | 16 | |
| 4JJC 160 010 110 | 16 X R1 | 32 | 110 | 16 | |
| 4JJC 160 010 160 | 16 X R1 | 32 | 160 | 16 | |

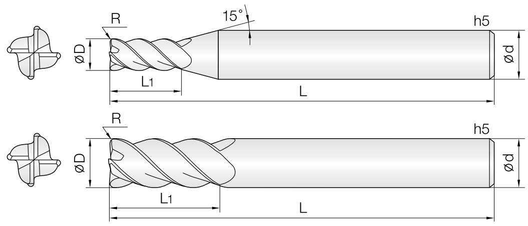
# 4JJCRL

## 4 Flutes JJ 45˚ Helix Corner Radius End Mills for Hardened Steels

## 4날 45˚ 헬릭스 고경도재 가공용 제이제이 코너 레디우스 엔드밀

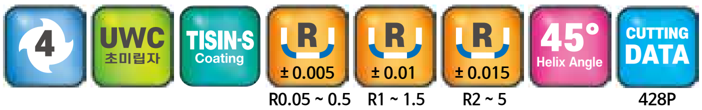
New






- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 코너R 형상을 날부치핑이 적도록 설계하였습니다.
- 45˚ 헬릭스 형상으로 설계하여 고속,고이송 가공에 적합합니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- 45˚ degree helix design for high speed, feed condition.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.




| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 20 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |
| | Ø14 ~ 20 | -0.01 ~ -0.02mm |

단위 : mm

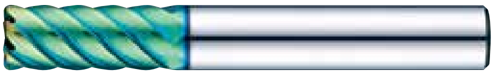
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4JJCRL 010 0005 050 | 1 X R0.05 | 2 | 50 | 6 | |
| 4JJCRL 010 001 050 | 1 X R0.1 | 2 | 50 | 6 | |
| 4JJCRL 010 002 050 | 1 X R0.2 | 2 | 50 | 6 | |
| 4JJCRL 010 003 050 | 1 X R0.3 | 2 | 50 | 6 | |
| 4JJCRL 012 0005 050 | 1.2 X R0.05 | 2.5 | 50 | 6 | |
| 4JJCRL 012 001 050 | 1.2 X R0.1 | 2.5 | 50 | 6 | |
| 4JJCRL 012 002 050 | 1.2 X R0.2 | 2.5 | 50 | 6 | |
| 4JJCRL 012 003 050 | 1.2 X R0.3 | 2.5 | 50 | 6 | |
| 4JJCRL 015 0005 050 | 1.5 X R0.05 | 3 | 50 | 6 | |
| 4JJCRL 015 001 050 | 1.5 X R0.1 | 3 | 50 | 6 | |
| 4JJCRL 015 002 050 | 1.5 X R0.2 | 3 | 50 | 6 | |
| 4JJCRL 015 003 050 | 1.5 X R0.3 | 3 | 50 | 6 | |
| 4JJCRL 015 005 050 | 1.5X R0.5 | 3 | 50 | 6 | |
| 4JJCRL 020 001 050 | 2 X R0.1 | 5 | 50 | 6 | |
| 4JJCRL 020 002 050 | 2 X R0.2 | 5 | 50 | 6 | |
| 4JJCRL 020 003 050 | 2 X R0.3 | 5 | 50 | 6 | |
| 4JJCRL 020 005 050 | 2 X R0.5 | 5 | 50 | 6 | |
| 4JJCRL 025 001 060 | 2.5 X R0.1 | 6 | 60 | 6 | |
| 4JJCRL 025 002 060 | 2.5 X R0.2 | 6 | 60 | 6 | |
| 4JJCRL 025 003 060 | 2.5 X R0.3 | 6 | 60 | 6 | |
| 4JJCRL 025 005 060 | 2.5 X R0.5 | 6 | 60 | 6 | |
| 4JJCRL 030 001 070 | 3 X R0.1 | 6 | 70 | 6 | |
| 4JJCRL 030 002 070 | 3 X R0.2 | 6 | 70 | 6 | |
| 4JJCRL 030 003 070 | 3 X R0.3 | 6 | 70 | 6 | |
| 4JJCRL 030 005 070 | 3 X R0.5 | 6 | 70 | 6 | |
| 4JJCRL 030 010 070 | 3 X R1 | 6 | 70 | 6 | |
| 4JJCRL 040 001 070 | 4 X R0.1 | 8 | 70 | 6 | |
| 4JJCRL 040 002 070 | 4 X R0.2 | 8 | 70 | 6 | |
| 4JJCRL 040 003 070 | 4X R0.3 | 8 | 70 | 6 | |
| 4JJCRL 040 005 070 | 4 X R0.5 | 8 | 70 | 6 | |
| 4JJCRL 040 010 070 | 4 X R1 | 8 | 70 | 6 | |
| 4JJCRL 050 001 080 | 5 X R0.1 | 10 | 80 | 6 | |
| 4JJCRL 050 002 080 | 5 X R0.2 | 10 | 80 | 6 | |
| 4JJCRL 050 003 080 | 5 X R0.3 | 10 | 80 | 6 | |
| 4JJCRL 050 005 080 | 5 X R0.5 | 10 | 80 | 6 | |
| 4JJCRL 050 010 080 | 5 X R1 | 10 | 80 | 6 | |
| 4JJCRL 060 001 060 | 6 X R0.1 | 12 | 60 | 6 | |
| 4JJCRL 060 001 080 | 6 X R0.1 | 15 | 80 | 6 | |
| 4JJCRL 060 002 060 | 6 X R0.2 | 12 | 60 | 6 | |
| 4JJCRL 060 002 080 | 6 X R0.2 | 15 | 80 | 6 | |
| 4JJCRL 060 003 060 | 6 X R0.3 | 12 | 60 | 6 | |
| 4JJCRL 060 003 080 | 6 X R0.3 | 15 | 80 | 6 | |
| 4JJCRL 060 005 060 | 6 X R0.5 | 12 | 60 | 6 | |
| 4JJCRL 060 005 080 | 6 X R0.5 | 15 | 80 | 6 | |
| 4JJCRL 060 010 060 | 6 X R1 | 12 | 60 | 6 | |
| 4JJCRL 060 010 080 | 6 X R1 | 15 | 80 | 6 | |
| 4JJCRL 060 015 060 | 6 X R1.5 | 12 | 60 | 6 | |
| 4JJCRL 060 015 080 | 6 X R1.5 | 15 | 80 | 6 | |
| 4JJCRL 060 020 060 | 6 X R2 | 12 | 60 | 6 | |
| 4JJCRL 060 020 080 | 6 X R2 | 15 | 80 | 6 | |

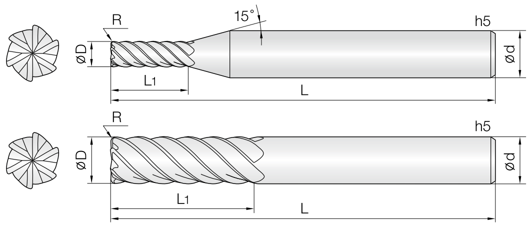
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4JJCRL 080 002 070 | 8 X R0.2 | 16 | 70 | 8 | |
| 4JJCRL 080 002 090 | 8 X R0.2 | 19 | 90 | 8 | |
| 4JJCRL 080 003 070 | 8 X R0.3 | 16 | 70 | 8 | |
| 4JJCRL 080 003 090 | 8 X R0.3 | 19 | 90 | 8 | |
| 4JJCRL 080 005 070 | 8 X R0.5 | 16 | 70 | 8 | |
| 4JJCRL 080 005 090 | 8 X R0.5 | 19 | 90 | 8 | |
| 4JJCRL 080 010 070 | 8 X R1 | 16 | 70 | 8 | |
| 4JJCRL 080 010 090 | 8 X R1 | 19 | 90 | 8 | |
| 4JJCRL 080 015 070 | 8 X R1.5 | 16 | 70 | 8 | |
| 4JJCRL 080 015 090 | 8 X R1.5 | 19 | 90 | 8 | |
| 4JJCRL 080 020 070 | 8 X R2 | 16 | 70 | 8 | |
| 4JJCRL 080 020 090 | 8 X R2 | 19 | 90 | 8 | |
| 4JJCRL 100 002 075 | 10 X R0.2 | 20 | 75 | 10 | |
| 4JJCRL 100 002 100 | 10 X R0.2 | 23 | 100 | 10 | |
| 4JJCRL 100 003 075 | 10 X R0.3 | 20 | 75 | 10 | |
| 4JJCRL 100 003 100 | 10 X R0.3 | 23 | 100 | 10 | |
| 4JJCRL 100 005 075 | 10 X R0.5 | 20 | 75 | 10 | |
| 4JJCRL 100 005 100 | 10 X R0.5 | 23 | 100 | 10 | |
| 4JJCRL 100 010 075 | 10 X R1 | 20 | 75 | 10 | |
| 4JJCRL 100 010 100 | 10 X R1 | 23 | 100 | 10 | |
| 4JJCRL 100 015 075 | 10 X R1.5 | 20 | 75 | 10 | |
| 4JJCRL 100 015 100 | 10 X R1.5 | 23 | 100 | 10 | |
| 4JJCRL 100 020 075 | 10 X R2 | 20 | 75 | 10 | |
| 4JJCRL 100 020 100 | 10 X R2 | 23 | 100 | 10 | |
| 4JJCRL 120 003 080 | 12 X R0.3 | 23 | 80 | 12 | |
| 4JJCRL 120 003 110 | 12 X R0.3 | 27 | 110 | 12 | |
| 4JJCRL 120 005 080 | 12 X R0.5 | 23 | 80 | 12 | |
| 4JJCRL 120 005 110 | 12 X R0.5 | 27 | 110 | 12 | |
| 4JJCRL 120 010 080 | 12 X R1 | 23 | 80 | 12 | |
| 4JJCRL 120 010 110 | 12 X R1 | 27 | 110 | 12 | |
| 4JJCRL 120 015 080 | 12 X R1.5 | 23 | 80 | 12 | |
| 4JJCRL 120 015 110 | 12 X R1.5 | 27 | 110 | 12 | |
| 4JJCRL 120 020 080 | 12 X R2 | 23 | 80 | 12 | |
| 4JJCRL 120 020 110 | 12 X R2 | 27 | 110 | 12 | |
| 4JJCRL 120 030 080 | 12 X R3 | 23 | 80 | 12 | |
| 4JJCRL 120 030 110 | 12 X R3 | 27 | 110 | 12 | |
| 4JJCRL 140 005 110 | 14 X R0.5 | 30 | 110 | 14 | |
| 4JJCRL 140 010 110 | 14 X R1 | 30 | 110 | 14 | |
| 4JJCRL 140 020 110 | 14 X R2 | 30 | 110 | 14 | |
| 4JJCRL 160 005 120 | 16 X R0.5 | 32 | 120 | 16 | |
| 4JJCRL 160 010 120 | 16 X R1 | 32 | 120 | 16 | |
| 4JJCRL 160 020 120 | 16 X R2 | 32 | 120 | 16 | |
| 4JJCRL 160 030 120 | 16 X R3 | 32 | 120 | 16 | |
| 4JJCRL 200 005 130 | 20 X R0.5 | 38 | 130 | 20 | |
| 4JJCRL 200 010 130 | 20 X R1 | 38 | 130 | 20 | |
| 4JJCRL 200 020 130 | 20 X R2 | 38 | 130 | 20 | |
| 4JJCRL 200 030 130 | 20 X R3 | 38 | 130 | 20 | |
| 4JJCRL 200 040 130 | 20 X R4 | 38 | 130 | 20 | |
| 4JJCRL 200 050 130 | 20 X R5 | 38 | 130 | 20 | |

# 6JJCRL

## 6 Flutes JJ 45˚ Helix Corner Radius End Mills for Hardened Steels

## 6날 45˚ 헬릭스 고경도재 가공용 제이제이 코너 레디우스 엔드밀






- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 45˚ 헬릭스 형상으로 설계하여 고속,고이송 가공에 적합합니다.
- 측벽 가공, 코너부, 무구배면 가공시 가공물의 표면조도가 뛰어나며, 인선날 길이 증가로 내마모성이 더욱 좋아집니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- 45˚ degree helix design for high speed, feed condition.
- Excellent surface roughness for side, corner, shoulder milling and improved wear resistance due to increased edge length.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

6 | UWC 초미립자 | TISIN-S Coating | R ±0.005 R0.1 ~ 0.5 | R ±0.01 R1 ~ 1.5 | R ±0.015 R2 | 45° Helix Angle | CUTTING DATA 428P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø3 ~ 16 | +0 ~ -0.01mm |

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

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 6JJCRL 030 001 060 | 3 X R0.1 | 7.5 | 60 | 6 | |
| 6JJCRL 030 002 060 | 3 X R0.2 | 7.5 | 60 | 6 | |
| 6JJCRL 030 003 060 | 3 X R0.3 | 7.5 | 60 | 6 | |
| 6JJCRL 030 005 060 | 3 X R0.5 | 7.5 | 60 | 6 | |
| 6JJCRL 030 010 060 | 3 X R1 | 7.5 | 60 | 6 | |
| 6JJCRL 040 001 060 | 4 X R0.1 | 10 | 60 | 6 | |
| 6JJCRL 040 002 060 | 4 X R0.2 | 10 | 60 | 6 | |
| 6JJCRL 040 003 060 | 4 X R0.3 | 10 | 60 | 6 | |
| 6JJCRL 040 005 060 | 4 X R0.5 | 10 | 60 | 6 | |
| 6JJCRL 040 010 060 | 4 X R1 | 10 | 60 | 6 | |
| 6JJCRL 050 002 060 | 5 X R0.2 | 13 | 60 | 6 | |
| 6JJCRL 050 003 060 | 5 X R0.3 | 13 | 60 | 6 | |
| 6JJCRL 050 005 060 | 5 X R0.5 | 13 | 60 | 6 | |
| 6JJCRL 050 010 060 | 5 X R1 | 13 | 60 | 6 | |
| 6JJCRL 060 001 060 | 6 X R0.1 | 15 | 60 | 6 | |
| 6JJCRL 060 002 060 | 6 X R0.2 | 15 | 60 | 6 | |
| 6JJCRL 060 002 080 | 6 X R0.2 | 15 | 80 | 6 | |
| 6JJCRL 060 003 060 | 6 X R0.3 | 15 | 60 | 6 | |
| 6JJCRL 060 003 080 | 6 X R0.3 | 15 | 80 | 6 | |
| 6JJCRL 060 005 060 | 6 X R0.5 | 15 | 60 | 6 | |
| 6JJCRL 060 005 080 | 6 X R0.5 | 15 | 80 | 6 | |
| 6JJCRL 060 010 060 | 6 X R1 | 15 | 60 | 6 | |
| 6JJCRL 060 010 080 | 6 X R1 | 15 | 80 | 6 | |
| 6JJCRL 080 002 070 | 8 X R0.2 | 20 | 70 | 8 | |
| 6JJCRL 080 003 070 | 8 X R0.3 | 20 | 70 | 8 | |
| 6JJCRL 080 003 090 | 8 X R0.3 | 20 | 90 | 8 | |
| 6JJCRL 080 005 070 | 8 X R0.5 | 20 | 70 | 8 | |
| 6JJCRL 080 005 090 | 8 X R0.5 | 20 | 90 | 8 | |
| 6JJCRL 080 010 070 | 8 X R1 | 20 | 70 | 8 | |
| 6JJCRL 080 010 090 | 8 X R1 | 20 | 90 | 8 | |
| 6JJCRL 080 015 070 | 8 X R1.5 | 20 | 70 | 8 | |
| 6JJCRL 100 002 075 | 10 X R0.2 | 25 | 75 | 10 | |
| 6JJCRL 100 003 075 | 10 X R0.3 | 25 | 75 | 10 | |
| 6JJCRL 100 003 100 | 10 X R0.3 | 25 | 100 | 10 | |
| 6JJCRL 100 005 075 | 10 X R0.5 | 25 | 75 | 10 | |
| 6JJCRL 100 005 100 | 10 X R0.5 | 25 | 100 | 10 | |
| 6JJCRL 100 010 075 | 10 X R1 | 25 | 75 | 10 | |
| 6JJCRL 100 010 100 | 10 X R1 | 25 | 100 | 10 | |
| 6JJCRL 100 020 075 | 10 X R2 | 25 | 75 | 10 | |
| 6JJCRL 120 002 080 | 12 X R0.2 | 30 | 80 | 12 | |
| 6JJCRL 120 003 080 | 12 X R0.3 | 30 | 80 | 12 | |
| 6JJCRL 120 003 110 | 12 X R0.3 | 30 | 110 | 12 | |
| 6JJCRL 120 005 080 | 12 X R0.5 | 30 | 80 | 12 | |
| 6JJCRL 120 005 110 | 12 X R0.5 | 30 | 110 | 12 | |
| 6JJCRL 120 010 080 | 12 X R1 | 30 | 80 | 12 | |
| 6JJCRL 120 010 110 | 12 X R1 | 30 | 110 | 12 | |
| 6JJCRL 120 020 080 | 12 X R2 | 30 | 80 | 12 | |
| 6JJCRL 160 005 110 | 16 X R0.5 | 50 | 110 | 16 | |
| 6JJCRL 160 010 110 | 16 X R1 | 50 | 110 | 16 | |
| 6JJCRL 160 020 110 | 16 X R2 | 50 | 110 | 16 | |

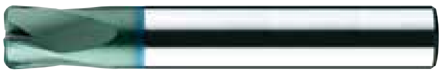
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

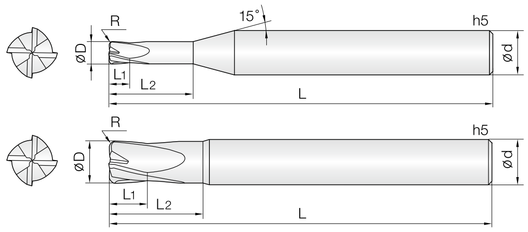
# 4&6JJRC

## 4&6 Flutes JJ Corner Radius Cutters for Hardened Steels

## 4&6날 고경도재 가공용 제이제이 코너 레디우스 커터

JJ series






- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 저속 RPM에서 고이송 작업이 가능하도록 설계하였습니다..
- 중삭 및 황삭 가공시 작업 효율이 극대화 됩니다.
- 항절력이 높은 초미립자 초경합금을 채택하여, 고이송 작업시 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for pre-hardened and hardened steels(HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Designed for low speed with high feed condition.
- Suitable for heavy duty and roughing application.
- Minimize fracturing at high feed by high TRS ultra fine WC grade.

4 | 6 | UWC 초미립자 | TISIN-S Coating | R ±0.005 (R0.2 ~ 0.5) | R ±0.01 (R1 ~ 1.5) | R ±0.015 (R2 ~ 3) | 15° Helix Angle | CUTTING DATA 429P

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

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

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4JJRC 010 002 025 | 1 X R0.2 | 1 | 2.5 | 50 | 4 | |
| 4JJRC 015 005 040 | 1.5 X R0.5 | 1.5 | 4 | 50 | 4 | |
| 4JJRC 020 005 060 | 2 X R0.5 | 2 | 6 | 50 | 6 | |
| 4JJRC 030 005 080 | 3 X R0.5 | 3 | 8 | 50 | 6 | |
| 4JJRC 040 005 120 | 4 X R0.5 | 4 | 12 | 60 | 6 | |
| 4JJRC 040 005 160 | 4 X R0.5 | 4 | 16 | 60 | 6 | |
| 4JJRC 040 010 120 | 4 X R1 | 4 | 12 | 60 | 6 | |
| 4JJRC 040 010 160 | 4 X R1 | 4 | 16 | 60 | 6 | |
| 4JJRC 050 005 150 | 5 X R0.5 | 5 | 15 | 60 | 6 | |
| 4JJRC 050 010 150 | 5 X R1 | 5 | 15 | 60 | 6 | |
| 4JJRC 060 003 150 | 6 X R0.3 | 6 | 15 | 60 | 6 | |
| 4JJRC 060 005 150 | 6 X R0.5 | 6 | 15 | 60 | 6 | |
| 4JJRC 060 010 150 | 6 X R1 | 6 | 15 | 60 | 6 | |
| 4JJRC 060 015 150 | 6 X R1.5 | 6 | 15 | 60 | 6 | |
| 4JJRC 080 003 160 | 8 X R0.3 | 8 | 16 | 60 | 8 | |
| 4JJRC 080 005 160 | 8 X R0.5 | 8 | 16 | 60 | 8 | |
| 4JJRC 080 005 200 | 8 X R0.5 | 8 | 20 | 80 | 8 | |
| 4JJRC 080 005 300 | 8 X R0.5 | 8 | 30 | 110 | 8 | |
| 4JJRC 080 010 160 | 8 X R1 | 8 | 16 | 60 | 8 | |
| 4JJRC 080 010 200 | 8 X R1 | 8 | 20 | 80 | 8 | |
| 4JJRC 080 010 300 | 8 X R1 | 8 | 30 | 110 | 8 | |
| 4JJRC 080 020 160 | 8 X R2 | 8 | 16 | 60 | 8 | |
| 4JJRC 080 020 200 | 8 X R2 | 8 | 20 | 80 | 8 | |
| 4JJRC 080 020 300 | 8 X R2 | 8 | 30 | 110 | 8 | |
| 4JJRC 100 003 200 | 10 X R0.3 | 10 | 20 | 70 | 10 | |
| 4JJRC 100 005 200 | 10 X R0.5 | 10 | 20 | 70 | 10 | |
| 4JJRC 100 005 250 | 10 X R0.5 | 10 | 25 | 90 | 10 | |
| 4JJRC 100 005 300 | 10 X R0.5 | 10 | 30 | 120 | 10 | |
| 4JJRC 100 010 200 | 10 X R1 | 10 | 20 | 70 | 10 | |
| 4JJRC 100 010 250 | 10 X R1 | 10 | 25 | 90 | 10 | |
| 4JJRC 100 010 300 | 10 X R1 | 10 | 30 | 120 | 10 | |
| 4JJRC 100 020 200 | 10 X R2 | 10 | 20 | 70 | 10 | |
| 4JJRC 100 020 250 | 10 X R2 | 10 | 25 | 90 | 10 | |
| 4JJRC 100 020 300 | 10 X R2 | 10 | 30 | 120 | 10 | |
| 4JJRC 120 005 250 | 12 X R0.5 | 12 | 25 | 80 | 12 | |
| 4JJRC 120 005 300 | 12 X R0.5 | 12 | 30 | 100 | 12 | |
| 4JJRC 120 005 350 | 12 X R0.5 | 12 | 35 | 130 | 12 | |
| 4JJRC 120 010 250 | 12 X R1 | 12 | 25 | 80 | 12 | |
| 4JJRC 120 010 300 | 12 X R1 | 12 | 30 | 100 | 12 | |
| 4JJRC 120 010 350 | 12 X R1 | 12 | 35 | 130 | 12 | |
| 4JJRC 120 020 250 | 12 X R2 | 12 | 25 | 80 | 12 | |
| 4JJRC 120 020 300 | 12 X R2 | 12 | 30 | 100 | 12 | |
| 4JJRC 120 020 350 | 12 X R2 | 12 | 35 | 130 | 12 | |
| 4JJRC 120 030 250 | 12 X R3 | 12 | 25 | 80 | 12 | |
| 4JJRC 160 010 300 | 16 X R1 | 16 | 30 | 110 | 16 | |
| 4JJRC 160 010 400 | 16 X R1 | 16 | 40 | 160 | 16 | |
| 4JJRC 160 020 300 | 16 X R2 | 16 | 30 | 110 | 16 | |
| 4JJRC 160 020 400 | 16 X R2 | 16 | 40 | 160 | 16 | |

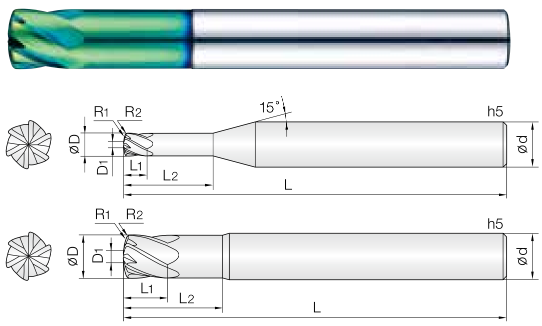
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 6JJRC 060 005 060 | 6 X R0.5 | 12 | 60 | 6 | |
| 6JJRC 060 010 060 | 6 X R1 | 12 | 60 | 6 | |
| 6JJRC 080 005 060 | 8 X R0.5 | 16 | 60 | 8 | |
| 6JJRC 080 010 060 | 8 X R1 | 16 | 60 | 8 | |
| 6JJRC 080 020 060 | 8 X R2 | 16 | 60 | 8 | |
| 6JJRC 100 005 070 | 10 X R0.5 | 20 | 70 | 10 | |
| 6JJRC 100 010 070 | 10 X R1 | 20 | 70 | 10 | |
| 6JJRC 100 020 070 | 10 X R2 | 20 | 70 | 10 | |
| 6JJRC 120 005 080 | 12 X R0.5 | 25 | 80 | 12 | |
| 6JJRC 120 010 080 | 12 X R1 | 25 | 80 | 12 | |
| 6JJRC 120 020 080 | 12 X R2 | 25 | 80 | 12 | |
| 6JJRC 160 005 100 | 16 X R0.5 | 30 | 100 | 16 | |
| 6JJRC 160 005 160 | 16 X R0.5 | 30 | 160 | 16 | |
| 6JJRC 160 010 100 | 16 X R1 | 30 | 100 | 16 | |
| 6JJRC 160 010 160 | 16 X R1 | 30 | 160 | 16 | |

# 4&6JJDRC

*4&6 Flutes JJ Double Corner Radius Cutters for Hardened Steels*

## 4&6날 고경도재 가공용 제이제이 더블 코너 레디우스 커터






- **고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀**
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 저속 RPM에서 고이송 작업이 가능하도록 설계하였습니다..
- 중삭 및 황삭 가공시 작업 효율이 극대화 됩니다.
- 바닥 인선부의 형상에 복합R 설계를 적용하여 절삭칩이 작게 배출되며, 절삭 부하를 줄였습니다.

- **Endmills for pre-hardened and hardened steels(HRc52~68)**
- Good wear resistance by high quality Si-based PVD coating.
- Designed for low speed with high feed condition.
- Suitable for heavy duty and roughing application.
- Applied multi-radius design on the endface of the tool, reduced cutting stress by splitting small chip emission.


428P

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

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

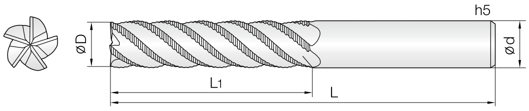
단위 : mm

| Order Number | 날경 Diameter D | 바닥R Large Radius R1 | 코너R Corner Radius R2 | 선단경 Front Diameter D1 | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|---|---|
| 4JJDRC 010 010 030 | 1 | 1 | 0.1 | 0.28 | 1 | 3 | 50 | 4 | |
| 4JJDRC 020 020 060 | 2 | 2 | 0.1 | 0.56 | 2 | 6 | 50 | 6 | |
| 4JJDRC 030 030 090 | 3 | 3 | 0.2 | 0.68 | 3 | 9 | 60 | 6 | |
| 4JJDRC 040 040 120 | 4 | 4 | 0.2 | 0.8 | 4 | 12 | 60 | 6 | |
| 4JJDRC 050 050 150 | 5 | 5 | 0.3 | 1.08 | 5 | 15 | 60 | 6 | |
| 6JJDRC 060 060 180 | 6 | 6 | 0.3 | 1.22 | 6 | 18 | 60 | 6 | |
| 6JJDRC 080 080 240 | 8 | 8 | 0.5 | 1.76 | 8 | 24 | 75 | 8 | |
| 6JJDRC 100 100 300 | 10 | 10 | 0.5 | 2.02 | 10 | 30 | 80 | 10 | |
| 6JJDRC 120 120 360 | 12 | 12 | 0.5 | 2.28 | 12 | 36 | 100 | 12 | |
| 6JJDRC 160 160 450 | 16 | 16 | 0.8 | 2.8 | 16 | 45 | 110 | 16 | |

# 5JJROU

## 5 Flutes Variable Helix Roughing End Mills

## 5날 가변형 헬릭스 라핑 엔드밀




- **합금강·SUS계열·인코넬·일반구조강 등 다양한 난삭재 황삭가공**
- TISIN/S 코팅 처리하여 내마모성이 향상됩니다.
- 가변 헬릭스 적용으로 절삭저항이 감소되어 장시간 가공에 적합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Roughing Endmills for hard to cut materials, alloy steels, SUS, Inconel and structural steels.**
- TISIN-S coating provides wear resistance improvement.
- Long machining time is available with variable helix application.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.


Shield Edge 430P Weldon Shank

| D Size | D Tolerance |
|---|---|
| ø6 ~ 8 | -0.02 ~ -0.04mm |
| ø10 ~ 20 | -0.02 ~ -0.05mm |

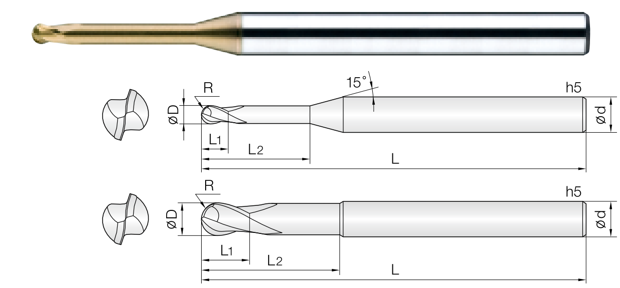
단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 5JJROU 060 140 060 | 6 | 14 | 60 | 6 | |
| 5JJROU 060 200 065 | 6 | 20 | 65 | 6 | |
| 5JJROU 060 260 070 | 6 | 26 | 70 | 6 | |
| 5JJROU 080 180 065 | 8 | 18 | 65 | 8 | |
| 5JJROU 080 260 070 | 8 | 26 | 70 | 8 | |
| 5JJROU 080 340 080 | 8 | 34 | 80 | 8 | |
| 5JJROU 100 220 075 | 10 | 22 | 75 | 10 | |
| 5JJROU 100 330 080 | 10 | 33 | 80 | 10 | |
| 5JJROU 100 430 090 | 10 | 43 | 90 | 10 | |
| 5JJROU 120 270 080 | 12 | 27 | 80 | 12 | |
| 5JJROU 120 390 095 | 12 | 39 | 95 | 12 | |
| 5JJROU 120 510 110 | 12 | 51 | 110 | 12 | |
| 5JJROU 160 360 100 | 16 | 36 | 100 | 16 | |
| 5JJROU 160 520 120 | 16 | 52 | 120 | 16 | |
| 5JJROU 160 680 130 | 16 | 68 | 130 | 16 | |
| 5JJROU 200 450 110 | 20 | 45 | 110 | 20 | |
| 5JJROU 200 650 130 | 20 | 65 | 130 | 20 | |
| 5JJROU 200 850 150 | 20 | 85 | 150 | 20 | |

# 2HRB

## 2 Flutes High Speed Rib Ball End Mills

## 2날 고속가공용 리브 볼 엔드밀




- **고경도강(HRc52~62), 프리하든강 계열의 고정밀 가공엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 날부인선의 조도가 뛰어나피삭재의 면조도가 우수합니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steel(HRc52~62)**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- Very nice work surface finish.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.


0.05 ~ 2.5R | 3 ~ 6R | 431P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.1 ~ 0.15 | +0 ~ -0.005mm |
| | Ø0.2 ~ 12 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HRB 001 003 S04 | 0.05R X 0.1 | 0.15 | 0.3 | 40 | 4 | |
| 2HRB 001 005 S04 | 0.05R X 0.1 | 0.15 | 0.5 | 40 | 4 | |
| 2HRB 0015 003 S04 | 0.075R X 0.15 | 0.15 | 0.3 | 40 | 4 | |
| 2HRB 0015 005 S04 | 0.075R X 0.15 | 0.15 | 0.5 | 40 | 4 | |
| 2HRB 0015 010 S04 | 0.075R X 0.15 | 0.15 | 1 | 40 | 4 | |
| 2HRB 002 005 S04 | 0.1R X 0.2 | 0.2 | 0.5 | 40 | 4 | |
| 2HRB 002 010 S04 | 0.1R X 0.2 | 0.2 | 1 | 40 | 4 | |
| 2HRB 002 015 S04 | 0.1R X 0.2 | 0.2 | 1.5 | 40 | 4 | |
| 2HRB 002 020 S04 | 0.1R X 0.2 | 0.2 | 2 | 40 | 4 | |
| 2HRB 002 025 S04 | 0.1R X 0.2 | 0.2 | 2.5 | 40 | 4 | |
| 2HRB 002 030 S04 | 0.1R X 0.2 | 0.2 | 3 | 40 | 4 | |
| 2HRB 0025 005 S04 | 0.125R X 0.25 | 0.25 | 0.5 | 40 | 4 | |
| 2HRB 0025 010 S04 | 0.125R X 0.25 | 0.25 | 1 | 40 | 4 | |
| 2HRB 0025 015 S04 | 0.125R X 0.25 | 0.25 | 1.5 | 40 | 4 | |
| 2HRB 0025 020 S04 | 0.125R X 0.25 | 0.25 | 2 | 40 | 4 | |
| 2HRB 0025 025 S04 | 0.125R X 0.25 | 0.25 | 2.5 | 40 | 4 | |
| 2HRB 0025 030 S04 | 0.125R X 0.25 | 0.25 | 3 | 40 | 4 | |
| 2HRB 003 010 S04 | 0.15R X 0.3 | 0.3 | 1 | 40 | 4 | |
| 2HRB 003 015 S04 | 0.15R X 0.3 | 0.3 | 1.5 | 40 | 4 | |
| 2HRB 003 020 S04 | 0.15R X 0.3 | 0.3 | 2 | 40 | 4 | |
| 2HRB 003 025 S04 | 0.15R X 0.3 | 0.3 | 2.5 | 40 | 4 | |
| 2HRB 003 030 S04 | 0.15R X 0.3 | 0.3 | 3 | 40 | 4 | |
| 2HRB 003 035 S04 | 0.15R X 0.3 | 0.3 | 3.5 | 40 | 4 | |
| 2HRB 003 040 S04 | 0.15R X 0.3 | 0.3 | 4 | 40 | 4 | |
| 2HRB 003 050 S04 | 0.15R X 0.3 | 0.3 | 5 | 40 | 4 | |
| 2HRB 004 010 S04 | 0.2R X 0.4 | 0.4 | 1 | 40 | 4 | |
| 2HRB 004 015 S04 | 0.2R X 0.4 | 0.4 | 1.5 | 40 | 4 | |
| 2HRB 004 020 S04 | 0.2R X 0.4 | 0.4 | 2 | 40 | 4 | |
| 2HRB 004 025 S04 | 0.2R X 0.4 | 0.4 | 2.5 | 40 | 4 | |
| 2HRB 004 030 S04 | 0.2R X 0.4 | 0.4 | 3 | 40 | 4 | |
| 2HRB 004 035 S04 | 0.2R X 0.4 | 0.4 | 3.5 | 40 | 4 | |
| 2HRB 004 040 S04 | 0.2R X 0.4 | 0.4 | 4 | 40 | 4 | |
| 2HRB 004 045 S04 | 0.2R X 0.4 | 0.4 | 4.5 | 40 | 4 | |
| 2HRB 004 050 S04 | 0.2R X 0.4 | 0.4 | 5 | 40 | 4 | |
| 2HRB 004 060 S04 | 0.2R X 0.4 | 0.4 | 6 | 40 | 4 | |
| 2HRB 004 080 S04 | 0.2R X 0.4 | 0.4 | 8 | 40 | 4 | |
| 2HRB 004 100 S04 | 0.2R X 0.4 | 0.4 | 10 | 40 | 4 | |
| 2HRB 005 010 S04 | 0.25R X 0.5 | 0.5 | 1 | 45 | 4 | |
| 2HRB 005 015 S04 | 0.25R X 0.5 | 0.5 | 1.5 | 45 | 4 | |
| 2HRB 005 020 S04 | 0.25R X 0.5 | 0.5 | 2 | 45 | 4 | |
| 2HRB 005 025 S04 | 0.25R X 0.5 | 0.5 | 2.5 | 45 | 4 | |
| 2HRB 005 030 S04 | 0.25R X 0.5 | 0.5 | 3 | 45 | 4 | |
| 2HRB 005 035 S04 | 0.25R X 0.5 | 0.5 | 3.5 | 45 | 4 | |
| 2HRB 005 040 S04 | 0.25R X 0.5 | 0.5 | 4 | 45 | 4 | |
| 2HRB 005 045 S04 | 0.25R X 0.5 | 0.5 | 4.5 | 45 | 4 | |
| 2HRB 005 050 S04 | 0.25R X 0.5 | 0.5 | 5 | 45 | 4 | |
| 2HRB 005 060 S04 | 0.25R X 0.5 | 0.5 | 6 | 45 | 4 | |
| 2HRB 005 080 S04 | 0.25R X 0.5 | 0.5 | 8 | 45 | 4 | |
| 2HRB 005 100 S04 | 0.25R X 0.5 | 0.5 | 10 | 45 | 4 | |
| 2HRB 005 120 S04 | 0.25R X 0.5 | 0.5 | 12 | 45 | 4 | |

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HRB 005 140 S04 | 0.25R X 0.5 | 0.5 | 14 | 45 | 4 | |
| 2HRB 006 010 S04 | 0.3R X 0.6 | 0.6 | 1 | 45 | 4 | |
| 2HRB 006 020 S04 | 0.3R X 0.6 | 0.6 | 2 | 45 | 4 | |
| 2HRB 006 030 S04 | 0.3R X 0.6 | 0.6 | 3 | 45 | 4 | |
| 2HRB 006 040 S04 | 0.3R X 0.6 | 0.6 | 4 | 45 | 4 | |
| 2HRB 006 050 S04 | 0.3R X 0.6 | 0.6 | 5 | 45 | 4 | |
| 2HRB 006 060 S04 | 0.3R X 0.6 | 0.6 | 6 | 45 | 4 | |
| 2HRB 006 080 S04 | 0.3R X 0.6 | 0.6 | 8 | 45 | 4 | |
| 2HRB 006 100 S04 | 0.3R X 0.6 | 0.6 | 10 | 45 | 4 | |
| 2HRB 006 120 S04 | 0.3R X 0.6 | 0.6 | 12 | 45 | 4 | |
| 2HRB 006 140 S04 | 0.3R X 0.6 | 0.6 | 14 | 45 | 4 | |
| 2HRB 006 160 S04 | 0.3R X 0.6 | 0.6 | 16 | 45 | 4 | |
| 2HRB 007 020 S04 | 0.35R X 0.7 | 0.7 | 2 | 45 | 4 | |
| 2HRB 007 040 S04 | 0.35R X 0.7 | 0.7 | 4 | 45 | 4 | |
| 2HRB 007 060 S04 | 0.35R X 0.7 | 0.7 | 6 | 45 | 4 | |
| 2HRB 007 080 S04 | 0.35R X 0.7 | 0.7 | 8 | 45 | 4 | |
| 2HRB 007 100 S04 | 0.35R X 0.7 | 0.7 | 10 | 45 | 4 | |
| 2HRB 007 120 S04 | 0.35R X 0.7 | 0.7 | 12 | 45 | 4 | |
| 2HRB 008 020 S04 | 0.4R X 0.8 | 0.8 | 2 | 45 | 4 | |
| 2HRB 008 030 S04 | 0.4R X 0.8 | 0.8 | 3 | 45 | 4 | |
| 2HRB 008 040 S04 | 0.4R X 0.8 | 0.8 | 4 | 45 | 4 | |
| 2HRB 008 050 S04 | 0.4R X 0.8 | 0.8 | 5 | 45 | 4 | |
| 2HRB 008 060 S04 | 0.4R X 0.8 | 0.8 | 6 | 45 | 4 | |
| 2HRB 008 080 S04 | 0.4R X 0.8 | 0.8 | 8 | 45 | 4 | |
| 2HRB 008 100 S04 | 0.4R X 0.8 | 0.8 | 10 | 45 | 4 | |
| 2HRB 008 120 S04 | 0.4R X 0.8 | 0.8 | 12 | 45 | 4 | |
| 2HRB 008 140 S04 | 0.4R X 0.8 | 0.8 | 14 | 45 | 4 | |
| 2HRB 008 160 S04 | 0.4R X 0.8 | 0.8 | 16 | 45 | 4 | |
| 2HRB 009 040 S04 | 0.45R X 0.9 | 0.9 | 4 | 45 | 4 | |
| 2HRB 010 020 S04 | 0.5R X 1 | 1 | 2 | 45 | 4 | |
| 2HRB 010 020 S06 | 0.5R X 1 | 1 | 2 | 50 | 6 | |
| 2HRB 010 030 S04 | 0.5R X 1 | 1 | 3 | 45 | 4 | |
| 2HRB 010 030 S06 | 0.5R X 1 | 1 | 3 | 50 | 6 | |
| 2HRB 010 040 S04 | 0.5R X 1 | 1 | 4 | 45 | 4 | |
| 2HRB 010 040 S06 | 0.5R X 1 | 1 | 4 | 50 | 6 | |
| 2HRB 010 050 S04 | 0.5R X 1 | 1 | 5 | 45 | 4 | |
| 2HRB 010 050 S06 | 0.5R X 1 | 1 | 5 | 50 | 6 | |
| 2HRB 010 060 S04 | 0.5R X 1 | 1 | 6 | 45 | 4 | |
| 2HRB 010 060 S06 | 0.5R X 1 | 1 | 6 | 50 | 6 | |
| 2HRB 010 080 S04 | 0.5R X 1 | 1 | 8 | 45 | 4 | |
| 2HRB 010 080 S06 | 0.5R X 1 | 1 | 8 | 50 | 6 | |
| 2HRB 010 100 S04 | 0.5R X 1 | 1 | 10 | 50 | 4 | |
| 2HRB 010 100 S06 | 0.5R X 1 | 1 | 10 | 50 | 6 | |
| 2HRB 010 120 S04 | 0.5R X 1 | 1 | 12 | 50 | 4 | |
| 2HRB 010 120 S06 | 0.5R X 1 | 1 | 12 | 50 | 6 | |
| 2HRB 010 140 S04 | 0.5R X 1 | 1 | 14 | 50 | 4 | |
| 2HRB 010 140 S06 | 0.5R X 1 | 1 | 14 | 50 | 6 | |
| 2HRB 010 160 S04 | 0.5R X 1 | 1 | 16 | 50 | 4 | |
| 2HRB 010 160 S06 | 0.5R X 1 | 1 | 16 | 60 | 6 | |
| 2HRB 010 180 S04 | 0.5R X 1 | 1 | 18 | 50 | 4 | |

# 2HRB

## 2 Flutes High Speed Rib Ball End Mills

## 2날 고속가공용 리브 볼 엔드밀

HARD series

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HRB 010 180 S06 | 0.5R X 1 | 1 | 18 | 60 | 6 | |
| 2HRB 010 200 S04 | 0.5R X 1 | 1 | 20 | 50 | 4 | |
| 2HRB 010 200 S06 | 0.5R X 1 | 1 | 20 | 60 | 6 | |
| 2HRB 010 220 S04 | 0.5R X 1 | 1 | 22 | 60 | 4 | |
| 2HRB 010 220 S06 | 0.5R X 1 | 1 | 22 | 65 | 6 | |
| 2HRB 010 250 S04 | 0.5R X 1 | 1 | 25 | 60 | 4 | |
| 2HRB 010 300 S04 | 0.5R X 1 | 1 | 30 | 70 | 4 | |
| 2HRB 012 040 S04 | 0.6R X 1.2 | 1.2 | 4 | 45 | 4 | |
| 2HRB 012 040 S06 | 0.6R X 1.2 | 1.2 | 4 | 50 | 6 | |
| 2HRB 012 060 S04 | 0.6R X 1.2 | 1.2 | 6 | 45 | 4 | |
| 2HRB 012 060 S06 | 0.6R X 1.2 | 1.2 | 6 | 50 | 6 | |
| 2HRB 012 080 S04 | 0.6R X 1.2 | 1.2 | 8 | 45 | 4 | |
| 2HRB 012 080 S06 | 0.6R X 1.2 | 1.2 | 8 | 50 | 6 | |
| 2HRB 012 100 S04 | 0.6R X 1.2 | 1.2 | 10 | 50 | 4 | |
| 2HRB 012 100 S06 | 0.6R X 1.2 | 1.2 | 10 | 50 | 6 | |
| 2HRB 012 120 S04 | 0.6R X 1.2 | 1.2 | 12 | 50 | 4 | |
| 2HRB 012 120 S06 | 0.6R X 1.2 | 1.2 | 12 | 50 | 6 | |
| 2HRB 012 160 S04 | 0.6R X 1.2 | 1.2 | 16 | 50 | 4 | |
| 2HRB 012 160 S06 | 0.6R X 1.2 | 1.2 | 16 | 60 | 6 | |
| 2HRB 012 200 S04 | 0.6R X 1.2 | 1.2 | 20 | 50 | 4 | |
| 2HRB 012 200 S06 | 0.6R X 1.2 | 1.2 | 20 | 60 | 6 | |
| 2HRB 012 240 S04 | 0.6R X 1.2 | 1.2 | 24 | 60 | 4 | |
| 2HRB 012 240 S06 | 0.6R X 1.2 | 1.2 | 24 | 65 | 6 | |
| 2HRB 014 060 S04 | 0.7R X 1.4 | 1.4 | 6 | 45 | 4 | |
| 2HRB 014 080 S04 | 0.7R X 1.4 | 1.4 | 8 | 45 | 4 | |
| 2HRB 014 120 S04 | 0.7R X 1.4 | 1.4 | 12 | 50 | 4 | |
| 2HRB 014 160 S04 | 0.7R X 1.4 | 1.4 | 16 | 50 | 4 | |
| 2HRB 015 030 S04 | 0.75R X 1.5 | 1.5 | 3 | 45 | 4 | |
| 2HRB 015 030 S06 | 0.75R X 1.5 | 1.5 | 3 | 50 | 6 | |
| 2HRB 015 040 S04 | 0.75R X 1.5 | 1.5 | 4 | 45 | 4 | |
| 2HRB 015 040 S06 | 0.75R X 1.5 | 1.5 | 4 | 50 | 6 | |
| 2HRB 015 060 S04 | 0.75R X 1.5 | 1.5 | 6 | 45 | 4 | |
| 2HRB 015 060 S06 | 0.75R X 1.5 | 1.5 | 6 | 50 | 6 | |
| 2HRB 015 080 S04 | 0.75R X 1.5 | 1.5 | 8 | 45 | 4 | |
| 2HRB 015 080 S06 | 0.75R X 1.5 | 1.5 | 8 | 50 | 6 | |
| 2HRB 015 100 S04 | 0.75R X 1.5 | 1.5 | 10 | 50 | 4 | |
| 2HRB 015 100 S06 | 0.75R X 1.5 | 1.5 | 10 | 50 | 6 | |
| 2HRB 015 120 S04 | 0.75R X 1.5 | 1.5 | 12 | 50 | 4 | |
| 2HRB 015 120 S06 | 0.75R X 1.5 | 1.5 | 12 | 50 | 6 | |
| 2HRB 015 140 S04 | 0.75R X 1.5 | 1.5 | 14 | 50 | 4 | |
| 2HRB 015 140 S06 | 0.75R X 1.5 | 1.5 | 14 | 50 | 6 | |
| 2HRB 015 160 S04 | 0.75R X 1.5 | 1.5 | 16 | 50 | 4 | |
| 2HRB 015 160 S06 | 0.75R X 1.5 | 1.5 | 16 | 60 | 6 | |
| 2HRB 015 180 S04 | 0.75R X 1.5 | 1.5 | 18 | 50 | 4 | |
| 2HRB 015 180 S06 | 0.75R X 1.5 | 1.5 | 18 | 60 | 6 | |
| 2HRB 015 200 S04 | 0.75R X 1.5 | 1.5 | 20 | 50 | 4 | |
| 2HRB 015 200 S06 | 0.75R X 1.5 | 1.5 | 20 | 60 | 6 | |
| 2HRB 015 220 S04 | 0.75R X 1.5 | 1.5 | 22 | 60 | 4 | |
| 2HRB 015 220 S06 | 0.75R X 1.5 | 1.5 | 22 | 65 | 6 | |
| 2HRB 015 250 S04 | 0.75R X 1.5 | 1.5 | 25 | 60 | 4 | |

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HRB 015 250 S06 | 0.75R X 1.5 | 1.5 | 25 | 65 | 6 | |
| 2HRB 015 300 S04 | 0.75R X 1.5 | 1.5 | 30 | 70 | 4 | |
| 2HRB 015 300 S06 | 0.75R X 1.5 | 1.5 | 30 | 70 | 6 | |
| 2HRB 015 350 S04 | 0.75R X 1.5 | 1.5 | 35 | 70 | 4 | |
| 2HRB 015 400 S04 | 0.75R X 1.5 | 1.5 | 40 | 80 | 4 | |
| 2HRB 016 060 S04 | 0.8R X 1.6 | 1.6 | 6 | 45 | 4 | |
| 2HRB 016 080 S04 | 0.8R X 1.6 | 1.6 | 8 | 45 | 4 | |
| 2HRB 016 120 S04 | 0.8R X 1.6 | 1.6 | 12 | 50 | 4 | |
| 2HRB 016 160 S04 | 0.8R X 1.6 | 1.6 | 16 | 50 | 4 | |
| 2HRB 016 200 S04 | 0.8R X 1.6 | 1.6 | 20 | 50 | 4 | |
| 2HRB 018 060 S04 | 0.9R X 1.8 | 1.8 | 6 | 45 | 4 | |
| 2HRB 018 080 S04 | 0.9R X 1.8 | 1.8 | 8 | 45 | 4 | |
| 2HRB 018 120 S04 | 0.9R X 1.8 | 1.8 | 12 | 50 | 4 | |
| 2HRB 018 160 S04 | 0.9R X 1.8 | 1.8 | 16 | 50 | 4 | |
| 2HRB 018 200 S04 | 0.9R X 1.8 | 1.8 | 20 | 50 | 4 | |
| 2HRB 020 040 S04 | 1R X 2 | 2 | 4 | 45 | 4 | |
| 2HRB 020 040 S06 | 1R X 2 | 2 | 4 | 50 | 6 | |
| 2HRB 020 060 S04 | 1R X 2 | 2 | 6 | 45 | 4 | |
| 2HRB 020 060 S06 | 1R X 2 | 2 | 6 | 50 | 6 | |
| 2HRB 020 080 S04 | 1R X 2 | 2 | 8 | 45 | 4 | |
| 2HRB 020 080 S06 | 1R X 2 | 2 | 8 | 50 | 6 | |
| 2HRB 020 100 S04 | 1R X 2 | 2 | 10 | 50 | 4 | |
| 2HRB 020 100 S06 | 1R X 2 | 2 | 10 | 50 | 6 | |
| 2HRB 020 120 S04 | 1R X 2 | 2 | 12 | 50 | 4 | |
| 2HRB 020 120 S06 | 1R X 2 | 2 | 12 | 50 | 6 | |
| 2HRB 020 140 S04 | 1R X 2 | 2 | 14 | 50 | 4 | |
| 2HRB 020 140 S06 | 1R X 2 | 2 | 14 | 50 | 6 | |
| 2HRB 020 160 S04 | 1R X 2 | 2 | 16 | 50 | 4 | |
| 2HRB 020 160 S06 | 1R X 2 | 2 | 16 | 60 | 6 | |
| 2HRB 020 180 S04 | 1R X 2 | 2 | 18 | 50 | 4 | |
| 2HRB 020 180 S06 | 1R X 2 | 2 | 18 | 60 | 6 | |
| 2HRB 020 200 S04 | 1R X 2 | 2 | 20 | 50 | 4 | |
| 2HRB 020 200 S06 | 1R X 2 | 2 | 20 | 60 | 6 | |
| 2HRB 020 220 S04 | 1R X 2 | 2 | 22 | 60 | 4 | |
| 2HRB 020 220 S06 | 1R X 2 | 2 | 22 | 65 | 6 | |
| 2HRB 020 250 S04 | 1R X 2 | 2 | 25 | 60 | 4 | |
| 2HRB 020 250 S06 | 1R X 2 | 2 | 25 | 65 | 6 | |
| 2HRB 020 300 S04 | 1R X 2 | 2 | 30 | 70 | 4 | |
| 2HRB 020 300 S06 | 1R X 2 | 2 | 30 | 70 | 6 | |
| 2HRB 020 350 S04 | 1R X 2 | 2 | 35 | 70 | 4 | |
| 2HRB 020 350 S06 | 1R X 2 | 2 | 35 | 75 | 6 | |
| 2HRB 020 400 S04 | 1R X 2 | 2 | 40 | 80 | 4 | |
| 2HRB 020 400 S06 | 1R X 2 | 2 | 40 | 80 | 6 | |
| 2HRB 020 450 S04 | 1R X 2 | 2 | 45 | 80 | 4 | |
| 2HRB 020 500 S04 | 1R X 2 | 2 | 50 | 90 | 4 | |
| 2HRB 025 080 S04 | 1.25R X 2.5 | 2.5 | 8 | 45 | 4 | |
| 2HRB 025 080 S06 | 1.25R X 2.5 | 2.5 | 8 | 50 | 6 | |
| 2HRB 025 100 S04 | 1.25R X 2.5 | 2.5 | 10 | 50 | 4 | |
| 2HRB 025 100 S06 | 1.25R X 2.5 | 2.5 | 10 | 50 | 6 | |
| 2HRB 025 120 S04 | 1.25R X 2.5 | 2.5 | 12 | 50 | 4 | |

단위 : mm

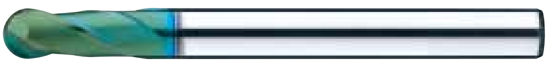
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HRB 025 120 S06 | 1.25R X 2.5 | 2.5 | 12 | 50 | 6 | |
| 2HRB 025 160 S04 | 1.25R X 2.5 | 2.5 | 16 | 50 | 4 | |
| 2HRB 025 160 S06 | 1.25R X 2.5 | 2.5 | 16 | 60 | 6 | |
| 2HRB 025 200 S04 | 1.25R X 2.5 | 2.5 | 20 | 60 | 4 | |
| 2HRB 025 250 S04 | 1.25R X 2.5 | 2.5 | 25 | 60 | 4 | |
| 2HRB 025 300 S04 | 1.25R X 2.5 | 2.5 | 30 | 70 | 4 | |
| 2HRB 025 350 S04 | 1.25R X 2.5 | 2.5 | 35 | 70 | 4 | |
| 2HRB 025 400 S04 | 1.25R X 2.5 | 2.5 | 40 | 80 | 4 | |
| 2HRB 030 060 S06 | 1.5R X 3 | 3 | 6 | 50 | 6 | |
| 2HRB 030 080 S06 | 1.5R X 3 | 3 | 8 | 50 | 6 | |
| 2HRB 030 100 S06 | 1.5R X 3 | 3 | 10 | 50 | 6 | |
| 2HRB 030 120 S06 | 1.5R X 3 | 3 | 12 | 50 | 6 | |
| 2HRB 030 160 S06 | 1.5R X 3 | 3 | 16 | 60 | 6 | |
| 2HRB 030 200 S06 | 1.5R X 3 | 3 | 20 | 60 | 6 | |
| 2HRB 030 250 S06 | 1.5R X 3 | 3 | 25 | 65 | 6 | |
| 2HRB 030 300 S06 | 1.5R X 3 | 3 | 30 | 70 | 6 | |
| 2HRB 030 350 S06 | 1.5R X 3 | 3 | 35 | 75 | 6 | |
| 2HRB 030 400 S06 | 1.5R X 3 | 3 | 40 | 80 | 6 | |
| 2HRB 030 450 S06 | 1.5R X 3 | 3 | 45 | 90 | 6 | |
| 2HRB 030 500 S06 | 1.5R X 3 | 3 | 50 | 100 | 6 | |
| 2HRB 030 600 S06 | 1.5R X 3 | 3 | 60 | 100 | 6 | |
| 2HRB 030 650 S06 | 1.5R X 3 | 3 | 65 | 110 | 6 | |
| 2HRB 030 700 S06 | 1.5R X 3 | 3 | 70 | 110 | 6 | |
| 2HRB 040 080 S06 | 2R X 4 | 4 | 8 | 50 | 6 | |
| 2HRB 040 100 S06 | 2R X 4 | 4 | 10 | 50 | 6 | |
| 2HRB 040 120 S06 | 2R X 4 | 4 | 12 | 50 | 6 | |
| 2HRB 040 160 S06 | 2R X 4 | 4 | 16 | 60 | 6 | |
| 2HRB 040 200 S06 | 2R X 4 | 4 | 20 | 60 | 6 | |
| 2HRB 040 250 S06 | 2R X 4 | 4 | 25 | 65 | 6 | |
| 2HRB 040 300 S06 | 2R X 4 | 4 | 30 | 70 | 6 | |
| 2HRB 040 350 S06 | 2R X 4 | 4 | 35 | 75 | 6 | |
| 2HRB 040 400 S06 | 2R X 4 | 4 | 40 | 80 | 6 | |
| 2HRB 040 450 S06 | 2R X 4 | 4 | 45 | 90 | 6 | |
| 2HRB 040 500 S06 | 2R X 4 | 4 | 50 | 100 | 6 | |
| 2HRB 040 550 S06 | 2R X 4 | 4 | 55 | 100 | 6 | |
| 2HRB 040 600 S06 | 2R X 4 | 4 | 60 | 100 | 6 | |
| 2HRB 040 650 S06 | 2R X 4 | 4 | 65 | 110 | 6 | |
| 2HRB 040 700 S06 | 2R X 4 | 4 | 70 | 110 | 6 | |
| 2HRB 050 160 S06 | 2.5R X 5 | 6 | 16 | 60 | 6 | |
| 2HRB 050 200 S06 | 2.5R X 5 | 6 | 20 | 60 | 6 | |
| 2HRB 050 250 S06 | 2.5R X 5 | 6 | 25 | 70 | 6 | |
| 2HRB 050 300 S06 | 2.5R X 5 | 6 | 30 | 75 | 6 | |
| 2HRB 050 400 S06 | 2.5R X 5 | 6 | 40 | 80 | 6 | |
| 2HRB 050 450 S06 | 2.5R X 5 | 6 | 45 | 90 | 6 | |
| 2HRB 050 500 S06 | 2.5R X 5 | 6 | 50 | 100 | 6 | |
| 2HRB 050 600 S06 | 2.5R X 5 | 6 | 60 | 100 | 6 | |
| 2HRB 050 650 S06 | 2.5R X 5 | 6 | 65 | 110 | 6 | |
| 2HRB 050 700 S06 | 2.5R X 5 | 6 | 70 | 110 | 6 | |
| 2HRB 060 150 S06 | 3R X 6 | 10 | 15 | 55 | 6 | |
| 2HRB 060 300 S06 | 3R X 6 | 10 | 30 | 110 | 6 | |

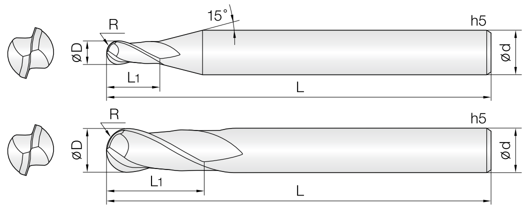
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HRB 080 250 060 | 4R X 8 | 12 | 25 | 60 | 8 | |
| 2HRB 080 300 100 | 4R X 8 | 12 | 30 | 100 | 8 | |
| 2HRB 100 300 070 | 5R X 10 | 16 | 30 | 70 | 10 | |
| 2HRB 100 350 100 | 5R X 10 | 16 | 35 | 100 | 10 | |
| 2HRB 120 300 075 | 6R X 12 | 18 | 30 | 75 | 12 | |
| 2HRB 120 400 110 | 6R X 12 | 18 | 40 | 110 | 12 | |

# 2PHCB

## 2 Flutes Ultra Precision Standard Length Ball End Mills

## 2날 초정밀 표준 길이 볼 엔드밀






- **고경도강(HRc52~62), 프리하든강 계열의 고정밀(±2㎛)가공용**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 초정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 날부인선의 조도가 뛰어나 피삭재의 면조도가 우수합니다.
- 초미립자 초경합금 (0.2㎛)을 채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc52~62)**
- Good wear resistance by Si-based PVD coating.
- Ultra high precise edge tolerance.
- Very nice work surface finish.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

2 | UWC 초미립자 | TISIN-S Coating | R ±0.002 | R ±0.003 | R ±0.005 | 30° Helix Angle | CUTTING DATA

0.1 ~ 1R | 1.25 ~ 2R | 2.5~ 6R | 432P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.2 ~ 12 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD =Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

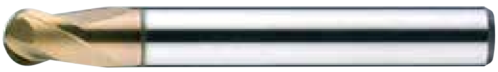
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2PHCB 002 004 S04 | 0.1R X 0.2 | 0.4 | 40 | 4 | |
| 2PHCB 003 006 S04 | 0.15R X 0.3 | 0.6 | 40 | 4 | |
| 2PHCB 004 008 S04 | 0.2R X 0.4 | 0.8 | 40 | 4 | |
| 2PHCB 005 010 S04 | 0.25R X 0.5 | 1 | 45 | 4 | |
| 2PHCB 006 012 S04 | 0.3R X 0.6 | 1.2 | 45 | 4 | |
| 2PHCB 007 015 S04 | 0.35R X 0.7 | 1.5 | 45 | 4 | |
| 2PHCB 008 020 S04 | 0.4R X 0.8 | 2 | 45 | 4 | |
| 2PHCB 009 020 S04 | 0.45R X 0.9 | 2 | 45 | 4 | |
| 2PHCB 010 025 S04 | 0.5R X 1 | 2.5 | 50 | 4 | |
| 2PHCB 010 025 S06 | 0.5R X 1 | 2.5 | 50 | 6 | |
| 2PHCB 012 030 S04 | 0.6R X 1.2 | 3 | 50 | 4 | |
| 2PHCB 015 040 S04 | 0.75R X 1.5 | 4 | 50 | 4 | |
| 2PHCB 015 040 S06 | 0.75R X 1.5 | 4 | 50 | 6 | |
| 2PHCB 020 050 S04 | 1R X 2 | 5 | 50 | 4 | |
| 2PHCB 020 050 S06 | 1R X 2 | 5 | 50 | 6 | |
| 2PHCB 025 060 S04 | 1.25R X 2.5 | 6 | 50 | 4 | |
| 2PHCB 030 080 S04 | 1.5R X 3 | 8 | 50 | 4 | |
| 2PHCB 030 080 S06 | 1.5R X 3 | 8 | 60 | 6 | |
| 2PHCB 035 080 S06 | 1.75R X 3.5 | 8 | 60 | 6 | |
| 2PHCB 040 080 S04 | 2R X 4 | 8 | 60 | 4 | |
| 2PHCB 040 080 S06 | 2R X 4 | 8 | 70 | 6 | |
| 2PHCB 045 080 S06 | 2.25R X 4.5 | 8 | 70 | 6 | |
| 2PHCB 050 100 S06 | 2.5R X 5 | 10 | 75 | 6 | |
| 2PHCB 055 100 S06 | 2.75R X 5.5 | 10 | 75 | 6 | |
| 2PHCB 060 120 080 | 3R X 6 | 12 | 80 | 6 | |
| 2PHCB 070 140 S08 | 3.5R X 7 | 14 | 80 | 8 | |
| 2PHCB 080 140 090 | 4R X 8 | 14 | 90 | 8 | |
| 2PHCB 100 180 100 | 5R X 10 | 18 | 100 | 10 | |
| 2PHCB 120 220 110 | 6R X 12 | 22 | 110 | 12 | |

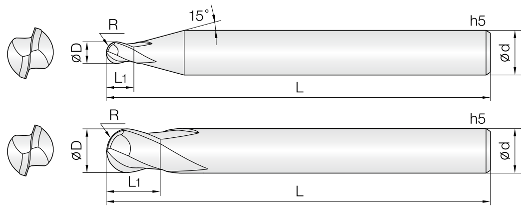
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 2HSB

## 2 Flutes High Speed Short Length Ball End Mills

## 2날 고속가공용 짧은 길이 볼 엔드밀






- **고경도강(HRc50~62), 프리하든강 계열의 고정밀 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 짧은 전장을 채택하여, 열박음척 사용이 용이합니다.
- 날부인선의 조도가 뛰어나피삭재의 면조도가 우수합니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc50~62)**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- Short overall length for easy use with shrinking chuck.
- Very nice work surface finish.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

2 | UWC 초미립자 | TISIN Coating | R ±0.005 0.05 ~ 2.5R | R ±0.01 3R ~ 6R | 30° Helix Angle | CUTTING DATA 432P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.1 ~ 0.15 | +0 ~ -0.005mm |
| | Ø0.2 ~ 12 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2HSB 001 001 S04 | 0.05R X 0.1 | 0.1 | 40 | 4 | |
| 2HSB 001 0015 S04 | 0.05R X 0.1 | 0.15 | 40 | 4 | |
| 2HSB 0015 0015 S04 | 0.075R X 0.15 | 0.15 | 40 | 4 | |
| 2HSB 0015 002 S04 | 0.075R X 0.15 | 0.2 | 40 | 4 | |
| 2HSB 002 002 S04 | 0.1R X 0.2 | 0.2 | 40 | 4 | |
| 2HSB 002 003 S04 | 0.1R X 0.2 | 0.3 | 40 | 4 | |
| 2HSB 0025 004 S04 | 0.125R X 0.25 | 0.4 | 40 | 4 | |
| 2HSB 003 003 S04 | 0.15R X 0.3 | 0.3 | 40 | 4 | |
| 2HSB 003 0045 S04 | 0.15R X 0.3 | 0.45 | 40 | 4 | |
| 2HSB 004 004 S04 | 0.2R X 0.4 | 0.4 | 40 | 4 | |
| 2HSB 004 006 S04 | 0.2R X 0.4 | 0.6 | 40 | 4 | |
| 2HSB 005 005 S04 | 0.25R X 0.5 | 0.5 | 40 | 4 | |
| 2HSB 005 0075 S04 | 0.25R X 0.5 | 0.75 | 40 | 4 | |
| 2HSB 006 006 S04 | 0.3R X 0.6 | 0.6 | 40 | 4 | |
| 2HSB 006 009 S04 | 0.3R X 0.6 | 0.9 | 40 | 4 | |
| 2HSB 007 007 S04 | 0.35R X 0.7 | 0.7 | 40 | 4 | |
| 2HSB 007 010 S04 | 0.35R X 0.7 | 1 | 40 | 4 | |
| 2HSB 008 008 S04 | 0.4R X 0.8 | 0.8 | 40 | 4 | |
| 2HSB 008 012 S04 | 0.4R X 0.8 | 1.2 | 40 | 4 | |
| 2HSB 009 009 S04 | 0.45R X 0.9 | 0.9 | 40 | 4 | |
| 2HSB 009 013 S04 | 0.45R X 0.9 | 1.3 | 40 | 4 | |
| 2HSB 010 010 S04 | 0.5R X 1 | 1 | 40 | 4 | |
| 2HSB 010 010 S06 | 0.5R X 1 | 1 | 40 | 6 | |
| 2HSB 010 015 S04 | 0.5R X 1 | 1.5 | 40 | 4 | |
| 2HSB 010 015 S06 | 0.5R X 1 | 1.5 | 40 | 6 | |
| 2HSB 012 012 S04 | 0.6R X 1.2 | 1.2 | 40 | 4 | |
| 2HSB 015 015 S04 | 0.75R X 1.5 | 1.5 | 40 | 4 | |
| 2HSB 015 015 S06 | 0.75R X 1.5 | 1.5 | 40 | 6 | |
| 2HSB 015 023 S04 | 0.75R X 1.5 | 2.3 | 40 | 4 | |
| 2HSB 015 023 S06 | 0.75R X 1.5 | 2.3 | 40 | 6 | |
| 2HSB 020 020 S04 | 1R X 2 | 2 | 45 | 4 | |
| 2HSB 020 020 S06 | 1R X 2 | 2 | 45 | 6 | |
| 2HSB 020 030 S04 | 1R X 2 | 3 | 45 | 4 | |
| 2HSB 020 030 S06 | 1R X 2 | 3 | 45 | 6 | |
| 2HSB 025 025 S04 | 1.25R X 2.5 | 2.5 | 45 | 4 | |
| 2HSB 025 025 S06 | 1.25R X 2.5 | 2.5 | 45 | 6 | |
| 2HSB 030 030 S04 | 1.5R X 3 | 3 | 45 | 4 | |
| 2HSB 030 030 S06 | 1.5R X 3 | 3 | 45 | 6 | |
| 2HSB 030 045 S04 | 1.5R X 3 | 4.5 | 45 | 4 | |
| 2HSB 030 045 S06 | 1.5R X 3 | 4.5 | 45 | 6 | |
| 2HSB 040 040 S04 | 2R X 4 | 4 | 45 | 4 | |
| 2HSB 040 040 S06 | 2R X 4 | 4 | 45 | 6 | |
| 2HSB 040 060 S04 | 2R X 4 | 6 | 45 | 4 | |
| 2HSB 040 060 S06 | 2R X 4 | 6 | 45 | 6 | |
| 2HSB 050 050 S06 | 2.5R X 5 | 5 | 50 | 6 | |
| 2HSB 050 075 S06 | 2.5R X 5 | 7.5 | 50 | 6 | |
| 2HSB 060 060 050 | 3R X 6 | 6 | 50 | 6 | |
| 2HSB 060 060 060 | 3R X 6 | 6 | 60 | 6 | |
| 2HSB 080 080 050 | 4R X 8 | 8 | 50 | 8 | |
| 2HSB 080 080 060 | 4R X 8 | 8 | 60 | 8 | |

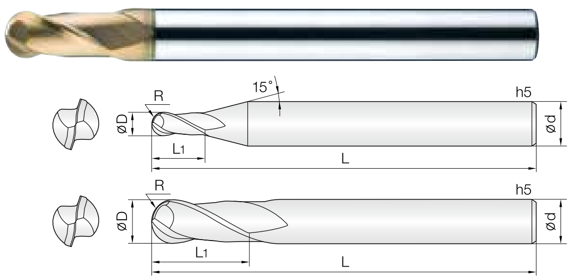
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2HSB 100 100 060 | 5R X 10 | 10 | 60 | 10 | |
| 2HSB 100 100 070 | 5R X 10 | 10 | 70 | 10 | |
| 2HSB 120 120 060 | 6R X 12 | 12 | 60 | 12 | |
| 2HSB 120 120 070 | 6R X 12 | 12 | 70 | 12 | |

# 2HCB

## 2 Flutes High Speed Standard Length Ball End Mills

## 2날 고속가공용 표준 길이 볼 엔드밀






- **고경도강(HRc50~62), 프리하든강 계열의 고정밀 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 날부인선의 조도가 뛰어나 피삭재의 면조도가 우수합니다.
- 초미립자 초경합금 (0.2㎛)을 채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc50~62)**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- Very nice work surface finish.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

2 | UWC 초미립자 | TISIN Coating | R ±0.005 (0.03 ~2.9R) | R ±0.01 (3 ~ 6R) | R ±0.015 (6.5 ~ 10R) | 30° Helix Angle | CUTTING DATA 432P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.06 ~ 0.15 | +0 ~ -0.005mm |
| | Ø0.2 ~ 20 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø3 ~ 12 | -0.005 ~ -0.015mm |
| | Ø14 ~ 20 | -0.01 ~ -0.02mm |

단위 : mm

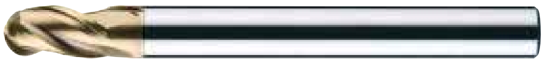
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2HCB 0006 001 S04 | 0.03R X 0.06 | 0.1 | 40 | 4 | |
| 2HCB 0007 0012 S04 | 0.035R X 0.07 | 0.12 | 40 | 4 | |
| 2HCB 0008 0015 S04 | 0.04R X 0.08 | 0.15 | 40 | 4 | |
| 2HCB 0009 0017 S04 | 0.045R X 0.09 | 0.17 | 40 | 4 | |
| 2HCB 001 002 S04 | 0.05R X 0.1 | 0.2 | 40 | 4 | |
| 2HCB 0015 003 S04 | 0.075R X 0.15 | 0.3 | 40 | 4 | |
| 2HCB 002 004 S04 | 0.1R X 0.2 | 0.4 | 40 | 4 | |
| 2HCB 003 006 S04 | 0.15R X 0.3 | 0.6 | 40 | 4 | |
| 2HCB 004 008 S04 | 0.2R X 0.4 | 0.8 | 40 | 4 | |
| 2HCB 005 010 S04 | 0.25R X 0.5 | 1 | 45 | 4 | |
| 2HCB 006 012 S04 | 0.3R X 0.6 | 1.2 | 45 | 4 | |
| 2HCB 007 015 S04 | 0.35R X 0.7 | 1.5 | 45 | 4 | |
| 2HCB 008 020 S04 | 0.4R X 0.8 | 2 | 45 | 4 | |
| 2HCB 009 020 S04 | 0.45R X 0.9 | 2 | 45 | 4 | |
| 2HCB 010 025 S03 | 0.5R X 1 | 2.5 | 50 | 3 | |
| 2HCB 010 025 S04 | 0.5R X 1 | 2.5 | 50 | 4 | |
| 2HCB 010 025 S06 | 0.5R X 1 | 2.5 | 50 | 6 | |
| 2HCB 010 025 070 | 0.5R X 1 | 2.5 | 70 | 6 | |
| 2HCB 010 025 100 | 0.5R X 1 | 2.5 | 100 | 6 | |
| 2HCB 011 027 S04 | 0.55R X 1.1 | 2.7 | 50 | 4 | |
| 2HCB 012 030 S03 | 0.6R X 1.2 | 3 | 50 | 3 | |
| 2HCB 012 030 S04 | 0.6R X 1.2 | 3 | 50 | 4 | |
| 2HCB 013 032 S04 | 0.65R X 1.3 | 3.2 | 50 | 4 | |
| 2HCB 014 035 S04 | 0.7R X 1.4 | 3.5 | 50 | 4 | |
| 2HCB 015 040 S03 | 0.75R X 1.5 | 4 | 50 | 3 | |
| 2HCB 015 040 S04 | 0.75R X 1.5 | 4 | 50 | 4 | |
| 2HCB 015 040 S06 | 0.75R X 1.5 | 4 | 50 | 6 | |
| 2HCB 015 040 070 | 0.75R X 1.5 | 4 | 70 | 6 | |
| 2HCB 015 040 100 | 0.75R X 1.5 | 4 | 100 | 6 | |
| 2HCB 016 040 S04 | 0.8R X 1.6 | 4 | 50 | 4 | |
| 2HCB 017 042 S04 | 0.85R X 1.7 | 4.2 | 50 | 4 | |
| 2HCB 018 045 S04 | 0.9R X 1.8 | 4.5 | 50 | 4 | |
| 2HCB 019 047 S04 | 0.95R X 1.9 | 4.7 | 50 | 4 | |
| 2HCB 020 050 S03 | 1R X 2 | 5 | 50 | 3 | |
| 2HCB 020 050 S04 | 1R X 2 | 5 | 50 | 4 | |
| 2HCB 020 050 S06 | 1R X 2 | 5 | 50 | 6 | |
| 2HCB 020 050 075 | 1R X 2 | 5 | 75 | 6 | |
| 2HCB 020 050 100 | 1R X 2 | 5 | 100 | 6 | |
| 2HCB 022 055 S04 | 1.1R X2.2 | 5.5 | 50 | 4 | |
| 2HCB 024 060 S04 | 1.2R X2.4 | 6 | 50 | 4 | |
| 2HCB 025 060 S03 | 1.25R X 2.5 | 6 | 50 | 3 | |
| 2HCB 025 060 S04 | 1.25R X 2.5 | 6 | 50 | 4 | |
| 2HCB 025 060 S06 | 1.25R X 2.5 | 6 | 75 | 6 | |
| 2HCB 025 060 100 | 1.25R X 2.5 | 6 | 100 | 6 | |
| 2HCB 026 060 S04 | 1.3R X 2.6 | 6 | 50 | 4 | |
| 2HCB 028 070 S04 | 1.4R X 2.8 | 7 | 50 | 4 | |
| 2HCB 030 080 S03 | 1.5R X 3 | 8 | 60 | 3 | |
| 2HCB 030 080 S04 | 1.5R X 3 | 8 | 50 | 4 | |
| 2HCB 030 080 S06 | 1.5R X 3 | 8 | 60 | 6 | |
| 2HCB 030 080 080 | 1.5R X 3 | 8 | 80 | 6 | |

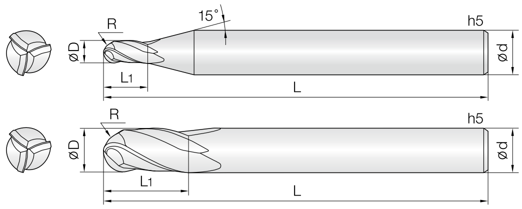
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2HCB 030 080 100 | 1.5R X 3 | 8 | 100 | 6 | |
| 2HCB 032 080 S04 | 1.6R X 3.2 | 8 | 60 | 4 | |
| 2HCB 034 080 S04 | 1.7R X 3.4 | 8 | 60 | 4 | |
| 2HCB 035 080 S06 | 1.75R X 3.5 | 8 | 60 | 6 | |
| 2HCB 036 090 S04 | 1.8R X 3.6 | 9 | 60 | 4 | |
| 2HCB 038 090 S04 | 1.9R X 3.8 | 9 | 60 | 4 | |
| 2HCB 040 080 060 | 2R X 4 | 8 | 60 | 4 | |
| 2HCB 040 080 080 | 2R X 4 | 8 | 80 | 4 | |
| 2HCB 040 080 S06 | 2R X 4 | 8 | 70 | 6 | |
| 2HCB 040 080 090 | 2R X 4 | 8 | 90 | 6 | |
| 2HCB 040 080 120 | 2R X 4 | 8 | 120 | 6 | |
| 2HCB 042 100 S06 | 2.1R X 4.2 | 10 | 70 | 6 | |
| 2HCB 044 100 S06 | 2.2R X 4.4 | 10 | 70 | 6 | |
| 2HCB 045 080 S06 | 2.25R X 4.5 | 8 | 70 | 6 | |
| 2HCB 046 100 S06 | 2.3R X 4.6 | 10 | 70 | 6 | |
| 2HCB 048 110 S06 | 2.4R X 4.8 | 11 | 70 | 6 | |
| 2HCB 050 080 S05 | 2.5R X 5 | 8 | 80 | 5 | |
| 2HCB 050 100 S06 | 2.5R X 5 | 10 | 75 | 6 | |
| 2HCB 052 120 S06 | 2.6R X 5.2 | 12 | 75 | 6 | |
| 2HCB 054 120 S06 | 2.7R X 5.4 | 12 | 75 | 6 | |
| 2HCB 055 100 S06 | 2.75R X 5.5 | 10 | 75 | 6 | |
| 2HCB 056 120 S06 | 2.8R X 5.6 | 12 | 75 | 6 | |
| 2HCB 058 120 S06 | 2.9R X 5.8 | 12 | 75 | 6 | |
| 2HCB 060 100 060 | 3R X 6 | 10 | 60 | 6 | |
| 2HCB 060 120 080 | 3R X 6 | 12 | 80 | 6 | |
| 2HCB 060 120 100 | 3R X 6 | 12 | 100 | 6 | |
| 2HCB 060 120 120 | 3R X 6 | 12 | 120 | 6 | |
| 2HCB 060 120 150 | 3R X 6 | 12 | 150 | 6 | |
| 2HCB 070 140 S08 | 3.5R X 7 | 14 | 80 | 8 | |
| 2HCB 080 140 090 | 4R X 8 | 14 | 90 | 8 | |
| 2HCB 080 140 110 | 4R X 8 | 14 | 110 | 8 | |
| 2HCB 080 140 150 | 4R X 8 | 14 | 150 | 8 | |
| 2HCB 090 160 S10 | 4.5R X 9 | 16 | 100 | 10 | |
| 2HCB 100 180 100 | 5R X 10 | 18 | 100 | 10 | |
| 2HCB 100 180 120 | 5R X 10 | 18 | 120 | 10 | |
| 2HCB 100 180 150 | 5R X 10 | 18 | 150 | 10 | |
| 2HCB 100 180 180 | 5R X 10 | 18 | 180 | 10 | |
| 2HCB 110 200 S12 | 5.5R X 11 | 20 | 110 | 12 | |
| 2HCB 120 220 110 | 6R X 12 | 22 | 110 | 12 | |
| 2HCB 120 220 130 | 6R X 12 | 22 | 130 | 12 | |
| 2HCB 120 220 150 | 6R X 12 | 22 | 150 | 12 | |
| 2HCB 120 220 200 | 6R X 12 | 22 | 200 | 12 | |
| 2HCB 130 240 S14 | 6.5R X 13 | 24 | 110 | 14 | |
| 2HCB 140 240 S14 | 7R X 14 | 24 | 110 | 14 | |
| 2HCB 160 300 130 | 8R X 16 | 30 | 130 | 16 | |
| 2HCB 160 300 160 | 8R X 16 | 30 | 160 | 16 | |
| 2HCB 160 300 200 | 8R X 16 | 30 | 200 | 16 | |
| 2HCB 200 380 160 | 10R X 20 | 38 | 160 | 20 | |
| 2HCB 200 380 200 | 10R X 20 | 38 | 200 | 20 | |

# 3HCB

## 3 Flutes High Speed Standard Length Ball End Mills

## 3날 고속가공용 표준 길이 볼 엔드밀






- **고경도강(HRc50~65), 프리하든강 계열의 고속 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 3날 볼타입 적용으로 고속 · 고이송 작업이 가능합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for pre-hardened and hardened steels(HRc50~65)**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- High speed, feed applicable by 3 flute ball edge.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

3 | WC 미립자 | TISIN Coating | R ±0.005 | R ±0.01 | 30° Helix Angle | CUTTING DATA

0.5 ~ 2.5R | 3R ~ 6R | 433P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø1 ~ 12 | +0 ~ -0.01mm | ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

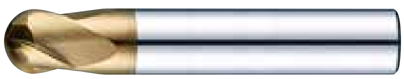
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 3HCB 010 025 S04 | 0.5R X 1 | 2.5 | 50 | 4 | |
| 3HCB 015 040 S04 | 0.75R X1.5 | 4 | 50 | 4 | |
| 3HCB 020 050 S06 | 1R X 2 | 5 | 50 | 6 | |
| 3HCB 030 080 S06 | 1.5R X 3 | 8 | 65 | 6 | |
| 3HCB 040 080 S04 | 2R X 4 | 8 | 60 | 4 | |
| 3HCB 040 080 S06 | 2R X 4 | 8 | 70 | 6 | |
| 3HCB 050 100 S06 | 2.5R X 5 | 10 | 75 | 6 | |
| 3HCB 060 120 S06 | 3R X 6 | 12 | 80 | 6 | |

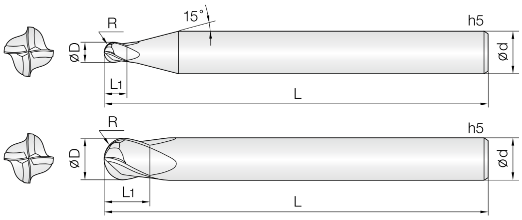
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 3HCB 060 120 120 | 3R X 6 | 12 | 120 | 6 | |
| 3HCB 080 140 S08 | 4R X 8 | 14 | 90 | 8 | |
| 3HCB 080 140 150 | 4R X 8 | 14 | 150 | 8 | |
| 3HCB 100 180 S10 | 5R X 10 | 18 | 100 | 10 | |
| 3HCB 100 180 150 | 5R X 10 | 18 | 150 | 10 | |
| 3HCB 120 220 S12 | 6R X 12 | 22 | 110 | 12 | |
| 3HCB 120 220 150 | 6R X 12 | 22 | 150 | 12 | |

# 4HSB

## 4 Flutes High Speed Short Length Ball End Mill

## 4날 고속가공용 짧은 길이 볼 엔드밀






- **고경도강(HRc50~62), 프리하든강 계열의 고정밀 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 짧은 전장을 채택하여, 열박음척 사용이 용이합니다.
- 4날 볼타입 적용으로 고속 · 고이송 작업이 가능합니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steel(HRc50~62)**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- Short overall length for easy use with shrinking chuck.
- High speed, feed applicable by 3 flute ball edge.
- Outstanding performance at high speed machining by ultra fine. (0.2㎛) WC grade.

4 | UWC 초미립자 | TISIN Coating | R ±0.005 | R ±0.01 | 30° Helix Angle | CUTTING DATA

0.5 ~ 2.5R | 3R ~ 6R | 433P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø1 ~ 12 | +0 ~ -0.01mm | ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4HSB 010 012 S04 | 0.5R X 1 | 1.2 | 40 | 4 | |
| 4HSB 012 015 S04 | 0.6R X 1.2 | 1.5 | 40 | 4 | |
| 4HSB 015 018 S04 | 0.75R X 1.5 | 1.8 | 40 | 4 | |
| 4HSB 020 024 S04 | 1R X 2 | 2.4 | 40 | 4 | |
| 4HSB 025 030 S04 | 1.25R X 2.5 | 3 | 45 | 4 | |
| 4HSB 030 036 S06 | 1.5R X 3 | 3.6 | 45 | 6 | |
| 4HSB 040 050 S04 | 2R X 4 | 5 | 45 | 4 | |
| 4HSB 040 050 S06 | 2R X 4 | 5 | 45 | 6 | |
| 4HSB 050 060 S06 | 2.5R X 5 | 6 | 50 | 6 | |
| 4HSB 060 070 S06 | 3R X 6 | 7 | 50 | 6 | |
| 4HSB 060 070 060 | 3R X 6 | 7 | 60 | 6 | |
| 4HSB 080 080 S08 | 4R X 8 | 8 | 60 | 8 | |
| 4HSB 100 100 S10 | 5R X 10 | 10 | 60 | 10 | |
| 4HSB 120 120 S12 | 6R X 12 | 12 | 75 | 12 | |

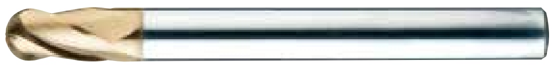
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

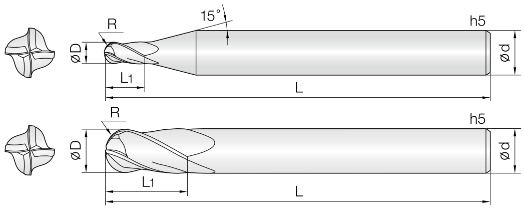
# 4HCB

## 4 Flutes High Speed Standard Length Ball End Mills

## 4날 고속가공용 표준 길이 볼 엔드밀

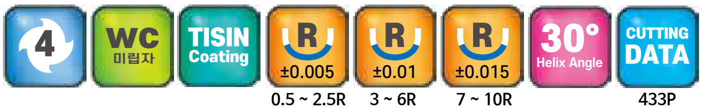







- **고경도강(HRc50~65), 프리하든강 계열의 고속 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 4날 볼타입 적용으로 고속 · 고이송 작업이 가능합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for pre-hardened and hardened steels(HRc50~65)**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- High speed, feed applicable by 4 flute ball edge.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.




| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 20 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |
| | Ø14 ~ 20 | -0.01 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4HCB 010 025 S06 | 0.5R X 1 | 2.5 | 50 | 6 | |
| 4HCB 010 025 080 | 0.5R X 1 | 2.5 | 80 | 6 | |
| 4HCB 015 040 S06 | 0.75R X 1.5 | 4 | 50 | 6 | |
| 4HCB 015 040 080 | 0.75R X 1.5 | 4 | 80 | 6 | |
| 4HCB 020 050 S06 | 1R X 2 | 5 | 50 | 6 | |
| 4HCB 020 050 080 | 1R X 2 | 5 | 80 | 6 | |
| 4HCB 025 070 S06 | 1.25R X 2.5 | 7 | 50 | 6 | |
| 4HCB 025 070 080 | 1.25R X 2.5 | 7 | 80 | 6 | |
| 4HCB 030 080 S06 | 1.5R X 3 | 8 | 60 | 6 | |
| 4HCB 030 080 090 | 1.5R X 3 | 8 | 90 | 6 | |
| 4HCB 040 080 S04 | 2R X 4 | 8 | 60 | 4 | |
| 4HCB 040 080 090 | 2R X 4 | 8 | 90 | 4 | |
| 4HCB 040 080 S06 | 2R X 4 | 8 | 70 | 6 | |
| 4HCB 040 080 100 | 2R X 4 | 8 | 100 | 6 | |
| 4HCB 050 100 S06 | 2.5R X 5 | 10 | 80 | 6 | |
| 4HCB 050 100 110 | 2.5R X 5 | 10 | 110 | 6 | |
| 4HCB 060 120 S06 | 3R X 6 | 12 | 90 | 6 | |
| 4HCB 060 120 110 | 3R X 6 | 12 | 110 | 6 | |
| 4HCB 080 140 S08 | 4R X 8 | 14 | 100 | 8 | |
| 4HCB 080 140 150 | 4R X 8 | 14 | 150 | 8 | |
| 4HCB 100 180 S10 | 5R X 10 | 18 | 100 | 10 | |
| 4HCB 100 180 150 | 5R X 10 | 18 | 150 | 10 | |
| 4HCB 120 220 S12 | 6R X 12 | 22 | 110 | 12 | |
| 4HCB 120 220 150 | 6R X 12 | 22 | 150 | 12 | |
| 4HCB 140 240 110 | 7R X 14 | 24 | 110 | 14 | |
| 4HCB 160 300 S16 | 8R X 16 | 30 | 130 | 16 | |
| 4HCB 160 300 160 | 8R X 16 | 30 | 160 | 16 | |
| 4HCB 200 400 S20 | 10R X 20 | 40 | 160 | 20 | |
| 4HCB 200 400 200 | 10R X 20 | 40 | 200 | 20 | |

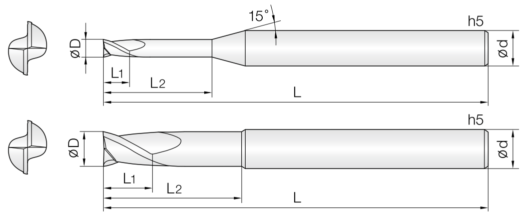
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 2HRE

## 2 Flutes High Speed Rib End Mills

## 2날 고속가공용 리브 엔드밀

HARD series




- **고경도강 (HRc50~60), 프리하든강 계열의 고정밀 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 초미립자 초경합금 (0.2㎛)을 채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc50~65)**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- High speed, feed applicable by 3 flute ball edge.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

2 UWC 초미립자 TISIN Coating 30° Helix Angle Shield Edge CUTTING DATA 434P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.1 ~ 0.15 | +0 ~ -0.005mm |
| | Ø0.2 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 12 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HRE 001 003 S04 | 0.1 | 0.15 | 0.3 | 40 | 4 | |
| 2HRE 001 005 S04 | 0.1 | 0.15 | 0.5 | 40 | 4 | |
| 2HRE 0015 003 S04 | 0.15 | 0.15 | 0.3 | 40 | 4 | |
| 2HRE 0015 005 S04 | 0.15 | 0.15 | 0.5 | 40 | 4 | |
| 2HRE 0015 0075 S04 | 0.15 | 0.15 | 0.75 | 40 | 4 | |
| 2HRE 0015 010 S04 | 0.15 | 0.15 | 1 | 40 | 4 | |
| 2HRE 002 005 S04 | 0.2 | 0.2 | 0.5 | 40 | 4 | |
| 2HRE 002 010 S04 | 0.2 | 0.2 | 1 | 40 | 4 | |
| 2HRE 002 015 S04 | 0.2 | 0.2 | 1.5 | 40 | 4 | |
| 2HRE 002 020 S04 | 0.2 | 0.2 | 2 | 40 | 4 | |
| 2HRE 002 025 S04 | 0.2 | 0.2 | 2.5 | 40 | 4 | |
| 2HRE 002 030 S04 | 0.2 | 0.2 | 3 | 40 | 4 | |
| 2HRE 0025 005 S04 | 0.25 | 0.25 | 0.5 | 40 | 4 | |
| 2HRE 0025 010 S04 | 0.25 | 0.25 | 1 | 40 | 4 | |
| 2HRE 0025 015 S04 | 0.25 | 0.25 | 1.5 | 40 | 4 | |
| 2HRE 0025 020 S04 | 0.25 | 0.25 | 2 | 40 | 4 | |
| 2HRE 0025 030 S04 | 0.25 | 0.25 | 3 | 40 | 4 | |
| 2HRE 003 010 S04 | 0.3 | 0.3 | 1 | 40 | 4 | |
| 2HRE 003 015 S04 | 0.3 | 0.3 | 1.5 | 40 | 4 | |
| 2HRE 003 020 S04 | 0.3 | 0.3 | 2 | 40 | 4 | |
| 2HRE 003 025 S04 | 0.3 | 0.3 | 2.5 | 40 | 4 | |
| 2HRE 003 030 S04 | 0.3 | 0.3 | 3 | 40 | 4 | |
| 2HRE 003 035 S04 | 0.3 | 0.3 | 3.5 | 40 | 4 | |
| 2HRE 003 040 S04 | 0.3 | 0.3 | 4 | 40 | 4 | |
| 2HRE 003 050 S04 | 0.3 | 0.3 | 5 | 40 | 4 | |
| 2HRE 004 010 S04 | 0.4 | 0.4 | 1 | 40 | 4 | |
| 2HRE 004 015 S04 | 0.4 | 0.4 | 1.5 | 40 | 4 | |
| 2HRE 004 020 S04 | 0.4 | 0.4 | 2 | 40 | 4 | |
| 2HRE 004 025 S04 | 0.4 | 0.4 | 2.5 | 40 | 4 | |
| 2HRE 004 030 S04 | 0.4 | 0.4 | 3 | 40 | 4 | |
| 2HRE 004 035 S04 | 0.4 | 0.4 | 3.5 | 40 | 4 | |
| 2HRE 004 040 S04 | 0.4 | 0.4 | 4 | 40 | 4 | |
| 2HRE 004 050 S04 | 0.4 | 0.4 | 5 | 40 | 4 | |
| 2HRE 004 060 S04 | 0.4 | 0.4 | 6 | 40 | 4 | |
| 2HRE 004 080 S04 | 0.4 | 0.4 | 8 | 40 | 4 | |
| 2HRE 004 100 S04 | 0.4 | 0.4 | 10 | 40 | 4 | |
| 2HRE 005 010 S04 | 0.5 | 0.5 | 1 | 40 | 4 | |
| 2HRE 005 020 S04 | 0.5 | 0.5 | 2 | 40 | 4 | |
| 2HRE 005 030 S04 | 0.5 | 0.5 | 3 | 40 | 4 | |
| 2HRE 005 040 S04 | 0.5 | 0.5 | 4 | 40 | 4 | |
| 2HRE 005 050 S04 | 0.5 | 0.5 | 5 | 40 | 4 | |
| 2HRE 005 060 S04 | 0.5 | 0.5 | 6 | 40 | 4 | |
| 2HRE 005 080 S04 | 0.5 | 0.5 | 8 | 40 | 4 | |
| 2HRE 005 100 S04 | 0.5 | 0.5 | 10 | 40 | 4 | |
| 2HRE 005 120 S04 | 0.5 | 0.5 | 12 | 45 | 4 | |
| 2HRE 005 140 S04 | 0.5 | 0.5 | 14 | 45 | 4 | |
| 2HRE 006 010 S04 | 0.6 | 0.6 | 1 | 40 | 4 | |
| 2HRE 006 020 S04 | 0.6 | 0.6 | 2 | 40 | 4 | |
| 2HRE 006 030 S04 | 0.6 | 0.6 | 3 | 40 | 4 | |
| 2HRE 006 040 S04 | 0.6 | 0.6 | 4 | 40 | 4 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HRE 006 050 S04 | 0.6 | 0.6 | 5 | 40 | 4 | |
| 2HRE 006 060 S04 | 0.6 | 0.6 | 6 | 40 | 4 | |
| 2HRE 006 080 S04 | 0.6 | 0.6 | 8 | 40 | 4 | |
| 2HRE 006 100 S04 | 0.6 | 0.6 | 10 | 40 | 4 | |
| 2HRE 006 120 S04 | 0.6 | 0.6 | 12 | 45 | 4 | |
| 2HRE 006 140 S04 | 0.6 | 0.6 | 14 | 45 | 4 | |
| 2HRE 006 160 S04 | 0.6 | 0.6 | 16 | 45 | 4 | |
| 2HRE 007 020 S04 | 0.7 | 0.7 | 2 | 40 | 4 | |
| 2HRE 007 040 S04 | 0.7 | 0.7 | 4 | 40 | 4 | |
| 2HRE 007 060 S04 | 0.7 | 0.7 | 6 | 40 | 4 | |
| 2HRE 007 080 S04 | 0.7 | 0.7 | 8 | 40 | 4 | |
| 2HRE 007 100 S04 | 0.7 | 0.7 | 10 | 40 | 4 | |
| 2HRE 007 120 S04 | 0.7 | 0.7 | 12 | 45 | 4 | |
| 2HRE 008 020 S04 | 0.8 | 0.8 | 2 | 40 | 4 | |
| 2HRE 008 030 S04 | 0.8 | 0.8 | 3 | 40 | 4 | |
| 2HRE 008 040 S04 | 0.8 | 0.8 | 4 | 40 | 4 | |
| 2HRE 008 050 S04 | 0.8 | 0.8 | 5 | 40 | 4 | |
| 2HRE 008 060 S04 | 0.8 | 0.8 | 6 | 40 | 4 | |
| 2HRE 008 080 S04 | 0.8 | 0.8 | 8 | 40 | 4 | |
| 2HRE 008 100 S04 | 0.8 | 0.8 | 10 | 40 | 4 | |
| 2HRE 008 120 S04 | 0.8 | 0.8 | 12 | 45 | 4 | |
| 2HRE 008 140 S04 | 0.8 | 0.8 | 14 | 45 | 4 | |
| 2HRE 009 060 S04 | 0.9 | 0.9 | 6 | 40 | 4 | |
| 2HRE 009 080 S04 | 0.9 | 0.9 | 8 | 40 | 4 | |
| 2HRE 009 100 S04 | 0.9 | 0.9 | 10 | 40 | 4 | |
| 2HRE 010 020 S04 | 1 | 1 | 2 | 45 | 4 | |
| 2HRE 010 030 S04 | 1 | 1 | 3 | 45 | 4 | |
| 2HRE 010 040 S04 | 1 | 1 | 4 | 45 | 4 | |
| 2HRE 010 050 S04 | 1 | 1 | 5 | 45 | 4 | |
| 2HRE 010 060 S04 | 1 | 1 | 6 | 45 | 4 | |
| 2HRE 010 080 S04 | 1 | 1 | 8 | 45 | 4 | |
| 2HRE 010 100 S04 | 1 | 1 | 10 | 45 | 4 | |
| 2HRE 010 120 S04 | 1 | 1 | 12 | 45 | 4 | |
| 2HRE 010 140 S04 | 1 | 1 | 14 | 45 | 4 | |
| 2HRE 010 160 S04 | 1 | 1 | 16 | 50 | 4 | |
| 2HRE 010 180 S04 | 1 | 1 | 18 | 50 | 4 | |
| 2HRE 010 200 S04 | 1 | 1 | 20 | 50 | 4 | |
| 2HRE 010 250 S04 | 1 | 1 | 25 | 60 | 4 | |
| 2HRE 010 300 S04 | 1 | 1 | 30 | 70 | 4 | |
| 2HRE 012 040 S04 | 1.2 | 1.2 | 4 | 45 | 4 | |
| 2HRE 012 060 S04 | 1.2 | 1.2 | 6 | 45 | 4 | |
| 2HRE 012 080 S04 | 1.2 | 1.2 | 8 | 45 | 4 | |
| 2HRE 012 100 S04 | 1.2 | 1.2 | 10 | 45 | 4 | |
| 2HRE 012 120 S04 | 1.2 | 1.2 | 12 | 45 | 4 | |
| 2HRE 012 160 S04 | 1.2 | 1.2 | 16 | 50 | 4 | |
| 2HRE 012 200 S04 | 1.2 | 1.2 | 20 | 50 | 4 | |
| 2HRE 012 250 S04 | 1.2 | 1.2 | 25 | 60 | 4 | |
| 2HRE 012 300 S04 | 1.2 | 1.2 | 30 | 70 | 4 | |
| 2HRE 014 060 S04 | 1.4 | 1.4 | 6 | 45 | 4 | |
| 2HRE 014 080 S04 | 1.4 | 1.4 | 8 | 45 | 4 | |

# 2HRE

## 2 Flutes High Speed Rib End Mills

## 2날 고속가공용 리브 엔드밀



단위 : mm

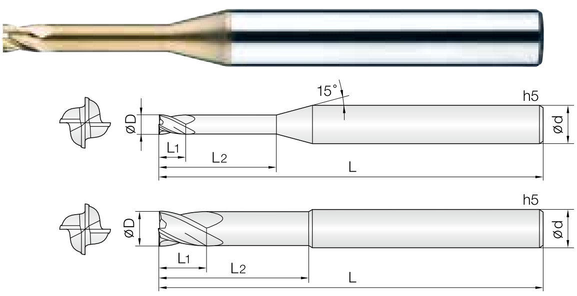
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HRE 014 100 S04 | 1.4 | 1.4 | 10 | 45 | 4 | |
| 2HRE 014 140 S04 | 1.4 | 1.4 | 14 | 45 | 4 | |
| 2HRE 014 160 S04 | 1.4 | 1.4 | 16 | 50 | 4 | |
| 2HRE 014 200 S04 | 1.4 | 1.4 | 20 | 50 | 4 | |
| 2HRE 015 040 S04 | 1.5 | 1.5 | 4 | 45 | 4 | |
| 2HRE 015 060 S04 | 1.5 | 1.5 | 6 | 45 | 4 | |
| 2HRE 015 080 S04 | 1.5 | 1.5 | 8 | 45 | 4 | |
| 2HRE 015 100 S04 | 1.5 | 1.5 | 10 | 45 | 4 | |
| 2HRE 015 120 S04 | 1.5 | 1.5 | 12 | 45 | 4 | |
| 2HRE 015 140 S04 | 1.5 | 1.5 | 14 | 50 | 4 | |
| 2HRE 015 160 S04 | 1.5 | 1.5 | 16 | 50 | 4 | |
| 2HRE 015 180 S04 | 1.5 | 1.5 | 18 | 50 | 4 | |
| 2HRE 015 200 S04 | 1.5 | 1.5 | 20 | 50 | 4 | |
| 2HRE 015 250 S04 | 1.5 | 1.5 | 25 | 60 | 4 | |
| 2HRE 015 300 S04 | 1.5 | 1.5 | 30 | 70 | 4 | |
| 2HRE 016 100 S04 | 1.6 | 1.6 | 10 | 45 | 4 | |
| 2HRE 016 140 S04 | 1.6 | 1.6 | 14 | 45 | 4 | |
| 2HRE 016 180 S04 | 1.6 | 1.6 | 18 | 50 | 4 | |
| 2HRE 018 100 S04 | 1.8 | 1.8 | 10 | 45 | 4 | |
| 2HRE 018 140 S04 | 1.8 | 1.8 | 14 | 45 | 4 | |
| 2HRE 018 180 S04 | 1.8 | 1.8 | 18 | 50 | 4 | |
| 2HRE 020 040 S04 | 2 | 2 | 4 | 45 | 4 | |
| 2HRE 020 060 S04 | 2 | 2 | 6 | 45 | 4 | |
| 2HRE 020 080 S04 | 2 | 2 | 8 | 45 | 4 | |
| 2HRE 020 100 S04 | 2 | 2 | 10 | 45 | 4 | |
| 2HRE 020 120 S04 | 2 | 2 | 12 | 45 | 4 | |
| 2HRE 020 140 S04 | 2 | 2 | 14 | 45 | 4 | |
| 2HRE 020 160 S04 | 2 | 2 | 16 | 50 | 4 | |
| 2HRE 020 180 S04 | 2 | 2 | 18 | 50 | 4 | |
| 2HRE 020 200 S04 | 2 | 2 | 20 | 50 | 4 | |
| 2HRE 020 220 S04 | 2 | 2 | 22 | 60 | 4 | |
| 2HRE 020 250 S04 | 2 | 2 | 25 | 60 | 4 | |
| 2HRE 020 300 S04 | 2 | 2 | 30 | 60 | 4 | |
| 2HRE 020 350 S04 | 2 | 2 | 35 | 70 | 4 | |
| 2HRE 020 400 S04 | 2 | 2 | 40 | 80 | 4 | |
| 2HRE 020 450 S04 | 2 | 2 | 45 | 80 | 4 | |
| 2HRE 020 500 S04 | 2 | 2 | 50 | 90 | 4 | |
| 2HRE 025 080 S04 | 2.5 | 2.5 | 8 | 45 | 4 | |
| 2HRE 025 100 S04 | 2.5 | 2.5 | 10 | 45 | 4 | |
| 2HRE 025 120 S04 | 2.5 | 2.5 | 12 | 45 | 4 | |
| 2HRE 025 160 S04 | 2.5 | 2.5 | 16 | 50 | 4 | |
| 2HRE 025 200 S04 | 2.5 | 2.5 | 20 | 50 | 4 | |
| 2HRE 025 250 S04 | 2.5 | 2.5 | 25 | 60 | 4 | |
| 2HRE 025 300 S04 | 2.5 | 2.5 | 30 | 70 | 4 | |
| 2HRE 025 350 S04 | 2.5 | 2.5 | 35 | 70 | 4 | |
| 2HRE 025 400 S04 | 2.5 | 2.5 | 40 | 80 | 4 | |
| 2HRE 025 500 S04 | 2.5 | 2.5 | 50 | 90 | 4 | |
| 2HRE 030 060 S06 | 3 | 3 | 6 | 45 | 6 | |
| 2HRE 030 080 S06 | 3 | 3 | 8 | 45 | 6 | |
| 2HRE 030 100 S06 | 3 | 3 | 10 | 45 | 6 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HRE 030 120 S06 | 3 | 3 | 12 | 50 | 6 | |
| 2HRE 030 160 S06 | 3 | 3 | 16 | 55 | 6 | |
| 2HRE 030 200 S06 | 3 | 3 | 20 | 60 | 6 | |
| 2HRE 030 250 S06 | 3 | 3 | 25 | 65 | 6 | |
| 2HRE 030 300 S06 | 3 | 3 | 30 | 70 | 6 | |
| 2HRE 030 350 S06 | 3 | 3 | 35 | 75 | 6 | |
| 2HRE 030 400 S06 | 3 | 3 | 40 | 80 | 6 | |
| 2HRE 030 450 S06 | 3 | 3 | 45 | 90 | 6 | |
| 2HRE 030 500 S06 | 3 | 3 | 50 | 100 | 6 | |
| 2HRE 030 600 S06 | 3 | 3 | 60 | 100 | 6 | |
| 2HRE 040 080 S06 | 4 | 4 | 8 | 50 | 6 | |
| 2HRE 040 100 S06 | 4 | 4 | 10 | 50 | 6 | |
| 2HRE 040 120 S06 | 4 | 4 | 12 | 50 | 6 | |
| 2HRE 040 160 S06 | 4 | 4 | 16 | 55 | 6 | |
| 2HRE 040 200 S06 | 4 | 4 | 20 | 60 | 6 | |
| 2HRE 040 250 S06 | 4 | 4 | 25 | 65 | 6 | |
| 2HRE 040 300 S06 | 4 | 4 | 30 | 70 | 6 | |
| 2HRE 040 350 S06 | 4 | 4 | 35 | 75 | 6 | |
| 2HRE 040 400 S06 | 4 | 4 | 40 | 80 | 6 | |
| 2HRE 040 450 S06 | 4 | 4 | 45 | 90 | 6 | |
| 2HRE 040 500 S06 | 4 | 4 | 50 | 100 | 6 | |
| 2HRE 040 550 S06 | 4 | 4 | 55 | 100 | 6 | |
| 2HRE 040 600 S06 | 4 | 4 | 60 | 100 | 6 | |
| 2HRE 050 160 S06 | 5 | 6 | 16 | 55 | 6 | |
| 2HRE 050 200 S06 | 5 | 6 | 20 | 60 | 6 | |
| 2HRE 050 250 S06 | 5 | 6 | 25 | 65 | 6 | |
| 2HRE 050 300 S06 | 5 | 6 | 30 | 70 | 6 | |
| 2HRE 050 350 S06 | 5 | 6 | 35 | 75 | 6 | |
| 2HRE 050 400 S06 | 5 | 6 | 40 | 80 | 6 | |
| 2HRE 050 500 S06 | 5 | 6 | 50 | 100 | 6 | |
| 2HRE 050 600 S06 | 5 | 6 | 60 | 100 | 6 | |
| 2HRE 060 200 S06 | 6 | 10 | 20 | 60 | 6 | |
| 2HRE 060 300 S06 | 6 | 10 | 30 | 75 | 6 | |
| 2HRE 060 400 S06 | 6 | 10 | 40 | 80 | 6 | |
| 2HRE 060 500 S06 | 6 | 10 | 50 | 90 | 6 | |
| 2HRE 060 600 S06 | 6 | 10 | 60 | 110 | 6 | |
| 2HRE 080 200 S08 | 8 | 12 | 20 | 65 | 8 | |
| 2HRE 080 300 S08 | 8 | 12 | 30 | 80 | 8 | |
| 2HRE 080 400 S08 | 8 | 12 | 40 | 100 | 8 | |
| 2HRE 100 250 S10 | 10 | 15 | 25 | 70 | 10 | |
| 2HRE 100 350 S10 | 10 | 15 | 35 | 80 | 10 | |
| 2HRE 100 450 S10 | 10 | 15 | 45 | 100 | 10 | |
| 2HRE 120 300 S12 | 12 | 18 | 30 | 80 | 12 | |
| 2HRE 120 400 S12 | 12 | 18 | 40 | 100 | 12 | |
| 2HRE 120 500 S12 | 12 | 18 | 50 | 120 | 12 | |

# 4HRE

## 4 Flutes High Speed Rib End Mills

## 4날 고속가공용 리브 엔드밀




- **고경도강 (HRc50~60), 프리하든강 계열의 고정밀 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 초미립자 초경합금 (0.2㎛)을 채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc50~65)**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- High speed, feed applicable by 3 flute ball edge.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

HARD series

4 | UWC 초미립자 | TiSIN Coating | 30° Helix Angle | Shield Edge | CUTTING DATA 437P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø0.5 ~ 6 | +0 ~ -0.01mm | ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | +0 ~ -0.015mm | | Ø8 ~ 12 | -0.01 ~ -0.025mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4HRE 005 010 S04 | 0.5 | 0.5 | 1 | 45 | 4 | |
| 4HRE 005 020 S04 | 0.5 | 0.5 | 2 | 45 | 4 | |
| 4HRE 005 030 S04 | 0.5 | 0.5 | 3 | 45 | 4 | |
| 4HRE 005 040 S04 | 0.5 | 0.5 | 4 | 45 | 4 | |
| 4HRE 005 050 S04 | 0.5 | 0.5 | 5 | 45 | 4 | |
| 4HRE 005 060 S04 | 0.5 | 0.5 | 6 | 45 | 4 | |
| 4HRE 005 080 S04 | 0.5 | 0.5 | 8 | 45 | 4 | |
| 4HRE 005 100 S04 | 0.5 | 0.5 | 10 | 50 | 4 | |
| 4HRE 006 010 S04 | 0.6 | 0.6 | 1 | 45 | 4 | |
| 4HRE 006 020 S04 | 0.6 | 0.6 | 2 | 45 | 4 | |
| 4HRE 006 030 S04 | 0.6 | 0.6 | 3 | 45 | 4 | |
| 4HRE 006 040 S04 | 0.6 | 0.6 | 4 | 45 | 4 | |
| 4HRE 006 060 S04 | 0.6 | 0.6 | 6 | 45 | 4 | |
| 4HRE 006 080 S04 | 0.6 | 0.6 | 8 | 45 | 4 | |
| 4HRE 006 100 S04 | 0.6 | 0.6 | 10 | 50 | 4 | |
| 4HRE 006 120 S04 | 0.6 | 0.6 | 12 | 50 | 4 | |
| 4HRE 007 020 S04 | 0.7 | 0.7 | 2 | 45 | 4 | |
| 4HRE 007 040 S04 | 0.7 | 0.7 | 4 | 45 | 4 | |
| 4HRE 007 060 S04 | 0.7 | 0.7 | 6 | 45 | 4 | |
| 4HRE 007 080 S04 | 0.7 | 0.7 | 8 | 45 | 4 | |
| 4HRE 007 100 S04 | 0.7 | 0.7 | 10 | 50 | 4 | |
| 4HRE 008 020 S04 | 0.8 | 0.8 | 2 | 45 | 4 | |
| 4HRE 008 040 S04 | 0.8 | 0.8 | 4 | 45 | 4 | |
| 4HRE 008 060 S04 | 0.8 | 0.8 | 6 | 45 | 4 | |
| 4HRE 008 080 S04 | 0.8 | 0.8 | 8 | 45 | 4 | |
| 4HRE 008 100 S04 | 0.8 | 0.8 | 10 | 45 | 4 | |
| 4HRE 008 120 S04 | 0.8 | 0.8 | 12 | 45 | 4 | |
| 4HRE 008 160 S04 | 0.8 | 0.8 | 16 | 50 | 4 | |
| 4HRE 009 020 S04 | 0.9 | 0.9 | 2 | 45 | 4 | |
| 4HRE 009 060 S04 | 0.9 | 0.9 | 6 | 45 | 4 | |
| 4HRE 009 080 S04 | 0.9 | 0.9 | 8 | 45 | 4 | |
| 4HRE 009 100 S04 | 0.9 | 0.9 | 10 | 45 | 4 | |
| 4HRE 010 020 S04 | 1 | 1 | 2 | 45 | 4 | |
| 4HRE 010 030 S04 | 1 | 1 | 3 | 45 | 4 | |
| 4HRE 010 040 S04 | 1 | 1 | 4 | 45 | 4 | |
| 4HRE 010 060 S04 | 1 | 1 | 6 | 45 | 4 | |
| 4HRE 010 080 S04 | 1 | 1 | 8 | 45 | 4 | |
| 4HRE 010 100 S04 | 1 | 1 | 10 | 45 | 4 | |
| 4HRE 010 120 S04 | 1 | 1 | 12 | 45 | 4 | |
| 4HRE 010 140 S04 | 1 | 1 | 14 | 50 | 4 | |
| 4HRE 010 160 S04 | 1 | 1 | 16 | 50 | 4 | |
| 4HRE 010 200 S04 | 1 | 1 | 20 | 50 | 4 | |
| 4HRE 010 250 S04 | 1 | 1 | 25 | 60 | 4 | |
| 4HRE 012 040 S04 | 1.2 | 1.2 | 4 | 45 | 4 | |
| 4HRE 012 060 S04 | 1.2 | 1.2 | 6 | 45 | 4 | |
| 4HRE 012 080 S04 | 1.2 | 1.2 | 8 | 45 | 4 | |
| 4HRE 012 100 S04 | 1.2 | 1.2 | 10 | 45 | 4 | |
| 4HRE 012 120 S04 | 1.2 | 1.2 | 12 | 45 | 4 | |
| 4HRE 012 160 S04 | 1.2 | 1.2 | 16 | 50 | 4 | |
| 4HRE 015 040 S04 | 1.5 | 1.5 | 4 | 45 | 4 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4HRE 015 060 S04 | 1.5 | 1.5 | 6 | 45 | 4 | |
| 4HRE 015 080 S04 | 1.5 | 1.5 | 8 | 45 | 4 | |
| 4HRE 015 100 S04 | 1.5 | 1.5 | 10 | 45 | 4 | |
| 4HRE 015 120 S04 | 1.5 | 1.5 | 12 | 45 | 4 | |
| 4HRE 015 160 S04 | 1.5 | 1.5 | 16 | 50 | 4 | |
| 4HRE 015 200 S04 | 1.5 | 1.5 | 20 | 50 | 4 | |
| 4HRE 015 250 S04 | 1.5 | 1.5 | 25 | 60 | 4 | |
| 4HRE 020 040 S04 | 2 | 2 | 4 | 45 | 4 | |
| 4HRE 020 060 S04 | 2 | 2 | 6 | 45 | 4 | |
| 4HRE 020 080 S04 | 2 | 2 | 8 | 45 | 4 | |
| 4HRE 020 100 S04 | 2 | 2 | 10 | 45 | 4 | |
| 4HRE 020 120 S04 | 2 | 2 | 12 | 45 | 4 | |
| 4HRE 020 140 S04 | 2 | 2 | 14 | 50 | 4 | |
| 4HRE 020 160 S04 | 2 | 2 | 16 | 50 | 4 | |
| 4HRE 020 180 S04 | 2 | 2 | 18 | 50 | 4 | |
| 4HRE 020 200 S04 | 2 | 2 | 20 | 50 | 4 | |
| 4HRE 020 250 S04 | 2 | 2 | 25 | 60 | 4 | |
| 4HRE 020 300 S04 | 2 | 2 | 30 | 70 | 4 | |
| 4HRE 025 100 S04 | 2.5 | 2.5 | 10 | 45 | 4 | |
| 4HRE 025 120 S04 | 2.5 | 2.5 | 12 | 45 | 4 | |
| 4HRE 025 160 S04 | 2.5 | 2.5 | 16 | 50 | 4 | |
| 4HRE 025 200 S04 | 2.5 | 2.5 | 20 | 50 | 4 | |
| 4HRE 025 250 S04 | 2.5 | 2.5 | 25 | 60 | 4 | |
| 4HRE 025 300 S04 | 2.5 | 2.5 | 30 | 70 | 4 | |
| 4HRE 030 060 S06 | 3 | 3 | 6 | 45 | 6 | |
| 4HRE 030 080 S06 | 3 | 3 | 8 | 45 | 6 | |
| 4HRE 030 100 S06 | 3 | 3 | 10 | 45 | 6 | |
| 4HRE 030 120 S06 | 3 | 3 | 12 | 50 | 6 | |
| 4HRE 030 160 S06 | 3 | 3 | 16 | 55 | 6 | |
| 4HRE 030 200 S06 | 3 | 3 | 20 | 60 | 6 | |
| 4HRE 030 250 S06 | 3 | 3 | 25 | 65 | 6 | |
| 4HRE 030 300 S06 | 3 | 3 | 30 | 70 | 6 | |
| 4HRE 030 350 S06 | 3 | 3 | 35 | 75 | 6 | |
| 4HRE 030 400 S06 | 3 | 3 | 40 | 80 | 6 | |
| 4HRE 030 450 S06 | 3 | 3 | 45 | 90 | 6 | |
| 4HRE 030 500 S06 | 3 | 3 | 50 | 100 | 6 | |
| 4HRE 035 120 S06 | 3.5 | 3.5 | 12 | 50 | 6 | |
| 4HRE 035 160 S06 | 3.5 | 3.5 | 16 | 55 | 6 | |
| 4HRE 035 200 S06 | 3.5 | 3.5 | 20 | 60 | 6 | |
| 4HRE 035 250 S06 | 3.5 | 3.5 | 25 | 65 | 6 | |
| 4HRE 035 300 S06 | 3.5 | 3.5 | 30 | 70 | 6 | |
| 4HRE 040 060 S06 | 4 | 4 | 6 | 50 | 6 | |
| 4HRE 040 080 S06 | 4 | 4 | 8 | 50 | 6 | |
| 4HRE 040 100 S06 | 4 | 4 | 10 | 50 | 6 | |
| 4HRE 040 120 S06 | 4 | 4 | 12 | 50 | 6 | |
| 4HRE 040 160 S06 | 4 | 4 | 16 | 55 | 6 | |
| 4HRE 040 200 S06 | 4 | 4 | 20 | 60 | 6 | |
| 4HRE 040 250 S06 | 4 | 4 | 25 | 65 | 6 | |
| 4HRE 040 300 S06 | 4 | 4 | 30 | 70 | 6 | |
| 4HRE 040 400 S06 | 4 | 4 | 40 | 80 | 6 | |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4HRE 040 450 S06 | 4 | 4 | 45 | 90 | 6 | |
| 4HRE 040 500 S06 | 4 | 4 | 50 | 100 | 6 | |
| 4HRE 040 600 S06 | 4 | 4 | 60 | 110 | 6 | |
| 4HRE 045 120 S06 | 4.5 | 4.5 | 12 | 50 | 6 | |
| 4HRE 045 160 S06 | 4.5 | 4.5 | 16 | 55 | 6 | |
| 4HRE 045 200 S06 | 4.5 | 4.5 | 20 | 60 | 6 | |
| 4HRE 045 250 S06 | 4.5 | 4.5 | 25 | 65 | 6 | |
| 4HRE 045 300 S06 | 4.5 | 4.5 | 30 | 70 | 6 | |
| 4HRE 050 160 S06 | 5 | 5 | 16 | 55 | 6 | |
| 4HRE 050 200 S06 | 5 | 5 | 20 | 60 | 6 | |
| 4HRE 050 250 S06 | 5 | 5 | 25 | 65 | 6 | |
| 4HRE 050 300 S06 | 5 | 5 | 30 | 70 | 6 | |
| 4HRE 050 400 S06 | 5 | 5 | 40 | 80 | 6 | |
| 4HRE 050 500 S06 | 5 | 5 | 50 | 100 | 6 | |
| 4HRE 050 600 S06 | 5 | 5 | 60 | 110 | 6 | |
| 4HRE 060 200 S06 | 6 | 6 | 20 | 60 | 6 | |
| 4HRE 060 300 S06 | 6 | 6 | 30 | 75 | 6 | |
| 4HRE 060 400 S06 | 6 | 6 | 40 | 80 | 6 | |
| 4HRE 060 500 S06 | 6 | 6 | 50 | 90 | 6 | |
| 4HRE 060 600 S06 | 6 | 6 | 60 | 110 | 6 | |
| 4HRE 080 200 S08 | 8 | 10 | 20 | 65 | 8 | |
| 4HRE 080 300 S08 | 8 | 10 | 30 | 80 | 8 | |
| 4HRE 080 400 S08 | 8 | 10 | 40 | 100 | 8 | |
| 4HRE 100 250 S10 | 10 | 15 | 25 | 70 | 10 | |
| 4HRE 100 350 S10 | 10 | 15 | 35 | 90 | 10 | |
| 4HRE 100 450 S10 | 10 | 15 | 45 | 110 | 10 | |
| 4HRE 120 300 S12 | 12 | 18 | 30 | 80 | 12 | |
| 4HRE 120 400 S12 | 12 | 18 | 40 | 100 | 12 | |
| 4HRE 120 500 S12 | 12 | 18 | 50 | 120 | 12 | |

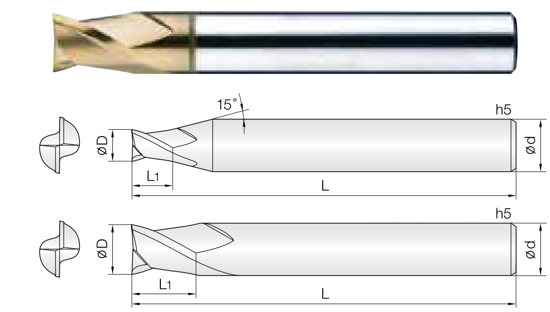
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

# 2HSE

## 2 Flutes High Speed Short Length End Mills

## 2날 고속가공용 짧은 길이 엔드밀






- **고경도강(HRc50~65), 프리하든강 계열의 고속 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 짧은 전장을 채택하여, 열박음척 사용이 용이합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for pre-hardened and hardened steels(HRc50~65)**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- Reinforced edge design for preventing edge chipping.
- Short overall length for easy use with shrinking chuck.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

2 | WC 미립자 | TISIN Coating | 30° Helix Angle | Shield Edge | CUTTING DATA 438P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø0.1 ~ 6 | +0 ~ -0.01mm | ØD = Ød | Ø4 ~ 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | +0 ~ -0.015mm | | Ø8 ~ 12 | -0.01 ~ -0.025mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2HSE 001 001 S04 | 0.1 | 0.1 | 40 | 4 | |
| 2HSE 0015 0015 S04 | 0.15 | 0.15 | 40 | 4 | |
| 2HSE 002 002 S04 | 0.2 | 0.2 | 40 | 4 | |
| 2HSE 0025 0025 S04 | 0.25 | 0.25 | 40 | 4 | |
| 2HSE 003 003 S04 | 0.3 | 0.3 | 40 | 4 | |
| 2HSE 004 004 S04 | 0.4 | 0.4 | 40 | 4 | |
| 2HSE 005 005 S04 | 0.5 | 0.5 | 40 | 4 | |
| 2HSE 006 006 S04 | 0.6 | 0.6 | 40 | 4 | |
| 2HSE 007 007 S04 | 0.7 | 0.7 | 40 | 4 | |
| 2HSE 008 008 S04 | 0.8 | 0.8 | 40 | 4 | |
| 2HSE 009 009 S04 | 0.9 | 0.9 | 40 | 4 | |
| 2HSE 010 010 S04 | 1 | 1 | 40 | 4 | |
| 2HSE 012 012 S04 | 1.2 | 1.2 | 40 | 4 | |
| 2HSE 015 015 S04 | 1.5 | 1.5 | 40 | 4 | |
| 2HSE 020 020 S04 | 2 | 2 | 40 | 4 | |
| 2HSE 030 030 S04 | 3 | 3 | 40 | 4 | |
| 2HSE 040 040 S04 | 4 | 4 | 40 | 4 | |
| 2HSE 050 050 S06 | 5 | 5 | 45 | 6 | |
| 2HSE 060 060 S06 | 6 | 6 | 45 | 6 | |
| 2HSE 080 080 S08 | 8 | 8 | 50 | 8 | |
| 2HSE 100 100 S10 | 10 | 10 | 60 | 10 | |
| 2HSE 120 120 S12 | 12 | 12 | 65 | 12 | |

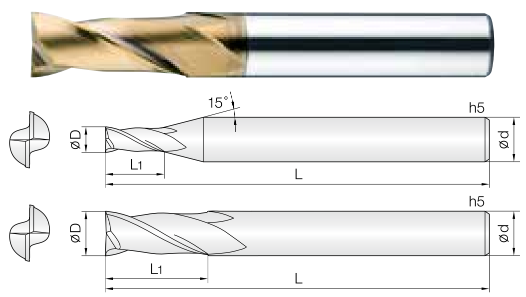
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 2HCE

## 2 Flutes High Speed Standard Length End Mills

## 2날 고속가공용 표준 길이 엔드밀






- **고경도강(HRc50~65), 프리하든강 계열의 고속 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 국내최초 날경 0.05mm 제품부터 생산합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for pre-hardened and hardened steels(HRc50~65)**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- Reinforced edge design for preventing edge chipping.
- Produce down to 0.05mm in diameter endmills at the first time in Korea.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

2 | WC 미립자 | TISIN Coating | 30° Helix Angle | Shield Edge | CUTTING DATA 438P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø0.05 ~ 0.15 | +0 ~ -0.005mm | ØD = Ød | Ø3 ~ 6 | -0.005 ~ -0.015mm |
| | Ø0.2 ~ 6 | +0 ~ -0.01mm | | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø6.1 ~ 20 | +0 ~ -0.015mm | | Ø14 ~ 20 | -0.015 ~ -0.03mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2HCE 0005 0008 S04 | 0.05 | 0.08 | 40 | 4 | |
| 2HCE 0006 001 S04 | 0.06 | 0.1 | 40 | 4 | |
| 2HCE 0007 0012 S04 | 0.07 | 0.12 | 40 | 4 | |
| 2HCE 0008 0015 S04 | 0.08 | 0.15 | 40 | 4 | |
| 2HCE 0009 0017 S04 | 0.09 | 0.17 | 40 | 4 | |
| 2HCE 001 002 S04 | 0.1 | 0.2 | 40 | 4 | |
| 2HCE 0015 003 S04 | 0.15 | 0.3 | 40 | 4 | |
| 2HCE 002 004 S04 | 0.2 | 0.4 | 40 | 4 | |
| 2HCE 0025 005 S04 | 0.25 | 0.5 | 40 | 4 | |
| 2HCE 003 006 S04 | 0.3 | 0.6 | 40 | 4 | |
| 2HCE 0035 007 S04 | 0.35 | 0.7 | 40 | 4 | |
| 2HCE 004 008 S04 | 0.4 | 0.8 | 40 | 4 | |
| 2HCE 0045 009 S04 | 0.45 | 0.9 | 40 | 4 | |
| 2HCE 005 010 S03 | 0.5 | 1 | 40 | 3 | |
| 2HCE 005 010 S04 | 0.5 | 1 | 40 | 4 | |
| 2HCE 0055 011 S04 | 0.55 | 1.1 | 40 | 4 | |
| 2HCE 006 012 S03 | 0.6 | 1.2 | 40 | 3 | |
| 2HCE 006 012 S04 | 0.6 | 1.2 | 40 | 4 | |
| 2HCE 0065 013 S04 | 0.65 | 1.3 | 40 | 4 | |
| 2HCE 007 014 S04 | 0.7 | 1.4 | 40 | 4 | |
| 2HCE 0075 015 S04 | 0.75 | 1.5 | 40 | 4 | |
| 2HCE 008 016 S03 | 0.8 | 1.6 | 40 | 3 | |
| 2HCE 008 016 S04 | 0.8 | 1.6 | 40 | 4 | |
| 2HCE 0085 017 S04 | 0.85 | 1.7 | 40 | 4 | |
| 2HCE 009 020 S04 | 0.9 | 2 | 40 | 4 | |
| 2HCE 0095 020 S04 | 0.95 | 2 | 40 | 4 | |
| 2HCE 010 025 S03 | 1 | 2.5 | 40 | 3 | |
| 2HCE 010 025 S04 | 1 | 2.5 | 40 | 4 | |
| 2HCE 010 025 S06 | 1 | 2.5 | 40 | 6 | |
| 2HCE 010 025 060 | 1 | 2.5 | 60 | 6 | |
| 2HCE 0105 025 S04 | 1.05 | 2.5 | 40 | 4 | |
| 2HCE 011 027 S04 | 1.1 | 2.7 | 40 | 4 | |
| 2HCE 0115 025 S04 | 1.15 | 2.5 | 40 | 4 | |
| 2HCE 012 030 S03 | 1.2 | 3 | 40 | 3 | |
| 2HCE 012 030 S04 | 1.2 | 3 | 40 | 4 | |
| 2HCE 012 030 060 | 1.2 | 3 | 60 | 6 | |
| 2HCE 0125 030 S04 | 1.25 | 3 | 40 | 4 | |
| 2HCE 013 032 S04 | 1.3 | 3.2 | 40 | 4 | |
| 2HCE 0135 032 S04 | 1.35 | 3.2 | 40 | 4 | |
| 2HCE 014 035 S04 | 1.4 | 3.5 | 40 | 4 | |
| 2HCE 0145 035 S04 | 1.45 | 3.5 | 40 | 4 | |
| 2HCE 015 040 S03 | 1.5 | 4 | 40 | 3 | |
| 2HCE 015 040 S04 | 1.5 | 4 | 40 | 4 | |
| 2HCE 015 040 S06 | 1.5 | 4 | 40 | 6 | |
| 2HCE 015 040 060 | 1.5 | 4 | 60 | 6 | |
| 2HCE 0155 040 S04 | 1.55 | 4 | 40 | 4 | |
| 2HCE 016 040 S04 | 1.6 | 4 | 40 | 4 | |
| 2HCE 0165 040 S04 | 1.65 | 4 | 40 | 4 | |
| 2HCE 017 042 S04 | 1.7 | 4.2 | 40 | 4 | |
| 2HCE 0175 042 S04 | 1.75 | 4.2 | 40 | 4 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2HCE 018 045 S04 | 1.8 | 4.5 | 40 | 4 | |
| 2HCE 0185 045 S04 | 1.85 | 4.5 | 40 | 4 | |
| 2HCE 019 050 S04 | 1.9 | 5 | 40 | 4 | |
| 2HCE 0195 050 S04 | 1.95 | 5 | 40 | 4 | |
| 2HCE 020 060 S03 | 2 | 6 | 40 | 3 | |
| 2HCE 020 060 S04 | 2 | 6 | 40 | 4 | |
| 2HCE 020 060 S06 | 2 | 6 | 40 | 6 | |
| 2HCE 020 060 060 | 2 | 6 | 60 | 6 | |
| 2HCE 021 060 S04 | 2.1 | 6 | 40 | 4 | |
| 2HCE 022 060 S04 | 2.2 | 6 | 40 | 4 | |
| 2HCE 023 060 S04 | 2.3 | 6 | 40 | 4 | |
| 2HCE 024 080 S04 | 2.4 | 8 | 45 | 4 | |
| 2HCE 025 080 S03 | 2.5 | 8 | 45 | 3 | |
| 2HCE 025 080 S04 | 2.5 | 8 | 45 | 4 | |
| 2HCE 025 080 S06 | 2.5 | 8 | 45 | 6 | |
| 2HCE 025 080 070 | 2.5 | 8 | 70 | 6 | |
| 2HCE 026 080 S04 | 2.6 | 8 | 45 | 4 | |
| 2HCE 027 080 S04 | 2.7 | 8 | 45 | 4 | |
| 2HCE 028 080 S04 | 2.8 | 8 | 45 | 4 | |
| 2HCE 029 080 S04 | 2.9 | 8 | 45 | 4 | |
| 2HCE 030 080 S03 | 3 | 8 | 45 | 3 | |
| 2HCE 030 080 S04 | 3 | 8 | 45 | 4 | |
| 2HCE 030 080 S06 | 3 | 8 | 45 | 6 | |
| 2HCE 030 080 070 | 3 | 8 | 70 | 6 | |
| 2HCE 031 080 S06 | 3.1 | 8 | 45 | 6 | |
| 2HCE 032 080 S06 | 3.2 | 8 | 45 | 6 | |
| 2HCE 033 080 S06 | 3.3 | 8 | 45 | 6 | |
| 2HCE 034 080 S06 | 3.4 | 8 | 45 | 6 | |
| 2HCE 035 100 S06 | 3.5 | 10 | 45 | 6 | |
| 2HCE 036 100 S06 | 3.6 | 10 | 45 | 6 | |
| 2HCE 037 100 S06 | 3.7 | 10 | 45 | 6 | |
| 2HCE 038 100 S06 | 3.8 | 10 | 45 | 6 | |
| 2HCE 039 100 S06 | 3.9 | 10 | 45 | 6 | |
| 2HCE 040 100 S04 | 4 | 10 | 45 | 4 | |
| 2HCE 040 110 S06 | 4 | 11 | 45 | 6 | |
| 2HCE 040 110 070 | 4 | 11 | 70 | 6 | |
| 2HCE 041 110 S06 | 4.1 | 11 | 45 | 6 | |
| 2HCE 042 110 S06 | 4.2 | 11 | 45 | 6 | |
| 2HCE 043 110 S06 | 4.3 | 11 | 45 | 6 | |
| 2HCE 044 110 S06 | 4.4 | 11 | 45 | 6 | |
| 2HCE 045 110 S06 | 4.5 | 11 | 45 | 6 | |
| 2HCE 046 110 S06 | 4.6 | 11 | 45 | 6 | |
| 2HCE 047 110 S06 | 4.7 | 11 | 45 | 6 | |
| 2HCE 048 110 S06 | 4.8 | 11 | 45 | 6 | |
| 2HCE 049 110 S06 | 4.9 | 11 | 45 | 6 | |
| 2HCE 050 130 S06 | 5 | 13 | 50 | 6 | |
| 2HCE 050 130 080 | 5 | 13 | 80 | 6 | |
| 2HCE 051 130 S06 | 5.1 | 13 | 50 | 6 | |
| 2HCE 052 130 S06 | 5.2 | 13 | 50 | 6 | |
| 2HCE 053 130 S06 | 5.3 | 13 | 50 | 6 | |

단위 : mm

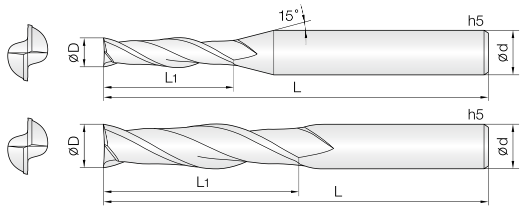
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2HCE 054 130 S06 | 5.4 | 13 | 50 | 6 | |
| 2HCE 055 130 S06 | 5.5 | 13 | 50 | 6 | |
| 2HCE 056 130 S06 | 5.6 | 13 | 50 | 6 | |
| 2HCE 057 130 S06 | 5.7 | 13 | 50 | 6 | |
| 2HCE 058 130 S06 | 5.8 | 13 | 50 | 6 | |
| 2HCE 059 130 S06 | 5.9 | 13 | 50 | 6 | |
| 2HCE 060 130 S06 | 6 | 13 | 50 | 6 | |
| 2HCE 060 130 080 | 6 | 13 | 80 | 6 | |
| 2HCE 061 150 S08 | 6.1 | 15 | 70 | 8 | |
| 2HCE 062 150 S08 | 6.2 | 15 | 70 | 8 | |
| 2HCE 063 150 S08 | 6.3 | 15 | 70 | 8 | |
| 2HCE 064 150 S08 | 6.4 | 15 | 70 | 8 | |
| 2HCE 065 160 S08 | 6.5 | 16 | 60 | 8 | |
| 2HCE 070 160 S08 | 7 | 16 | 60 | 8 | |
| 2HCE 075 160 S08 | 7.5 | 16 | 60 | 8 | |
| 2HCE 080 190 S08 | 8 | 19 | 60 | 8 | |
| 2HCE 085 190 S10 | 8.5 | 19 | 70 | 10 | |
| 2HCE 090 190 S10 | 9 | 19 | 70 | 10 | |
| 2HCE 095 190 S10 | 9.5 | 19 | 70 | 10 | |
| 2HCE 100 220 S10 | 10 | 22 | 70 | 10 | |
| 2HCE 105 220 S12 | 10.5 | 22 | 75 | 12 | |
| 2HCE 110 220 S12 | 11 | 22 | 75 | 12 | |
| 2HCE 115 220 S12 | 11.5 | 22 | 75 | 12 | |
| 2HCE 120 260 S12 | 12 | 26 | 75 | 12 | |
| 2HCE 130 260 S14 | 13 | 26 | 80 | 14 | |
| 2HCE 140 260 S14 | 14 | 26 | 80 | 14 | |
| 2HCE 140 260 S16 | 14 | 26 | 90 | 16 | |
| 2HCE 150 350 S16 | 15 | 35 | 100 | 16 | |
| 2HCE 160 350 S16 | 16 | 35 | 100 | 16 | |
| 2HCE 170 350 S18 | 17 | 35 | 100 | 18 | |
| 2HCE 180 350 S18 | 18 | 35 | 100 | 18 | |
| 2HCE 200 400 S20 | 20 | 40 | 100 | 20 | |

# 2LEM

## 2 Flutes Long Length End Mills

## 2날 긴 길이 엔드밀






- **HRc55 이하의 고경도강, 프리하든강, 공구강, 주철등 피삭재 가공**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 균일한 런아웃 공차관리로 공구의 성능을 향상시켰습니다.
- 다양한 날길이와 전장을 채택, 다양한 작업에 효율성을 극대화 하였습니다.
- 코너부 강성을 보강하여 날부치핑을 최소화 하였습니다.

- **Endmills for various work materials, hardened steels(~HRc55), pre-hardened steels, tool steels and cast irons**
- Good wear resistance by Si-based PVD coating.
- Improve tool performance by even run-out and tolerance control.
- Various flute and overall length design for covering wide range applications as well as high efficiency machining.
- Minimize edge chipping by improving corner strength.

2 | WC 미립자 | TISIN Coating | 30° Helix Angle | Shield Edge | CUTTING DATA 440P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 25 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 25 | -0.015 ~ -0.03mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2LEM 010 030 S06 | 1 | 3 | 60 | 6 | |
| 2LEM 010 050 S06 | 1 | 5 | 60 | 6 | |
| 2LEM 010 070 S06 | 1 | 7 | 60 | 6 | |
| 2LEM 010 100 S06 | 1 | 10 | 60 | 6 | |
| 2LEM 010 120 S06 | 1 | 12 | 60 | 6 | |
| 2LEM 010 150 S06 | 1 | 15 | 60 | 6 | |
| 2LEM 012 060 S06 | 1.2 | 6 | 60 | 6 | |
| 2LEM 012 080 S06 | 1.2 | 8 | 60 | 6 | |
| 2LEM 012 100 S06 | 1.2 | 10 | 60 | 6 | |
| 2LEM 012 120 S06 | 1.2 | 12 | 60 | 6 | |
| 2LEM 015 060 S06 | 1.5 | 6 | 60 | 6 | |
| 2LEM 015 075 S06 | 1.5 | 7.5 | 60 | 6 | |
| 2LEM 015 100 S06 | 1.5 | 10 | 60 | 6 | |
| 2LEM 015 150 S06 | 1.5 | 15 | 60 | 6 | |
| 2LEM 015 200 S06 | 1.5 | 20 | 60 | 6 | |
| 2LEM 020 060 S06 | 2 | 6 | 60 | 6 | |
| 2LEM 020 100 S06 | 2 | 10 | 60 | 6 | |
| 2LEM 020 150 S06 | 2 | 15 | 60 | 6 | |
| 2LEM 020 200 S06 | 2 | 20 | 60 | 6 | |
| 2LEM 025 100 S06 | 2.5 | 10 | 60 | 6 | |
| 2LEM 025 150 S06 | 2.5 | 15 | 60 | 6 | |
| 2LEM 025 200 S06 | 2.5 | 20 | 60 | 6 | |
| 2LEM 030 120 S06 | 3 | 12 | 70 | 6 | |
| 2LEM 030 150 S06 | 3 | 15 | 70 | 6 | |
| 2LEM 030 200 S06 | 3 | 20 | 70 | 6 | |
| 2LEM 030 250 S06 | 3 | 25 | 70 | 6 | |
| 2LEM 030 300 S06 | 3 | 30 | 70 | 6 | |
| 2LEM 035 120 S06 | 3.5 | 12 | 70 | 6 | |
| 2LEM 035 150 S06 | 3.5 | 15 | 70 | 6 | |
| 2LEM 035 200 S06 | 3.5 | 20 | 70 | 6 | |
| 2LEM 040 150 S06 | 4 | 15 | 70 | 6 | |
| 2LEM 040 200 S06 | 4 | 20 | 70 | 6 | |
| 2LEM 040 300 S06 | 4 | 30 | 75 | 6 | |
| 2LEM 040 350 S06 | 4 | 35 | 75 | 6 | |
| 2LEM 040 400 S06 | 4 | 40 | 80 | 6 | |
| 2LEM 045 120 S06 | 4.5 | 12 | 70 | 6 | |
| 2LEM 045 150 S06 | 4.5 | 15 | 70 | 6 | |
| 2LEM 045 200 S06 | 4.5 | 20 | 70 | 6 | |
| 2LEM 050 200 S06 | 5 | 20 | 80 | 6 | |
| 2LEM 050 250 S06 | 5 | 25 | 70 | 6 | |
| 2LEM 050 300 S06 | 5 | 30 | 75 | 6 | |
| 2LEM 050 400 S06 | 5 | 40 | 80 | 6 | |
| 2LEM 060 200 S06 | 6 | 20 | 75 | 6 | |
| 2LEM 060 200 100 | 6 | 20 | 100 | 6 | |
| 2LEM 060 250 S06 | 6 | 25 | 75 | 6 | |
| 2LEM 060 300 S06 | 6 | 30 | 80 | 6 | |
| 2LEM 060 350 S06 | 6 | 35 | 80 | 6 | |
| 2LEM 060 400 S06 | 6 | 40 | 90 | 6 | |
| 2LEM 060 450 S06 | 6 | 45 | 90 | 6 | |
| 2LEM 060 500 S06 | 6 | 50 | 100 | 6 | |

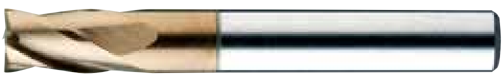
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2LEM 080 250 S08 | 8 | 25 | 75 | 8 | |
| 2LEM 080 250 100 | 8 | 25 | 100 | 8 | |
| 2LEM 080 300 S08 | 8 | 30 | 80 | 8 | |
| 2LEM 080 350 S08 | 8 | 35 | 80 | 8 | |
| 2LEM 080 400 S08 | 8 | 40 | 90 | 8 | |
| 2LEM 080 450 S08 | 8 | 45 | 100 | 8 | |
| 2LEM 080 500 S08 | 8 | 50 | 100 | 8 | |
| 2LEM 080 550 S08 | 8 | 55 | 100 | 8 | |
| 2LEM 080 600 S08 | 8 | 60 | 110 | 8 | |
| 2LEM 100 300 S10 | 10 | 30 | 80 | 10 | |
| 2LEM 100 300 110 | 10 | 30 | 110 | 10 | |
| 2LEM 100 350 S10 | 10 | 35 | 90 | 10 | |
| 2LEM 100 400 S10 | 10 | 40 | 90 | 10 | |
| 2LEM 100 450 S10 | 10 | 45 | 100 | 10 | |
| 2LEM 100 500 S10 | 10 | 50 | 100 | 10 | |
| 2LEM 100 550 S10 | 10 | 55 | 110 | 10 | |
| 2LEM 100 600 S10 | 10 | 60 | 110 | 10 | |
| 2LEM 100 650 S10 | 10 | 65 | 120 | 10 | |
| 2LEM 100 700 S10 | 10 | 70 | 120 | 10 | |
| 2LEM 120 300 S12 | 12 | 30 | 90 | 12 | |
| 2LEM 120 350 110 | 12 | 35 | 110 | 12 | |
| 2LEM 120 400 S12 | 12 | 40 | 100 | 12 | |
| 2LEM 120 450 S12 | 12 | 45 | 100 | 12 | |
| 2LEM 120 500 S12 | 12 | 50 | 100 | 12 | |
| 2LEM 120 550 S12 | 12 | 55 | 110 | 12 | |
| 2LEM 120 600 S12 | 12 | 60 | 110 | 12 | |
| 2LEM 120 700 S12 | 12 | 70 | 130 | 12 | |
| 2LEM 120 800 S12 | 12 | 80 | 130 | 12 | |
| 2LEM 140 500 S14 | 14 | 50 | 110 | 14 | |
| 2LEM 160 400 160 | 16 | 40 | 160 | 16 | |
| 2LEM 160 550 S16 | 16 | 55 | 120 | 16 | |
| 2LEM 160 700 S16 | 16 | 70 | 130 | 16 | |
| 2LEM 160 800 S16 | 16 | 80 | 160 | 16 | |
| 2LEM 160 1000 S16 | 16 | 100 | 160 | 16 | |
| 2LEM 200 500 160 | 20 | 50 | 160 | 20 | |
| 2LEM 200 600 S20 | 20 | 60 | 130 | 20 | |
| 2LEM 200 1000 S20 | 20 | 100 | 200 | 20 | |
| 2LEM 250 750 S25 | 25 | 75 | 160 | 25 | |

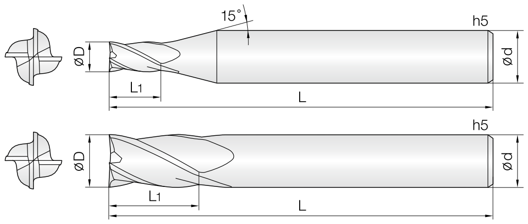
# 4HSE

## 4 Flutes High Speed Short Length End Mills

## 4날 고속가공용 짧은 길이 엔드밀








- **고경도강(HRc50~65), 프리하든강 계열의 고정밀 가공 엔드밀**
- 실리콘계코팅(Si) 처리하여 내마모성이 우수합니다.
- 짧은 날장의 채택으로 강력절삭에 적합합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 짧은 전장을 채택하여 열박음척 사용이 용이합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for pre-hardened and hardened steels(HRc50~65)**
- Good wear resistance by Si-based PVD coating.
- Optimum for heavy condition by short flute design.
- Reinforced edge design for preventing edge chipping.
- Short overall length for easy use with shrinking chuck.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

4
WC 미립자
TISIN Coating
30° Helix Angle
Shield Edge
CUTTING DATA 439P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.5 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 16 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø12 ~ 16 | -0.015 ~ -0.03mm |

단위 : mm

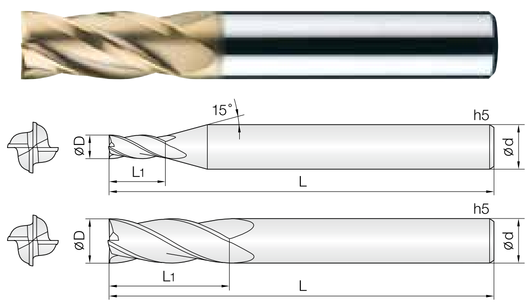
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4HSE 005 0075 S04 | 0.5 | 0.75 | 40 | 4 | |
| 4HSE 006 009 S04 | 0.6 | 0.9 | 40 | 4 | |
| 4HSE 008 012 S04 | 0.8 | 1.2 | 40 | 4 | |
| 4HSE 010 015 S04 | 1 | 1.5 | 40 | 4 | |
| 4HSE 012 020 S04 | 1.2 | 2 | 40 | 4 | |
| 4HSE 015 022 S04 | 1.5 | 2.2 | 40 | 4 | |
| 4HSE 020 035 S04 | 2 | 3.5 | 40 | 4 | |
| 4HSE 020 035 S06 | 2 | 3.5 | 40 | 6 | |
| 4HSE 025 038 S04 | 2.5 | 3.8 | 40 | 4 | |
| 4HSE 030 045 S04 | 3 | 4.5 | 40 | 4 | |
| 4HSE 030 045 S06 | 3 | 4.5 | 40 | 6 | |
| 4HSE 035 052 S06 | 3.5 | 5.2 | 40 | 6 | |
| 4HSE 040 060 S04 | 4 | 6 | 40 | 4 | |
| 4HSE 040 060 S06 | 4 | 6 | 40 | 6 | |
| 4HSE 045 068 S06 | 4.5 | 6.8 | 40 | 6 | |
| 4HSE 050 075 S06 | 5 | 7.5 | 45 | 6 | |
| 4HSE 060 090 S06 | 6 | 9 | 45 | 6 | |
| 4HSE 080 120 S08 | 8 | 12 | 55 | 8 | |
| 4HSE 100 150 S10 | 10 | 15 | 60 | 10 | |
| 4HSE 120 180 S12 | 12 | 18 | 65 | 12 | |
| 4HSE 160 240 S16 | 16 | 24 | 75 | 16 | |

# 4HCE

## 4 Flutes High Speed Standard Length End Mills

## 4날 고속가공용 표준 길이 엔드밀






- **고경도강(HRc50~60), 프리하든강 계열의 고정밀 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for pre-hardened and hardened steels(HRc50~60)**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- Reinforced edge design for preventing edge chipping.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

4 | WC 미립자 | TISIN Coating | 30° Helix Angle | Shield Edge | CUTTING DATA 439P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø0.3 ~ 6 | +0 ~ -0.01mm | ØD = Ød | Ø3 ~ 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 20 | +0 ~ -0.015mm | | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | | | | Ø14 ~ 20 | -0.015 ~ -0.03mm |

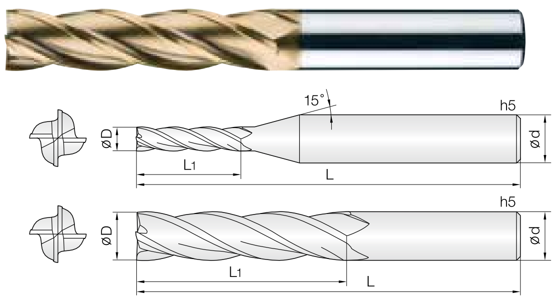
단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4HCE 003 006 S04 | 0.3 | 0.6 | 40 | 4 | |
| 4HCE 004 008 S04 | 0.4 | 0.8 | 40 | 4 | |
| 4HCE 005 010 S04 | 0.5 | 1 | 40 | 4 | |
| 4HCE 006 012 S04 | 0.6 | 1.2 | 40 | 4 | |
| 4HCE 007 014 S04 | 0.7 | 1.4 | 40 | 4 | |
| 4HCE 008 020 S04 | 0.8 | 2 | 40 | 4 | |
| 4HCE 009 018 S04 | 0.9 | 1.8 | 40 | 4 | |
| 4HCE 010 025 S03 | 1 | 2.5 | 40 | 3 | |
| 4HCE 010 025 S04 | 1 | 2.5 | 40 | 4 | |
| 4HCE 010 025 S06 | 1 | 2.5 | 40 | 6 | |
| 4HCE 010 025 060 | 1 | 2.5 | 60 | 6 | |
| 4HCE 010 025 080 | 1 | 2.5 | 80 | 6 | |
| 4HCE 012 030 S03 | 1.2 | 3 | 40 | 3 | |
| 4HCE 012 030 S04 | 1.2 | 3 | 40 | 4 | |
| 4HCE 012 030 S06 | 1.2 | 3 | 40 | 6 | |
| 4HCE 012 030 060 | 1.2 | 3 | 60 | 6 | |
| 4HCE 015 040 S03 | 1.5 | 4 | 40 | 3 | |
| 4HCE 015 040 S04 | 1.5 | 4 | 40 | 4 | |
| 4HCE 015 040 S06 | 1.5 | 4 | 40 | 6 | |
| 4HCE 015 040 060 | 1.5 | 4 | 60 | 6 | |
| 4HCE 015 040 080 | 1.5 | 4 | 80 | 6 | |
| 4HCE 020 060 S03 | 2 | 6 | 40 | 3 | |
| 4HCE 020 060 S04 | 2 | 6 | 40 | 4 | |
| 4HCE 020 060 S06 | 2 | 6 | 40 | 6 | |
| 4HCE 020 060 060 | 2 | 6 | 60 | 6 | |
| 4HCE 020 060 100 | 2 | 6 | 100 | 6 | |
| 4HCE 025 080 S03 | 2.5 | 8 | 45 | 3 | |
| 4HCE 025 080 S04 | 2.5 | 8 | 45 | 4 | |
| 4HCE 025 080 S06 | 2.5 | 8 | 45 | 6 | |
| 4HCE 025 080 070 | 2.5 | 8 | 70 | 6 | |
| 4HCE 025 080 100 | 2.5 | 8 | 100 | 6 | |
| 4HCE 030 080 S03 | 3 | 8 | 45 | 3 | |
| 4HCE 030 080 S04 | 3 | 8 | 45 | 4 | |
| 4HCE 030 080 S06 | 3 | 8 | 45 | 6 | |
| 4HCE 030 080 070 | 3 | 8 | 70 | 6 | |
| 4HCE 030 080 100 | 3 | 8 | 100 | 6 | |
| 4HCE 035 100 S06 | 3.5 | 10 | 45 | 6 | |
| 4HCE 040 110 S04 | 4 | 11 | 45 | 4 | |
| 4HCE 040 110 S06 | 4 | 11 | 45 | 6 | |
| 4HCE 040 110 070 | 4 | 11 | 70 | 6 | |
| 4HCE 040 110 100 | 4 | 11 | 100 | 6 | |
| 4HCE 045 110 S06 | 4.5 | 11 | 45 | 6 | |
| 4HCE 050 130 S06 | 5 | 13 | 50 | 6 | |
| 4HCE 050 130 080 | 5 | 13 | 80 | 6 | |
| 4HCE 050 130 100 | 5 | 13 | 100 | 6 | |
| 4HCE 055 130 S06 | 5.5 | 13 | 50 | 6 | |
| 4HCE 060 130 S06 | 6 | 13 | 50 | 6 | |
| 4HCE 060 130 080 | 6 | 13 | 80 | 6 | |
| 4HCE 060 130 100 | 6 | 13 | 100 | 6 | |
| 4HCE 065 160 S08 | 6.5 | 16 | 60 | 8 | |
| 4HCE 070 160 S08 | 7 | 16 | 60 | 8 | |
| 4HCE 075 160 S08 | 7.5 | 16 | 60 | 8 | |
| 4HCE 080 190 S08 | 8 | 19 | 60 | 8 | |
| 4HCE 085 190 S10 | 8.5 | 19 | 70 | 10 | |
| 4HCE 090 190 S10 | 9 | 19 | 70 | 10 | |
| 4HCE 095 190 S10 | 9.5 | 19 | 70 | 10 | |
| 4HCE 100 220 S10 | 10 | 22 | 70 | 10 | |
| 4HCE 105 220 S12 | 10.5 | 22 | 75 | 12 | |
| 4HCE 110 220 S12 | 11 | 22 | 75 | 12 | |
| 4HCE 115 220 S12 | 11.5 | 22 | 75 | 12 | |
| 4HCE 120 260 S12 | 12 | 26 | 75 | 12 | |
| 4HCE 130 260 S14 | 13 | 26 | 80 | 14 | |
| 4HCE 140 260 S14 | 14 | 26 | 80 | 14 | |
| 4HCE 140 260 S16 | 14 | 26 | 90 | 16 | |
| 4HCE 150 350 S16 | 15 | 35 | 100 | 16 | |
| 4HCE 160 350 S16 | 16 | 35 | 100 | 16 | |
| 4HCE 170 350 S18 | 17 | 35 | 100 | 18 | |
| 4HCE 180 350 S18 | 18 | 35 | 100 | 18 | |
| 4HCE 200 400 S20 | 20 | 40 | 100 | 20 | |

# 4LEM

## 4 Flutes Long Length End Mills

## 4날 긴 길이 엔드밀




- **HRc55 이하의 고경도강, 프리하든강, 공구강, 주철등 피삭재 가공**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 균일한 런아웃 공차관리로 공구의 성능을 향상시켰습니다.
- 다양한 날길이와 전장을 채택, 다양한 작업에 효율성을 극대화 하였습니다.
- 코너부 강성을 보강하여 날부치핑을 최소화 하였습니다.

- **Endmills for various work materials, hardened steels(~HRc55), pre-hardened steels, tool steels and cast irons**
- Good wear resistance by Si-based PVD coating.
- Improve tool performance by even run-out and tolerance control.
- Various flute and overall length design for covering wide range applications as well as high efficiency machining.
- Minimize edge chipping by improving corner strength.


| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.5 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 25 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 25 | -0.015 ~ -0.03mm |

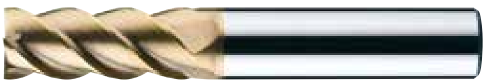
단위 : mm

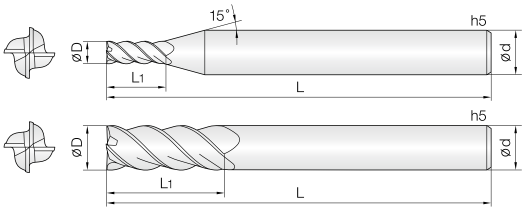
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4LEM 005 015 S04 | 0.5 | 1.5 | 40 | 4 | |
| 4LEM 005 020 S04 | 0.5 | 2 | 40 | 4 | |
| 4LEM 006 018 S04 | 0.6 | 1.8 | 40 | 4 | |
| 4LEM 006 024 S04 | 0.6 | 2.4 | 40 | 4 | |
| 4LEM 008 024 S04 | 0.8 | 2.4 | 40 | 4 | |
| 4LEM 008 032 S04 | 0.8 | 3.2 | 40 | 4 | |
| 4LEM 010 030 S06 | 1 | 3 | 60 | 6 | |
| 4LEM 010 050 S06 | 1 | 5 | 60 | 6 | |
| 4LEM 010 070 S06 | 1 | 7 | 60 | 6 | |
| 4LEM 010 100 S06 | 1 | 10 | 60 | 6 | |
| 4LEM 010 120 S06 | 1 | 12 | 60 | 6 | |
| 4LEM 012 040 S06 | 1.2 | 4 | 60 | 6 | |
| 4LEM 012 060 S06 | 1.2 | 6 | 60 | 6 | |
| 4LEM 012 080 S06 | 1.2 | 8 | 60 | 6 | |
| 4LEM 012 100 S06 | 1.2 | 10 | 60 | 6 | |
| 4LEM 015 060 S06 | 1.5 | 6 | 60 | 6 | |
| 4LEM 015 080 S06 | 1.5 | 8 | 60 | 6 | |
| 4LEM 015 100 S06 | 1.5 | 10 | 60 | 6 | |
| 4LEM 015 120 S06 | 1.5 | 12 | 60 | 6 | |
| 4LEM 015 150 S06 | 1.5 | 15 | 60 | 6 | |
| 4LEM 020 080 S06 | 2 | 8 | 60 | 6 | |
| 4LEM 020 100 S06 | 2 | 10 | 60 | 6 | |
| 4LEM 020 120 S06 | 2 | 12 | 60 | 6 | |
| 4LEM 020 150 S06 | 2 | 15 | 60 | 6 | |
| 4LEM 020 200 S06 | 2 | 20 | 70 | 6 | |
| 4LEM 030 100 S06 | 3 | 10 | 70 | 6 | |
| 4LEM 030 150 S06 | 3 | 15 | 70 | 6 | |
| 4LEM 030 200 S06 | 3 | 20 | 70 | 6 | |
| 4LEM 030 250 S06 | 3 | 25 | 70 | 6 | |
| 4LEM 030 300 S06 | 3 | 30 | 70 | 6 | |
| 4LEM 030 350 S06 | 3 | 35 | 75 | 6 | |
| 4LEM 030 400 S06 | 3 | 40 | 80 | 6 | |
| 4LEM 035 120 S06 | 3.5 | 12 | 70 | 6 | |
| 4LEM 035 150 S06 | 3.5 | 15 | 70 | 6 | |
| 4LEM 035 200 S06 | 3.5 | 20 | 70 | 6 | |
| 4LEM 040 120 S06 | 4 | 12 | 70 | 6 | |
| 4LEM 040 150 S04 | 4 | 15 | 70 | 4 | |
| 4LEM 040 150 S06 | 4 | 15 | 70 | 6 | |
| 4LEM 040 200 S04 | 4 | 20 | 70 | 4 | |
| 4LEM 040 200 S06 | 4 | 20 | 70 | 6 | |
| 4LEM 040 250 S06 | 4 | 25 | 70 | 6 | |
| 4LEM 040 300 S06 | 4 | 30 | 75 | 6 | |
| 4LEM 040 350 S06 | 4 | 35 | 75 | 6 | |
| 4LEM 040 400 S06 | 4 | 40 | 80 | 6 | |
| 4LEM 040 450 S06 | 4 | 45 | 90 | 6 | |
| 4LEM 040 500 S06 | 4 | 50 | 100 | 6 | |
| 4LEM 045 150 S06 | 4.5 | 15 | 70 | 6 | |
| 4LEM 045 200 S06 | 4.5 | 20 | 70 | 6 | |
| 4LEM 050 200 S06 | 5 | 20 | 70 | 6 | |
| 4LEM 050 250 S06 | 5 | 25 | 75 | 6 | |
| 4LEM 050 300 S06 | 5 | 30 | 80 | 6 | |
| 4LEM 050 400 S06 | 5 | 40 | 80 | 6 | |
| 4LEM 050 500 S06 | 5 | 50 | 100 | 6 | |
| 4LEM 060 200 S06 | 6 | 20 | 75 | 6 | |
| 4LEM 060 200 100 | 6 | 20 | 100 | 6 | |
| 4LEM 060 250 S06 | 6 | 25 | 75 | 6 | |
| 4LEM 060 300 S06 | 6 | 30 | 80 | 6 | |
| 4LEM 060 350 S06 | 6 | 35 | 80 | 6 | |
| 4LEM 060 400 S06 | 6 | 40 | 90 | 6 | |
| 4LEM 060 450 S06 | 6 | 45 | 90 | 6 | |
| 4LEM 060 500 S06 | 6 | 50 | 100 | 6 | |
| 4LEM 080 250 S08 | 8 | 25 | 75 | 8 | |
| 4LEM 080 250 100 | 8 | 25 | 100 | 8 | |
| 4LEM 080 300 S08 | 8 | 30 | 80 | 8 | |
| 4LEM 080 350 S08 | 8 | 35 | 90 | 8 | |
| 4LEM 080 400 S08 | 8 | 40 | 90 | 8 | |
| 4LEM 080 450 S08 | 8 | 45 | 100 | 8 | |
| 4LEM 080 500 S08 | 8 | 50 | 100 | 8 | |
| 4LEM 080 550 S08 | 8 | 55 | 100 | 8 | |
| 4LEM 080 600 S08 | 8 | 60 | 110 | 8 | |
| 4LEM 100 300 S10 | 10 | 30 | 80 | 10 | |
| 4LEM 100 300 110 | 10 | 30 | 110 | 10 | |
| 4LEM 100 350 S10 | 10 | 35 | 90 | 10 | |
| 4LEM 100 400 S10 | 10 | 40 | 90 | 10 | |
| 4LEM 100 450 S10 | 10 | 45 | 100 | 10 | |
| 4LEM 100 500 S10 | 10 | 50 | 100 | 10 | |
| 4LEM 100 550 S10 | 10 | 55 | 100 | 10 | |
| 4LEM 100 600 S10 | 10 | 60 | 110 | 10 | |
| 4LEM 100 650 S10 | 10 | 65 | 120 | 10 | |
| 4LEM 100 700 S10 | 10 | 70 | 120 | 10 | |
| 4LEM 120 300 S12 | 12 | 30 | 90 | 12 | |
| 4LEM 120 350 110 | 12 | 35 | 110 | 12 | |
| 4LEM 120 400 S12 | 12 | 40 | 100 | 12 | |
| 4LEM 120 450 S12 | 12 | 45 | 100 | 12 | |
| 4LEM 120 500 S12 | 12 | 50 | 100 | 12 | |
| 4LEM 120 550 S12 | 12 | 55 | 110 | 12 | |
| 4LEM 120 600 S12 | 12 | 60 | 110 | 12 | |
| 4LEM 120 700 S12 | 12 | 70 | 130 | 12 | |
| 4LEM 120 800 S12 | 12 | 80 | 130 | 12 | |
| 4LEM 140 500 S14 | 14 | 50 | 110 | 14 | |
| 4LEM 160 400 160 | 16 | 40 | 160 | 16 | |
| 4LEM 160 550 S16 | 16 | 55 | 120 | 16 | |
| 4LEM 160 700 S16 | 16 | 70 | 130 | 16 | |
| 4LEM 160 900 S16 | 16 | 90 | 150 | 16 | |
| 4LEM 160 1000 S16 | 16 | 100 | 160 | 16 | |
| 4LEM 200 500 160 | 20 | 50 | 160 | 20 | |
| 4LEM 200 600 S20 | 20 | 60 | 130 | 20 | |
| 4LEM 200 800 S20 | 20 | 80 | 160 | 20 | |
| 4LEM 200 1000 S20 | 20 | 100 | 200 | 20 | |
| 4LEM 250 750 S25 | 25 | 75 | 160 | 25 | |

# 4HEM

## 4 Flutes High Speed 45˚Helix End Mills

## 4날 고속가공용 45°헬릭스 엔드밀






- **고경도강(HRc50~62), 프리하든강 계열의 고정밀 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 45˚헬릭스 형상으로 설계하여 고속,고이송 가공에 적합합니다.
- 초미립자 초경합금(0.2㎛)을 채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc50~62)**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- Reinforced edge design for preventing edge chipping.
- 45˚degree helix design for high speed, feed condition.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

4 | UWC 초미립자 | TISIN Coating | 45° Helix Angle | Shield Edge | CUTTING DATA 441P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD≠Ød | Ø1 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 25 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD=Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 25 | -0.015 ~ -0.03mm |

단위 : mm

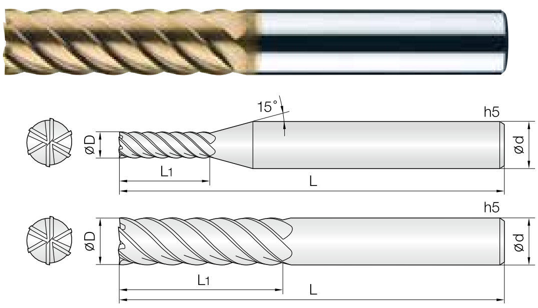
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4HEM 010 025 S06 | 1 | 2.5 | 40 | 6 | |
| 4HEM 010 035 S06 | 1 | 3.5 | 40 | 6 | |
| 4HEM 010 050 S06 | 1 | 5 | 45 | 6 | |
| 4HEM 012 030 S06 | 1.2 | 3 | 40 | 6 | |
| 4HEM 015 040 S06 | 1.5 | 4 | 40 | 6 | |
| 4HEM 015 060 S06 | 1.5 | 6 | 40 | 6 | |
| 4HEM 015 080 S06 | 1.5 | 8 | 45 | 6 | |
| 4HEM 020 050 S06 | 2 | 5 | 40 | 6 | |
| 4HEM 020 080 S06 | 2 | 8 | 45 | 6 | |
| 4HEM 020 100 S06 | 2 | 10 | 50 | 6 | |
| 4HEM 030 080 S06 | 3 | 8 | 45 | 6 | |
| 4HEM 030 120 S06 | 3 | 12 | 50 | 6 | |
| 4HEM 030 150 S06 | 3 | 15 | 55 | 6 | |
| 4HEM 040 110 S06 | 4 | 11 | 45 | 6 | |
| 4HEM 040 160 S06 | 4 | 16 | 55 | 6 | |
| 4HEM 040 200 S06 | 4 | 20 | 60 | 6 | |
| 4HEM 050 130 S06 | 5 | 13 | 50 | 6 | |
| 4HEM 050 180 S06 | 5 | 18 | 60 | 6 | |
| 4HEM 050 250 S06 | 5 | 25 | 70 | 6 | |
| 4HEM 060 130 S06 | 6 | 13 | 50 | 6 | |
| 4HEM 060 200 S06 | 6 | 20 | 60 | 6 | |
| 4HEM 060 250 S06 | 6 | 25 | 70 | 6 | |
| 4HEM 080 200 S08 | 8 | 20 | 60 | 8 | |
| 4HEM 080 250 S08 | 8 | 25 | 70 | 8 | |
| 4HEM 080 300 S08 | 8 | 30 | 75 | 8 | |
| 4HEM 080 400 S08 | 8 | 40 | 90 | 8 | |
| 4HEM 100 220 S10 | 10 | 22 | 70 | 10 | |
| 4HEM 100 300 S10 | 10 | 30 | 80 | 10 | |
| 4HEM 100 400 S10 | 10 | 40 | 90 | 10 | |
| 4HEM 100 500 S10 | 10 | 50 | 100 | 10 | |
| 4HEM 120 260 S12 | 12 | 26 | 75 | 12 | |
| 4HEM 120 400 S12 | 12 | 40 | 90 | 12 | |
| 4HEM 120 500 S12 | 12 | 50 | 100 | 12 | |
| 4HEM 120 600 S12 | 12 | 60 | 110 | 12 | |
| 4HEM 140 300 S14 | 14 | 30 | 80 | 14 | |
| 4HEM 140 500 S14 | 14 | 50 | 110 | 14 | |
| 4HEM 160 350 S16 | 16 | 35 | 90 | 16 | |
| 4HEM 160 500 S16 | 16 | 50 | 110 | 16 | |
| 4HEM 160 650 S16 | 16 | 65 | 120 | 16 | |
| 4HEM 200 400 S20 | 20 | 40 | 100 | 20 | |
| 4HEM 200 500 S20 | 20 | 50 | 110 | 20 | |
| 4HEM 200 700 S20 | 20 | 70 | 130 | 20 | |
| 4HEM 250 800 S25 | 25 | 80 | 160 | 25 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 6&8HEM

## 6&8 Flutes High Speed 45°Helix End Mills

## 6&8날 고속가공용 45°헬릭스 엔드밀




- **고경도강(HRc50~60), 프리하든강 계열의 고정밀 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 균일한 런아웃과 고정밀 공차 적용으로 초정밀가공에 적합합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 45°헬릭스 형상으로 설계하여 고속,고이송가공에 적합합니다.
- 초미립자 초경합금(0.2㎛)을 채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc50~62)**
- Good wear resistance by Si-based PVD coating.
- Precise run-out and tolerance for finish machining.
- Reinforced edge design for preventing edge chipping.
- 45°degree helix design for high speed, feed condition.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

6 | 8 | UWC 초미립자 | TISIN Coating | 45° Helix Angle | Shield Edge | CUTTING DATA 441P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø3 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 25 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø16 ~ 25 | -0.015 ~ -0.03mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 6HEM 030 100 S06 | 3 | 10 | 50 | 6 | |
| 6HEM 030 150 S06 | 3 | 15 | 50 | 6 | |
| 6HEM 040 120 S06 | 4 | 12 | 50 | 6 | |
| 6HEM 040 160 S06 | 4 | 16 | 50 | 6 | |
| 6HEM 050 150 S06 | 5 | 15 | 50 | 6 | |
| 6HEM 050 200 S06 | 5 | 20 | 60 | 6 | |
| 6HEM 060 150 S06 | 6 | 15 | 50 | 6 | |
| 6HEM 060 200 S06 | 6 | 20 | 60 | 6 | |
| 6HEM 060 250 S06 | 6 | 25 | 65 | 6 | |
| 6HEM 060 300 S06 | 6 | 30 | 70 | 6 | |
| 6HEM 060 350 S06 | 6 | 35 | 75 | 6 | |
| 6HEM 080 200 S08 | 8 | 20 | 60 | 8 | |
| 6HEM 080 250 S08 | 8 | 25 | 65 | 8 | |
| 6HEM 080 300 S08 | 8 | 30 | 75 | 8 | |
| 6HEM 080 350 S08 | 8 | 35 | 80 | 8 | |
| 6HEM 080 400 S08 | 8 | 40 | 90 | 8 | |
| 6HEM 080 450 S08 | 8 | 45 | 100 | 8 | |
| 6HEM 080 500 S08 | 8 | 50 | 100 | 8 | |
| 6HEM 100 250 S10 | 10 | 25 | 70 | 10 | |
| 6HEM 100 350 S10 | 10 | 35 | 90 | 10 | |
| 6HEM 100 450 S10 | 10 | 45 | 100 | 10 | |
| 6HEM 100 500 S10 | 10 | 50 | 100 | 10 | |
| 6HEM 100 600 S10 | 10 | 60 | 110 | 10 | |
| 6HEM 120 300 S12 | 12 | 30 | 80 | 12 | |
| 6HEM 120 400 S12 | 12 | 40 | 90 | 12 | |
| 6HEM 120 500 S12 | 12 | 50 | 100 | 12 | |
| 6HEM 120 600 S12 | 12 | 60 | 110 | 12 | |
| 6HEM 120 700 S12 | 12 | 70 | 120 | 12 | |
| 6HEM 160 350 S16 | 16 | 35 | 90 | 16 | |
| 6HEM 160 500 S16 | 16 | 50 | 110 | 16 | |
| 6HEM 160 650 S16 | 16 | 65 | 120 | 16 | |
| 6HEM 160 800 S16 | 16 | 80 | 150 | 16 | |
| 6HEM 160 900 S16 | 16 | 90 | 160 | 16 | |
| 6HEM 160 1000 S16 | 16 | 100 | 160 | 16 | |
| 6HEM 200 450 S20 | 20 | 45 | 100 | 20 | |
| 6HEM 200 600 S20 | 20 | 60 | 120 | 20 | |
| 6HEM 200 800 S20 | 20 | 80 | 150 | 20 | |
| 6HEM 200 900 S20 | 20 | 90 | 160 | 20 | |
| 6HEM 200 1000 S20 | 20 | 100 | 160 | 20 | |
| 6HEM 200 1100 S20 | 20 | 110 | 170 | 20 | |
| 6HEM 200 1200 S20 | 20 | 120 | 180 | 20 | |
| 8HEM 250 1000 S25 | 25 | 100 | 160 | 25 | |
| 8HEM 250 1250 S25 | 25 | 125 | 200 | 25 | |

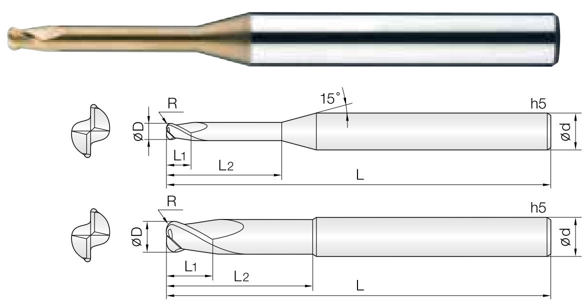
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 2CRE

## 2 Flutes Rib Corner Radius End Mills

## 2날 리브 코너 레디우스 엔드밀






- **고경도강(HRc52~62), 프리하든강 계열의 고속 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 코너R 형상을 날부치핑이 적도록설계하였습니다.
- 다양한 코너R과 유효장으로 맞춤 가공이 가능합니다.
- 초미립자 초경합금(0.2㎛)을 채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc52~62)**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- Various corner R and flute length for wide range application.
- Outstanding performance at high speed machining by ultra fine (0.2㎛ ) WC grade.

2 | UWC 초미립자 | TISIN Coating | R ± 0.005 R0.02 ~ 0.5 | R ± 0.01 R1 ~ 1.5 | R ± 0.015 R2 ~ 3 | 30° Helix Angle | CUTTING DATA 442P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.2 ~ 16 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |
| | Ø16 | -0.01 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CRE 002 0002 010 | 0.2 X R0.02 | 0.2 | 1 | 40 | 4 | |
| 2CRE 002 0002 015 | 0.2 X R0.02 | 0.2 | 1.5 | 40 | 4 | |
| 2CRE 002 0002 020 | 0.2 X R0.02 | 0.2 | 2 | 40 | 4 | |
| 2CRE 002 0005 010 | 0.2 X R0.05 | 0.2 | 1 | 40 | 4 | |
| 2CRE 002 0005 015 | 0.2 X R0.05 | 0.2 | 1.5 | 40 | 4 | |
| 2CRE 002 0005 020 | 0.2 X R0.05 | 0.2 | 2 | 40 | 4 | |
| 2CRE 003 0005 010 | 0.3 X R0.05 | 0.3 | 1 | 40 | 4 | |
| 2CRE 003 0005 020 | 0.3 X R0.05 | 0.3 | 2 | 40 | 4 | |
| 2CRE 003 0005 030 | 0.3 X R0.05 | 0.3 | 3 | 40 | 4 | |
| 2CRE 003 0005 040 | 0.3 X R0.05 | 0.3 | 4 | 40 | 4 | |
| 2CRE 003 0005 050 | 0.3 X R0.05 | 0.3 | 5 | 40 | 4 | |
| 2CRE 004 0005 010 | 0.4 X R0.05 | 0.4 | 1 | 40 | 4 | |
| 2CRE 004 0005 020 | 0.4 X R0.05 | 0.4 | 2 | 40 | 4 | |
| 2CRE 004 0005 030 | 0.4 X R0.05 | 0.4 | 3 | 40 | 4 | |
| 2CRE 004 0005 040 | 0.4 X R0.05 | 0.4 | 4 | 40 | 4 | |
| 2CRE 004 0005 050 | 0.4 X R0.05 | 0.4 | 5 | 40 | 4 | |
| 2CRE 004 0005 060 | 0.4 X R0.05 | 0.4 | 6 | 40 | 4 | |
| 2CRE 004 001 010 | 0.4 X R0.1 | 0.4 | 1 | 40 | 4 | |
| 2CRE 004 001 015 | 0.4 X R0.1 | 0.4 | 1.5 | 40 | 4 | |
| 2CRE 004 001 020 | 0.4 X R0.1 | 0.4 | 2 | 40 | 4 | |
| 2CRE 004 001 030 | 0.4 X R0.1 | 0.4 | 3 | 40 | 4 | |
| 2CRE 004 001 040 | 0.4 X R0.1 | 0.4 | 4 | 40 | 4 | |
| 2CRE 005 0002 010 | 0.5 X R0.02 | 0.5 | 1 | 45 | 4 | |
| 2CRE 005 0002 015 | 0.5 X R0.02 | 0.5 | 1.5 | 45 | 4 | |
| 2CRE 005 0002 020 | 0.5 X R0.02 | 0.5 | 2 | 45 | 4 | |
| 2CRE 005 0002 025 | 0.5 X R0.02 | 0.5 | 2.5 | 45 | 4 | |
| 2CRE 005 0002 030 | 0.5 X R0.02 | 0.5 | 3 | 45 | 4 | |
| 2CRE 005 0002 040 | 0.5 X R0.02 | 0.5 | 4 | 45 | 4 | |
| 2CRE 005 0002 050 | 0.5 X R0.02 | 0.5 | 5 | 45 | 4 | |
| 2CRE 005 0002 060 | 0.5 X R0.02 | 0.5 | 6 | 45 | 4 | |
| 2CRE 005 0002 080 | 0.5 X R0.02 | 0.5 | 8 | 45 | 4 | |
| 2CRE 005 0002 100 | 0.5 X R0.02 | 0.5 | 10 | 50 | 4 | |
| 2CRE 005 0005 010 | 0.5 X R0.05 | 0.5 | 1 | 45 | 4 | |
| 2CRE 005 0005 015 | 0.5 X R0.05 | 0.5 | 1.5 | 45 | 4 | |
| 2CRE 005 0005 020 | 0.5 X R0.05 | 0.5 | 2 | 45 | 4 | |
| 2CRE 005 0005 025 | 0.5 X R0.05 | 0.5 | 2.5 | 45 | 4 | |
| 2CRE 005 0005 030 | 0.5 X R0.05 | 0.5 | 3 | 45 | 4 | |
| 2CRE 005 0005 040 | 0.5 X R0.05 | 0.5 | 4 | 45 | 4 | |
| 2CRE 005 0005 050 | 0.5 X R0.05 | 0.5 | 5 | 45 | 4 | |
| 2CRE 005 0005 060 | 0.5 X R0.05 | 0.5 | 6 | 45 | 4 | |
| 2CRE 005 0005 080 | 0.5 X R0.05 | 0.5 | 8 | 45 | 4 | |
| 2CRE 005 0005 100 | 0.5 X R0.05 | 0.5 | 10 | 50 | 4 | |
| 2CRE 005 0005 120 | 0.5 X R0.05 | 0.5 | 12 | 50 | 4 | |
| 2CRE 005 001 010 | 0.5 X R0.1 | 0.5 | 1 | 45 | 4 | |
| 2CRE 005 001 015 | 0.5 X R0.1 | 0.5 | 1.5 | 45 | 4 | |
| 2CRE 005 001 020 | 0.5 X R0.1 | 0.5 | 2 | 45 | 4 | |
| 2CRE 005 001 025 | 0.5 X R0.1 | 0.5 | 2.5 | 45 | 4 | |
| 2CRE 005 001 030 | 0.5 X R0.1 | 0.5 | 3 | 45 | 4 | |
| 2CRE 005 001 040 | 0.5 X R0.1 | 0.5 | 4 | 45 | 4 | |
| 2CRE 005 001 050 | 0.5 X R0.1 | 0.5 | 5 | 45 | 4 | |

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CRE 005 001 060 | 0.5 X R0.1 | 0.5 | 6 | 45 | 4 | |
| 2CRE 005 001 080 | 0.5 X R0.1 | 0.5 | 8 | 45 | 4 | |
| 2CRE 005 001 100 | 0.5 X R0.1 | 0.5 | 10 | 50 | 4 | |
| 2CRE 005 001 120 | 0.5 X R0.1 | 0.5 | 12 | 50 | 4 | |
| 2CRE 006 0002 020 | 0.6 X R0.02 | 0.6 | 2 | 45 | 4 | |
| 2CRE 006 0002 030 | 0.6 X R0.02 | 0.6 | 3 | 45 | 4 | |
| 2CRE 006 0002 040 | 0.6 X R0.02 | 0.6 | 4 | 45 | 4 | |
| 2CRE 006 0002 060 | 0.6 X R0.02 | 0.6 | 6 | 45 | 4 | |
| 2CRE 006 0002 080 | 0.6 X R0.02 | 0.6 | 8 | 45 | 4 | |
| 2CRE 006 0002 100 | 0.6 X R0.02 | 0.6 | 10 | 50 | 4 | |
| 2CRE 006 0005 020 | 0.6 X R0.05 | 0.6 | 2 | 45 | 4 | |
| 2CRE 006 0005 030 | 0.6 X R0.05 | 0.6 | 3 | 45 | 4 | |
| 2CRE 006 0005 040 | 0.6 X R0.05 | 0.6 | 4 | 45 | 4 | |
| 2CRE 006 0005 060 | 0.6 X R0.05 | 0.6 | 6 | 45 | 4 | |
| 2CRE 006 0005 080 | 0.6 X R0.05 | 0.6 | 8 | 45 | 4 | |
| 2CRE 006 0005 100 | 0.6 X R0.05 | 0.6 | 10 | 50 | 4 | |
| 2CRE 006 0005 120 | 0.6 X R0.05 | 0.6 | 12 | 50 | 4 | |
| 2CRE 006 001 020 | 0.6 X R0.1 | 0.6 | 2 | 45 | 4 | |
| 2CRE 006 001 030 | 0.6 X R0.1 | 0.6 | 3 | 45 | 4 | |
| 2CRE 006 001 040 | 0.6 X R0.1 | 0.6 | 4 | 45 | 4 | |
| 2CRE 006 001 060 | 0.6 X R0.1 | 0.6 | 6 | 45 | 4 | |
| 2CRE 006 001 080 | 0.6 X R0.1 | 0.6 | 8 | 45 | 4 | |
| 2CRE 006 001 100 | 0.6 X R0.1 | 0.6 | 10 | 50 | 4 | |
| 2CRE 006 001 120 | 0.6 X R0.1 | 0.6 | 12 | 50 | 4 | |
| 2CRE 007 001 020 | 0.7 X R0.1 | 0.7 | 2 | 45 | 4 | |
| 2CRE 007 001 040 | 0.7 X R0.1 | 0.7 | 4 | 45 | 4 | |
| 2CRE 007 001 060 | 0.7 X R0.1 | 0.7 | 6 | 45 | 4 | |
| 2CRE 007 001 080 | 0.7 X R0.1 | 0.7 | 8 | 45 | 4 | |
| 2CRE 007 001 100 | 0.7 X R0.1 | 0.7 | 10 | 45 | 4 | |
| 2CRE 008 0002 020 | 0.8 X R0.02 | 0.8 | 2 | 45 | 4 | |
| 2CRE 008 0002 040 | 0.8 X R0.02 | 0.8 | 4 | 45 | 4 | |
| 2CRE 008 0002 060 | 0.8 X R0.02 | 0.8 | 6 | 45 | 4 | |
| 2CRE 008 0002 080 | 0.8 X R0.02 | 0.8 | 8 | 45 | 4 | |
| 2CRE 008 0002 100 | 0.8 X R0.02 | 0.8 | 10 | 50 | 4 | |
| 2CRE 008 0005 020 | 0.8 X R0.05 | 0.8 | 2 | 45 | 4 | |
| 2CRE 008 0005 040 | 0.8 X R0.05 | 0.8 | 4 | 45 | 4 | |
| 2CRE 008 0005 060 | 0.8 X R0.05 | 0.8 | 6 | 45 | 4 | |
| 2CRE 008 0005 080 | 0.8 X R0.05 | 0.8 | 8 | 45 | 4 | |
| 2CRE 008 0005 100 | 0.8 X R0.05 | 0.8 | 10 | 50 | 4 | |
| 2CRE 008 0005 120 | 0.8 X R0.05 | 0.8 | 12 | 50 | 4 | |
| 2CRE 008 001 020 | 0.8 X R0.1 | 0.8 | 2 | 45 | 4 | |
| 2CRE 008 001 040 | 0.8 X R0.1 | 0.8 | 4 | 45 | 4 | |
| 2CRE 008 001 060 | 0.8 X R0.1 | 0.8 | 6 | 45 | 4 | |
| 2CRE 008 001 080 | 0.8 X R0.1 | 0.8 | 8 | 45 | 4 | |
| 2CRE 008 001 100 | 0.8 X R0.1 | 0.8 | 10 | 50 | 4 | |
| 2CRE 008 001 120 | 0.8 X R0.1 | 0.8 | 12 | 50 | 4 | |
| 2CRE 008 001 140 | 0.8 X R0.1 | 0.8 | 14 | 50 | 4 | |
| 2CRE 008 002 020 | 0.8 X R0.2 | 0.8 | 2 | 45 | 4 | |
| 2CRE 008 002 040 | 0.8 X R0.2 | 0.8 | 4 | 45 | 4 | |
| 2CRE 008 002 060 | 0.8 X R0.2 | 0.8 | 6 | 45 | 4 | |

# 2CRE

## 2 Flutes Rib Corner Radius End Mills

## 2날 리브 코너 레디우스 엔드밀



단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CRE 008 002 080 | 0.8 X R0.2 | 0.8 | 8 | 45 | 4 | |
| 2CRE 008 002 100 | 0.8 X R0.2 | 0.8 | 10 | 50 | 4 | |
| 2CRE 008 002 120 | 0.8 X R0.2 | 0.8 | 12 | 50 | 4 | |
| 2CRE 008 002 140 | 0.8 X R0.2 | 0.8 | 14 | 50 | 4 | |
| 2CRE 010 0005 040 | 1 X R0.05 | 1 | 4 | 45 | 4 | |
| 2CRE 010 0005 060 | 1 X R0.05 | 1 | 6 | 45 | 4 | |
| 2CRE 010 0005 080 | 1 X R0.05 | 1 | 8 | 45 | 4 | |
| 2CRE 010 0005 100 | 1 X R0.05 | 1 | 10 | 50 | 4 | |
| 2CRE 010 0005 120 | 1 X R0.05 | 1 | 12 | 50 | 4 | |
| 2CRE 010 0005 140 | 1 X R0.05 | 1 | 14 | 50 | 4 | |
| 2CRE 010 0005 160 | 1 X R0.05 | 1 | 16 | 50 | 4 | |
| 2CRE 010 0005 200 | 1 X R0.05 | 1 | 20 | 50 | 4 | |
| 2CRE 010 0005 220 | 1 X R0.05 | 1 | 22 | 60 | 4 | |
| 2CRE 010 0005 250 | 1 X R0.05 | 1 | 25 | 60 | 4 | |
| 2CRE 010 001 040 | 1 X R0.1 | 1 | 4 | 45 | 4 | |
| 2CRE 010 001 060 | 1 X R0.1 | 1 | 6 | 45 | 4 | |
| 2CRE 010 001 080 | 1 X R0.1 | 1 | 8 | 45 | 4 | |
| 2CRE 010 001 100 | 1 X R0.1 | 1 | 10 | 50 | 4 | |
| 2CRE 010 001 120 | 1 X R0.1 | 1 | 12 | 50 | 4 | |
| 2CRE 010 001 140 | 1 X R0.1 | 1 | 14 | 50 | 4 | |
| 2CRE 010 001 160 | 1 X R0.1 | 1 | 16 | 50 | 4 | |
| 2CRE 010 001 200 | 1 X R0.1 | 1 | 20 | 50 | 4 | |
| 2CRE 010 001 220 | 1 X R0.1 | 1 | 22 | 60 | 4 | |
| 2CRE 010 001 250 | 1 X R0.1 | 1 | 25 | 60 | 4 | |
| 2CRE 010 002 040 | 1 X R0.2 | 1 | 4 | 45 | 4 | |
| 2CRE 010 002 060 | 1 X R0.2 | 1 | 6 | 45 | 4 | |
| 2CRE 010 002 080 | 1 X R0.2 | 1 | 8 | 45 | 4 | |
| 2CRE 010 002 100 | 1 X R0.2 | 1 | 10 | 50 | 4 | |
| 2CRE 010 002 120 | 1 X R0.2 | 1 | 12 | 50 | 4 | |
| 2CRE 010 002 140 | 1 X R0.2 | 1 | 14 | 50 | 4 | |
| 2CRE 010 002 160 | 1 X R0.2 | 1 | 16 | 50 | 4 | |
| 2CRE 010 002 200 | 1 X R0.2 | 1 | 20 | 50 | 4 | |
| 2CRE 010 002 220 | 1 X R0.2 | 1 | 22 | 60 | 4 | |
| 2CRE 010 002 250 | 1 X R0.2 | 1 | 25 | 60 | 4 | |
| 2CRE 010 003 040 | 1 X R0.3 | 1 | 4 | 45 | 4 | |
| 2CRE 010 003 060 | 1 X R0.3 | 1 | 6 | 45 | 4 | |
| 2CRE 010 003 080 | 1 X R0.3 | 1 | 8 | 45 | 4 | |
| 2CRE 010 003 100 | 1 X R0.3 | 1 | 10 | 50 | 4 | |
| 2CRE 010 003 120 | 1 X R0.3 | 1 | 12 | 50 | 4 | |
| 2CRE 010 003 140 | 1 X R0.3 | 1 | 14 | 50 | 4 | |
| 2CRE 010 003 160 | 1 X R0.3 | 1 | 16 | 50 | 4 | |
| 2CRE 010 003 200 | 1 X R0.3 | 1 | 20 | 50 | 4 | |
| 2CRE 010 003 220 | 1 X R0.3 | 1 | 22 | 60 | 4 | |
| 2CRE 010 003 250 | 1 X R0.3 | 1 | 25 | 60 | 4 | |
| 2CRE 012 001 040 | 1.2 X R0.1 | 1.2 | 4 | 45 | 4 | |
| 2CRE 012 001 060 | 1.2 X R0.1 | 1.2 | 6 | 45 | 4 | |
| 2CRE 012 001 080 | 1.2 X R0.1 | 1.2 | 8 | 45 | 4 | |
| 2CRE 012 001 100 | 1.2 X R0.1 | 1.2 | 10 | 50 | 4 | |
| 2CRE 012 001 120 | 1.2 X R0.1 | 1.2 | 12 | 50 | 4 | |
| 2CRE 012 001 140 | 1.2 X R0.1 | 1.2 | 14 | 50 | 4 | |
| 2CRE 012 001 160 | 1.2 X R0.1 | 1.2 | 16 | 50 | 4 | |
| 2CRE 012 001 200 | 1.2 X R0.1 | 1.2 | 20 | 50 | 4 | |
| 2CRE 012 002 040 | 1.2 X R0.2 | 1.2 | 4 | 45 | 4 | |
| 2CRE 012 002 060 | 1.2 X R0.2 | 1.2 | 6 | 45 | 4 | |
| 2CRE 012 002 080 | 1.2 X R0.2 | 1.2 | 8 | 45 | 4 | |
| 2CRE 012 002 100 | 1.2 X R0.2 | 1.2 | 10 | 50 | 4 | |
| 2CRE 012 002 120 | 1.2 X R0.2 | 1.2 | 12 | 50 | 4 | |
| 2CRE 012 002 140 | 1.2 X R0.2 | 1.2 | 14 | 50 | 4 | |
| 2CRE 012 002 160 | 1.2 X R0.2 | 1.2 | 16 | 50 | 4 | |
| 2CRE 012 002 200 | 1.2 X R0.2 | 1.2 | 20 | 50 | 4 | |
| 2CRE 012 003 040 | 1.2 X R0.3 | 1.2 | 4 | 45 | 4 | |
| 2CRE 012 003 060 | 1.2 X R0.3 | 1.2 | 6 | 45 | 4 | |
| 2CRE 012 003 080 | 1.2 X R0.3 | 1.2 | 8 | 45 | 4 | |
| 2CRE 012 003 100 | 1.2 X R0.3 | 1.2 | 10 | 50 | 4 | |
| 2CRE 012 003 120 | 1.2 X R0.3 | 1.2 | 12 | 50 | 4 | |
| 2CRE 012 003 140 | 1.2 X R0.3 | 1.2 | 14 | 50 | 4 | |
| 2CRE 012 003 160 | 1.2 X R0.3 | 1.2 | 16 | 50 | 4 | |
| 2CRE 012 003 200 | 1.2 X R0.3 | 1.2 | 20 | 50 | 4 | |
| 2CRE 015 001 040 | 1.5 X R0.1 | 1.5 | 4 | 45 | 4 | |
| 2CRE 015 001 060 | 1.5 X R0.1 | 1.5 | 6 | 45 | 4 | |
| 2CRE 015 001 080 | 1.5 X R0.1 | 1.5 | 8 | 45 | 4 | |
| 2CRE 015 001 100 | 1.5 X R0.1 | 1.5 | 10 | 50 | 4 | |
| 2CRE 015 001 120 | 1.5 X R0.1 | 1.5 | 12 | 50 | 4 | |
| 2CRE 015 001 140 | 1.5 X R0.1 | 1.5 | 14 | 50 | 4 | |
| 2CRE 015 001 160 | 1.5 X R0.1 | 1.5 | 16 | 50 | 4 | |
| 2CRE 015 001 200 | 1.5 X R0.1 | 1.5 | 20 | 50 | 4 | |
| 2CRE 015 001 220 | 1.5 X R0.1 | 1.5 | 22 | 60 | 4 | |
| 2CRE 015 001 250 | 1.5 X R0.1 | 1.5 | 25 | 60 | 4 | |
| 2CRE 015 002 040 | 1.5 X R0.2 | 1.5 | 4 | 45 | 4 | |
| 2CRE 015 002 060 | 1.5 X R0.2 | 1.5 | 6 | 45 | 4 | |
| 2CRE 015 002 080 | 1.5 X R0.2 | 1.5 | 8 | 45 | 4 | |
| 2CRE 015 002 100 | 1.5 X R0.2 | 1.5 | 10 | 50 | 4 | |
| 2CRE 015 002 120 | 1.5 X R0.2 | 1.5 | 12 | 50 | 4 | |
| 2CRE 015 002 140 | 1.5 X R0.2 | 1.5 | 14 | 50 | 4 | |
| 2CRE 015 002 160 | 1.5 X R0.2 | 1.5 | 16 | 50 | 4 | |
| 2CRE 015 002 200 | 1.5 X R0.2 | 1.5 | 20 | 50 | 4 | |
| 2CRE 015 002 220 | 1.5 X R0.2 | 1.5 | 22 | 60 | 4 | |
| 2CRE 015 002 250 | 1.5 X R0.2 | 1.5 | 25 | 60 | 4 | |
| 2CRE 015 003 040 | 1.5 X R0.3 | 1.5 | 4 | 45 | 4 | |
| 2CRE 015 003 060 | 1.5 X R0.3 | 1.5 | 6 | 45 | 4 | |
| 2CRE 015 003 080 | 1.5 X R0.3 | 1.5 | 8 | 45 | 4 | |
| 2CRE 015 003 100 | 1.5 X R0.3 | 1.5 | 10 | 50 | 4 | |
| 2CRE 015 003 120 | 1.5 X R0.3 | 1.5 | 12 | 50 | 4 | |
| 2CRE 015 003 140 | 1.5 X R0.3 | 1.5 | 14 | 50 | 4 | |
| 2CRE 015 003 160 | 1.5 X R0.3 | 1.5 | 16 | 50 | 4 | |
| 2CRE 015 003 200 | 1.5 X R0.3 | 1.5 | 20 | 50 | 4 | |
| 2CRE 015 003 220 | 1.5 X R0.3 | 1.5 | 22 | 60 | 4 | |
| 2CRE 015 003 250 | 1.5 X R0.3 | 1.5 | 25 | 60 | 4 | |
| 2CRE 015 005 040 | 1.5 X R0.5 | 1.5 | 4 | 45 | 4 | |
| 2CRE 015 005 060 | 1.5 X R0.5 | 1.5 | 6 | 45 | 4 | |
| 2CRE 015 005 080 | 1.5 X R0.5 | 1.5 | 8 | 45 | 4 | |
| 2CRE 015 005 100 | 1.5 X R0.5 | 1.5 | 10 | 50 | 4 | |
| 2CRE 015 005 120 | 1.5 X R0.5 | 1.5 | 12 | 50 | 4 | |
| 2CRE 015 005 140 | 1.5 X R0.5 | 1.5 | 14 | 50 | 4 | |
| 2CRE 015 005 160 | 1.5 X R0.5 | 1.5 | 16 | 50 | 4 | |
| 2CRE 015 005 200 | 1.5 X R0.5 | 1.5 | 20 | 50 | 4 | |
| 2CRE 015 005 220 | 1.5 X R0.5 | 1.5 | 22 | 60 | 4 | |
| 2CRE 015 005 250 | 1.5 X R0.5 | 1.5 | 25 | 60 | 4 | |
| 2CRE 020 001 060 | 2 X R0.1 | 2 | 6 | 45 | 4 | |
| 2CRE 020 001 080 | 2 X R0.1 | 2 | 8 | 45 | 4 | |
| 2CRE 020 001 100 | 2 X R0.1 | 2 | 10 | 50 | 4 | |
| 2CRE 020 001 120 | 2 X R0.1 | 2 | 12 | 50 | 4 | |
| 2CRE 020 001 140 | 2 X R0.1 | 2 | 14 | 50 | 4 | |
| 2CRE 020 001 160 | 2 X R0.1 | 2 | 16 | 50 | 4 | |
| 2CRE 020 001 200 | 2 X R0.1 | 2 | 20 | 50 | 4 | |
| 2CRE 020 001 250 | 2 X R0.1 | 2 | 25 | 60 | 4 | |
| 2CRE 020 001 300 | 2 X R0.1 | 2 | 30 | 70 | 4 | |
| 2CRE 020 001 350 | 2 X R0.1 | 2 | 35 | 80 | 4 | |
| 2CRE 020 001 400 | 2 X R0.1 | 2 | 40 | 80 | 4 | |
| 2CRE 020 002 060 | 2 X R0.2 | 2 | 6 | 45 | 4 | |
| 2CRE 020 002 080 | 2 X R0.2 | 2 | 8 | 45 | 4 | |
| 2CRE 020 002 100 | 2 X R0.2 | 2 | 10 | 50 | 4 | |
| 2CRE 020 002 120 | 2 X R0.2 | 2 | 12 | 50 | 4 | |
| 2CRE 020 002 140 | 2 X R0.2 | 2 | 14 | 50 | 4 | |
| 2CRE 020 002 160 | 2 X R0.2 | 2 | 16 | 50 | 4 | |
| 2CRE 020 002 200 | 2 X R0.2 | 2 | 20 | 50 | 4 | |
| 2CRE 020 002 250 | 2 X R0.2 | 2 | 25 | 60 | 4 | |
| 2CRE 020 002 300 | 2 X R0.2 | 2 | 30 | 70 | 4 | |

# 2CRE

## 2 Flutes Rib Corner Radius End Mills

## 2날 리브 코너 레디우스 엔드밀

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CRE 020 003 060 | 2 X R0.3 | 2 | 6 | 45 | 4 | |
| 2CRE 020 003 080 | 2 X R0.3 | 2 | 8 | 45 | 4 | |
| 2CRE 020 003 100 | 2 X R0.3 | 2 | 10 | 50 | 4 | |
| 2CRE 020 003 120 | 2 X R0.3 | 2 | 12 | 50 | 4 | |
| 2CRE 020 003 140 | 2 X R0.3 | 2 | 14 | 50 | 4 | |
| 2CRE 020 003 160 | 2 X R0.3 | 2 | 16 | 50 | 4 | |
| 2CRE 020 003 200 | 2 X R0.3 | 2 | 20 | 50 | 4 | |
| 2CRE 020 003 250 | 2 X R0.3 | 2 | 25 | 60 | 4 | |
| 2CRE 020 003 300 | 2 X R0.3 | 2 | 30 | 70 | 4 | |
| 2CRE 020 005 060 | 2 X R0.5 | 2 | 6 | 45 | 4 | |
| 2CRE 020 005 080 | 2 X R0.5 | 2 | 8 | 45 | 4 | |
| 2CRE 020 005 100 | 2 X R0.5 | 2 | 10 | 50 | 4 | |
| 2CRE 020 005 120 | 2 X R0.5 | 2 | 12 | 50 | 4 | |
| 2CRE 020 005 140 | 2 X R0.5 | 2 | 14 | 50 | 4 | |
| 2CRE 020 005 160 | 2 X R0.5 | 2 | 16 | 50 | 4 | |
| 2CRE 020 005 200 | 2 X R0.5 | 2 | 20 | 50 | 4 | |
| 2CRE 020 005 250 | 2 X R0.5 | 2 | 25 | 60 | 4 | |
| 2CRE 020 005 300 | 2 X R0.5 | 2 | 30 | 70 | 4 | |
| 2CRE 020 005 350 | 2 X R0.5 | 2 | 35 | 80 | 4 | |
| 2CRE 020 005 400 | 2 X R0.5 | 2 | 40 | 80 | 4 | |
| 2CRE 025 001 100 | 2.5 X R0.1 | 2.5 | 10 | 50 | 4 | |
| 2CRE 025 001 160 | 2.5 X R0.1 | 2.5 | 16 | 50 | 4 | |
| 2CRE 025 001 200 | 2.5 X R0.1 | 2.5 | 20 | 50 | 4 | |
| 2CRE 025 001 250 | 2.5 X R0.1 | 2.5 | 25 | 60 | 4 | |
| 2CRE 025 001 300 | 2.5 X R0.1 | 2.5 | 30 | 70 | 4 | |
| 2CRE 025 002 100 | 2.5 X R0.2 | 2.5 | 10 | 50 | 4 | |
| 2CRE 025 002 160 | 2.5 X R0.2 | 2.5 | 16 | 50 | 4 | |
| 2CRE 025 002 200 | 2.5 X R0.2 | 2.5 | 20 | 50 | 4 | |
| 2CRE 025 002 250 | 2.5 X R0.2 | 2.5 | 25 | 60 | 4 | |
| 2CRE 025 002 300 | 2.5 X R0.2 | 2.5 | 30 | 70 | 4 | |
| 2CRE 025 003 100 | 2.5 X R0.3 | 2.5 | 10 | 50 | 4 | |
| 2CRE 025 003 160 | 2.5 X R0.3 | 2.5 | 16 | 50 | 4 | |
| 2CRE 025 003 200 | 2.5 X R0.3 | 2.5 | 20 | 50 | 4 | |
| 2CRE 025 003 250 | 2.5 X R0.3 | 2.5 | 25 | 60 | 4 | |
| 2CRE 025 003 300 | 2.5 X R0.3 | 2.5 | 30 | 70 | 4 | |
| 2CRE 025 005 100 | 2.5 X R0.5 | 2.5 | 10 | 50 | 4 | |
| 2CRE 025 005 160 | 2.5 X R0.5 | 2.5 | 16 | 50 | 4 | |
| 2CRE 025 005 200 | 2.5 X R0.5 | 2.5 | 20 | 50 | 4 | |
| 2CRE 025 005 250 | 2.5 X R0.5 | 2.5 | 25 | 60 | 4 | |
| 2CRE 025 005 300 | 2.5 X R0.5 | 2.5 | 30 | 70 | 4 | |
| 2CRE 030 001 100 | 3 X R0.1 | 3 | 10 | 50 | 6 | |
| 2CRE 030 001 120 | 3 X R0.1 | 3 | 12 | 55 | 6 | |
| 2CRE 030 001 160 | 3 X R0.1 | 3 | 16 | 55 | 6 | |
| 2CRE 030 001 200 | 3 X R0.1 | 3 | 20 | 60 | 6 | |
| 2CRE 030 001 250 | 3 X R0.1 | 3 | 25 | 65 | 6 | |
| 2CRE 030 001 300 | 3 X R0.1 | 3 | 30 | 70 | 6 | |
| 2CRE 030 001 350 | 3 X R0.1 | 3 | 35 | 75 | 6 | |
| 2CRE 030 001 400 | 3 X R0.1 | 3 | 40 | 80 | 6 | |
| 2CRE 030 002 100 | 3 X R0.2 | 3 | 10 | 50 | 6 | |
| 2CRE 030 002 120 | 3 X R0.2 | 3 | 12 | 55 | 6 | |
| 2CRE 030 002 160 | 3 X R0.2 | 3 | 16 | 55 | 6 | |
| 2CRE 030 002 200 | 3 X R0.2 | 3 | 20 | 60 | 6 | |
| 2CRE 030 002 250 | 3 X R0.2 | 3 | 25 | 65 | 6 | |
| 2CRE 030 002 300 | 3 X R0.2 | 3 | 30 | 70 | 6 | |
| 2CRE 030 002 350 | 3 X R0.2 | 3 | 35 | 75 | 6 | |
| 2CRE 030 002 400 | 3 X R0.2 | 3 | 40 | 80 | 6 | |
| 2CRE 030 002 450 | 3 X R0.2 | 3 | 45 | 90 | 6 | |
| 2CRE 030 002 500 | 3 X R0.2 | 3 | 50 | 100 | 6 | |
| 2CRE 030 003 100 | 3 X R0.3 | 3 | 10 | 50 | 6 | |
| 2CRE 030 003 120 | 3 X R0.3 | 3 | 12 | 55 | 6 | |
| 2CRE 030 003 160 | 3 X R0.3 | 3 | 16 | 55 | 6 | |
| 2CRE 030 003 200 | 3 X R0.3 | 3 | 20 | 60 | 6 | |
| 2CRE 030 003 250 | 3 X R0.3 | 3 | 25 | 65 | 6 | |
| 2CRE 030 003 300 | 3 X R0.3 | 3 | 30 | 70 | 6 | |

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CRE 030 003 350 | 3 X R0.3 | 3 | 35 | 75 | 6 | |
| 2CRE 030 003 400 | 3 X R0.3 | 3 | 40 | 80 | 6 | |
| 2CRE 030 005 100 | 3 X R0.5 | 3 | 10 | 50 | 6 | |
| 2CRE 030 005 120 | 3 X R0.5 | 3 | 12 | 55 | 6 | |
| 2CRE 030 005 160 | 3 X R0.5 | 3 | 16 | 55 | 6 | |
| 2CRE 030 005 200 | 3 X R0.5 | 3 | 20 | 60 | 6 | |
| 2CRE 030 005 250 | 3 X R0.5 | 3 | 25 | 65 | 6 | |
| 2CRE 030 005 300 | 3 X R0.5 | 3 | 30 | 70 | 6 | |
| 2CRE 030 005 350 | 3 X R0.5 | 3 | 35 | 75 | 6 | |
| 2CRE 030 005 400 | 3 X R0.5 | 3 | 40 | 80 | 6 | |
| 2CRE 030 005 450 | 3 X R0.5 | 3 | 45 | 90 | 6 | |
| 2CRE 030 005 500 | 3 X R0.5 | 3 | 50 | 100 | 6 | |
| 2CRE 030 010 100 | 3 X R1 | 3 | 10 | 50 | 6 | |
| 2CRE 030 010 120 | 3 X R1 | 3 | 12 | 55 | 6 | |
| 2CRE 030 010 160 | 3 X R1 | 3 | 16 | 55 | 6 | |
| 2CRE 030 010 200 | 3 X R1 | 3 | 20 | 60 | 6 | |
| 2CRE 030 010 250 | 3 X R1 | 3 | 25 | 65 | 6 | |
| 2CRE 030 010 300 | 3 X R1 | 3 | 30 | 70 | 6 | |
| 2CRE 030 010 350 | 3 X R1 | 3 | 35 | 75 | 6 | |
| 2CRE 030 010 400 | 3 X R1 | 3 | 40 | 80 | 6 | |
| 2CRE 040 001 050 | 4 X R0.1 | 4 | 12 | 50 | 4 | |
| 2CRE 040 001 070 | 4 X R0.1 | 4 | 20 | 70 | 4 | |
| 2CRE 040 001 120 | 4 X R0.1 | 4 | 12 | 55 | 6 | |
| 2CRE 040 001 160 | 4 X R0.1 | 4 | 16 | 55 | 6 | |
| 2CRE 040 001 200 | 4 X R0.1 | 4 | 20 | 60 | 6 | |
| 2CRE 040 001 250 | 4 X R0.1 | 4 | 25 | 65 | 6 | |
| 2CRE 040 001 300 | 4 X R0.1 | 4 | 30 | 70 | 6 | |
| 2CRE 040 001 350 | 4 X R0.1 | 4 | 35 | 75 | 6 | |
| 2CRE 040 001 400 | 4 X R0.1 | 4 | 40 | 80 | 6 | |
| 2CRE 040 001 450 | 4 X R0.1 | 4 | 45 | 90 | 6 | |
| 2CRE 040 001 500 | 4 X R0.1 | 4 | 50 | 100 | 6 | |
| 2CRE 040 002 050 | 4 X R0.2 | 4 | 12 | 50 | 4 | |
| 2CRE 040 002 070 | 4 X R0.2 | 4 | 20 | 70 | 4 | |
| 2CRE 040 002 120 | 4 X R0.2 | 4 | 12 | 55 | 6 | |
| 2CRE 040 002 160 | 4 X R0.2 | 4 | 16 | 55 | 6 | |
| 2CRE 040 002 200 | 4 X R0.2 | 4 | 20 | 60 | 6 | |
| 2CRE 040 002 250 | 4 X R0.2 | 4 | 25 | 65 | 6 | |
| 2CRE 040 002 300 | 4 X R0.2 | 4 | 30 | 70 | 6 | |
| 2CRE 040 002 350 | 4 X R0.2 | 4 | 35 | 75 | 6 | |
| 2CRE 040 002 400 | 4 X R0.2 | 4 | 40 | 80 | 6 | |
| 2CRE 040 002 450 | 4 X R0.2 | 4 | 45 | 90 | 6 | |
| 2CRE 040 002 500 | 4 X R0.2 | 4 | 50 | 100 | 6 | |
| 2CRE 040 003 050 | 4 X R0.3 | 4 | 12 | 50 | 4 | |
| 2CRE 040 003 070 | 4 X R0.3 | 4 | 20 | 70 | 4 | |
| 2CRE 040 003 120 | 4 X R0.3 | 4 | 12 | 55 | 6 | |
| 2CRE 040 003 160 | 4 X R0.3 | 4 | 16 | 55 | 6 | |
| 2CRE 040 003 200 | 4 X R0.3 | 4 | 20 | 60 | 6 | |
| 2CRE 040 003 250 | 4 X R0.3 | 4 | 25 | 65 | 6 | |
| 2CRE 040 003 300 | 4 X R0.3 | 4 | 30 | 70 | 6 | |
| 2CRE 040 003 350 | 4 X R0.3 | 4 | 35 | 75 | 6 | |
| 2CRE 040 003 400 | 4 X R0.3 | 4 | 40 | 80 | 6 | |
| 2CRE 040 003 450 | 4 X R0.3 | 4 | 45 | 90 | 6 | |
| 2CRE 040 003 500 | 4 X R0.3 | 4 | 50 | 100 | 6 | |
| 2CRE 040 005 050 | 4 X R0.5 | 4 | 12 | 50 | 4 | |
| 2CRE 040 005 070 | 4 X R0.5 | 4 | 20 | 70 | 4 | |
| 2CRE 040 005 120 | 4 X R0.5 | 4 | 12 | 55 | 6 | |
| 2CRE 040 005 160 | 4 X R0.5 | 4 | 16 | 55 | 6 | |
| 2CRE 040 005 200 | 4 X R0.5 | 4 | 20 | 60 | 6 | |
| 2CRE 040 005 250 | 4 X R0.5 | 4 | 25 | 65 | 6 | |
| 2CRE 040 005 300 | 4 X R0.5 | 4 | 30 | 70 | 6 | |
| 2CRE 040 005 350 | 4 X R0.5 | 4 | 35 | 75 | 6 | |
| 2CRE 040 005 400 | 4 X R0.5 | 4 | 40 | 80 | 6 | |
| 2CRE 040 005 450 | 4 X R0.5 | 4 | 45 | 90 | 6 | |
| 2CRE 040 005 500 | 4 X R0.5 | 4 | 50 | 100 | 6 | |

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CRE 040 010 050 | 4 X R1 | 4 | 12 | 50 | 4 | |
| 2CRE 040 010 070 | 4 X R1 | 4 | 20 | 70 | 4 | |
| 2CRE 040 010 120 | 4 X R1 | 4 | 12 | 55 | 6 | |
| 2CRE 040 010 160 | 4 X R1 | 4 | 16 | 55 | 6 | |
| 2CRE 040 010 200 | 4 X R1 | 4 | 20 | 60 | 6 | |
| 2CRE 040 010 250 | 4 X R1 | 4 | 25 | 65 | 6 | |
| 2CRE 040 010 300 | 4 X R1 | 4 | 30 | 70 | 6 | |
| 2CRE 040 010 350 | 4 X R1 | 4 | 35 | 75 | 6 | |
| 2CRE 040 010 400 | 4 X R1 | 4 | 40 | 80 | 6 | |
| 2CRE 040 010 450 | 4 X R1 | 4 | 45 | 90 | 6 | |
| 2CRE 040 010 500 | 4 X R1 | 4 | 50 | 100 | 6 | |
| 2CRE 050 002 150 | 5 X R0.2 | 6 | 15 | 60 | 6 | |
| 2CRE 050 002 250 | 5 X R0.2 | 6 | 25 | 70 | 6 | |
| 2CRE 050 002 300 | 5 X R0.2 | 6 | 30 | 70 | 6 | |
| 2CRE 050 002 400 | 5 X R0.2 | 6 | 40 | 80 | 6 | |
| 2CRE 050 002 500 | 5 X R0.2 | 6 | 50 | 100 | 6 | |
| 2CRE 050 005 150 | 5 X R0.5 | 6 | 15 | 60 | 6 | |
| 2CRE 050 005 250 | 5 X R0.5 | 6 | 25 | 70 | 6 | |
| 2CRE 050 005 300 | 5 X R0.5 | 6 | 30 | 70 | 6 | |
| 2CRE 050 005 400 | 5 X R0.5 | 6 | 40 | 80 | 6 | |
| 2CRE 050 005 500 | 5 X R0.5 | 6 | 50 | 100 | 6 | |
| 2CRE 050 010 150 | 5 X R1 | 6 | 15 | 60 | 6 | |
| 2CRE 050 010 250 | 5 X R1 | 6 | 25 | 70 | 6 | |
| 2CRE 050 010 300 | 5 X R1 | 6 | 30 | 70 | 6 | |
| 2CRE 050 010 400 | 5 X R1 | 6 | 40 | 80 | 6 | |
| 2CRE 050 010 500 | 5 X R1 | 6 | 50 | 100 | 6 | |
| 2CRE 060 001 200 | 6 X R0.1 | 7 | 20 | 60 | 6 | |
| 2CRE 060 001 400 | 6 X R0.1 | 7 | 40 | 90 | 6 | |
| 2CRE 060 002 200 | 6 X R0.2 | 7 | 20 | 60 | 6 | |
| 2CRE 060 002 400 | 6 X R0.2 | 7 | 40 | 90 | 6 | |
| 2CRE 060 002 600 | 6 X R0.2 | 7 | 60 | 110 | 6 | |
| 2CRE 060 003 200 | 6 X R0.3 | 7 | 20 | 60 | 6 | |
| 2CRE 060 003 400 | 6 X R0.3 | 7 | 40 | 90 | 6 | |
| 2CRE 060 005 200 | 6 X R0.5 | 7 | 20 | 60 | 6 | |
| 2CRE 060 005 400 | 6 X R0.5 | 7 | 40 | 90 | 6 | |
| 2CRE 060 005 600 | 6 X R0.5 | 7 | 60 | 110 | 6 | |
| 2CRE 060 010 200 | 6 X R1 | 7 | 20 | 60 | 6 | |
| 2CRE 060 010 400 | 6 X R1 | 7 | 40 | 90 | 6 | |
| 2CRE 060 010 600 | 6 X R1 | 7 | 60 | 110 | 6 | |
| 2CRE 060 015 200 | 6 X R1.5 | 7 | 20 | 60 | 6 | |
| 2CRE 060 015 400 | 6 X R1.5 | 7 | 40 | 90 | 6 | |
| 2CRE 080 002 220 | 8 X R0.2 | 9 | 22 | 65 | 8 | |
| 2CRE 080 002 400 | 8 X R0.2 | 9 | 40 | 100 | 8 | |
| 2CRE 080 003 220 | 8 X R0.3 | 9 | 22 | 65 | 8 | |
| 2CRE 080 003 400 | 8 X R0.3 | 9 | 40 | 100 | 8 | |
| 2CRE 080 005 220 | 8 X R0.5 | 9 | 22 | 65 | 8 | |
| 2CRE 080 005 400 | 8 X R0.5 | 9 | 40 | 100 | 8 | |
| 2CRE 080 005 600 | 8 X R0.5 | 9 | 60 | 120 | 8 | |
| 2CRE 080 010 220 | 8 X R1 | 9 | 22 | 65 | 8 | |
| 2CRE 080 010 400 | 8 X R1 | 9 | 40 | 100 | 8 | |
| 2CRE 080 010 600 | 8 X R1 | 9 | 60 | 120 | 8 | |
| 2CRE 080 015 220 | 8 X R1.5 | 9 | 22 | 65 | 8 | |
| 2CRE 080 015 400 | 8 X R1.5 | 9 | 40 | 100 | 8 | |
| 2CRE 100 002 240 | 10 X R0.2 | 11 | 24 | 70 | 10 | |
| 2CRE 100 002 450 | 10 X R0.2 | 11 | 45 | 100 | 10 | |
| 2CRE 100 002 600 | 10 X R0.2 | 11 | 60 | 120 | 10 | |
| 2CRE 100 003 240 | 10 X R0.3 | 11 | 24 | 70 | 10 | |
| 2CRE 100 003 450 | 10 X R0.3 | 11 | 45 | 100 | 10 | |
| 2CRE 100 005 240 | 10 X R0.5 | 11 | 24 | 70 | 10 | |
| 2CRE 100 005 450 | 10 X R0.5 | 11 | 45 | 100 | 10 | |
| 2CRE 100 005 600 | 10 X R0.5 | 11 | 60 | 120 | 10 | |
| 2CRE 100 010 240 | 10 X R1 | 11 | 24 | 70 | 10 | |
| 2CRE 100 010 450 | 10 X R1 | 11 | 45 | 100 | 10 | |
| 2CRE 100 010 600 | 10 X R1 | 11 | 60 | 120 | 10 | |

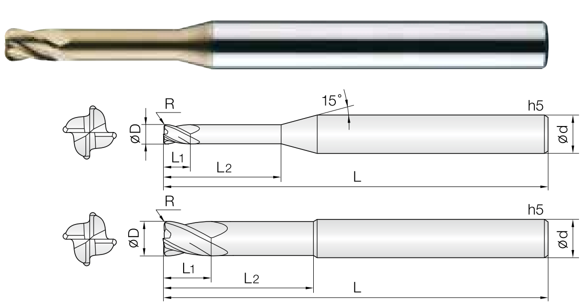
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CRE 100 015 240 | 10 X R1.5 | 11 | 24 | 70 | 10 | |
| 2CRE 100 015 450 | 10 X R1.5 | 11 | 45 | 100 | 10 | |
| 2CRE 100 020 240 | 10 X R2 | 11 | 24 | 70 | 10 | |
| 2CRE 100 020 450 | 10 X R2 | 11 | 45 | 100 | 10 | |
| 2CRE 120 002 260 | 12 X R0.2 | 13 | 26 | 80 | 12 | |
| 2CRE 120 002 500 | 12 X R0.2 | 13 | 50 | 110 | 12 | |
| 2CRE 120 003 260 | 12 X R0.3 | 13 | 26 | 80 | 12 | |
| 2CRE 120 003 500 | 12 X R0.3 | 13 | 50 | 110 | 12 | |
| 2CRE 120 005 260 | 12 X R0.5 | 13 | 26 | 80 | 12 | |
| 2CRE 120 005 500 | 12 X R0.5 | 13 | 50 | 110 | 12 | |
| 2CRE 120 005 700 | 12 X R0.5 | 13 | 70 | 130 | 12 | |
| 2CRE 120 010 260 | 12 X R1 | 13 | 26 | 80 | 12 | |
| 2CRE 120 010 500 | 12 X R1 | 13 | 50 | 110 | 12 | |
| 2CRE 120 010 700 | 12 X R1 | 13 | 70 | 130 | 12 | |
| 2CRE 120 015 260 | 12 X R1.5 | 13 | 26 | 80 | 12 | |
| 2CRE 120 015 500 | 12 X R1.5 | 13 | 50 | 110 | 12 | |
| 2CRE 120 020 260 | 12 X R2 | 13 | 26 | 80 | 12 | |
| 2CRE 120 020 500 | 12 X R2 | 13 | 50 | 110 | 12 | |
| 2CRE 120 030 260 | 12 X R3 | 13 | 26 | 80 | 12 | |
| 2CRE 120 030 500 | 12 X R3 | 13 | 50 | 110 | 12 | |
| 2CRE 160 005 110 | 16 X R0.5 | 20 | 40 | 110 | 16 | |
| 2CRE 160 005 160 | 16 X R0.5 | 20 | 60 | 160 | 16 | |
| 2CRE 160 010 110 | 16 X R1 | 20 | 40 | 110 | 16 | |
| 2CRE 160 010 160 | 16 X R1 | 20 | 60 | 160 | 16 | |

# 4CRE

## 4 Flutes Rib Corner Radius End Mills

## 4날 리브 코너 레디우스 엔드밀

HARD series




- **고경도강(HRc50~62), 프리하든강 계열의 고속 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 코너R 형상을 날부치핑이 적도록 설계하였습니다.
- 다양한 코너R과 유효장으로 맞춤 가공이 가능합니다.
- 초미립자 초경합금(0.2㎛)을 채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc50~62)**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- Various corner R and flute length for wide range application.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

4 | UWC 초미립자 | TISIN Coating | R ± 0.005 (R0.02 ~ 0.5) | R ± 0.01 (R1 ~ 1.5) | R ± 0.015 (R2 ~ 3) | 30° Helix Angle | CUTTING DATA 443P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø0.8 ~ 12 | +0 ~ -0.01mm | ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4CRE 008 0002 020 | 0.8 X R0.02 | 0.8 | 2 | 45 | 4 | |
| 4CRE 008 0002 040 | 0.8 X R0.02 | 0.8 | 4 | 45 | 4 | |
| 4CRE 008 0002 060 | 0.8 X R0.02 | 0.8 | 6 | 45 | 4 | |
| 4CRE 008 0002 080 | 0.8 X R0.02 | 0.8 | 8 | 45 | 4 | |
| 4CRE 008 0002 100 | 0.8 X R0.02 | 0.8 | 10 | 45 | 4 | |
| 4CRE 008 0002 120 | 0.8 X R0.02 | 0.8 | 12 | 50 | 4 | |
| 4CRE 008 0005 020 | 0.8 X R0.05 | 0.8 | 2 | 45 | 4 | |
| 4CRE 008 0005 040 | 0.8 X R0.05 | 0.8 | 4 | 45 | 4 | |
| 4CRE 008 0005 060 | 0.8 X R0.05 | 0.8 | 6 | 45 | 4 | |
| 4CRE 008 0005 080 | 0.8 X R0.05 | 0.8 | 8 | 45 | 4 | |
| 4CRE 008 0005 100 | 0.8 X R0.05 | 0.8 | 10 | 45 | 4 | |
| 4CRE 008 0005 120 | 0.8 X R0.05 | 0.8 | 12 | 50 | 4 | |
| 4CRE 008 001 020 | 0.8 X R0.1 | 0.8 | 2 | 45 | 4 | |
| 4CRE 008 001 040 | 0.8 X R0.1 | 0.8 | 4 | 45 | 4 | |
| 4CRE 008 001 060 | 0.8 X R0.1 | 0.8 | 6 | 45 | 4 | |
| 4CRE 008 001 080 | 0.8 X R0.1 | 0.8 | 8 | 45 | 4 | |
| 4CRE 008 001 100 | 0.8 X R0.1 | 0.8 | 10 | 45 | 4 | |
| 4CRE 008 001 120 | 0.8 X R0.1 | 0.8 | 12 | 50 | 4 | |
| 4CRE 010 0002 040 | 1 X R0.02 | 1 | 4 | 45 | 4 | |
| 4CRE 010 0002 060 | 1 X R0.02 | 1 | 6 | 45 | 4 | |
| 4CRE 010 0002 080 | 1 X R0.02 | 1 | 8 | 45 | 4 | |
| 4CRE 010 0002 100 | 1 X R0.02 | 1 | 10 | 50 | 4 | |
| 4CRE 010 0002 120 | 1 X R0.02 | 1 | 12 | 50 | 4 | |
| 4CRE 010 0002 140 | 1 X R0.02 | 1 | 14 | 50 | 4 | |
| 4CRE 010 0002 160 | 1 X R0.02 | 1 | 16 | 50 | 4 | |
| 4CRE 010 0002 200 | 1 X R0.02 | 1 | 20 | 50 | 4 | |
| 4CRE 010 0002 250 | 1 X R0.02 | 1 | 25 | 60 | 4 | |
| 4CRE 010 0002 300 | 1 X R0.02 | 1 | 30 | 70 | 4 | |
| 4CRE 010 0005 040 | 1 X R0.05 | 1 | 4 | 45 | 4 | |
| 4CRE 010 0005 060 | 1 X R0.05 | 1 | 6 | 45 | 4 | |
| 4CRE 010 0005 080 | 1 X R0.05 | 1 | 8 | 45 | 4 | |
| 4CRE 010 0005 100 | 1 X R0.05 | 1 | 10 | 50 | 4 | |
| 4CRE 010 0005 120 | 1 X R0.05 | 1 | 12 | 50 | 4 | |
| 4CRE 010 0005 140 | 1 X R0.05 | 1 | 14 | 50 | 4 | |
| 4CRE 010 0005 160 | 1 X R0.05 | 1 | 16 | 50 | 4 | |
| 4CRE 010 0005 200 | 1 X R0.05 | 1 | 20 | 50 | 4 | |
| 4CRE 010 0005 250 | 1 X R0.05 | 1 | 25 | 60 | 4 | |
| 4CRE 010 0005 300 | 1 X R0.05 | 1 | 30 | 70 | 4 | |
| 4CRE 010 001 040 | 1 X R0.1 | 1 | 4 | 45 | 4 | |
| 4CRE 010 001 060 | 1 X R0.1 | 1 | 6 | 45 | 4 | |
| 4CRE 010 001 080 | 1 X R0.1 | 1 | 8 | 45 | 4 | |
| 4CRE 010 001 100 | 1 X R0.1 | 1 | 10 | 50 | 4 | |
| 4CRE 010 001 120 | 1 X R0.1 | 1 | 12 | 50 | 4 | |
| 4CRE 010 001 140 | 1 X R0.1 | 1 | 14 | 50 | 4 | |
| 4CRE 010 001 160 | 1 X R0.1 | 1 | 16 | 50 | 4 | |
| 4CRE 010 001 200 | 1 X R0.1 | 1 | 20 | 50 | 4 | |
| 4CRE 010 001 250 | 1 X R0.1 | 1 | 25 | 60 | 4 | |
| 4CRE 010 001 300 | 1 X R0.1 | 1 | 30 | 70 | 4 | |
| 4CRE 010 002 040 | 1 X R0.2 | 1 | 4 | 45 | 4 | |
| 4CRE 010 002 060 | 1 X R0.2 | 1 | 6 | 45 | 4 | |

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4CRE 010 002 080 | 1 X R0.2 | 1 | 8 | 45 | 4 | |
| 4CRE 010 002 100 | 1 X R0.2 | 1 | 10 | 50 | 4 | |
| 4CRE 010 002 120 | 1 X R0.2 | 1 | 12 | 50 | 4 | |
| 4CRE 010 002 140 | 1 X R0.2 | 1 | 14 | 50 | 4 | |
| 4CRE 010 002 160 | 1 X R0.2 | 1 | 16 | 50 | 4 | |
| 4CRE 010 002 200 | 1 X R0.2 | 1 | 20 | 50 | 4 | |
| 4CRE 010 002 250 | 1 X R0.2 | 1 | 25 | 60 | 4 | |
| 4CRE 010 002 300 | 1 X R0.2 | 1 | 30 | 70 | 4 | |
| 4CRE 010 003 040 | 1 X R0.3 | 1 | 4 | 45 | 4 | |
| 4CRE 010 003 060 | 1 X R0.3 | 1 | 6 | 45 | 4 | |
| 4CRE 010 003 080 | 1 X R0.3 | 1 | 8 | 45 | 4 | |
| 4CRE 010 003 100 | 1 X R0.3 | 1 | 10 | 50 | 4 | |
| 4CRE 010 003 120 | 1 X R0.3 | 1 | 12 | 50 | 4 | |
| 4CRE 010 003 140 | 1 X R0.3 | 1 | 14 | 50 | 4 | |
| 4CRE 010 003 160 | 1 X R0.3 | 1 | 16 | 50 | 4 | |
| 4CRE 010 003 200 | 1 X R0.3 | 1 | 20 | 50 | 4 | |
| 4CRE 010 003 250 | 1 X R0.3 | 1 | 25 | 60 | 4 | |
| 4CRE 010 003 300 | 1 X R0.3 | 1 | 30 | 70 | 4 | |
| 4CRE 012 0002 040 | 1.2 X R0.02 | 1.2 | 4 | 45 | 4 | |
| 4CRE 012 0002 060 | 1.2 X R0.02 | 1.2 | 6 | 45 | 4 | |
| 4CRE 012 0002 080 | 1.2 X R0.02 | 1.2 | 8 | 45 | 4 | |
| 4CRE 012 0002 100 | 1.2 X R0.02 | 1.2 | 10 | 50 | 4 | |
| 4CRE 012 0002 120 | 1.2 X R0.02 | 1.2 | 12 | 50 | 4 | |
| 4CRE 012 0002 140 | 1.2 X R0.02 | 1.2 | 14 | 50 | 4 | |
| 4CRE 012 0002 160 | 1.2 X R0.02 | 1.2 | 16 | 50 | 4 | |
| 4CRE 012 0002 200 | 1.2 X R0.02 | 1.2 | 20 | 50 | 4 | |
| 4CRE 012 0005 040 | 1.2 X R0.05 | 1.2 | 4 | 45 | 4 | |
| 4CRE 012 0005 060 | 1.2 X R0.05 | 1.2 | 6 | 45 | 4 | |
| 4CRE 012 0005 080 | 1.2 X R0.05 | 1.2 | 8 | 45 | 4 | |
| 4CRE 012 0005 100 | 1.2 X R0.05 | 1.2 | 10 | 50 | 4 | |
| 4CRE 012 0005 120 | 1.2 X R0.05 | 1.2 | 12 | 50 | 4 | |
| 4CRE 012 0005 140 | 1.2 X R0.05 | 1.2 | 14 | 50 | 4 | |
| 4CRE 012 0005 160 | 1.2 X R0.05 | 1.2 | 16 | 50 | 4 | |
| 4CRE 012 0005 200 | 1.2 X R0.05 | 1.2 | 20 | 50 | 4 | |
| 4CRE 012 001 040 | 1.2 X R0.1 | 1.2 | 4 | 45 | 4 | |
| 4CRE 012 001 060 | 1.2 X R0.1 | 1.2 | 6 | 45 | 4 | |
| 4CRE 012 001 080 | 1.2 X R0.1 | 1.2 | 8 | 45 | 4 | |
| 4CRE 012 001 100 | 1.2 X R0.1 | 1.2 | 10 | 50 | 4 | |
| 4CRE 012 001 120 | 1.2 X R0.1 | 1.2 | 12 | 50 | 4 | |
| 4CRE 012 001 140 | 1.2 X R0.1 | 1.2 | 14 | 50 | 4 | |
| 4CRE 012 001 160 | 1.2 X R0.1 | 1.2 | 16 | 50 | 4 | |
| 4CRE 012 001 200 | 1.2 X R0.1 | 1.2 | 20 | 50 | 4 | |
| 4CRE 012 002 040 | 1.2 X R0.2 | 1.2 | 4 | 45 | 4 | |
| 4CRE 012 002 060 | 1.2 X R0.2 | 1.2 | 6 | 45 | 4 | |
| 4CRE 012 002 080 | 1.2 X R0.2 | 1.2 | 8 | 45 | 4 | |
| 4CRE 012 002 100 | 1.2 X R0.2 | 1.2 | 10 | 50 | 4 | |
| 4CRE 012 002 120 | 1.2 X R0.2 | 1.2 | 12 | 50 | 4 | |
| 4CRE 012 002 140 | 1.2 X R0.2 | 1.2 | 14 | 50 | 4 | |
| 4CRE 012 002 160 | 1.2 X R0.2 | 1.2 | 16 | 50 | 4 | |
| 4CRE 012 002 200 | 1.2 X R0.2 | 1.2 | 20 | 50 | 4 | |

# 4날 리브 코너 레디우스 엔드밀



단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4CRE 012 003 040 | 1.2 X R0.3 | 1.2 | 4 | 45 | 4 | |
| 4CRE 012 003 060 | 1.2 X R0.3 | 1.2 | 6 | 45 | 4 | |
| 4CRE 012 003 080 | 1.2 X R0.3 | 1.2 | 8 | 45 | 4 | |
| 4CRE 012 003 100 | 1.2 X R0.3 | 1.2 | 10 | 50 | 4 | |
| 4CRE 012 003 120 | 1.2 X R0.3 | 1.2 | 12 | 50 | 4 | |
| 4CRE 012 003 140 | 1.2 X R0.3 | 1.2 | 14 | 50 | 4 | |
| 4CRE 012 003 160 | 1.2 X R0.3 | 1.2 | 16 | 50 | 4 | |
| 4CRE 012 003 200 | 1.2 X R0.3 | 1.2 | 20 | 50 | 4 | |
| 4CRE 015 0002 060 | 1.5 X R0.02 | 1.5 | 6 | 45 | 4 | |
| 4CRE 015 0002 080 | 1.5 X R0.02 | 1.5 | 8 | 45 | 4 | |
| 4CRE 015 0002 100 | 1.5 X R0.02 | 1.5 | 10 | 50 | 4 | |
| 4CRE 015 0002 120 | 1.5 X R0.02 | 1.5 | 12 | 50 | 4 | |
| 4CRE 015 0002 140 | 1.5 X R0.02 | 1.5 | 14 | 50 | 4 | |
| 4CRE 015 0002 160 | 1.5 X R0.02 | 1.5 | 16 | 50 | 4 | |
| 4CRE 015 0002 200 | 1.5 X R0.02 | 1.5 | 20 | 50 | 4 | |
| 4CRE 015 0002 220 | 1.5 X R0.02 | 1.5 | 22 | 60 | 4 | |
| 4CRE 015 0002 250 | 1.5 X R0.02 | 1.5 | 25 | 60 | 4 | |
| 4CRE 015 0005 060 | 1.5 X R0.05 | 1.5 | 6 | 45 | 4 | |
| 4CRE 015 0005 080 | 1.5 X R0.05 | 1.5 | 8 | 45 | 4 | |
| 4CRE 015 0005 100 | 1.5 X R0.05 | 1.5 | 10 | 50 | 4 | |
| 4CRE 015 0005 120 | 1.5 X R0.05 | 1.5 | 12 | 50 | 4 | |
| 4CRE 015 0005 140 | 1.5 X R0.05 | 1.5 | 14 | 50 | 4 | |
| 4CRE 015 0005 160 | 1.5 X R0.05 | 1.5 | 16 | 50 | 4 | |
| 4CRE 015 0005 200 | 1.5 X R0.05 | 1.5 | 20 | 50 | 4 | |
| 4CRE 015 0005 220 | 1.5 X R0.05 | 1.5 | 22 | 60 | 4 | |
| 4CRE 015 0005 250 | 1.5 X R0.05 | 1.5 | 25 | 60 | 4 | |
| 4CRE 015 001 060 | 1.5 X R0.1 | 1.5 | 6 | 45 | 4 | |
| 4CRE 015 001 080 | 1.5 X R0.1 | 1.5 | 8 | 45 | 4 | |
| 4CRE 015 001 100 | 1.5 X R0.1 | 1.5 | 10 | 50 | 4 | |
| 4CRE 015 001 120 | 1.5 X R0.1 | 1.5 | 12 | 50 | 4 | |
| 4CRE 015 001 140 | 1.5 X R0.1 | 1.5 | 14 | 50 | 4 | |
| 4CRE 015 001 160 | 1.5 X R0.1 | 1.5 | 16 | 50 | 4 | |
| 4CRE 015 001 200 | 1.5 X R0.1 | 1.5 | 20 | 50 | 4 | |
| 4CRE 015 001 220 | 1.5 X R0.1 | 1.5 | 22 | 60 | 4 | |
| 4CRE 015 001 250 | 1.5 X R0.1 | 1.5 | 25 | 60 | 4 | |
| 4CRE 015 002 060 | 1.5 X R0.2 | 1.5 | 6 | 45 | 4 | |
| 4CRE 015 002 080 | 1.5 X R0.2 | 1.5 | 8 | 45 | 4 | |
| 4CRE 015 002 100 | 1.5 X R0.2 | 1.5 | 10 | 50 | 4 | |
| 4CRE 015 002 120 | 1.5 X R0.2 | 1.5 | 12 | 50 | 4 | |
| 4CRE 015 002 140 | 1.5 X R0.2 | 1.5 | 14 | 50 | 4 | |
| 4CRE 015 002 160 | 1.5 X R0.2 | 1.5 | 16 | 50 | 4 | |
| 4CRE 015 002 200 | 1.5 X R0.2 | 1.5 | 20 | 50 | 4 | |
| 4CRE 015 002 220 | 1.5 X R0.2 | 1.5 | 22 | 60 | 4 | |
| 4CRE 015 002 250 | 1.5 X R0.2 | 1.5 | 25 | 60 | 4 | |
| 4CRE 015 003 060 | 1.5 X R0.3 | 1.5 | 6 | 45 | 4 | |
| 4CRE 015 003 080 | 1.5 X R0.3 | 1.5 | 8 | 45 | 4 | |
| 4CRE 015 003 100 | 1.5 X R0.3 | 1.5 | 10 | 50 | 4 | |
| 4CRE 015 003 120 | 1.5 X R0.3 | 1.5 | 12 | 50 | 4 | |
| 4CRE 015 003 140 | 1.5 X R0.3 | 1.5 | 14 | 50 | 4 | |
| 4CRE 015 003 160 | 1.5 X R0.3 | 1.5 | 16 | 50 | 4 | |
| 4CRE 015 003 200 | 1.5 X R0.3 | 1.5 | 20 | 50 | 4 | |
| 4CRE 015 003 220 | 1.5 X R0.3 | 1.5 | 22 | 60 | 4 | |
| 4CRE 015 003 250 | 1.5 X R0.3 | 1.5 | 25 | 60 | 4 | |
| 4CRE 015 005 060 | 1.5 X R0.5 | 1.5 | 6 | 45 | 4 | |
| 4CRE 015 005 080 | 1.5 X R0.5 | 1.5 | 8 | 45 | 4 | |
| 4CRE 015 005 100 | 1.5 X R0.5 | 1.5 | 10 | 50 | 4 | |
| 4CRE 015 005 120 | 1.5 X R0.5 | 1.5 | 12 | 50 | 4 | |
| 4CRE 015 005 140 | 1.5 X R0.5 | 1.5 | 14 | 50 | 4 | |
| 4CRE 015 005 160 | 1.5 X R0.5 | 1.5 | 16 | 50 | 4 | |
| 4CRE 015 005 200 | 1.5 X R0.5 | 1.5 | 20 | 50 | 4 | |
| 4CRE 015 005 220 | 1.5 X R0.5 | 1.5 | 22 | 60 | 4 | |
| 4CRE 015 005 250 | 1.5 X R0.5 | 1.5 | 25 | 60 | 4 | |
| 4CRE 020 0002 060 | 2 X R0.02 | 2 | 6 | 45 | 4 | |
| 4CRE 020 0002 080 | 2 X R0.02 | 2 | 8 | 45 | 4 | |

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4CRE 020 0002 100 | 2 X R0.02 | 2 | 10 | 50 | 4 | |
| 4CRE 020 0002 120 | 2 X R0.02 | 2 | 12 | 50 | 4 | |
| 4CRE 020 0002 140 | 2 X R0.02 | 2 | 14 | 50 | 4 | |
| 4CRE 020 0002 160 | 2 X R0.02 | 2 | 16 | 50 | 4 | |
| 4CRE 020 0002 180 | 2 X R0.02 | 2 | 18 | 50 | 4 | |
| 4CRE 020 0002 200 | 2 X R0.02 | 2 | 20 | 50 | 4 | |
| 4CRE 020 0002 220 | 2 X R0.02 | 2 | 22 | 60 | 4 | |
| 4CRE 020 0002 250 | 2 X R0.02 | 2 | 25 | 60 | 4 | |
| 4CRE 020 0002 300 | 2 X R0.02 | 2 | 30 | 70 | 4 | |
| 4CRE 020 0002 350 | 2 X R0.02 | 2 | 35 | 70 | 4 | |
| 4CRE 020 0005 060 | 2 X R0.05 | 2 | 6 | 45 | 4 | |
| 4CRE 020 0005 080 | 2 X R0.05 | 2 | 8 | 45 | 4 | |
| 4CRE 020 0005 100 | 2 X R0.05 | 2 | 10 | 50 | 4 | |
| 4CRE 020 0005 120 | 2 X R0.05 | 2 | 12 | 50 | 4 | |
| 4CRE 020 0005 140 | 2 X R0.05 | 2 | 14 | 50 | 4 | |
| 4CRE 020 0005 160 | 2 X R0.05 | 2 | 16 | 50 | 4 | |
| 4CRE 020 0005 180 | 2 X R0.05 | 2 | 18 | 50 | 4 | |
| 4CRE 020 0005 200 | 2 X R0.05 | 2 | 20 | 50 | 4 | |
| 4CRE 020 0005 220 | 2 X R0.05 | 2 | 22 | 60 | 4 | |
| 4CRE 020 0005 250 | 2 X R0.05 | 2 | 25 | 60 | 4 | |
| 4CRE 020 0005 300 | 2 X R0.05 | 2 | 30 | 70 | 4 | |
| 4CRE 020 0005 350 | 2 X R0.05 | 2 | 35 | 70 | 4 | |
| 4CRE 020 001 060 | 2 X R0.1 | 2 | 6 | 45 | 4 | |
| 4CRE 020 001 080 | 2 X R0.1 | 2 | 8 | 45 | 4 | |
| 4CRE 020 001 100 | 2 X R0.1 | 2 | 10 | 50 | 4 | |
| 4CRE 020 001 120 | 2 X R0.1 | 2 | 12 | 50 | 4 | |
| 4CRE 020 001 140 | 2 X R0.1 | 2 | 14 | 50 | 4 | |
| 4CRE 020 001 160 | 2 X R0.1 | 2 | 16 | 50 | 4 | |
| 4CRE 020 001 180 | 2 X R0.1 | 2 | 18 | 50 | 4 | |
| 4CRE 020 001 200 | 2 X R0.1 | 2 | 20 | 50 | 4 | |
| 4CRE 020 001 220 | 2 X R0.1 | 2 | 22 | 60 | 4 | |
| 4CRE 020 001 250 | 2 X R0.1 | 2 | 25 | 60 | 4 | |
| 4CRE 020 001 300 | 2 X R0.1 | 2 | 30 | 70 | 4 | |
| 4CRE 020 001 350 | 2 X R0.1 | 2 | 35 | 70 | 4 | |
| 4CRE 020 002 060 | 2 X R0.2 | 2 | 6 | 45 | 4 | |
| 4CRE 020 002 080 | 2 X R0.2 | 2 | 8 | 45 | 4 | |
| 4CRE 020 002 100 | 2 X R0.2 | 2 | 10 | 50 | 4 | |
| 4CRE 020 002 120 | 2 X R0.2 | 2 | 12 | 50 | 4 | |
| 4CRE 020 002 140 | 2 X R0.2 | 2 | 14 | 50 | 4 | |
| 4CRE 020 002 160 | 2 X R0.2 | 2 | 16 | 50 | 4 | |
| 4CRE 020 002 180 | 2 X R0.2 | 2 | 18 | 50 | 4 | |
| 4CRE 020 002 200 | 2 X R0.2 | 2 | 20 | 50 | 4 | |
| 4CRE 020 002 220 | 2 X R0.2 | 2 | 22 | 60 | 4 | |
| 4CRE 020 002 250 | 2 X R0.2 | 2 | 25 | 60 | 4 | |
| 4CRE 020 002 300 | 2 X R0.2 | 2 | 30 | 70 | 4 | |
| 4CRE 020 002 350 | 2 X R0.2 | 2 | 35 | 70 | 4 | |
| 4CRE 020 003 060 | 2 X R0.3 | 2 | 6 | 45 | 4 | |
| 4CRE 020 003 080 | 2 X R0.3 | 2 | 8 | 45 | 4 | |
| 4CRE 020 003 100 | 2 X R0.3 | 2 | 10 | 50 | 4 | |
| 4CRE 020 003 120 | 2 X R0.3 | 2 | 12 | 50 | 4 | |
| 4CRE 020 003 140 | 2 X R0.3 | 2 | 14 | 50 | 4 | |
| 4CRE 020 003 160 | 2 X R0.3 | 2 | 16 | 50 | 4 | |
| 4CRE 020 003 180 | 2 X R0.3 | 2 | 18 | 50 | 4 | |
| 4CRE 020 003 200 | 2 X R0.3 | 2 | 20 | 50 | 4 | |
| 4CRE 020 003 220 | 2 X R0.3 | 2 | 22 | 60 | 4 | |
| 4CRE 020 003 250 | 2 X R0.3 | 2 | 25 | 60 | 4 | |
| 4CRE 020 003 300 | 2 X R0.3 | 2 | 30 | 70 | 4 | |
| 4CRE 020 003 350 | 2 X R0.3 | 2 | 35 | 70 | 4 | |
| 4CRE 020 005 060 | 2 X R0.5 | 2 | 6 | 45 | 4 | |
| 4CRE 020 005 080 | 2 X R0.5 | 2 | 8 | 45 | 4 | |
| 4CRE 020 005 100 | 2 X R0.5 | 2 | 10 | 50 | 4 | |
| 4CRE 020 005 120 | 2 X R0.5 | 2 | 12 | 50 | 4 | |
| 4CRE 020 005 140 | 2 X R0.5 | 2 | 14 | 50 | 4 | |
| 4CRE 020 005 160 | 2 X R0.5 | 2 | 16 | 50 | 4 | |

# 4CRE

## 4 Flutes Rib Corner Radius End Mills

## 4날 리브 코너 레디우스 엔드밀

HARD series

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4CRE 020 005 180 | 2 X R0.5 | 2 | 18 | 50 | 4 | |
| 4CRE 020 005 200 | 2 X R0.5 | 2 | 20 | 50 | 4 | |
| 4CRE 020 005 220 | 2 X R0.5 | 2 | 22 | 60 | 4 | |
| 4CRE 020 005 250 | 2 X R0.5 | 2 | 25 | 60 | 4 | |
| 4CRE 020 005 300 | 2 X R0.5 | 2 | 30 | 70 | 4 | |
| 4CRE 020 005 350 | 2 X R0.5 | 2 | 35 | 70 | 4 | |
| 4CRE 025 001 100 | 2.5 X R0.1 | 2.5 | 10 | 50 | 4 | |
| 4CRE 025 001 120 | 2.5 X R0.1 | 2.5 | 12 | 50 | 4 | |
| 4CRE 025 001 160 | 2.5 X R0.1 | 2.5 | 16 | 50 | 4 | |
| 4CRE 025 001 200 | 2.5 X R0.1 | 2.5 | 20 | 50 | 4 | |
| 4CRE 025 001 250 | 2.5 X R0.1 | 2.5 | 25 | 60 | 4 | |
| 4CRE 025 001 300 | 2.5 X R0.1 | 2.5 | 30 | 70 | 4 | |
| 4CRE 025 002 100 | 2.5 X R0.2 | 2.5 | 10 | 50 | 4 | |
| 4CRE 025 002 120 | 2.5 X R0.2 | 2.5 | 12 | 50 | 4 | |
| 4CRE 025 002 160 | 2.5 X R0.2 | 2.5 | 16 | 50 | 4 | |
| 4CRE 025 002 200 | 2.5 X R0.2 | 2.5 | 20 | 50 | 4 | |
| 4CRE 025 002 250 | 2.5 X R0.2 | 2.5 | 25 | 60 | 4 | |
| 4CRE 025 002 300 | 2.5 X R0.2 | 2.5 | 30 | 70 | 4 | |
| 4CRE 025 003 100 | 2.5 X R0.3 | 2.5 | 10 | 50 | 4 | |
| 4CRE 025 003 120 | 2.5 X R0.3 | 2.5 | 12 | 50 | 4 | |
| 4CRE 025 003 160 | 2.5 X R0.3 | 2.5 | 16 | 50 | 4 | |
| 4CRE 025 003 200 | 2.5 X R0.3 | 2.5 | 20 | 50 | 4 | |
| 4CRE 025 003 250 | 2.5 X R0.3 | 2.5 | 25 | 60 | 4 | |
| 4CRE 025 003 300 | 2.5 X R0.3 | 2.5 | 30 | 70 | 4 | |
| 4CRE 025 005 100 | 2.5 X R0.5 | 2.5 | 10 | 50 | 4 | |
| 4CRE 025 005 120 | 2.5 X R0.5 | 2.5 | 12 | 50 | 4 | |
| 4CRE 025 005 160 | 2.5 X R0.5 | 2.5 | 16 | 50 | 4 | |
| 4CRE 025 005 200 | 2.5 X R0.5 | 2.5 | 20 | 50 | 4 | |
| 4CRE 025 005 250 | 2.5 X R0.5 | 2.5 | 25 | 60 | 4 | |
| 4CRE 025 005 300 | 2.5 X R0.5 | 2.5 | 30 | 70 | 4 | |
| 4CRE 030 001 100 | 3 X R0.1 | 3 | 10 | 50 | 6 | |
| 4CRE 030 001 120 | 3 X R0.1 | 3 | 12 | 50 | 6 | |
| 4CRE 030 001 160 | 3 X R0.1 | 3 | 16 | 55 | 6 | |
| 4CRE 030 001 200 | 3 X R0.1 | 3 | 20 | 60 | 6 | |
| 4CRE 030 001 250 | 3 X R0.1 | 3 | 25 | 65 | 6 | |
| 4CRE 030 001 300 | 3 X R0.1 | 3 | 30 | 70 | 6 | |
| 4CRE 030 001 350 | 3 X R0.1 | 3 | 35 | 75 | 6 | |
| 4CRE 030 001 400 | 3 X R0.1 | 3 | 40 | 80 | 6 | |
| 4CRE 030 001 500 | 3 X R0.1 | 3 | 50 | 100 | 6 | |
| 4CRE 030 002 100 | 3 X R0.2 | 3 | 10 | 50 | 6 | |
| 4CRE 030 002 120 | 3 X R0.2 | 3 | 12 | 50 | 6 | |
| 4CRE 030 002 160 | 3 X R0.2 | 3 | 16 | 55 | 6 | |
| 4CRE 030 002 200 | 3 X R0.2 | 3 | 20 | 60 | 6 | |
| 4CRE 030 002 250 | 3 X R0.2 | 3 | 25 | 65 | 6 | |
| 4CRE 030 002 300 | 3 X R0.2 | 3 | 30 | 70 | 6 | |
| 4CRE 030 002 350 | 3 X R0.2 | 3 | 35 | 75 | 6 | |
| 4CRE 030 002 400 | 3 X R0.2 | 3 | 40 | 80 | 6 | |
| 4CRE 030 002 500 | 3 X R0.2 | 3 | 50 | 100 | 6 | |
| 4CRE 030 003 100 | 3 X R0.3 | 3 | 10 | 50 | 6 | |
| 4CRE 030 003 120 | 3 X R0.3 | 3 | 12 | 50 | 6 | |
| 4CRE 030 003 160 | 3 X R0.3 | 3 | 16 | 55 | 6 | |
| 4CRE 030 003 200 | 3 X R0.3 | 3 | 20 | 60 | 6 | |
| 4CRE 030 003 250 | 3 X R0.3 | 3 | 25 | 65 | 6 | |
| 4CRE 030 003 300 | 3 X R0.3 | 3 | 30 | 70 | 6 | |
| 4CRE 030 003 350 | 3 X R0.3 | 3 | 35 | 75 | 6 | |
| 4CRE 030 003 400 | 3 X R0.3 | 3 | 40 | 80 | 6 | |
| 4CRE 030 003 500 | 3 X R0.3 | 3 | 50 | 100 | 6 | |
| 4CRE 030 005 100 | 3 X R0.5 | 3 | 10 | 50 | 6 | |
| 4CRE 030 005 120 | 3 X R0.5 | 3 | 12 | 50 | 6 | |
| 4CRE 030 005 160 | 3 X R0.5 | 3 | 16 | 55 | 6 | |
| 4CRE 030 005 200 | 3 X R0.5 | 3 | 20 | 60 | 6 | |
| 4CRE 030 005 250 | 3 X R0.5 | 3 | 25 | 65 | 6 | |
| 4CRE 030 005 300 | 3 X R0.5 | 3 | 30 | 70 | 6 | |
| 4CRE 030 005 350 | 3 X R0.5 | 3 | 35 | 75 | 6 | |

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4CRE 030 005 400 | 3 X R0.5 | 3 | 40 | 80 | 6 | |
| 4CRE 030 005 500 | 3 X R0.5 | 3 | 50 | 100 | 6 | |
| 4CRE 030 005 600 | 3 X R0.5 | 3 | 60 | 110 | 6 | |
| 4CRE 030 010 100 | 3 X R1 | 3 | 10 | 50 | 6 | |
| 4CRE 030 010 120 | 3 X R1 | 3 | 12 | 50 | 6 | |
| 4CRE 030 010 160 | 3 X R1 | 3 | 16 | 55 | 6 | |
| 4CRE 030 010 200 | 3 X R1 | 3 | 20 | 60 | 6 | |
| 4CRE 030 010 250 | 3 X R1 | 3 | 25 | 65 | 6 | |
| 4CRE 030 010 300 | 3 X R1 | 3 | 30 | 70 | 6 | |
| 4CRE 030 010 350 | 3 X R1 | 3 | 35 | 75 | 6 | |
| 4CRE 030 010 400 | 3 X R1 | 3 | 40 | 80 | 6 | |
| 4CRE 030 010 500 | 3 X R1 | 3 | 50 | 100 | 6 | |
| 4CRE 030 010 600 | 3 X R1 | 3 | 60 | 110 | 6 | |
| 4CRE 040 001 050 | 4 X R0.1 | 4 | 12 | 50 | 4 | |
| 4CRE 040 001 070 | 4 X R0.1 | 4 | 20 | 70 | 4 | |
| 4CRE 040 001 130 | 4 X R0.1 | 4 | 13 | 55 | 6 | |
| 4CRE 040 001 160 | 4 X R0.1 | 4 | 16 | 55 | 6 | |
| 4CRE 040 001 200 | 4 X R0.1 | 4 | 20 | 60 | 6 | |
| 4CRE 040 001 250 | 4 X R0.1 | 4 | 25 | 65 | 6 | |
| 4CRE 040 001 300 | 4 X R0.1 | 4 | 30 | 70 | 6 | |
| 4CRE 040 001 350 | 4 X R0.1 | 4 | 35 | 75 | 6 | |
| 4CRE 040 001 400 | 4 X R0.1 | 4 | 40 | 80 | 6 | |
| 4CRE 040 001 450 | 4 X R0.1 | 4 | 45 | 90 | 6 | |
| 4CRE 040 001 500 | 4 X R0.1 | 4 | 50 | 100 | 6 | |
| 4CRE 040 001 600 | 4 X R0.1 | 4 | 60 | 110 | 6 | |
| 4CRE 040 002 050 | 4 X R0.2 | 4 | 12 | 50 | 4 | |
| 4CRE 040 002 070 | 4 X R0.2 | 4 | 20 | 70 | 4 | |
| 4CRE 040 002 130 | 4 X R0.2 | 4 | 13 | 55 | 6 | |
| 4CRE 040 002 160 | 4 X R0.2 | 4 | 16 | 55 | 6 | |
| 4CRE 040 002 200 | 4 X R0.2 | 4 | 20 | 60 | 6 | |
| 4CRE 040 002 250 | 4 X R0.2 | 4 | 25 | 65 | 6 | |
| 4CRE 040 002 300 | 4 X R0.2 | 4 | 30 | 70 | 6 | |
| 4CRE 040 002 350 | 4 X R0.2 | 4 | 35 | 75 | 6 | |
| 4CRE 040 002 400 | 4 X R0.2 | 4 | 40 | 80 | 6 | |
| 4CRE 040 002 450 | 4 X R0.2 | 4 | 45 | 90 | 6 | |
| 4CRE 040 002 500 | 4 X R0.2 | 4 | 50 | 100 | 6 | |
| 4CRE 040 002 600 | 4 X R0.2 | 4 | 60 | 110 | 6 | |
| 4CRE 040 003 050 | 4 X R0.3 | 4 | 12 | 50 | 4 | |
| 4CRE 040 003 070 | 4 X R0.3 | 4 | 20 | 70 | 4 | |
| 4CRE 040 003 130 | 4 X R0.3 | 4 | 13 | 55 | 6 | |
| 4CRE 040 003 160 | 4 X R0.3 | 4 | 16 | 55 | 6 | |
| 4CRE 040 003 200 | 4 X R0.3 | 4 | 20 | 60 | 6 | |
| 4CRE 040 003 250 | 4 X R0.3 | 4 | 25 | 65 | 6 | |
| 4CRE 040 003 300 | 4 X R0.3 | 4 | 30 | 70 | 6 | |
| 4CRE 040 003 350 | 4 X R0.3 | 4 | 35 | 75 | 6 | |
| 4CRE 040 003 400 | 4 X R0.3 | 4 | 40 | 80 | 6 | |
| 4CRE 040 003 450 | 4 X R0.3 | 4 | 45 | 90 | 6 | |
| 4CRE 040 003 500 | 4 X R0.3 | 4 | 50 | 100 | 6 | |
| 4CRE 040 003 600 | 4 X R0.3 | 4 | 60 | 110 | 6 | |
| 4CRE 040 005 050 | 4 X R0.5 | 4 | 12 | 50 | 4 | |
| 4CRE 040 005 070 | 4 X R0.5 | 4 | 20 | 70 | 4 | |
| 4CRE 040 005 130 | 4 X R0.5 | 4 | 13 | 55 | 6 | |
| 4CRE 040 005 160 | 4 X R0.5 | 4 | 16 | 55 | 6 | |
| 4CRE 040 005 200 | 4 X R0.5 | 4 | 20 | 60 | 6 | |
| 4CRE 040 005 250 | 4 X R0.5 | 4 | 25 | 65 | 6 | |
| 4CRE 040 005 300 | 4 X R0.5 | 4 | 30 | 70 | 6 | |
| 4CRE 040 005 350 | 4 X R0.5 | 4 | 35 | 75 | 6 | |
| 4CRE 040 005 400 | 4 X R0.5 | 4 | 40 | 80 | 6 | |
| 4CRE 040 005 450 | 4 X R0.5 | 4 | 45 | 90 | 6 | |
| 4CRE 040 005 500 | 4 X R0.5 | 4 | 50 | 100 | 6 | |
| 4CRE 040 005 600 | 4 X R0.5 | 4 | 60 | 110 | 6 | |
| 4CRE 040 010 050 | 4 X R1 | 4 | 12 | 50 | 4 | |
| 4CRE 040 010 070 | 4 X R1 | 4 | 20 | 70 | 4 | |
| 4CRE 040 010 130 | 4 X R1 | 4 | 13 | 55 | 6 | |

# 4CRE

## 4 Flutes Rib Corner Radius End Mills

## 4날 리브 코너 레디우스 엔드밀

단위 : mm

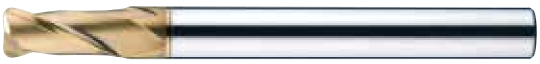
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4CRE 040 010 160 | 4 X R1 | 4 | 16 | 55 | 6 | |
| 4CRE 040 010 200 | 4 X R1 | 4 | 20 | 60 | 6 | |
| 4CRE 040 010 250 | 4 X R1 | 4 | 25 | 65 | 6 | |
| 4CRE 040 010 300 | 4 X R1 | 4 | 30 | 70 | 6 | |
| 4CRE 040 010 350 | 4 X R1 | 4 | 35 | 75 | 6 | |
| 4CRE 040 010 400 | 4 X R1 | 4 | 40 | 80 | 6 | |
| 4CRE 040 010 450 | 4 X R1 | 4 | 45 | 90 | 6 | |
| 4CRE 040 010 500 | 4 X R1 | 4 | 50 | 100 | 6 | |
| 4CRE 040 010 600 | 4 X R1 | 4 | 60 | 110 | 6 | |
| 4CRE 050 001 160 | 5 X R0.1 | 5 | 16 | 60 | 6 | |
| 4CRE 050 001 300 | 5 X R0.1 | 5 | 30 | 70 | 6 | |
| 4CRE 050 001 400 | 5 X R0.1 | 5 | 40 | 80 | 6 | |
| 4CRE 050 001 500 | 5 X R0.1 | 5 | 50 | 100 | 6 | |
| 4CRE 050 002 160 | 5 X R0.2 | 5 | 16 | 60 | 6 | |
| 4CRE 050 002 300 | 5 X R0.2 | 5 | 30 | 70 | 6 | |
| 4CRE 050 002 400 | 5 X R0.2 | 5 | 40 | 80 | 6 | |
| 4CRE 050 002 500 | 5 X R0.2 | 5 | 50 | 100 | 6 | |
| 4CRE 050 003 160 | 5 X R0.3 | 5 | 16 | 60 | 6 | |
| 4CRE 050 003 300 | 5 X R0.3 | 5 | 30 | 70 | 6 | |
| 4CRE 050 003 400 | 5 X R0.3 | 5 | 40 | 80 | 6 | |
| 4CRE 050 003 500 | 5 X R0.3 | 5 | 50 | 100 | 6 | |
| 4CRE 050 005 160 | 5 X R0.5 | 5 | 16 | 60 | 6 | |
| 4CRE 050 005 300 | 5 X R0.5 | 5 | 30 | 70 | 6 | |
| 4CRE 050 005 400 | 5 X R0.5 | 5 | 40 | 80 | 6 | |
| 4CRE 050 005 500 | 5 X R0.5 | 5 | 50 | 100 | 6 | |
| 4CRE 050 005 600 | 5 X R0.5 | 5 | 60 | 110 | 6 | |
| 4CRE 050 010 160 | 5 X R1 | 5 | 16 | 60 | 6 | |
| 4CRE 050 010 300 | 5 X R1 | 5 | 30 | 70 | 6 | |
| 4CRE 050 010 400 | 5 X R1 | 5 | 40 | 80 | 6 | |
| 4CRE 050 010 500 | 5 X R1 | 5 | 50 | 100 | 6 | |
| 4CRE 050 010 600 | 5 X R1 | 5 | 60 | 110 | 6 | |
| 4CRE 060 001 200 | 6 X R0.1 | 7 | 20 | 60 | 6 | |
| 4CRE 060 001 400 | 6 X R0.1 | 7 | 40 | 80 | 6 | |
| 4CRE 060 001 500 | 6 X R0.1 | 7 | 50 | 100 | 6 | |
| 4CRE 060 002 200 | 6 X R0.2 | 7 | 20 | 60 | 6 | |
| 4CRE 060 002 400 | 6 X R0.2 | 7 | 40 | 80 | 6 | |
| 4CRE 060 002 500 | 6 X R0.2 | 7 | 50 | 100 | 6 | |
| 4CRE 060 002 600 | 6 X R0.2 | 7 | 60 | 110 | 6 | |
| 4CRE 060 003 200 | 6 X R0.3 | 7 | 20 | 60 | 6 | |
| 4CRE 060 003 400 | 6 X R0.3 | 7 | 40 | 80 | 6 | |
| 4CRE 060 003 500 | 6 X R0.3 | 7 | 50 | 100 | 6 | |
| 4CRE 060 005 200 | 6 X R0.5 | 7 | 20 | 60 | 6 | |
| 4CRE 060 005 400 | 6 X R0.5 | 7 | 40 | 80 | 6 | |
| 4CRE 060 005 500 | 6 X R0.5 | 7 | 50 | 100 | 6 | |
| 4CRE 060 005 600 | 6 X R0.5 | 7 | 60 | 110 | 6 | |
| 4CRE 060 010 200 | 6 X R1 | 7 | 20 | 60 | 6 | |
| 4CRE 060 010 400 | 6 X R1 | 7 | 40 | 80 | 6 | |
| 4CRE 060 010 500 | 6 X R1 | 7 | 50 | 100 | 6 | |
| 4CRE 060 010 600 | 6 X R1 | 7 | 60 | 110 | 6 | |
| 4CRE 060 015 200 | 6 X R1.5 | 7 | 20 | 60 | 6 | |
| 4CRE 060 015 400 | 6 X R1.5 | 7 | 40 | 80 | 6 | |
| 4CRE 060 015 500 | 6 X R1.5 | 7 | 50 | 100 | 6 | |
| 4CRE 080 002 220 | 8 X R0.2 | 9 | 22 | 65 | 8 | |
| 4CRE 080 002 400 | 8 X R0.2 | 9 | 40 | 100 | 8 | |
| 4CRE 080 003 220 | 8 X R0.3 | 9 | 22 | 65 | 8 | |
| 4CRE 080 003 400 | 8 X R0.3 | 9 | 40 | 100 | 8 | |
| 4CRE 080 005 220 | 8 X R0.5 | 9 | 22 | 65 | 8 | |
| 4CRE 080 005 400 | 8 X R0.5 | 9 | 40 | 100 | 8 | |
| 4CRE 080 005 600 | 8 X R0.5 | 9 | 60 | 120 | 8 | |
| 4CRE 080 010 220 | 8 X R1 | 9 | 22 | 65 | 8 | |
| 4CRE 080 010 400 | 8 X R1 | 9 | 40 | 100 | 8 | |
| 4CRE 080 010 600 | 8 X R1 | 9 | 60 | 120 | 8 | |
| 4CRE 080 015 220 | 8 X R1.5 | 9 | 22 | 65 | 8 | |
| 4CRE 080 015 400 | 8 X R1.5 | 9 | 40 | 100 | 8 | |
| 4CRE 080 020 220 | 8 X R2 | 9 | 22 | 65 | 8 | |
| 4CRE 080 020 400 | 8 X R2 | 9 | 40 | 100 | 8 | |
| 4CRE 100 002 240 | 10 X R0.2 | 11 | 24 | 70 | 10 | |
| 4CRE 100 002 400 | 10 X R0.2 | 11 | 40 | 100 | 10 | |
| 4CRE 100 003 240 | 10 X R0.3 | 11 | 24 | 70 | 10 | |
| 4CRE 100 003 400 | 10 X R0.3 | 11 | 40 | 100 | 10 | |
| 4CRE 100 005 240 | 10 X R0.5 | 11 | 24 | 70 | 10 | |
| 4CRE 100 005 400 | 10 X R0.5 | 11 | 40 | 100 | 10 | |
| 4CRE 100 005 600 | 10 X R0.5 | 11 | 60 | 120 | 10 | |
| 4CRE 100 010 240 | 10 X R1 | 11 | 24 | 70 | 10 | |
| 4CRE 100 010 400 | 10 X R1 | 11 | 40 | 100 | 10 | |
| 4CRE 100 010 600 | 10 X R1 | 11 | 60 | 120 | 10 | |
| 4CRE 100 015 240 | 10 X R1.5 | 11 | 24 | 70 | 10 | |
| 4CRE 100 015 400 | 10 X R1.5 | 11 | 40 | 100 | 10 | |
| 4CRE 100 020 240 | 10 X R2 | 11 | 24 | 70 | 10 | |
| 4CRE 100 020 400 | 10 X R2 | 11 | 40 | 100 | 10 | |
| 4CRE 100 025 240 | 10 X R2.5 | 11 | 24 | 70 | 10 | |
| 4CRE 120 003 260 | 12 X R0.3 | 13 | 26 | 80 | 12 | |
| 4CRE 120 005 260 | 12 X R0.5 | 13 | 26 | 80 | 12 | |
| 4CRE 120 005 400 | 12 X R0.5 | 13 | 40 | 110 | 12 | |
| 4CRE 120 005 600 | 12 X R0.5 | 13 | 60 | 130 | 12 | |
| 4CRE 120 010 260 | 12 X R1 | 13 | 26 | 80 | 12 | |
| 4CRE 120 010 400 | 12 X R1 | 13 | 40 | 110 | 12 | |
| 4CRE 120 010 600 | 12 X R1 | 13 | 60 | 130 | 12 | |
| 4CRE 120 015 260 | 12 X R1.5 | 13 | 26 | 80 | 12 | |
| 4CRE 120 015 400 | 12 X R1.5 | 13 | 40 | 110 | 12 | |
| 4CRE 120 020 260 | 12 X R2 | 13 | 26 | 80 | 12 | |
| 4CRE 120 020 400 | 12 X R2 | 13 | 40 | 110 | 12 | |
| 4CRE 120 030 260 | 12 X R3 | 13 | 26 | 80 | 12 | |

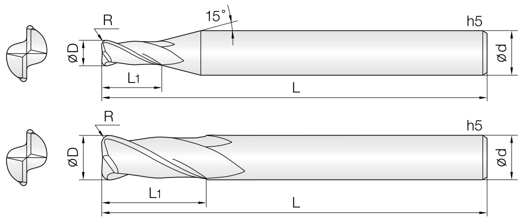
# 2NCR

## 2 Flutes Corner Radius End Mills

## 2날 코너 레디우스 엔드밀








- **고경도강(HRc50~62), 프리하든강 계열의 고속 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 코너R 형상을 날부치핑이 적도록 설계하였습니다.
- 다양한 코너R과 유효장으로 맞춤 가공이 가능합니다.
- 초미립자 초경합금(0.2㎛)을 채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc50~62)**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- Various corner R and flute length for wide range application.
- Outstanding performance at high speed machining by ultra fine (0.2㎛ ) WC grade.

2 | UWC 초미립자 | TISIN Coating | R ± 0.005 R0.02 ~ 0.5 | R ± 0.01 R1 ~ 1.5 | R ± 0.015 R2 ~ 5 | 30° Helix Angle | CUTTING DATA 444P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.2 ~ 16 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |
| | Ø14 ~ 16 | -0.01 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2NCR 002 0002 S04 | 0.2 X R0.02 | 0.6 | 45 | 4 | |
| 2NCR 002 0005 S04 | 0.2 X R0.05 | 0.6 | 45 | 4 | |
| 2NCR 003 0002 S04 | 0.3 X R0.02 | 0.6 | 45 | 4 | |
| 2NCR 003 0005 S04 | 0.3 X R0.05 | 0.6 | 45 | 4 | |
| 2NCR 003 001 S04 | 0.3 X R0.1 | 0.6 | 45 | 4 | |
| 2NCR 004 0002 S04 | 0.4 X R0.02 | 0.8 | 45 | 4 | |
| 2NCR 004 0005 S04 | 0.4 X R0.05 | 0.8 | 45 | 4 | |
| 2NCR 004 001 S04 | 0.4 X R0.1 | 0.8 | 45 | 4 | |
| 2NCR 005 0002 S04 | 0.5 X R0.02 | 1 | 45 | 4 | |
| 2NCR 005 0005 S04 | 0.5 X R0.05 | 1 | 45 | 4 | |
| 2NCR 005 001 S04 | 0.5 X R0.1 | 1 | 45 | 4 | |
| 2NCR 006 0002 S04 | 0.6 X R0.02 | 1.2 | 45 | 4 | |
| 2NCR 006 0005 S04 | 0.6 X R0.05 | 1.2 | 45 | 4 | |
| 2NCR 006 001 S04 | 0.6 X R0.1 | 1.2 | 45 | 4 | |
| 2NCR 006 002 S04 | 0.6 X R0.2 | 1.2 | 45 | 4 | |
| 2NCR 007 0005 S04 | 0.7 X R0.05 | 1.4 | 45 | 4 | |
| 2NCR 007 001 S04 | 0.7 X R0.1 | 1.4 | 45 | 4 | |
| 2NCR 007 002 S04 | 0.7 X R0.2 | 1.4 | 45 | 4 | |
| 2NCR 008 0002 S04 | 0.8 X R0.02 | 1.6 | 45 | 4 | |
| 2NCR 008 0005 S04 | 0.8 X R0.05 | 1.6 | .45 | 4 | |
| 2NCR 008 001 S04 | 0.8 X R0.1 | 1.6 | 45 | 4 | |
| 2NCR 008 002 S04 | 0.8 X R0.2 | 1.6 | 45 | 4 | |
| 2NCR 009 0005 S04 | 0.9 X R0.05 | 1.8 | 45 | 4 | |
| 2NCR 009 001 S04 | 0.9 X R0.1 | 1.8 | 45 | 4 | |
| 2NCR 010 0002 S04 | 1 X R0.02 | 2.5 | 45 | 4 | |
| 2NCR 010 0005 S04 | 1 X R0.05 | 2.5 | 45 | 4 | |
| 2NCR 010 001 S04 | 1 X R0.1 | 2.5 | 45 | 4 | |
| 2NCR 010 002 S04 | 1 X R0.2 | 2.5 | 45 | 4 | |
| 2NCR 010 003 S04 | 1 X R0.3 | 2.5 | 45 | 4 | |
| 2NCR 010 004 S04 | 1 X R0.4 | 2.5 | 45 | 4 | |
| 2NCR 012 0005 S04 | 1.2 X R0.05 | 3.2 | 45 | 4 | |
| 2NCR 012 001 S04 | 1.2 X R0.1 | 3.2 | 45 | 4 | |
| 2NCR 012 002 S04 | 1.2 X R0.2 | 3.2 | 45 | 4 | |
| 2NCR 012 003 S04 | 1.2 X R0.3 | 3.2 | 45 | 4 | |
| 2NCR 015 0002 S04 | 1.5 X R0.02 | 4 | 45 | 4 | |
| 2NCR 015 0005 S04 | 1.5 X R0.05 | 4 | 45 | 4 | |
| 2NCR 015 001 S04 | 1.5 X R0.1 | 4 | 45 | 4 | |
| 2NCR 015 002 S04 | 1.5 X R0.2 | 4 | 45 | 4 | |
| 2NCR 015 003 S04 | 1.5 X R0.3 | 4 | 45 | 4 | |
| 2NCR 015 004 S04 | 1.5 X R0.4 | 4 | 45 | 4 | |
| 2NCR 015 005 S04 | 1.5 X R0.5 | 4 | 45 | 4 | |
| 2NCR 020 0002 S04 | 2 X R0.02 | 6 | 45 | 4 | |
| 2NCR 020 0005 S04 | 2 X R0.05 | 6 | 45 | 4 | |
| 2NCR 020 001 S04 | 2 X R0.1 | 6 | 45 | 4 | |
| 2NCR 020 002 S04 | 2 X R0.2 | 6 | 45 | 4 | |
| 2NCR 020 003 S04 | 2 X R0.3 | 6 | 45 | 4 | |
| 2NCR 020 004 S04 | 2 X R0.4 | 6 | 45 | 4 | |
| 2NCR 020 005 S04 | 2 X R0.5 | 6 | 45 | 4 | |
| 2NCR 025 0005 S04 | 2.5 X R0.05 | 6 | 50 | 4 | |
| 2NCR 025 001 S04 | 2.5 X R0.1 | 6 | 50 | 4 | |

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2NCR 025 002 S04 | 2.5 X R0.2 | 6 | 50 | 4 | |
| 2NCR 025 003 S04 | 2.5 X R0.3 | 6 | 50 | 4 | |
| 2NCR 025 004 S04 | 2.5 X R0.4 | 6 | 50 | 4 | |
| 2NCR 025 005 S04 | 2.5 X R0.5 | 6 | 50 | 4 | |
| 2NCR 030 0005 S06 | 3 X R0.05 | 8 | 60 | 6 | |
| 2NCR 030 001 S06 | 3 X R0.1 | 8 | 60 | 6 | |
| 2NCR 030 002 S06 | 3 X R0.2 | 8 | 60 | 6 | |
| 2NCR 030 003 S06 | 3 X R0.3 | 8 | 60 | 6 | |
| 2NCR 030 004 S06 | 3 X R0.4 | 8 | 60 | 6 | |
| 2NCR 030 005 S06 | 3 X R0.5 | 8 | 60 | 6 | |
| 2NCR 030 010 S06 | 3 X R1 | 8 | 60 | 6 | |
| 2NCR 035 001 S06 | 3.5 X R0.1 | 9 | 70 | 6 | |
| 2NCR 035 002 S06 | 3.5 X R0.2 | 9 | 70 | 6 | |
| 2NCR 035 003 S06 | 3.5 X R0.3 | 9 | 70 | 6 | |
| 2NCR 035 005 S06 | 3.5 X R0.5 | 9 | 70 | 6 | |
| 2NCR 035 010 S06 | 3.5 X R1 | 9 | 70 | 6 | |
| 2NCR 040 0005 060 | 4 X R0.05 | 9 | 60 | 4 | |
| 2NCR 040 0005 080 | 4 X R0.05 | 9 | 80 | 4 | |
| 2NCR 040 0005 S06 | 4 X R0.05 | 9 | 70 | 6 | |
| 2NCR 040 001 060 | 4 X R0.1 | 9 | 60 | 4 | |
| 2NCR 040 001 080 | 4 X R0.1 | 9 | 80 | 4 | |
| 2NCR 040 001 S06 | 4 X R0.1 | 10 | 70 | 6 | |
| 2NCR 040 002 060 | 4 X R0.2 | 9 | 60 | 4 | |
| 2NCR 040 002 080 | 4 X R0.2 | 9 | 80 | 4 | |
| 2NCR 040 002 S06 | 4 X R0.2 | 10 | 70 | 6 | |
| 2NCR 040 003 060 | 4 X R0.3 | 9 | 60 | 4 | |
| 2NCR 040 003 080 | 4 X R0.3 | 9 | 80 | 4 | |
| 2NCR 040 003 S06 | 4 X R0.3 | 10 | 70 | 6 | |
| 2NCR 040 004 060 | 4 X R0.4 | 9 | 60 | 4 | |
| 2NCR 040 004 080 | 4 X R0.4 | 9 | 80 | 4 | |
| 2NCR 040 004 S06 | 4 X R0.4 | 10 | 70 | 6 | |
| 2NCR 040 005 060 | 4 X R0.5 | 9 | 60 | 4 | |
| 2NCR 040 005 080 | 4 X R0.5 | 9 | 80 | 4 | |
| 2NCR 040 005 S06 | 4 X R0.5 | 10 | 70 | 6 | |
| 2NCR 040 010 060 | 4 X R1 | 9 | 60 | 4 | |
| 2NCR 040 010 080 | 4 X R1 | 9 | 80 | 4 | |
| 2NCR 040 010 S06 | 4 X R1 | 10 | 70 | 6 | |
| 2NCR 045 001 S06 | 4.5 X R0.1 | 11 | 75 | 6 | |
| 2NCR 045 002 S06 | 4.5 X R0.2 | 11 | 75 | 6 | |
| 2NCR 045 003 S06 | 4.5 X R0.3 | 11 | 75 | 6 | |
| 2NCR 045 005 S06 | 4.5 X R0.5 | 11 | 75 | 6 | |
| 2NCR 045 010 S06 | 4.5 X R1 | 11 | 75 | 6 | |
| 2NCR 050001 S06 | 5 X R0.1 | 13 | 75 | 6 | |
| 2NCR 050 002 S06 | 5 X R0.2 | 13 | 75 | 6 | |
| 2NCR 050 003 S06 | 5 X R0.3 | 13 | 75 | 6 | |
| 2NCR 050 004 S06 | 5 X R0.4 | 13 | 75 | 6 | |
| 2NCR 050 005 S06 | 5 X R0.5 | 13 | 75 | 6 | |
| 2NCR 050 010 S06 | 5 X R1 | 13 | 75 | 6 | |
| 2NCR 055 002 S06 | 5.5 X R0.2 | 13 | 75 | 6 | |
| 2NCR 055 003 S06 | 5.5 X R0.3 | 13 | 75 | 6 | |

# 2 Flutes Corner Radius End Mills

## 2날 코너 레디우스 엔드밀



단위 : mm

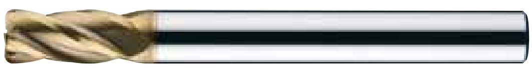
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2NCR 055 005 S06 | 5.5 X R0.5 | 13 | 75 | 6 | |
| 2NCR 055 010 S06 | 5.5 X R1 | 13 | 75 | 6 | |
| 2NCR 060 0005 060 | 6 X R0.05 | 11 | 60 | 6 | |
| 2NCR 060 0005 090 | 6 X R0.05 | 13 | 90 | 6 | |
| 2NCR 060 001 060 | 6 X R0.1 | 11 | 60 | 6 | |
| 2NCR 060 001 090 | 6 X R0.1 | 13 | 90 | 6 | |
| 2NCR 060 002 060 | 6 X R0.2 | 11 | 60 | 6 | |
| 2NCR 060 002 090 | 6 X R0.2 | 13 | 90 | 6 | |
| 2NCR 060 003 060 | 6 X R0.3 | 11 | 60 | 6 | |
| 2NCR 060 003 090 | 6 X R0.3 | 13 | 90 | 6 | |
| 2NCR 060 004 060 | 6 X R0.4 | 11 | 60 | 6 | |
| 2NCR 060 004 090 | 6 X R0.4 | 13 | 90 | 6 | |
| 2NCR 060 005 060 | 6 X R0.5 | 11 | 60 | 6 | |
| 2NCR 060 005 090 | 6 X R0.5 | 13 | 90 | 6 | |
| 2NCR 060 010 060 | 6 X R1 | 11 | 60 | 6 | |
| 2NCR 060 010 090 | 6 X R1 | 13 | 90 | 6 | |
| 2NCR 060 015 060 | 6 X R1.5 | 11 | 60 | 6 | |
| 2NCR 060 015 090 | 6 X R1.5 | 13 | 90 | 6 | |
| 2NCR 060 020 060 | 6 X R2 | 11 | 60 | 6 | |
| 2NCR 060 020 090 | 6 X R2 | 13 | 90 | 6 | |
| 2NCR 060 025 090 | 6 X R2.5 | 13 | 90 | 6 | |
| 2NCR 080 001 070 | 8 X R0.1 | 16 | 70 | 8 | |
| 2NCR 080 001 100 | 8 X R0.1 | 19 | 100 | 8 | |
| 2NCR 080 002 070 | 8 X R0.2 | 16 | 70 | 8 | |
| 2NCR 080 002 100 | 8 X R0.2 | 19 | 100 | 8 | |
| 2NCR 080 003 070 | 8 X R0.3 | 16 | 70 | 8 | |
| 2NCR 080 003 100 | 8 X R0.3 | 19 | 100 | 8 | |
| 2NCR 080 005 070 | 8 X R0.5 | 16 | 70 | 8 | |
| 2NCR 080 005 100 | 8 X R0.5 | 19 | 100 | 8 | |
| 2NCR 080 005 120 | 8 X R0.5 | 19 | 120 | 8 | |
| 2NCR 080 010 070 | 8 X R1 | 16 | 70 | 8 | |
| 2NCR 080 010 100 | 8 X R1 | 19 | 100 | 8 | |
| 2NCR 080 010 120 | 8 X R1 | 19 | 120 | 8 | |
| 2NCR 080 015 070 | 8 X R1.5 | 16 | 70 | 8 | |
| 2NCR 080 015 100 | 8 X R1.5 | 19 | 100 | 8 | |
| 2NCR 080 020 070 | 8 X R2 | 16 | 70 | 8 | |
| 2NCR 080 020 100 | 8 X R2 | 19 | 100 | 8 | |
| 2NCR 080 025 100 | 8 X R2.5 | 19 | 100 | 8 | |
| 2NCR 080 030 100 | 8 X R3 | 19 | 100 | 8 | |
| 2NCR 080 035 100 | 8 X R3.5 | 19 | 100 | 8 | |
| 2NCR 100 001 075 | 10 X R0.1 | 19 | 75 | 10 | |
| 2NCR 100 001 100 | 10 X R0.1 | 22 | 100 | 10 | |
| 2NCR 100 002 075 | 10 X R0.2 | 19 | 75 | 10 | |
| 2NCR 100 002 100 | 10 X R0.2 | 22 | 100 | 10 | |
| 2NCR 100 003 075 | 10 X R0.3 | 19 | 75 | 10 | |
| 2NCR 100 003 100 | 10 X R0.3 | 22 | 100 | 10 | |
| 2NCR 100 005 075 | 10 X R0.5 | 19 | 75 | 10 | |
| 2NCR 100 005 100 | 10 X R0.5 | 22 | 100 | 10 | |
| 2NCR 100 005 130 | 10 X R0.5 | 22 | 130 | 10 | |
| 2NCR 100 010 075 | 10 X R1 | 19 | 75 | 10 | |
| 2NCR 100 010 100 | 10 X R1 | 22 | 100 | 10 | |
| 2NCR 100 010 130 | 10 X R1 | 22 | 130 | 10 | |
| 2NCR 100 015 075 | 10 X R1.5 | 19 | 75 | 10 | |
| 2NCR 100 015 100 | 10 X R1.5 | 22 | 100 | 10 | |
| 2NCR 100 015 130 | 10 X R1.5 | 22 | 130 | 10 | |
| 2NCR 100 020 075 | 10 X R2 | 19 | 75 | 10 | |
| 2NCR 100 020 100 | 10 X R2 | 22 | 100 | 10 | |
| 2NCR 100 025 100 | 10 X R2.5 | 22 | 100 | 10 | |
| 2NCR 100 030 100 | 10 X R3 | 22 | 100 | 10 | |
| 2NCR 100 040 100 | 10 X R4 | 22 | 100 | 10 | |
| 2NCR 120 001 080 | 12 X R0.1 | 22 | 80 | 12 | |
| 2NCR 120 001 110 | 12 X R0.1 | 26 | 110 | 12 | |
| 2NCR 120 002 080 | 12 X R0.2 | 22 | 80 | 12 | |
| 2NCR 120 002 110 | 12 X R0.2 | 26 | 110 | 12 | |
| 2NCR 120 003 080 | 12 X R0.3 | 22 | 80 | 12 | |
| 2NCR 120 003 110 | 12 X R0.3 | 26 | 110 | 12 | |
| 2NCR 120 005 080 | 12 X R0.5 | 22 | 80 | 12 | |
| 2NCR 120 005 110 | 12 X R0.5 | 26 | 110 | 12 | |
| 2NCR 120 005 130 | 12 X R0.5 | 26 | 130 | 12 | |
| 2NCR 120 010 080 | 12 X R1 | 22 | 80 | 12 | |
| 2NCR 120 010 110 | 12 X R1 | 26 | 110 | 12 | |
| 2NCR 120 010 130 | 12 X R1 | 26 | 130 | 12 | |
| 2NCR 120 015 080 | 12 X R1.5 | 22 | 80 | 12 | |
| 2NCR 120 015 110 | 12 X R1.5 | 26 | 110 | 12 | |
| 2NCR 120 015 130 | 12 X R1.5 | 26 | 130 | 12 | |
| 2NCR 120 020 080 | 12 X R2 | 22 | 80 | 12 | |
| 2NCR 120 020 110 | 12 X R2 | 26 | 110 | 12 | |
| 2NCR 120 020 130 | 12 X R2 | 26 | 130 | 12 | |
| 2NCR 120 025 110 | 12 X R2.5 | 26 | 110 | 12 | |
| 2NCR 120 030 110 | 12 X R3 | 26 | 110 | 12 | |
| 2NCR 120 040 110 | 12 X R4 | 26 | 110 | 12 | |
| 2NCR 120 050 110 | 12 X R5 | 26 | 110 | 12 | |
| 2NCR 140 005 110 | 14 X R0.5 | 30 | 110 | 14 | |
| 2NCR 140 010 110 | 14 X R1 | 30 | 110 | 14 | |
| 2NCR 140 020 110 | 14 X R2 | 30 | 110 | 14 | |
| 2NCR 160 005 160 | 16 X R0.5 | 32 | 160 | 16 | |
| 2NCR 160 010 160 | 16 X R1 | 32 | 160 | 16 | |

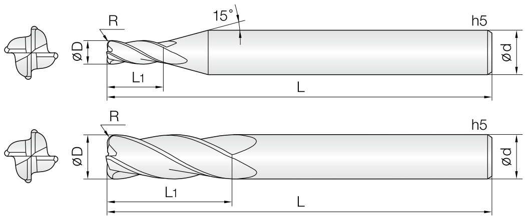
# 4NCR

## 4 Flutes Corner Radius End Mills

## 4날 코너 레디우스 엔드밀








- **고경도강(HRc50~62), 프리하든강 계열의 고속 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 코너R 형상을 날부치핑이 적도록 설계하였습니다.
- 다양한 코너R과 유효장으로 맞춤 가공이 가능합니다.
- 초미립자 초경합금(0.2㎛)을 채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc50~62)**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- Various corner R and flute length for wide range application.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

4 | UWC 초미립자 | TiSiN Coating | R ± 0.005 (R0.02 ~ 0.5) | R ± 0.01 (R1 ~ 1.5) | R ± 0.015 (R2 ~ 4) | 30° Helix Angle | CUTTING DATA 444P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.5 ~ 20 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |
| | Ø14 ~ 20 | -0.01 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4NCR 005 0005 S04 | 0.5 X R0.05 | 1 | 45 | 4 | |
| 4NCR 005 001 S04 | 0.5 X R0.1 | 1 | 45 | 4 | |
| 4NCR 006 001 S04 | 0.6 X R0.1 | 1.2 | 45 | 4 | |
| 4NCR 006 002 S04 | 0.6 X R0.2 | 1.2 | 45 | 4 | |
| 4NCR 008 001 S04 | 0.8 X R0.1 | 1.6 | 45 | 4 | |
| 4NCR 008 002 S04 | 0.8 X R0.2 | 1.6 | 45 | 4 | |
| 4NCR 010 0002 S04 | 1 X R0.02 | 2.5 | 45 | 4 | |
| 4NCR 010 0005 S04 | 1 X R0.05 | 2.5 | 45 | 4 | |
| 4NCR 010 001 S04 | 1 X R0.1 | 2.5 | 45 | 4 | |
| 4NCR 010 002 S04 | 1 X R0.2 | 2.5 | 45 | 4 | |
| 4NCR 010 003 S04 | 1 X R0.3 | 2.5 | 45 | 4 | |
| 4NCR 012 0002 S04 | 1.2 X R0.02 | 4 | 45 | 4 | |
| 4NCR 012 0005 S04 | 1.2 X R0.05 | 4 | 45 | 4 | |
| 4NCR 012 001 S04 | 1.2 X R0.1 | 4 | 45 | 4 | |
| 4NCR 012 002 S04 | 1.2 X R0.2 | 4 | 45 | 4 | |
| 4NCR 012 003 S04 | 1.2 X R0.3 | 4 | 45 | 4 | |
| 4NCR 015 0002 S04 | 1.5 X R0.02 | 4 | 45 | 4 | |
| 4NCR 015 0005 S04 | 1.5 X R0.05 | 4 | 45 | 4 | |
| 4NCR 015 001 S04 | 1.5 X R0.1 | 4 | 45 | 4 | |
| 4NCR 015 002 S04 | 1.5 X R0.2 | 4 | 45 | 4 | |
| 4NCR 015 003 S04 | 1.5 X R0.3 | 4 | 45 | 4 | |
| 4NCR 015 004 S04 | 1.5 X R0.4 | 4 | 45 | 4 | |
| 4NCR 015 005 S04 | 1.5 X R0.5 | 4 | 45 | 4 | |
| 4NCR 020 0002 S04 | 2 X R0.02 | 6 | 45 | 4 | |
| 4NCR 020 0005 S04 | 2 X R0.05 | 6 | 45 | 4 | |
| 4NCR 020 001 S04 | 2 X R0.1 | 6 | 45 | 4 | |
| 4NCR 020 002 S04 | 2 X R0.2 | 6 | 45 | 4 | |
| 4NCR 020 003 S04 | 2 X R0.3 | 6 | 45 | 4 | |
| 4NCR 020 004 S04 | 2 X R0.4 | 6 | 45 | 4 | |
| 4NCR 020 005 S04 | 2 X R0.5 | 6 | 45 | 4 | |
| 4NCR 025 0005 S04 | 2.5 X R0.05 | 6 | 50 | 4 | |
| 4NCR 025 001 S04 | 2.5 X R0.1 | 6 | 50 | 4 | |
| 4NCR 025 002 S04 | 2.5 X R0.2 | 6 | 50 | 4 | |
| 4NCR 025 003 S04 | 2.5 X R0.3 | 6 | 50 | 4 | |
| 4NCR 025 005 S04 | 2.5 X R0.5 | 6 | 50 | 4 | |
| 4NCR 030 0005 S06 | 3 X R0.05 | 8 | 60 | 6 | |
| 4NCR 030 001 S06 | 3 X R0.1 | 8 | 60 | 6 | |
| 4NCR 030 002 S06 | 3 X R0.2 | 8 | 60 | 6 | |
| 4NCR 030 003 S06 | 3 X R0.3 | 8 | 60 | 6 | |
| 4NCR 030 004 S06 | 3 X R0.4 | 8 | 60 | 6 | |
| 4NCR 030 005 S06 | 3 X R0.5 | 8 | 60 | 6 | |
| 4NCR 030 010 S06 | 3 X R1 | 8 | 60 | 6 | |
| 4NCR 040 0005 060 | 4 X R0.05 | 9 | 60 | 4 | |
| 4NCR 040 0005 080 | 4 X R0.05 | 9 | 80 | 4 | |
| 4NCR 040 0005 S06 | 4 X R0.05 | 10 | 70 | 6 | |
| 4NCR 040 001 060 | 4 X R0.1 | 9 | 60 | 4 | |
| 4NCR 040 001 080 | 4 X R0.1 | 9 | 80 | 4 | |
| 4NCR 040 001 S06 | 4 X R0.1 | 10 | 70 | 6 | |
| 4NCR 040 002 060 | 4 X R0.2 | 9 | 60 | 4 | |
| 4NCR 040 002 080 | 4 X R0.2 | 9 | 80 | 4 | |
| 4NCR 040 002 S06 | 4 X R0.2 | 10 | 70 | 6 | |
| 4NCR 040 003 060 | 4 X R0.3 | 9 | 60 | 4 | |
| 4NCR 040 003 080 | 4 X R0.3 | 9 | 80 | 4 | |
| 4NCR 040 003 S06 | 4 X R0.3 | 10 | 70 | 6 | |
| 4NCR 040 004 060 | 4 X R0.4 | 9 | 60 | 4 | |
| 4NCR 040 004 080 | 4 X R0.4 | 9 | 80 | 4 | |
| 4NCR 040 004 S06 | 4 X R0.4 | 10 | 70 | 6 | |
| 4NCR 040 005 060 | 4 X R0.5 | 9 | 60 | 4 | |
| 4NCR 040 005 080 | 4 X R0.5 | 9 | 80 | 4 | |
| 4NCR 040 005 S06 | 4 X R0.5 | 10 | 70 | 6 | |
| 4NCR 040 010 060 | 4 X R1 | 9 | 60 | 4 | |
| 4NCR 040 010 080 | 4 X R1 | 9 | 80 | 4 | |
| 4NCR 040 010 S06 | 4 X R1 | 10 | 70 | 6 | |
| 4NCR 050 0005 S06 | 5 X R0.05 | 13 | 75 | 6 | |
| 4NCR 050 001 S06 | 5 X R0.1 | 13 | 75 | 6 | |
| 4NCR 050 002 S06 | 5 X R0.2 | 13 | 75 | 6 | |
| 4NCR 050 003 S06 | 5 X R0.3 | 13 | 75 | 6 | |
| 4NCR 050 004 S06 | 5 X R0.4 | 13 | 75 | 6 | |
| 4NCR 050 005 S06 | 5 X R0.5 | 13 | 75 | 6 | |
| 4NCR 050 010 S06 | 5 X R1 | 13 | 75 | 6 | |
| 4NCR 055 002 S06 | 5.5 X R0.2 | 13 | 75 | 6 | |
| 4NCR 055 003 S06 | 5.5 X R0.3 | 13 | 75 | 6 | |
| 4NCR 055 005 S06 | 5.5 X R0.5 | 13 | 75 | 6 | |
| 4NCR 055 010 S06 | 5.5 X R1 | 13 | 75 | 6 | |
| 4NCR 060 0005 080 | 6 X R0.05 | 13 | 80 | 6 | |
| 4NCR 060 001 060 | 6 X R0.1 | 11 | 60 | 6 | |
| 4NCR 060 001 080 | 6 X R0.1 | 13 | 80 | 6 | |
| 4NCR 060 002 060 | 6 X R0.2 | 11 | 60 | 6 | |
| 4NCR 060 002 080 | 6 X R0.2 | 13 | 80 | 6 | |
| 4NCR 060 003 060 | 6 X R0.3 | 11 | 60 | 6 | |
| 4NCR 060 003 080 | 6 X R0.3 | 13 | 80 | 6 | |
| 4NCR 060 004 080 | 6 X R0.4 | 13 | 80 | 6 | |
| 4NCR 060 005 060 | 6 X R0.5 | 11 | 60 | 6 | |
| 4NCR 060 005 080 | 6 X R0.5 | 13 | 80 | 6 | |
| 4NCR 060 010 060 | 6 X R1 | 11 | 60 | 6 | |
| 4NCR 060 010 080 | 6 X R1 | 13 | 80 | 6 | |
| 4NCR 060 015 060 | 6 X R1.5 | 11 | 60 | 6 | |
| 4NCR 060 015 080 | 6 X R1.5 | 13 | 80 | 6 | |
| 4NCR 060 020 060 | 6 X R2 | 11 | 60 | 6 | |
| 4NCR 060 020 080 | 6 X R2 | 13 | 80 | 6 | |
| 4NCR 080 001 070 | 8 X R0.1 | 16 | 70 | 8 | |
| 4NCR 080 001 090 | 8 X R0.1 | 19 | 90 | 8 | |
| 4NCR 080 002 070 | 8 X R0.2 | 16 | 70 | 8 | |
| 4NCR 080 002 090 | 8 X R0.2 | 19 | 90 | 8 | |
| 4NCR 080 003 070 | 8 X R0.3 | 16 | 70 | 8 | |
| 4NCR 080 003 090 | 8 X R0.3 | 19 | 90 | 8 | |
| 4NCR 080 005 070 | 8 X R0.5 | 16 | 70 | 8 | |
| 4NCR 080 005 090 | 8 X R0.5 | 19 | 90 | 8 | |
| 4NCR 080 005 110 | 8 X R0.5 | 19 | 110 | 8 | |
| 4NCR 080 010 070 | 8 X R1 | 16 | 70 | 8 | |

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4NCR 080 010 090 | 8 X R1 | 19 | 90 | 8 | |
| 4NCR 080 010 110 | 8 X R1 | 19 | 110 | 8 | |
| 4NCR 080 015 070 | 8 X R1.5 | 16 | 70 | 8 | |
| 4NCR 080 015 090 | 8 X R1.5 | 19 | 90 | 8 | |
| 4NCR 080 015 110 | 8 X R1.5 | 19 | 110 | 8 | |
| 4NCR 080 020 070 | 8 X R2 | 16 | 70 | 8 | |
| 4NCR 080 020 090 | 8 X R2 | 19 | 90 | 8 | |
| 4NCR 080 020 110 | 8 X R2 | 19 | 110 | 8 | |
| 4NCR 080 025 090 | 8 X R2.5 | 19 | 90 | 8 | |
| 4NCR 100 001 075 | 10 X R0.1 | 19 | 75 | 10 | |
| 4NCR 100 001 100 | 10 X R0.1 | 22 | 100 | 10 | |
| 4NCR 100 002 075 | 10 X R0.2 | 19 | 75 | 10 | |
| 4NCR 100 002 100 | 10 X R0.2 | 22 | 100 | 10 | |
| 4NCR 100 002 120 | 10 X R0.2 | 22 | 120 | 10 | |
| 4NCR 100 003 075 | 10 X R0.3 | 19 | 75 | 10 | |
| 4NCR 100 003 100 | 10 X R0.3 | 22 | 100 | 10 | |
| 4NCR 100 005 075 | 10 X R0.5 | 19 | 75 | 10 | |
| 4NCR 100 005 100 | 10 X R0.5 | 22 | 100 | 10 | |
| 4NCR 100 005 120 | 10 X R0.5 | 22 | 120 | 10 | |
| 4NCR 100 010 075 | 10 X R1 | 19 | 75 | 10 | |
| 4NCR 100 010 100 | 10 X R1 | 22 | 100 | 10 | |
| 4NCR 100 010 120 | 10 X R1 | 22 | 120 | 10 | |
| 4NCR 100 015 075 | 10 X R1.5 | 19 | 75 | 10 | |
| 4NCR 100 015 100 | 10 X R1.5 | 22 | 100 | 10 | |
| 4NCR 100 015 120 | 10 X R1.5 | 22 | 120 | 10 | |
| 4NCR 100 020 075 | 10 X R2 | 19 | 75 | 10 | |
| 4NCR 100 020 100 | 10 X R2 | 22 | 100 | 10 | |
| 4NCR 100 020 120 | 10 X R2 | 22 | 120 | 10 | |
| 4NCR 100 025 075 | 10 X R2.5 | 19 | 75 | 10 | |
| 4NCR 100 025 100 | 10 X R2.5 | 22 | 100 | 10 | |
| 4NCR 100 025 120 | 10 X R2.5 | 22 | 120 | 10 | |
| 4NCR 100 030 100 | 10 X R3 | 22 | 100 | 10 | |
| 4NCR 120 002 080 | 12 X R0.2 | 22 | 80 | 12 | |
| 4NCR 120 002 110 | 12 X R0.2 | 26 | 110 | 12 | |
| 4NCR 120 002 130 | 12 X R0.2 | 26 | 130 | 12 | |
| 4NCR 120 003 080 | 12 X R0.3 | 22 | 80 | 12 | |
| 4NCR 120 003 110 | 12 X R0.3 | 26 | 110 | 12 | |
| 4NCR 120 005 080 | 12 X R0.5 | 22 | 80 | 12 | |
| 4NCR 120 005 110 | 12 X R0.5 | 26 | 110 | 12 | |
| 4NCR 120 005 130 | 12 X R0.5 | 26 | 130 | 12 | |
| 4NCR 120 010 080 | 12 X R1 | 22 | 80 | 12 | |
| 4NCR 120 010 110 | 12 X R1 | 26 | 110 | 12 | |
| 4NCR 120 010 130 | 12 X R1 | 26 | 130 | 12 | |
| 4NCR 120 015 080 | 12 X R1.5 | 22 | 80 | 12 | |
| 4NCR 120 015 110 | 12 X R1.5 | 26 | 110 | 12 | |
| 4NCR 120 015 130 | 12 X R1.5 | 26 | 130 | 12 | |
| 4NCR 120 020 080 | 12 X R2 | 22 | 80 | 12 | |
| 4NCR 120 020 110 | 12 X R2 | 26 | 110 | 12 | |
| 4NCR 120 020 130 | 12 X R2 | 26 | 130 | 12 | |
| 4NCR 120 025 080 | 12 X R2.5 | 22 | 80 | 12 | |

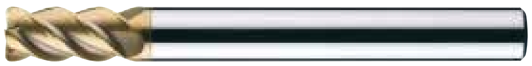
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4NCR 120 025 110 | 12 X R2.5 | 26 | 110 | 12 | |
| 4NCR 120 025 130 | 12 X R2.5 | 26 | 130 | 12 | |
| 4NCR 120 030 080 | 12 X R3 | 22 | 80 | 12 | |
| 4NCR 120 030 110 | 12 X R3 | 26 | 110 | 12 | |
| 4NCR 120 030 130 | 12 X R3 | 26 | 130 | 12 | |
| 4NCR 120 035 110 | 12 X R3.5 | 26 | 110 | 12 | |
| 4NCR 120 040 110 | 12 X R4 | 26 | 110 | 12 | |
| 4NCR 140 005 110 | 14 X R0.5 | 30 | 110 | 14 | |
| 4NCR 140 010 110 | 14 X R1 | 30 | 110 | 14 | |
| 4NCR 140 020 110 | 14 X R2 | 30 | 110 | 14 | |
| 4NCR 160 005 110 | 16 X R0.5 | 32 | 110 | 16 | |
| 4NCR 160 005 160 | 16 X R0.5 | 32 | 160 | 16 | |
| 4NCR 160 010 110 | 16 X R1 | 32 | 110 | 16 | |
| 4NCR 160 010 160 | 16 X R1 | 32 | 160 | 16 | |
| 4NCR 160 015 110 | 16 X R1.5 | 32 | 110 | 16 | |
| 4NCR 160 020 110 | 16 X R2 | 32 | 110 | 16 | |
| 4NCR 160 030 110 | 16 X R3 | 32 | 110 | 16 | |
| 4NCR 200 005 160 | 20 X R0.5 | 38 | 160 | 20 | |
| 4NCR 200 010 160 | 20 X R1 | 38 | 160 | 20 | |
| 4NCR 200 015 160 | 20 X R1.5 | 38 | 160 | 20 | |
| 4NCR 200 020 160 | 20 X R2 | 38 | 160 | 20 | |

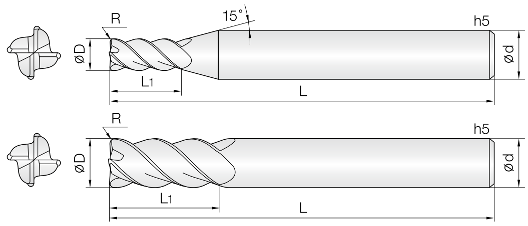
# 4CRL

## 4 Flutes 45˚ Helix Corner Radius Long End Mills

## 4날 45˚헬릭스 코너 레디우스 롱 엔드밀








- **고경도강(HRc50~62), 프리하든강 계열의 고정밀 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 코너R 형상을 날부치핑이 적도록 설계하였습니다.
- 45˚ 헬릭스 형상으로 설계하여 고속,고이송 가공에 적합합니다.
- 초미립자 초경합금(0.2㎛)을 채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc50~62)**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- 45˚ degree helix design for high speed, feed condition.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

4 | UWC 초미립자 | TISIN Coating | R ± 0.005 R0.05 ~ 0.5 | R ± 0.01 R1 ~ 1.5 | R ± 0.015 R2 ~ 5 | 45° Helix Angle | CUTTING DATA 445P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 20 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |
| | Ø16 ~ 20 | -0.01 ~ -0.02mm |

단위 : mm

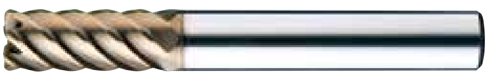
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4CRL 010 0005 S06 | 1 X R0.05 | 2 | 50 | 6 | |
| 4CRL 010 001 S06 | 1 X R0.1 | 2 | 50 | 6 | |
| 4CRL 010 002 S06 | 1 X R0.2 | 2 | 50 | 6 | |
| 4CRL 010 003 S06 | 1 X R0.3 | 2 | 50 | 6 | |
| 4CRL 012 0005 S06 | 1.2 X R0.05 | 2.5 | 50 | 6 | |
| 4CRL 012 001 S06 | 1.2 X R0.1 | 2.5 | 50 | 6 | |
| 4CRL 012 002 S06 | 1.2 X R0.2 | 2.5 | 50 | 6 | |
| 4CRL 012 003 S06 | 1.2 X R0.3 | 2.5 | 50 | 6 | |
| 4CRL 015 0005 S06 | 1.5 X R0.05 | 3 | 50 | 6 | |
| 4CRL 015 001 S06 | 1.5 X R0.1 | 3 | 50 | 6 | |
| 4CRL 015 002 S06 | 1.5 X R0.2 | 3 | 50 | 6 | |
| 4CRL 015 003 S06 | 1.5 X R0.3 | 3 | 50 | 6 | |
| 4CRL 015 005 S06 | 1.5X R0.5 | 3 | 50 | 6 | |
| 4CRL 020 001 S06 | 2 X R0.1 | 5 | 50 | 6 | |
| 4CRL 020 002 S06 | 2 X R0.2 | 5 | 50 | 6 | |
| 4CRL 020 003 S06 | 2 X R0.3 | 5 | 50 | 6 | |
| 4CRL 020 005 S06 | 2 X R0.5 | 5 | 50 | 6 | |
| 4CRL 025 001 S06 | 2.5 X R0.1 | 6 | 60 | 6 | |
| 4CRL 025 002 S06 | 2.5 X R0.2 | 6 | 60 | 6 | |
| 4CRL 025 003 S06 | 2.5 X R0.3 | 6 | 60 | 6 | |
| 4CRL 025 005 S06 | 2.5 X R0.5 | 6 | 60 | 6 | |
| 4CRL 030 001 S06 | 3 X R0.1 | 6 | 70 | 6 | |
| 4CRL 030 002 S06 | 3 X R0.2 | 6 | 70 | 6 | |
| 4CRL 030 003 S06 | 3 X R0.3 | 6 | 70 | 6 | |
| 4CRL 030 005 S06 | 3 X R0.5 | 6 | 70 | 6 | |
| 4CRL 030 010 S06 | 3 X R1 | 6 | 70 | 6 | |
| 4CRL 040 001 S06 | 4 X R0.1 | 8 | 70 | 6 | |
| 4CRL 040 002 S06 | 4 X R0.2 | 8 | 70 | 6 | |
| 4CRL 040 003 S06 | 4X R0.3 | 8 | 70 | 6 | |
| 4CRL 040 005 S06 | 4 X R0.5 | 8 | 70 | 6 | |
| 4CRL 040 010 S06 | 4 X R1 | 8 | 70 | 6 | |
| 4CRL 050 001 S06 | 5 X R0.1 | 10 | 80 | 6 | |
| 4CRL 050 002 S06 | 5 X R0.2 | 10 | 80 | 6 | |
| 4CRL 050 003 S06 | 5 X R0.3 | 10 | 80 | 6 | |
| 4CRL 050 005 S06 | 5 X R0.5 | 10 | 80 | 6 | |
| 4CRL 050 010 S06 | 5 X R1 | 10 | 80 | 6 | |
| 4CRL 060 001 S06 | 6 X R0.1 | 12 | 90 | 6 | |
| 4CRL 060 002 S06 | 6 X R0.2 | 12 | 90 | 6 | |
| 4CRL 060 003 S06 | 6 X R0.3 | 12 | 90 | 6 | |
| 4CRL 060 005 S06 | 6 X R0.5 | 12 | 90 | 6 | |
| 4CRL 060 010 S06 | 6 X R1 | 12 | 90 | 6 | |
| 4CRL 060 015 S06 | 6 X R1.5 | 12 | 90 | 6 | |
| 4CRL 060 020 S06 | 6 X R2 | 12 | 90 | 6 | |
| 4CRL 080 002 S08 | 8 X R0.2 | 16 | 90 | 8 | |
| 4CRL 080 003 S08 | 8 X R0.3 | 16 | 90 | 8 | |
| 4CRL 080 005 S08 | 8 X R0.5 | 16 | 90 | 8 | |
| 4CRL 080 010 S08 | 8 X R1 | 16 | 90 | 8 | |
| 4CRL 080 015 S08 | 8 X R1.5 | 16 | 90 | 8 | |
| 4CRL 080 020 S08 | 8 X R2 | 16 | 90 | 8 | |
| 4CRL 100 002 S10 | 10 X R0.2 | 20 | 100 | 10 | |

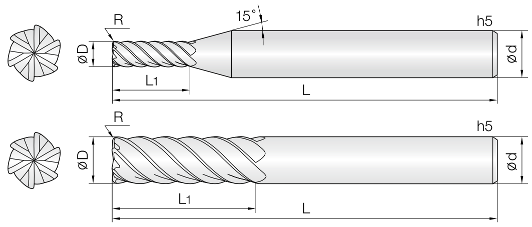
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4CRL 100 003 S10 | 10 X R0.3 | 20 | 100 | 10 | |
| 4CRL 100 005 S10 | 10 X R0.5 | 20 | 100 | 10 | |
| 4CRL 100 010 S10 | 10 X R1 | 20 | 100 | 10 | |
| 4CRL 100 015 S10 | 10 X R1.5 | 20 | 100 | 10 | |
| 4CRL 100 020 S10 | 10 X R2 | 20 | 100 | 10 | |
| 4CRL 120 003 S12 | 12 X R0.3 | 24 | 110 | 12 | |
| 4CRL 120 005 S12 | 12 X R0.5 | 24 | 110 | 12 | |
| 4CRL 120 010 S12 | 12 X R1 | 24 | 110 | 12 | |
| 4CRL 120 015 S12 | 12 X R1.5 | 24 | 110 | 12 | |
| 4CRL 120 020 S12 | 12 X R2 | 24 | 110 | 12 | |
| 4CRL 120 030 S12 | 12 X R3 | 24 | 110 | 12 | |
| 4CRL 160 005 S16 | 16 X R0.5 | 32 | 120 | 16 | |
| 4CRL 160 010 S16 | 16 X R1 | 32 | 120 | 16 | |
| 4CRL 160 020 S16 | 16 X R2 | 32 | 120 | 16 | |
| 4CRL 160 030 S16 | 16 X R3 | 32 | 120 | 16 | |
| 4CRL 200 005 S20 | 20 X R0.5 | 38 | 130 | 20 | |
| 4CRL 200 010 S20 | 20 X R1 | 38 | 130 | 20 | |
| 4CRL 200 020 S20 | 20 X R2 | 38 | 130 | 20 | |
| 4CRL 200 030 S20 | 20 X R3 | 38 | 130 | 20 | |
| 4CRL 200 040 S20 | 20 X R4 | 38 | 130 | 20 | |
| 4CRL 200 050 S20 | 20 X R5 | 38 | 130 | 20 | |

# 6CRL

## 6 Flutes 45° Helix Corner Radius Long End Mills

## 6날 45°헬릭스 코너 레디우스 롱 엔드밀






- **고경도강(HRc50~62), 프리하든강 계열의 고정밀 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 45° 헬릭스 형상으로 설계하여 고속,고이송 가공에 적합합니다.
- 측벽가공, 코너부, 무구배면 가공시 가공물의 표면조도가 뛰어나며, 인선날 길이 증가로 내마모성이 더욱 좋아집니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- **Endmills for pre-hardened and hardened steels(HRc50~62)**
- Good wear resistance by Si-based PVD coating.
- 45°degree helix design for high speed, feed condition.
- Improved wear resistance with longer edge and excellent work surface finish in various machining applications.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

HARD series

6 | UWC 초미립자 | TISIN Coating | R ±0.005 R0.1 ~ 0.5 | R ±0.01 R1 ~ 1.5 | R ±0.015 R2 | 45° Helix Angle | CUTTING DATA 445P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø3 ~ 16 | +0 ~ -0.01mm |

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

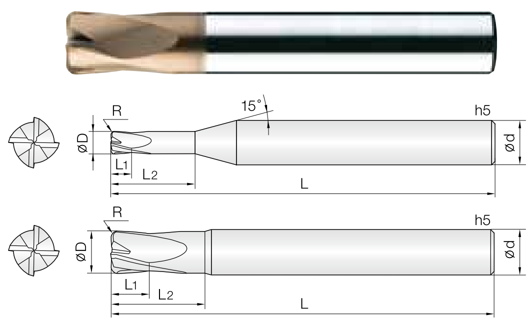
단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 6CRL 030 001 060 | 3 X R0.1 | 7.5 | 60 | 6 | |
| 6CRL 030 002 060 | 3 X R0.2 | 7.5 | 60 | 6 | |
| 6CRL 030 003 060 | 3 X R0.3 | 7.5 | 60 | 6 | |
| 6CRL 030 005 060 | 3 X R0.5 | 7.5 | 60 | 6 | |
| 6CRL 030 010 060 | 3 X R1 | 7.5 | 60 | 6 | |
| 6CRL 040 001 060 | 4 X R0.1 | 10 | 60 | 6 | |
| 6CRL 040 002 060 | 4 X R0.2 | 10 | 60 | 6 | |
| 6CRL 040 003 060 | 4 X R0.3 | 10 | 60 | 6 | |
| 6CRL 040 005 060 | 4 X R0.5 | 10 | 60 | 6 | |
| 6CRL 040 010 060 | 4 X R1 | 10 | 60 | 6 | |
| 6CRL 050 002 060 | 5 X R0.2 | 13 | 60 | 6 | |
| 6CRL 050 003 060 | 5 X R0.3 | 13 | 60 | 6 | |
| 6CRL 050 005 060 | 5 X R0.5 | 13 | 60 | 6 | |
| 6CRL 050 010 060 | 5 X R1 | 13 | 60 | 6 | |
| 6CRL 060 001 060 | 6 X R0.1 | 15 | 60 | 6 | |
| 6CRL 060 002 060 | 6 X R0.2 | 15 | 60 | 6 | |
| 6CRL 060 002 080 | 6 X R0.2 | 15 | 80 | 6 | |
| 6CRL 060 003 060 | 6 X R0.3 | 15 | 60 | 6 | |
| 6CRL 060 003 080 | 6 X R0.3 | 15 | 80 | 6 | |
| 6CRL 060 005 060 | 6 X R0.5 | 15 | 60 | 6 | |
| 6CRL 060 005 080 | 6 X R0.5 | 15 | 80 | 6 | |
| 6CRL 060 010 060 | 6 X R1 | 15 | 60 | 6 | |
| 6CRL 060 010 080 | 6 X R1 | 15 | 80 | 6 | |
| 6CRL 080 002 070 | 8 X R0.2 | 20 | 70 | 8 | |
| 6CRL 080 003 070 | 8 X R0.3 | 20 | 70 | 8 | |
| 6CRL 080 003 090 | 8 X R0.3 | 20 | 90 | 8 | |
| 6CRL 080 005 070 | 8 X R0.5 | 20 | 70 | 8 | |
| 6CRL 080 005 090 | 8 X R0.5 | 20 | 90 | 8 | |
| 6CRL 080 010 070 | 8 X R1 | 20 | 70 | 8 | |
| 6CRL 080 010 090 | 8 X R1 | 20 | 90 | 8 | |
| 6CRL 080 015 070 | 8 X R1.5 | 20 | 70 | 8 | |
| 6CRL 100 002 075 | 10 X R0.2 | 20 | 75 | 10 | |
| 6CRL 100 003 075 | 10 X R0.3 | 25 | 75 | 10 | |
| 6CRL 100 003 100 | 10 X R0.3 | 25 | 100 | 10 | |
| 6CRL 100 005 075 | 10 X R0.5 | 25 | 75 | 10 | |
| 6CRL 100 005 100 | 10 X R0.5 | 25 | 100 | 10 | |
| 6CRL 100 010 075 | 10 X R1 | 25 | 75 | 10 | |
| 6CRL 100 010 100 | 10 X R1 | 25 | 100 | 10 | |
| 6CRL 100 020 075 | 10 X R2 | 25 | 75 | 10 | |
| 6CRL 120 002 080 | 12 X R0.2 | 25 | 80 | 12 | |
| 6CRL 120 003 080 | 12 X R0.3 | 30 | 80 | 12 | |
| 6CRL 120 003 110 | 12 X R0.3 | 30 | 110 | 12 | |
| 6CRL 120 005 080 | 12 X R0.5 | 30 | 80 | 12 | |
| 6CRL 120 005 110 | 12 X R0.5 | 30 | 110 | 12 | |
| 6CRL 120 010 080 | 12 X R1 | 30 | 80 | 12 | |
| 6CRL 120 010 110 | 12 X R1 | 30 | 110 | 12 | |
| 6CRL 120 020 080 | 12 X R2 | 30 | 80 | 12 | |
| 6CRL 160 005 110 | 16 X R0.5 | 50 | 110 | 16 | |
| 6CRL 160 010 110 | 16 X R1 | 50 | 110 | 16 | |
| 6CRL 160 020 110 | 16 X R2 | 50 | 110 | 16 | |

# 4RCU 4 Flutes High Speed Corner Radius Cutters

## 4날 고이송 코너 레디우스 커터

HARD series




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

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

4 | WC 미립자 | TISIN Coating | R ± 0.005 (R0.2 ~ 0.5) | R ± 0.01 (R1 ~ 1.5) | R ± 0.015 (R2 ~ 3) | 15° Helix Angle | CUTTING DATA 446P

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

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

단위 : mm

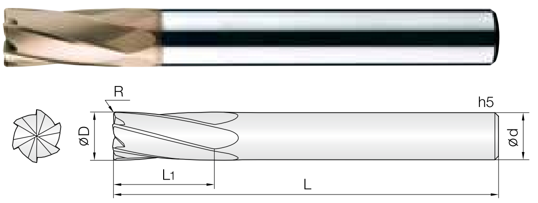
| | Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|
| | 4RCU 010 002 025 | 1 X R0.2 | 1 | 2.5 | 50 | 4 | |
| | 4RCU 015 005 040 | 1.5 X R0.5 | 1.5 | 4 | 50 | 4 | |
| | 4RCU 020 005 060 | 2 X R0.5 | 2 | 6 | 50 | 6 | |
| | 4RCU 030 005 080 | 3 X R0.5 | 3 | 8 | 50 | 6 | |
| | 4RCU 040 005 120 | 4 X R0.5 | 4 | 12 | 60 | 6 | |
| | 4RCU 040 005 160 | 4 X R0.5 | 4 | 16 | 60 | 6 | |
| | 4RCU 040 010 120 | 4 X R1 | 4 | 12 | 60 | 6 | |
| | 4RCU 040 010 160 | 4 X R1 | 4 | 16 | 60 | 6 | |
| | 4RCU 050 005 150 | 5 X R0.5 | 5 | 15 | 60 | 6 | |
| | 4RCU 050 010 150 | 5 X R1 | 5 | 15 | 60 | 6 | |
| | 4RCU 060 003 150 | 6 X R0.3 | 6 | 15 | 60 | 6 | |
| | 4RCU 060 005 150 | 6 X R0.5 | 6 | 15 | 60 | 6 | |
| | 4RCU 060 010 150 | 6 X R1 | 6 | 15 | 60 | 6 | |
| | 4RCU 060 015 150 | 6 X R1.5 | 6 | 15 | 60 | 6 | |
| New | 4RCU 060 020 150 | 6 X R2 | 6 | 15 | 60 | 6 | |
| New | 4RCU 060 025 150 | 6 X R2.5 | 6 | 15 | 60 | 6 | |
| | 4RCU 080 003 160 | 8 X R0.3 | 8 | 16 | 60 | 8 | |
| | 4RCU 080 005 160 | 8 X R0.5 | 8 | 16 | 60 | 8 | |
| | 4RCU 080 005 200 | 8 X R0.5 | 8 | 20 | 80 | 8 | |
| | 4RCU 080 005 300 | 8 X R0.5 | 8 | 30 | 110 | 8 | |
| | 4RCU 080 010 160 | 8 X R1 | 8 | 16 | 60 | 8 | |
| | 4RCU 080 010 200 | 8 X R1 | 8 | 20 | 80 | 8 | |
| | 4RCU 080 010 300 | 8 X R1 | 8 | 30 | 110 | 8 | |
| | 4RCU 080 020 160 | 8 X R2 | 8 | 16 | 60 | 8 | |
| | 4RCU 080 020 200 | 8 X R2 | 8 | 20 | 80 | 8 | |
| | 4RCU 080 020 300 | 8 X R2 | 8 | 30 | 110 | 8 | |
| New | 4RCU 080 030 160 | 8 X R3 | 8 | 16 | 60 | 8 | |
| New | 4RCU 080 030 200 | 8 X R3 | 8 | 20 | 80 | 8 | |
| New | 4RCU 080 030 300 | 8 X R3 | 8 | 30 | 110 | 8 | |
| | 4RCU 100 003 200 | 10 X R0.3 | 10 | 20 | 70 | 10 | |
| | 4RCU 100 005 200 | 10 X R0.5 | 10 | 20 | 70 | 10 | |
| | 4RCU 100 005 250 | 10 X R0.5 | 10 | 25 | 90 | 10 | |
| | 4RCU 100 005 300 | 10 X R0.5 | 10 | 30 | 120 | 10 | |
| | 4RCU 100 010 200 | 10 X R1 | 10 | 20 | 70 | 10 | |
| | 4RCU 100 010 250 | 10 X R1 | 10 | 25 | 90 | 10 | |
| | 4RCU 100 010 300 | 10 X R1 | 10 | 30 | 120 | 10 | |
| | 4RCU 100 020 200 | 10 X R2 | 10 | 20 | 70 | 10 | |
| | 4RCU 100 020 250 | 10 X R2 | 10 | 25 | 90 | 10 | |
| | 4RCU 100 020 300 | 10 X R2 | 10 | 30 | 120 | 10 | |
| New | 4RCU 100 030 200 | 10 X R3 | 10 | 20 | 70 | 10 | |
| New | 4RCU 100 030 250 | 10 X R3 | 10 | 25 | 90 | 10 | |
| New | 4RCU 100 030 300 | 10 X R3 | 10 | 30 | 120 | 10 | |
| | 4RCU 120 005 250 | 12 X R0.5 | 12 | 25 | 80 | 12 | |
| | 4RCU 120 005 300 | 12 X R0.5 | 12 | 30 | 100 | 12 | |
| | 4RCU 120 005 350 | 12 X R0.5 | 12 | 35 | 130 | 12 | |
| | 4RCU 120 010 250 | 12 X R1 | 12 | 25 | 80 | 12 | |
| | 4RCU 120 010 300 | 12 X R1 | 12 | 30 | 100 | 12 | |
| | 4RCU 120 010 350 | 12 X R1 | 12 | 35 | 130 | 12 | |
| | 4RCU 120 020 250 | 12 X R2 | 12 | 25 | 80 | 12 | |
| | 4RCU 120 020 300 | 12 X R2 | 12 | 30 | 100 | 12 | |

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

# 6RCU

## 6 Flutes High Speed Corner Radius Cutters

## 6날 고이송 코너 레디우스 커터




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

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

HARD series

6 | WC 미립자 | TISIN Coating | R ± 0.005 | R ± 0.01 | R ± 0.015 | 15° Helix Angle | CUTTING DATA

R0.5 R1 ~ 1.5 R2 446P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø6 ~ 20 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |
| | Ø16 ~ 20 | -0.01 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 6RCU 060 005 060 | 6 X R0.5 | 12 | 60 | 6 | |
| 6RCU 060 005 080 | 6 X R0.5 | 12 | 80 | 6 | |
| 6RCU 060 010 060 | 6 X R1 | 12 | 60 | 6 | |
| 6RCU 060 010 080 | 6 X R1 | 12 | 80 | 6 | |
| 6RCU 080 005 060 | 8 X R0.5 | 16 | 60 | 8 | |
| 6RCU 080 005 090 | 8 X R0.5 | 16 | 90 | 8 | |
| 6RCU 080 010 060 | 8 X R1 | 16 | 60 | 8 | |
| 6RCU 080 010 090 | 8 X R1 | 16 | 90 | 8 | |
| 6RCU 080 020 060 | 8 X R2 | 16 | 60 | 8 | |
| 6RCU 080 020 090 | 8 X R2 | 16 | 90 | 8 | |
| 6RCU 100 005 070 | 10 X R0.5 | 20 | 70 | 10 | |
| 6RCU 100 005 100 | 10 X R0.5 | 20 | 100 | 10 | |
| 6RCU 100 010 070 | 10 X R1 | 20 | 70 | 10 | |
| 6RCU 100 010 100 | 10 X R1 | 20 | 100 | 10 | |
| 6RCU 100 020 070 | 10 X R2 | 20 | 70 | 10 | |
| 6RCU 100 020 100 | 10 X R2 | 20 | 100 | 10 | |
| 6RCU 120 005 080 | 12 X R0.5 | 25 | 80 | 12 | |
| 6RCU 120 005 110 | 12 X R0.5 | 25 | 110 | 12 | |
| 6RCU 120 010 080 | 12 X R1 | 25 | 80 | 12 | |
| 6RCU 120 010 110 | 12 X R1 | 25 | 110 | 12 | |
| 6RCU 120 020 080 | 12 X R2 | 25 | 80 | 12 | |
| 6RCU 120 020 110 | 12 X R2 | 25 | 110 | 12 | |
| 6RCU 160 005 160 | 16 X R0.5 | 35 | 160 | 16 | |
| 6RCU 160 005 200 | 16 X R0.5 | 35 | 200 | 16 | |
| 6RCU 160 010 160 | 16 X R1 | 35 | 160 | 16 | |
| 6RCU 160 010 200 | 16 X R1 | 35 | 200 | 16 | |
| 6RCU 160 015 160 | 16 X R1.5 | 35 | 160 | 16 | |
| 6RCU 160 015 200 | 16 X R1.5 | 35 | 200 | 16 | |
| 6RCU 160 020 160 | 16 X R2 | 35 | 160 | 16 | |
| 6RCU 160 020 200 | 16 X R2 | 35 | 200 | 16 | |
| 6RCU 200 005 150 | 20 X R0.5 | 40 | 150 | 20 | |
| 6RCU 200 005 200 | 20 X R0.5 | 40 | 200 | 20 | |
| 6RCU 200 010 150 | 20 X R1 | 40 | 150 | 20 | |
| 6RCU 200 010 200 | 20 X R1 | 40 | 200 | 20 | |
| 6RCU 200 015 150 | 20 X R1.5 | 40 | 150 | 20 | |
| 6RCU 200 015 200 | 20 X R1.5 | 40 | 200 | 20 | |
| 6RCU 200 020 150 | 20 X R2 | 40 | 150 | 20 | |
| 6RCU 200 020 200 | 20 X R2 | 40 | 200 | 20 | |

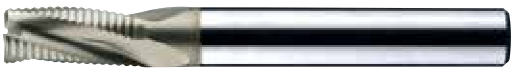
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

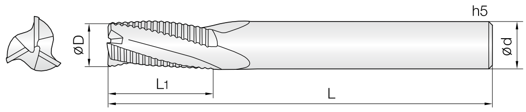
# 3&4ROU

## 3&4 Flutes Roughing End Mills

## 3&4날 라핑 엔드밀








- **공구강, 합금강 및 고경도 일반강 황삭가공 엔드밀**
- JCRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 뛰어난 칩배출력으로 가공시간을 단축하였습니다.
- 항절력이 높은 미립자 초경합금을 채택하여, 고이송 작업시 엔드밀의 파손을 최소화하였습니다.

- **Roughing Endmills for tool steels, alloy steels**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Reduce machining time by excellent chip control.
- Minimize fracturing at high feed by high TRS fine WC grade.


| D Size | D Tolerance |
|---|---|
| ø4 ~ 9 | -0.02 ~ -0.04mm |
| ø10 ~ 20 | -0.02 ~ -0.05mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 3ROU 040 100 S06 | 4 | 10 | 50 | 6 | |
| 3ROU 050 130 S06 | 5 | 13 | 50 | 6 | |
| 3ROU 060 100 050 | 6 | 10 | 50 | 6 | |
| 3ROU 060 150 055 | 6 | 15 | 55 | 6 | |
| 3ROU 060 200 060 | 6 | 20 | 60 | 6 | |
| 3ROU 070 180 S08 | 7 | 18 | 65 | 8 | |
| 3ROU 080 120 060 | 8 | 12 | 60 | 8 | |
| 3ROU 080 190 065 | 8 | 19 | 65 | 8 | |
| 3ROU 080 250 070 | 8 | 25 | 70 | 8 | |
| 4ROU 090 220 S10 | 9 | 22 | 70 | 10 | |
| 4ROU 100 150 070 | 10 | 15 | 70 | 10 | |
| 4ROU 100 220 070 | 10 | 22 | 70 | 10 | |
| 4ROU 100 300 080 | 10 | 30 | 80 | 10 | |
| 4ROU 110 270 S12 | 11 | 27 | 80 | 12 | |
| 4ROU 120 200 075 | 12 | 20 | 75 | 12 | |
| 4ROU 120 260 080 | 12 | 26 | 80 | 12 | |
| 4ROU 120 350 090 | 12 | 35 | 90 | 12 | |
| 4ROU 160 320 090 | 16 | 32 | 90 | 16 | |
| 4ROU 160 400 100 | 16 | 40 | 100 | 16 | |
| 4ROU 200 380 110 | 20 | 38 | 110 | 20 | |
| 4ROU 200 500 110 | 20 | 50 | 110 | 20 | |

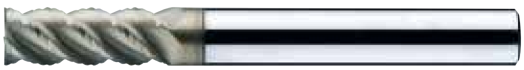
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

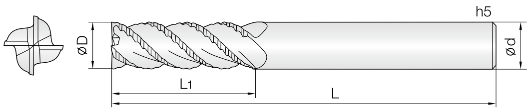
# 3&4HROU

3&4 Flutes 45˚ Helix Fine Pitch Roughing End Mills

## 3&4날 45˚헬릭스 파인피치형 라핑 엔드밀








- **합금강, SUS계열, 인코넬, 일반구조강 등 다양한 난삭재의 황삭가공**
- JCRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 45˚ 헬릭스 적용으로 절삭 저항이 감소되어 장시간 가공에 적합합니다.
- 파인피치 형상 채택으로 고속, 황삭가공 작업에 적합합니다.

- **Roughing Endmills for hard to cut materials, alloy steels, SUS, Inconel and structural steels.**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Long tool life with low cutting force by 45˚ degree helix design.
- Fine pitch shape design for high speed roughing application.

3 | 4 | WC 미립자 | JCRO Coating | 45° Helix Angle | Shield Edge | CUTTING DATA 448P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø4 ~ 6 | +0 ~ -0.01mm |
| | Ø7 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø16 ~ 20 | -0.015 ~ -0.03mm |

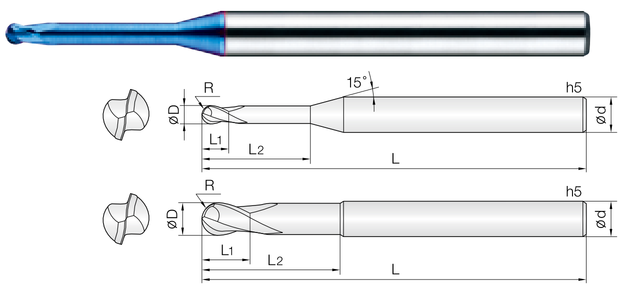
단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 3HROU 040 100 S06 | 4 | 10 | 50 | 6 | |
| 3HROU 050 130 S06 | 5 | 13 | 50 | 6 | |
| 3HROU 060 100 050 | 6 | 10 | 50 | 6 | |
| 3HROU 060 160 055 | 6 | 16 | 55 | 6 | |
| 3HROU 060 200 060 | 6 | 20 | 60 | 6 | |
| 3HROU 070 180 S08 | 7 | 18 | 65 | 8 | |
| 3HROU 080 120 060 | 8 | 12 | 60 | 8 | |
| 3HROU 080 190 065 | 8 | 19 | 65 | 8 | |
| 3HROU 080 250 070 | 8 | 25 | 70 | 8 | |
| 3HROU 080 300 075 | 8 | 30 | 75 | 8 | |
| 4HROU 090 220 S10 | 9 | 22 | 70 | 10 | |
| 4HROU 100 150 070 | 10 | 15 | 70 | 10 | |
| 4HROU 100 220 070 | 10 | 22 | 70 | 10 | |
| 4HROU 100 300 080 | 10 | 30 | 80 | 10 | |
| 4HROU 100 400 090 | 10 | 40 | 90 | 10 | |
| 4HROU 110 270 S12 | 11 | 27 | 80 | 12 | |
| 4HROU 120 200 075 | 12 | 20 | 75 | 12 | |
| 4HROU 120 250 080 | 12 | 25 | 80 | 12 | |
| 4HROU 120 350 090 | 12 | 35 | 90 | 12 | |
| 4HROU 120 500 100 | 12 | 50 | 100 | 12 | |
| 4HROU 160 320 090 | 16 | 32 | 90 | 16 | |
| 4HROU 160 400 110 | 16 | 40 | 110 | 16 | |
| 4HROU 200 380 110 | 20 | 38 | 110 | 20 | |
| 4HROU 200 500 120 | 20 | 50 | 120 | 20 | |

# 2HRBE

## 2 Flutes Rib Ball End Mills for Heavy Cuts

## 2날 강력 절삭용 리브 볼 엔드밀




- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강등 다양한 피삭재 가공 엔드밀**
- 고함량 실리콘계 코팅(Si)처리하여 내마모성이 우수합니다.
- 넓은 영역의 피삭재 가공에 적합한 형상으로 설계 하였습니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52),pre-hardened steels, carbon steels, mold steels**
- Good wear resistance by high quality Si-based PVD coating.
- Suitable shape is designed for tooling in wide areas.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

2 | WC 미립자 | BLUE Coating | R ± 0.005 | R ± 0.01 | 30° Helix Angle | CUTTING DATA

0.1 ~ 2.5R | 3 ~ 6R | 449P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø0.2 ~ 12 | +0 ~ -0.01mm | ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HRBE 002 005 S04 | 0.1R X 0.2 | 0.2 | 0.5 | 40 | 4 | |
| 2HRBE 002 010 S04 | 0.1R X 0.2 | 0.2 | 1 | 40 | 4 | |
| 2HRBE 002 015 S04 | 0.1R X 0.2 | 0.2 | 1.5 | 40 | 4 | |
| 2HRBE 002 020 S04 | 0.1R X 0.2 | 0.2 | 2 | 40 | 4 | |
| 2HRBE 003 010 S04 | 0.15R X 0.3 | 0.3 | 1 | 40 | 4 | |
| 2HRBE 003 015 S04 | 0.15R X 0.3 | 0.3 | 1.5 | 40 | 4 | |
| 2HRBE 003 020 S04 | 0.15R X 0.3 | 0.3 | 2 | 40 | 4 | |
| 2HRBE 003 030 S04 | 0.15R X 0.3 | 0.3 | 3 | 40 | 4 | |
| 2HRBE 003 040 S04 | 0.15R X 0.3 | 0.3 | 4 | 40 | 4 | |
| 2HRBE 004 010 S04 | 0.2R X 0.4 | 0.4 | 1 | 40 | 4 | |
| 2HRBE 004 020 S04 | 0.2R X 0.4 | 0.4 | 2 | 40 | 4 | |
| 2HRBE 004 030 S04 | 0.2R X 0.4 | 0.4 | 3 | 40 | 4 | |
| 2HRBE 004 040 S04 | 0.2R X 0.4 | 0.4 | 4 | 40 | 4 | |
| 2HRBE 004 050 S04 | 0.2R X 0.4 | 0.4 | 5 | 40 | 4 | |
| 2HRBE 004 060 S04 | 0.2R X 0.4 | 0.4 | 6 | 40 | 4 | |
| 2HRBE 004 080 S04 | 0.2R X 0.4 | 0.4 | 8 | 40 | 4 | |
| 2HRBE 005 010 S04 | 0.25R X 0.5 | 0.5 | 1 | 45 | 4 | |
| 2HRBE 005 020 S04 | 0.25R X 0.5 | 0.5 | 2 | 45 | 4 | |
| 2HRBE 005 030 S04 | 0.25R X 0.5 | 0.5 | 3 | 45 | 4 | |
| 2HRBE 005 040 S04 | 0.25R X 0.5 | 0.5 | 4 | 45 | 4 | |
| 2HRBE 005 050 S04 | 0.25R X 0.5 | 0.5 | 5 | 45 | 4 | |
| 2HRBE 005 060 S04 | 0.25R X 0.5 | 0.5 | 6 | 45 | 4 | |
| 2HRBE 005 080 S04 | 0.25R X 0.5 | 0.5 | 8 | 45 | 4 | |
| 2HRBE 005 100 S04 | 0.25R X 0.5 | 0.5 | 10 | 45 | 4 | |
| 2HRBE 005 120 S04 | 0.25R X 0.5 | 0.5 | 12 | 45 | 4 | |
| 2HRBE 006 010 S04 | 0.3R X 0.6 | 0.6 | 1 | 45 | 4 | |
| 2HRBE 006 020 S04 | 0.3R X 0.6 | 0.6 | 2 | 45 | 4 | |
| 2HRBE 006 030 S04 | 0.3R X 0.6 | 0.6 | 3 | 45 | 4 | |
| 2HRBE 006 040 S04 | 0.3R X 0.6 | 0.6 | 4 | 45 | 4 | |
| 2HRBE 006 050 S04 | 0.3R X 0.6 | 0.6 | 5 | 45 | 4 | |
| 2HRBE 006 060 S04 | 0.3R X 0.6 | 0.6 | 6 | 45 | 4 | |
| 2HRBE 006 080 S04 | 0.3R X 0.6 | 0.6 | 8 | 45 | 4 | |
| 2HRBE 006 100 S04 | 0.3R X 0.6 | 0.6 | 10 | 45 | 4 | |
| 2HRBE 006 120 S04 | 0.3R X 0.6 | 0.6 | 12 | 45 | 4 | |
| 2HRBE 006 140 S04 | 0.3R X 0.6 | 0.6 | 14 | 45 | 4 | |
| 2HRBE 007 020 S04 | 0.35R X 0.7 | 0.7 | 2 | 45 | 4 | |
| 2HRBE 007 040 S04 | 0.35R X 0.7 | 0.7 | 4 | 45 | 4 | |
| 2HRBE 007 060 S04 | 0.35R X 0.7 | 0.7 | 6 | 45 | 4 | |
| 2HRBE 007 080 S04 | 0.35R X 0.7 | 0.7 | 8 | 45 | 4 | |
| 2HRBE 007 100 S04 | 0.35R X 0.7 | 0.7 | 10 | 45 | 4 | |
| 2HRBE 007 120 S04 | 0.35R X 0.7 | 0.7 | 12 | 45 | 4 | |
| 2HRBE 008 020 S04 | 0.4R X 0.8 | 0.8 | 2 | 45 | 4 | |
| 2HRBE 008 030 S04 | 0.4R X 0.8 | 0.8 | 3 | 45 | 4 | |
| 2HRBE 008 040 S04 | 0.4R X 0.8 | 0.8 | 4 | 45 | 4 | |
| 2HRBE 008 050 S04 | 0.4R X 0.8 | 0.8 | 5 | 45 | 4 | |
| 2HRBE 008 060 S04 | 0.4R X 0.8 | 0.8 | 6 | 45 | 4 | |
| 2HRBE 008 080 S04 | 0.4R X 0.8 | 0.8 | 8 | 45 | 4 | |
| 2HRBE 008 100 S04 | 0.4R X 0.8 | 0.8 | 10 | 45 | 4 | |
| 2HRBE 008 120 S04 | 0.4R X 0.8 | 0.8 | 12 | 45 | 4 | |
| 2HRBE 009 040 S04 | 0.45R X 0.9 | 0.9 | 4 | 45 | 4 | |

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HRBE 009 060 S04 | 0.45R X 0.9 | 0.9 | 6 | 45 | 4 | |
| 2HRBE 009 080 S04 | 0.45R X 0.9 | 0.9 | 8 | 45 | 4 | |
| 2HRBE 009 100 S04 | 0.45R X 0.9 | 0.9 | 10 | 50 | 4 | |
| 2HRBE 010 020 S04 | 0.5R X 1 | 1 | 2 | 45 | 4 | |
| 2HRBE 010 030 S04 | 0.5R X 1 | 1 | 3 | 45 | 4 | |
| 2HRBE 010 040 S04 | 0.5R X 1 | 1 | 4 | 45 | 4 | |
| 2HRBE 010 050 S04 | 0.5R X 1 | 1 | 5 | 45 | 4 | |
| 2HRBE 010 060 S04 | 0.5R X 1 | 1 | 6 | 45 | 4 | |
| 2HRBE 010 080 S04 | 0.5R X 1 | 1 | 8 | 45 | 4 | |
| 2HRBE 010 100 S04 | 0.5R X 1 | 1 | 10 | 50 | 4 | |
| 2HRBE 010 120 S04 | 0.5R X 1 | 1 | 12 | 50 | 4 | |
| 2HRBE 010 140 S04 | 0.5R X 1 | 1 | 14 | 50 | 4 | |
| 2HRBE 010 160 S04 | 0.5R X 1 | 1 | 16 | 50 | 4 | |
| 2HRBE 010 180 S04 | 0.5R X 1 | 1 | 18 | 50 | 4 | |
| 2HRBE 010 200 S04 | 0.5R X 1 | 1 | 20 | 50 | 4 | |
| 2HRBE 010 220 S04 | 0.5R X 1 | 1 | 22 | 60 | 4 | |
| 2HRBE 010 250 S04 | 0.5R X 1 | 1 | 25 | 60 | 4 | |
| 2HRBE 012 040 S04 | 0.6R X 1.2 | 1.2 | 4 | 45 | 4 | |
| 2HRBE 012 060 S04 | 0.6R X 1.2 | 1.2 | 6 | 45 | 4 | |
| 2HRBE 012 080 S04 | 0.6R X 1.2 | 1.2 | 8 | 45 | 4 | |
| 2HRBE 012 100 S04 | 0.6R X 1.2 | 1.2 | 10 | 50 | 4 | |
| 2HRBE 012 120 S04 | 0.6R X 1.2 | 1.2 | 12 | 50 | 4 | |
| 2HRBE 012 160 S04 | 0.6R X 1.2 | 1.2 | 16 | 50 | 4 | |
| 2HRBE 012 200 S04 | 0.6R X 1.2 | 1.2 | 20 | 50 | 4 | |
| 2HRBE 012 240 S04 | 0.6R X 1.2 | 1.2 | 24 | 60 | 4 | |
| 2HRBE 014 060 S04 | 0.7R X 1.4 | 1.4 | 6 | 45 | 4 | |
| 2HRBE 014 080 S04 | 0.7R X 1.4 | 1.4 | 8 | 45 | 4 | |
| 2HRBE 014 120 S04 | 0.7R X 1.4 | 1.4 | 12 | 50 | 4 | |
| 2HRBE 014 160 S04 | 0.7R X 1.4 | 1.4 | 16 | 50 | 4 | |
| 2HRBE 015 030 S04 | 0.75R X 1.5 | 1.5 | 3 | 45 | 4 | |
| 2HRBE 015 040 S04 | 0.75R X 1.5 | 1.5 | 4 | 45 | 4 | |
| 2HRBE 015 060 S04 | 0.75R X 1.5 | 1.5 | 6 | 45 | 4 | |
| 2HRBE 015 080 S04 | 0.75R X 1.5 | 1.5 | 8 | 45 | 4 | |
| 2HRBE 015 100 S04 | 0.75R X 1.5 | 1.5 | 10 | 50 | 4 | |
| 2HRBE 015 120 S04 | 0.75R X 1.5 | 1.5 | 12 | 50 | 4 | |
| 2HRBE 015 140 S04 | 0.75R X 1.5 | 1.5 | 14 | 50 | 4 | |
| 2HRBE 015 160 S04 | 0.75R X 1.5 | 1.5 | 16 | 50 | 4 | |
| 2HRBE 015 180 S04 | 0.75R X 1.5 | 1.5 | 18 | 50 | 4 | |
| 2HRBE 015 200 S04 | 0.75R X 1.5 | 1.5 | 20 | 50 | 4 | |
| 2HRBE 015 220 S04 | 0.75R X 1.5 | 1.5 | 22 | 60 | 4 | |
| 2HRBE 015 250 S04 | 0.75R X 1.5 | 1.5 | 25 | 60 | 4 | |
| 2HRBE 015 300 S04 | 0.75R X 1.5 | 1.5 | 30 | 70 | 4 | |
| 2HRBE 016 060 S04 | 0.8R X 1.6 | 1.6 | 6 | 45 | 4 | |
| 2HRBE 016 080 S04 | 0.8R X 1.6 | 1.6 | 8 | 45 | 4 | |
| 2HRBE 016 120 S04 | 0.8R X 1.6 | 1.6 | 12 | 50 | 4 | |
| 2HRBE 016 160 S04 | 0.8R X 1.6 | 1.6 | 16 | 50 | 4 | |
| 2HRBE 016 200 S04 | 0.8R X 1.6 | 1.6 | 20 | 50 | 4 | |
| 2HRBE 018 060 S04 | 0.9R X 1.8 | 1.8 | 6 | 45 | 4 | |
| 2HRBE 018 080 S04 | 0.9R X 1.8 | 1.8 | 8 | 45 | 4 | |
| 2HRBE 018 120 S04 | 0.9R X 1.8 | 1.8 | 12 | 50 | 4 | |

단위 : mm

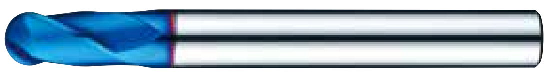
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HRBE 018 160 S04 | 0.9R X 1.8 | 1.8 | 16 | 50 | 4 | |
| 2HRBE 018 200 S04 | 0.9R X 1.8 | 1.8 | 20 | 50 | 4 | |
| 2HRBE 020 040 S04 | 1R X 2 | 2 | 4 | 45 | 4 | |
| 2HRBE 020 060 S04 | 1R X 2 | 2 | 6 | 45 | 4 | |
| 2HRBE 020 080 S04 | 1R X 2 | 2 | 8 | 45 | 4 | |
| 2HRBE 020 100 S04 | 1R X 2 | 2 | 10 | 50 | 4 | |
| 2HRBE 020 120 S04 | 1R X 2 | 2 | 12 | 50 | 4 | |
| 2HRBE 020 140 S04 | 1R X 2 | 2 | 14 | 50 | 4 | |
| 2HRBE 020 160 S04 | 1R X 2 | 2 | 16 | 50 | 4 | |
| 2HRBE 020 180 S04 | 1R X 2 | 2 | 18 | 50 | 4 | |
| 2HRBE 020 200 S04 | 1R X 2 | 2 | 20 | 50 | 4 | |
| 2HRBE 020 220 S04 | 1R X 2 | 2 | 22 | 60 | 4 | |
| 2HRBE 020 250 S04 | 1R X 2 | 2 | 25 | 60 | 4 | |
| 2HRBE 020 300 S04 | 1R X 2 | 2 | 30 | 60 | 4 | |
| 2HRBE 025 080 S04 | 1.25R X 2.5 | 2.5 | 8 | 45 | 4 | |
| 2HRBE 025 100 S04 | 1.25R X 2.5 | 2.5 | 10 | 50 | 4 | |
| 2HRBE 025 120 S04 | 1.25R X 2.5 | 2.5 | 12 | 50 | 4 | |
| 2HRBE 025 160 S04 | 1.25R X 2.5 | 2.5 | 16 | 50 | 4 | |
| 2HRBE 025 200 S04 | 1.25R X 2.5 | 2.5 | 20 | 60 | 4 | |
| 2HRBE 025 250 S04 | 1.25R X 2.5 | 2.5 | 25 | 60 | 4 | |
| 2HRBE 025 300 S04 | 1.25R X 2.5 | 2.5 | 30 | 70 | 4 | |
| 2HRBE 030 060 S06 | 1.5R X 3 | 3 | 6 | 50 | 6 | |
| 2HRBE 030 080 S06 | 1.5R X 3 | 3 | 8 | 50 | 6 | |
| 2HRBE 030 100 S06 | 1.5R X 3 | 3 | 10 | 50 | 6 | |
| 2HRBE 030 120 S06 | 1.5R X 3 | 3 | 12 | 50 | 6 | |
| 2HRBE 030 160 S06 | 1.5R X 3 | 3 | 16 | 60 | 6 | |
| 2HRBE 030 200 S06 | 1.5R X 3 | 3 | 20 | 60 | 6 | |
| 2HRBE 030 250 S06 | 1.5R X 3 | 3 | 25 | 65 | 6 | |
| 2HRBE 030 300 S06 | 1.5R X 3 | 3 | 30 | 70 | 6 | |
| 2HRBE 030 350 S06 | 1.5R X 3 | 3 | 35 | 75 | 6 | |
| 2HRBE 030 400 S06 | 1.5R X 3 | 3 | 40 | 80 | 6 | |
| 2HRBE 030 450 S06 | 1.5R X 3 | 3 | 45 | 90 | 6 | |
| 2HRBE 040 080 S06 | 2R X 4 | 4 | 8 | 50 | 6 | |
| 2HRBE 040 100 S06 | 2R X 4 | 4 | 10 | 50 | 6 | |
| 2HRBE 040 120 S06 | 2R X 4 | 4 | 12 | 50 | 6 | |
| 2HRBE 040 160 S06 | 2R X 4 | 4 | 16 | 60 | 6 | |
| 2HRBE 040 200 S06 | 2R X 4 | 4 | 20 | 60 | 6 | |
| 2HRBE 040 250 S06 | 2R X 4 | 4 | 25 | 65 | 6 | |
| 2HRBE 040 300 S06 | 2R X 4 | 4 | 30 | 70 | 6 | |
| 2HRBE 040 350 S06 | 2R X 4 | 4 | 35 | 75 | 6 | |
| 2HRBE 040 400 S06 | 2R X 4 | 4 | 40 | 80 | 6 | |
| 2HRBE 040 450 S06 | 2R X 4 | 4 | 45 | 90 | 6 | |
| 2HRBE 050 160 S06 | 2.5R X 5 | 6 | 16 | 60 | 6 | |
| 2HRBE 050 200 S06 | 2.5R X 5 | 6 | 20 | 60 | 6 | |
| 2HRBE 050 250 S06 | 2.5R X 5 | 6 | 25 | 70 | 6 | |
| 2HRBE 050 300 S06 | 2.5R X 5 | 6 | 30 | 75 | 6 | |
| 2HRBE 050 400 S06 | 2.5R X 5 | 6 | 40 | 80 | 6 | |
| 2HRBE 050 500 S06 | 2.5R X 5 | 6 | 50 | 90 | 6 | |
| 2HRBE 060 150 S06 | 3R X 6 | 10 | 15 | 55 | 6 | |
| 2HRBE 080 250 060 | 4R X 8 | 12 | 25 | 60 | 8 | |
| 2HRBE 100 300 070 | 5R X 10 | 16 | 30 | 70 | 10 | |
| 2HRBE 120 300 075 | 6R X 12 | 18 | 30 | 75 | 12 | |

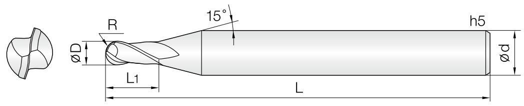
# 2HCBE

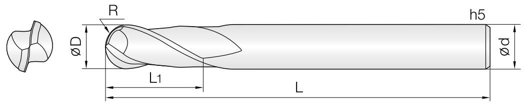
## 2 Flutes Ball End Mills for Heavy Cuts

## 2날 강력 절삭용 볼 엔드밀








- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강등 다양한 피삭재 가공 엔드밀**
- 고함량 실리콘계 코팅(Si)처리하여 내마모성이 우수합니다.
- 넓은 영역의 피삭재 가공에 적합한 형상으로 설계 하였습니다.
- 경제적인 가격으로 가공 생산비 절감을 극대화합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52),pre-hardened steels, carbon steels, mold steels**
- Good wear resistance by high quality Si-based PVD coating.
- Suitable shape is designed for tooling in wide areas.
- Maximize the manufacturing cost saving with low price of products.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

2 | WC 미립자 | BLUE Coating | R ± 0.005 (0.1 ~ 2.5R) | R ± 0.01 (3 ~ 6R) | R ± 0.015 (8R) | 30° Helix Angle | CUTTING DATA (452P)

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.2 ~ 16 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |
| | Ø16 | -0.01 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2HCBE 002 004 S04 | 0.1R X 0.2 | 0.4 | 40 | 4 | |
| 2HCBE 003 006 S04 | 0.15R X 0.3 | 0.6 | 40 | 4 | |
| 2HCBE 004 008 S04 | 0.2R X 0.4 | 0.8 | 40 | 4 | |
| 2HCBE 005 010 S04 | 0.25R X 0.5 | 1 | 45 | 4 | |
| 2HCBE 006 012 S04 | 0.3R X 0.6 | 1.2 | 45 | 4 | |
| 2HCBE 007 014 S04 | 0.35R X 0.7 | 1.4 | 45 | 4 | |
| 2HCBE 008 016 S04 | 0.4R X 0.8 | 1.6 | 45 | 4 | |
| 2HCBE 009 018 S04 | 0.45R X 0.9 | 1.8 | 45 | 4 | |
| 2HCBE 010 025 S04 | 0.5R X 1 | 2.5 | 50 | 4 | |
| 2HCBE 010 025 S06 | 0.5R X 1 | 2.5 | 50 | 6 | |
| 2HCBE 012 030 S04 | 0.6R X 1.2 | 3 | 50 | 4 | |
| 2HCBE 015 040 S04 | 0.75R X 1.5 | 4 | 50 | 4 | |
| 2HCBE 015 040 S06 | 0.75R X 1.5 | 4 | 50 | 6 | |
| 2HCBE 020 050 S04 | 1R X 2 | 5 | 50 | 4 | |
| 2HCBE 020 050 S06 | 1R X 2 | 5 | 50 | 6 | |
| 2HCBE 025 050 S04 | 1.25R X 2.5 | 5 | 50 | 4 | |
| 2HCBE 025 050 S06 | 1.25R X 2.5 | 5 | 50 | 6 | |
| 2HCBE 030 060 S04 | 1.5R X 3 | 6 | 50 | 4 | |
| 2HCBE 030 060 S06 | 1.5R X 3 | 6 | 50 | 6 | |
| 2HCBE 030 060 060 | 1.5R X 3 | 6 | 60 | 6 | |
| 2HCBE 040 080 S04 | 2R X 4 | 8 | 50 | 4 | |
| 2HCBE 040 080 080 | 2R X 4 | 8 | 80 | 4 | |
| 2HCBE 040 080 S06 | 2R X 4 | 8 | 50 | 6 | |
| 2HCBE 040 080 070 | 2R X 4 | 8 | 70 | 6 | |
| 2HCBE 050 100 S06 | 2.5R X 5 | 10 | 50 | 6 | |
| 2HCBE 050 120 S06 | 2.5R X 5 | 12 | 80 | 6 | |
| 2HCBE 060 100 050 | 3R X 6 | 10 | 50 | 6 | |
| 2HCBE 060 100 060 | 3R X 6 | 10 | 60 | 6 | |
| 2HCBE 060 120 080 | 3R X 6 | 12 | 80 | 6 | |
| 2HCBE 060 120 100 | 3R X 6 | 12 | 100 | 6 | |
| 2HCBE 080 120 060 | 4R X 8 | 12 | 60 | 8 | |
| 2HCBE 080 140 080 | 4R X 8 | 14 | 80 | 8 | |
| 2HCBE 080 140 100 | 4R X 8 | 14 | 100 | 8 | |
| 2HCBE 100 150 075 | 5R X 10 | 15 | 75 | 10 | |
| 2HCBE 100 180 100 | 5R X 10 | 18 | 100 | 10 | |
| 2HCBE 120 180 080 | 6R X 12 | 18 | 80 | 12 | |
| 2HCBE 120 220 110 | 6R X 12 | 22 | 110 | 12 | |
| 2HCBE 160 300 110 | 8R X 16 | 30 | 110 | 16 | |

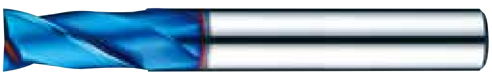
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

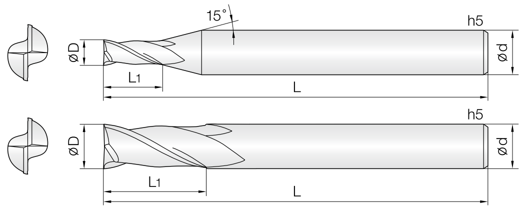
# 2HCEE

## 2 Flutes Standard Length End Mills for Heavy Cuts

## 2날 강력 절삭용 표준 길이 엔드밀








- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강등 다양한 피삭재 가공 엔드밀**
- 고함량 실리콘계 코팅(Si)처리하여 내마모성이 우수합니다.
- 넓은 영역의 피삭재 가공에 적합한 형상으로 설계 하였습니다.
- 경제적인 가격으로 가공 생산비 절감을 극대화합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52),pre-hardened steels, carbon steels, mold steels**
- Good wear resistance by high quality Si-based PVD coating.
- Suitable shape is designed for tooling in wide areas.
- Maximize the manufacturing cost saving with low price of products.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

Shield Edge 453P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.2 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 16 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø16 | -0.015 ~ -0.03mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2HCEE 002 004 S04 | 0.2 | 0.4 | 40 | 4 | |
| 2HCEE 003 006 S04 | 0.3 | 0.6 | 40 | 4 | |
| 2HCEE 004 008 S04 | 0.4 | 0.8 | 40 | 4 | |
| 2HCEE 005 010 S04 | 0.5 | 1 | 40 | 4 | |
| 2HCEE 006 012 S04 | 0.6 | 1.2 | 40 | 4 | |
| 2HCEE 007 014 S04 | 0.7 | 1.4 | 40 | 4 | |
| 2HCEE 008 016 S04 | 0.8 | 1.6 | 40 | 4 | |
| 2HCEE 009 018 S04 | 0.9 | 1.8 | 40 | 4 | |
| 2HCEE 010 025 S04 | 1 | 2.5 | 45 | 4 | |
| 2HCEE 012 030 S04 | 1.2 | 3 | 45 | 4 | |
| 2HCEE 015 040 S04 | 1.5 | 4 | 45 | 4 | |
| 2HCEE 020 060 S04 | 2 | 6 | 45 | 4 | |
| 2HCEE 025 080 S04 | 2.5 | 8 | 45 | 4 | |
| 2HCEE 030 080 S04 | 3 | 8 | 50 | 4 | |
| 2HCEE 030 080 S06 | 3 | 8 | 50 | 6 | |
| 2HCEE 040 110 S04 | 4 | 11 | 50 | 4 | |
| 2HCEE 040 110 S06 | 4 | 11 | 50 | 6 | |
| 2HCEE 050 130 S06 | 5 | 13 | 50 | 6 | |
| 2HCEE 060 130 050 | 6 | 13 | 50 | 6 | |
| 2HCEE 060 160 055 | 6 | 16 | 55 | 6 | |
| 2HCEE 080 200 060 | 8 | 20 | 60 | 8 | |
| 2HCEE 080 240 070 | 8 | 24 | 70 | 8 | |
| 2HCEE 100 220 070 | 10 | 22 | 70 | 10 | |
| 2HCEE 100 250 075 | 10 | 25 | 75 | 10 | |
| 2HCEE 120 260 075 | 12 | 26 | 75 | 12 | |
| 2HCEE 120 300 080 | 12 | 30 | 80 | 12 | |
| 2HCEE 160 400 090 | 16 | 40 | 90 | 16 | |

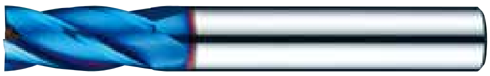
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

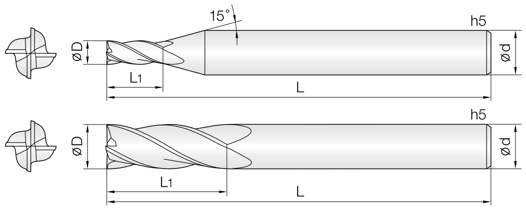
# 4HCEE

## 4 Flutes Standard Length End Mills for Heavy Cuts

## 4날 강력 절삭용 표준 길이 엔드밀

E series






- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강등 다양한 피삭재 가공 엔드밀**
- 고함량 실리콘계 코팅(Si)처리하여 내마모성이 우수합니다.
- 넓은 영역의 피삭재 가공에 적합한 형상으로 설계 하였습니다.
- 경제적인 가격으로 가공 생산비 절감을 극대화합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52),pre-hardened steels, carbon steels, mold steels**
- Good wear resistance by high quality Si-based PVD coating.
- Suitable shape is designed for tooling in wide areas.
- Maximize the manufacturing cost saving with low price of products.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.


Shield Edge 453P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 16 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø16 | -0.015 ~ -0.03mm |

단위 : mm

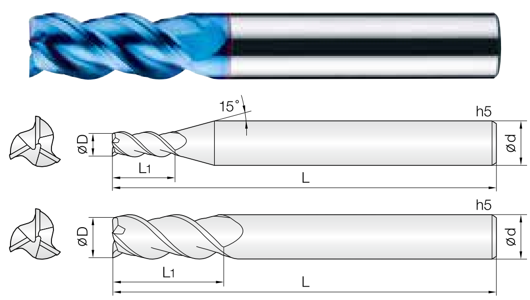
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4HCEE 010 025 S04 | 1 | 2.5 | 45 | 4 | |
| 4HCEE 015 040 S04 | 1.5 | 4 | 45 | 4 | |
| 4HCEE 020 060 S04 | 2 | 6 | 45 | 4 | |
| 4HCEE 025 080 S04 | 2.5 | 8 | 45 | 4 | |
| 4HCEE 025 080 S06 | 2.5 | 8 | 45 | 6 | |
| 4HCEE 025 120 S06 | 2.5 | 12 | 50 | 6 | |
| 4HCEE 030 080 S04 | 3 | 8 | 50 | 4 | |
| 4HCEE 030 080 S06 | 3 | 8 | 50 | 6 | |
| 4HCEE 040 110 S04 | 4 | 11 | 50 | 4 | |
| 4HCEE 040 110 S06 | 4 | 11 | 50 | 6 | |
| 4HCEE 050 130 S06 | 5 | 13 | 50 | 6 | |
| 4HCEE 060 130 050 | 6 | 13 | 50 | 6 | |
| 4HCEE 060 160 055 | 6 | 16 | 55 | 6 | |
| 4HCEE 080 200 060 | 8 | 20 | 60 | 8 | |
| 4HCEE 080 240 070 | 8 | 24 | 70 | 8 | |
| 4HCEE 100 220 070 | 10 | 22 | 70 | 10 | |
| 4HCEE 100 250 075 | 10 | 25 | 75 | 10 | |
| 4HCEE 120 260 075 | 12 | 26 | 75 | 12 | |
| 4HCEE 120 300 080 | 12 | 30 | 80 | 12 | |
| 4HCEE 160 400 090 | 16 | 40 | 90 | 16 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 3NSE

## 3 Flutes End Mills for Heavy Cuts

## 3날 강력 절삭용 엔드밀




- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강, SUS계열, Ti/Ni계 합금, 인코넬 등 다양한 피삭재 가공 엔드밀**
- 고함량 실리콘계 코팅(Si)처리하여 내마모성이 우수합니다.
- 3날 적용 및 깊은 포켓으로 칩배출이 원활하며, 피삭재 면조도가 우수합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels, SUS, Ti/Ni-base alloys, Inconel**
- Good wear resistance by high quality Si-based PVD coating.
- Excellent work surface finish by 3 flute and deep chip pocket
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.


Shield Edge 454P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 12 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |

단위 : mm

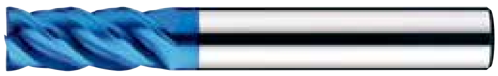
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 3NSE 010 025 S04 | 1 | 2.5 | 45 | 4 | |
| 3NSE 012 030 S04 | 1.2 | 3 | 45 | 4 | |
| 3NSE 015 040 S04 | 1.5 | 4 | 45 | 4 | |
| 3NSE 020 060 S04 | 2 | 6 | 45 | 4 | |
| 3NSE 025 080 S06 | 2.5 | 8 | 45 | 6 | |
| 3NSE 030 080 S06 | 3 | 8 | 45 | 6 | |
| 3NSE 040 110 S06 | 4 | 11 | 50 | 6 | |
| 3NSE 050 130 S06 | 5 | 13 | 50 | 6 | |
| 3NSE 060 130 S06 | 6 | 13 | 55 | 6 | |
| 3NSE 080 190 S08 | 8 | 19 | 60 | 8 | |
| 3NSE 100 220 S10 | 10 | 22 | 70 | 10 | |
| 3NSE 120 260 S12 | 12 | 26 | 80 | 12 | |

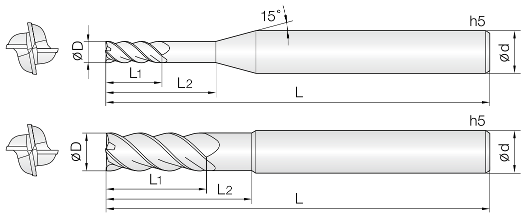
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 4NSE

## 4 Flutes End Mills for Heavy Cuts

## 4날 강력 절삭용 엔드밀






- **중저경도강(HRc52이하), 프리하든강계열, 탄소강, 금형강, SUS계열, Ti/Ni계합금, 인코넬등 다양한 피삭재 가공 엔드밀**
- 고함량 실리콘계 코팅(Si)처리하여 내마모성이 우수합니다.
- 강력한 체터링 방지 설계로 엔드밀의 진동을 최소화하였습니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels**
- Good wear resistance by high quality Si-based PVD coating.
- Minimize chattering by unequal flute spacing design.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.


| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 20 | -0.015 ~ -0.03mm |

단위 : mm

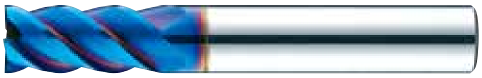
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4NSE 010 025 S04 | 1 | 2.5 | - | 45 | 4 | |
| 4NSE 010 040 S04 | 1 | 2.5 | 4 | 45 | 4 | |
| 4NSE 012 030 S04 | 1.2 | 3 | - | 45 | 4 | |
| 4NSE 012 050 S04 | 1.2 | 3 | 5 | 45 | 4 | |
| 4NSE 015 040 S04 | 1.5 | 4 | - | 45 | 4 | |
| 4NSE 015 060 S04 | 1.5 | 4 | 6 | 45 | 4 | |
| 4NSE 020 060 S04 | 2 | 6 | - | 45 | 4 | |
| 4NSE 020 100 S04 | 2 | 6 | 10 | 45 | 4 | |
| 4NSE 025 070 S04 | 2.5 | 7 | - | 45 | 4 | |
| 4NSE 025 100 S04 | 2.5 | 7 | 10 | 45 | 4 | |
| 4NSE 030 080 S06 | 3 | 8 | - | 50 | 6 | |
| 4NSE 030 100 S06 | 3 | 10 | - | 50 | 6 | |
| 4NSE 030 120 S06 | 3 | 8 | 12 | 50 | 6 | |
| 4NSE 040 100 S06 | 4 | 10 | - | 50 | 6 | |
| 4NSE 040 120 S06 | 4 | 12 | - | 50 | 6 | |
| 4NSE 040 160 S06 | 4 | 10 | 16 | 50 | 6 | |
| 4NSE 050 120 S06 | 5 | 12 | - | 55 | 6 | |
| 4NSE 050 160 S06 | 5 | 16 | - | 55 | 6 | |
| 4NSE 050 200 S06 | 5 | 12 | 20 | 55 | 6 | |
| 4NSE 060 130 S06 | 6 | 13 | - | 55 | 6 | |
| 4NSE 060 180 S06 | 6 | 18 | - | 55 | 6 | |
| 4NSE 060 210 055 | 6 | 13 | 21 | 55 | 6 | |
| 4NSE 080 200 S08 | 8 | 20 | - | 60 | 8 | |
| 4NSE 080 250 S08 | 8 | 25 | - | 70 | 8 | |
| 4NSE 080 270 070 | 8 | 20 | 27 | 70 | 8 | |
| 4NSE 100 220 S10 | 10 | 22 | - | 70 | 10 | |
| 4NSE 100 300 S10 | 10 | 30 | - | 75 | 10 | |
| 4NSE 100 320 075 | 10 | 22 | 32 | 75 | 10 | |
| 4NSE 120 260 S12 | 12 | 26 | - | 75 | 12 | |
| 4NSE 120 300 S12 | 12 | 30 | - | 80 | 12 | |
| 4NSE 120 380 080 | 12 | 26 | 38 | 80 | 12 | |
| 4NSE 140 320 090 | 14 | 32 | - | 90 | 14 | |
| 4NSE 160 450 S16 | 16 | 35 | 45 | 90 | 16 | |
| 4NSE 200 520 S20 | 20 | 40 | 52 | 100 | 20 | |

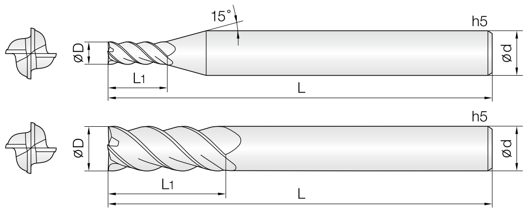
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

# 4HEME

## 4 Flutes High Speed 45˚ Helix End Mills for Heavy Cuts

## 4날 고속 • 강력 절삭용 45° 헬릭스 엔드밀






- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강등 다양한 피삭재 가공 엔드밀**
- 고함량 실리콘계 코팅(Si)처리하여 내마모성이 우수합니다.
- 넓은 영역의 피삭재 가공에 적합한 형상으로 설계 하였습니다.
- 45˚헬릭스 형상으로 설계하여 고속,고이송 가공에 적합합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52),pre-hardened steels, carbon steels, mold steels**
- Good wear resistance by high quality Si-based PVD coating.
- Suitable shape is designed for tooling in wide areas.
- 45˚ degree helix design for high speed, feed condition.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

E series

4 | WC 미립자 | BLUE Coating | 45° Helix Angle | Shield Edge | CUTTING DATA 455P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 16 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 16 | -0.015 ~ -0.03mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4HEME 010 025 S04 | 1 | 2.5 | 40 | 4 | |
| 4HEME 010 025 S06 | 1 | 2.5 | 40 | 6 | |
| 4HEME 010 035 S04 | 1 | 3.5 | 40 | 4 | |
| 4HEME 010 035 S06 | 1 | 3.5 | 40 | 6 | |
| 4HEME 012 030 S04 | 1.2 | 3 | 40 | 4 | |
| 4HEME 012 030 S06 | 1.2 | 3 | 40 | 6 | |
| 4HEME 015 040 S04 | 1.5 | 4 | 40 | 4 | |
| 4HEME 015 060 S04 | 1.5 | 6 | 40 | 4 | |
| 4HEME 015 060 S06 | 1.5 | 6 | 40 | 6 | |
| 4HEME 020 050 S04 | 2 | 5 | 40 | 4 | |
| 4HEME 020 080 S04 | 2 | 8 | 40 | 4 | |
| 4HEME 020 080 S06 | 2 | 8 | 45 | 6 | |
| 4HEME 030 080 S06 | 3 | 8 | 45 | 6 | |
| 4HEME 030 120 S06 | 3 | 12 | 50 | 6 | |
| 4HEME 040 110 S06 | 4 | 11 | 45 | 6 | |
| 4HEME 040 160 S06 | 4 | 16 | 55 | 6 | |
| 4HEME 050 130 S06 | 5 | 13 | 50 | 6 | |
| 4HEME 050 180 S06 | 5 | 18 | 60 | 6 | |
| 4HEME 060 130 S06 | 6 | 13 | 50 | 6 | |
| 4HEME 060 200 S06 | 6 | 20 | 60 | 6 | |
| 4HEME 080 200 S08 | 8 | 20 | 60 | 8 | |
| 4HEME 080 250 S08 | 8 | 25 | 70 | 8 | |
| 4HEME 080 300 S08 | 8 | 30 | 75 | 8 | |
| 4HEME 100 220 S10 | 10 | 22 | 70 | 10 | |
| 4HEME 100 300 S10 | 10 | 30 | 80 | 10 | |
| 4HEME 100 400 S10 | 10 | 40 | 90 | 10 | |
| 4HEME 120 260 S12 | 12 | 26 | 75 | 12 | |
| 4HEME 120 400 S12 | 12 | 40 | 90 | 12 | |
| 4HEME 120 500 S12 | 12 | 50 | 100 | 12 | |
| 4HEME 140 300 S14 | 14 | 30 | 80 | 14 | |
| 4HEME 140 500 S14 | 14 | 50 | 110 | 14 | |
| 4HEME 160 350 S16 | 16 | 35 | 90 | 16 | |
| 4HEME 160 500 S16 | 16 | 50 | 110 | 16 | |

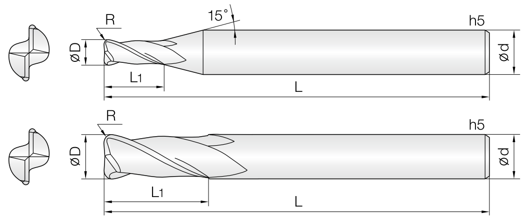
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 2NCRE

## 2 Flutes Corner Radius End Mills for Heavy Cuts

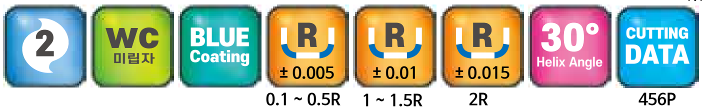
## 2날 강력 절삭용 코너 레디우스 엔드밀






- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강, SUS계열, Ti/Ni계 합금, 인코넬 등 다양한 피삭재 가공 엔드밀**
- 고함량 실리콘계 코팅(Si)처리하여 내마모성이 우수합니다.
- 코너R 형상을 날부치핑이 적도록 설계하였습니다.
- 다양한 코너R과 전장으로 맞춤 가공이 가능합니다.
- 경제적인 가격으로 가공 생산비 절감을 극대화합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels**
- Good wear resistance by high quality Si-based PVD coating.
- Designed for minimizing edge chipping by corner R shape.
- Various corner R and overall length for wide range application.
- Maximize the manufacturing cost saving with low price of products.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.




| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø1 ~ 12 | +0 ~ -0.01mm | ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |

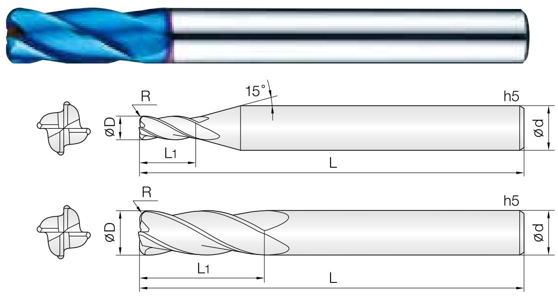
단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2NCRE 010 001 S04 | 1 X R0.1 | 3 | 50 | 4 | |
| 2NCRE 010 002 S04 | 1 X R0.2 | 3 | 50 | 4 | |
| 2NCRE 010 003 S04 | 1 X R0.3 | 3 | 50 | 4 | |
| 2NCRE 012 001 S04 | 1.2 X R0.1 | 4 | 50 | 4 | |
| 2NCRE 012 002 S04 | 1.2 X R0.2 | 4 | 50 | 4 | |
| 2NCRE 012 003 S04 | 1.2 X R0.3 | 4 | 50 | 4 | |
| 2NCRE 015 001 S04 | 1.5 X R0.1 | 4 | 50 | 4 | |
| 2NCRE 015 002 S04 | 1.5 X R0.2 | 4 | 50 | 4 | |
| 2NCRE 015 003 S04 | 1.5 X R0.3 | 4 | 50 | 4 | |
| 2NCRE 015 005 S04 | 1.5 X R0.5 | 4 | 50 | 4 | |
| 2NCRE 020 001 S04 | 2 X R0.1 | 6 | 50 | 4 | |
| 2NCRE 020 002 S04 | 2 X R0.2 | 6 | 50 | 4 | |
| 2NCRE 020 003 S04 | 2 X R0.3 | 6 | 50 | 4 | |
| 2NCRE 020 005 S04 | 2 X R0.5 | 6 | 50 | 4 | |
| 2NCRE 025 001 S04 | 2.5 X R0.1 | 6 | 50 | 4 | |
| 2NCRE 025 002 S04 | 2.5 X R0.2 | 6 | 50 | 4 | |
| 2NCRE 025 003 S04 | 2.5 X R0.3 | 6 | 50 | 4 | |
| 2NCRE 025 005 S04 | 2.5 X R0.5 | 6 | 50 | 4 | |
| 2NCRE 030 001 S06 | 3 X R0.1 | 8 | 60 | 6 | |
| 2NCRE 030 002 S06 | 3 X R0.2 | 8 | 60 | 6 | |
| 2NCRE 030 003 S06 | 3 X R0.3 | 8 | 60 | 6 | |
| 2NCRE 030 005 S06 | 3 X R0.5 | 8 | 60 | 6 | |
| 2NCRE 030 010 S06 | 3 X R1 | 8 | 60 | 6 | |
| 2NCRE 040 001 S04 | 4 X R0.1 | 10 | 50 | 4 | |
| 2NCRE 040 001 S06 | 4 X R0.1 | 10 | 70 | 6 | |
| 2NCRE 040 002 S04 | 4 X R0.2 | 10 | 50 | 4 | |
| 2NCRE 040 002 S06 | 4 X R0.2 | 10 | 70 | 6 | |
| 2NCRE 040 003 S04 | 4 X R0.3 | 10 | 50 | 4 | |
| 2NCRE 040 003 S06 | 4 X R0.3 | 10 | 70 | 6 | |
| 2NCRE 040 005 S04 | 4 X R0.5 | 10 | 50 | 4 | |
| 2NCRE 040 005 S06 | 4 X R0.5 | 10 | 70 | 6 | |
| 2NCRE 040 010 S04 | 4 X R1 | 10 | 50 | 4 | |
| 2NCRE 040 010 S06 | 4 X R1 | 10 | 70 | 6 | |
| 2NCRE 050 001 S06 | 5 X R0.1 | 13 | 75 | 6 | |
| 2NCRE 050 002 S06 | 5 X R0.2 | 13 | 75 | 6 | |
| 2NCRE 050 003 S06 | 5 X R0.3 | 13 | 75 | 6 | |
| 2NCRE 050 005 S06 | 5 X R0.5 | 13 | 75 | 6 | |
| 2NCRE 050 010 S06 | 5 X R1 | 13 | 75 | 6 | |
| 2NCRE 060 002 080 | 6 X R0.2 | 13 | 80 | 6 | |
| 2NCRE 060 003 080 | 6 X R0.3 | 13 | 80 | 6 | |
| 2NCRE 060 005 080 | 6 X R0.5 | 13 | 80 | 6 | |
| 2NCRE 060 010 080 | 6 X R1 | 13 | 80 | 6 | |
| 2NCRE 080 003 090 | 8 X R0.3 | 19 | 90 | 8 | |
| 2NCRE 080 005 090 | 8 X R0.5 | 19 | 90 | 8 | |
| 2NCRE 080 010 090 | 8 X R1 | 19 | 90 | 8 | |
| 2NCRE 100 003 100 | 10 X R0.3 | 22 | 100 | 10 | |
| 2NCRE 100 005 100 | 10 X R0.5 | 22 | 100 | 10 | |
| 2NCRE 100 010 100 | 10 X R1 | 22 | 100 | 10 | |
| 2NCRE 120 003 110 | 12 X R0.3 | 26 | 110 | 12 | |
| 2NCRE 120 005 110 | 12 X R0.5 | 26 | 110 | 12 | |
| 2NCRE 120 010 110 | 12 X R1 | 26 | 110 | 12 | |
| 2NCRE 120 020 110 | 12 X R2 | 26 | 110 | 12 | |

# 4NCRE

## 4 Flutes Corner Radius End Mills for Heavy Cuts

## 4날 강력 절삭용 코너 레디우스 엔드밀




- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강, SUS계열, Ti/Ni계 합금, 인코넬 등 다양한 피삭재 가공 엔드밀**
- 고함량 실리콘계 코팅(Si)처리하여 내마모성이 우수합니다.
- 코너R 형상을 날부치핑이 적도록 설계하였습니다.
- 다양한 코너R과 전장으로 맞춤 가공이 가능합니다.
- 경제적인 가격으로 가공 생산비 절감을 극대화합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels**
- Good wear resistance by high quality Si-based PVD coating.
- Designed for minimizing edge chipping by corner R shape.
- Various corner R and overall length for wide range application.
- Maximize the manufacturing cost saving with low price of products.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

E series

4 | WC 미립자 | BLUE Coating | R ± 0.005 (0.1 ~ 0.5R) | R ± 0.01 (1 ~ 1.5R) | R ± 0.015 (2R) | 30° Helix Angle | CUTTING DATA 456P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø1 ~ 12 | +0 ~ -0.01mm | ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

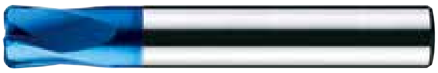
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4NCRE 010 001 S04 | 1 X R0.1 | 3 | 50 | 4 | |
| 4NCRE 010 002 S04 | 1 X R0.2 | 3 | 50 | 4 | |
| 4NCRE 010 003 S04 | 1 X R0.3 | 3 | 50 | 4 | |
| 4NCRE 012 001 S04 | 1.2 X R0.1 | 4 | 50 | 4 | |
| 4NCRE 012 002 S04 | 1.2 X R0.2 | 4 | 50 | 4 | |
| 4NCRE 012 003 S04 | 1.2 X R0.3 | 4 | 50 | 4 | |
| 4NCRE 015 001 S04 | 1.5 X R0.1 | 4 | 50 | 4 | |
| 4NCRE 015 002 S04 | 1.5 X R0.2 | 4 | 50 | 4 | |
| 4NCRE 015 003 S04 | 1.5 X R0.3 | 4 | 50 | 4 | |
| 4NCRE 015 005 S04 | 1.5 X R0.5 | 4 | 50 | 4 | |
| 4NCRE 020 001 S04 | 2 X R0.1 | 6 | 50 | 4 | |
| 4NCRE 020 002 S04 | 2 X R0.2 | 6 | 50 | 4 | |
| 4NCRE 020 003 S04 | 2 X R0.3 | 6 | 50 | 4 | |
| 4NCRE 020 005 S04 | 2 X R0.5 | 6 | 50 | 4 | |
| 4NCRE 025 001 S04 | 2.5 X R0.1 | 6 | 50 | 4 | |
| 4NCRE 025 002 S04 | 2.5 X R0.2 | 6 | 50 | 4 | |
| 4NCRE 025 003 S04 | 2.5 X R0.3 | 6 | 50 | 4 | |
| 4NCRE 025 005 S04 | 2.5 X R0.5 | 6 | 50 | 4 | |
| 4NCRE 030 001 S04 | 3 X R0.1 | 8 | 50 | 4 | |
| 4NCRE 030 001 S06 | 3 X R0.1 | 8 | 50 | 6 | |
| 4NCRE 030 001 060 | 3 X R0.1 | 8 | 60 | 6 | |
| 4NCRE 030 002 S04 | 3 X R0.2 | 8 | 50 | 4 | |
| 4NCRE 030 002 S06 | 3 X R0.2 | 8 | 50 | 6 | |
| 4NCRE 030 002 060 | 3 X R0.2 | 8 | 60 | 6 | |
| 4NCRE 030 003 S04 | 3 X R0.3 | 8 | 50 | 4 | |
| 4NCRE 030 003 S06 | 3 X R0.3 | 8 | 50 | 6 | |
| 4NCRE 030 003 060 | 3 X R0.3 | 8 | 60 | 6 | |
| 4NCRE 030 005 S04 | 3 X R0.5 | 8 | 50 | 4 | |
| 4NCRE 030 005 S06 | 3 X R0.5 | 8 | 50 | 6 | |
| 4NCRE 030 005 060 | 3 X R0.5 | 8 | 60 | 6 | |
| 4NCRE 030 010 S04 | 3 X R1 | 8 | 50 | 4 | |
| 4NCRE 030 010 S06 | 3 X R1 | 8 | 50 | 6 | |
| 4NCRE 030 010 060 | 3 X R1 | 8 | 60 | 6 | |
| 4NCRE 040 001 S04 | 4 X R0.1 | 10 | 50 | 4 | |
| 4NCRE 040 001 S06 | 4 X R0.1 | 10 | 50 | 6 | |
| 4NCRE 040 001 070 | 4 X R0.1 | 10 | 70 | 6 | |
| 4NCRE 040 002 S04 | 4 X R0.2 | 10 | 50 | 4 | |
| 4NCRE 040 002 S06 | 4 X R0.2 | 10 | 50 | 6 | |
| 4NCRE 040 002 070 | 4 X R0.2 | 10 | 70 | 6 | |
| 4NCRE 040 003 S04 | 4 X R0.3 | 10 | 50 | 4 | |
| 4NCRE 040 003 S06 | 4 X R0.3 | 10 | 50 | 6 | |
| 4NCRE 040 003 070 | 4 X R0.3 | 10 | 70 | 6 | |
| 4NCRE 040 005 S04 | 4 X R0.5 | 10 | 50 | 4 | |
| 4NCRE 040 005 S06 | 4 X R0.5 | 10 | 50 | 6 | |
| 4NCRE 040 005 070 | 4 X R0.5 | 10 | 70 | 6 | |
| 4NCRE 040 010 S04 | 4 X R1 | 10 | 50 | 4 | |
| 4NCRE 040 010 S06 | 4 X R1 | 10 | 50 | 6 | |
| 4NCRE 040 010 070 | 4 X R1 | 10 | 70 | 6 | |
| 4NCRE 050 001 S06 | 5 X R0.1 | 10 | 50 | 6 | |
| 4NCRE 050 001 075 | 5 X R0.1 | 13 | 75 | 6 | |

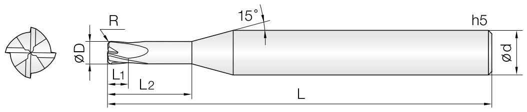
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4NCRE 050 002 S06 | 5 X R0.2 | 10 | 50 | 6 | |
| 4NCRE 050 002 075 | 5 X R0.2 | 13 | 75 | 6 | |
| 4NCRE 050 003 S06 | 5 X R0.3 | 10 | 50 | 6 | |
| 4NCRE 050 003 075 | 5 X R0.3 | 13 | 75 | 6 | |
| 4NCRE 050 005 S06 | 5 X R0.5 | 10 | 50 | 6 | |
| 4NCRE 050 005 075 | 5 X R0.5 | 13 | 75 | 6 | |
| 4NCRE 050 010 S06 | 5 X R1 | 10 | 50 | 6 | |
| 4NCRE 050 010 075 | 5 X R1 | 13 | 75 | 6 | |
| 4NCRE 060 001 050 | 6 X R0.1 | 10 | 50 | 6 | |
| 4NCRE 060 001 080 | 6 X R0.1 | 13 | 80 | 6 | |
| 4NCRE 060 002 050 | 6 X R0.2 | 10 | 50 | 6 | |
| 4NCRE 060 002 080 | 6 X R0.2 | 13 | 80 | 6 | |
| 4NCRE 060 003 050 | 6 X R0.3 | 10 | 50 | 6 | |
| 4NCRE 060 003 080 | 6 X R0.3 | 13 | 80 | 6 | |
| 4NCRE 060 005 050 | 6 X R0.5 | 10 | 50 | 6 | |
| 4NCRE 060 005 080 | 6 X R0.5 | 13 | 80 | 6 | |
| 4NCRE 060 010 050 | 6 X R1 | 10 | 50 | 6 | |
| 4NCRE 060 010 080 | 6 X R1 | 13 | 80 | 6 | |
| 4NCRE 080 002 060 | 8 X R0.2 | 16 | 60 | 8 | |
| 4NCRE 080 002 090 | 8 X R0.2 | 19 | 90 | 8 | |
| 4NCRE 080 003 060 | 8 X R0.3 | 16 | 60 | 8 | |
| 4NCRE 080 003 090 | 8 X R0.3 | 19 | 90 | 8 | |
| 4NCRE 080 005 060 | 8 X R0.5 | 16 | 60 | 8 | |
| 4NCRE 080 005 090 | 8 X R0.5 | 19 | 90 | 8 | |
| 4NCRE 080 010 060 | 8 X R1 | 16 | 60 | 8 | |
| 4NCRE 080 010 090 | 8 X R1 | 19 | 90 | 8 | |
| 4NCRE 080 020 060 | 8 X R2 | 16 | 60 | 8 | |
| 4NCRE 080 020 090 | 8 X R2 | 19 | 90 | 8 | |
| 4NCRE 100 002 075 | 10 X R0.2 | 18 | 75 | 10 | |
| 4NCRE 100 002 100 | 10 X R0.2 | 22 | 100 | 10 | |
| 4NCRE 100 003 075 | 10 X R0.3 | 18 | 75 | 10 | |
| 4NCRE 100 003 100 | 10 X R0.3 | 22 | 100 | 10 | |
| 4NCRE 100 005 075 | 10 X R0.5 | 18 | 75 | 10 | |
| 4NCRE 100 005 100 | 10 X R0.5 | 22 | 100 | 10 | |
| 4NCRE 100 010 075 | 10 X R1 | 18 | 75 | 10 | |
| 4NCRE 100 010 100 | 10 X R1 | 22 | 100 | 10 | |
| 4NCRE 100 020 075 | 10 X R2 | 18 | 75 | 10 | |
| 4NCRE 100 020 100 | 10 X R2 | 22 | 100 | 10 | |
| 4NCRE 120 002 075 | 12 X R0.2 | 22 | 75 | 12 | |
| 4NCRE 120 002 110 | 12 X R0.2 | 26 | 110 | 12 | |
| 4NCRE 120 003 075 | 12 X R0.3 | 22 | 75 | 12 | |
| 4NCRE 120 003 110 | 12 X R0.3 | 26 | 110 | 12 | |
| 4NCRE 120 005 075 | 12 X R0.5 | 22 | 75 | 12 | |
| 4NCRE 120 005 110 | 12 X R0.5 | 26 | 110 | 12 | |
| 4NCRE 120 010 075 | 12 X R1 | 22 | 75 | 12 | |
| 4NCRE 120 010 110 | 12 X R1 | 26 | 110 | 12 | |
| 4NCRE 120 020 075 | 12 X R2 | 22 | 75 | 12 | |
| 4NCRE 120 020 110 | 12 X R2 | 26 | 110 | 12 | |

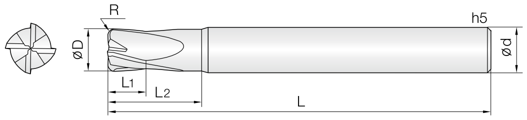
# 4RCUE

## 4 Flutes High Speed Corner Radius Cutters for Heavy Cuts

## 4날 강력 절삭용 고이송 코너 레디우스 커터






- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강 등 가공**
- 고함량 실리콘계 코팅(Si)처리하여 내마모성이 우수합니다.
- 저속 RPM에서 고이송 작업이 가능 하도록 설계하였습니다.
- 중삭 및 황삭 가공시 작업 효율이 극대화 됩니다.
- 항절력이 높은 미립자 초경합금을 채택하여, 고이송 작업시 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels**
- Good wear resistance by high quality Si-based PVD coating.
- Designed for low speed with high feed condition.
- Suitable for heavy duty and roughing application.
- Minimize fracturing at high feed by high TRS ultra fine WC grade.

E series

4 | WC 미립자 | BLUE Coating | R ± 0.005 (0.2 ~ 0.5R) | R ± 0.01 (1 ~ 1.5R) | R ± 0.015 (2 ~ 3R) | 15° Helix Angle | CUTTING DATA 457P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø1 ~ 12 | +0 ~ -0.01mm | ØD =Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |

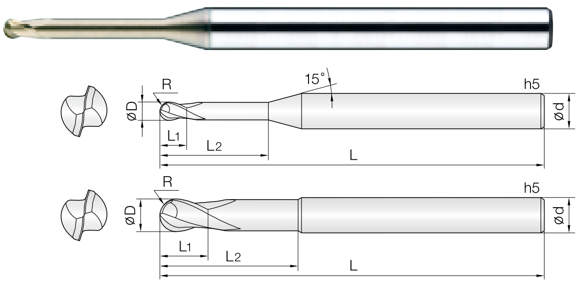
단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4RCUE 010 002 025 | 1 X R0.2 | 0.75 | 2.5 | 50 | 4 | |
| 4RCUE 015 005 040 | 1.5 X R0.5 | 1.2 | 4 | 50 | 4 | |
| 4RCUE 020 005 060 | 2 X R0.5 | 1.5 | 6 | 50 | 6 | |
| 4RCUE 030 005 080 | 3 X R0.5 | 2.3 | 8 | 50 | 6 | |
| 4RCUE 040 005 120 | 4 X R0.5 | 3 | 12 | 60 | 6 | |
| 4RCUE 040 005 160 | 4 X R0.5 | 3 | 16 | 60 | 6 | |
| 4RCUE 040 010 120 | 4 X R1 | 3 | 12 | 60 | 6 | |
| 4RCUE 040 010 160 | 4 X R1 | 3 | 16 | 60 | 6 | |
| 4RCUE 050 005 150 | 5 X R0.5 | 4 | 15 | 60 | 6 | |
| 4RCUE 050 010 150 | 5 X R1 | 4 | 15 | 60 | 6 | |
| 4RCUE 060 005 150 | 6 X R0.5 | 4.5 | 15 | 60 | 6 | |
| 4RCUE 060 005 250 | 6 X R0.5 | 4.5 | 25 | 80 | 6 | |
| 4RCUE 060 010 150 | 6 X R1 | 4.5 | 15 | 60 | 6 | |
| 4RCUE 060 010 250 | 6 X R1 | 4.5 | 25 | 80 | 6 | |
| 4RCUE 060 015 150 | 6 X R1.5 | 4.5 | 15 | 60 | 6 | |
| 4RCUE 060 015 250 | 6 X R1.5 | 4.5 | 25 | 80 | 6 | |
| 4RCUE 080 005 200 | 8 X R0.5 | 6 | 20 | 60 | 8 | |
| 4RCUE 080 005 300 | 8 X R0.5 | 6 | 30 | 90 | 8 | |
| 4RCUE 080 010 200 | 8 X R1 | 6 | 20 | 60 | 8 | |
| 4RCUE 080 010 300 | 8 X R1 | 6 | 30 | 90 | 8 | |
| 4RCUE 080 020 200 | 8 X R2 | 6 | 20 | 60 | 8 | |
| 4RCUE 080 020 300 | 8 X R2 | 6 | 30 | 90 | 8 | |
| 4RCUE 100 005 250 | 10 X R0.5 | 7.5 | 25 | 70 | 10 | |
| 4RCUE 100 005 400 | 10 X R0.5 | 7.5 | 40 | 100 | 10 | |
| 4RCUE 100 010 250 | 10 X R1 | 7.5 | 25 | 70 | 10 | |
| 4RCUE 100 010 400 | 10 X R1 | 7.5 | 40 | 100 | 10 | |
| 4RCUE 100 020 250 | 10 X R2 | 7.5 | 25 | 70 | 10 | |
| 4RCUE 100 020 400 | 10 X R2 | 7.5 | 40 | 100 | 10 | |
| 4RCUE 120 005 300 | 12 X R0.5 | 9 | 30 | 80 | 12 | |
| 4RCUE 120 005 400 | 12 X R0.5 | 9 | 40 | 100 | 12 | |
| 4RCUE 120 010 300 | 12 X R1 | 9 | 30 | 80 | 12 | |
| 4RCUE 120 010 400 | 12 X R1 | 9 | 40 | 100 | 12 | |
| 4RCUE 120 020 300 | 12 X R2 | 9 | 30 | 80 | 12 | |
| 4RCUE 120 020 400 | 12 X R2 | 9 | 40 | 100 | 12 | |
| 4RCUE 120 030 300 | 12 X R3 | 9 | 30 | 80 | 12 | |

# 2HRBG

## 2 Flutes Rib Ball End Mills for Multi Purpose

## 2날 범용 리브 볼 엔드밀




- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강 등 다양한 피삭재 가공**
- JCRO 코팅 처리하여 넓은 영역의 피삭재 가공에 적합합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택,엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels**
- Optimum for various work materials by JCRO coating.
- High precise edge tolerance.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

2 | WC 미립자 | JCRO Coating | R ± 0.005 (0.05 ~ 2.5R) | R ± 0.01 (3 ~ 6R) | 35° Helix Angle | CUTTING DATA (458P)

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.1 | +0 ~ -0.005mm |
| | Ø0.2 ~ 12 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HRBG 001 003 S04 | 0.05R X 0.1 | 0.15 | 0.3 | 40 | 4 | |
| 2HRBG 001 005 S04 | 0.05R X 0.1 | 0.15 | 0.5 | 40 | 4 | |
| 2HRBG 002 005 S04 | 0.1R X 0.2 | 0.2 | 0.5 | 40 | 4 | |
| 2HRBG 002 010 S04 | 0.1R X 0.2 | 0.2 | 1 | 40 | 4 | |
| 2HRBG 002 015 S04 | 0.1R X 0.2 | 0.2 | 1.5 | 40 | 4 | |
| 2HRBG 002 020 S04 | 0.1R X 0.2 | 0.2 | 2 | 40 | 4 | |
| 2HRBG 003 010 S04 | 0.15R X 0.3 | 0.3 | 1 | 40 | 4 | |
| 2HRBG 003 015 S04 | 0.15R X 0.3 | 0.3 | 1.5 | 40 | 4 | |
| 2HRBG 003 020 S04 | 0.15R X 0.3 | 0.3 | 2 | 40 | 4 | |
| 2HRBG 003 030 S04 | 0.15R X 0.3 | 0.3 | 3 | 40 | 4 | |
| 2HRBG 003 040 S04 | 0.15R X 0.3 | 0.3 | 4 | 40 | 4 | |
| 2HRBG 003 050 S04 | 0.15R X 0.3 | 0.3 | 5 | 40 | 4 | |
| 2HRBG 004 010 S04 | 0.2R X 0.4 | 0.4 | 1 | 40 | 4 | |
| 2HRBG 004 020 S04 | 0.2R X 0.4 | 0.4 | 2 | 40 | 4 | |
| 2HRBG 004 030 S04 | 0.2R X 0.4 | 0.4 | 3 | 40 | 4 | |
| 2HRBG 004040 S04 | 0.2R X 0.4 | 0.4 | 4 | 40 | 4 | |
| 2HRBG 004 050 S04 | 0.2R X 0.4 | 0.4 | 5 | 40 | 4 | |
| 2HRBG 004 060 S04 | 0.2R X 0.4 | 0.4 | 6 | 40 | 4 | |
| 2HRBG 004 080 S04 | 0.2R X 0.4 | 0.4 | 8 | 40 | 4 | |
| 2HRBG 004 100 S04 | 0.2R X 0.4 | 0.4 | 10 | 40 | 4 | |
| 2HRBG 005 010 S04 | 0.25R X 0.5 | 0.5 | 1 | 45 | 4 | |
| 2HRBG 005 020 S04 | 0.25R X 0.5 | 0.5 | 2 | 45 | 4 | |
| 2HRBG 005 030 S04 | 0.25R X 0.5 | 0.5 | 3 | 45 | 4 | |
| 2HRBG 005 040 S04 | 0.25R X 0.5 | 0.5 | 4 | 45 | 4 | |
| 2HRBG 005 050 S04 | 0.25R X 0.5 | 0.5 | 5 | 45 | 4 | |
| 2HRBG 005 060 S04 | 0.25R X 0.5 | 0.5 | 6 | 45 | 4 | |
| 2HRBG 005 080 S04 | 0.25R X 0.5 | 0.5 | 8 | 45 | 4 | |
| 2HRBG 005 100 S04 | 0.25R X 0.5 | 0.5 | 10 | 45 | 4 | |
| 2HRBG 005 120 S04 | 0.25R X 0.5 | 0.5 | 12 | 45 | 4 | |
| 2HRBG 005 140 S04 | 0.25R X 0.5 | 0.5 | 14 | 45 | 4 | |
| 2HRBG 006 010 S04 | 0.3R X 0.6 | 0.6 | 1 | 45 | 4 | |
| 2HRBG 006 020 S04 | 0.3R X 0.6 | 0.6 | 2 | 45 | 4 | |
| 2HRBG 006 030 S04 | 0.3R X 0.6 | 0.6 | 3 | 45 | 4 | |
| 2HRBG 006 040 S04 | 0.3R X 0.6 | 0.6 | 4 | 45 | 4 | |
| 2HRBG 006 050 S04 | 0.3R X 0.6 | 0.6 | 5 | 45 | 4 | |
| 2HRBG 006 060 S04 | 0.3R X 0.6 | 0.6 | 6 | 45 | 4 | |
| 2HRBG 006 080 S04 | 0.3R X 0.6 | 0.6 | 8 | 45 | 4 | |
| 2HRBG 006 100 S04 | 0.3R X 0.6 | 0.6 | 10 | 45 | 4 | |
| 2HRBG 006 120 S04 | 0.3R X 0.6 | 0.6 | 12 | 45 | 4 | |
| 2HRBG 006 140 S04 | 0.3R X 0.6 | 0.6 | 14 | 45 | 4 | |
| 2HRBG 006 160 S04 | 0.3R X 0.6 | 0.6 | 16 | 45 | 4 | |
| 2HRBG 007 020 S04 | 0.35R X 0.7 | 0.7 | 2 | 45 | 4 | |
| 2HRBG 007 040 S04 | 0.35R X 0.7 | 0.7 | 4 | 45 | 4 | |
| 2HRBG 007 080 S04 | 0.35R X 0.7 | 0.7 | 8 | 45 | 4 | |
| 2HRBG 007 100 S04 | 0.35R X 0.7 | 0.7 | 10 | 45 | 4 | |
| 2HRBG 007 120 S04 | 0.35R X 0.7 | 0.7 | 12 | 45 | 4 | |
| 2HRBG 008 020 S04 | 0.4R X 0.8 | 0.8 | 2 | 45 | 4 | |
| 2HRBG 008 040 S04 | 0.4R X 0.8 | 0.8 | 4 | 45 | 4 | |
| 2HRBG 008 060 S04 | 0.4R X 0.8 | 0.8 | 6 | 45 | 4 | |
| 2HRBG 008 080 S04 | 0.4R X 0.8 | 0.8 | 8 | 45 | 4 | |

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HRBG 008 100 S04 | 0.4R X 0.8 | 0.8 | 10 | 45 | 4 | |
| 2HRBG 008 120 S04 | 0.4R X 0.8 | 0.8 | 12 | 45 | 4 | |
| 2HRBG 008 140 S04 | 0.4R X 0.8 | 0.8 | 14 | 45 | 4 | |
| 2HRBG 008 160 S04 | 0.4R X 0.8 | 0.8 | 16 | 45 | 4 | |
| 2HRBG 009 040 S04 | 0.45R X 0.9 | 0.9 | 4 | 45 | 4 | |
| 2HRBG 010 020 S04 | 0.5R X 1 | 1 | 2 | 45 | 4 | |
| 2HRBG 010 020 S06 | 0.5R X 1 | 1 | 2 | 45 | 6 | |
| 2HRBG 010 030 S04 | 0.5R X 1 | 1 | 3 | 45 | 4 | |
| 2HRBG 010 030 S06 | 0.5R X 1 | 1 | 3 | 45 | 6 | |
| 2HRBG 010 040 S04 | 0.5R X 1 | 1 | 4 | 45 | 4 | |
| 2HRBG 010 040 S06 | 0.5R X 1 | 1 | 4 | 45 | 6 | |
| 2HRBG 010 050 S04 | 0.5R X 1 | 1 | 5 | 45 | 4 | |
| 2HRBG 010 050 S06 | 0.5R X 1 | 1 | 5 | 45 | 6 | |
| 2HRBG 010 060 S04 | 0.5R X 1 | 1 | 6 | 45 | 4 | |
| 2HRBG 010 060 S06 | 0.5R X 1 | 1 | 6 | 45 | 6 | |
| 2HRBG 010 080 S04 | 0.5R X 1 | 1 | 8 | 45 | 4 | |
| 2HRBG 010 080 S06 | 0.5R X 1 | 1 | 8 | 45 | 6 | |
| 2HRBG 010 100 S04 | 0.5R X 1 | 1 | 10 | 50 | 4 | |
| 2HRBG 010 100 S06 | 0.5R X 1 | 1 | 10 | 50 | 6 | |
| 2HRBG 010 120 S04 | 0.5R X 1 | 1 | 12 | 50 | 4 | |
| 2HRBG 010 120 S06 | 0.5R X 1 | 1 | 12 | 50 | 6 | |
| 2HRBG 010 140 S04 | 0.5R X 1 | 1 | 14 | 50 | 4 | |
| 2HRBG 010 140 S06 | 0.5R X 1 | 1 | 14 | 50 | 6 | |
| 2HRBG 010 160 S04 | 0.5R X 1 | 1 | 16 | 50 | 4 | |
| 2HRBG 010 160 S06 | 0.5R X 1 | 1 | 16 | 55 | 6 | |
| 2HRBG 010 180 S04 | 0.5R X 1 | 1 | 18 | 50 | 4 | |
| 2HRBG 010 180 S06 | 0.5R X 1 | 1 | 18 | 60 | 6 | |
| 2HRBG 010 200 S04 | 0.5R X 1 | 1 | 20 | 50 | 4 | |
| 2HRBG 010 200 S06 | 0.5R X 1 | 1 | 20 | 60 | 6 | |
| 2HRBG 010 220 S04 | 0.5R X 1 | 1 | 22 | 60 | 4 | |
| 2HRBG 010 220 S06 | 0.5R X 1 | 1 | 22 | 65 | 6 | |
| 2HRBG 010 250 S04 | 0.5R X 1 | 1 | 25 | 60 | 4 | |
| 2HRBG 012 040 S04 | 0.6R X 1.2 | 1.2 | 4 | 45 | 4 | |
| 2HRBG 012 040 S06 | 0.6R X 1.2 | 1.2 | 4 | 45 | 6 | |
| 2HRBG 012 060 S04 | 0.6R X 1.2 | 1.2 | 6 | 45 | 4 | |
| 2HRBG 012 060 S06 | 0.6R X 1.2 | 1.2 | 6 | 45 | 6 | |
| 2HRBG 012 080 S04 | 0.6R X 1.2 | 1.2 | 8 | 45 | 4 | |
| 2HRBG 012 080 S06 | 0.6R X 1.2 | 1.2 | 8 | 45 | 6 | |
| 2HRBG 012 100 S04 | 0.6R X 1.2 | 1.2 | 10 | 50 | 4 | |
| 2HRBG 012 100 S06 | 0.6R X 1.2 | 1.2 | 10 | 50 | 6 | |
| 2HRBG 012 120 S04 | 0.6R X 1.2 | 1.2 | 12 | 50 | 4 | |
| 2HRBG 012 120 S06 | 0.6R X 1.2 | 1.2 | 12 | 50 | 6 | |
| 2HRBG 012 160 S04 | 0.6R X 1.2 | 1.2 | 16 | 50 | 4 | |
| 2HRBG 012 160 S06 | 0.6R X 1.2 | 1.2 | 16 | 55 | 6 | |
| 2HRBG 012 200 S04 | 0.6R X 1.2 | 1.2 | 20 | 50 | 4 | |
| 2HRBG 012 200 S06 | 0.6R X 1.2 | 1.2 | 20 | 60 | 6 | |
| 2HRBG 012 240 S04 | 0.6R X 1.2 | 1.2 | 24 | 60 | 4 | |
| 2HRBG 012 240 S06 | 0.6R X 1.2 | 1.2 | 24 | 65 | 6 | |
| 2HRBG 014 060 S04 | 0.7R X 1.4 | 1.4 | 6 | 45 | 4 | |
| 2HRBG 014 080 S04 | 0.7R X 1.4 | 1.4 | 8 | 45 | 4 | |

# 2HRBG

2 Flutes Rib Ball End Mills for Multi Purpose

2날 범용 리브 볼 엔드밀



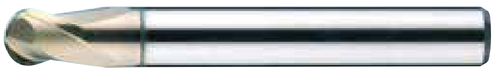
단위 : mm

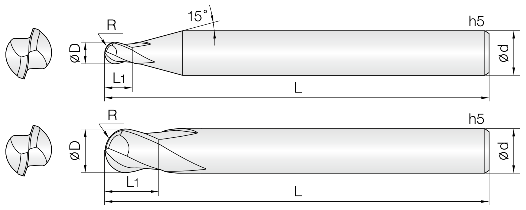
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HRBG 014 120 S04 | 0.7R X 1.4 | 1.4 | 12 | 50 | 4 | |
| 2HRBG 014 160 S04 | 0.7R X 1.4 | 1.4 | 16 | 50 | 4 | |
| 2HRBG 015 030 S04 | 0.75R X 1.5 | 1.5 | 3 | 45 | 4 | |
| 2HRBG 015 030 S06 | 0.75R X 1.5 | 1.5 | 3 | 45 | 6 | |
| 2HRBG 015 040 S04 | 0.75R X 1.5 | 1.5 | 4 | 45 | 4 | |
| 2HRBG 015 040 S06 | 0.75R X 1.5 | 1.5 | 4 | 45 | 6 | |
| 2HRBG 015 060 S04 | 0.75R X 1.5 | 1.5 | 6 | 45 | 4 | |
| 2HRBG 015 060 S06 | 0.75R X 1.5 | 1.5 | 6 | 45 | 6 | |
| 2HRBG 015 080 S04 | 0.75R X 1.5 | 1.5 | 8 | 45 | 4 | |
| 2HRBG 015 080 S06 | 0.75R X 1.5 | 1.5 | 8 | 45 | 6 | |
| 2HRBG 015 100 S04 | 0.75R X 1.5 | 1.5 | 10 | 50 | 4 | |
| 2HRBG 015 100 S06 | 0.75R X 1.5 | 1.5 | 10 | 50 | 6 | |
| 2HRBG 015 120 S04 | 0.75R X 1.5 | 1.5 | 12 | 50 | 4 | |
| 2HRBG 015 120 S06 | 0.75R X 1.5 | 1.5 | 12 | 50 | 6 | |
| 2HRBG 015 140 S04 | 0.75R X 1.5 | 1.5 | 14 | 50 | 4 | |
| 2HRBG 015 140 S06 | 0.75R X 1.5 | 1.5 | 14 | 50 | 6 | |
| 2HRBG 015 160 S04 | 0.75R X 1.5 | 1.5 | 16 | 50 | 4 | |
| 2HRBG 015 160 S06 | 0.75R X 1.5 | 1.5 | 16 | 55 | 6 | |
| 2HRBG 015 180 S04 | 0.75R X 1.5 | 1.5 | 18 | 50 | 4 | |
| 2HRBG 015 180 S06 | 0.75R X 1.5 | 1.5 | 18 | 60 | 6 | |
| 2HRBG 015 200 S04 | 0.75R X 1.5 | 1.5 | 20 | 50 | 4 | |
| 2HRBG 015 200 S06 | 0.75R X 1.5 | 1.5 | 20 | 60 | 6 | |
| 2HRBG 015 220 S04 | 0.75R X 1.5 | 1.5 | 22 | 60 | 4 | |
| 2HRBG 015 220 S06 | 0.75R X 1.5 | 1.5 | 22 | 65 | 6 | |
| 2HRBG 015 250 S04 | 0.75R X 1.5 | 1.5 | 25 | 60 | 4 | |
| 2HRBG 015 250 S06 | 0.75R X 1.5 | 1.5 | 25 | 65 | 6 | |
| 2HRBG 015 300 S04 | 0.75R X 1.5 | 1.5 | 30 | 70 | 4 | |
| 2HRBG 015 300 S06 | 0.75R X 1.5 | 1.5 | 30 | 70 | 6 | |
| 2HRBG 015 350 S04 | 0.75R X 1.5 | 1.5 | 35 | 70 | 4 | |
| 2HRBG 016 060 S04 | 0.8R X 1.6 | 1.6 | 6 | 45 | 4 | |
| 2HRBG 016 080 S04 | 0.8R X 1.6 | 1.6 | 8 | 45 | 4 | |
| 2HRBG 016 120 S04 | 0.8R X 1.6 | 1.6 | 12 | 50 | 4 | |
| 2HRBG 016 160 S04 | 0.8R X 1.6 | 1.6 | 16 | 50 | 4 | |
| 2HRBG 016 200 S04 | 0.8R X 1.6 | 1.6 | 20 | 50 | 4 | |
| 2HRBG 018 060 S04 | 0.9R X 1.8 | 1.8 | 6 | 45 | 4 | |
| 2HRBG 018 080 S04 | 0.9R X 1.8 | 1.8 | 8 | 45 | 4 | |
| 2HRBG 018 120 S04 | 0.9R X 1.8 | 1.8 | 12 | 50 | 4 | |
| 2HRBG 018 160 S04 | 0.9R X 1.8 | 1.8 | 16 | 50 | 4 | |
| 2HRBG 018 200 S04 | 0.9R X 1.8 | 1.8 | 20 | 50 | 4 | |
| 2HRBG 020 040 S04 | 1R X 2 | 2 | 4 | 45 | 4 | |
| 2HRBG 020 040 S06 | 1R X 2 | 2 | 4 | 45 | 6 | |
| 2HRBG 020 060 S04 | 1R X 2 | 2 | 6 | 45 | 4 | |
| 2HRBG 020 060 S06 | 1R X 2 | 2 | 6 | 45 | 6 | |
| 2HRBG 020 080 S04 | 1R X 2 | 2 | 8 | 45 | 4 | |
| 2HRBG 020 080 S06 | 1R X 2 | 2 | 8 | 45 | 6 | |
| 2HRBG 020 100 S04 | 1R X 2 | 2 | 10 | 50 | 4 | |
| 2HRBG 020 100 S06 | 1R X 2 | 2 | 10 | 50 | 6 | |
| 2HRBG 020 120 S04 | 1R X 2 | 2 | 12 | 50 | 4 | |
| 2HRBG 020 120 S06 | 1R X 2 | 2 | 12 | 50 | 6 | |
| 2HRBG 020 140 S04 | 1R X 2 | 2 | 14 | 50 | 4 | |
| 2HRBG 020 140 S06 | 1R X 2 | 2 | 14 | 50 | 6 | |
| 2HRBG 020 160 S04 | 1R X 2 | 2 | 16 | 50 | 4 | |
| 2HRBG 020 160 S06 | 1R X 2 | 2 | 16 | 60 | 6 | |
| 2HRBG 020 180 S04 | 1R X 2 | 2 | 18 | 50 | 4 | |
| 2HRBG 020 180 S06 | 1R X 2 | 2 | 18 | 60 | 6 | |
| 2HRBG 020 200 S04 | 1R X 2 | 2 | 20 | 50 | 4 | |
| 2HRBG 020 200 S06 | 1R X 2 | 2 | 20 | 60 | 6 | |
| 2HRBG 020 220 S04 | 1R X 2 | 2 | 22 | 60 | 4 | |
| 2HRBG 020 220 S06 | 1R X 2 | 2 | 22 | 65 | 6 | |
| 2HRBG 020 250 S04 | 1R X 2 | 2 | 25 | 60 | 4 | |
| 2HRBG 020 250 S06 | 1R X 2 | 2 | 25 | 65 | 6 | |
| 2HRBG 020 300 S04 | 1R X 2 | 2 | 30 | 70 | 4 | |
| 2HRBG 020 300 S06 | 1R X 2 | 2 | 30 | 70 | 6 | |
| 2HRBG 020 350 S04 | 1R X 2 | 2 | 35 | 70 | 4 | |
| 2HRBG 020 350 S06 | 1R X 2 | 2 | 35 | 75 | 6 | |
| 2HRBG 020 400 S04 | 1R X 2 | 2 | 40 | 80 | 4 | |
| 2HRBG 020 400 S06 | 1R X 2 | 2 | 40 | 80 | 6 | |
| 2HRBG 020 450 S04 | 1R X 2 | 2 | 45 | 80 | 4 | |
| 2HRBG 025 080 S04 | 1.25R X 2.5 | 2.5 | 8 | 45 | 4 | |
| 2HRBG 025 100 S04 | 1.25R X 2.5 | 2.5 | 10 | 50 | 4 | |
| 2HRBG 025 160 S04 | 1.25R X 2.5 | 2.5 | 16 | 50 | 4 | |
| 2HRBG 025 200 S04 | 1.25R X 2.5 | 2.5 | 20 | 50 | 4 | |
| 2HRBG 025 250 S04 | 1.25R X 2.5 | 2.5 | 25 | 60 | 4 | |
| 2HRBG 025 300 S04 | 1.25R X 2.5 | 2.5 | 30 | 70 | 4 | |
| 2HRBG 025 350 S04 | 1.25R X 2.5 | 2.5 | 35 | 70 | 4 | |
| 2HRBG 030 060 S06 | 1.5R X 3 | 3 | 6 | 45 | 6 | |
| 2HRBG 030 080 S06 | 1.5R X 3 | 3 | 8 | 45 | 6 | |
| 2HRBG 030 100 S06 | 1.5R X 3 | 3 | 10 | 50 | 6 | |
| 2HRBG 030 120 S06 | 1.5R X 3 | 3 | 12 | 50 | 6 | |
| 2HRBG 030 160 S06 | 1.5R X 3 | 3 | 16 | 55 | 6 | |
| 2HRBG 030 200 S06 | 1.5R X 3 | 3 | 20 | 60 | 6 | |
| 2HRBG 030 250 S06 | 1.5R X 3 | 3 | 25 | 65 | 6 | |
| 2HRBG 030 300 S06 | 1.5R X 3 | 3 | 30 | 70 | 6 | |
| 2HRBG 030 350 S06 | 1.5R X 3 | 3 | 35 | 75 | 6 | |
| 2HRBG 030 400 S06 | 1.5R X 3 | 3 | 40 | 80 | 6 | |
| 2HRBG 030 450 S06 | 1.5R X 3 | 3 | 45 | 90 | 6 | |
| 2HRBG 030 500 S06 | 1.5R X 3 | 3 | 50 | 100 | 6 | |
| 2HRBG 030 600 S06 | 1.5R X 3 | 3 | 60 | 100 | 6 | |
| 2HRBG 040 080 S06 | 2R X 4 | 4 | 8 | 45 | 6 | |
| 2HRBG 040 100 S06 | 2R X 4 | 4 | 10 | 50 | 6 | |
| 2HRBG 040 120 S06 | 2R X 4 | 4 | 12 | 50 | 6 | |
| 2HRBG 040 160 S06 | 2R X 4 | 4 | 16 | 55 | 6 | |
| 2HRBG 040 200 S06 | 2R X 4 | 4 | 20 | 60 | 6 | |
| 2HRBG 040 250 S06 | 2R X 4 | 4 | 25 | 65 | 6 | |
| 2HRBG 040 300 S06 | 2R X 4 | 4 | 30 | 70 | 6 | |
| 2HRBG 040 350 S06 | 2R X 4 | 4 | 35 | 75 | 6 | |
| 2HRBG 040 400 S06 | 2R X 4 | 4 | 40 | 80 | 6 | |
| 2HRBG 040 450 S06 | 2R X 4 | 4 | 45 | 90 | 6 | |
| 2HRBG 040 500 S06 | 2R X 4 | 4 | 50 | 100 | 6 | |
| 2HRBG 040 550 S06 | 2R X 4 | 4 | 55 | 100 | 6 | |
| 2HRBG 040 600 S06 | 2R X 4 | 4 | 60 | 100 | 6 | |
| 2HRBG 050 150 S06 | 2.5R X 5 | 6 | 15 | 55 | 6 | |
| 2HRBG 050 200 S06 | 2.5R X 5 | 6 | 20 | 60 | 6 | |
| 2HRBG 050 250 S06 | 2.5R X 5 | 6 | 25 | 70 | 6 | |
| 2HRBG 050 300 S06 | 2.5R X 5 | 6 | 30 | 75 | 6 | |
| 2HRBG 050 400 S06 | 2.5R X 5 | 6 | 40 | 80 | 6 | |
| 2HRBG 050 450 S06 | 2.5R X 5 | 6 | 45 | 90 | 6 | |
| 2HRBG 050 500 S06 | 2.5R X 5 | 6 | 50 | 100 | 6 | |
| 2HRBG 050 600 S06 | 2.5R X 5 | 6 | 60 | 100 | 6 | |
| 2HRBG 060 150 S06 | 3R X 6 | 10 | 15 | 55 | 6 | |
| 2HRBG 060 300 S06 | 3R X 6 | 10 | 30 | 110 | 6 | |
| 2HRBG 080 250 060 | 4R X 8 | 12 | 25 | 60 | 8 | |
| 2HRBG 080 300 100 | 4R X 8 | 12 | 30 | 100 | 8 | |
| 2HRBG 100 300 070 | 5R X 10 | 16 | 30 | 70 | 10 | |
| 2HRBG 100 350 100 | 5R X 10 | 16 | 35 | 100 | 10 | |
| 2HRBG 120 300 075 | 6R X 12 | 18 | 30 | 75 | 12 | |
| 2HRBG 120 400 110 | 6R X 12 | 18 | 40 | 110 | 12 | |

# 2HSBG

## 2 Flutes Short Length Ball End Mills for Multi Purpose

## 2날 범용 짧은 길이 볼 엔드밀






- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강 등 다양한 피삭재 가공**
- JCRO 코팅 처리하여 넓은 영역의 피삭재 가공에 적합합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels**
- Optimum for various work materials by JCRO coating.
- High precise edge tolerance.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

2 | WC 미립자 | JCRO Coating | R ± 0.005 | R ± 0.01 | 35° Helix Angle | CUTTING DATA

0.1R ~ 2.5R | 3R ~ 6R | 461P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø0.2 ~ 12 | +0 ~ -0.01mm | ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

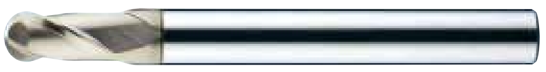
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2HSBG 002 002 S04 | 0.1R X 0.2 | 0.2 | 40 | 4 | |
| 2HSBG 003 003 S04 | 0.15R X 0.3 | 0.3 | 40 | 4 | |
| 2HSBG 004 004 S04 | 0.2R X 0.4 | 0.4 | 40 | 4 | |
| 2HSBG 005 005 S04 | 0.25R X 0.5 | 0.5 | 40 | 4 | |
| 2HSBG 006 006 S04 | 0.3R X 0.6 | 0.6 | 40 | 4 | |
| 2HSBG 007 007 S04 | 0.35R X 0.7 | 0.7 | 40 | 4 | |
| 2HSBG 008 008 S04 | 0.4R X 0.8 | 0.8 | 40 | 4 | |
| 2HSBG 009 009 S04 | 0.45R X 0.9 | 0.9 | 40 | 4 | |
| 2HSBG 010 010 S04 | 0.5R X 1 | 1 | 40 | 4 | |
| 2HSBG 010 010 S06 | 0.5R X 1 | 1 | 40 | 6 | |
| 2HSBG 012 012 S04 | 0.6R X 1.2 | 1.2 | 40 | 4 | |
| 2HSBG 015 015 S04 | 0.75R X 1.5 | 1.5 | 40 | 4 | |
| 2HSBG 015 015 S06 | 0.75R X 1.5 | 1.5 | 40 | 6 | |
| 2HSBG 020 020 S04 | 1R X 2 | 2 | 45 | 4 | |
| 2HSBG 020 020 S06 | 1R X 2 | 2 | 45 | 6 | |
| 2HSBG 030 030 S04 | 1.5R X 3 | 3 | 45 | 4 | |
| 2HSBG 030 030 S06 | 1.5R X 3 | 3 | 45 | 6 | |
| 2HSBG 040 040 S04 | 2R X 4 | 4 | 45 | 4 | |
| 2HSBG 040 040 S06 | 2R X 4 | 4 | 45 | 6 | |
| 2HSBG 050 050 S06 | 2.5R X 5 | 5 | 50 | 6 | |
| 2HSBG 060 060 050 | 3R X 6 | 6 | 50 | 6 | |
| 2HSBG 060 060 060 | 3R X 6 | 6 | 60 | 6 | |
| 2HSBG 080 080 050 | 4R X 8 | 8 | 50 | 8 | |
| 2HSBG 080 080 060 | 4R X 8 | 8 | 60 | 8 | |
| 2HSBG 100 100 060 | 5R X 10 | 10 | 60 | 10 | |
| 2HSBG 100 100 070 | 5R X 10 | 10 | 70 | 10 | |
| 2HSBG 120 120 060 | 6R X 12 | 12 | 60 | 12 | |
| 2HSBG 120 120 070 | 6R X 12 | 12 | 70 | 12 | |

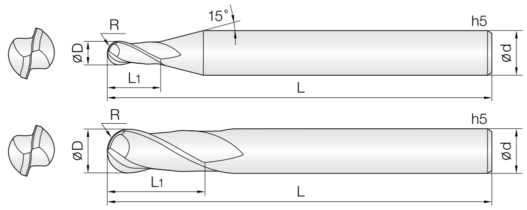
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 2HCBG

## 2 Flutes Standard Length Ball End Mills for Multi Purpose

## 2날 범용 표준 길이 볼 엔드밀






- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강 등 다양한 피삭재 가공**
- JCRO 코팅 처리하여 넓은 영역의 피삭재 가공에 적합합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택,엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels**
- Optimum for various work materials by JCRO coating.
- High precise edge tolerance.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

2 | WC 미립자 | JCRO Coating | R ± 0.005 | R ± 0.01 | R ± 0.015 | 35° Helix Angle | CUTTING DATA

0.05~2.75R | 3 ~ 6R | 6.5 ~ 10R | 461P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.1 ~ 0.15 | +0 ~ -0.005mm |
| | Ø0.2 ~ 20 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |
| | Ø14 ~ 20 | -0.01 ~ -0.02mm |

단위 : mm

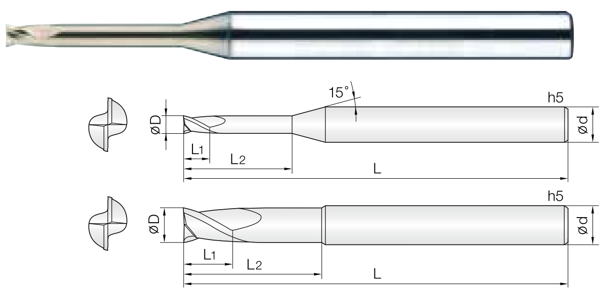
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2HCBG 001 002 S04 | 0.05R X 0.1 | 0.2 | 40 | 4 | |
| 2HCBG 0015 003 S04 | 0.075R X 0.15 | 0.3 | 40 | 4 | |
| 2HCBG 002 004 S04 | 0.1R X 0.2 | 0.4 | 40 | 4 | |
| 2HCBG 003 006 S04 | 0.15R X 0.3 | 0.6 | 40 | 4 | |
| 2HCBG 004 008 S04 | 0.2R X 0.4 | 0.8 | 40 | 4 | |
| 2HCBG 005 010 S04 | 0.25R X 0.5 | 1 | 45 | 4 | |
| 2HCBG 006 012 S04 | 0.3R X 0.6 | 1.2 | 45 | 4 | |
| 2HCBG 007 015 S04 | 0.35R X 0.7 | 1.5 | 45 | 4 | |
| 2HCBG 008 020 S04 | 0.4R X 0.8 | 2 | 45 | 4 | |
| 2HCBG 009 020 S04 | 0.45R X 0.9 | 2 | 45 | 4 | |
| 2HCBG 010 025 S04 | 0.5R X 1 | 2.5 | 50 | 4 | |
| 2HCBG 010 025 S06 | 0.5R X 1 | 2.5 | 50 | 6 | |
| 2HCBG 010 025 070 | 0.5R X 1 | 2.5 | 70 | 6 | |
| 2HCBG 010 025 100 | 0.5R X 1 | 2.5 | 100 | 6 | |
| 2HCBG 012 030 S04 | 0.6R X 1.2 | 3 | 50 | 4 | |
| 2HCBG 015 040 S04 | 0.75R X 1.5 | 4 | 50 | 4 | |
| 2HCBG 015 040 S06 | 0.75R X 1.5 | 4 | 50 | 6 | |
| 2HCBG 015 040 070 | 0.75R X 1.5 | 4 | 70 | 6 | |
| 2HCBG 015 040 100 | 0.75R X 1.5 | 4 | 100 | 6 | |
| 2HCBG 020 050 S04 | 1R X 2 | 5 | 50 | 4 | |
| 2HCBG 020 050 S06 | 1R X 2 | 5 | 50 | 6 | |
| 2HCBG 020 050 075 | 1R X 2 | 5 | 75 | 6 | |
| 2HCBG 020 050 100 | 1R X 2 | 5 | 100 | 6 | |
| 2HCBG 025 060 S04 | 1.25R X 2.5 | 6 | 50 | 4 | |
| 2HCBG 025 060 S06 | 1.25R X 2.5 | 6 | 60 | 6 | |
| 2HCBG 025 060 075 | 1.25R X 2.5 | 6 | 75 | 6 | |
| 2HCBG 025 060 100 | 1.25R X 2.5 | 6 | 100 | 6 | |
| 2HCBG 030 080 S03 | 1.5R X 3 | 8 | 60 | 3 | |
| 2HCBG 030 080 S04 | 1.5R X 3 | 8 | 50 | 4 | |
| 2HCBG 030 080 S06 | 1.5R X 3 | 8 | 60 | 6 | |
| 2HCBG 030 080 080 | 1.5R X 3 | 8 | 80 | 6 | |
| 2HCBG 030 080 100 | 1.5R X 3 | 8 | 100 | 6 | |
| 2HCBG 035 080 S06 | 1.75R X 3.5 | 8 | 60 | 6 | |
| 2HCBG 040 080 060 | 2R X 4 | 8 | 60 | 4 | |
| 2HCBG 040 080 080 | 2R X 4 | 8 | 80 | 4 | |
| 2HCBG 040 080 S06 | 2R X 4 | 8 | 70 | 6 | |
| 2HCBG 040 080 090 | 2R X 4 | 8 | 90 | 6 | |
| 2HCBG 040 080 120 | 2R X 4 | 8 | 120 | 6 | |
| 2HCBG 045 080 S06 | 2.25R X 4.5 | 8 | 70 | 6 | |
| 2HCBG 050 080 S05 | 2.5R X 5 | 8 | 80 | 5 | |
| 2HCBG 050 100 S06 | 2.5R X 5 | 10 | 75 | 6 | |
| 2HCBG 055 100 S06 | 2.75R X 5.5 | 10 | 75 | 6 | |
| 2HCBG 060 100 060 | 3R X 6 | 10 | 60 | 6 | |
| 2HCBG 060 120 080 | 3R X 6 | 12 | 80 | 6 | |
| 2HCBG 060 120 100 | 3R X 6 | 12 | 100 | 6 | |
| 2HCBG 060 120 120 | 3R X 6 | 12 | 120 | 6 | |
| 2HCBG 070 140 S08 | 3.5R X 7 | 14 | 80 | 8 | |
| 2HCBG 080 120 060 | 4R X 8 | 12 | 60 | 8 | |
| 2HCBG 080 140 090 | 4R X 8 | 14 | 90 | 8 | |
| 2HCBG 080 140 110 | 4R X 8 | 14 | 110 | 8 | |

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2HCBG 080 140 150 | 4R X 8 | 14 | 150 | 8 | |
| 2HCBG 090 160 S10 | 4.5R X 9 | 16 | 100 | 10 | |
| 2HCBG 100 150 070 | 5R X 10 | 15 | 70 | 10 | |
| 2HCBG 100 180 100 | 5R X 10 | 18 | 100 | 10 | |
| 2HCBG 100 180 120 | 5R X 10 | 18 | 120 | 10 | |
| 2HCBG 100 180 150 | 5R X 10 | 18 | 150 | 10 | |
| 2HCBG 100 180 180 | 5R X 10 | 18 | 180 | 10 | |
| 2HCBG 110 200 S12 | 5.5R X 11 | 20 | 110 | 12 | |
| 2HCBG 120 180 070 | 6R X 12 | 18 | 70 | 12 | |
| 2HCBG 120 220 110 | 6R X 12 | 22 | 110 | 12 | |
| 2HCBG 120 220 130 | 6R X 12 | 22 | 130 | 12 | |
| 2HCBG 120 220 150 | 6R X 12 | 22 | 150 | 12 | |
| 2HCBG 120 220 200 | 6R X 12 | 22 | 200 | 12 | |
| 2HCBG 130 240 S14 | 6.5R X 13 | 24 | 110 | 14 | |
| 2HCBG 140 240 S14 | 7R X 14 | 24 | 110 | 14 | |
| 2HCBG 160 300 130 | 8R X 16 | 30 | 130 | 16 | |
| 2HCBG 160 300 160 | 8R X 16 | 30 | 160 | 16 | |
| 2HCBG 160 300 200 | 8R X 16 | 30 | 200 | 16 | |
| 2HCBG 200 380 160 | 10R X 20 | 38 | 160 | 20 | |
| 2HCBG 200 380 200 | 10R X 20 | 38 | 200 | 20 | |

# 2HREG

*2 Flutes Rib End Mills for Multi Purpose*

## 2날 범용 리브 엔드밀




- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강 등 다양한 피삭재 가공**
- JCRO 코팅 처리하여 넓은 영역의 피삭재 가공에 적합합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택,엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels**
- Optimum for various work materials by JCRO coating.
- High precise edge tolerance.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

2 | WC 미립자 | JCRO Coating | 35° Helix Angle | Shield Edge | CUTTING DATA 462P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.1 | +0 ~ -0.005mm |
| | Ø0.2 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 12 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HREG 001 003 S04 | 0.1 | 0.15 | 0.3 | 40 | 4 | |
| 2HREG 001 005 S04 | 0.1 | 0.15 | 0.5 | 40 | 4 | |
| 2HREG 002 005 S04 | 0.2 | 0.3 | 0.5 | 40 | 4 | |
| 2HREG 002 010 S04 | 0.2 | 0.2 | 1 | 40 | 4 | |
| 2HREG 002 015 S04 | 0.2 | 0.2 | 1.5 | 40 | 4 | |
| 2HREG 002 020 S04 | 0.2 | 0.2 | 2 | 40 | 4 | |
| 2HREG 003 010 S04 | 0.3 | 0.3 | 1 | 40 | 4 | |
| 2HREG 003 015 S04 | 0.3 | 0.3 | 1.5 | 40 | 4 | |
| 2HREG 003 020 S04 | 0.3 | 0.3 | 2 | 40 | 4 | |
| 2HREG 003 030 S04 | 0.3 | 0.3 | 3 | 40 | 4 | |
| 2HREG 003 040 S04 | 0.3 | 0.3 | 4 | 40 | 4 | |
| 2HREG 003 050 S04 | 0.3 | 0.3 | 5 | 40 | 4 | |
| 2HREG 004 010 S04 | 0.4 | 0.4 | 1 | 40 | 4 | |
| 2HREG 004 020 S04 | 0.4 | 0.4 | 2 | 40 | 4 | |
| 2HREG 004 030 S04 | 0.4 | 0.4 | 3 | 40 | 4 | |
| 2HREG 004 040 S04 | 0.4 | 0.4 | 4 | 40 | 4 | |
| 2HREG 004 050 S04 | 0.4 | 0.4 | 5 | 40 | 4 | |
| 2HREG 004 060 S04 | 0.4 | 0.4 | 6 | 40 | 4 | |
| 2HREG 004 080 S04 | 0.4 | 0.4 | 8 | 40 | 4 | |
| 2HREG 004 100 S04 | 0.4 | 0.4 | 10 | 40 | 4 | |
| 2HREG 005 020 S04 | 0.5 | 0.5 | 2 | 45 | 4 | |
| 2HREG 005 030 S04 | 0.5 | 0.5 | 3 | 45 | 4 | |
| 2HREG 005 040 S04 | 0.5 | 0.5 | 4 | 45 | 4 | |
| 2HREG 005 050 S04 | 0.5 | 0.5 | 5 | 45 | 4 | |
| 2HREG 005 060 S04 | 0.5 | 0.5 | 6 | 45 | 4 | |
| 2HREG 005 080 S04 | 0.5 | 0.5 | 8 | 45 | 4 | |
| 2HREG 005 100 S04 | 0.5 | 0.5 | 10 | 45 | 4 | |
| 2HREG 005 120 S04 | 0.5 | 0.5 | 12 | 45 | 4 | |
| 2HREG 005 140 S04 | 0.5 | 0.5 | 14 | 45 | 4 | |
| 2HREG 006 020 S04 | 0.6 | 0.6 | 2 | 45 | 4 | |
| 2HREG 006 030 S04 | 0.6 | 0.6 | 3 | 45 | 4 | |
| 2HREG 006 040 S04 | 0.6 | 0.6 | 4 | 45 | 4 | |
| 2HREG 006 050 S04 | 0.6 | 0.6 | 5 | 45 | 4 | |
| 2HREG 006 060 S04 | 0.6 | 0.6 | 6 | 45 | 4 | |
| 2HREG 006 080 S04 | 0.6 | 0.6 | 8 | 45 | 4 | |
| 2HREG 006 100 S04 | 0.6 | 0.6 | 10 | 45 | 4 | |
| 2HREG 006 120 S04 | 0.6 | 0.6 | 12 | 45 | 4 | |
| 2HREG 006 140 S04 | 0.6 | 0.6 | 14 | 45 | 4 | |
| 2HREG 006 160 S04 | 0.6 | 0.6 | 16 | 45 | 4 | |
| 2HREG 007 020 S04 | 0.7 | 0.7 | 2 | 45 | 4 | |
| 2HREG 007 040 S04 | 0.7 | 0.7 | 4 | 45 | 4 | |
| 2HREG 007 060 S04 | 0.7 | 0.7 | 6 | 45 | 4 | |
| 2HREG 007 080 S04 | 0.7 | 0.7 | 8 | 45 | 4 | |
| 2HREG 007 100 S04 | 0.7 | 0.7 | 10 | 45 | 4 | |
| 2HREG 007 120 S04 | 0.7 | 0.7 | 12 | 45 | 4 | |
| 2HREG 008 020 S04 | 0.8 | 0.8 | 2 | 45 | 4 | |
| 2HREG 008 040 S04 | 0.8 | 0.8 | 4 | 45 | 4 | |
| 2HREG 008 060 S04 | 0.8 | 0.8 | 6 | 45 | 4 | |
| 2HREG 008 080 S04 | 0.8 | 0.8 | 8 | 45 | 4 | |
| 2HREG 008 100 S04 | 0.8 | 0.8 | 10 | 45 | 4 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HREG 008 120 S04 | 0.8 | 0.8 | 12 | 45 | 4 | |
| 2HREG 008 140 S04 | 0.8 | 0.8 | 14 | 45 | 4 | |
| 2HREG 009 060 S04 | 0.9 | 0.9 | 6 | 45 | 4 | |
| 2HREG 009 080 S04 | 0.9 | 0.9 | 8 | 45 | 4 | |
| 2HREG 009 100 S04 | 0.9 | 0.9 | 10 | 45 | 4 | |
| 2HREG 010 020 S04 | 1 | 1 | 2 | 45 | 4 | |
| 2HREG 010 030 S04 | 1 | 1 | 3 | 45 | 4 | |
| 2HREG 010 040 S04 | 1 | 1 | 4 | 45 | 4 | |
| 2HREG 010 050 S04 | 1 | 1 | 5 | 45 | 4 | |
| 2HREG 010 060 S04 | 1 | 1 | 6 | 45 | 4 | |
| 2HREG 010 080 S04 | 1 | 1 | 8 | 45 | 4 | |
| 2HREG 010 100 S04 | 1 | 1 | 10 | 50 | 4 | |
| 2HREG 010 120 S04 | 1 | 1 | 12 | 50 | 4 | |
| 2HREG 010 140 S04 | 1 | 1 | 14 | 50 | 4 | |
| 2HREG 010 160 S04 | 1 | 1 | 16 | 50 | 4 | |
| 2HREG 010 180 S04 | 1 | 1 | 18 | 50 | 4 | |
| 2HREG 010 200 S04 | 1 | 1 | 20 | 50 | 4 | |
| 2HREG 010 250 S04 | 1 | 1 | 25 | 60 | 4 | |
| 2HREG 010 300 S04 | 1 | 1 | 30 | 70 | 4 | |
| 2HREG 012 040 S04 | 1.2 | 1.2 | 4 | 45 | 4 | |
| 2HREG 012 060 S04 | 1.2 | 1.2 | 6 | 45 | 4 | |
| 2HREG 012 080 S04 | 1.2 | 1.2 | 8 | 45 | 4 | |
| 2HREG 012 100 S04 | 1.2 | 1.2 | 10 | 50 | 4 | |
| 2HREG 012 120 S04 | 1.2 | 1.2 | 12 | 50 | 4 | |
| 2HREG 012 160 S04 | 1.2 | 1.2 | 16 | 50 | 4 | |
| 2HREG 012 200 S04 | 1.2 | 1.2 | 20 | 50 | 4 | |
| 2HREG 012 250 S04 | 1.2 | 1.2 | 25 | 60 | 4 | |
| 2HREG 012 300 S04 | 1.2 | 1.2 | 30 | 70 | 4 | |
| 2HREG 014 060 S04 | 1.4 | 1.4 | 6 | 45 | 4 | |
| 2HREG 014 080 S04 | 1.4 | 1.4 | 8 | 45 | 4 | |
| 2HREG 014 100 S04 | 1.4 | 1.4 | 10 | 50 | 4 | |
| 2HREG 014 140 S04 | 1.4 | 1.4 | 14 | 50 | 4 | |
| 2HREG 014 160 S04 | 1.4 | 1.4 | 16 | 50 | 4 | |
| 2HREG 014 200 S04 | 1.4 | 1.4 | 20 | 50 | 4 | |
| 2HREG 015 040 S04 | 1.5 | 1.5 | 4 | 45 | 4 | |
| 2HREG 015 060 S04 | 1.5 | 1.5 | 6 | 45 | 4 | |
| 2HREG 015 080 S04 | 1.5 | 1.5 | 8 | 45 | 4 | |
| 2HREG 015 100 S04 | 1.5 | 1.5 | 10 | 50 | 4 | |
| 2HREG 015 120 S04 | 1.5 | 1.5 | 12 | 50 | 4 | |
| 2HREG 015 140 S04 | 1.5 | 1.5 | 14 | 50 | 4 | |
| 2HREG 015 160 S04 | 1.5 | 1.5 | 16 | 50 | 4 | |
| 2HREG 015 180 S04 | 1.5 | 1.5 | 18 | 50 | 4 | |
| 2HREG 015 200 S04 | 1.5 | 1.5 | 20 | 50 | 4 | |
| 2HREG 015 250 S04 | 1.5 | 1.5 | 25 | 60 | 4 | |
| 2HREG 015 300 S04 | 1.5 | 1.5 | 30 | 70 | 4 | |
| 2HREG 016 100 S04 | 1.6 | 1.6 | 10 | 50 | 4 | |
| 2HREG 016 140 S04 | 1.6 | 1.6 | 14 | 50 | 4 | |
| 2HREG 016 180 S04 | 1.6 | 1.6 | 18 | 50 | 4 | |
| 2HREG 018 100 S04 | 1.8 | 1.8 | 10 | 50 | 4 | |
| 2HREG 018 140 S04 | 1.8 | 1.8 | 14 | 50 | 4 | |

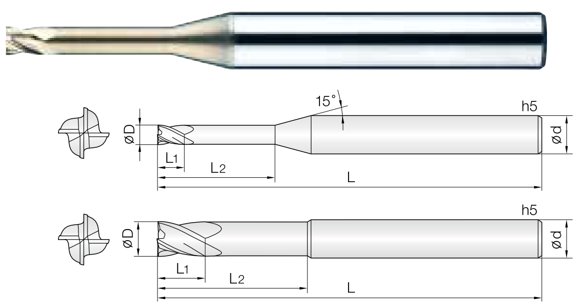
단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2HREG 018 180 S04 | 1.8 | 1.8 | 18 | 50 | 4 | |
| 2HREG 020 040 S04 | 2 | 2 | 4 | 45 | 4 | |
| 2HREG 020 060 S04 | 2 | 2 | 6 | 45 | 4 | |
| 2HREG 020 080 S04 | 2 | 2 | 8 | 45 | 4 | |
| 2HREG 020 100 S04 | 2 | 2 | 10 | 50 | 4 | |
| 2HREG 020 120 S04 | 2 | 2 | 12 | 50 | 4 | |
| 2HREG 020 140 S04 | 2 | 2 | 14 | 50 | 4 | |
| 2HREG 020 160 S04 | 2 | 2 | 16 | 50 | 4 | |
| 2HREG 020 180 S04 | 2 | 2 | 18 | 50 | 4 | |
| 2HREG 020 200 S04 | 2 | 2 | 20 | 50 | 4 | |
| 2HREG 020 220 S04 | 2 | 2 | 22 | 60 | 4 | |
| 2HREG 020 250 S04 | 2 | 2 | 25 | 60 | 4 | |
| 2HREG 020 300 S04 | 2 | 2 | 30 | 70 | 4 | |
| 2HREG 020 350 S04 | 2 | 2 | 35 | 70 | 4 | |
| 2HREG 020 400 S04 | 2 | 2 | 40 | 80 | 4 | |
| 2HREG 020 450 S04 | 2 | 2 | 45 | 80 | 4 | |
| 2HREG 020 500 S04 | 2 | 2 | 50 | 90 | 4 | |
| 2HREG 025 080 S04 | 2.5 | 2.5 | 8 | 45 | 4 | |
| 2HREG 025 100 S04 | 2.5 | 2.5 | 10 | 50 | 4 | |
| 2HREG 025 120 S04 | 2.5 | 2.5 | 12 | 50 | 4 | |
| 2HREG 025 160 S04 | 2.5 | 2.5 | 16 | 50 | 4 | |
| 2HREG 025 200 S04 | 2.5 | 2.5 | 20 | 50 | 4 | |
| 2HREG 025 250 S04 | 2.5 | 2.5 | 25 | 60 | 4 | |
| 2HREG 025 300 S04 | 2.5 | 2.5 | 30 | 70 | 4 | |
| 2HREG 025 350 S04 | 2.5 | 2.5 | 35 | 70 | 4 | |
| 2HREG 025 400 S04 | 2.5 | 2.5 | 40 | 80 | 4 | |
| 2HREG 025 500 S04 | 2.5 | 2.5 | 50 | 90 | 4 | |
| 2HREG 030 060 S06 | 3 | 3 | 6 | 45 | 6 | |
| 2HREG 030 080 S06 | 3 | 3 | 8 | 45 | 6 | |
| 2HREG 030 100 S06 | 3 | 3 | 10 | 50 | 6 | |
| 2HREG 030 120 S06 | 3 | 3 | 12 | 50 | 6 | |
| 2HREG 030 160 S06 | 3 | 3 | 16 | 55 | 6 | |
| 2HREG 030 200 S06 | 3 | 3 | 20 | 60 | 6 | |
| 2HREG 030 250 S06 | 3 | 3 | 25 | 65 | 6 | |
| 2HREG 030 300 S06 | 3 | 3 | 30 | 70 | 6 | |
| 2HREG 030 350 S06 | 3 | 3 | 35 | 75 | 6 | |
| 2HREG 030 400 S06 | 3 | 3 | 40 | 80 | 6 | |
| 2HREG 030 450 S06 | 3 | 3 | 45 | 90 | 6 | |
| 2HREG 030 500 S06 | 3 | 3 | 50 | 100 | 6 | |
| 2HREG 030 600 S06 | 3 | 3 | 60 | 100 | 6 | |
| 2HREG 040 080 S06 | 4 | 4 | 8 | 45 | 6 | |
| 2HREG 040 100 S06 | 4 | 4 | 10 | 50 | 6 | |
| 2HREG 040 120 S06 | 4 | 4 | 12 | 50 | 6 | |
| 2HREG 040 160 S06 | 4 | 4 | 16 | 55 | 6 | |
| 2HREG 040 200 S06 | 4 | 4 | 20 | 60 | 6 | |
| 2HREG 040 250 S06 | 4 | 4 | 25 | 65 | 6 | |
| 2HREG 040 300 S06 | 4 | 4 | 30 | 70 | 6 | |
| 2HREG 040 350 S06 | 4 | 4 | 35 | 75 | 6 | |
| 2HREG 040 400 S06 | 4 | 4 | 40 | 80 | 6 | |
| 2HREG 040 450 S06 | 4 | 4 | 45 | 90 | 6 | |
| 2HREG 040 500 S06 | 4 | 4 | 50 | 100 | 6 | |
| 2HREG 040 550 S06 | 4 | 4 | 55 | 100 | 6 | |
| 2HREG 040 600 S06 | 4 | 4 | 60 | 100 | 6 | |
| 2HREG 050 150 S06 | 5 | 6 | 15 | 55 | 6 | |
| 2HREG 050 200 S06 | 5 | 6 | 20 | 60 | 6 | |
| 2HREG 050 250 S06 | 5 | 6 | 25 | 70 | 6 | |
| 2HREG 050 300 S06 | 5 | 6 | 30 | 75 | 6 | |
| 2HREG 050 350 S06 | 5 | 6 | 35 | 75 | 6 | |
| 2HREG 050 400 S06 | 5 | 6 | 40 | 80 | 6 | |
| 2HREG 050 500 S06 | 5 | 6 | 50 | 100 | 6 | |
| 2HREG 050 600 S06 | 5 | 6 | 60 | 100 | 6 | |
| 2HREG 060 200 S06 | 6 | 10 | 20 | 60 | 6 | |
| 2HREG 060 300 S06 | 6 | 10 | 30 | 75 | 6 | |
| 2HREG 060 400 S06 | 6 | 10 | 40 | 80 | 6 | |
| 2HREG 060 500 S06 | 6 | 10 | 50 | 90 | 6 | |
| 2HREG 060 600 S06 | 6 | 10 | 60 | 110 | 6 | |
| 2HREG 080 200 S08 | 8 | 12 | 20 | 65 | 8 | |
| 2HREG 080 300 S08 | 8 | 12 | 30 | 80 | 8 | |
| 2HREG 080 400 S08 | 8 | 12 | 40 | 100 | 8 | |
| 2HREG 100 250 S10 | 10 | 15 | 25 | 70 | 10 | |
| 2HREG 100 350 S10 | 10 | 15 | 35 | 80 | 10 | |
| 2HREG 100 450 S10 | 10 | 15 | 45 | 100 | 10 | |
| 2HREG 120 300 S12 | 12 | 18 | 30 | 80 | 12 | |
| 2HREG 120 400 S12 | 12 | 18 | 40 | 100 | 12 | |
| 2HREG 120 500 S12 | 12 | 18 | 50 | 120 | 12 | |

# 4HREG

## 4 Flutes Rib End Mills for Multi Purpose

## 4날 범용 리브 엔드밀




- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강 등 다양한 피삭재 가공**
- JCRO 코팅 처리하여 넓은 영역의 피삭재 가공에 적합합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택,엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels**
- Optimum for various work materials by JCRO coating.
- High precise edge tolerance.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.




| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.8 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 12 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |

단위 : mm

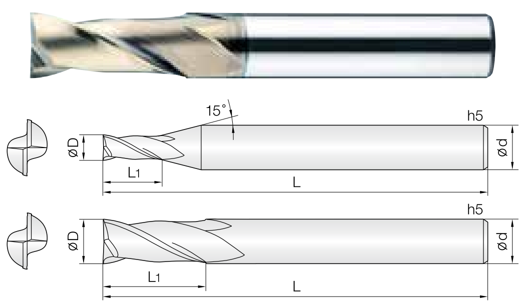
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4HREG 008 020 S04 | 0.8 | 0.8 | 2 | 45 | 4 | |
| 4HREG 008 040 S04 | 0.8 | 0.8 | 4 | 45 | 4 | |
| 4HREG 008 060 S04 | 0.8 | 0.8 | 6 | 45 | 4 | |
| 4HREG 008 080 S04 | 0.8 | 0.8 | 8 | 45 | 4 | |
| 4HREG 008 100 S04 | 0.8 | 0.8 | 10 | 45 | 4 | |
| 4HREG 008 120 S04 | 0.8 | 0.8 | 12 | 45 | 4 | |
| 4HREG 008 160 S04 | 0.8 | 0.8 | 16 | 45 | 4 | |
| 4HREG 009 020 S04 | 0.9 | 0.9 | 2 | 45 | 4 | |
| 4HREG 009 060 S04 | 0.9 | 0.9 | 6 | 45 | 4 | |
| 4HREG 009 080 S04 | 0.9 | 0.9 | 8 | 45 | 4 | |
| 4HREG 009 100 S04 | 0.9 | 0.9 | 10 | 45 | 4 | |
| 4HREG 010 030 S04 | 1 | 1 | 3 | 45 | 4 | |
| 4HREG 010 040 S04 | 1 | 1 | 4 | 45 | 4 | |
| 4HREG 010 060 S04 | 1 | 1 | 6 | 45 | 4 | |
| 4HREG 010 080 S04 | 1 | 1 | 8 | 45 | 4 | |
| 4HREG 010 100 S04 | 1 | 1 | 10 | 50 | 4 | |
| 4HREG 010 120 S04 | 1 | 1 | 12 | 50 | 4 | |
| 4HREG 010 160 S04 | 1 | 1 | 16 | 50 | 4 | |
| 4HREG 010 200 S04 | 1 | 1 | 20 | 50 | 4 | |
| 4HREG 010 250 S04 | 1 | 1 | 25 | 60 | 4 | |
| 4HREG 012 060 S04 | 1.2 | 1.2 | 6 | 45 | 4 | |
| 4HREG 012 080 S04 | 1.2 | 1.2 | 8 | 45 | 4 | |
| 4HREG 012 100 S04 | 1.2 | 1.2 | 10 | 50 | 4 | |
| 4HREG 012 120 S04 | 1.2 | 1.2 | 12 | 50 | 4 | |
| 4HREG 012 160 S04 | 1.2 | 1.2 | 16 | 50 | 4 | |
| 4HREG 015 060 S04 | 1.5 | 1.5 | 6 | 45 | 4 | |
| 4HREG 015 080 S04 | 1.5 | 1.5 | 8 | 45 | 4 | |
| 4HREG 015 100 S04 | 1.5 | 1.5 | 10 | 50 | 4 | |
| 4HREG 015 120 S04 | 1.5 | 1.5 | 12 | 50 | 4 | |
| 4HREG 015 160 S04 | 1.5 | 1.5 | 16 | 50 | 4 | |
| 4HREG 015 200 S04 | 1.5 | 1.5 | 20 | 50 | 4 | |
| 4HREG 015 250 S04 | 1.5 | 1.5 | 25 | 60 | 4 | |
| 4HREG 020 060 S04 | 2 | 2 | 6 | 45 | 4 | |
| 4HREG 020 080 S04 | 2 | 2 | 8 | 45 | 4 | |
| 4HREG 020 100 S04 | 2 | 2 | 10 | 50 | 4 | |
| 4HREG 020 120 S04 | 2 | 2 | 12 | 50 | 4 | |
| 4HREG 020 160 S04 | 2 | 2 | 16 | 50 | 4 | |
| 4HREG 020 200 S04 | 2 | 2 | 20 | 50 | 4 | |
| 4HREG 020 250 S04 | 2 | 2 | 25 | 60 | 4 | |
| 4HREG 020 300 S04 | 2 | 2 | 30 | 70 | 4 | |
| 4HREG 025 100 S04 | 2.5 | 2.5 | 10 | 50 | 4 | |
| 4HREG 025 120 S04 | 2.5 | 2.5 | 12 | 50 | 4 | |
| 4HREG 025 160 S04 | 2.5 | 2.5 | 16 | 50 | 4 | |
| 4HREG 025 200 S04 | 2.5 | 2.5 | 20 | 50 | 4 | |
| 4HREG 025 250 S04 | 2.5 | 2.5 | 25 | 60 | 4 | |
| 4HREG 025 300 S04 | 2.5 | 2.5 | 30 | 70 | 4 | |
| 4HREG 030 100 S06 | 3 | 3 | 10 | 50 | 6 | |
| 4HREG 030 120 S06 | 3 | 3 | 12 | 50 | 6 | |
| 4HREG 030 160 S06 | 3 | 3 | 16 | 55 | 6 | |
| 4HREG 030 200 S06 | 3 | 3 | 20 | 60 | 6 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4HREG 030 250 S06 | 3 | 3 | 25 | 65 | 6 | |
| 4HREG 030 300 S06 | 3 | 3 | 30 | 70 | 6 | |
| 4HREG 030 350 S06 | 3 | 3 | 35 | 75 | 6 | |
| 4HREG 030 400 S06 | 3 | 3 | 40 | 80 | 6 | |
| 4HREG 040 100 S06 | 4 | 4 | 10 | 50 | 6 | |
| 4HREG 040 120 S06 | 4 | 4 | 12 | 50 | 6 | |
| 4HREG 040 160 S06 | 4 | 4 | 16 | 55 | 6 | |
| 4HREG 040 200 S06 | 4 | 4 | 20 | 60 | 6 | |
| 4HREG 040 250 S06 | 4 | 4 | 25 | 65 | 6 | |
| 4HREG 040 300 S06 | 4 | 4 | 30 | 70 | 6 | |
| 4HREG 040 400 S06 | 4 | 4 | 40 | 80 | 6 | |
| 4HREG 040 450 S06 | 4 | 4 | 45 | 90 | 6 | |
| 4HREG 040 500 S06 | 4 | 4 | 50 | 100 | 6 | |
| 4HREG 050 150 S06 | 5 | 5 | 15 | 55 | 6 | |
| 4HREG 050 200 S06 | 5 | 5 | 20 | 60 | 6 | |
| 4HREG 050 250 S06 | 5 | 5 | 25 | 65 | 6 | |
| 4HREG 050 300 S06 | 5 | 5 | 30 | 70 | 6 | |
| 4HREG 050 400 S06 | 5 | 5 | 40 | 80 | 6 | |
| 4HREG 050 500 S06 | 5 | 5 | 50 | 100 | 6 | |
| 4HREG 060 200 S06 | 6 | 6 | 20 | 60 | 6 | |
| 4HREG 060 300 S06 | 6 | 6 | 30 | 75 | 6 | |
| 4HREG 060 400 S06 | 6 | 6 | 40 | 80 | 6 | |
| 4HREG 060 500 S06 | 6 | 6 | 50 | 90 | 6 | |
| 4HREG 080 200 S08 | 8 | 12 | 20 | 65 | 8 | |
| 4HREG 080 300 S08 | 8 | 12 | 30 | 80 | 8 | |
| 4HREG 080 400 S08 | 8 | 12 | 40 | 100 | 8 | |
| 4HREG 100 250 S10 | 10 | 15 | 25 | 70 | 10 | |
| 4HREG 100 350 S10 | 10 | 15 | 35 | 90 | 10 | |
| 4HREG 100 450 S10 | 10 | 15 | 45 | 110 | 10 | |
| 4HREG 120 300 S12 | 12 | 18 | 30 | 80 | 12 | |
| 4HREG 120 400 S12 | 12 | 18 | 40 | 100 | 12 | |
| 4HREG 120 500 S12 | 12 | 18 | 50 | 120 | 12 | |

# 2HCEG

## 2 Flutes Standard Length End Mills for Multi Purpose

## 2날 범용 표준 길이 엔드밀




- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강 등 다양한 피삭재 가공**
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- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택,엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels**
- Optimum for various work materials by JCRO coating.
- High precise edge tolerance.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.




| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø0.1 ~ 0.15 | +0 ~ -0.005mm | ØD = Ød | Ø4 ~ 6 | -0.005 ~ -0.015mm |
| | Ø0.2 ~ 6 | +0 ~ -0.01mm | | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø6.5 ~ 20 | +0 ~ -0.015mm | | Ø14 ~ 20 | -0.015 ~ -0.03mm |

단위 : mm

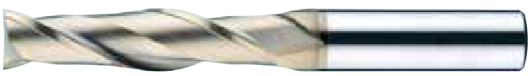
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2HCEG 001 002 S04 | 0.1 | 0.2 | 40 | 4 | |
| 2HCEG 0015 003 S04 | 0.15 | 0.3 | 40 | 4 | |
| 2HCEG 002 004 S04 | 0.2 | 0.4 | 40 | 4 | |
| 2HCEG 0025 005 S04 | 0.25 | 0.5 | 40 | 4 | |
| 2HCEG 003 006 S04 | 0.3 | 0.6 | 40 | 4 | |
| 2HCEG 0035 007 S04 | 0.35 | 0.7 | 40 | 4 | |
| 2HCEG 004 008 S04 | 0.4 | 0.8 | 40 | 4 | |
| 2HCEG 0045 009 S04 | 0.45 | 0.9 | 40 | 4 | |
| 2HCEG 005 010 S04 | 0.5 | 1 | 40 | 4 | |
| 2HCEG 0055 011 S04 | 0.55 | 1.1 | 40 | 4 | |
| 2HCEG 006 012 S04 | 0.6 | 1.2 | 40 | 4 | |
| 2HCEG 0065 013 S04 | 0.65 | 1.3 | 40 | 4 | |
| 2HCEG 007 014 S04 | 0.7 | 1.4 | 40 | 4 | |
| 2HCEG 0075 015 S04 | 0.75 | 1.5 | 40 | 4 | |
| 2HCEG 008 016 S04 | 0.8 | 1.6 | 40 | 4 | |
| 2HCEG 0085 017 S04 | 0.85 | 1.7 | 40 | 4 | |
| 2HCEG 009 020 S04 | 0.9 | 2 | 40 | 4 | |
| 2HCEG 0095 020 S04 | 0.95 | 2 | 40 | 4 | |
| 2HCEG 010 010 S04 | 1 | 1 | 40 | 4 | |
| 2HCEG 010 025 S04 | 1 | 2.5 | 40 | 4 | |
| 2HCEG 010 025 S06 | 1 | 2.5 | 40 | 6 | |
| 2HCEG 010 025 060 | 1 | 2.5 | 60 | 6 | |
| 2HCEG 010 040 S06 | 1 | 4 | 50 | 6 | |
| 2HCEG 011 027 S04 | 1.1 | 2.7 | 40 | 4 | |
| 2HCEG 012 012 S04 | 1.2 | 1.2 | 40 | 4 | |
| 2HCEG 012 030 S04 | 1.2 | 3 | 40 | 4 | |
| 2HCEG 012 030 S06 | 1.2 | 3 | 40 | 6 | |
| 2HCEG 012 030 060 | 1.2 | 3 | 60 | 6 | |
| 2HCEG 012 060 S06 | 1.2 | 6 | 50 | 6 | |
| 2HCEG 013 032 S04 | 1.3 | 3.2 | 40 | 4 | |
| 2HCEG 014 035 S04 | 1.4 | 3.5 | 40 | 4 | |
| 2HCEG 015 015 S04 | 1.5 | 1.5 | 40 | 4 | |
| 2HCEG 015 040 S04 | 1.5 | 4 | 40 | 4 | |
| 2HCEG 015 040 S06 | 1.5 | 4 | 40 | 6 | |
| 2HCEG 015 040 060 | 1.5 | 4 | 60 | 6 | |
| 2HCEG 016 040 S04 | 1.6 | 4 | 40 | 4 | |
| 2HCEG 017 042 S04 | 1.7 | 4.2 | 40 | 4 | |
| 2HCEG 018 045 S04 | 1.8 | 4.5 | 40 | 4 | |
| 2HCEG 019 050 S04 | 1.9 | 5 | 40 | 4 | |
| 2HCEG 020 020 S04 | 2 | 2 | 40 | 4 | |
| 2HCEG 020 060 S04 | 2 | 6 | 40 | 4 | |
| 2HCEG 020 060 S06 | 2 | 6 | 40 | 6 | |
| 2HCEG 020 060 060 | 2 | 6 | 60 | 6 | |
| 2HCEG 021 060 S04 | 2.1 | 6 | 40 | 4 | |
| 2HCEG 022 060 S04 | 2.2 | 6 | 40 | 4 | |
| 2HCEG 023 060 S04 | 2.3 | 6 | 40 | 4 | |
| 2HCEG 024 080 S04 | 2.4 | 8 | 45 | 4 | |
| 2HCEG 025 080 S04 | 2.5 | 8 | 45 | 4 | |
| 2HCEG 025 080 S06 | 2.5 | 8 | 45 | 6 | |
| 2HCEG 025 080 070 | 2.5 | 8 | 70 | 6 | |

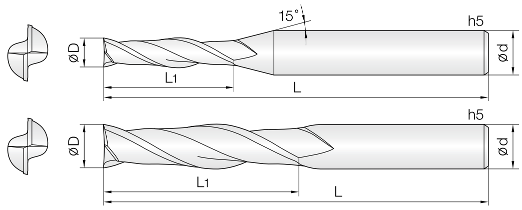
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2HCEG 026 080 S04 | 2.6 | 8 | 45 | 4 | |
| 2HCEG 027 080 S04 | 2.7 | 8 | 45 | 4 | |
| 2HCEG 028 080 S04 | 2.8 | 8 | 45 | 4 | |
| 2HCEG 029 080 S04 | 2.9 | 8 | 45 | 4 | |
| 2HCEG 030 030 S04 | 3 | 3 | 40 | 4 | |
| 2HCEG 030 080 S04 | 3 | 8 | 45 | 4 | |
| 2HCEG 030 080 S06 | 3 | 8 | 45 | 6 | |
| 2HCEG 030 080 070 | 3 | 8 | 70 | 6 | |
| 2HCEG 035 100 S06 | 3.5 | 10 | 45 | 6 | |
| 2HCEG 040 040 S04 | 4 | 4 | 40 | 4 | |
| 2HCEG 040 100 S04 | 4 | 10 | 45 | 4 | |
| 2HCEG 040 110 S06 | 4 | 11 | 45 | 6 | |
| 2HCEG 040 110 070 | 4 | 11 | 70 | 6 | |
| 2HCEG 045 110 S06 | 4.5 | 11 | 45 | 6 | |
| 2HCEG 050 130 S06 | 5 | 13 | 50 | 6 | |
| 2HCEG 050 130 080 | 5 | 13 | 80 | 6 | |
| 2HCEG 055 130 S06 | 5.5 | 13 | 50 | 6 | |
| 2HCEG 060 060 S06 | 6 | 6 | 45 | 6 | |
| 2HCEG 060 130 S06 | 6 | 13 | 50 | 6 | |
| 2HCEG 060 130 080 | 6 | 13 | 80 | 6 | |
| 2HCEG 060 150 S06 | 6 | 15 | 60 | 6 | |
| 2HCEG 065 160 S08 | 6.5 | 16 | 60 | 8 | |
| 2HCEG 070 160 S08 | 7 | 16 | 60 | 8 | |
| 2HCEG 075 160 S08 | 7.5 | 16 | 60 | 8 | |
| 2HCEG 080 080 S08 | 8 | 8 | 50 | 8 | |
| 2HCEG 080 190 S08 | 8 | 19 | 60 | 8 | |
| 2HCEG 080 200 S08 | 8 | 20 | 70 | 8 | |
| 2HCEG 085 190 S10 | 8.5 | 19 | 70 | 10 | |
| 2HCEG 090 190 S10 | 9 | 19 | 70 | 10 | |
| 2HCEG 095 190 S10 | 9.5 | 19 | 70 | 10 | |
| 2HCEG 100 100 S10 | 10 | 10 | 60 | 10 | |
| 2HCEG 100 220 S10 | 10 | 22 | 70 | 10 | |
| 2HCEG 100 250 S10 | 10 | 25 | 75 | 10 | |
| 2HCEG 105 220 S12 | 10.5 | 22 | 75 | 12 | |
| 2HCEG 110 220 S12 | 11 | 22 | 75 | 12 | |
| 2HCEG 115 220 S12 | 11.5 | 22 | 75 | 12 | |
| 2HCEG 120 120 S12 | 12 | 12 | 65 | 12 | |
| 2HCEG 120 260 S12 | 12 | 26 | 75 | 12 | |
| 2HCEG 120 300 S12 | 12 | 30 | 80 | 12 | |
| 2HCEG 140 260 S14 | 14 | 26 | 80 | 14 | |
| 2HCEG 140 260 S16 | 14 | 26 | 85 | 16 | |
| 2HCEG 160 350 S16 | 16 | 35 | 100 | 16 | |
| 2HCEG 160 400 S16 | 16 | 40 | 100 | 16 | |
| 2HCEG 180 350 S18 | 18 | 35 | 100 | 18 | |
| 2HCEG 200 400 S20 | 20 | 40 | 100 | 20 | |
| 2HCEG 200 500 S20 | 20 | 50 | 110 | 20 | |

# 2LEMG

## 2 Flutes Long Length End Mills for Multi Purpose

## 2날 범용 긴 길이 엔드밀






- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강 등 다양한 피삭재 가공**
- 균일한 런아웃 공차관리로 공구의 성능을 향상시켰습니다.
- 다양한 날길이와 전장을 채택, 다양한 작업에 효율성을 극대화 하였습니다.
- 코너부 강성을 보강하여 날부치핑을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels**
- Improve tool performance by even run-out and tolerance control.
- Various flute and overall length design for covering wide range applications as well as high efficiency machining.
- Minimize edge chipping by improving corner strength.

2 | WC 미립자 | JCRO Coating | 35° Helix Angle | Shield Edge | CUTTING DATA 466P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 25 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 25 | -0.015 ~ -0.03mm |

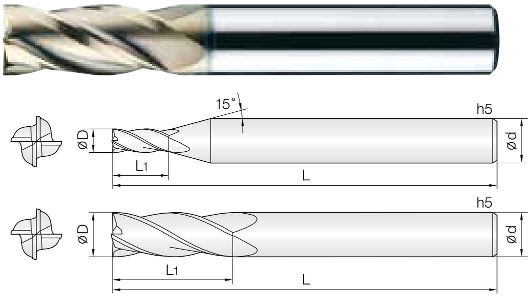
단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2LEMG 010 030 S06 | 1 | 3 | 60 | 6 | |
| 2LEMG 010 050 S06 | 1 | 5 | 60 | 6 | |
| 2LEMG 010 070 S06 | 1 | 7 | 60 | 6 | |
| 2LEMG 010 100 S06 | 1 | 10 | 60 | 6 | |
| 2LEMG 010 150 S06 | 1 | 15 | 60 | 6 | |
| 2LEMG 015 060 S06 | 1.5 | 6 | 60 | 6 | |
| 2LEMG 015 075 S06 | 1.5 | 7.5 | 60 | 6 | |
| 2LEMG 015 100 S06 | 1.5 | 10 | 60 | 6 | |
| 2LEMG 015 150 S06 | 1.5 | 15 | 60 | 6 | |
| 2LEMG 015 200 S06 | 1.5 | 20 | 60 | 6 | |
| 2LEMG 020 060 S06 | 2 | 6 | 60 | 6 | |
| 2LEMG 020 100 S06 | 2 | 10 | 60 | 6 | |
| 2LEMG 020 150 S06 | 2 | 15 | 60 | 6 | |
| 2LEMG 020 200 S06 | 2 | 20 | 60 | 6 | |
| 2LEMG 030 120 S06 | 3 | 12 | 70 | 6 | |
| 2LEMG 030 150 S06 | 3 | 15 | 70 | 6 | |
| 2LEMG 030 200 S06 | 3 | 20 | 70 | 6 | |
| 2LEMG 030 250 S06 | 3 | 25 | 70 | 6 | |
| 2LEMG 030 300 S06 | 3 | 30 | 70 | 6 | |
| 2LEMG 040 150 S06 | 4 | 15 | 70 | 6 | |
| 2LEMG 040 200 S06 | 4 | 20 | 70 | 6 | |
| 2LEMG 040 300 S06 | 4 | 30 | 75 | 6 | |
| 2LEMG 050 200 S06 | 5 | 20 | 70 | 6 | |
| 2LEMG 050 250 S06 | 5 | 25 | 75 | 6 | |
| 2LEMG 050 300 S06 | 5 | 30 | 80 | 6 | |
| 2LEMG 060 200 S06 | 6 | 20 | 75 | 6 | |
| 2LEMG 060 200 100 | 6 | 20 | 100 | 6 | |
| 2LEMG 060 250 S06 | 6 | 25 | 75 | 6 | |
| 2LEMG 060 300 S06 | 6 | 30 | 80 | 6 | |
| 2LEMG 080 250 S08 | 8 | 25 | 75 | 8 | |
| 2LEMG 080 250 100 | 8 | 25 | 100 | 8 | |
| 2LEMG 080 300 S08 | 8 | 30 | 80 | 8 | |
| 2LEMG 080 350 S08 | 8 | 35 | 80 | 8 | |
| 2LEMG 080 400 S08 | 8 | 40 | 90 | 8 | |
| 2LEMG 080 500 S08 | 8 | 50 | 100 | 8 | |
| 2LEMG 100 300 S10 | 10 | 30 | 80 | 10 | |
| 2LEMG 100 300 110 | 10 | 30 | 110 | 10 | |
| 2LEMG 100 350 S10 | 10 | 35 | 90 | 10 | |
| 2LEMG 100 400 S10 | 10 | 40 | 90 | 10 | |
| 2LEMG 100 500 S10 | 10 | 50 | 100 | 10 | |
| 2LEMG 100 600 S10 | 10 | 60 | 110 | 10 | |
| 2LEMG 120 300 S12 | 12 | 30 | 90 | 12 | |
| 2LEMG 120 350 110 | 12 | 35 | 110 | 12 | |
| 2LEMG 120 400 S12 | 12 | 40 | 100 | 12 | |
| 2LEMG 120 500 S12 | 12 | 50 | 100 | 12 | |
| 2LEMG 120 600 S12 | 12 | 60 | 110 | 12 | |
| 2LEMG 120 700 S12 | 12 | 70 | 130 | 12 | |
| 2LEMG 140 500 S14 | 14 | 50 | 110 | 14 | |
| 2LEMG 160 400 160 | 16 | 40 | 160 | 16 | |
| 2LEMG 160 550 S16 | 16 | 55 | 120 | 16 | |
| 2LEMG 160 700 S16 | 16 | 70 | 130 | 16 | |
| 2LEMG 160 800 S16 | 16 | 80 | 160 | 16 | |
| 2LEMG 200 500 160 | 20 | 50 | 160 | 20 | |
| 2LEMG 200 600 S20 | 20 | 60 | 130 | 20 | |
| 2LEMG 200 1000 S20 | 20 | 100 | 200 | 20 | |
| 2LEMG 250 750 S25 | 25 | 75 | 160 | 25 | |

G series

# 4HCEG 4 Flutes Standard Length End Mills for Multi Purpose

## 4날 범용 표준 길이 엔드밀




- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강 등 다양한 피삭재 가공**
- JCRO 코팅 처리하여 넓은 영역의 피삭재 가공에 적합합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택,엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels**
- Optimum for various work materials by JCRO coating.
- High precise edge tolerance.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

4
WC 미립자
JCRO Coating
35° Helix Angle
Shield Edge
CUTTING DATA
467P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.8 ~ 6 | +0 ~ -0.01mm |
| | Ø6.5 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 20 | -0.015 ~ -0.03mm |

단위 : mm

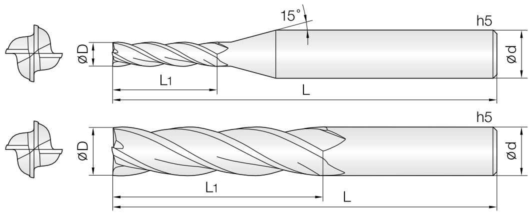
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4HCEG 008 020 S04 | 0.8 | 2 | 40 | 4 | |
| 4HCEG 010 010 S04 | 1 | 1 | 40 | 4 | |
| 4HCEG 010 025 S04 | 1 | 2.5 | 40 | 4 | |
| 4HCEG 010 025 S06 | 1 | 2.5 | 40 | 6 | |
| 4HCEG 010 025 060 | 1 | 2.5 | 60 | 6 | |
| 4HCEG 010 025 080 | 1 | 2.5 | 80 | 6 | |
| 4HCEG 010 040 S06 | 1 | 4 | 50 | 6 | |
| 4HCEG 012 012 S04 | 1.2 | 1.2 | 40 | 4 | |
| 4HCEG 012 030 S04 | 1.2 | 3 | 40 | 4 | |
| 4HCEG 012 030 S06 | 1.2 | 3 | 40 | 6 | |
| 4HCEG 012 030 060 | 1.2 | 3 | 60 | 6 | |
| 4HCEG 012 060 S06 | 1.2 | 6 | 50 | 6 | |
| 4HCEG 015 015 S04 | 1.5 | 1.5 | 40 | 4 | |
| 4HCEG 015 040 S04 | 1.5 | 4 | 40 | 4 | |
| 4HCEG 015 040 S06 | 1.5 | 4 | 40 | 6 | |
| 4HCEG 015 040 060 | 1.5 | 4 | 60 | 6 | |
| 4HCEG 015 040 080 | 1.5 | 4 | 80 | 6 | |
| 4HCEG 020 020 S04 | 2 | 2 | 40 | 4 | |
| 4HCEG 020 060 S04 | 2 | 6 | 40 | 4 | |
| 4HCEG 020 060 S06 | 2 | 6 | 40 | 6 | |
| 4HCEG 020 060 060 | 2 | 6 | 60 | 6 | |
| 4HCEG 020 060 100 | 2 | 6 | 100 | 6 | |
| 4HCEG 025 080 S04 | 2.5 | 8 | 45 | 4 | |
| 4HCEG 025 080 S06 | 2.5 | 8 | 45 | 6 | |
| 4HCEG 025 080 070 | 2.5 | 8 | 70 | 6 | |
| 4HCEG 025 080 100 | 2.5 | 8 | 100 | 6 | |
| 4HCEG 030 080 S03 | 3 | 8 | 45 | 3 | |
| 4HCEG 030 080 S04 | 3 | 8 | 45 | 4 | |
| 4HCEG 030 080 S06 | 3 | 8 | 45 | 6 | |
| 4HCEG 030 080 070 | 3 | 8 | 70 | 6 | |
| 4HCEG 030 080 100 | 3 | 8 | 100 | 6 | |
| 4HCEG 035 100 S06 | 3.5 | 10 | 45 | 6 | |
| 4HCEG 040 040 S04 | 4 | 4 | 40 | 4 | |
| 4HCEG 040 110 S04 | 4 | 11 | 45 | 4 | |
| 4HCEG 040 110 S06 | 4 | 11 | 45 | 6 | |
| 4HCEG 040 110 070 | 4 | 11 | 70 | 6 | |
| 4HCEG 040 110 100 | 4 | 11 | 100 | 6 | |
| 4HCEG 045 110 S06 | 4.5 | 11 | 45 | 6 | |
| 4HCEG 050 130 S06 | 5 | 13 | 50 | 6 | |
| 4HCEG 050 130 080 | 5 | 13 | 80 | 6 | |
| 4HCEG 050 130 100 | 5 | 13 | 100 | 6 | |
| 4HCEG 055 130 S06 | 5.5 | 13 | 50 | 6 | |
| 4HCEG 060 060 S06 | 6 | 6 | 45 | 6 | |
| 4HCEG 060 130 S06 | 6 | 13 | 50 | 6 | |
| 4HCEG 060 130 080 | 6 | 13 | 80 | 6 | |
| 4HCEG 060 130 100 | 6 | 13 | 100 | 6 | |
| 4HCEG 060 150 S06 | 6 | 15 | 60 | 6 | |
| 4HCEG 065 160 S08 | 6.5 | 16 | 60 | 8 | |
| 4HCEG 070 160 S08 | 7 | 16 | 60 | 8 | |
| 4HCEG 075 160 S08 | 7.5 | 16 | 60 | 8 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4HCEG 080 080 S08 | 8 | 8 | 50 | 8 | |
| 4HCEG 080 190 S08 | 8 | 19 | 60 | 8 | |
| 4HCEG 080 200 S08 | 8 | 20 | 70 | 8 | |
| 4HCEG 085 190 S10 | 8.5 | 19 | 70 | 10 | |
| 4HCEG 090 190 S10 | 9 | 19 | 70 | 10 | |
| 4HCEG 095 190 S10 | 9.5 | 19 | 70 | 10 | |
| 4HCEG 100 100 S10 | 10 | 10 | 60 | 10 | |
| 4HCEG 100 220 S10 | 10 | 22 | 70 | 10 | |
| 4HCEG 100 250 S10 | 10 | 25 | 75 | 10 | |
| 4HCEG 105 220 S12 | 10.5 | 22 | 75 | 12 | |
| 4HCEG 110 220 S12 | 11 | 22 | 75 | 12 | |
| 4HCEG 115 220 S12 | 11.5 | 22 | 75 | 12 | |
| 4HCEG 120 120 S12 | 12 | 12 | 65 | 12 | |
| 4HCEG 120 260 S12 | 12 | 26 | 75 | 12 | |
| 4HCEG 120 300 S12 | 12 | 30 | 80 | 12 | |
| 4HCEG 140 260 S14 | 14 | 26 | 80 | 14 | |
| 4HCEG 140 260 S16 | 14 | 26 | 85 | 16 | |
| 4HCEG 160 350 S16 | 16 | 35 | 100 | 16 | |
| 4HCEG 160 400 S16 | 16 | 40 | 100 | 16 | |
| 4HCEG 180 350 S18 | 18 | 35 | 100 | 18 | |
| 4HCEG 200 400 S20 | 20 | 40 | 100 | 20 | |
| 4HCEG 200 450 S20 | 20 | 45 | 100 | 20 | |

# 4LEMG

## 4Flutes Long Length End Mills for Multi Purpose

## 4날 범용 긴 길이 엔드밀




- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강 등 다양한 피삭재 가공**
- JCRO 코팅 처리하여 넓은 영역의 피삭재 가공에 적합합니다.
- 균일한 런아웃 공차관리로 공구의 성능을 향상시켰습니다.
- 다양한 날길이와 전장을 채택, 다양한 작업에 효율성을 극대화 하였습니다.
- 코너부 강성을 보강하여 날부치핑을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels**
- Optimum for various work materials by JCRO coating.
- Improve tool performance by even run-out and tolerance control.
- Various flute and overall length design for covering wide range applications as well as high efficiency machining.
- Minimize edge chipping by improving corner strength.


| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 25 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 25 | -0.015 ~ -0.03mm |

단위 : mm

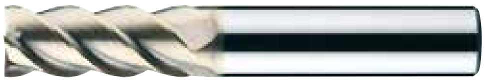
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4LEMG 010 030 S06 | 1 | 3 | 60 | 6 | |
| 4LEMG 010 050 S06 | 1 | 5 | 60 | 6 | |
| 4LEMG 015 060 S06 | 1.5 | 6 | 60 | 6 | |
| 4LEMG 015 080 S06 | 1.5 | 8 | 60 | 6 | |
| 4LEMG 020 080 S06 | 2 | 8 | 60 | 6 | |
| 4LEMG 020 100 S06 | 2 | 10 | 60 | 6 | |
| 4LEMG 030 100 S06 | 3 | 10 | 70 | 6 | |
| 4LEMG 030 150 S06 | 3 | 15 | 70 | 6 | |
| 4LEMG 030 200 S06 | 3 | 20 | 70 | 6 | |
| 4LEMG 030 250 S06 | 3 | 25 | 70 | 6 | |
| 4LEMG 040 120 S06 | 4 | 12 | 70 | 6 | |
| 4LEMG 040 150 S04 | 4 | 15 | 70 | 4 | |
| 4LEMG 040 150 S06 | 4 | 15 | 70 | 6 | |
| 4LEMG 040 200 S04 | 4 | 20 | 70 | 4 | |
| 4LEMG 040 200 S06 | 4 | 20 | 70 | 6 | |
| 4LEMG 040 250 S06 | 4 | 25 | 70 | 6 | |
| 4LEMG 040 300 S06 | 4 | 30 | 75 | 6 | |
| 4LEMG 050 200 S06 | 5 | 20 | 70 | 6 | |
| 4LEMG 050 250 S06 | 5 | 25 | 75 | 6 | |
| 4LEMG 050 300 S06 | 5 | 30 | 80 | 6 | |
| 4LEMG 060 200 S06 | 6 | 20 | 75 | 6 | |
| 4LEMG 060 200 100 | 6 | 20 | 100 | 6 | |
| 4LEMG 060 250 S06 | 6 | 25 | 75 | 6 | |
| 4LEMG 060 300 S06 | 6 | 30 | 80 | 6 | |
| 4LEMG 060 350 S06 | 6 | 35 | 80 | 6 | |
| 4LEMG 080 250 S08 | 8 | 25 | 75 | 8 | |
| 4LEMG 080 250 100 | 8 | 25 | 100 | 8 | |
| 4LEMG 080 300 S08 | 8 | 30 | 80 | 8 | |
| 4LEMG 080 350 S08 | 8 | 35 | 90 | 8 | |
| 4LEMG 080 400 S08 | 8 | 40 | 90 | 8 | |
| 4LEMG 080 450 S08 | 8 | 45 | 100 | 8 | |
| 4LEMG 100 300 S10 | 10 | 30 | 80 | 10 | |
| 4LEMG 100 300 110 | 10 | 30 | 110 | 10 | |
| 4LEMG 100 350 S10 | 10 | 35 | 90 | 10 | |
| 4LEMG 100 400 S10 | 10 | 40 | 90 | 10 | |
| 4LEMG 100 500 S10 | 10 | 50 | 100 | 10 | |
| 4LEMG 100 600 S10 | 10 | 60 | 110 | 10 | |
| 4LEMG 120 300 S12 | 12 | 30 | 90 | 12 | |
| 4LEMG 120 350 110 | 12 | 35 | 110 | 12 | |
| 4LEMG 120 400 S12 | 12 | 40 | 100 | 12 | |
| 4LEMG 120 500 S12 | 12 | 50 | 100 | 12 | |
| 4LEMG 120 600 S12 | 12 | 60 | 110 | 12 | |
| 4LEMG 120 700 S12 | 12 | 70 | 130 | 12 | |
| 4LEMG 140 500 S14 | 14 | 50 | 110 | 14 | |
| 4LEMG 160 400 160 | 16 | 40 | 160 | 16 | |
| 4LEMG 160 550 S16 | 16 | 55 | 120 | 16 | |
| 4LEMG 160 700 S16 | 16 | 70 | 130 | 16 | |
| 4LEMG 180 800 160 | 18 | 80 | 160 | 18 | |
| 4LEMG 200 500 160 | 20 | 50 | 160 | 20 | |
| 4LEMG 200 600 S20 | 20 | 60 | 130 | 20 | |
| 4LEMG 200 1000 S20 | 20 | 100 | 200 | 20 | |
| 4LEMG 250 750 S25 | 25 | 75 | 160 | 25 | |

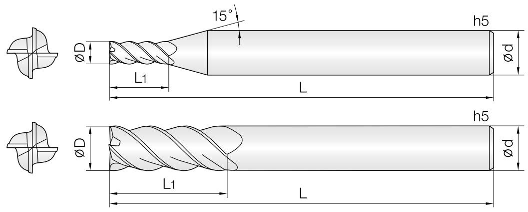
G series

# 4HEMG

## 4 Flutes 45˚ Helix End Mills for Multi Purpose

## 4날 범용 45°헬릭스 엔드밀






- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강 등 가공**
- JCRO 코팅 처리하여 넓은 영역의 피삭재 가공에 적합합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 45°헬릭스 형상으로 설계하여 고속,고이송 가공에 적합합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels**
- Optimum for various work materials by JCRO coating.
- High precise edge tolerance.
- 45˚ degree helix design for high speed, feed condition.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

G series


Shield Edge 468P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø16 ~ 20 | -0.015 ~ -0.03mm |

단위 : mm

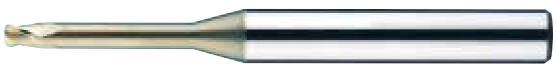
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4HEMG 010 025 S06 | 1 | 2.5 | 40 | 6 | |
| 4HEMG 010 035 S06 | 1 | 3.5 | 40 | 6 | |
| 4HEMG 015 040 S06 | 1.5 | 4 | 40 | 6 | |
| 4HEMG 015 060 S06 | 1.5 | 6 | 40 | 6 | |
| 4HEMG 020 050 S06 | 2 | 5 | 40 | 6 | |
| 4HEMG 020 080 S06 | 2 | 8 | 45 | 6 | |
| 4HEMG 030 080 S06 | 3 | 8 | 45 | 6 | |
| 4HEMG 030 120 S06 | 3 | 12 | 50 | 6 | |
| 4HEMG 040 110 S06 | 4 | 11 | 45 | 6 | |
| 4HEMG 040 160 S06 | 4 | 16 | 55 | 6 | |
| 4HEMG 050 130 S06 | 5 | 13 | 50 | 6 | |
| 4HEMG 050 180 S06 | 5 | 18 | 60 | 6 | |
| 4HEMG 060 130 S06 | 6 | 13 | 50 | 6 | |
| 4HEMG 060 200 S06 | 6 | 20 | 60 | 6 | |
| 4HEMG 080 200 S08 | 8 | 20 | 60 | 8 | |
| 4HEMG 080 250 S08 | 8 | 25 | 70 | 8 | |
| 4HEMG 100 220 S10 | 10 | 22 | 70 | 10 | |
| 4HEMG 100 300 S10 | 10 | 30 | 80 | 10 | |
| 4HEMG 120 260 S12 | 12 | 26 | 75 | 12 | |
| 4HEMG 120 400 S12 | 12 | 40 | 90 | 12 | |
| 4HEMG 120 500 S12 | 12 | 50 | 100 | 12 | |
| 4HEMG 160 350 S16 | 16 | 35 | 90 | 16 | |
| 4HEMG 160 500 S16 | 16 | 50 | 110 | 16 | |
| 4HEMG 200 400 S20 | 20 | 40 | 100 | 20 | |
| 4HEMG 200 500 S20 | 20 | 50 | 110 | 20 | |

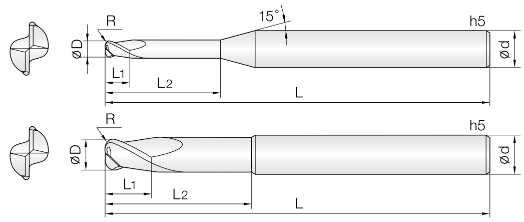
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 2CREG

## 2 Flutes Rib Corner Radius End Mills for Multi Purpose

## 2날 범용 리브 코너 레디우스 엔드밀






- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강 등 가공**
- JCRO 코팅 처리하여 넓은 영역의 피삭재 가공에 적합합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 코너R 형상을 날부치핑이 적도록 설계하였습니다.
- 다양한 코너R과 유효장으로 맞춤 가공이 가능합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택,엔드밀의 파손을 최소화

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels**
- Optimum for various work materials by JCRO coating.
- High precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- Various corner R and flute length for wide range application.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

2 | WC 미립자 | JCRO Coating | R ± 0.005 | R ± 0.01 | R ± 0.015 | 35° Helix Angle | CUTTING DATA

R0.02 ~ 0.5 | R1 ~ 1.5 | R2 ~ 3 | 469P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.2 ~ 16 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |
| | Ø16 | -0.01 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CREG 002 0002 010 | 0.2 X R0.02 | 0.2 | 1 | 40 | 4 | |
| 2CREG 002 0002 015 | 0.2 X R0.02 | 0.2 | 1.5 | 40 | 4 | |
| 2CREG 002 0005 010 | 0.2 X R0.05 | 0.2 | 1 | 40 | 4 | |
| 2CREG 002 0005 015 | 0.2 X R0.05 | 0.2 | 1.5 | 40 | 4 | |
| 2CREG 003 0005 010 | 0.3 X R0.05 | 0.2 | 1 | 40 | 4 | |
| 2CREG 003 0005 020 | 0.3 X R0.05 | 0.2 | 2 | 40 | 4 | |
| 2CREG 003 0005 030 | 0.3 X R0.05 | 0.2 | 3 | 40 | 4 | |
| 2CREG 004 0005 010 | 0.4 X R0.05 | 0.4 | 1 | 40 | 4 | |
| 2CREG 004 0005 020 | 0.4 X R0.05 | 0.4 | 2 | 40 | 4 | |
| 2CREG 004 0005 030 | 0.4 X R0.05 | 0.4 | 3 | 40 | 4 | |
| 2CREG 004 0005 040 | 0.4 X R0.05 | 0.4 | 4 | 40 | 4 | |
| 2CREG 004 001 010 | 0.4 X R0.1 | 0.4 | 1 | 40 | 4 | |
| 2CREG 004 001 015 | 0.4 X R0.1 | 0.4 | 1.5 | 40 | 4 | |
| 2CREG 004 001 020 | 0.4 X R0.1 | 0.4 | 2 | 40 | 4 | |
| 2CREG 004 001 030 | 0.4 X R0.1 | 0.4 | 3 | 40 | 4 | |
| 2CREG 004 001 040 | 0.4 X R0.1 | 0.4 | 4 | 40 | 4 | |
| 2CREG 005 0005 010 | 0.5 X R0.05 | 0.5 | 1 | 45 | 4 | |
| 2CREG 005 0005 015 | 0.5 X R0.05 | 0.5 | 1.5 | 45 | 4 | |
| 2CREG 005 0005 020 | 0.5 X R0.05 | 0.5 | 2 | 45 | 4 | |
| 2CREG 005 0005 025 | 0.5 X R0.05 | 0.5 | 2.5 | 45 | 4 | |
| 2CREG 005 0005 030 | 0.5 X R0.05 | 0.5 | 3 | 45 | 4 | |
| 2CREG 005 0005 040 | 0.5 X R0.05 | 0.5 | 4 | 45 | 4 | |
| 2CREG 005 0005 050 | 0.5 X R0.05 | 0.5 | 5 | 45 | 4 | |
| 2CREG 005 0005 060 | 0.5 X R0.05 | 0.5 | 6 | 45 | 4 | |
| 2CREG 005 001 010 | 0.5 X R0.1 | 0.5 | 1 | 45 | 4 | |
| 2CREG 005 001 015 | 0.5 X R0.1 | 0.5 | 1.5 | 45 | 4 | |
| 2CREG 005 001 020 | 0.5 X R0.1 | 0.5 | 2 | 45 | 4 | |
| 2CREG 005 001 025 | 0.5 X R0.1 | 0.5 | 2.5 | 45 | 4 | |
| 2CREG 005 001 030 | 0.5 X R0.1 | 0.5 | 3 | 45 | 4 | |
| 2CREG 005 001 040 | 0.5 X R0.1 | 0.5 | 4 | 45 | 4 | |
| 2CREG 005 001 050 | 0.5 X R0.1 | 0.5 | 5 | 45 | 4 | |
| 2CREG 005 001 060 | 0.5 X R0.1 | 0.5 | 6 | 45 | 4 | |
| 2CREG 006 0005 020 | 0.6 X R0.05 | 0.6 | 2 | 45 | 4 | |
| 2CREG 006 0005 030 | 0.6 X R0.05 | 0.6 | 3 | 45 | 4 | |
| 2CREG 006 0005 040 | 0.6 X R0.05 | 0.6 | 4 | 45 | 4 | |
| 2CREG 006 0005 060 | 0.6 X R0.05 | 0.6 | 6 | 45 | 4 | |
| 2CREG 006 0005 080 | 0.6 X R0.05 | 0.6 | 8 | 45 | 4 | |
| 2CREG 006 001 020 | 0.6 X R0.1 | 0.6 | 2 | 45 | 4 | |
| 2CREG 006 001 030 | 0.6 X R0.1 | 0.6 | 3 | 45 | 4 | |
| 2CREG 006 001 040 | 0.6 X R0.1 | 0.6 | 4 | 45 | 4 | |
| 2CREG 006 001 060 | 0.6 X R0.1 | 0.6 | 6 | 45 | 4 | |
| 2CREG 006 001 080 | 0.6 X R0.1 | 0.6 | 8 | 45 | 4 | |
| 2CREG 007 001 020 | 0.7 X R0.1 | 0.7 | 2 | 45 | 4 | |
| 2CREG 007 001 040 | 0.7 X R0.1 | 0.7 | 4 | 45 | 4 | |
| 2CREG 007 001 060 | 0.7 X R0.1 | 0.7 | 6 | 45 | 4 | |
| 2CREG 008 001 020 | 0.8 X R0.1 | 0.8 | 2 | 45 | 4 | |
| 2CREG 008 001 040 | 0.8 X R0.1 | 0.8 | 4 | 45 | 4 | |
| 2CREG 008 001 060 | 0.8 X R0.1 | 0.8 | 6 | 45 | 4 | |
| 2CREG 008 001 080 | 0.8 X R0.1 | 0.8 | 8 | 45 | 4 | |
| 2CREG 008 002 020 | 0.8 X R0.2 | 0.8 | 2 | 45 | 4 | |

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CREG 008 002 040 | 0.8 X R0.2 | 0.8 | 4 | 45 | 4 | |
| 2CREG 008 002 060 | 0.8 X R0.2 | 0.8 | 6 | 45 | 4 | |
| 2CREG 008 002 080 | 0.8 X R0.2 | 0.8 | 8 | 45 | 4 | |
| 2CREG 010 001 040 | 1 X R0.1 | 1 | 4 | 45 | 4 | |
| 2CREG 010 001 060 | 1 X R0.1 | 1 | 6 | 45 | 4 | |
| 2CREG 010 001 080 | 1 X R0.1 | 1 | 8 | 45 | 4 | |
| 2CREG 010 001 100 | 1 X R0.1 | 1 | 10 | 50 | 4 | |
| 2CREG 010 001 120 | 1 X R0.1 | 1 | 12 | 50 | 4 | |
| 2CREG 010 001 160 | 1 X R0.1 | 1 | 16 | 50 | 4 | |
| 2CREG 010 001 200 | 1 X R0.1 | 1 | 20 | 50 | 4 | |
| 2CREG 010 002 040 | 1 X R0.2 | 1 | 4 | 45 | 4 | |
| 2CREG 010 002 060 | 1 X R0.2 | 1 | 6 | 45 | 4 | |
| 2CREG 010 002 080 | 1 X R0.2 | 1 | 8 | 45 | 4 | |
| 2CREG 010 002 100 | 1 X R0.2 | 1 | 10 | 50 | 4 | |
| 2CREG 010 002 120 | 1 X R0.2 | 1 | 12 | 50 | 4 | |
| 2CREG 010 002 160 | 1 X R0.2 | 1 | 16 | 50 | 4 | |
| 2CREG 010 002 200 | 1 X R0.2 | 1 | 20 | 50 | 4 | |
| 2CREG 010 003 040 | 1 X R0.3 | 1 | 4 | 45 | 4 | |
| 2CREG 010 003 060 | 1 X R0.3 | 1 | 6 | 45 | 4 | |
| 2CREG 010 003 080 | 1 X R0.3 | 1 | 8 | 45 | 4 | |
| 2CREG 010 003 100 | 1 X R0.3 | 1 | 10 | 50 | 4 | |
| 2CREG 010 003 120 | 1 X R0.3 | 1 | 12 | 50 | 4 | |
| 2CREG 010 003 160 | 1 X R0.3 | 1 | 16 | 50 | 4 | |
| 2CREG 010 003 200 | 1 X R0.3 | 1 | 20 | 50 | 4 | |
| 2CREG 012 001 040 | 1.2 X R0.1 | 1.2 | 4 | 45 | 4 | |
| 2CREG 012 001 060 | 1.2 X R0.1 | 1.2 | 6 | 45 | 4 | |
| 2CREG 012 001 080 | 1.2 X R0.1 | 1.2 | 8 | 45 | 4 | |
| 2CREG 012 001 100 | 1.2 X R0.1 | 1.2 | 10 | 50 | 4 | |
| 2CREG 012 001 120 | 1.2 X R0.1 | 1.2 | 12 | 50 | 4 | |
| 2CREG 012 001 160 | 1.2 X R0.1 | 1.2 | 16 | 50 | 4 | |
| 2CREG 012 001 200 | 1.2 X R0.1 | 1.2 | 20 | 50 | 4 | |
| 2CREG 012 002 040 | 1.2 X R0.2 | 1.2 | 4 | 45 | 4 | |
| 2CREG 012 002 060 | 1.2 X R0.2 | 1.2 | 6 | 45 | 4 | |
| 2CREG 012 002 080 | 1.2 X R0.2 | 1.2 | 8 | 45 | 4 | |
| 2CREG 012 002 100 | 1.2 X R0.2 | 1.2 | 10 | 50 | 4 | |
| 2CREG 012 002 120 | 1.2 X R0.2 | 1.2 | 12 | 50 | 4 | |
| 2CREG 012 002 160 | 1.2 X R0.2 | 1.2 | 16 | 50 | 4 | |
| 2CREG 012 002 200 | 1.2 X R0.2 | 1.2 | 20 | 50 | 4 | |
| 2CREG 012 003 040 | 1.2 X R0.3 | 1.2 | 4 | 45 | 4 | |
| 2CREG 012 003 060 | 1.2 X R0.3 | 1.2 | 6 | 45 | 4 | |
| 2CREG 012 003 080 | 1.2 X R0.3 | 1.2 | 8 | 45 | 4 | |
| 2CREG 012 003 100 | 1.2 X R0.3 | 1.2 | 10 | 50 | 4 | |
| 2CREG 012 003 120 | 1.2 X R0.3 | 1.2 | 12 | 50 | 4 | |
| 2CREG 012 003 160 | 1.2 X R0.3 | 1.2 | 16 | 50 | 4 | |
| 2CREG 012 003 200 | 1.2 X R0.3 | 1.2 | 20 | 50 | 4 | |
| 2CREG 015 001 040 | 1.5 X R0.1 | 1.5 | 4 | 45 | 4 | |
| 2CREG 015 001 060 | 1.5 X R0.1 | 1.5 | 6 | 45 | 4 | |
| 2CREG 015 001 080 | 1.5 X R0.1 | 1.5 | 8 | 45 | 4 | |
| 2CREG 015 001 100 | 1.5 X R0.1 | 1.5 | 10 | 50 | 4 | |
| 2CREG 015 001 120 | 1.5 X R0.1 | 1.5 | 12 | 50 | 4 | |

# 2CREG

## 2 Flutes Rib Corner Radius End Mills for Multi Purpose

## 2날 범용 리브 코너 레디우스 엔드밀

G series

단위 : mm

| Order Number | 날경<br>Diameter<br>D×R | 날장<br>Length of cut<br>L1 | 유효장<br>Effective Length<br>L2 | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d | 비고 |
|---|---|---|---|---|---|---|
| 2CREG 015 001 160 | 1.5 X R0.1 | 1.5 | 16 | 50 | 4 | |
| 2CREG 015 001 200 | 1.5 X R0.1 | 1.5 | 20 | 50 | 4 | |
| 2CREG 015 001 220 | 1.5 X R0.1 | 1.5 | 22 | 60 | 4 | |
| 2CREG 015 001 250 | 1.5 X R0.1 | 1.5 | 25 | 60 | 4 | |
| 2CREG 015 002 040 | 1.5 X R0.2 | 1.5 | 4 | 45 | 4 | |
| 2CREG 015 002 060 | 1.5 X R0.2 | 1.5 | 6 | 45 | 4 | |
| 2CREG 015 002 080 | 1.5 X R0.2 | 1.5 | 8 | 45 | 4 | |
| 2CREG 015 002 100 | 1.5 X R0.2 | 1.5 | 10 | 50 | 4 | |
| 2CREG 015 002 120 | 1.5 X R0.2 | 1.5 | 12 | 50 | 4 | |
| 2CREG 015 002 160 | 1.5 X R0.2 | 1.5 | 16 | 50 | 4 | |
| 2CREG 015 002 200 | 1.5 X R0.2 | 1.5 | 20 | 50 | 4 | |
| 2CREG 015 002 220 | 1.5 X R0.2 | 1.5 | 22 | 60 | 4 | |
| 2CREG 015 002 250 | 1.5 X R0.2 | 1.5 | 25 | 60 | 4 | |
| 2CREG 015 003 040 | 1.5 X R0.3 | 1.5 | 4 | 45 | 4 | |
| 2CREG 015 003 060 | 1.5 X R0.3 | 1.5 | 6 | 45 | 4 | |
| 2CREG 015 003 080 | 1.5 X R0.3 | 1.5 | 8 | 45 | 4 | |
| 2CREG 015 003 100 | 1.5 X R0.3 | 1.5 | 10 | 50 | 4 | |
| 2CREG 015 003 120 | 1.5 X R0.3 | 1.5 | 12 | 50 | 4 | |
| 2CREG 015 003 160 | 1.5 X R0.3 | 1.5 | 16 | 50 | 4 | |
| 2CREG 015 003 200 | 1.5 X R0.3 | 1.5 | 20 | 50 | 4 | |
| 2CREG 015 003 220 | 1.5 X R0.3 | 1.5 | 22 | 60 | 4 | |
| 2CREG 015 003 250 | 1.5 X R0.3 | 1.5 | 25 | 60 | 4 | |
| 2CREG 015 005 040 | 1.5 X R0.5 | 1.5 | 4 | 45 | 4 | |
| 2CREG 015 005 060 | 1.5 X R0.5 | 1.5 | 6 | 45 | 4 | |
| 2CREG 015 005 080 | 1.5 X R0.5 | 1.5 | 8 | 45 | 4 | |
| 2CREG 015 005 100 | 1.5 X R0.5 | 1.5 | 10 | 50 | 4 | |
| 2CREG 015 005 120 | 1.5 X R0.5 | 1.5 | 12 | 50 | 4 | |
| 2CREG 015 005 160 | 1.5 X R0.5 | 1.5 | 16 | 50 | 4 | |
| 2CREG 015 005 200 | 1.5 X R0.5 | 1.5 | 20 | 50 | 4 | |
| 2CREG 015 005 220 | 1.5 X R0.5 | 1.5 | 22 | 60 | 4 | |
| 2CREG 015 005 250 | 1.5 X R0.5 | 1.5 | 25 | 60 | 4 | |
| 2CREG 020 001 060 | 2 X R0.1 | 2 | 6 | 45 | 4 | |
| 2CREG 020 001 080 | 2 X R0.1 | 2 | 8 | 45 | 4 | |
| 2CREG 020 001 100 | 2 X R0.1 | 2 | 10 | 50 | 4 | |
| 2CREG 020 001 120 | 2 X R0.1 | 2 | 12 | 50 | 4 | |
| 2CREG 020 001 160 | 2 X R0.1 | 2 | 16 | 50 | 4 | |
| 2CREG 020 001 200 | 2 X R0.1 | 2 | 20 | 50 | 4 | |
| 2CREG 020 001 250 | 2 X R0.1 | 2 | 25 | 60 | 4 | |
| 2CREG 020 001 300 | 2 X R0.1 | 2 | 30 | 70 | 4 | |
| 2CREG 020 002 060 | 2 X R0.2 | 2 | 6 | 45 | 4 | |
| 2CREG 020 002 080 | 2 X R0.2 | 2 | 8 | 45 | 4 | |
| 2CREG 020 002 100 | 2 X R0.2 | 2 | 10 | 50 | 4 | |
| 2CREG 020 002 120 | 2 X R0.2 | 2 | 12 | 50 | 4 | |
| 2CREG 020 002 160 | 2 X R0.2 | 2 | 16 | 50 | 4 | |
| 2CREG 020 002 200 | 2 X R0.2 | 2 | 20 | 50 | 4 | |
| 2CREG 020 002 250 | 2 X R0.2 | 2 | 25 | 60 | 4 | |
| 2CREG 020 002 300 | 2 X R0.2 | 2 | 30 | 70 | 4 | |
| 2CREG 020 003 060 | 2 X R0.3 | 2 | 6 | 45 | 4 | |
| 2CREG 020 003 080 | 2 X R0.3 | 2 | 8 | 45 | 4 | |
| 2CREG 020 003 100 | 2 X R0.3 | 2 | 10 | 50 | 4 | |
| 2CREG 020 003 120 | 2 X R0.3 | 2 | 12 | 50 | 4 | |
| 2CREG 020 003 160 | 2 X R0.3 | 2 | 16 | 50 | 4 | |
| 2CREG 020 003 200 | 2 X R0.3 | 2 | 20 | 50 | 4 | |
| 2CREG 020 003 250 | 2 X R0.3 | 2 | 25 | 60 | 4 | |
| 2CREG 020 003 300 | 2 X R0.3 | 2 | 30 | 70 | 4 | |
| 2CREG 020 005 060 | 2 X R0.5 | 2 | 6 | 45 | 4 | |
| 2CREG 020 005 080 | 2 X R0.5 | 2 | 8 | 45 | 4 | |
| 2CREG 020 005 100 | 2 X R0.5 | 2 | 10 | 50 | 4 | |
| 2CREG 020 005 120 | 2 X R0.5 | 2 | 12 | 50 | 4 | |
| 2CREG 020 005 160 | 2 X R0.5 | 2 | 16 | 50 | 4 | |
| 2CREG 020 005 200 | 2 X R0.5 | 2 | 20 | 50 | 4 | |
| 2CREG 020 005 250 | 2 X R0.5 | 2 | 25 | 60 | 4 | |
| 2CREG 020 005 300 | 2 X R0.5 | 2 | 30 | 70 | 4 | |
| 2CREG 025 001 100 | 2.5 X R0.1 | 2.5 | 10 | 50 | 4 | |
| 2CREG 025 001 160 | 2.5 X R0.1 | 2.5 | 16 | 50 | 4 | |
| 2CREG 025 001 200 | 2.5 X R0.1 | 2.5 | 20 | 50 | 4 | |
| 2CREG 025 001 250 | 2.5 X R0.1 | 2.5 | 25 | 60 | 4 | |
| 2CREG 025 001 300 | 2.5 X R0.1 | 2.5 | 30 | 70 | 4 | |
| 2CREG 025 002 100 | 2.5 X R0.2 | 2.5 | 10 | 50 | 4 | |
| 2CREG 025 002 160 | 2.5 X R0.2 | 2.5 | 16 | 50 | 4 | |
| 2CREG 025 002 200 | 2.5 X R0.2 | 2.5 | 20 | 50 | 4 | |
| 2CREG 025 002 250 | 2.5 X R0.2 | 2.5 | 25 | 60 | 4 | |
| 2CREG 025 002 300 | 2.5 X R0.2 | 2.5 | 30 | 70 | 4 | |
| 2CREG 025 003 100 | 2.5 X R0.3 | 2.5 | 10 | 50 | 4 | |
| 2CREG 025 003 160 | 2.5 X R0.3 | 2.5 | 16 | 50 | 4 | |
| 2CREG 025 003 200 | 2.5 X R0.3 | 2.5 | 20 | 50 | 4 | |
| 2CREG 025 003 250 | 2.5 X R0.3 | 2.5 | 25 | 60 | 4 | |
| 2CREG 025 003 300 | 2.5 X R0.3 | 2.5 | 30 | 70 | 4 | |
| 2CREG 025 005 100 | 2.5 X R0.5 | 2.5 | 10 | 50 | 4 | |
| 2CREG 025 005 160 | 2.5 X R0.5 | 2.5 | 16 | 50 | 4 | |
| 2CREG 025 005 200 | 2.5 X R0.5 | 2.5 | 20 | 50 | 4 | |
| 2CREG 025 005 250 | 2.5 X R0.5 | 2.5 | 25 | 60 | 4 | |
| 2CREG 025 005 300 | 2.5 X R0.5 | 2.5 | 30 | 70 | 4 | |
| 2CREG 030 001 100 | 3 X R0.1 | 3 | 10 | 50 | 6 | |
| 2CREG 030 001 120 | 3 X R0.1 | 3 | 12 | 50 | 6 | |
| 2CREG 030 001 160 | 3 X R0.1 | 3 | 16 | 55 | 6 | |
| 2CREG 030 001 200 | 3 X R0.1 | 3 | 20 | 60 | 6 | |
| 2CREG 030 001 250 | 3 X R0.1 | 3 | 25 | 65 | 6 | |
| 2CREG 030 001 300 | 3 X R0.1 | 3 | 30 | 70 | 6 | |
| 2CREG 030 001 350 | 3 X R0.1 | 3 | 35 | 75 | 6 | |
| 2CREG 030 001 400 | 3 X R0.1 | 3 | 40 | 80 | 6 | |
| 2CREG 030 002 100 | 3 X R0.2 | 3 | 10 | 50 | 6 | |
| 2CREG 030 002 120 | 3 X R0.2 | 3 | 12 | 50 | 6 | |
| 2CREG 030 002 160 | 3 X R0.2 | 3 | 16 | 55 | 6 | |
| 2CREG 030 002 200 | 3 X R0.2 | 3 | 20 | 60 | 6 | |
| 2CREG 030 002 250 | 3 X R0.2 | 3 | 25 | 65 | 6 | |
| 2CREG 030 002 300 | 3 X R0.2 | 3 | 30 | 70 | 6 | |
| 2CREG 030 002 350 | 3 X R0.2 | 3 | 35 | 75 | 6 | |
| 2CREG 030 002 400 | 3 X R0.2 | 3 | 40 | 80 | 6 | |
| 2CREG 030 003 100 | 3 X R0.3 | 3 | 10 | 50 | 6 | |
| 2CREG 030 003 120 | 3 X R0.3 | 3 | 12 | 50 | 6 | |
| 2CREG 030 003 160 | 3 X R0.3 | 3 | 16 | 55 | 6 | |
| 2CREG 030 003 200 | 3 X R0.3 | 3 | 20 | 60 | 6 | |
| 2CREG 030 003 250 | 3 X R0.3 | 3 | 25 | 65 | 6 | |
| 2CREG 030 003 300 | 3 X R0.3 | 3 | 30 | 70 | 6 | |
| 2CREG 030 003 350 | 3 X R0.3 | 3 | 35 | 75 | 6 | |
| 2CREG 030 003 400 | 3 X R0.3 | 3 | 40 | 80 | 6 | |
| 2CREG 030 005 100 | 3 X R0.5 | 3 | 10 | 50 | 6 | |
| 2CREG 030 005 120 | 3 X R0.5 | 3 | 12 | 50 | 6 | |
| 2CREG 030 005 160 | 3 X R0.5 | 3 | 16 | 55 | 6 | |
| 2CREG 030 005 200 | 3 X R0.5 | 3 | 20 | 60 | 6 | |
| 2CREG 030 005 250 | 3 X R0.5 | 3 | 25 | 65 | 6 | |
| 2CREG 030 005 300 | 3 X R0.5 | 3 | 30 | 70 | 6 | |
| 2CREG 030 005 350 | 3 X R0.5 | 3 | 35 | 75 | 6 | |
| 2CREG 030 005 400 | 3 X R0.5 | 3 | 40 | 80 | 6 | |
| 2CREG 030 010 100 | 3 X R1 | 3 | 10 | 50 | 6 | |
| 2CREG 030 010 120 | 3 X R1 | 3 | 12 | 50 | 6 | |
| 2CREG 030 010 160 | 3 X R1 | 3 | 16 | 55 | 6 | |
| 2CREG 030 010 200 | 3 X R1 | 3 | 20 | 60 | 6 | |
| 2CREG 030 010 250 | 3 X R1 | 3 | 25 | 65 | 6 | |
| 2CREG 030 010 300 | 3 X R1 | 3 | 30 | 70 | 6 | |
| 2CREG 030 010 350 | 3 X R1 | 3 | 35 | 75 | 6 | |
| 2CREG 030 010 400 | 3 X R1 | 3 | 40 | 80 | 6 | |
| 2CREG 040 001 050 | 4 X R0.1 | 4 | 12 | 50 | 4 | |
| 2CREG 040 001 070 | 4 X R0.1 | 4 | 20 | 70 | 4 | |
| 2CREG 040 001 120 | 4 X R0.1 | 4 | 12 | 50 | 6 | |
| 2CREG 040 001 160 | 4 X R0.1 | 4 | 16 | 55 | 6 | |
| 2CREG 040 001 200 | 4 X R0.1 | 4 | 20 | 60 | 6 | |

# 2CREG

## 2 Flutes Rib Corner Radius End Mills for Multi Purpose

## 2날 범용 리브 코너 레디우스 엔드밀

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CREG 040 001 250 | 4 X R0.1 | 4 | 25 | 65 | 6 | |
| 2CREG 040 001 300 | 4 X R0.1 | 4 | 30 | 70 | 6 | |
| 2CREG 040 001 350 | 4 X R0.1 | 4 | 35 | 75 | 6 | |
| 2CREG 040 001 400 | 4 X R0.1 | 4 | 40 | 80 | 6 | |
| 2CREG 040 001 450 | 4 X R0.1 | 4 | 45 | 90 | 6 | |
| 2CREG 040 001 500 | 4 X R0.1 | 4 | 50 | 100 | 6 | |
| 2CREG 040 002 050 | 4 X R0.2 | 4 | 12 | 50 | 4 | |
| 2CREG 040 002 070 | 4 X R0.2 | 4 | 20 | 70 | 4 | |
| 2CREG 040 002 120 | 4 X R0.2 | 4 | 12 | 50 | 6 | |
| 2CREG 040 002 160 | 4 X R0.2 | 4 | 16 | 55 | 6 | |
| 2CREG 040 002 200 | 4 X R0.2 | 4 | 20 | 60 | 6 | |
| 2CREG 040 002 250 | 4 X R0.2 | 4 | 25 | 65 | 6 | |
| 2CREG 040 002 300 | 4 X R0.2 | 4 | 30 | 70 | 6 | |
| 2CREG 040 002 350 | 4 X R0.2 | 4 | 35 | 75 | 6 | |
| 2CREG 040 002 400 | 4 X R0.2 | 4 | 40 | 80 | 6 | |
| 2CREG 040 002 450 | 4 X R0.2 | 4 | 45 | 90 | 6 | |
| 2CREG 040 002 500 | 4 X R0.2 | 4 | 50 | 100 | 6 | |
| 2CREG 040 003 050 | 4 X R0.3 | 4 | 12 | 50 | 4 | |
| 2CREG 040 003 070 | 4 X R0.3 | 4 | 20 | 70 | 4 | |
| 2CREG 040 003 120 | 4 X R0.3 | 4 | 12 | 50 | 6 | |
| 2CREG 040 003 160 | 4 X R0.3 | 4 | 16 | 55 | 6 | |
| 2CREG 040 003 200 | 4 X R0.3 | 4 | 20 | 60 | 6 | |
| 2CREG 040 003 250 | 4 X R0.3 | 4 | 25 | 65 | 6 | |
| 2CREG 040 003 300 | 4 X R0.3 | 4 | 30 | 70 | 6 | |
| 2CREG 040 003 350 | 4 X R0.3 | 4 | 35 | 75 | 6 | |
| 2CREG 040 003 400 | 4 X R0.3 | 4 | 40 | 80 | 6 | |
| 2CREG 040 003 450 | 4 X R0.3 | 4 | 45 | 90 | 6 | |
| 2CREG 040 003 500 | 4 X R0.3 | 4 | 50 | 100 | 6 | |
| 2CREG 040 005 050 | 4 X R0.5 | 4 | 12 | 50 | 4 | |
| 2CREG 040 005 070 | 4 X R0.5 | 4 | 20 | 70 | 4 | |
| 2CREG 040 005 120 | 4 X R0.5 | 4 | 12 | 50 | 6 | |
| 2CREG 040 005 160 | 4 X R0.5 | 4 | 16 | 55 | 6 | |
| 2CREG 040 005 200 | 4 X R0.5 | 4 | 20 | 60 | 6 | |
| 2CREG 040 005 250 | 4 X R0.5 | 4 | 25 | 65 | 6 | |
| 2CREG 040 005 300 | 4 X R0.5 | 4 | 30 | 70 | 6 | |
| 2CREG 040 005 350 | 4 X R0.5 | 4 | 35 | 75 | 6 | |
| 2CREG 040 005 400 | 4 X R0.5 | 4 | 40 | 80 | 6 | |
| 2CREG 040 005 450 | 4 X R0.5 | 4 | 45 | 90 | 6 | |
| 2CREG 040 005 500 | 4 X R0.5 | 4 | 50 | 100 | 6 | |
| 2CREG 040 010 050 | 4 X R1 | 4 | 12 | 50 | 4 | |
| 2CREG 040 010 070 | 4 X R1 | 4 | 20 | 70 | 4 | |
| 2CREG 040 010 120 | 4 X R1 | 4 | 12 | 50 | 6 | |
| 2CREG 040 010 160 | 4 X R1 | 4 | 16 | 55 | 6 | |
| 2CREG 040 010 200 | 4 X R1 | 4 | 20 | 60 | 6 | |
| 2CREG 040 010 250 | 4 X R1 | 4 | 25 | 65 | 6 | |
| 2CREG 040 010 300 | 4 X R1 | 4 | 30 | 70 | 6 | |
| 2CREG 040 010 350 | 4 X R1 | 4 | 35 | 75 | 6 | |
| 2CREG 040 010 400 | 4 X R1 | 4 | 40 | 80 | 6 | |
| 2CREG 040 010 450 | 4 X R1 | 4 | 45 | 90 | 6 | |
| 2CREG 040 010 500 | 4 X R1 | 4 | 50 | 100 | 6 | |
| 2CREG 050 002 150 | 5 X R0.2 | 6 | 15 | 55 | 6 | |
| 2CREG 050 002 250 | 5 X R0.2 | 6 | 25 | 70 | 6 | |
| 2CREG 050 002 300 | 5 X R0.2 | 6 | 30 | 70 | 6 | |
| 2CREG 050 002 400 | 5 X R0.2 | 6 | 40 | 80 | 6 | |
| 2CREG 050 002 500 | 5 X R0.2 | 6 | 50 | 100 | 6 | |
| 2CREG 050 005 150 | 5 X R0.5 | 6 | 15 | 55 | 6 | |
| 2CREG 050 005 250 | 5 X R0.5 | 6 | 25 | 70 | 6 | |
| 2CREG 050 005 300 | 5 X R0.5 | 6 | 30 | 70 | 6 | |
| 2CREG 050 005 400 | 5 X R0.5 | 6 | 40 | 80 | 6 | |
| 2CREG 050 005 500 | 5 X R0.5 | 6 | 50 | 100 | 6 | |
| 2CREG 050 010 150 | 5 X R1 | 6 | 15 | 55 | 6 | |
| 2CREG 050 010 250 | 5 X R1 | 6 | 25 | 70 | 6 | |
| 2CREG 050 010 300 | 5 X R1 | 6 | 30 | 70 | 6 | |
| 2CREG 050 010 400 | 5 X R1 | 6 | 40 | 80 | 6 | |

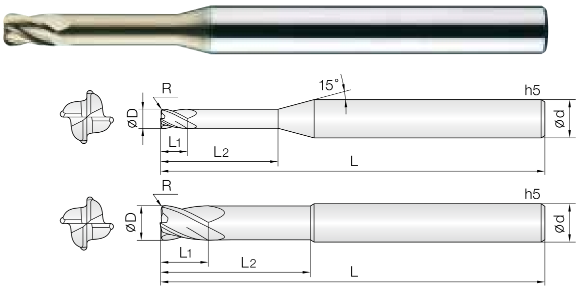
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CREG 050 010 500 | 5 X R1 | 6 | 50 | 100 | 6 | |
| 2CREG 060 001 200 | 6 X R0.1 | 7 | 20 | 60 | 6 | |
| 2CREG 060 001 400 | 6 X R0.1 | 7 | 40 | 90 | 6 | |
| 2CREG 060 002 200 | 6 X R0.2 | 7 | 20 | 60 | 6 | |
| 2CREG 060 002 400 | 6 X R0.2 | 7 | 40 | 90 | 6 | |
| 2CREG 060 003 200 | 6 X R0.3 | 7 | 20 | 60 | 6 | |
| 2CREG 060 003 400 | 6 X R0.3 | 7 | 40 | 90 | 6 | |
| 2CREG 060 005 200 | 6 X R0.5 | 7 | 20 | 60 | 6 | |
| 2CREG 060 005 400 | 6 X R0.5 | 7 | 40 | 90 | 6 | |
| 2CREG 060 010 200 | 6 X R1 | 7 | 20 | 60 | 6 | |
| 2CREG 060 010 400 | 6 X R1 | 7 | 40 | 90 | 6 | |
| 2CREG 060 015 200 | 6 X R1.5 | 7 | 20 | 60 | 6 | |
| 2CREG 060 015 400 | 6 X R1.5 | 7 | 40 | 90 | 6 | |
| 2CREG 080 002 220 | 8 X R0.2 | 9 | 22 | 65 | 8 | |
| 2CREG 080 002 400 | 8 X R0.2 | 9 | 40 | 100 | 8 | |
| 2CREG 080 003 220 | 8 X R0.3 | 9 | 22 | 65 | 8 | |
| 2CREG 080 003 400 | 8 X R0.3 | 9 | 40 | 100 | 8 | |
| 2CREG 080 005 220 | 8 X R0.5 | 9 | 22 | 65 | 8 | |
| 2CREG 080 005 400 | 8 X R0.5 | 9 | 40 | 100 | 8 | |
| 2CREG 080 010 220 | 8 X R1 | 9 | 22 | 65 | 8 | |
| 2CREG 080 010 400 | 8 X R1 | 9 | 40 | 100 | 8 | |
| 2CREG 080 015 220 | 8 X R1.5 | 9 | 22 | 65 | 8 | |
| 2CREG 080 015 400 | 8 X R1.5 | 9 | 40 | 100 | 8 | |
| 2CREG 100 002 240 | 10 X R0.2 | 11 | 24 | 70 | 10 | |
| 2CREG 100 002 450 | 10 X R0.2 | 11 | 45 | 100 | 10 | |
| 2CREG 100 003 240 | 10 X R0.3 | 11 | 24 | 70 | 10 | |
| 2CREG 100 003 450 | 10 X R0.3 | 11 | 45 | 100 | 10 | |
| 2CREG 100 005 240 | 10 X R0.5 | 11 | 24 | 70 | 10 | |
| 2CREG 100 005 450 | 10 X R0.5 | 11 | 45 | 100 | 10 | |
| 2CREG 100 010 240 | 10 X R1 | 11 | 24 | 70 | 10 | |
| 2CREG 100 010 450 | 10 X R1 | 11 | 45 | 100 | 10 | |
| 2CREG 100 015 240 | 10 X R1.5 | 11 | 24 | 70 | 10 | |
| 2CREG 100 015 450 | 10 X R1.5 | 11 | 45 | 100 | 10 | |
| 2CREG 100 020 240 | 10 X R2 | 11 | 24 | 70 | 10 | |
| 2CREG 100 020 450 | 10 X R2 | 11 | 45 | 100 | 10 | |
| 2CREG 120 002 260 | 12 X R0.2 | 13 | 26 | 80 | 12 | |
| 2CREG 120 002 500 | 12 X R0.2 | 13 | 50 | 110 | 12 | |
| 2CREG 120 003 260 | 12 X R0.3 | 13 | 26 | 80 | 12 | |
| 2CREG 120 003 500 | 12 X R0.3 | 13 | 50 | 110 | 12 | |
| 2CREG 120 005 260 | 12 X R0.5 | 13 | 26 | 80 | 12 | |
| 2CREG 120 005 500 | 12 X R0.5 | 13 | 50 | 110 | 12 | |
| 2CREG 120 010 260 | 12 X R1 | 13 | 26 | 80 | 12 | |
| 2CREG 120 010 500 | 12 X R1 | 13 | 50 | 110 | 12 | |
| 2CREG 120 015 260 | 12 X R1.5 | 13 | 26 | 80 | 12 | |
| 2CREG 120 015 500 | 12 X R1.5 | 13 | 50 | 110 | 12 | |
| 2CREG 120 020 260 | 12 X R2 | 13 | 26 | 80 | 12 | |
| 2CREG 120 020 500 | 12 X R2 | 13 | 50 | 110 | 12 | |
| 2CREG 120 030 260 | 12 X R3 | 13 | 26 | 80 | 12 | |
| 2CREG 120 030 500 | 12 X R3 | 13 | 50 | 110 | 12 | |
| 2CREG 160 005 110 | 16 X R0.5 | 20 | 35 | 110 | 16 | |
| 2CREG 160 005 160 | 16 X R0.5 | 20 | 35 | 160 | 16 | |
| 2CREG 160 010 110 | 16 X R1 | 20 | 35 | 110 | 16 | |
| 2CREG 160 010 160 | 16 X R1 | 20 | 35 | 160 | 16 | |

G series

# 4CREG

## 4 Flutes Rib Corner Radius End Mills for Multi Purpose

## 4날 범용 리브 코너 레디우스 엔드밀




- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강 등 가공**
- JCRO 코팅 처리하여 넓은 영역의 피삭재 가공에 적합합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 코너R 형상을 날부치핑이 적도록 설계하였습니다.
- 다양한 코너R과 유효장으로 맞춤 가공이 가능합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택,엔드밀의 파손을 최소화

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels**
- Optimum for various work materials by JCRO coating.
- High precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- Various corner R and flute length for wide range application.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

4 | WC 미립자 | JCRO Coating | R ± 0.005 (R0.05 ~ 0.5) | R ± 0.01 (R1 ~ 1.5) | R ± 0.015 (R2 ~ 3) | 35° Helix Angle | CUTTING DATA 470P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø1 ~ 12 | +0 ~ -0.01mm | ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4CREG 010 0005 040 | 1 X R0.05 | 1 | 4 | 45 | 4 | |
| 4CREG 010 0005 060 | 1 X R0.05 | 1 | 6 | 45 | 4 | |
| 4CREG 010 0005 080 | 1 X R0.05 | 1 | 8 | 45 | 4 | |
| 4CREG 010 0005 100 | 1 X R0.05 | 1 | 10 | 50 | 4 | |
| 4CREG 010 0005 120 | 1 X R0.05 | 1 | 12 | 50 | 4 | |
| 4CREG 010 0005 160 | 1 X R0.05 | 1 | 16 | 50 | 4 | |
| 4CREG 010 0005 200 | 1 X R0.05 | 1 | 20 | 50 | 4 | |
| 4CREG 010 001 040 | 1 X R0.1 | 1 | 4 | 45 | 4 | |
| 4CREG 010 001 060 | 1 X R0.1 | 1 | 6 | 45 | 4 | |
| 4CREG 010 001 080 | 1 X R0.1 | 1 | 8 | 45 | 4 | |
| 4CREG 010 001 100 | 1 X R0.1 | 1 | 10 | 50 | 4 | |
| 4CREG 010 001 120 | 1 X R0.1 | 1 | 12 | 50 | 4 | |
| 4CREG 010 001 160 | 1 X R0.1 | 1 | 16 | 50 | 4 | |
| 4CREG 010 001 200 | 1 X R0.1 | 1 | 20 | 50 | 4 | |
| 4CREG 010 002 040 | 1 X R0.2 | 1 | 4 | 45 | 4 | |
| 4CREG 010 002 060 | 1 X R0.2 | 1 | 6 | 45 | 4 | |
| 4CREG 010 002 080 | 1 X R0.2 | 1 | 8 | 45 | 4 | |
| 4CREG 010 002 100 | 1 X R0.2 | 1 | 10 | 50 | 4 | |
| 4CREG 010 002 120 | 1 X R0.2 | 1 | 12 | 50 | 4 | |
| 4CREG 010 002 160 | 1 X R0.2 | 1 | 16 | 50 | 4 | |
| 4CREG 010 002 200 | 1 X R0.2 | 1 | 20 | 50 | 4 | |
| 4CREG 010 003 040 | 1 X R0.3 | 1 | 4 | 45 | 4 | |
| 4CREG 010 003 060 | 1 X R0.3 | 1 | 6 | 45 | 4 | |
| 4CREG 010 003 080 | 1 X R0.3 | 1 | 8 | 45 | 4 | |
| 4CREG 010 003 100 | 1 X R0.3 | 1 | 10 | 50 | 4 | |
| 4CREG 010 003 120 | 1 X R0.3 | 1 | 12 | 50 | 4 | |
| 4CREG 010 003 160 | 1 X R0.3 | 1 | 16 | 50 | 4 | |
| 4CREG 010 003 200 | 1 X R0.3 | 1 | 20 | 50 | 4 | |
| 4CREG 012 001 040 | 1.2 X R0.1 | 1.2 | 4 | 45 | 4 | |
| 4CREG 012 001 060 | 1.2 X R0.1 | 1.2 | 6 | 45 | 4 | |
| 4CREG 012 001 080 | 1.2 X R0.1 | 1.2 | 8 | 45 | 4 | |
| 4CREG 012 001 100 | 1.2 X R0.1 | 1.2 | 10 | 50 | 4 | |
| 4CREG 012 001 120 | 1.2 X R0.1 | 1.2 | 12 | 50 | 4 | |
| 4CREG 012 001 160 | 1.2 X R0.1 | 1.2 | 16 | 50 | 4 | |
| 4CREG 012 001 200 | 1.2 X R0.1 | 1.2 | 20 | 50 | 4 | |
| 4CREG 012 002 040 | 1.2 X R0.2 | 1.2 | 4 | 45 | 4 | |
| 4CREG 012 002 060 | 1.2 X R0.2 | 1.2 | 6 | 45 | 4 | |
| 4CREG 012 002 080 | 1.2 X R0.2 | 1.2 | 8 | 45 | 4 | |
| 4CREG 012 002 100 | 1.2 X R0.2 | 1.2 | 10 | 50 | 4 | |
| 4CREG 012 002 120 | 1.2 X R0.2 | 1.2 | 12 | 50 | 4 | |
| 4CREG 012 002 160 | 1.2 X R0.2 | 1.2 | 16 | 50 | 4 | |
| 4CREG 012 002 200 | 1.2 X R0.2 | 1.2 | 20 | 50 | 4 | |
| 4CREG 012 003 040 | 1.2 X R0.3 | 1.2 | 4 | 45 | 4 | |
| 4CREG 012 003 060 | 1.2 X R0.3 | 1.2 | 6 | 45 | 4 | |
| 4CREG 012 003 080 | 1.2 X R0.3 | 1.2 | 8 | 45 | 4 | |
| 4CREG 012 003 100 | 1.2 X R0.3 | 1.2 | 10 | 50 | 4 | |
| 4CREG 012 003 120 | 1.2 X R0.3 | 1.2 | 12 | 50 | 4 | |
| 4CREG 012 003 160 | 1.2 X R0.3 | 1.2 | 16 | 50 | 4 | |
| 4CREG 012 003 200 | 1.2 X R0.3 | 1.2 | 20 | 50 | 4 | |
| 4CREG 015 001 060 | 1.5 X R0.1 | 1.5 | 6 | 45 | 4 | |

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4CREG 015 001 080 | 1.5 X R0.1 | 1.5 | 8 | 45 | 4 | |
| 4CREG 015 001 100 | 1.5 X R0.1 | 1.5 | 10 | 50 | 4 | |
| 4CREG 015 001 120 | 1.5 X R0.1 | 1.5 | 12 | 50 | 4 | |
| 4CREG 015 001 160 | 1.5 X R0.1 | 1.5 | 16 | 50 | 4 | |
| 4CREG 015 001 200 | 1.5 X R0.1 | 1.5 | 20 | 50 | 4 | |
| 4CREG 015 001 220 | 1.5 X R0.1 | 1.5 | 22 | 60 | 4 | |
| 4CREG 015 001 250 | 1.5 X R0.1 | 1.5 | 25 | 60 | 4 | |
| 4CREG 015 002 060 | 1.5 X R0.2 | 1.5 | 6 | 45 | 4 | |
| 4CREG 015 002 080 | 1.5 X R0.2 | 1.5 | 8 | 45 | 4 | |
| 4CREG 015 002 100 | 1.5 X R0.2 | 1.5 | 10 | 50 | 4 | |
| 4CREG 015 002 120 | 1.5 X R0.2 | 1.5 | 12 | 50 | 4 | |
| 4CREG 015 002 160 | 1.5 X R0.2 | 1.5 | 16 | 50 | 4 | |
| 4CREG 015 002 200 | 1.5 X R0.2 | 1.5 | 20 | 50 | 4 | |
| 4CREG 015 002 220 | 1.5 X R0.2 | 1.5 | 22 | 60 | 4 | |
| 4CREG 015 002 250 | 1.5 X R0.2 | 1.5 | 25 | 60 | 4 | |
| 4CREG 015 003 060 | 1.5 X R0.3 | 1.5 | 6 | 45 | 4 | |
| 4CREG 015 003 080 | 1.5 X R0.3 | 1.5 | 8 | 45 | 4 | |
| 4CREG 015 003 100 | 1.5 X R0.3 | 1.5 | 10 | 50 | 4 | |
| 4CREG 015 003 120 | 1.5 X R0.3 | 1.5 | 12 | 50 | 4 | |
| 4CREG 015 003 160 | 1.5 X R0.3 | 1.5 | 16 | 50 | 4 | |
| 4CREG 015 003 200 | 1.5 X R0.3 | 1.5 | 20 | 50 | 4 | |
| 4CREG 015 003 220 | 1.5 X R0.3 | 1.5 | 22 | 60 | 4 | |
| 4CREG 015 003 250 | 1.5 X R0.3 | 1.5 | 25 | 60 | 4 | |
| 4CREG 015 005 060 | 1.5 X R0.5 | 1.5 | 6 | 45 | 4 | |
| 4CREG 015 005 080 | 1.5 X R0.5 | 1.5 | 8 | 45 | 4 | |
| 4CREG 015 005 100 | 1.5 X R0.5 | 1.5 | 10 | 50 | 4 | |
| 4CREG 015 005 120 | 1.5 X R0.5 | 1.5 | 12 | 50 | 4 | |
| 4CREG 015 005 160 | 1.5 X R0.5 | 1.5 | 16 | 50 | 4 | |
| 4CREG 015 005 200 | 1.5 X R0.5 | 1.5 | 20 | 50 | 4 | |
| 4CREG 015 005 220 | 1.5 X R0.5 | 1.5 | 22 | 60 | 4 | |
| 4CREG 015 005 250 | 1.5 X R0.5 | 1.5 | 25 | 60 | 4 | |
| 4CREG 020 001 060 | 2 X R0.1 | 2 | 6 | 45 | 4 | |
| 4CREG 020 001 080 | 2 X R0.1 | 2 | 8 | 45 | 4 | |
| 4CREG 020 001 100 | 2 X R0.1 | 2 | 10 | 50 | 4 | |
| 4CREG 020 001 120 | 2 X R0.1 | 2 | 12 | 50 | 4 | |
| 4CREG 020 001 160 | 2 X R0.1 | 2 | 16 | 50 | 4 | |
| 4CREG 020 001 200 | 2 X R0.1 | 2 | 20 | 50 | 4 | |
| 4CREG 020 001 250 | 2 X R0.1 | 2 | 25 | 60 | 4 | |
| 4CREG 020 001 300 | 2 X R0.1 | 2 | 30 | 70 | 4 | |
| 4CREG 020 001 350 | 2 X R0.1 | 2 | 35 | 70 | 4 | |
| 4CREG 020 002 060 | 2 X R0.2 | 2 | 6 | 45 | 4 | |
| 4CREG 020 002 080 | 2 X R0.2 | 2 | 8 | 45 | 4 | |
| 4CREG 020 002 100 | 2 X R0.2 | 2 | 10 | 50 | 4 | |
| 4CREG 020 002 120 | 2 X R0.2 | 2 | 12 | 50 | 4 | |
| 4CREG 020 002 160 | 2 X R0.2 | 2 | 16 | 50 | 4 | |
| 4CREG 020 002 200 | 2 X R0.2 | 2 | 20 | 50 | 4 | |
| 4CREG 020 002 250 | 2 X R0.2 | 2 | 25 | 60 | 4 | |
| 4CREG 020 002 300 | 2 X R0.2 | 2 | 30 | 70 | 4 | |
| 4CREG 020 002 350 | 2 X R0.2 | 2 | 35 | 70 | 4 | |
| 4CREG 020 003 060 | 2 X R0.3 | 2 | 6 | 45 | 4 | |

# 4CREG

## 4 Flutes Rib Corner Radius End Mills for Multi Purpose

## 4날 범용 리브 코너 레디우스 엔드밀



단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4CREG 020 003 080 | 2 X R0.3 | 2 | 8 | 45 | 4 | |
| 4CREG 020 003 100 | 2 X R0.3 | 2 | 10 | 50 | 4 | |
| 4CREG 020 003 120 | 2 X R0.3 | 2 | 12 | 50 | 4 | |
| 4CREG 020 003 160 | 2 X R0.3 | 2 | 16 | 50 | 4 | |
| 4CREG 020 003 200 | 2 X R0.3 | 2 | 20 | 50 | 4 | |
| 4CREG 020 003 250 | 2 X R0.3 | 2 | 25 | 60 | 4 | |
| 4CREG 020 003 300 | 2 X R0.3 | 2 | 30 | 70 | 4 | |
| 4CREG 020 003 350 | 2 X R0.3 | 2 | 35 | 70 | 4 | |
| 4CREG 020 005 060 | 2 X R0.5 | 2 | 6 | 45 | 4 | |
| 4CREG 020 005 080 | 2 X R0.5 | 2 | 8 | 45 | 4 | |
| 4CREG 020 005 100 | 2 X R0.5 | 2 | 10 | 50 | 4 | |
| 4CREG 020 005 120 | 2 X R0.5 | 2 | 12 | 50 | 4 | |
| 4CREG 020 005 160 | 2 X R0.5 | 2 | 16 | 50 | 4 | |
| 4CREG 020 005 200 | 2 X R0.5 | 2 | 20 | 50 | 4 | |
| 4CREG 020 005 250 | 2 X R0.5 | 2 | 25 | 60 | 4 | |
| 4CREG 020 005 300 | 2 X R0.5 | 2 | 30 | 70 | 4 | |
| 4CREG 020 005 350 | 2 X R0.5 | 2 | 35 | 70 | 4 | |
| 4CREG 025 001 100 | 2.5 X R0.1 | 2.5 | 10 | 50 | 4 | |
| 4CREG 025 001 160 | 2.5 X R0.1 | 2.5 | 16 | 50 | 4 | |
| 4CREG 025 001 200 | 2.5 X R0.1 | 2.5 | 20 | 50 | 4 | |
| 4CREG 025 001 250 | 2.5 X R0.1 | 2.5 | 25 | 60 | 4 | |
| 4CREG 025 001 300 | 2.5 X R0.1 | 2.5 | 30 | 70 | 4 | |
| 4CREG 025 002 100 | 2.5 X R0.2 | 2.5 | 10 | 50 | 4 | |
| 4CREG 025 002 160 | 2.5 X R0.2 | 2.5 | 16 | 50 | 4 | |
| 4CREG 025 002 200 | 2.5 X R0.2 | 2.5 | 20 | 50 | 4 | |
| 4CREG 025 002 250 | 2.5 X R0.2 | 2.5 | 25 | 60 | 4 | |
| 4CREG 025 002 300 | 2.5 X R0.2 | 2.5 | 30 | 70 | 4 | |
| 4CREG 025 003 100 | 2.5 X R0.3 | 2.5 | 10 | 50 | 4 | |
| 4CREG 025 003 160 | 2.5 X R0.3 | 2.5 | 16 | 50 | 4 | |
| 4CREG 025 003 200 | 2.5 X R0.3 | 2.5 | 20 | 50 | 4 | |
| 4CREG 025 003 250 | 2.5 X R0.3 | 2.5 | 25 | 60 | 4 | |
| 4CREG 025 003 300 | 2.5 X R0.3 | 2.5 | 30 | 70 | 4 | |
| 4CREG 025 005 100 | 2.5 X R0.5 | 2.5 | 10 | 50 | 4 | |
| 4CREG 025 005 160 | 2.5 X R0.5 | 2.5 | 16 | 50 | 4 | |
| 4CREG 025 005 200 | 2.5 X R0.5 | 2.5 | 20 | 50 | 4 | |
| 4CREG 025 005 250 | 2.5 X R0.5 | 2.5 | 25 | 60 | 4 | |
| 4CREG 025 005 300 | 2.5 X R0.5 | 2.5 | 30 | 70 | 4 | |
| 4CREG 030 001 100 | 3 X R0.1 | 3 | 10 | 50 | 6 | |
| 4CREG 030 001 160 | 3 X R0.1 | 3 | 16 | 55 | 6 | |
| 4CREG 030 001 200 | 3 X R0.1 | 3 | 20 | 60 | 6 | |
| 4CREG 030 001 250 | 3 X R0.1 | 3 | 25 | 65 | 6 | |
| 4CREG 030 001 300 | 3 X R0.1 | 3 | 30 | 70 | 6 | |
| 4CREG 030 001 350 | 3 X R0.1 | 3 | 35 | 75 | 6 | |
| 4CREG 030 001 400 | 3 X R0.1 | 3 | 40 | 80 | 6 | |
| 4CREG 030 001 500 | 3 X R0.1 | 3 | 50 | 100 | 6 | |
| 4CREG 030 002 100 | 3 X R0.2 | 3 | 10 | 50 | 6 | |
| 4CREG 030 002 160 | 3 X R0.2 | 3 | 16 | 55 | 6 | |
| 4CREG 030 002 200 | 3 X R0.2 | 3 | 20 | 60 | 6 | |
| 4CREG 030 002 250 | 3 X R0.2 | 3 | 25 | 65 | 6 | |
| 4CREG 030 002 300 | 3 X R0.2 | 3 | 30 | 70 | 6 | |
| 4CREG 030 002 350 | 3 X R0.2 | 3 | 35 | 75 | 6 | |
| 4CREG 030 002 400 | 3 X R0.2 | 3 | 40 | 80 | 6 | |
| 4CREG 030 002 500 | 3 X R0.2 | 3 | 50 | 100 | 6 | |
| 4CREG 030 003 100 | 3 X R0.3 | 3 | 10 | 50 | 6 | |
| 4CREG 030 003 160 | 3 X R0.3 | 3 | 16 | 55 | 6 | |
| 4CREG 030 003 200 | 3 X R0.3 | 3 | 20 | 60 | 6 | |
| 4CREG 030 003 250 | 3 X R0.3 | 3 | 25 | 65 | 6 | |
| 4CREG 030 003 300 | 3 X R0.3 | 3 | 30 | 70 | 6 | |
| 4CREG 030 003 350 | 3 X R0.3 | 3 | 35 | 75 | 6 | |
| 4CREG 030 003 400 | 3 X R0.3 | 3 | 40 | 80 | 6 | |
| 4CREG 030 003 500 | 3 X R0.3 | 3 | 50 | 100 | 6 | |
| 4CREG 030 005 100 | 3 X R0.5 | 3 | 10 | 50 | 6 | |
| 4CREG 030 005 160 | 3 X R0.5 | 3 | 16 | 55 | 6 | |
| 4CREG 030 005 200 | 3 X R0.5 | 3 | 20 | 60 | 6 | |

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4CREG 030 005 250 | 3 X R0.5 | 3 | 25 | 65 | 6 | |
| 4CREG 030 005 300 | 3 X R0.5 | 3 | 30 | 70 | 6 | |
| 4CREG 030 005 350 | 3 X R0.5 | 3 | 35 | 75 | 6 | |
| 4CREG 030 005 400 | 3 X R0.5 | 3 | 40 | 80 | 6 | |
| 4CREG 030 005 500 | 3 X R0.5 | 3 | 50 | 100 | 6 | |
| 4CREG 030 010 100 | 3 X R1 | 3 | 10 | 50 | 6 | |
| 4CREG 030 010 160 | 3 X R1 | 3 | 16 | 55 | 6 | |
| 4CREG 030 010 200 | 3 X R1 | 3 | 20 | 60 | 6 | |
| 4CREG 030 010 250 | 3 X R1 | 3 | 25 | 65 | 6 | |
| 4CREG 030 010 300 | 3 X R1 | 3 | 30 | 70 | 6 | |
| 4CREG 030 010 350 | 3 X R1 | 3 | 35 | 75 | 6 | |
| 4CREG 030 010 400 | 3 X R1 | 3 | 40 | 80 | 6 | |
| 4CREG 030 010 500 | 3 X R1 | 3 | 50 | 100 | 6 | |
| 4CREG 040 001 050 | 4 X R0.1 | 4 | 12 | 50 | 4 | |
| 4CREG 040 001 070 | 4 X R0.1 | 4 | 20 | 70 | 4 | |
| 4CREG 040 001 120 | 4 X R0.1 | 4 | 12 | 50 | 6 | |
| 4CREG 040 001 160 | 4 X R0.1 | 4 | 16 | 55 | 6 | |
| 4CREG 040 001 200 | 4 X R0.1 | 4 | 20 | 60 | 6 | |
| 4CREG 040 001 250 | 4 X R0.1 | 4 | 25 | 65 | 6 | |
| 4CREG 040 001 300 | 4 X R0.1 | 4 | 30 | 70 | 6 | |
| 4CREG 040 001 350 | 4 X R0.1 | 4 | 35 | 75 | 6 | |
| 4CREG 040 001 400 | 4 X R0.1 | 4 | 40 | 80 | 6 | |
| 4CREG 040 001 450 | 4 X R0.1 | 4 | 45 | 90 | 6 | |
| 4CREG 040 001 500 | 4 X R0.1 | 4 | 50 | 100 | 6 | |
| 4CREG 040 002 050 | 4 X R0.2 | 4 | 12 | 50 | 4 | |
| 4CREG 040 002 070 | 4 X R0.2 | 4 | 20 | 70 | 4 | |
| 4CREG 040 002 120 | 4 X R0.2 | 4 | 12 | 50 | 6 | |
| 4CREG 040 002 160 | 4 X R0.2 | 4 | 16 | 55 | 6 | |
| 4CREG 040 002 200 | 4 X R0.2 | 4 | 20 | 60 | 6 | |
| 4CREG 040 002 250 | 4 X R0.2 | 4 | 25 | 65 | 6 | |
| 4CREG 040 002 300 | 4 X R0.2 | 4 | 30 | 70 | 6 | |
| 4CREG 040 002 350 | 4 X R0.2 | 4 | 35 | 75 | 6 | |
| 4CREG 040 002 400 | 4 X R0.2 | 4 | 40 | 80 | 6 | |
| 4CREG 040 002 450 | 4 X R0.2 | 4 | 45 | 90 | 6 | |
| 4CREG 040 002 500 | 4 X R0.2 | 4 | 50 | 100 | 6 | |
| 4CREG 040 003 050 | 4 X R0.3 | 4 | 12 | 50 | 4 | |
| 4CREG 040 003 070 | 4 X R0.3 | 4 | 20 | 70 | 4 | |
| 4CREG 040 003 120 | 4 X R0.3 | 4 | 12 | 50 | 6 | |
| 4CREG 040 003 160 | 4 X R0.3 | 4 | 16 | 55 | 6 | |
| 4CREG 040 003 200 | 4 X R0.3 | 4 | 20 | 60 | 6 | |
| 4CREG 040 003 250 | 4 X R0.3 | 4 | 25 | 65 | 6 | |
| 4CREG 040 003 300 | 4 X R0.3 | 4 | 30 | 70 | 6 | |
| 4CREG 040 003 350 | 4 X R0.3 | 4 | 35 | 75 | 6 | |
| 4CREG 040 003 400 | 4 X R0.3 | 4 | 40 | 80 | 6 | |
| 4CREG 040 003 450 | 4 X R0.3 | 4 | 45 | 90 | 6 | |
| 4CREG 040 003 500 | 4 X R0.3 | 4 | 50 | 100 | 6 | |
| 4CREG 040 005 050 | 4 X R0.5 | 4 | 12 | 50 | 4 | |
| 4CREG 040 005 070 | 4 X R0.5 | 4 | 20 | 70 | 4 | |
| 4CREG 040 005 120 | 4 X R0.5 | 4 | 12 | 50 | 6 | |
| 4CREG 040 005 160 | 4 X R0.5 | 4 | 16 | 55 | 6 | |
| 4CREG 040 005 200 | 4 X R0.5 | 4 | 20 | 60 | 6 | |
| 4CREG 040 005 250 | 4 X R0.5 | 4 | 25 | 65 | 6 | |
| 4CREG 040 005 300 | 4 X R0.5 | 4 | 30 | 70 | 6 | |
| 4CREG 040 005 350 | 4 X R0.5 | 4 | 35 | 75 | 6 | |
| 4CREG 040 005 400 | 4 X R0.5 | 4 | 40 | 80 | 6 | |
| 4CREG 040 005 450 | 4 X R0.5 | 4 | 45 | 90 | 6 | |
| 4CREG 040 005 500 | 4 X R0.5 | 4 | 50 | 100 | 6 | |
| 4CREG 040 010 050 | 4 X R1 | 4 | 12 | 50 | 4 | |
| 4CREG 040 010 070 | 4 X R1 | 4 | 20 | 70 | 4 | |
| 4CREG 040 010 120 | 4 X R1 | 4 | 12 | 50 | 6 | |
| 4CREG 040 010 160 | 4 X R1 | 4 | 16 | 55 | 6 | |
| 4CREG 040 010 200 | 4 X R1 | 4 | 20 | 60 | 6 | |
| 4CREG 040 010 250 | 4 X R1 | 4 | 25 | 65 | 6 | |
| 4CREG 040 010 300 | 4 X R1 | 4 | 30 | 70 | 6 | |

# 4CREG

## 4 Flutes Rib Corner Radius End Mills for Multi Purpose

## 4날 범용 리브 코너 레디우스 엔드밀



단위 : mm

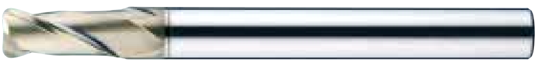
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4CREG 040 010 350 | 4 X R1 | 4 | 35 | 75 | 6 | |
| 4CREG 040 010 400 | 4 X R1 | 4 | 40 | 80 | 6 | |
| 4CREG 040 010 450 | 4 X R1 | 4 | 45 | 90 | 6 | |
| 4CREG 040 010 500 | 4 X R1 | 4 | 50 | 100 | 6 | |
| 4CREG 050 001 150 | 5 X R0.1 | 5 | 15 | 55 | 6 | |
| 4CREG 050 001 300 | 5 X R0.1 | 5 | 30 | 70 | 6 | |
| 4CREG 050 001 400 | 5 X R0.1 | 5 | 40 | 80 | 6 | |
| 4CREG 050 001 500 | 5 X R0.1 | 5 | 50 | 100 | 6 | |
| 4CREG 050 002 150 | 5 X R0.2 | 5 | 15 | 55 | 6 | |
| 4CREG 050 002 300 | 5 X R0.2 | 5 | 30 | 70 | 6 | |
| 4CREG 050 002 400 | 5 X R0.2 | 5 | 40 | 80 | 6 | |
| 4CREG 050 002 500 | 5 X R0.2 | 5 | 50 | 100 | 6 | |
| 4CREG 050 003 150 | 5 X R0.3 | 5 | 15 | 55 | 6 | |
| 4CREG 050 003 300 | 5 X R0.3 | 5 | 30 | 70 | 6 | |
| 4CREG 050 003 400 | 5 X R0.3 | 5 | 40 | 80 | 6 | |
| 4CREG 050 003 500 | 5 X R0.3 | 5 | 50 | 100 | 6 | |
| 4CREG 050 005 150 | 5 X R0.5 | 5 | 15 | 55 | 6 | |
| 4CREG 050 005 300 | 5 X R0.5 | 5 | 30 | 70 | 6 | |
| 4CREG 050 005 400 | 5 X R0.5 | 5 | 40 | 80 | 6 | |
| 4CREG 050 005 500 | 5 X R0.5 | 5 | 50 | 100 | 6 | |
| 4CREG 050 010 150 | 5 X R1 | 5 | 15 | 55 | 6 | |
| 4CREG 050 010 300 | 5 X R1 | 5 | 30 | 70 | 6 | |
| 4CREG 050 010 400 | 5 X R1 | 5 | 40 | 80 | 6 | |
| 4CREG 050 010 500 | 5 X R1 | 5 | 50 | 100 | 6 | |
| 4CREG 060 001 200 | 6 X R0.1 | 7 | 20 | 60 | 6 | |
| 4CREG 060 001 400 | 6 X R0.1 | 7 | 40 | 80 | 6 | |
| 4CREG 060 001 500 | 6 X R0.1 | 7 | 50 | 100 | 6 | |
| 4CREG 060 002 200 | 6 X R0.2 | 7 | 20 | 60 | 6 | |
| 4CREG 060 002 400 | 6 X R0.2 | 7 | 40 | 80 | 6 | |
| 4CREG 060 002 500 | 6 X R0.2 | 7 | 50 | 100 | 6 | |
| 4CREG 060 003 200 | 6 X R0.3 | 7 | 20 | 60 | 6 | |
| 4CREG 060 003 400 | 6 X R0.3 | 7 | 40 | 80 | 6 | |
| 4CREG 060 003 500 | 6 X R0.3 | 7 | 50 | 100 | 6 | |
| 4CREG 060 005 200 | 6 X R0.5 | 7 | 20 | 60 | 6 | |
| 4CREG 060 005 400 | 6 X R0.5 | 7 | 40 | 80 | 6 | |
| 4CREG 060 005 500 | 6 X R0.5 | 7 | 50 | 100 | 6 | |
| 4CREG 060 010 200 | 6 X R1 | 7 | 20 | 60 | 6 | |
| 4CREG 060 010 400 | 6 X R1 | 7 | 40 | 80 | 6 | |
| 4CREG 060 010 500 | 6 X R1 | 7 | 50 | 100 | 6 | |
| 4CREG 060 015 200 | 6 X R1.5 | 7 | 20 | 60 | 6 | |
| 4CREG 060 015 400 | 6 X R1.5 | 7 | 40 | 80 | 6 | |
| 4CREG 060 015 500 | 6 X R1.5 | 7 | 50 | 100 | 6 | |
| 4CREG 080 002 220 | 8 X R0.2 | 9 | 22 | 65 | 8 | |
| 4CREG 080 003 220 | 8 X R0.3 | 9 | 22 | 65 | 8 | |
| 4CREG 080 005 220 | 8 X R0.5 | 9 | 22 | 65 | 8 | |
| 4CREG 080 005 400 | 8 X R0.5 | 9 | 40 | 100 | 8 | |
| 4CREG 080 010 220 | 8 X R1 | 9 | 22 | 65 | 8 | |
| 4CREG 080 010 400 | 8 X R1 | 9 | 40 | 100 | 8 | |
| 4CREG 080 015 220 | 8 X R1.5 | 9 | 22 | 65 | 8 | |
| 4CREG 080 015400 | 8 X R1.5 | 9 | 40 | 100 | 8 | |
| 4CREG 080 020 220 | 8 X R2 | 9 | 22 | 65 | 8 | |
| 4CREG 100 002 240 | 10 X R0.2 | 11 | 24 | 70 | 10 | |
| 4CREG 100 003 240 | 10 X R0.3 | 11 | 24 | 70 | 10 | |
| 4CREG 100 005 240 | 10 X R0.5 | 11 | 24 | 70 | 10 | |
| 4CREG 100 005 400 | 10 X R0.5 | 11 | 40 | 100 | 10 | |
| 4CREG 100 010 240 | 10 X R1 | 11 | 24 | 70 | 10 | |
| 4CREG 100 010 400 | 10 X R1 | 11 | 40 | 100 | 10 | |
| 4CREG 100 015 240 | 10 X R1.5 | 11 | 24 | 70 | 10 | |
| 4CREG 100 015 400 | 10 X R1.5 | 11 | 40 | 100 | 10 | |
| 4CREG 100 020 240 | 10 X R2 | 11 | 24 | 70 | 10 | |
| 4CREG 100 025 240 | 10 X R2.5 | 11 | 24 | 70 | 10 | |
| 4CREG 120 003 260 | 12 X R0.3 | 13 | 26 | 80 | 12 | |
| 4CREG 120 005 260 | 12 X R0.5 | 13 | 26 | 80 | 12 | |
| 4CREG 120 005 400 | 12 X R0.5 | 13 | 40 | 110 | 12 | |

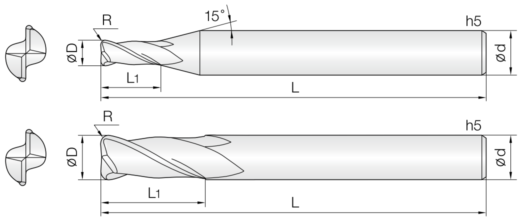
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4CREG 120 010 260 | 12 X R1 | 13 | 26 | 80 | 12 | |
| 4CREG 120 010 400 | 12 X R1 | 13 | 40 | 110 | 12 | |
| 4CREG 120 015 260 | 12 X R1.5 | 13 | 26 | 80 | 12 | |
| 4CREG 120 015 400 | 12 X R1.5 | 13 | 40 | 110 | 12 | |
| 4CREG 120 020 260 | 12 X R2 | 13 | 26 | 80 | 12 | |
| 4CREG 120 030 260 | 12 X R3 | 13 | 26 | 80 | 12 | |

# 2NCRG

## 2 Flutes Corner Radius End Mills for Multi Purpose

## 2날 범용 코너 레디우스 엔드밀






- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강 등 가공**
- JCRO 코팅 처리하여 넓은 영역의 피삭재 가공에 적합합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 코너R 형상을 날부치핑이 적도록 설계하였습니다.
- 다양한 코너R과 유효장으로 맞춤 가공이 가능합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택,엔드밀의 파손을 최소화

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels**
- Optimum for various work materials by JCRO coating.
- High precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- Various corner R and flute length for wide range application.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

2 | WC 미립자 | JCRO Coating | R ± 0.005 | R ± 0.01 | R ± 0.015 | 35° Helix Angle | CUTTING DATA

R0.05 ~ 0.5 | R1 ~ 1.5 | R2 ~ 5 | 471P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.4 ~ 12 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2NCRG 004 0005 S04 | 0.4 X R0.05 | 0.8 | 45 | 4 | |
| 2NCRG 004 001 S04 | 0.4 X R0.1 | 0.8 | 45 | 4 | |
| 2NCRG 005 0005 S04 | 0.5 X R0.05 | 1 | 45 | 4 | |
| 2NCRG 005 001 S04 | 0.5 X R0.1 | 1 | 45 | 4 | |
| 2NCRG 006 0005 S04 | 0.6 X R0.05 | 1.2 | 45 | 4 | |
| 2NCRG 006 001 S04 | 0.6 X R0.1 | 1.2 | 45 | 4 | |
| 2NCRG 006 002 S04 | 0.6 X R0.2 | 1.2 | 45 | 4 | |
| 2NCRG 007 0005 S04 | 0.7 X R0.05 | 1.4 | 45 | 4 | |
| 2NCRG 007 001 S04 | 0.7 X R0.1 | 1.4 | 45 | 4 | |
| 2NCRG 007 002 S04 | 0.7 X R0.2 | 1.4 | 45 | 4 | |
| 2NCRG 008 0005 S04 | 0.8 X R0.05 | 1.6 | 45 | 4 | |
| 2NCRG 008 001 S04 | 0.8 X R0.1 | 1.6 | 45 | 4 | |
| 2NCRG 008 002 S04 | 0.8 X R0.2 | 1.6 | 45 | 4 | |
| 2NCRG 009 0005 S04 | 0.9 X R0.05 | 1.8 | 45 | 4 | |
| 2NCRG 009 001 S04 | 0.9 X R0.1 | 1.8 | 45 | 4 | |
| 2NCRG 010 001 S04 | 1 X R0.1 | 2.5 | 45 | 4 | |
| 2NCRG 010 002 S04 | 1 X R0.2 | 2.5 | 45 | 4 | |
| 2NCRG 010 003 S04 | 1 X R0.3 | 2.5 | 45 | 4 | |
| 2NCRG 012 001 S04 | 1.2 X R0.1 | 3.2 | 45 | 4 | |
| 2NCRG 012 002 S04 | 1.2 X R0.2 | 3.2 | 45 | 4 | |
| 2NCRG 012 003 S04 | 1.2 X R0.3 | 3.2 | 45 | 4 | |
| 2NCRG 015 001 S04 | 1.5 X R0.1 | 4 | 45 | 4 | |
| 2NCRG 015 002 S04 | 1.5 X R0.2 | 4 | 45 | 4 | |
| 2NCRG 015 003 S04 | 1.5 X R0.3 | 4 | 45 | 4 | |
| 2NCRG 015 005 S04 | 1.5 X R0.5 | 4 | 45 | 4 | |
| 2NCRG 020 001 S04 | 2 X R0.1 | 6 | 45 | 4 | |
| 2NCRG 020 002 S04 | 2 X R0.2 | 6 | 45 | 4 | |
| 2NCRG 020 003 S04 | 2 X R0.3 | 6 | 45 | 4 | |
| 2NCRG 020 005 S04 | 2 X R0.5 | 6 | 45 | 4 | |
| 2NCRG 025 001 S04 | 2.5 X R0.1 | 6 | 50 | 4 | |
| 2NCRG 025 002 S04 | 2.5 X R0.2 | 6 | 50 | 4 | |
| 2NCRG 025 003 S04 | 2.5 X R0.3 | 6 | 50 | 4 | |
| 2NCRG 025 005 S04 | 2.5 X R0.5 | 6 | 50 | 4 | |
| 2NCRG 030 001 S06 | 3 X R0.1 | 8 | 60 | 6 | |
| 2NCRG 030 002 S06 | 3 X R0.2 | 8 | 60 | 6 | |
| 2NCRG 030 003 S06 | 3 X R0.3 | 8 | 60 | 6 | |
| 2NCRG 030 005 S06 | 3 X R0.5 | 8 | 60 | 6 | |
| 2NCRG 030 010 S06 | 3 X R1 | 8 | 60 | 6 | |
| 2NCRG 040 001 060 | 4 X R0.1 | 9 | 60 | 4 | |
| 2NCRG 040 001 080 | 4 X R0.1 | 9 | 80 | 4 | |
| 2NCRG 040 001 S06 | 4 X R0.1 | 10 | 70 | 6 | |
| 2NCRG 040 002 060 | 4 X R0.2 | 9 | 60 | 4 | |
| 2NCRG 040 002 080 | 4 X R0.2 | 9 | 80 | 4 | |
| 2NCRG 040 002 S06 | 4 X R0.2 | 10 | 70 | 6 | |
| 2NCRG 040 003 060 | 4 X R0.3 | 9 | 60 | 4 | |
| 2NCRG 040 003 080 | 4 X R0.3 | 9 | 80 | 4 | |
| 2NCRG 040 003 S06 | 4 X R0.3 | 10 | 70 | 6 | |
| 2NCRG 040 005 060 | 4 X R0.5 | 9 | 60 | 4 | |
| 2NCRG 040 005 080 | 4 X R0.5 | 9 | 80 | 4 | |
| 2NCRG 040 005 S06 | 4 X R0.5 | 10 | 70 | 6 | |

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2NCRG 040 010 060 | 4 X R1 | 9 | 60 | 4 | |
| 2NCRG 040 010 080 | 4 X R1 | 9 | 80 | 4 | |
| 2NCRG 040 010 S06 | 4 X R1 | 10 | 70 | 6 | |
| 2NCRG 050 001 S06 | 5 X R0.1 | 13 | 75 | 6 | |
| 2NCRG 050 002 S06 | 5 X R0.2 | 13 | 75 | 6 | |
| 2NCRG 050 003 S06 | 5 X R0.3 | 13 | 75 | 6 | |
| 2NCRG 050 005 S06 | 5 X R0.5 | 13 | 75 | 6 | |
| 2NCRG 050 010 S06 | 5 X R1 | 13 | 75 | 6 | |
| 2NCRG 060 001 060 | 6 X R0.1 | 11 | 60 | 6 | |
| 2NCRG 060 001 090 | 6 X R0.1 | 13 | 90 | 6 | |
| 2NCRG 060 002 060 | 6 X R0.2 | 11 | 60 | 6 | |
| 2NCRG 060 002 090 | 6 X R0.2 | 13 | 90 | 6 | |
| 2NCRG 060 003 060 | 6 X R0.3 | 11 | 60 | 6 | |
| 2NCRG 060 003 090 | 6 X R0.3 | 13 | 90 | 6 | |
| 2NCRG 060 005 060 | 6 X R0.5 | 11 | 60 | 6 | |
| 2NCRG 060 005 090 | 6 X R0.5 | 13 | 90 | 6 | |
| 2NCRG 060 010 060 | 6 X R1 | 11 | 60 | 6 | |
| 2NCRG 060 010 090 | 6 X R1 | 13 | 90 | 6 | |
| 2NCRG 060 015 060 | 6 X R1.5 | 11 | 60 | 6 | |
| 2NCRG 060 015 090 | 6 X R1.5 | 13 | 90 | 6 | |
| 2NCRG 060 020 060 | 6 X R2 | 11 | 60 | 6 | |
| 2NCRG 060 020 090 | 6 X R2 | 13 | 90 | 6 | |
| 2NCRG 060 025 090 | 6 X R2.5 | 13 | 90 | 6 | |
| 2NCRG 080 001 070 | 8 X R0.1 | 16 | 70 | 8 | |
| 2NCRG 080 001 100 | 8 X R0.1 | 19 | 100 | 8 | |
| 2NCRG 080 002 070 | 8 X R0.2 | 16 | 70 | 8 | |
| 2NCRG 080 002 100 | 8 X R0.2 | 19 | 100 | 8 | |
| 2NCRG 080 003 070 | 8 X R0.3 | 16 | 70 | 8 | |
| 2NCRG 080 003 100 | 8 X R0.3 | 19 | 100 | 8 | |
| 2NCRG 080 005 070 | 8 X R0.5 | 16 | 70 | 8 | |
| 2NCRG 080 005 100 | 8 X R0.5 | 19 | 100 | 8 | |
| 2NCRG 080 005 120 | 8 X R0.5 | 19 | 120 | 8 | |
| 2NCRG 080 010 070 | 8 X R1 | 16 | 70 | 8 | |
| 2NCRG 080 010 100 | 8 X R1 | 19 | 100 | 8 | |
| 2NCRG 080 010 120 | 8 X R1 | 19 | 120 | 8 | |
| 2NCRG 080 015 070 | 8 X R1.5 | 16 | 70 | 8 | |
| 2NCRG 080 015 100 | 8 X R1.5 | 19 | 100 | 8 | |
| 2NCRG 080 020 070 | 8 X R2 | 16 | 70 | 8 | |
| 2NCRG 080 020 100 | 8 X R2 | 19 | 100 | 8 | |
| 2NCRG 080 025 100 | 8 X R2.5 | 19 | 100 | 8 | |
| 2NCRG 080 030 100 | 8 X R3 | 19 | 100 | 8 | |
| 2NCRG 080 035 100 | 8 X R3.5 | 19 | 100 | 8 | |
| 2NCRG 100 001 075 | 10 X R0.1 | 19 | 75 | 10 | |
| 2NCRG 100 001 100 | 10 X R0.1 | 22 | 100 | 10 | |
| 2NCRG 100 002 075 | 10 X R0.2 | 19 | 75 | 10 | |
| 2NCRG 100 002 100 | 10 X R0.2 | 22 | 100 | 10 | |
| 2NCRG 100 003 075 | 10 X R0.3 | 19 | 75 | 10 | |
| 2NCRG 100 003 100 | 10 X R0.3 | 22 | 100 | 10 | |
| 2NCRG 100 005 075 | 10 X R0.5 | 19 | 75 | 10 | |
| 2NCRG 100 005 100 | 10 X R0.5 | 22 | 100 | 10 | |

단위 : mm

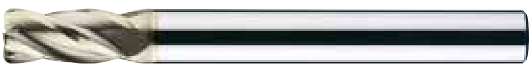
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2NCRG 100 005 130 | 10 X R0.5 | 22 | 130 | 10 | |
| 2NCRG 100 010 075 | 10 X R1 | 19 | 75 | 10 | |
| 2NCRG 100 010 100 | 10 X R1 | 22 | 100 | 10 | |
| 2NCRG 100 010 130 | 10 X R1 | 22 | 130 | 10 | |
| 2NCRG 100 015 075 | 10 X R1.5 | 19 | 75 | 10 | |
| 2NCRG 100 015 100 | 10 X R1.5 | 22 | 100 | 10 | |
| 2NCRG 100 015 130 | 10 X R1.5 | 22 | 130 | 10 | |
| 2NCRG 100 020 075 | 10 X R2 | 19 | 75 | 10 | |
| 2NCRG 100 020 100 | 10 X R2 | 22 | 100 | 10 | |
| 2NCRG 100 025 100 | 10 X R2.5 | 22 | 100 | 10 | |
| 2NCRG 100 030 100 | 10 X R3 | 22 | 100 | 10 | |
| 2NCRG 100 040 100 | 10 X R4 | 22 | 100 | 10 | |
| 2NCRG 120 001 080 | 12 X R0.1 | 22 | 80 | 12 | |
| 2NCRG 120 001 110 | 12 X R0.1 | 26 | 110 | 12 | |
| 2NCRG 120 002 080 | 12 X R0.2 | 22 | 80 | 12 | |
| 2NCRG 120 002 110 | 12 X R0.2 | 26 | 110 | 12 | |
| 2NCRG 120 003 080 | 12 X R0.3 | 22 | 80 | 12 | |
| 2NCRG 120 003 110 | 12 X R0.3 | 26 | 110 | 12 | |
| 2NCRG 120 005 080 | 12 X R0.5 | 22 | 80 | 12 | |
| 2NCRG 120 005 110 | 12 X R0.5 | 26 | 110 | 12 | |
| 2NCRG 120 005 130 | 12 X R0.5 | 26 | 130 | 12 | |
| 2NCRG 120 010 080 | 12 X R1 | 22 | 80 | 12 | |
| 2NCRG 120 010 110 | 12 X R1 | 26 | 110 | 12 | |
| 2NCRG 120 010 130 | 12 X R1 | 26 | 130 | 12 | |
| 2NCRG 120 015 080 | 12 X R1.5 | 22 | 80 | 12 | |
| 2NCRG 120 015 110 | 12 X R1.5 | 26 | 110 | 12 | |
| 2NCRG 120 015 130 | 12 X R1.5 | 26 | 130 | 12 | |
| 2NCRG 120 020 080 | 12 X R2 | 22 | 80 | 12 | |
| 2NCRG 120 020 110 | 12 X R2 | 26 | 110 | 12 | |
| 2NCRG 120 020 130 | 12 X R2 | 26 | 130 | 12 | |
| 2NCRG 120 025 110 | 12 X R2.5 | 26 | 110 | 12 | |
| 2NCRG 120 030 110 | 12 X R3 | 26 | 110 | 12 | |
| 2NCRG 120 040 110 | 12 X R4 | 26 | 110 | 12 | |
| 2NCRG 120 050 110 | 12 X R5 | 26 | 110 | 12 | |

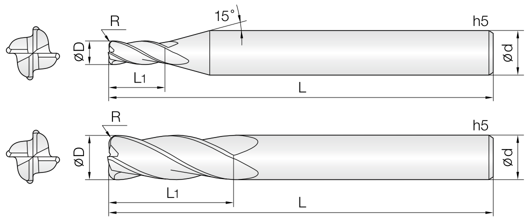
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 4NCRG

## 4 Flutes Corner Radius End Mills for Multi Purpose

## 4날 범용 코너 레디우스 엔드밀






- **중저경도강(HRc52이하), 프리하든강 계열, 탄소강, 금형강 등 가공**
- JCRO 코팅 처리하여 넓은 영역의 피삭재 가공에 적합합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 코너R 형상을 날부치핑이 적도록 설계하였습니다.
- 다양한 코너R과 유효장으로 맞춤 가공이 가능합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택,엔드밀의 파손을 최소화

- **Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels**
- Optimum for various work materials by JCRO coating.
- High precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- Various corner R and flute length for wide range application.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

4 | WC 미립자 | JCRO Coating | R ± 0.005 R0.05 ~ 0.5 | R ± 0.01 R1 ~ 1.5 | R ± 0.015 R2 ~ 4 | 35° Helix Angle | CUTTING DATA 472P

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

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |
| | Ø12.1 ~ 25 | -0.01 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4NCRG 010 0005 S04 | 1 X R0.05 | 2.5 | 45 | 4 | |
| 4NCRG 010 001 S04 | 1 X R0.1 | 2.5 | 45 | 4 | |
| 4NCRG 010 002 S04 | 1 X R0.2 | 2.5 | 45 | 4 | |
| 4NCRG 010 003 S04 | 1 X R0.3 | 2.5 | 45 | 4 | |
| 4NCRG 015 0005 S04 | 1.5 X R0.05 | 4 | 45 | 4 | |
| 4NCRG 015 001 S04 | 1.5 X R0.1 | 4 | 45 | 4 | |
| 4NCRG 015 002 S04 | 1.5 X R0.2 | 4 | 45 | 4 | |
| 4NCRG 015 003 S04 | 1.5 X R0.3 | 4 | 45 | 4 | |
| 4NCRG 015 005 S04 | 1.5 X R0.5 | 4 | 45 | 4 | |
| 4NCRG 020 0005 S04 | 2 X R0.05 | 6 | 45 | 4 | |
| 4NCRG 020 001 S04 | 2 X R0.1 | 6 | 45 | 4 | |
| 4NCRG 020 002 S04 | 2 X R0.2 | 6 | 45 | 4 | |
| 4NCRG 020 003 S04 | 2 X R0.3 | 6 | 45 | 4 | |
| 4NCRG 020 005 S04 | 2 X R0.5 | 6 | 45 | 4 | |
| 4NCRG 025 001 S04 | 2.5 X R0.1 | 6 | 50 | 4 | |
| 4NCRG 025 002 S04 | 2.5 X R0.2 | 6 | 50 | 4 | |
| 4NCRG 025 003 S04 | 2.5 X R0.3 | 6 | 50 | 4 | |
| 4NCRG 025 005 S04 | 2.5 X R0.5 | 6 | 50 | 4 | |
| 4NCRG 030 001 S06 | 3 X R0.1 | 8 | 60 | 6 | |
| 4NCRG 030 002 S06 | 3 X R0.2 | 8 | 60 | 6 | |
| 4NCRG 030 003 S06 | 3 X R0.3 | 8 | 60 | 6 | |
| 4NCRG 030 005 S06 | 3 X R0.5 | 8 | 60 | 6 | |
| 4NCRG 030 010 S06 | 3 X R1 | 8 | 60 | 6 | |
| 4NCRG 040 001 060 | 4 X R0.1 | 9 | 60 | 4 | |
| 4NCRG 040 001 080 | 4 X R0.1 | 9 | 80 | 4 | |
| 4NCRG 040 001 S06 | 4 X R0.1 | 10 | 70 | 6 | |
| 4NCRG 040 002 060 | 4 X R0.2 | 9 | 60 | 4 | |
| 4NCRG 040 002 080 | 4 X R0.2 | 9 | 80 | 4 | |
| 4NCRG 040 002 S06 | 4 X R0.2 | 10 | 70 | 6 | |
| 4NCRG 040 003 060 | 4 X R0.3 | 9 | 60 | 4 | |
| 4NCRG 040 003 080 | 4 X R0.3 | 9 | 80 | 4 | |
| 4NCRG 040 003 S06 | 4 X R0.3 | 10 | 70 | 6 | |
| 4NCRG 040 005 060 | 4 X R0.5 | 9 | 60 | 4 | |
| 4NCRG 040 005 080 | 4 X R0.5 | 9 | 80 | 4 | |
| 4NCRG 040 005 S06 | 4 X R0.5 | 10 | 70 | 6 | |
| 4NCRG 040 010 060 | 4 X R1 | 9 | 60 | 4 | |
| 4NCRG 040 010 080 | 4 X R1 | 9 | 80 | 4 | |
| 4NCRG 040 010 S06 | 4 X R1 | 10 | 70 | 6 | |
| 4NCRG 050 001 S06 | 5 X R0.1 | 13 | 75 | 6 | |
| 4NCRG 050 002 S06 | 5 X R0.2 | 13 | 75 | 6 | |
| 4NCRG 050 003 S06 | 5 X R0.3 | 13 | 75 | 6 | |
| 4NCRG 050 005 S06 | 5 X R0.5 | 13 | 75 | 6 | |
| 4NCRG 050 010 S06 | 5 X R1 | 13 | 75 | 6 | |
| 4NCRG 060 001 060 | 6 X R0.1 | 11 | 60 | 6 | |
| 4NCRG 060 001 080 | 6 X R0.1 | 13 | 80 | 6 | |
| 4NCRG 060 002 060 | 6 X R0.2 | 11 | 60 | 6 | |
| 4NCRG 060 002 080 | 6 X R0.2 | 13 | 80 | 6 | |
| 4NCRG 060 003 060 | 6 X R0.3 | 11 | 60 | 6 | |
| 4NCRG 060 003 080 | 6 X R0.3 | 13 | 80 | 6 | |
| 4NCRG 060 005 060 | 6 X R0.5 | 11 | 60 | 6 | |

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4NCRG 060 005 080 | 6 X R0.5 | 13 | 80 | 6 | |
| 4NCRG 060 010 060 | 6 X R1 | 11 | 60 | 6 | |
| 4NCRG 060 010 080 | 6 X R1 | 13 | 80 | 6 | |
| 4NCRG 060 015 060 | 6 X R1.5 | 11 | 60 | 6 | |
| 4NCRG 060 015 080 | 6 X R1.5 | 13 | 80 | 6 | |
| 4NCRG 060 020 060 | 6 X R2 | 11 | 60 | 6 | |
| 4NCRG 060 020 080 | 6 X R2 | 13 | 80 | 6 | |
| 4NCRG 080 001 070 | 8 X R0.1 | 16 | 70 | 8 | |
| 4NCRG 080 001 090 | 8 X R0.1 | 19 | 90 | 8 | |
| 4NCRG 080 002 070 | 8 X R0.2 | 16 | 70 | 8 | |
| 4NCRG 080 002 090 | 8 X R0.2 | 19 | 90 | 8 | |
| 4NCRG 080 003 070 | 8 X R0.3 | 16 | 70 | 8 | |
| 4NCRG 080 003 090 | 8 X R0.3 | 19 | 90 | 8 | |
| 4NCRG 080 005 070 | 8 X R0.5 | 16 | 70 | 8 | |
| 4NCRG 080 005 090 | 8 X R0.5 | 19 | 90 | 8 | |
| 4NCRG 080 005 110 | 8 X R0.5 | 19 | 110 | 8 | |
| 4NCRG 080 010 070 | 8 X R1 | 16 | 70 | 8 | |
| 4NCRG 080 010 090 | 8 X R1 | 19 | 90 | 8 | |
| 4NCRG 080 010 110 | 8 X R1 | 19 | 110 | 8 | |
| 4NCRG 080 015 070 | 8 X R1.5 | 16 | 70 | 8 | |
| 4NCRG 080 015 090 | 8 X R1.5 | 19 | 90 | 8 | |
| 4NCRG 080 015 110 | 8 X R1.5 | 19 | 110 | 8 | |
| 4NCRG 080 020 070 | 8 X R2 | 16 | 70 | 8 | |
| 4NCRG 080 020 090 | 8 X R2 | 19 | 90 | 8 | |
| 4NCRG 080 020 110 | 8 X R2 | 19 | 110 | 8 | |
| 4NCRG 080 025 090 | 8 X R2.5 | 19 | 90 | 8 | |
| 4NCRG 100 001 075 | 10 X R0.1 | 19 | 75 | 10 | |
| 4NCRG 100 001 100 | 10 X R0.1 | 22 | 100 | 10 | |
| 4NCRG 100 002 075 | 10 X R0.2 | 19 | 75 | 10 | |
| 4NCRG 100 002 100 | 10 X R0.2 | 22 | 100 | 10 | |
| 4NCRG 100 003 075 | 10 X R0.3 | 19 | 75 | 10 | |
| 4NCRG 100 003 100 | 10 X R0.3 | 22 | 100 | 10 | |
| 4NCRG 100 005 075 | 10 X R0.5 | 19 | 75 | 10 | |
| 4NCRG 100 005 100 | 10 X R0.5 | 22 | 100 | 10 | |
| 4NCRG 100 005 120 | 10 X R0.5 | 22 | 120 | 10 | |
| 4NCRG 100 010 075 | 10 X R1 | 19 | 75 | 10 | |
| 4NCRG 100 010 100 | 10 X R1 | 22 | 100 | 10 | |
| 4NCRG 100 010 120 | 10 X R1 | 22 | 120 | 10 | |
| 4NCRG 100 015 075 | 10 X R1.5 | 19 | 75 | 10 | |
| 4NCRG 100 015 100 | 10 X R1.5 | 22 | 100 | 10 | |
| 4NCRG 100 015 120 | 10 X R1.5 | 22 | 120 | 10 | |
| 4NCRG 100 020 075 | 10 X R2 | 19 | 75 | 10 | |
| 4NCRG 100 020 100 | 10 X R2 | 22 | 100 | 10 | |
| 4NCRG 100 020 120 | 10 X R2 | 22 | 120 | 10 | |
| 4NCRG 100 025 075 | 10 X R2.5 | 19 | 75 | 10 | |
| 4NCRG 100 025 100 | 10 X R2.5 | 22 | 100 | 10 | |
| 4NCRG 100 025 120 | 10 X R2.5 | 22 | 120 | 10 | |
| 4NCRG 100 030 100 | 10 X R3 | 22 | 100 | 10 | |
| 4NCRG 120 002 080 | 12 X R0.2 | 22 | 80 | 12 | |
| 4NCRG 120 002 110 | 12 X R0.2 | 26 | 110 | 12 | |

단위 : mm

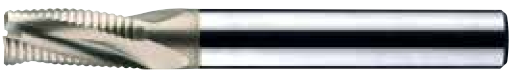
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4NCRG 120 003 080 | 12 X R0.3 | 22 | 80 | 12 | |
| 4NCRG 120 003 110 | 12 X R0.3 | 26 | 110 | 12 | |
| 4NCRG 120 005 080 | 12 X R0.5 | 22 | 80 | 12 | |
| 4NCRG 120 005 110 | 12 X R0.5 | 26 | 110 | 12 | |
| 4NCRG 120 005 130 | 12 X R0.5 | 26 | 130 | 12 | |
| 4NCRG 120 010 080 | 12 X R1 | 22 | 80 | 12 | |
| 4NCRG 120 010 110 | 12 X R1 | 26 | 110 | 12 | |
| 4NCRG 120 010 130 | 12 X R1 | 26 | 130 | 12 | |
| 4NCRG 120 015 080 | 12 X R1.5 | 22 | 80 | 12 | |
| 4NCRG 120 015 110 | 12 X R1.5 | 26 | 110 | 12 | |
| 4NCRG 120 015 130 | 12 X R1.5 | 26 | 130 | 12 | |
| 4NCRG 120 020 080 | 12 X R2 | 22 | 80 | 12 | |
| 4NCRG 120 020 110 | 12 X R2 | 26 | 110 | 12 | |
| 4NCRG 120 020 130 | 12 X R2 | 26 | 130 | 12 | |
| 4NCRG 120 025 080 | 12 X R2.5 | 22 | 80 | 12 | |
| 4NCRG 120 025 110 | 12 X R2.5 | 26 | 110 | 12 | |
| 4NCRG 120 025 130 | 12 X R2.5 | 26 | 130 | 12 | |
| 4NCRG 120 030 080 | 12 X R3 | 22 | 80 | 12 | |
| 4NCRG 120 030 110 | 12 X R3 | 26 | 110 | 12 | |
| 4NCRG 120 030 130 | 12 X R3 | 26 | 130 | 12 | |
| 4NCRG 120 035 110 | 12 X R3.5 | 26 | 110 | 12 | |
| 4NCRG 120 040 110 | 12 X R4 | 26 | 110 | 12 | |
| 4NCRG 160 005 110 | 16 X R0.5 | 35 | 110 | 16 | |
| 4NCRG 160 005 160 | 16 X R0.5 | 35 | 160 | 16 | |
| 4NCRG 160 010 110 | 16 X R1 | 35 | 110 | 16 | |
| 4NCRG 160 010 160 | 16 X R1 | 35 | 160 | 16 | |

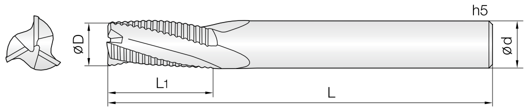
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 3&4ROUG

*3&4 Flutes Roughing End Mills for Multi Purpose*

## 3&4날 범용 라핑 엔드밀






- **공구강, 합금강 및 고경도 일반강 황삭가공 엔드밀**
- JCRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 뛰어난 칩배출력으로 가공시간을 단축하였습니다.
- 고속가공으로 작업의 효율성을 극대화합니다.
- 항절력이 높은 미립자 초경합금을 채택하여, 엔드밀의 파손을 최소화 하였습니다.

- **Roughing Endmills for tool steels, alloy steels**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Reduce machining time by excellent chip control.
- Maximize work efficiency by high speed machining.
- Minimize fracturing at high feed by high TRS fine WC grade.

3 | 4 | WC 미립자 | JCRO Coating | 35° Helix Angle | Shield Edge | CUTTING DATA 472P

| D Size | D Tolerance |
|---|---|
| ø4 ~ 9 | -0.02 ~ -0.04mm |
| ø10 ~ 20 | -0.02 ~ -0.05mm |

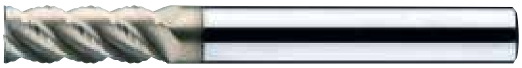
단위 : mm

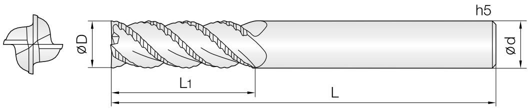
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| New 3ROUG 025 050 S06 | 2.5 | 5 | 45 | 6 | |
| New 3ROUG 030 080 S06 | 3 | 8 | 45 | 6 | |
| 3ROUG 040 100 S06 | 4 | 10 | 50 | 6 | |
| 3ROUG 050 130 S06 | 5 | 13 | 50 | 6 | |
| 3ROUG 060 100 050 | 6 | 10 | 50 | 6 | |
| 3ROUG 060 150 055 | 6 | 15 | 55 | 6 | |
| 3ROUG 060 200 060 | 6 | 20 | 60 | 6 | |
| 3ROUG 070 180 S08 | 7 | 18 | 65 | 8 | |
| 3ROUG 080 120 060 | 8 | 12 | 60 | 8 | |
| 3ROUG 080 190 065 | 8 | 19 | 65 | 8 | |
| 3ROUG 080 250 070 | 8 | 25 | 70 | 8 | |
| 4ROUG 090 220 S10 | 9 | 22 | 70 | 10 | |
| 4ROUG 100 150 070 | 10 | 15 | 70 | 10 | |
| 4ROUG 100 220 070 | 10 | 22 | 70 | 10 | |
| 4ROUG 100 300 080 | 10 | 30 | 80 | 10 | |
| 4ROUG 110 270 S12 | 11 | 27 | 80 | 12 | |
| 4ROUG 120 200 075 | 12 | 20 | 75 | 12 | |
| 4ROUG 120 260 080 | 12 | 26 | 80 | 12 | |
| 4ROUG 120 350 090 | 12 | 35 | 90 | 12 | |
| 4ROUG 160 320 090 | 16 | 32 | 90 | 16 | |
| 4ROUG 160 400 100 | 16 | 40 | 100 | 16 | |
| 4ROUG 200 380 110 | 20 | 38 | 110 | 20 | |
| 4ROUG 200 500 110 | 20 | 50 | 110 | 20 | |

# 3&4HROUG

*3&4 Flutes 45°Helix Fine Pitch Roughing End Mills for Multi Purpose*

## 3&4날 범용 45°헬릭스 파인피치형 라핑 엔드밀






- **합금강, SUS계열, 인코넬, 일반구조강 등 다양한 난삭재의 황삭가공**
- JCRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 45°헬릭스 적용으로 절삭 저항이 감소되어 장시간 가공에 적합합니다.
- 파인피치 형상 채택으로 고속, 황삭가공 작업에 적합합니다.

- **Roughing Endmills for hard to cut materials, alloy steels, SUS, Inconel and structural steels**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Long tool life with low cutting force by 45°degree helix design.
- Fine pitch shape design for high speed roughing application.

G series

3 | 4 | WC 미립자 | JCRO Coating | 45° Helix Angle | Shield Edge | CUTTING DATA 473P

| D Size | D Tolerance |
|---|---|
| ø4 ~ 9 | -0.02 ~ -0.04mm |
| ø10 ~ 20 | -0.02 ~ -0.05mm |

단위 : mm

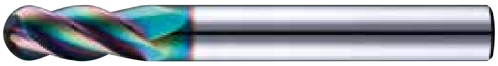
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 3HROUG 040 100 S06 | 4 | 10 | 50 | 6 | |
| 3HROUG 050 130 S06 | 5 | 13 | 50 | 6 | |
| 3HROUG 060 100 050 | 6 | 10 | 50 | 6 | |
| 3HROUG 060 160 055 | 6 | 16 | 55 | 6 | |
| 3HROUG 060 200 060 | 6 | 20 | 60 | 6 | |
| 3HROUG 070 180 S08 | 7 | 18 | 65 | 8 | |
| 3HROUG 080 120 060 | 8 | 12 | 60 | 8 | |
| 3HROUG 080 190 065 | 8 | 19 | 65 | 8 | |
| 3HROUG 080 250 070 | 8 | 25 | 70 | 8 | |
| 4HROUG 090 220 S10 | 9 | 22 | 70 | 10 | |
| 4HROUG 100 150 070 | 10 | 15 | 70 | 10 | |
| 4HROUG 100 220 070 | 10 | 22 | 70 | 10 | |
| 4HROUG 100 300 080 | 10 | 30 | 80 | 10 | |
| 4HROUG 110 270 S12 | 11 | 27 | 80 | 12 | |
| 4HROUG 120 200 075 | 12 | 20 | 75 | 12 | |
| 4HROUG 120 250 080 | 12 | 25 | 80 | 12 | |
| 4HROUG 120 350 090 | 12 | 35 | 90 | 12 | |
| 4HROUG 160 320 090 | 16 | 32 | 90 | 16 | |
| 4HROUG 160 400 110 | 16 | 40 | 110 | 16 | |
| 4HROUG 200 380 110 | 20 | 38 | 110 | 20 | |
| 4HROUG 200 500 120 | 20 | 50 | 120 | 20 | |

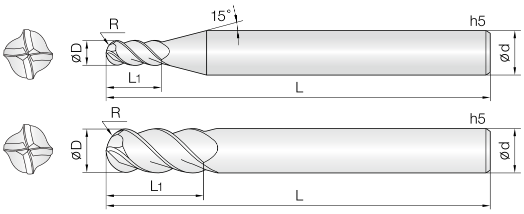
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

4 Flutes Various Symmetry End Mills for Steel, Cast Iron & Stainless Steels

New

# 4날 고능률 범용 볼 엔드밀






- **중저경도강(HRc 42이하), 연강, 주철, SUS계열 가공 엔드밀**
- HR코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며 내마모성 또한 향상 됩니다.
- 부등분할 볼방식과 가변 헬릭스 인선설계로 채터링이 더욱 감소 하였습니다.
- 4날 적용과 깊은 포켓으로 칩배출이 원활하며, 피삭재 면조도가 우수합니다.

- **Mid-low hardened steels(~HRc42), Mild steels, Cast irons, SUS**
- HR coating reduces stress of flute and enhances wear resistance.
- Unequal pitch Ball design and helix enable decrease of chattering.
- 4flutes and deep pocket enable chip evacuation and increase surface roughness.

| 4 | WC 미립자 | HR Coating | R ± 0.005 | R ± 0.01 | R ± 0.015 | 35°/38° Helix Angle | CUTTING DATA |
|---|---|---|---|---|---|---|---|
| | | | 0.5 ~ 2.5R | 3 ~ 6R | 8~12.5R | Ø1 ~25 | 474P |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 25 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø16 ~ 25 | -0.015 ~ -0.03mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4VSB 010 025 S06 | 0.5R X 1 | 2.5 | 50 | 6 | |
| 4VSB 012 030 S06 | 0.6R X 1.2 | 3 | 50 | 6 | |
| 4VSB 015 040 S06 | 0.75R X 1.5 | 4 | 50 | 6 | |
| 4VSB 020 050 S06 | 1R X 2 | 5 | 50 | 6 | |
| 4VSB 025 060 S06 | 1.25R X 2.5 | 6 | 50 | 6 | |
| 4VSB 030 060 S03 | 1.5R X 3 | 6 | 50 | 3 | |
| 4VSB 030 080 S06 | 1.5R X 3 | 8 | 50 | 6 | |
| 4VSB 040 080 S04 | 2R X 4 | 8 | 50 | 4 | |
| 4VSB 040 100 S06 | 2R X 4 | 10 | 50 | 6 | |
| 4VSB 050 150 S06 | 2.5R X 5 | 15 | 60 | 6 | |
| 4VSB 060 150 S06 | 3R X 6 | 15 | 60 | 6 | |
| 4VSB 060 150 090 | 3R X 6 | 15 | 90 | 6 | |
| 4VSB 080 200 S08 | 4R X 8 | 20 | 70 | 8 | |
| 4VSB 080 200 100 | 4R X 8 | 20 | 100 | 8 | |
| 4VSB 100 250 S10 | 5R X 10 | 25 | 75 | 10 | |
| 4VSB 100 250 100 | 5R X 10 | 25 | 100 | 10 | |
| 4VSB 120 300 S12 | 6R X 12 | 30 | 80 | 12 | |
| 4VSB 120 300 120 | 6R X 12 | 30 | 120 | 12 | |
| 4VSB 160 400 S16 | 8R X 16 | 40 | 100 | 16 | |
| 4VSB 160 400 130 | 8R X 16 | 40 | 130 | 16 | |
| 4VSB 200 450 S20 | 10R X 20 | 45 | 100 | 20 | |
| 4VSB 200 450 150 | 10R X 20 | 45 | 150 | 20 | |
| 4VSB 250 500 S25 | 12.5R X 25 | 50 | 125 | 25 | |
| 4VSB 250 500 160 | 12.5R X 25 | 50 | 160 | 25 | |

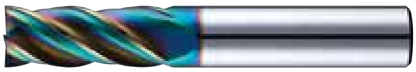
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

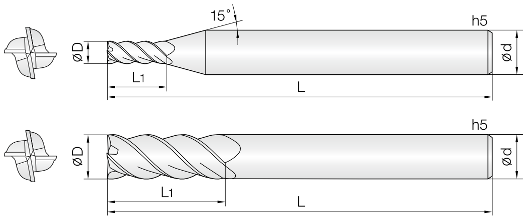
# 4VSE

4 Flutes Various Symmetry End Mills for Steels, Cast Irons & Stainless Steels

## 4날 고능률 범용 엔드밀

New






- 중저경도강(HRc 42이하), 연강, 주철, SUS계열 가공 엔드밀
- HR코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며 내마모성 또한 향상 됩니다.
- 부등분할 방식과 가변 헬릭스 인선설계로 채터링이 더욱 감소 하였습니다.
- 4날 적용과 깊은 포켓으로 칩배출이 원활하며, 피삭재 면조도가 우수합니다.

- Mid-low hardened steels(~HRc42), Mild steels, Cast irons, SUS
- HR coating reduces stress of flute and enhances wear resistance.
- Unequal pitch design and helix enable decrease of chattering.
- 4flutes and deep pocket enable chip evacuation and increase surface roughness.

4 | WC 미립자 | HR Coating | 38° Helix Angle Ø1~2.5 | 35°/38° Helix Angle Ø3~20 | Shield Edge | CUTTING DATA 475P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 20 | -0.015 ~ -0.03mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4VSE 010 025 S06 | 1 | 2.5 | 50 | 6 | |
| 4VSE 010 035 S06 | 1 | 3.5 | 50 | 6 | |
| 4VSE 012 030 S06 | 1.2 | 3 | 50 | 6 | |
| 4VSE 012 045 S06 | 1.2 | 4.5 | 50 | 6 | |
| 4VSE 015 040 S06 | 1.5 | 4 | 50 | 6 | |
| 4VSE 015 060 S06 | 1.5 | 6 | 50 | 6 | |
| 4VSE 020 060 S06 | 2 | 6 | 50 | 6 | |
| 4VSE 020 090 S06 | 2 | 9 | 50 | 6 | |
| 4VSE 025 070 S06 | 2.5 | 7 | 50 | 6 | |
| 4VSE 025 100 S06 | 2.5 | 10 | 50 | 6 | |
| 4VSE 030 080 S06 | 3 | 8 | 50 | 6 | |
| 4VSE 030 120 S06 | 3 | 12 | 50 | 6 | |
| 4VSE 035 090 S06 | 3.5 | 9 | 50 | 6 | |
| 4VSE 035 130 S06 | 3.5 | 13 | 50 | 6 | |
| 4VSE 040 100 S06 | 4 | 10 | 50 | 6 | |
| 4VSE 040 150 S06 | 4 | 15 | 60 | 6 | |
| 4VSE 045 120 S06 | 4.5 | 12 | 60 | 6 | |
| 4VSE 045 180 S06 | 4.5 | 18 | 60 | 6 | |
| 4VSE 050 150 S06 | 5 | 15 | 60 | 6 | |
| 4VSE 050 200 S06 | 5 | 20 | 70 | 6 | |
| 4VSE 060 150 S06 | 6 | 15 | 60 | 6 | |
| 4VSE 060 200 S06 | 6 | 20 | 70 | 6 | |
| 4VSE 080 200 S08 | 8 | 20 | 70 | 8 | |
| 4VSE 080 300 S08 | 8 | 30 | 80 | 8 | |
| 4VSE 100 250 S10 | 10 | 25 | 75 | 10 | |
| 4VSE 100 400 S10 | 10 | 40 | 90 | 10 | |
| 4VSE 120 300 S12 | 12 | 30 | 80 | 12 | |
| 4VSE 120 450 S12 | 12 | 45 | 100 | 12 | |
| New 4VSE 140 350 S14 | 14 | 35 | 90 | 14 | |
| New 4VSE 140 500 S14 | 14 | 50 | 110 | 14 | |
| 4VSE 160 400 S16 | 16 | 40 | 100 | 16 | |
| 4VSE 160 600 S16 | 16 | 60 | 120 | 16 | |
| 4VSE 200 450 S20 | 20 | 45 | 100 | 20 | |
| 4VSE 200 650 S20 | 20 | 65 | 120 | 20 | |

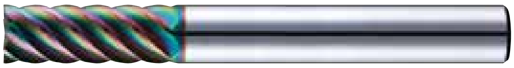
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

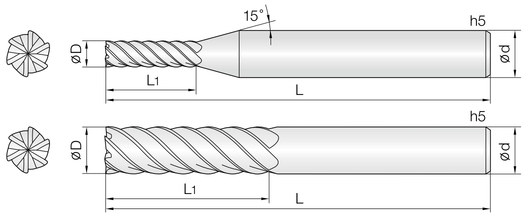
# 6VSE

6 Flutes Various Symmetry End Mills for Steels, Cast Irons & Stainless Steels

New

## 6날 고능률 범용 엔드밀






- **중저경도강(HRc 42이하), 연강, 주철, SUS계열 가공 엔드밀**
- HR코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며 내마모성 또한 향상 됩니다.
- 깊은 홀 헬릭스 인선설계로 칩배출이 원활하며 피삭제 면조도가 우수합니다.

- **Mid-low hardened steels(~HRc42), Mild steels, Cast irons, SUS**
- HR coating reduces stress of flute and enhances wear resistance.
- Deep hole helix design enable chip evacuation and increase surface roughness.

6 | WC 미립자 | HR Coating | 45° Helix Angle | Ø3~20 | Shield Edge | CUTTING DATA 475P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø3 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 20 | -0.015 ~ -0.03mm |

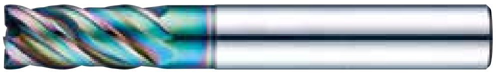
단위 : mm

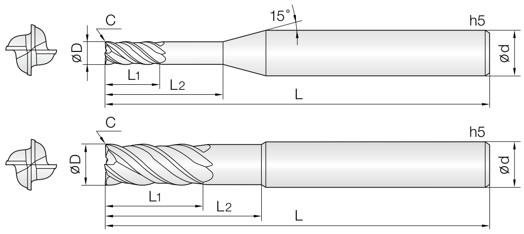
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 6VSE 030 080 S06 | 3 | 8 | 50 | 6 | |
| 6VSE 030 120 S06 | 3 | 12 | 60 | 6 | |
| 6VSE 040 100 S06 | 4 | 10 | 50 | 6 | |
| 6VSE 040 160 S06 | 4 | 16 | 60 | 6 | |
| 6VSE 050 150 S06 | 5 | 15 | 60 | 6 | |
| 6VSE 050 200 S06 | 5 | 20 | 70 | 6 | |
| 6VSE 050 250 S06 | 5 | 25 | 75 | 6 | |
| 6VSE 060 150 S06 | 6 | 15 | 60 | 6 | |
| 6VSE 060 200 S06 | 6 | 20 | 70 | 6 | |
| 6VSE 060 250 S06 | 6 | 25 | 75 | 6 | |
| 6VSE 080 210 S08 | 8 | 21 | 70 | 8 | |
| 6VSE 080 260 S08 | 8 | 26 | 70 | 8 | |
| 6VSE 080 320 S08 | 8 | 32 | 75 | 8 | |
| 6VSE 100 260 S10 | 10 | 26 | 75 | 10 | |
| 6VSE 100 350 S10 | 10 | 35 | 90 | 10 | |
| 6VSE 100 420 S10 | 10 | 42 | 100 | 10 | |
| 6VSE 120 310 S12 | 12 | 31 | 80 | 12 | |
| 6VSE 120 410 S12 | 12 | 41 | 100 | 12 | |
| 6VSE 120 510 S12 | 12 | 51 | 120 | 12 | |
| New 6VSE 140 360 S14 | 14 | 36 | 90 | 14 | |
| New 6VSE 140 550 S14 | 14 | 55 | 120 | 14 | |
| 6VSE 160 400 S16 | 16 | 40 | 100 | 16 | |
| 6VSE 160 650 S16 | 16 | 65 | 130 | 16 | |
| 6VSE 200 450 S20 | 20 | 45 | 100 | 20 | |
| 6VSE 200 800 S20 | 20 | 80 | 160 | 20 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 4SLE 4 Flutes High Speed Sloting End Mills for SUS

## 4날 고속 슬로팅 가공 엔드밀






- **합금강, SUS계열, 인코넬, 일반구조강 등 다양한 난삭재 정삭, 황삭 가공**
- 슬롯팅 가공시 2중의 옆날 홈으로 칩 배출이 우수하며, 두터운 2중의 코어는 흔들림 없는 가공을 구현합니다.
- TISIN-R 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화.

- **Endmills for finishing and roughing of alloy steels, SUS, Inconel, Mild steels and various hard-to-cut materials.**
- Chip emission is excellent for slotting, and thick double core designed enables continuous machining without chattering.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.
- TISIN-R coating provides wear resistance improvement as well as avoid edge stress in various applications.

4 | WC 미립자 | HR Coating | 42° Helix Angle | C Cutting | CUTTING DATA 476P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 20 | -0.015 ~ -0.03mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 면취량 Chamfer C | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|
| New 4SLE 010 030 S04 | 1 | 3 | 0.02 | - | 50 | 4 | |
| New 4SLE 010 060 S04 | 1 | 3 | 0.02 | 6 | 60 | 4 | |
| New 4SLE 010 080 S04 | 1 | 3 | 0.02 | 8 | 60 | 4 | |
| New 4SLE 010 100 S04 | 1 | 3 | 0.02 | 10 | 60 | 4 | |
| New 4SLE 015 040 S04 | 1.5 | 4 | 0.03 | - | 50 | 4 | |
| New 4SLE 015 060 S04 | 1.5 | 4 | 0.03 | 6 | 60 | 4 | |
| New 4SLE 015 080 S04 | 1.5 | 4 | 0.03 | 8 | 60 | 4 | |
| New 4SLE 015 100 S04 | 1.5 | 4 | 0.03 | 10 | 60 | 4 | |
| New 4SLE 015 120 S04 | 1.5 | 4 | 0.03 | 12 | 60 | 4 | |
| New 4SLE 020 060 S04 | 2 | 6 | 0.04 | - | 50 | 4 | |
| New 4SLE 020 080 S04 | 2 | 6 | 0.04 | 8 | 60 | 4 | |
| New 4SLE 020 100 S04 | 2 | 6 | 0.04 | 10 | 60 | 4 | |
| New 4SLE 020 120 S04 | 2 | 6 | 0.04 | 12 | 60 | 4 | |
| New 4SLE 020 160 S04 | 2 | 6 | 0.04 | 16 | 60 | 4 | |
| New 4SLE 025 070 S04 | 2.5 | 7 | 0.05 | - | 50 | 4 | |
| New 4SLE 025 180 S04 | 2.5 | 7 | 0.05 | 18 | 60 | 4 | |
| 4SLE 030 080 S06 | 3 | 8 | 0.06 | - | 50 | 6 | |
| 4SLE 030 210 S06 | 3 | 8 | 0.06 | 21 | 60 | 6 | |
| 4SLE 040 100 S06 | 4 | 10 | 0.08 | - | 50 | 6 | |
| 4SLE 040 210 S06 | 4 | 10 | 0.08 | 21 | 60 | 6 | |
| 4SLE 060 150 S06 | 6 | 15 | 0.12 | - | 60 | 6 | |
| 4SLE 060 210 S06 | 6 | 15 | 0.12 | 21 | 60 | 6 | |
| 4SLE 080 200 S08 | 8 | 20 | 0.16 | - | 70 | 8 | |
| 4SLE 080 270 S08 | 8 | 20 | 0.16 | 27 | 70 | 8 | |
| 4SLE 100 250 S10 | 10 | 25 | 0.2 | - | 80 | 10 | |
| 4SLE 100 350 S10 | 10 | 25 | 0.2 | 35 | 80 | 10 | |
| 4SLE 120 300 S12 | 12 | 30 | 0.24 | - | 90 | 12 | |
| 4SLE 120 400 S12 | 12 | 30 | 0.24 | 40 | 90 | 12 | |
| New 4SLE 140 350 S14 | 14 | 35 | 0.28 | - | 100 | 14 | |
| New 4SLE 140 450 S14 | 14 | 35 | 0.28 | 45 | 100 | 14 | |
| 4SLE 160 400 S16 | 16 | 40 | 0.32 | - | 100 | 16 | |
| 4SLE 160 500 S16 | 16 | 40 | 0.32 | 50 | 100 | 16 | |
| 4SLE 200 450 S20 | 20 | 45 | 0.4 | - | 110 | 20 | |
| 4SLE 200 550 S20 | 20 | 45 | 0.4 | 55 | 110 | 20 | |

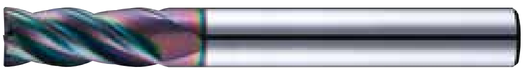
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 면취량 Chamfer C | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|

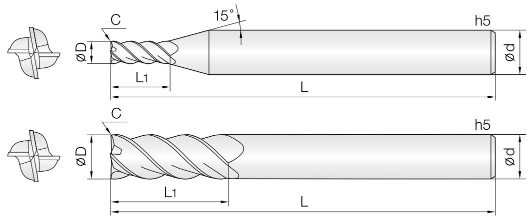
# 4VCC

4 Flutes Various Symmetry C End Mills for Steels, Cast Irons & Stainless Steels

New

## 4날 고능률 범용 C 엔드밀






- 중저경도강(HRc 42이하), 연강, 주철, SUS계열 가공 엔드밀
- HR코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며 내마모성 또한 향상 됩니다.
- 부등분할 방식과 가변 헬릭스 인선설계로 채터링이 더욱 감소 하였습니다.
- 4날 적용과 깊은 포켓으로 칩배출이 원활하며, 피삭재 면조도가 우수합니다.

- Mid-low hardened steels(~HRc42), Mild steels, Cast irons, SUS
- HR coating reduces stress of flute and enhances wear resistance.
- Unequal pitch design and helix enable decrease of chattering.
- 4flutes and deep pocket enable chip evacuation and increase surface roughness.

4 | WC 미립자 | HR Coating | 38° Helix Angle | 35°/38° Helix Angle | | CUTTING DATA

Ø1~2.5 | Ø3~20 | C Cutting | 475P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 20 | -0.015 ~ -0.03mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 면취량 Chamfer C | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4VCC 010 020 S04 | 1 | 2 | 0.03 | 45 | 4 | |
| 4VCC 010 025 S06 | 1 | 2.5 | 0.03 | 50 | 6 | |
| 4VCC 010 035 S06 | 1 | 3.5 | 0.03 | 50 | 6 | |
| 4VCC 012 020 S04 | 1.2 | 2 | 0.04 | 45 | 4 | |
| 4VCC 012 030 S06 | 1.2 | 3 | 0.04 | 50 | 6 | |
| 4VCC 012 050 S06 | 1.2 | 5 | 0.04 | 50 | 6 | |
| 4VCC 015 030 S04 | 1.5 | 3 | 0.05 | 45 | 4 | |
| 4VCC 015 040 S06 | 1.5 | 4 | 0.05 | 50 | 6 | |
| 4VCC 015 060 S06 | 1.5 | 6 | 0.05 | 50 | 6 | |
| 4VCC 020 040 S04 | 2 | 4 | 0.075 | 45 | 4 | |
| 4VCC 020 060 S06 | 2 | 6 | 0.075 | 50 | 6 | |
| 4VCC 020 090 S06 | 2 | 9 | 0.075 | 50 | 6 | |
| 4VCC 025 050 S04 | 2.5 | 5 | 0.08 | 50 | 4 | |
| 4VCC 025 070 S06 | 2.5 | 7 | 0.08 | 50 | 6 | |
| 4VCC 025 100 S06 | 2.5 | 10 | 0.08 | 50 | 6 | |
| 4VCC 030 060 S04 | 3 | 6 | 0.1 | 50 | 4 | |
| 4VCC 030 060 S06 | 3 | 6 | 0.1 | 50 | 6 | |
| 4VCC 030 080 S06 | 3 | 8 | 0.1 | 50 | 6 | |
| 4VCC 030 120 S06 | 3 | 12 | 0.1 | 50 | 6 | |
| 4VCC 040 080 S04 | 4 | 8 | 0.15 | 50 | 4 | |
| 4VCC 040 080 S06 | 4 | 8 | 0.15 | 50 | 6 | |
| 4VCC 040 100 S06 | 4 | 10 | 0.15 | 50 | 6 | |
| 4VCC 040 150 S06 | 4 | 15 | 0.15 | 60 | 6 | |
| 4VCC 050 100 S06 | 5 | 10 | 0.15 | 50 | 6 | |
| 4VCC 050 150 S06 | 5 | 15 | 0.15 | 60 | 6 | |
| 4VCC 050 200 S06 | 5 | 20 | 0.15 | 70 | 6 | |
| 4VCC 060 120 S06 | 6 | 12 | 0.2 | 50 | 6 | |
| 4VCC 060 150 S06 | 6 | 15 | 0.2 | 60 | 6 | |
| 4VCC 060 200 S06 | 6 | 20 | 0.2 | 70 | 6 | |
| 4VCC 080 160 S08 | 8 | 16 | 0.2 | 60 | 8 | |
| 4VCC 080 200 S08 | 8 | 20 | 0.2 | 70 | 8 | |
| 4VCC 080 300 S08 | 8 | 30 | 0.2 | 80 | 8 | |
| 4VCC 100 200 S10 | 10 | 20 | 0.3 | 75 | 10 | |
| 4VCC 100 250 S10 | 10 | 25 | 0.3 | 75 | 10 | |
| 4VCC 100 350 S10 | 10 | 35 | 0.3 | 90 | 10 | |
| 4VCC 120 240 S12 | 12 | 24 | 0.35 | 75 | 12 | |
| 4VCC 120 300 S12 | 12 | 30 | 0.35 | 80 | 12 | |
| 4VCC 120 450 S12 | 12 | 45 | 0.35 | 100 | 12 | |
| New 4VCC 140 360 S14 | 14 | 36 | 0.38 | 90 | 14 | |
| New 4VCC 140 500 S14 | 14 | 50 | 0.38 | 110 | 14 | |
| 4VCC 160 400 S16 | 16 | 40 | 0.4 | 100 | 16 | |
| 4VCC 160 600 S16 | 16 | 60 | 0.4 | 120 | 16 | |
| 4VCC 200 450 S20 | 20 | 45 | 0.5 | 100 | 20 | |
| 4VCC 200 650 S20 | 20 | 65 | 0.5 | 120 | 20 | |

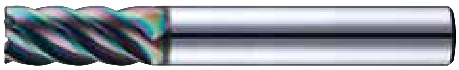
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 면취량 Chamfer C | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

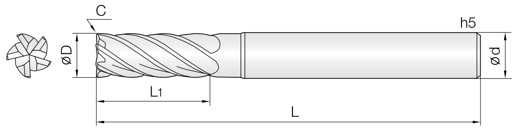
# 5VCC

*5 Flutes Various Symmetry Corner C End Mills for Steels, Cast Irons & Stainless Steels*

## 5날 고능률 범용 코너 C 엔드밀

New






- **중저경도강(HRc 42이하), 연강, 주철, SUS계열 가공 엔드밀**
- HR코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며 내마모성 또한 향상 됩니다.
- 부등분할 방식과 가변 헬릭스 인선설계로 채터링이 더욱 감소 하였습니다.
- 4날 적용과 깊은 포켓으로 칩배출이 원활하며, 피삭재 면조도가 우수합니다.

- **Mid-low hardened steels(~HRc42), Mild steels, Cast irons, SUS**
- HR coating reduces stress of flute and enhances wear resistance.
- Unequal pitch design and helix enable decrease of chattering.
- 4flutes and deep pocket enable chip evacuation and increase surface roughness.

5 | WC 미립자 | HR Coating | 41°~43° Helix Angle | | CUTTING DATA

Ø6 ~20 | C Cutting | 476P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø6 | +0 ~ -0.01mm |
| | Ø8 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 20 | -0.015 ~ -0.03mm |

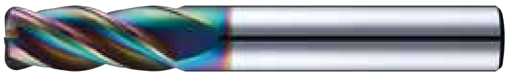
단위 : mm

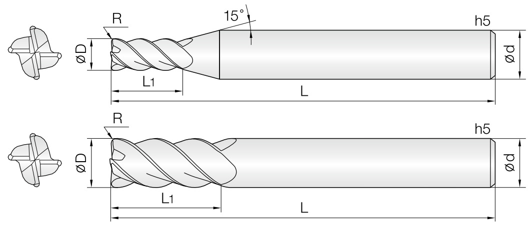
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 면취량 Chamfer C | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 5VCC 060 130 S06 | 6 | 13 | 0.1 | 55 | 6 | |
| 5VCC 080 190 S08 | 8 | 19 | 0.1 | 60 | 8 | |
| 5VCC 100 220 S10 | 10 | 22 | 0.1 | 70 | 10 | |
| 5VCC 120 260 S12 | 12 | 26 | 0.1 | 80 | 12 | |
| 5VCC 140 260 S14 | 14 | 26 | 0.2 | 80 | 14 | |
| 5VCC 160 320 S16 | 16 | 32 | 0.2 | 90 | 16 | |
| 5VCC 180 320 S18 | 18 | 32 | 0.2 | 90 | 18 | |
| 5VCC 200 380 S20 | 20 | 38 | 0.2 | 100 | 20 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 면취량 Chamfer C | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

# 4VSC
## 4날 고능률 범용 코너 레디우스 엔드밀

New






- **중저경도강(HRc 42이하), 연강, 주철, SUS계열 가공 엔드밀**
- HR코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며 내마모성 또한 향상 됩니다.
- 부등분할 방식과 가변 헬릭스 인선설계로 채터링이 더욱 감소 하였습니다.
- 4날 적용과 깊은 포켓으로 칩배출이 원활하며, 피삭재 면조도가 우수합니다.

- **Mid-low hardened steels(~HRc42), Mild steels, Cast irons, SUS**
- HR coating reduces stress of flute and enhances wear resistance.
- Unequal pitch design and helix enable decrease of chattering.
- 4flutes and deep pocket enable chip evacuation and increase surface roughness.

| 4 | WC 미립자 | HR Coating | R ± 0.005 | R ± 0.01 | R ± 0.015 | 38° Helix Angle | 35°/38° Helix Angle | CUTTING DATA |
|---|---|---|---|---|---|---|---|---|
| | | | R0.1 ~ 0.5 | R1 ~ 1.5 | R2 ~ 3 | Ø1~2.5 | Ø3 ~20 | 475P |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 20 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |
| | Ø14 ~ 20 | -0.01 ~ -0.02mm |

단위 : mm

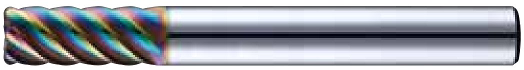
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4VSC 010 001 S06 | 1 X R0.1 | 2.5 | 50 | 6 | |
| 4VSC 010 002 S06 | 1 X R0.2 | 2.5 | 50 | 6 | |
| 4VSC 012 001 S06 | 1.2 X R0.1 | 3 | 50 | 6 | |
| 4VSC 012 002 S06 | 1.2 X R0.2 | 3 | 50 | 6 | |
| 4VSC 015 001 S06 | 1.5 X R0.1 | 4 | 50 | 6 | |
| 4VSC 015 002 S06 | 1.5 X R0.2 | 4 | 50 | 6 | |
| 4VSC 020 001 S06 | 2 X R0.1 | 6 | 50 | 6 | |
| 4VSC 020 002 S06 | 2 X R0.2 | 6 | 50 | 6 | |
| 4VSC 025 001 S06 | 2.5 X R0.1 | 7 | 50 | 6 | |
| 4VSC 025 002 S06 | 2.5 X R0.2 | 7 | 50 | 6 | |
| 4VSC 030 002 S06 | 3 X R0.2 | 8 | 50 | 6 | |
| 4VSC 030 003 S06 | 3 X R0.3 | 8 | 50 | 6 | |
| 4VSC 030 005 S06 | 3 X R0.5 | 8 | 50 | 6 | |
| 4VSC 040 002 S06 | 4 X R0.2 | 10 | 50 | 6 | |
| 4VSC 040 003 S06 | 4 X R0.3 | 10 | 50 | 6 | |
| 4VSC 040 005 S06 | 4 X R0.5 | 10 | 50 | 6 | |
| New 4VSC 040 010 S06 | 4 X R1 | 10 | 50 | 6 | |
| 4VSC 050 002 S06 | 5 X R0.2 | 15 | 60 | 6 | |
| 4VSC 050 003 S06 | 5 X R0.3 | 15 | 60 | 6 | |
| 4VSC 050 005 S06 | 5 X R0.5 | 15 | 60 | 6 | |
| New 4VSC 050 010 S06 | 5 X R1 | 15 | 60 | 6 | |
| 4VSC 060 002 S06 | 6 X R0.2 | 15 | 60 | 6 | |
| 4VSC 060 003 S06 | 6 X R0.3 | 15 | 60 | 6 | |
| 4VSC 060 005 S06 | 6 X R0.5 | 15 | 60 | 6 | |
| 4VSC 060 010 S06 | 6 X R1 | 15 | 60 | 6 | |
| New 4VSC 060 015 S06 | 6 X R1.5 | 15 | 60 | 6 | |
| 4VSC 080 003 S08 | 8 X R0.3 | 20 | 70 | 8 | |
| 4VSC 080 005 S08 | 8 X R0.5 | 20 | 70 | 8 | |
| 4VSC 080 010 S08 | 8 X R1 | 20 | 70 | 8 | |
| New 4VSC 080 020 S08 | 8 X R2 | 20 | 70 | 8 | |
| 4VSC 100 003 S10 | 10 X R0.3 | 25 | 75 | 10 | |
| 4VSC 100 005 S10 | 10 X R0.5 | 25 | 75 | 10 | |
| 4VSC 100 010 S10 | 10 X R1 | 25 | 75 | 10 | |
| 4VSC 100 015 S10 | 10 X R1.5 | 25 | 75 | 10 | |
| 4VSC 100 020 S10 | 10 X R2 | 25 | 75 | 10 | |
| New 4VSC 100 030 S10 | 10 X R3 | 25 | 75 | 10 | |
| 4VSC 120 005 S12 | 12 X R0.5 | 30 | 80 | 12 | |
| 4VSC 120 010 S12 | 12 X R1 | 30 | 80 | 12 | |
| 4VSC 120 020 S12 | 12 X R2 | 30 | 80 | 12 | |
| New 4VSC 120 030 S12 | 12 X R3 | 30 | 80 | 12 | |
| New 4VSC 140 005 S14 | 14 X R0.5 | 36 | 90 | 14 | |
| New 4VSC 140 010 S14 | 14 X R1 | 36 | 90 | 14 | |
| New 4VSC 140 020 S14 | 14 X R2 | 36 | 90 | 14 | |
| New 4VSC 140 030 S14 | 14 X R3 | 36 | 90 | 14 | |
| New 4VSC 140 040 S14 | 14 X R4 | 36 | 90 | 14 | |
| 4VSC 160 005 S16 | 16 X R0.5 | 40 | 100 | 16 | |
| 4VSC 160 010 S16 | 16 X R1 | 40 | 100 | 16 | |
| 4VSC 160 020 S16 | 16 X R2 | 40 | 100 | 16 | |
| 4VSC 160 030 S16 | 16 X R3 | 40 | 100 | 16 | |
| New 4VSC 160 040 S16 | 16 X R4 | 40 | 100 | 16 | |

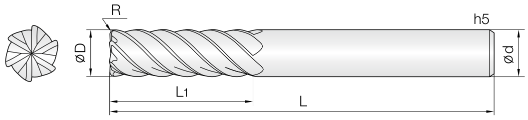
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| New 4VSC 160 050 S16 | 16 X R5 | 40 | 100 | 16 | |
| 4VSC 200 005 S20 | 20 X R0.5 | 45 | 100 | 20 | |
| 4VSC 200 010 S20 | 20 X R1 | 45 | 100 | 20 | |
| 4VSC 200 020 S20 | 20 X R2 | 45 | 100 | 20 | |
| 4VSC 200 030 S20 | 20 X R3 | 45 | 100 | 20 | |
| New 4VSC 200 040 S20 | 20 X R4 | 45 | 100 | 20 | |
| New 4VSC 200 050 S20 | 20 X R5 | 45 | 100 | 20 | |

*6 Flutes Various Symmetry Corner R End Mills for Steel, Cast Irons & Stainless Steels*

# 6날 고능률 범용 코너 레디우스 엔드밀

New






- **중저경도강(HRc 42이하), 연강, 주철, SUS계열 가공 엔드밀**
- HR코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며 내마모성 또한 향상 됩니다.
- 45˚ 헬릭스 형상으로 설계하여 고속, 고이송 가공에 적합 합니다.

- **Mid-low hardened steels(~HRc42), Mild steels, Cast irons, SUS**
- HR coating reduces stress of flute and enhances wear resistance.
- 45˚ helix design is suitable for high speed machining.

6 | WC 미립자 | HR Coating | R ± 0.005 (R0.5) | R ± 0.01 (R1 ~ 1.5) | R ± 0.015 (R2 ~ 3) | 45° Helix Angle | CUTTING DATA 475P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø6 ~ 20 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |
| | Ø14 ~ 20 | -0.01 ~ -0.02mm |

단위 : mm

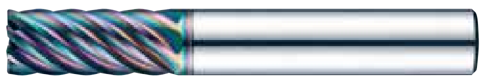
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 6VSC 060 005 S06 | 6 X R0.5 | 15 | 60 | 6 | |
| 6VSC 060 010 S06 | 6 X R1 | 15 | 60 | 6 | |
| New 6VSC 060 015 S06 | 6 X R1.5 | 15 | 60 | 6 | |
| 6VSC 080 005 S08 | 8 X R0.5 | 20 | 70 | 8 | |
| 6VSC 080 010 S08 | 8 X R1 | 20 | 70 | 8 | |
| New 6VSC 080 020 S08 | 8 X R2 | 20 | 70 | 8 | |
| 6VSC 100 005 S10 | 10 X R0.5 | 25 | 75 | 10 | |
| 6VSC 100 010 S10 | 10 X R1 | 25 | 75 | 10 | |
| 6VSC 100 015 S10 | 10 X R1.5 | 25 | 75 | 10 | |
| 6VSC 100 020 S10 | 10 X R2 | 25 | 75 | 10 | |
| New 6VSC 100 030 S10 | 10 X R3 | 25 | 75 | 10 | |
| 6VSC 120 005 S12 | 12 X R0.5 | 30 | 80 | 12 | |
| 6VSC 120 010 S12 | 12 X R1 | 30 | 80 | 12 | |
| 6VSC 120 015 S12 | 12 X R1.5 | 30 | 80 | 12 | |
| 6VSC 120 020 S12 | 12 X R2 | 30 | 80 | 12 | |
| 6VSC 120 030 S12 | 12 X R3 | 30 | 80 | 12 | |
| New 6VSC 120 040 S12 | 12 X R4 | 30 | 80 | 12 | |
| New 6VSC 140 005 S14 | 14 X R0.5 | 36 | 90 | 14 | |
| New 6VSC 140 010 S14 | 14 X R1 | 36 | 90 | 14 | |
| New 6VSC 140 020 S14 | 14 X R2 | 36 | 90 | 14 | |
| New 6VSC 140 030 S14 | 14 X R3 | 36 | 90 | 14 | |
| New 6VSC 140 040 S14 | 14 X R4 | 36 | 90 | 14 | |
| New 6VSC 160 005 S16 | 16 X R0.5 | 40 | 100 | 16 | |
| 6VSC 160 010 S16 | 16 X R1 | 40 | 100 | 16 | |
| 6VSC 160 015 S16 | 16 X R1.5 | 40 | 100 | 16 | |
| 6VSC 160 020 S16 | 16 X R2 | 40 | 100 | 16 | |
| 6VSC 160 030 S16 | 16 X R3 | 40 | 100 | 16 | |
| New 6VSC 160 040 S16 | 16 X R4 | 40 | 100 | 16 | |
| New 6VSC 160 050 S16 | 16 X R5 | 40 | 100 | 16 | |
| New 6VSC 200 005 S20 | 20 X R0.5 | 45 | 100 | 20 | |
| 6VSC 200 010 S20 | 20 X R1 | 45 | 100 | 20 | |
| 6VSC 200 015 S20 | 20 X R1.5 | 45 | 100 | 20 | |
| 6VSC 200 020 S20 | 20 X R2 | 45 | 100 | 20 | |
| 6VSC 200 030 S20 | 20 X R3 | 45 | 100 | 20 | |
| New 6VSC 200 040 S20 | 20 X R4 | 45 | 100 | 20 | |
| New 6VSC 200 050 S20 | 20 X R5 | 45 | 100 | 20 | |

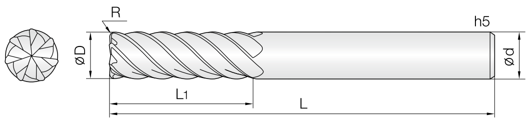
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 7SUC

## 7 Flutes Non Symmetry Corner Radius End Mills for SUS

## 7날 SUS가공용 코너 레디우스 엔드밀






- **합금강, SUS계열, Ti/Ni계 합금, 인코넬 등 난삭재 가공 엔드밀**
- TISIN-R 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 강력한 채터링방지 설계로 엔드밀의 진동을 최소화하였습니다.
- 코너R부 적용으로 밑날 치핑을 방지 하였습니다.
- 항절력이 높은 미립자 초경합금을 채택하여, 고이송 작업시 엔드밀의 파손을 최소화.

- **Endmills for alloy steel, SUS, Ti/Ni base alloys, Inconel and hard-to-cut materials.**
- TISIN-R coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Strong design for protection against chattering.
- Preventing bottom edge chipping by corner R.
- Minimize fracturing at high feed by high TRS fine WC grade.

7 | WC 미립자 | HR Coating | R ± 0.005 | 42° Helix Angle | CUTTING DATA

R0.5 477P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø6 ~ 20 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |
| | Ø14 ~ 20 | -0.01 ~ -0.02mm |

단위 : mm

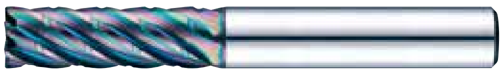
| | Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| | 7SUC 060 005 060 | 6 X R0.5 | 15 | 60 | 6 | |
| | 7SUC 080 005 070 | 8 X R0.5 | 25 | 70 | 8 | |
| | 7SUC 100 005 075 | 10 X R0.5 | 25 | 75 | 10 | |
| | 7SUC 120 005 085 | 12 X R0.5 | 30 | 85 | 12 | |
| New | 7SUC 140 005 090 | 14 X R0.5 | 36 | 90 | 14 | |
| | 7SUC 160 005 100 | 16 X R0.5 | 42 | 100 | 16 | |
| | 7SUC 200 005 110 | 20 X R0.5 | 48 | 110 | 20 | |

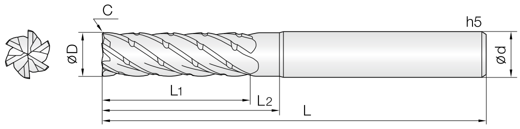
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 5&6TROE

## 5&6 Flutes Trochoidal Milling End Mills

## 5&6날 트로코이달 가공 엔드밀






- **합금강, SUS계열, 인코넬, 일반구조강 등 다양한 난삭재의 황삭가공**
- 옆날 칩블레이커 설계와 TISIN-R 코팅 처리로 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 강력한 채터링 방지 설계로 엔드밀의 진동을 최소화 하였습니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Roughing Endmills for alloy steels, SUS, Inconel, Mild steels and various hard-to-cut materials.**
- Chip breaker designed for side flute and TISIN-R coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Chatter-resistant design minimizes end mill vibrations.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.


| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø6 | +0 ~ -0.01mm |
| | Ø8 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 20 | -0.015 ~ -0.03mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 면취량 Chamfer C | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|
| 6TROE 060 140 060 | 6 | 14 | 0.12 | - | 60 | 6 | |
| 6TROE 060 200 065 | 6 | 20 | 0.12 | - | 65 | 6 | |
| 5TROE 060 260 070 | 6 | 26 | 0.12 | - | 70 | 6 | |
| 6TROE 060 300 070 | 6 | 16 | 0.12 | 30 | 70 | 6 | |
| 6TROE 080 180 065 | 8 | 18 | 0.16 | - | 65 | 8 | |
| 6TROE 080 260 070 | 8 | 26 | 0.16 | - | 70 | 8 | |
| 5TROE 080 340 080 | 8 | 34 | 0.16 | - | 80 | 8 | |
| 6TROE 080 400 080 | 8 | 21 | 0.16 | 40 | 80 | 8 | |
| 6TROE 100 220 075 | 10 | 22 | 0.2 | - | 75 | 10 | |
| 6TROE 100 330 080 | 10 | 33 | 0.2 | - | 80 | 10 | |
| 5TROE 100 430 090 | 10 | 43 | 0.2 | - | 90 | 10 | |
| 6TROE 100 500 100 | 10 | 26 | 0.2 | 50 | 100 | 10 | |
| 6TROE 120 270 080 | 12 | 27 | 0.24 | - | 80 | 12 | |
| 6TROE 120 390 095 | 12 | 39 | 0.24 | - | 95 | 12 | |
| 5TROE 120 510 110 | 12 | 51 | 0.24 | - | 110 | 12 | |
| 6TROE 120 600 110 | 12 | 31 | 0.24 | 60 | 110 | 12 | |
| New 6TROE 140 320 090 | 14 | 32 | 0.28 | - | 90 | 14 | |
| New 6TROE 140 450 100 | 14 | 45 | 0.28 | - | 100 | 14 | |
| New 5TROE 140 600 110 | 14 | 60 | 0.28 | - | 110 | 14 | |
| New 6TROE 140 700 120 | 14 | 38 | 0.28 | 70 | 120 | 14 | |
| 6TROE 160 360 100 | 16 | 36 | 0.32 | - | 100 | 16 | |
| 6TROE 160 520 120 | 16 | 52 | 0.32 | - | 120 | 16 | |
| 5TROE 160 680 130 | 16 | 68 | 0.32 | - | 130 | 16 | |
| 6TROE 160 800 130 | 16 | 41 | 0.32 | 80 | 130 | 16 | |
| 6TROE 200 450 110 | 20 | 45 | 0.4 | - | 110 | 20 | |
| 6TROE 200 650 130 | 20 | 65 | 0.4 | - | 130 | 20 | |
| 5TROE 200 850 150 | 20 | 85 | 0.4 | - | 150 | 20 | |
| 6TROE 200 900 150 | 20 | 51 | 0.4 | 90 | 150 | 20 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 면취량 Chamfer C | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|

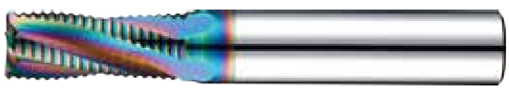
V series

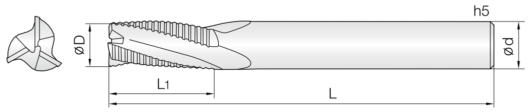
# 3&4VROU

*3&4 Flutes Various Roughing End Mills*

## 3&4날 고능률 라핑 엔드밀

New






- **공구강, 합금강 및 고경도 일반강 황삭가공 엔드밀**
- HR코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며 내마모성 또한 향상됩니다.
- 뛰어난 칩배출력으로 가공시간을 단축하였습니다.
- 항절력이 높은 미립자 초경합금을 채택하여, 고이송 작업시 엔드밀의 파손을 최소화하였습니다.

- **Roughing Endmills for tool steels, alloy steels**
- HR coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Reduce machining time by excellent chip control.
- Minimize fracturing at high feed by high TRS fine WC grade.

3 | 4 | WC 미립자 | HR Coating | 20° Helix Angle | Shield Edge | CUTTING DATA 474P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø3 ~ 20 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø3 ~ 12 | -0.005 ~ -0.015mm |
| | Ø13 ~ 20 | -0.01 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 3VROU 030 080 S06 | 3 | 8 | 50 | 6 | |
| 3VROU 040 100 S06 | 4 | 10 | 50 | 6 | |
| 3VROU 050 130 S06 | 5 | 13 | 50 | 6 | |
| 3VROU 060 100 S06 | 6 | 10 | 60 | 6 | |
| 3VROU 060 150 S06 | 6 | 15 | 60 | 6 | |
| 3VROU 060 200 S06 | 6 | 20 | 60 | 6 | |
| 3VROU 070 180 S08 | 7 | 18 | 70 | 8 | |
| 3VROU 080 120 S08 | 8 | 12 | 65 | 8 | |
| 3VROU 080 200 S08 | 8 | 20 | 65 | 8 | |
| 3VROU 080 250 S08 | 8 | 25 | 70 | 8 | |
| 4VROU 090 220 S10 | 9 | 22 | 75 | 10 | |
| 4VROU 100 150 S10 | 10 | 15 | 70 | 10 | |
| 4VROU 100 250 S10 | 10 | 25 | 75 | 10 | |
| 4VROU 100 300 S10 | 10 | 30 | 75 | 10 | |
| 4VROU 110 270 S12 | 11 | 27 | 80 | 12 | |
| 4VROU 120 200 S12 | 12 | 20 | 80 | 12 | |
| 4VROU 120 300 S12 | 12 | 30 | 80 | 12 | |
| 4VROU 120 350 S12 | 12 | 35 | 80 | 12 | |
| 4VROU 130 350 S14 | 13 | 35 | 100 | 14 | |
| 4VROU 140 250 S14 | 14 | 25 | 100 | 14 | |
| 4VROU 140 350 S16 | 14 | 35 | 100 | 16 | |
| 4VROU 160 250 S16 | 16 | 25 | 100 | 16 | |
| 4VROU 160 400 S16 | 16 | 40 | 100 | 16 | |
| 4VROU 180 400 S18 | 18 | 40 | 100 | 18 | |
| 4VROU 200 300 S20 | 20 | 30 | 100 | 20 | |
| 4VROU 200 500 S20 | 20 | 50 | 100 | 20 | |

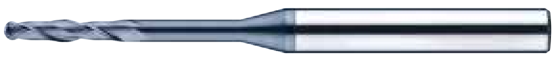
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

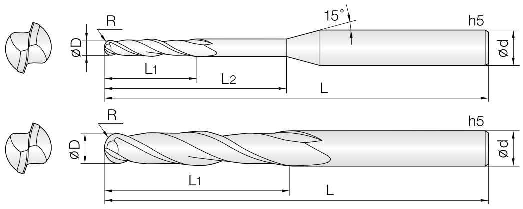
V series

# 2GBE

## 2 Flutes Long Shank Ball End Mills for Graphite

## 2날 긴 길이 볼 엔드밀 & 흑연가공용 볼 엔드밀






- **그라파이트(흑연), HRc48 이하의 고경도강, 프리하든강, 공구강, 주철등 다양한 피삭재 가공**
- ALTIN 코팅을 적용하여 절삭저항이 적으며, 내마모성이 우수합니다.
- 긴날장으로 설계하여, 깊은 측벽가공이 많은 흑연 가공에 가장 적합합니다.
- 미립자 초경합금을 채택하여 다양한 비철합금 및 목업의 피삭재 영역에 적용이 가능합니다.

- **Endmills for various work materials, graphite, hardened steels(HRc~48), pre-hardened steels, tool steels and cast irons**
- Excellent performance with low cutting force by ALTIN coating.
- Long flute length optimized for deep-side wall machining of graphite.
- Applied fine WC grade optimized for various non-ferrous and non-metallic work materials.

2 | WC 미립자 | ALTIN Coating | R ±0.005 (0.25 ~ 2.5R) | R ±0.01 (3 ~ 6R) | R ±0.015 (8 ~ 12.5R) | 30° Helix Angle | CUTTING DATA 478P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.5 ~ 25 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø3 ~ 12 | -0.005 ~ -0.015mm |
| | Ø16 ~ 25 | -0.01 ~ -0.02mm |

단위 : mm

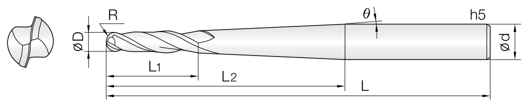
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2GBE 005 020 S04 | 0.25R X 0.5 | 2 | - | 50 | 4 | |
| 2GBE 005 050 S04 | 0.25R X 0.5 | 2 | 5 | 50 | 4 | |
| 2GBE 010 050 S04 | 0.5R X 1 | 5 | - | 60 | 4 | |
| 2GBE 010 050 S06 | 0.5R X 1 | 5 | - | 60 | 6 | |
| 2GBE 010 100 S04 | 0.5R X 1 | 5 | 10 | 60 | 4 | |
| 2GBE 010 100 S06 | 0.5R X 1 | 5 | 10 | 60 | 6 | |
| 2GBE 010 150 S04 | 0.5R X 1 | 5 | 15 | 60 | 4 | |
| 2GBE 010 200 S04 | 0.5R X 1 | 5 | 20 | 60 | 4 | |
| 2GBE 010 250 S04 | 0.5R X 1 | 5 | 25 | 70 | 4 | |
| 2GBE 010 300 S04 | 0.5R X 1 | 5 | 30 | 80 | 4 | |
| 2GBE 010 350 S04 | 0.5R X 1 | 5 | 35 | 80 | 4 | |
| 2GBE 010 400 S04 | 0.5R X 1 | 5 | 40 | 90 | 4 | |
| 2GBE 015 080 S06 | 0.75R X 1.5 | 8 | - | 60 | 6 | |
| 2GBE 015 100 S04 | 0.75R X 1.5 | 8 | 10 | 60 | 4 | |
| 2GBE 015 150 S04 | 0.75R X 1.5 | 8 | 15 | 60 | 4 | |
| 2GBE 015 150 S06 | 0.75R X 1.5 | 8 | 15 | 60 | 6 | |
| 2GBE 015 200 S04 | 0.75R X 1.5 | 8 | 20 | 60 | 4 | |
| 2GBE 015 250 S04 | 0.75R X 1.5 | 8 | 25 | 70 | 4 | |
| 2GBE 015 300 S04 | 0.75R X 1.5 | 8 | 30 | 80 | 4 | |
| 2GBE 015 350 S04 | 0.75R X 1.5 | 8 | 35 | 80 | 4 | |
| 2GBE 015 400 S04 | 0.75R X 1.5 | 8 | 40 | 90 | 4 | |
| 2GBE 020 100 S04 | 1R X 2 | 10 | - | 60 | 4 | |
| 2GBE 020 100 S06 | 1R X 2 | 10 | - | 70 | 6 | |
| 2GBE 020 150 S04 | 1R X 2 | 10 | 15 | 60 | 4 | |
| 2GBE 020 200 S04 | 1R X 2 | 10 | 20 | 60 | 4 | |
| 2GBE 020 200 S06 | 1R X 2 | 10 | 20 | 70 | 6 | |
| 2GBE 020 250 S04 | 1R X 2 | 10 | 25 | 70 | 4 | |
| 2GBE 020 300 S04 | 1R X2 | 10 | 30 | 80 | 4 | |
| 2GBE 020 350 S04 | 1R X 2 | 10 | 35 | 80 | 4 | |
| 2GBE 020 400 S04 | 1R X 2 | 10 | 40 | 90 | 4 | |
| 2GBE 020 500 S04 | 1R X 2 | 10 | 50 | 100 | 4 | |
| 2GBE 020 600 S04 | 1R X 2 | 10 | 60 | 100 | 4 | |
| 2GBE 025 200 S04 | 1.25R X 2.5 | 10 | 20 | 70 | 4 | |
| 2GBE 030 150 100 | 1.5R X 3 | 15 | - | 100 | 3 | |
| 2GBE 030 150 S06 | 1.5R X 3 | 15 | - | 70 | 6 | |
| 2GBE 030 200 S04 | 1.5R X 3 | 15 | 20 | 70 | 4 | |
| 2GBE 030 300 S04 | 1.5R X 3 | 15 | 30 | 80 | 4 | |
| 2GBE 030 300 S06 | 1.5R X 3 | 15 | 30 | 75 | 6 | |
| 2GBE 030 400 S04 | 1.5R X 3 | 15 | 40 | 90 | 4 | |
| 2GBE 030 400 S06 | 1.5R X 3 | 15 | 40 | 90 | 6 | |
| 2GBE 030 500 S04 | 1.5R X 3 | 15 | 50 | 100 | 4 | |
| 2GBE 030 600 S04 | 1.5R X 3 | 15 | 60 | 100 | 4 | |
| 2GBE 040 200 080 | 2R X 4 | 20 | - | 80 | 4 | |
| 2GBE 040 200 100 | 2R X 4 | 20 | - | 100 | 4 | |
| 2GBE 040 200 130 | 2R X 4 | 20 | - | 130 | 4 | |
| 2GBE 040 200 S06 | 2R X 4 | 20 | - | 75 | 6 | |
| 2GBE 040 350 S06 | 2R X 4 | 20 | 35 | 90 | 6 | |
| 2GBE 040 450 S06 | 2R X 4 | 20 | 45 | 100 | 6 | |
| 2GBE 050 250 100 | 2.5R X 5 | 25 | - | 100 | 5 | |
| 2GBE 050 250 130 | 2.5R X 5 | 25 | - | 130 | 5 | |

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2GBE 050 250 S06 | 2.5R X 5 | 25 | - | 90 | 6 | |
| 2GBE 050 500 S06 | 2.5R X 5 | 25 | 50 | 110 | 6 | |
| 2GBE 060 250 110 | 3R X 6 | 25 | - | 110 | 6 | |
| 2GBE 060 300 150 | 3R X 6 | 30 | - | 150 | 6 | |
| 2GBE 060 300 200 | 3R X 6 | 30 | - | 200 | 6 | |
| 2GBE 060 300 220 | 3R X 6 | 30 | - | 220 | 6 | |
| 2GBE 080 350 110 | 4R X 8 | 35 | - | 110 | 8 | |
| 2GBE 080 400 150 | 4R X 8 | 40 | - | 150 | 8 | |
| 2GBE 080 400 200 | 4R X 8 | 40 | - | 200 | 8 | |
| 2GBE 080 400 220 | 4R X 8 | 40 | - | 220 | 8 | |
| 2GBE 100 400 120 | 5R X 10 | 40 | - | 120 | 10 | |
| 2GBE 100 450 150 | 5R X 10 | 45 | - | 150 | 10 | |
| 2GBE 100 450 200 | 5R X 10 | 45 | - | 200 | 10 | |
| 2GBE 100 450 230 | 5R X 10 | 45 | - | 230 | 10 | |
| 2GBE 120 500 130 | 6R X 12 | 50 | - | 130 | 12 | |
| 2GBE 120 500 150 | 6R X 12 | 50 | - | 150 | 12 | |
| 2GBE 120 550 200 | 6R X 12 | 55 | - | 200 | 12 | |
| 2GBE 120 550 250 | 6R X 12 | 55 | - | 250 | 12 | |
| 2GBE 160 600 160 | 8R X 16 | 60 | - | 160 | 16 | |
| 2GBE 160 650 200 | 8R X 16 | 65 | - | 200 | 16 | |
| 2GBE 160 650 250 | 8R X 16 | 65 | - | 250 | 16 | |
| 2GBE 160 700 320 | 8R X 16 | 70 | - | 320 | 16 | |
| 2GBE 200 700 160 | 10R X 20 | 70 | - | 160 | 20 | |
| 2GBE 200 750 200 | 10R X 20 | 75 | - | 200 | 20 | |
| 2GBE 200 750 250 | 10R X 20 | 75 | - | 250 | 20 | |
| 2GBE 200 900 320 | 10R X 20 | 90 | - | 320 | 20 | |
| 2GBE 250 1000 250 | 12.5R X 25 | 100 | - | 250 | 25 | |

# 2TGB

## 2 Flutes Taper Neck Ball End Mills for Graphite

## 2날 흑연가공용 테이퍼 넥 볼 엔드밀




- **그라파이트(흑연), HRc48 이하의 고경도강, 프리하든강, 공구강, 주철등 다양한 피삭재 가공**
- ALTIN 코팅을 적용하여 절삭저항이 적으며, 내마모성이 우수합니다.
- 긴날장으로 설계하여, 깊은 측벽가공이 많은 흑연 가공에 가장 적합합니다.
- 미립자 초경합금을 채택하여 다양한 비철합금 및 목업의 피삭재 영역에 적용이 가능합니다.

- **Endmills for various work materials, graphite, hardened steels(HRc~48), pre-hardened steels, tool steels and cast irons**
- Excellent performance with low cutting force by ALTIN coating.
- Long flute length optimized for deep-side wall machining of graphite.
- Applied fine WC grade optimized for various non-ferrous and non-metallic work materials.

2 | WC 미립자 | ALTIN Coating | R ± 0.005 (0.5~2.5R) | R ± 0.01 (3~6R) | 30° Helix Angle | CUTTING DATA 479P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 12 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø3 ~ 12 | -0.005 ~ -0.015mm |
| | Ø12.1 ~ 25 | -0.01 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 각도 Angle θ | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|
| 2TGB 010 003 200 | 0.5R X 1 | 0°30 | 4 | 20 | 60 | 4 | |
| 2TGB 010 003 300 | 0.5R X 1 | 0°30 | 4 | 30 | 75 | 4 | |
| 2TGB 010 003 400 | 0.5R X 1 | 0°30 | 4 | 40 | 90 | 4 | |
| 2TGB 010 010 250 | 0.5R X 1 | 1° | 4 | 25 | 60 | 4 | |
| 2TGB 010 010 350 | 0.5R X 1 | 1° | 4 | 35 | 75 | 4 | |
| 2TGB 010 010 500 | 0.5R X 1 | 1° | 4 | 50 | 100 | 4 | |
| 2TGB 015 003 300 | 0.75R X 1.5 | 0°30 | 6 | 30 | 75 | 4 | |
| 2TGB 015 003 400 | 0.75R X 1.5 | 0°30 | 6 | 40 | 80 | 4 | |
| 2TGB 015 003 500 | 0.75R X 1.5 | 0°30 | 6 | 50 | 100 | 4 | |
| 2TGB 015 010 300 | 0.75R X 1.5 | 1° | 6 | 30 | 75 | 4 | |
| 2TGB 015 010 500 | 0.75R X 1.5 | 1° | 6 | 50 | 100 | 4 | |
| 2TGB 015 010 600 | 0.75R X 1.5 | 1° | 6 | 60 | 100 | 4 | |
| 2TGB 020 003 400 | 1R X 2 | 0°30 | 8 | 40 | 90 | 4 | |
| 2TGB 020 003 500 | 1R X 2 | 0°30 | 8 | 50 | 100 | 4 | |
| 2TGB 020 003 700 | 1R X 2 | 0°30 | 8 | 70 | 130 | 4 | |
| 2TGB 020 010 600 | 1R X 2 | 1° | 8 | 60 | 110 | 6 | |
| 2TGB 020 010 900 | 1R X 2 | 1° | 8 | 90 | 150 | 6 | |
| 2TGB 030 003 700 | 1.5R X 3 | 0°30 | 10 | 70 | 120 | 6 | |
| 2TGB 030 010 900 | 1.5R X 3 | 1° | 10 | 90 | 150 | 6 | |
| 2TGB 040 003 700 | 2R X 4 | 0°30 | 14 | 70 | 120 | 6 | |
| 2TGB 040 010 800 | 2R X 4 | 1° | 14 | 80 | 150 | 6 | |
| 2TGB 050 003 800 | 2.5R X 5 | 0°30 | 16 | 80 | 130 | 6 | |
| 2TGB 060 003 1000 | 3R X 6 | 0°30 | 16 | 100 | 150 | 8 | |
| 2TGB 060 010 1000 | 3R X 6 | 1° | 16 | 100 | 150 | 10 | |
| 2TGB 080 010 1000 | 4R X 8 | 1° | 20 | 100 | 150 | 12 | |
| 2TGB 100 010 830 | 5R X 10 | 1° | 25 | 83 | 200 | 12 | |
| 2TGB 120 010 1100 | 6R X 12 | 1° | 30 | 110 | 200 | 16 | |

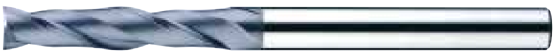
| Order Number | 날경 Diameter R × D | 각도 Angle θ | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|

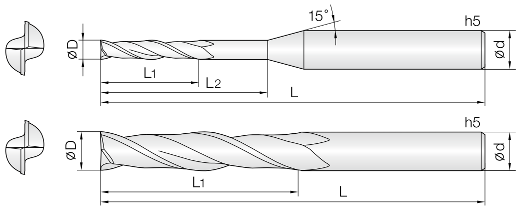
FOR GRAPHITE

# 2GEM

## 2 Flutes Long Shank End Mills for Graphite

## 2날 롱 섕크 엔드밀 & 흑연가공용 롱 섕크 엔드밀






- **그라파이트(흑연), HRc48 이하의 고경도강, 프리하든강, 공구강, 주철등 다양한 피삭재 가공**
- ALTIN 코팅을 적용하여 절삭저항이 적으며, 내마모성이 우수합니다.
- 긴날장으로 설계하여, 깊은 측벽가공이 많은 흑연 가공에 가장 적합합니다.
- 미립자 초경합금을 채택하여 HRc48 이하의 다양한 합금강의 피삭재 영역에 적용이 가능합니다.

- **Endmills for various work materials, graphite, hardened steels(HRc~48), pre-hardened steels, tool steels and cast irons**
- Excellent performance with low cutting force by ALTIN coating.
- Long flute length optimized for deep-side wall machining of graphite.
- Applied fine WC grade optimized for various alloy steels applications, below HRc48.

2 | WC 미립자 | ALTIN Coating | 30° Helix Angle | Shield Edge | CUTTING DATA 480P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.5 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø16 ~ 20 | -0.015 ~ -0.03mm |

단위 : mm

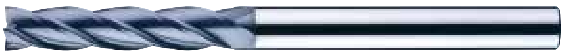
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2GEM 005 020 S04 | 0.5 | 2 | - | 50 | 4 | |
| 2GEM 010 050 S04 | 1 | 5 | - | 60 | 4 | |
| 2GEM 010 100 S04 | 1 | 5 | 10 | 60 | 4 | |
| 2GEM 010 100 S06 | 1 | 5 | 10 | 60 | 6 | |
| 2GEM 010 150 S04 | 1 | 5 | 15 | 60 | 4 | |
| 2GEM 010 200 S04 | 1 | 5 | 20 | 60 | 4 | |
| 2GEM 010 250 S04 | 1 | 5 | 25 | 70 | 4 | |
| 2GEM 015 100 S04 | 1.5 | 10 | - | 60 | 4 | |
| 2GEM 015 150 S04 | 1.5 | 8 | 15 | 60 | 4 | |
| 2GEM 015 200 S04 | 1.5 | 8 | 20 | 60 | 4 | |
| 2GEM 015 200 S06 | 1.5 | 8 | 20 | 60 | 6 | |
| 2GEM 015 250 S04 | 1.5 | 8 | 25 | 70 | 4 | |
| 2GEM 020 100 S04 | 2 | 10 | - | 60 | 4 | |
| 2GEM 020 150 S04 | 2 | 10 | 15 | 60 | 4 | |
| 2GEM 020 200 S04 | 2 | 10 | 20 | 60 | 4 | |
| 2GEM 020 200 S06 | 2 | 10 | 20 | 60 | 6 | |
| 2GEM 020 250 S04 | 2 | 10 | 25 | 70 | 4 | |
| 2GEM 020 300 S04 | 2 | 10 | 30 | 80 | 4 | |
| 2GEM 030 150 S04 | 3 | 15 | - | 70 | 4 | |
| 2GEM 030 250 S04 | 3 | 15 | 25 | 75 | 4 | |
| 2GEM 030 300 S06 | 3 | 15 | 30 | 75 | 6 | |
| 2GEM 040 200 100 | 4 | 20 | - | 100 | 4 | |
| 2GEM 040 400 S06 | 4 | 20 | 40 | 100 | 6 | |
| 2GEM 050 250 100 | 5 | 25 | - | 100 | 5 | |
| 2GEM 060 300 110 | 6 | 30 | - | 110 | 6 | |
| 2GEM 060 300 150 | 6 | 30 | - | 150 | 6 | |
| 2GEM 080 400 150 | 8 | 40 | - | 150 | 8 | |
| 2GEM 100 450 150 | 10 | 45 | - | 150 | 10 | |
| 2GEM 100 500 200 | 10 | 50 | - | 200 | 10 | |
| 2GEM 120 600 150 | 12 | 60 | - | 150 | 12 | |
| 2GEM 120 600 200 | 12 | 60 | - | 200 | 12 | |
| 2GEM 160 600 130 | 16 | 60 | - | 130 | 16 | |
| 2GEM 160 700 160 | 16 | 70 | - | 160 | 16 | |
| 2GEM 160 700 200 | 16 | 70 | - | 200 | 16 | |
| 2GEM 200 800 160 | 20 | 80 | - | 160 | 20 | |
| 2GEM 200 900 200 | 20 | 90 | - | 200 | 20 | |
| 2GEM 200 1200 320 | 20 | 120 | - | 320 | 20 | |

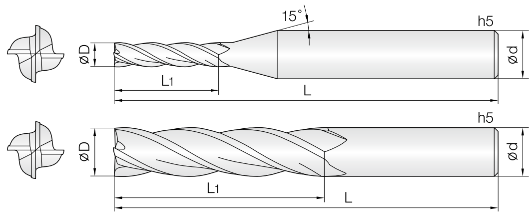
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

# 4GEM

## 4 Flutes Long Shank End Mills for Graphite

## 4날 롱 생크 엔드밀 & 흑연가공용 롱 생크 엔드밀






- **그라파이트(흑연), HRc50 이하의 고경도강, 프리하든강, 공구강, 주철등 다양한 피삭재 가공**
- ALTIN 코팅을 적용하여 절삭저항이 적으며, 내마모성이 우수합니다.
- 긴날장으로 설계하여, 깊은 측벽가공이 많은 흑연 가공에 가장 적합합니다.
- 미립자 초경합금을 채택하여 HRc48 이하의 다양한 합금강의 피삭재 영역에 적용이 가능합니다.

- **Endmills for various work materials, graphite, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons**
- Excellent performance with low cutting force by ALTIN coating.
- Long flute length optimized for deep-side wall machining of graphite.
- Applied fine WC grade optimized for various alloy steels applications, below HRc48.

4 | WC 미립자 | ALTIN Coating | 30° Helix Angle | Shield Edge | CUTTING DATA 480P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø3 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø16 ~ 20 | -0.015 ~ -0.03mm |

단위 : mm

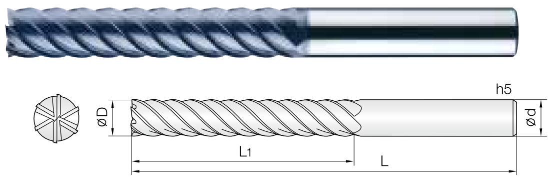
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4GEM 030 100 S06 | 3 | 10 | 100 | 6 | |
| 4GEM 030 150 S06 | 3 | 15 | 100 | 6 | |
| 4GEM 040 150 S06 | 4 | 15 | 100 | 6 | |
| 4GEM 040 200 100 | 4 | 20 | 100 | 4 | |
| 4GEM 040 200 S06 | 4 | 20 | 100 | 6 | |
| 4GEM 050 200 S06 | 5 | 20 | 100 | 6 | |
| 4GEM 060 300 110 | 6 | 30 | 110 | 6 | |
| 4GEM 060 300 150 | 6 | 30 | 150 | 6 | |
| 4GEM 080 400 150 | 8 | 40 | 150 | 8 | |
| 4GEM 080 400 200 | 8 | 40 | 200 | 8 | |
| 4GEM 100 500 150 | 10 | 50 | 150 | 10 | |
| 4GEM 100 500 200 | 10 | 50 | 200 | 10 | |
| 4GEM 120 600 150 | 12 | 60 | 150 | 12 | |
| 4GEM 120 600 200 | 12 | 60 | 200 | 12 | |
| 4GEM 160 700 160 | 16 | 70 | 160 | 16 | |
| 4GEM 160 800 200 | 16 | 80 | 200 | 16 | |
| 4GEM 200 750 160 | 20 | 75 | 160 | 20 | |
| 4GEM 200 900 200 | 20 | 90 | 200 | 20 | |
| 4GEM 200 1000 320 | 20 | 100 | 320 | 20 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 6GEM

## 6 Flutes 45˚Long Shank End Mills for Graphite

## 6날 45˚헬릭스 엔드밀 & 흑연가공용 롱 생크 엔드밀




- **그라파이트(흑연), HRc50 이하의 고경도강, 프리하든강, 공구강, 주철등 다양한 피삭재 가공**
- ALTIN 코팅을 적용하여 절삭저항이 적으며, 내마모성이 우수합니다.
- 긴날장으로 설계하여, 깊은 측벽가공이 많은 흑연 가공에 가장 적합합니다.
- 미립자 초경합금을 채택하여 HRc48 이하의 다양한 합금강의 피삭재 영역에 적용이 가능합니다.

- **Endmills for various work materials, graphite, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons**
- Excellent performance with low cutting force by ALTIN coating.
- Long flute length optimized for deep-side wall machining of graphite.
- Applied fine WC grade optimized for various alloy steels applications, below HRc48.


Shield Edge 480P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø6 | +0 ~ -0.01mm |
| | Ø8 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø16 ~ 20 | -0.015 ~ -0.03mm |

단위 : mm

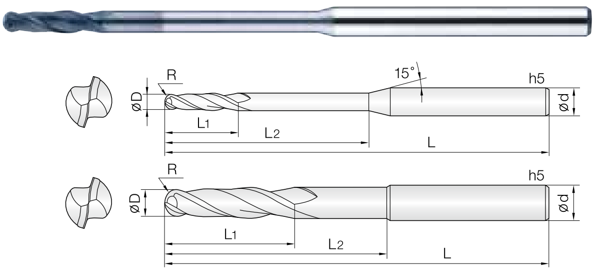
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 6GEM 060 300 110 | 6 | 30 | 110 | 6 | |
| 6GEM 080 400 110 | 8 | 40 | 110 | 8 | |
| 6GEM 100 500 120 | 10 | 50 | 120 | 10 | |
| 6GEM 100 500 150 | 10 | 50 | 150 | 10 | |
| 6GEM 120 600 130 | 12 | 60 | 130 | 12 | |
| 6GEM 120 600 160 | 12 | 60 | 160 | 12 | |
| 6GEM 160 900 160 | 16 | 90 | 160 | 16 | |
| 6GEM 160 900 200 | 16 | 90 | 200 | 16 | |
| 6GEM 160 900 250 | 16 | 90 | 250 | 16 | |
| 6GEM 200 1000 200 | 20 | 100 | 200 | 20 | |
| 6GEM 200 1000 250 | 20 | 100 | 250 | 20 | |
| 6GEM 200 1000 320 | 20 | 100 | 320 | 20 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 2DBE

## 2 Flutes Diamond Coated Ball End Mills for Graphite

## 2날 흑연가공용 다이아몬드 코팅 볼 엔드밀




- **그라파이트(흑연), 강화플라스틱, 탄소섬유 등 비철, 비금속 계열의 다양한 피삭재 전용 엔드밀**
- CVD 순수 다이아몬드 코팅을 적용하여 내마모성이 우수합니다.
- 다양한 피삭재의 형상에 적용하도록 규격을 다양화하여, 넓은 가공 영역에 뛰어난 수명과 성능을 발휘합니다.

- **Endmills for Graphite, reinforced plastic, carbon fiber, Non-ferrous and non-metallic materials.**
- Excellent wear resistance by applying qualified CVD diamond coating.
- Wide range products prepared for various work shape and excellent performance.

2 | WC 미립자 | DIA. Coating | R ±0.01 | 30° Helix Angle | CUTTING DATA

0.1 ~ 6R 481P

| D Size | D Tolerance |
|---|---|
| Ø0.2 ~ 12 | +0 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2DBE 002 010 S04 | 0.1R X 0.2 | 1 | – | 45 | 4 | |
| 2DBE 003 012 S04 | 0.15R X 0.3 | 1.2 | – | 45 | 4 | |
| 2DBE 003 020 S04 | 0.15R X 0.3 | 1.2 | 2 | 45 | 4 | |
| 2DBE 004 015 S04 | 0.2R X 0.4 | 1.5 | – | 45 | 4 | |
| 2DBE 004 020 S04 | 0.2R X 0.4 | 1.5 | 2 | 45 | 4 | |
| 2DBE 004 030 S04 | 0.2R X 0.4 | 1.5 | 3 | 45 | 4 | |
| 2DBE 004 040 S04 | 0.2R X 0.4 | 1.5 | 4 | 45 | 4 | |
| 2DBE 004 050 S04 | 0.2R X 0.4 | 1.5 | 5 | 45 | 4 | |
| 2DBE 004 080 S04 | 0.2R X 0.4 | 1.5 | 8 | 45 | 4 | |
| 2DBE 004 100 S04 | 0.2R X 0.4 | 1.5 | 10 | 45 | 4 | |
| 2DBE 005 020 S04 | 0.25R X 0.5 | 2 | – | 45 | 4 | |
| 2DBE 005 030 S04 | 0.25R X 0.5 | 2 | 3 | 45 | 4 | |
| 2DBE 005 040 S04 | 0.25R X 0.5 | 2 | 4 | 45 | 4 | |
| 2DBE 005 050 S04 | 0.25R X 0.5 | 2 | 5 | 45 | 4 | |
| 2DBE 005 060 S04 | 0.25R X 0.5 | 2 | 6 | 45 | 4 | |
| 2DBE 005 080 S04 | 0.25R X 0.5 | 2 | 8 | 45 | 4 | |
| 2DBE 005 100 S04 | 0.25R X 0.5 | 2 | 10 | 45 | 4 | |
| 2DBE 005 120 S04 | 0.25R X 0.5 | 2 | 12 | 45 | 4 | |
| 2DBE 006 020 S04 | 0.3R X 0.6 | 2 | – | 45 | 4 | |
| 2DBE 006 030 S04 | 0.3R X 0.6 | 2 | 3 | 45 | 4 | |
| 2DBE 006 040 S04 | 0.3R X 0.6 | 2 | 4 | 45 | 4 | |
| 2DBE 006 050 S04 | 0.3R X 0.6 | 2 | 5 | 45 | 4 | |
| 2DBE 006 060 S04 | 0.3R X 0.6 | 2 | 6 | 45 | 4 | |
| 2DBE 006 080 S04 | 0.3R X 0.6 | 2 | 8 | 45 | 4 | |
| 2DBE 006 100 S04 | 0.3R X 0.6 | 2 | 10 | 45 | 4 | |
| 2DBE 006 120 S04 | 0.3R X 0.6 | 2 | 12 | 45 | 4 | |
| 2DBE 006 150 S04 | 0.3R X 0.6 | 2 | 15 | 45 | 4 | |
| 2DBE 006 200 S04 | 0.3R X 0.6 | 2 | 20 | 45 | 4 | |
| 2DBE 008 030 S04 | 0.4R X 0.8 | 3 | – | 45 | 4 | |
| 2DBE 008 040 S04 | 0.4R X 0.8 | 3 | 4 | 45 | 4 | |
| 2DBE 008 050 S04 | 0.4R X 0.8 | 3 | 5 | 45 | 4 | |
| 2DBE 008 060 S04 | 0.4R X 0.8 | 3 | 6 | 45 | 4 | |
| 2DBE 008 080 S04 | 0.4R X 0.8 | 3 | 8 | 45 | 4 | |
| 2DBE 008 100 S04 | 0.4R X 0.8 | 3 | 10 | 45 | 4 | |
| 2DBE 008 150 S04 | 0.4R X 0.8 | 3 | 15 | 45 | 4 | |
| 2DBE 008 200 S04 | 0.4R X 0.8 | 3 | 20 | 45 | 4 | |
| 2DBE 010 030 S04 | 0.5R X 1 | 3 | – | 60 | 4 | |
| 2DBE 010 040 S04 | 0.5R X 1 | 3 | 4 | 60 | 4 | |
| 2DBE 010 050 S04 | 0.5R X 1 | 3 | 5 | 60 | 4 | |
| 2DBE 010 060 S04 | 0.5R X 1 | 3 | 6 | 60 | 4 | |
| 2DBE 010 080 S04 | 0.5R X 1 | 3 | 8 | 60 | 4 | |
| 2DBE 010 100 S04 | 0.5R X 1 | 3 | 10 | 60 | 4 | |
| 2DBE 010 120 S04 | 0.5R X 1 | 3 | 12 | 60 | 4 | |
| 2DBE 010 150 S04 | 0.5R X 1 | 3 | 15 | 60 | 4 | |
| 2DBE 010 200 S04 | 0.5R X 1 | 3 | 20 | 60 | 4 | |
| 2DBE 010 250 S04 | 0.5R X 1 | 3 | 25 | 80 | 4 | |
| 2DBE 010 300 S04 | 0.5R X 1 | 3 | 30 | 80 | 4 | |
| 2DBE 010 350 S04 | 0.5R X 1 | 3 | 35 | 80 | 4 | |
| 2DBE 010 400 S04 | 0.5R X 1 | 3 | 40 | 80 | 4 | |
| 2DBE 010 450 S04 | 0.5R X 1 | 3 | 45 | 80 | 4 | |

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2DBE 010 500 S04 | 0.5R X 1 | 3 | 50 | 80 | 4 | |
| 2DBE 015 045 S04 | 0.75R X 1.5 | 4.5 | – | 60 | 4 | |
| 2DBE 015 080 S04 | 0.75R X 1.5 | 4.5 | 8 | 80 | 4 | |
| 2DBE 015 100 S04 | 0.75R X 1.5 | 4.5 | 10 | 80 | 4 | |
| 2DBE 015 120 S04 | 0.75R X 1.5 | 4.5 | 12 | 80 | 4 | |
| 2DBE 015 150 S04 | 0.75R X 1.5 | 4.5 | 15 | 80 | 4 | |
| 2DBE 015 180 S04 | 0.75R X 1.5 | 4.5 | 18 | 80 | 4 | |
| 2DBE 015 200 S04 | 0.75R X 1.5 | 4.5 | 20 | 80 | 4 | |
| 2DBE 015 250 S04 | 0.75R X 1.5 | 4.5 | 25 | 80 | 4 | |
| 2DBE 015 300 S04 | 0.75R X 1.5 | 4.5 | 30 | 80 | 4 | |
| 2DBE 015 350 S04 | 0.75R X 1.5 | 4.5 | 35 | 80 | 4 | |
| 2DBE 015 400 S04 | 0.75R X 1.5 | 4.5 | 40 | 80 | 4 | |
| 2DBE 020 060 S04 | 1R X 2 | 6 | – | 60 | 4 | |
| 2DBE 020 100 S04 | 1R X 2 | 6 | 10 | 80 | 4 | |
| 2DBE 020 150 S04 | 1R X 2 | 6 | 15 | 80 | 4 | |
| 2DBE 020 200 S04 | 1R X 2 | 6 | 20 | 80 | 4 | |
| 2DBE 020 250 S04 | 1R X 2 | 6 | 25 | 80 | 4 | |
| 2DBE 020 300 S04 | 1R X 2 | 6 | 30 | 80 | 4 | |
| 2DBE 020 350 S04 | 1R X 2 | 6 | 35 | 80 | 4 | |
| 2DBE 020 400 S04 | 1R X 2 | 6 | 40 | 100 | 4 | |
| 2DBE 020 450 S04 | 1R X 2 | 6 | 45 | 100 | 4 | |
| 2DBE 020 500 S04 | 1R X 2 | 6 | 50 | 100 | 4 | |
| 2DBE 020 600 S04 | 1R X 2 | 6 | 60 | 100 | 4 | |
| 2DBE 020 700 S04 | 1R X 2 | 6 | 70 | 100 | 4 | |
| 2DBE 030 150 100 | 1.5R X 3 | 8 | 15 | 100 | 3 | |
| 2DBE 030 080 S04 | 1.5R X 3 | 8 | – | 60 | 4 | |
| 2DBE 030 080 S06 | 1.5R X 3 | 3 | 8 | 60 | 6 | |
| 2DBE 030 150 S04 | 1.5R X 3 | 8 | 15 | 100 | 4 | |
| 2DBE 030 200 S04 | 1.5R X 3 | 8 | 20 | 100 | 4 | |
| 2DBE 030 250 S04 | 1.5R X 3 | 8 | 25 | 100 | 4 | |
| 2DBE 030 300 S04 | 1.5R X 3 | 8 | 30 | 100 | 4 | |
| 2DBE 030 350 S04 | 1.5R X 3 | 8 | 35 | 100 | 4 | |
| 2DBE 030 400 S04 | 1.5R X 3 | 8 | 40 | 100 | 4 | |
| 2DBE 030 500 S04 | 1.5R X 3 | 8 | 50 | 100 | 4 | |
| 2DBE 030 600 S04 | 1.5R X 3 | 8 | 60 | 100 | 4 | |
| 2DBE 030 700 S04 | 1.5R X 3 | 8 | 70 | 100 | 4 | |
| 2DBE 040 040 060 | 2R X 4 | 4 | – | 60 | 4 | |
| 2DBE 040 160 060 | 2R X 4 | 16 | – | 60 | 4 | |
| 2DBE 040 160 080 | 2R X 4 | 16 | – | 80 | 4 | |
| 2DBE 040 300 080 | 2R X 4 | 16 | 30 | 80 | 4 | |
| 2DBE 040 160 100 | 2R X 4 | 16 | – | 100 | 4 | |
| 2DBE 040 400 100 | 2R X 4 | 16 | 40 | 100 | 4 | |
| 2DBE 040 160 130 | 2R X 4 | 16 | – | 130 | 4 | |
| 2DBE 040 400 130 | 2R X 4 | 16 | 40 | 130 | 4 | |
| 2DBE 040 160 150 | 2R X 4 | 16 | – | 150 | 4 | |
| 2DBE 040 500 150 | 2R X 4 | 16 | 50 | 150 | 4 | |
| 2DBE 050 160 110 | 2.5R X 5 | 16 | – | 110 | 5 | |
| 2DBE 050 400 110 | 2.5R X 5 | 16 | 40 | 110 | 5 | |
| 2DBE 050 200 S06 | 2.5R X 5 | 16 | 20 | 110 | 6 | |
| 2DBE 050 400 S06 | 2.5R X 5 | 16 | 40 | 110 | 6 | |

FOR GRAPHITE

단위 : mm

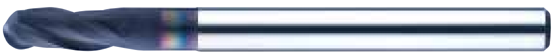
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2DBE 050 600 S06 | 2.5R X 5 | 16 | 60 | 110 | 6 | |
| New 2DBE 060 100 060 | 3R X 6 | 10 | – | 60 | 6 | |
| 2DBE 060 250 080 | 3R X 6 | 16 | 25 | 80 | 6 | |
| 2DBE 060 250 110 | 3R X 6 | 16 | 25 | 110 | 6 | |
| 2DBE 060 400 110 | 3R X 6 | 16 | 40 | 110 | 6 | |
| 2DBE 060 300 150 | 3R X 6 | 16 | 30 | 150 | 6 | |
| 2DBE 060 500 150 | 3R X 6 | 16 | 50 | 150 | 6 | |
| 2DBE 080 300 080 | 4R X 8 | 20 | 30 | 80 | 8 | |
| 2DBE 080 300 110 | 4R X 8 | 20 | 30 | 110 | 8 | |
| 2DBE 080 400 110 | 4R X 8 | 20 | 40 | 110 | 8 | |
| 2DBE 080 500 150 | 4R X 8 | 20 | 50 | 150 | 8 | |
| 2DBE 080 400 200 | 4R X 8 | 20 | 40 | 200 | 8 | |
| 2DBE 100 400 080 | 5R X 10 | 22 | 40 | 80 | 10 | |
| 2DBE 100 400 110 | 5R X 10 | 22 | 40 | 110 | 10 | |
| 2DBE 100 500 110 | 5R X 10 | 22 | 50 | 110 | 10 | |
| 2DBE 100 600 160 | 5R X 10 | 22 | 60 | 160 | 10 | |
| 2DBE 100 500 200 | 5R X 10 | 22 | 50 | 200 | 10 | |
| 2DBE 120 500 110 | 6R X 12 | 25 | 50 | 110 | 12 | |
| 2DBE 120 500 160 | 6R X 12 | 25 | 50 | 160 | 12 | |
| 2DBE 120 600 200 | 6R X 12 | 25 | 60 | 200 | 12 | |

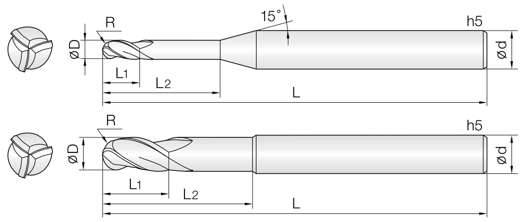
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

# 3DBE

## 3 Flutes Diamond Coated Ball End Mills for Graphite

## 3날 흑연가공용 다이아몬드 코팅 볼 엔드밀






- **그라파이트(흑연), 강화플라스틱, 탄소섬유 등 비철, 비금속 계열의 다양한 피삭재 전용 엔드밀**
- CVD 순수 다이아몬드 코팅을 적용하여 내마모성이 우수합니다.
- 다양한 피삭재의 형상에 적용하도록 규격을 다양화하여, 넓은 가공 영역에 뛰어난 수명과 성능을 발휘합니다.

- **Endmills for Graphite, reinforced plastics, carbon fiber, Non-ferrous and non-metallic materials.**
- Excellent wear resistance by applying qualified CVD diamond coating.
- Wide range products prepared for various work shape and excellent performance.

3 | WC 미립자 | DIA. Coating | R ± 0.01 | 30° Helix Angle | CUTTING DATA

0.5 ~ 6R | 481P

| D Size | D Tolerance |
|---|---|
| Ø 1 ~ 12 | +0 ~ -0.02mm |

단위 : mm

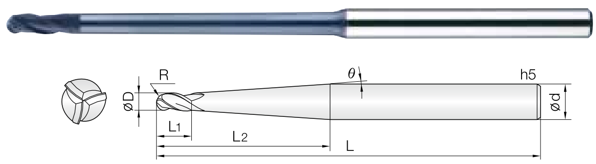
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 3DBE 010 030 S04 | 0.5R X 1 | 3 | - | 60 | 4 | |
| 3DBE 010 050 S04 | 0.5R X 1 | 3 | 5 | 60 | 4 | |
| 3DBE 010 100 S04 | 0.5R X 1 | 3 | 10 | 60 | 4 | |
| 3DBE 010 150 S04 | 0.5R X 1 | 3 | 15 | 60 | 4 | |
| 3DBE 010 200 S04 | 0.5R X 1 | 3 | 20 | 60 | 4 | |
| 3DBE 010 250 S04 | 0.5R X 1 | 3 | 25 | 80 | 4 | |
| 3DBE 010 300 S04 | 0.5R X 1 | 3 | 30 | 80 | 4 | |
| 3DBE 010 350 S04 | 0.5R X 1 | 3 | 35 | 80 | 4 | |
| 3DBE 010 400 S04 | 0.5R X 1 | 3 | 40 | 80 | 4 | |
| 3DBE 010 450 S04 | 0.5R X 1 | 3 | 45 | 80 | 4 | |
| 3DBE 010 500 S04 | 0.5R X 1 | 3 | 50 | 80 | 4 | |
| 3DBE 015 045 S04 | 0.75R X 1.5 | 4.5 | - | 60 | 4 | |
| 3DBE 015 100 S04 | 0.75R X 1.5 | 4.5 | 10 | 80 | 4 | |
| 3DBE 015 150 S04 | 0.75R X 1.5 | 4.5 | 15 | 80 | 4 | |
| 3DBE 015 200 S04 | 0.75R X 1.5 | 4.5 | 20 | 80 | 4 | |
| 3DBE 015 250 S04 | 0.75R X 1.5 | 4.5 | 25 | 80 | 4 | |
| 3DBE 015 300 S04 | 0.75R X 1.5 | 4.5 | 30 | 80 | 4 | |
| 3DBE 015 350 S04 | 0.75R X 1.5 | 4.5 | 35 | 80 | 4 | |
| 3DBE 015 400 S04 | 0.75R X 1.5 | 4.5 | 40 | 80 | 4 | |
| 3DBE 015 450 S04 | 0.75R X 1.5 | 4.5 | 45 | 80 | 4 | |
| 3DBE 015 500 S04 | 0.75R X 1.5 | 4.5 | 50 | 80 | 4 | |
| 3DBE 020 060 S04 | 1R X 2 | 6 | - | 60 | 4 | |
| 3DBE 020 100 S04 | 1R X 2 | 6 | 10 | 80 | 4 | |
| 3DBE 020 150 S04 | 1R X 2 | 6 | 15 | 80 | 4 | |
| 3DBE 020 200 S04 | 1R X 2 | 6 | 20 | 80 | 4 | |
| 3DBE 020 250 S04 | 1R X 2 | 6 | 25 | 80 | 4 | |
| 3DBE 020 300 S04 | 1R X 2 | 6 | 30 | 80 | 4 | |
| 3DBE 020 350 S04 | 1R X 2 | 6 | 35 | 80 | 4 | |
| 3DBE 020 400 S04 | 1R X 2 | 6 | 40 | 100 | 4 | |
| 3DBE 020 500 S04 | 1R X 2 | 6 | 50 | 100 | 4 | |
| 3DBE 020 600 S04 | 1R X 2 | 6 | 60 | 100 | 4 | |
| 3DBE 020 700 S04 | 1R X 2 | 6 | 70 | 100 | 4 | |
| 3DBE 030 150 100 | 1.5R X 3 | 8 | 15 | 100 | 3 | |
| 3DBE 030 080 S04 | 1.5R X 3 | 8 | - | 60 | 4 | |
| 3DBE 030 150 S04 | 1.5R X 3 | 8 | 15 | 100 | 4 | |
| 3DBE 030 200 S04 | 1.5R X 3 | 8 | 20 | 100 | 4 | |
| 3DBE 030 300 S04 | 1.5R X 3 | 8 | 30 | 100 | 4 | |
| 3DBE 030 400 S04 | 1.5R X 3 | 8 | 40 | 100 | 4 | |
| 3DBE 030 500 S04 | 1.5R X 3 | 8 | 50 | 100 | 4 | |
| 3DBE 040 160 080 | 2R X 4 | 16 | - | 80 | 4 | |
| 3DBE 040 300 080 | 2R X 4 | 16 | 30 | 80 | 4 | |
| 3DBE 040 160 100 | 2R X 4 | 16 | - | 100 | 4 | |
| 3DBE 040 400 100 | 2R X 4 | 16 | 40 | 100 | 4 | |
| 3DBE 040 160 130 | 2R X 4 | 16 | - | 130 | 4 | |
| 3DBE 040 400 130 | 2R X 4 | 16 | 40 | 130 | 4 | |
| 3DBE 050 160 110 | 2.5R X 5 | 16 | - | 110 | 5 | |
| 3DBE 050 400 110 | 2.5R X 5 | 16 | 40 | 110 | 5 | |
| 3DBE 060 250 110 | 3R X 6 | 16 | 25 | 110 | 6 | |
| 3DBE 060 400 110 | 3R X 6 | 16 | 40 | 110 | 6 | |
| 3DBE 060 300 150 | 3R X 6 | 16 | 30 | 150 | 6 | |

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 3DBE 060 500 150 | 3R X 6 | 16 | 50 | 150 | 6 | |
| 3DBE 060 500 180 | 3R X 6 | 16 | 50 | 180 | 6 | |
| 3DBE 080 400 110 | 4R X 8 | 20 | 40 | 110 | 8 | |
| 3DBE 080 500 150 | 4R X 8 | 20 | 50 | 150 | 8 | |
| 3DBE 100 400 110 | 5R X 10 | 22 | 40 | 110 | 10 | |
| 3DBE 100 600 160 | 5R X 10 | 22 | 60 | 160 | 10 | |
| 3DBE 120 500 110 | 6R X 12 | 25 | 50 | 110 | 12 | |
| 3DBE 120 500 160 | 6R X 12 | 25 | 50 | 160 | 12 | |
| 3DBE 120 600 200 | 6R X 12 | 25 | 60 | 200 | 12 | |

# 3TBD

## 3 Flutes Diamond Coated Taper Neck Ball End Mills for Graphite

## 3날 흑연가공용 다이아몬드 테이퍼 넥 볼 엔드밀




- **그라파이트(흑연), 강화플라스틱, 탄소섬유 등 비철, 비금속 계열의 다양한 피삭재 전용 엔드밀**
- CVD 순수 다이아몬드 코팅을 적용하여 내마모성이 우수합니다.
- 다양한 피삭재의 형상에 적용하도록 규격을 다양화하여, 넓은 가공 영역에 뛰어난 수명과 성능을 발휘합니다.

- **Endmills for Graphite, reinforced plastics, carbon fiber, Non-ferrous and non-metallic materials.**
- Excellent wear resistance by applying qualified CVD diamond coating.
- Wide range products prepared for various work shape and excellent performance.

3 | WC 미립자 | DIA. Coating | R ± 0.01 (0.5 ~ 2R) | 30° Helix Angle | CUTTING DATA (479P)

| D Size | D Tolerance |
|---|---|
| ø1 ~ 4 | +0 ~ -0.04mm |

단위 : mm

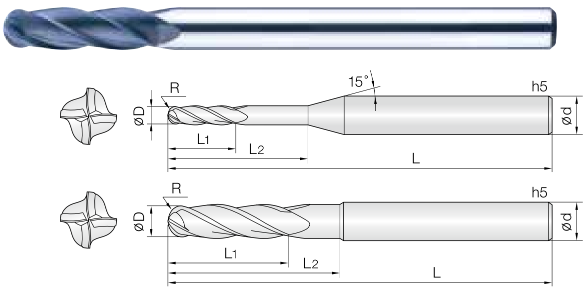
| Order Number | 날경 Diameter R × D | 각도 Angle θ | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|
| 3TBD 010 003 300 | 0.5R X 1 | 0°30 | 3 | 30 | 100 | 4 | |
| 3TBD 010 003 400 | 0.5R X 1 | 0°30 | 3 | 40 | 100 | 4 | |
| 3TBD 010 003 500 | 0.5R X 1 | 0°30 | 3 | 50 | 100 | 4 | |
| 3TBD 010 010 300 | 0.5R X 1 | 1° | 3 | 30 | 100 | 4 | |
| 3TBD 010 010 400 | 0.5R X 1 | 1° | 3 | 40 | 100 | 4 | |
| 3TBD 010 010 500 | 0.5R X 1 | 1° | 3 | 50 | 100 | 4 | |
| 3TBD 010 010 600 | 0.5R X 1 | 1° | 3 | 60 | 100 | 4 | |
| 3TBD 015 003 300 | 0.75R X 1.5 | 0°30 | 4 | 30 | 100 | 4 | |
| 3TBD 015 003 400 | 0.75R X 1.5 | 0°30 | 4 | 40 | 100 | 4 | |
| 3TBD 015 003 500 | 0.75R X 1.5 | 0°30 | 4 | 50 | 100 | 4 | |
| 3TBD 015 010 400 | 0.75R X 1.5 | 1° | 4 | 40 | 100 | 4 | |
| 3TBD 015 010 500 | 0.75R X 1.5 | 1° | 4 | 50 | 100 | 4 | |
| 3TBD 015 010 600 | 0.75R X1.5 | 1° | 4 | 60 | 100 | 4 | |
| 3TBD 020 003 400 | 1R X 2 | 0°30 | 5 | 40 | 130 | 4 | |
| 3TBD 020 003 500 | 1R X 2 | 0°30 | 5 | 50 | 130 | 4 | |
| 3TBD 020 003 600 | 1R X 2 | 0°30 | 5 | 60 | 130 | 4 | |
| 3TBD 020 010 500 | 1R X 2 | 1° | 5 | 50 | 130 | 4 | |
| 3TBD 020 010 600 | 1R X 2 | 1° | 5 | 60 | 130 | 4 | |
| 3TBD 020 010 700 | 1R X 2 | 1° | 5 | 70 | 130 | 4 | |
| 3TBD 030 003 600 | 1.5R X 3 | 0°30 | 6 | 60 | 150 | 6 | |
| 3TBD 030 003 800 | 1.5R X 3 | 0°30 | 6 | 80 | 150 | 6 | |
| 3TBD 030 010 700 | 1.5R X 3 | 1° | 6 | 70 | 150 | 6 | |
| 3TBD 030 010 900 | 1.5R X 3 | 1° | 6 | 90 | 150 | 6 | |
| 3TBD 040 003 800 | 2R X 4 | 0°30 | 8 | 80 | 150 | 6 | |
| 3TBD 040 003 1000 | 2R X 4 | 0°30 | 8 | 100 | 150 | 6 | |
| 3TBD 040 010 650 | 2R X 4 | 1° | 8 | 65 | 150 | 6 | |

FOR GRAPHITE

# 4DBE

## 4 Flutes Diamond Coated Ball End Mills for Graphite

## 4날 흑연가공용 다이아몬드 코팅 볼 엔드밀




- **그라파이트(흑연), 강화플라스틱, 탄소섬유 등 비철, 비금속 계열의 다양한 피삭재 전용 엔드밀**
- CVD 순수 다이아몬드 코팅을 적용하여 내마모성이 우수합니다.
- 다양한 피삭재의 형상에 적용하도록 규격을 다양화하여, 넓은 가공 영역에 뛰어난 수명과 성능을 발휘합니다.

- **Endmills for Graphite, reinforced plastics, carbon fiber, Non-ferrous and non-metallic materials.**
- Excellent wear resistance by applying qualified CVD diamond coating.
- Wide range products prepared for various work shape and excellent performance.

4 | WC 미립자 | DIA. Coating | R ±0.01 (0.5 ~ 6R) | 30° Helix Angle | CUTTING DATA (481P)

| D Size | D Tolerance |
|---|---|
| ø1 ~ 12 | +0 ~ -0.02mm |

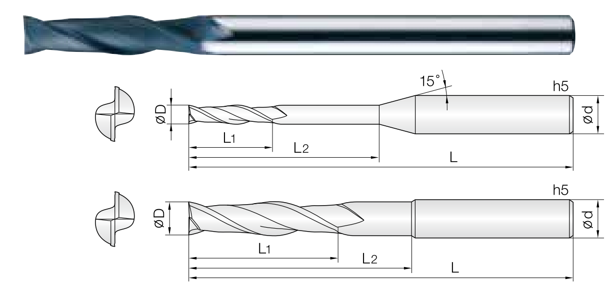
단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4DBE 010 030 S04 | 0.5R X 1 | 3 | - | 60 | 4 | |
| 4DBE 010 050 S04 | 0.5R X 1 | 3 | 5 | 60 | 4 | |
| 4DBE 010 100 S04 | 0.5R X 1 | 3 | 10 | 60 | 4 | |
| 4DBE 010 150 S04 | 0.5R X 1 | 3 | 15 | 60 | 4 | |
| 4DBE 010 200 S04 | 0.5R X 1 | 3 | 20 | 60 | 4 | |
| 4DBE 010 250 S04 | 0.5R X 1 | 3 | 25 | 60 | 4 | |
| 4DBE 010 300 S04 | 0.5R X 1 | 3 | 30 | 80 | 4 | |
| 4DBE 010 350 S04 | 0.5R X 1 | 3 | 35 | 80 | 4 | |
| 4DBE 010 400 S04 | 0.5R X 1 | 3 | 40 | 80 | 4 | |
| 4DBE 010 450 S04 | 0.5R X 1 | 3 | 45 | 80 | 4 | |
| 4DBE 010 500 S04 | 0.5R X 1 | 3 | 50 | 80 | 4 | |
| 4DBE 015 045 S04 | 0.75R X 1.5 | 4.5 | - | 60 | 4 | |
| 4DBE 015 100 S04 | 0.75R X 1.5 | 4.5 | 10 | 60 | 4 | |
| 4DBE 015 150 S04 | 0.75R X 1.5 | 4.5 | 15 | 60 | 4 | |
| 4DBE 015 200 S04 | 0.75R X 1.5 | 4.5 | 20 | 60 | 4 | |
| 4DBE 015 250 S04 | 0.75R X 1.5 | 4.5 | 25 | 60 | 4 | |
| 4DBE 015 300 S04 | 0.75R X 1.5 | 4.5 | 30 | 80 | 4 | |
| 4DBE 015 350 S04 | 0.75R X 1.5 | 4.5 | 35 | 80 | 4 | |
| 4DBE 015 400 S04 | 0.75R X 1.5 | 4.5 | 40 | 80 | 4 | |
| 4DBE 015 450 S04 | 0.75R X 1.5 | 4.5 | 45 | 80 | 4 | |
| 4DBE 015 500 S04 | 0.75R X 1.5 | 4.5 | 50 | 80 | 4 | |
| 4DBE 020 060 S04 | 1R X 2 | 6 | - | 60 | 4 | |
| 4DBE 020 100 S04 | 1R X 2 | 6 | 10 | 80 | 4 | |
| 4DBE 020 200 S04 | 1R X 2 | 6 | 20 | 80 | 4 | |
| 4DBE 020 300 S04 | 1R X 2 | 6 | 30 | 80 | 4 | |
| 4DBE 020 400 S04 | 1R X 2 | 6 | 40 | 80 | 4 | |
| 4DBE 020 500 S04 | 1R X 2 | 6 | 50 | 100 | 4 | |
| 4DBE 020 600 S04 | 1R X 2 | 6 | 60 | 100 | 4 | |
| 4DBE 020 700 S04 | 1R X 2 | 6 | 70 | 100 | 4 | |
| 4DBE 030 080 S04 | 1.5R X 3 | 8 | - | 60 | 4 | |
| 4DBE 030 150 S04 | 1.5R X 3 | 8 | 15 | 100 | 4 | |
| 4DBE 030 200 S04 | 1.5R X 3 | 8 | 20 | 100 | 4 | |
| 4DBE 030 300 S04 | 1.5R X 3 | 8 | 30 | 100 | 4 | |
| 4DBE 030 400 S04 | 1.5R X 3 | 8 | 40 | 100 | 4 | |
| 4DBE 030 500 S04 | 1.5R X 3 | 8 | 50 | 100 | 4 | |
| 4DBE 030 600 S04 | 1.5R X 3 | 8 | 60 | 100 | 4 | |
| 4DBE 030 700 S04 | 1.5R X 3 | 8 | 70 | 100 | 4 | |
| 4DBE 040 160 060 | 2R X 4 | 16 | - | 60 | 4 | |
| 4DBE 040 160 080 | 2R X 4 | 16 | - | 80 | 4 | |
| 4DBE 040 160 100 | 2R X 4 | 16 | - | 100 | 4 | |
| 4DBE 040 160 130 | 2R X 4 | 16 | - | 130 | 4 | |
| 4DBE 060 250 080 | 3R X 6 | 16 | 25 | 80 | 6 | |
| 4DBE 060 250 110 | 3R X 6 | 16 | 25 | 110 | 6 | |
| 4DBE 060 300 150 | 3R X 6 | 16 | 30 | 150 | 6 | |
| 4DBE 080 300 080 | 4R X 8 | 20 | 30 | 80 | 8 | |
| 4DBE 080 300 110 | 4R X 8 | 20 | 30 | 110 | 8 | |
| 4DBE 080 350 150 | 4R X 8 | 20 | 35 | 150 | 8 | |
| 4DBE 080 400 200 | 4R X 8 | 20 | 40 | 200 | 8 | |
| 4DBE 100 350 080 | 5R X 10 | 22 | 35 | 80 | 10 | |
| 4DBE 100 350 110 | 5R X 10 | 22 | 35 | 110 | 10 | |
| 4DBE 100 400 160 | 5R X 10 | 22 | 40 | 160 | 10 | |
| 4DBE 100 500 200 | 5R X 10 | 22 | 50 | 200 | 10 | |
| 4DBE 120 500 110 | 6R X 12 | 25 | 50 | 110 | 12 | |
| 4DBE 120 500 160 | 6R X 12 | 25 | 50 | 160 | 12 | |
| 4DBE 120 600 200 | 6R X 12 | 25 | 60 | 200 | 12 | |

# 2DEM

## 2 Flutes Diamond Coated End Mills for Graphite

## 2날 흑연가공용 다이아몬드 코팅 엔드밀




- **그라파이트(흑연), 강화플라스틱, 탄소섬유 등 비철, 비금속 계열의 다양한 피삭재 전용 엔드밀**
- CVD 순수다이아몬드 코팅을 적용하여 내마모성이 우수합니다.
- 다양한 피삭재의 형상에 적용하도록 규격을 다양화하여, 넓은 가공 영역에 뛰어난 수명과 성능을 발휘합니다.

- **Endmills for Graphite, reinforced plastics, carbon fiber, Non-ferrous and non-metallic materials.**
- Excellent wear resistance by applying qualified CVD diamond coating.
- Wide range products prepared for various work shape and excellent performance.

2 | WC 미립자 | DIA. Coating | 30° Helix Angle | Shield Edge | CUTTING DATA 481P

| D Size | D Tolerance |
|---|---|
| ø0.2 ~ 12 | +0 ~ -0.02mm |

단위 : mm

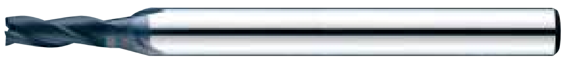
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2DEM 002 004 S04 | 0.2 | 0.4 | - | 45 | 4 | |
| 2DEM 003 006 S04 | 0.3 | 0.6 | - | 45 | 4 | |
| 2DEM 003 020 S04 | 0.3 | 0.6 | 2 | 45 | 4 | |
| 2DEM 003 040 S04 | 0.3 | 0.6 | 4 | 45 | 4 | |
| 2DEM 004 008 S04 | 0.4 | 0.8 | - | 45 | 4 | |
| 2DEM 004 020 S04 | 0.4 | 0.8 | 2 | 45 | 4 | |
| 2DEM 004 040 S04 | 0.4 | 0.8 | 4 | 45 | 4 | |
| 2DEM 005 010 S04 | 0.5 | 1 | - | 45 | 4 | |
| 2DEM 005 030 S04 | 0.5 | 1 | 3 | 45 | 4 | |
| 2DEM 005 050 S04 | 0.5 | 1 | 5 | 45 | 4 | |
| 2DEM 006 012 S04 | 0.6 | 1.2 | - | 45 | 4 | |
| 2DEM 006 030 S04 | 0.6 | 1.2 | 3 | 45 | 4 | |
| 2DEM 006 050 S04 | 0.6 | 1.2 | 5 | 45 | 4 | |
| 2DEM 007 015 S04 | 0.7 | 1.5 | - | 45 | 4 | |
| 2DEM 007 040 S04 | 0.7 | 1.5 | 4 | 45 | 4 | |
| 2DEM 007 060 S04 | 0.7 | 1.5 | 6 | 45 | 4 | |
| 2DEM 007 080 S04 | 0.7 | 1.5 | 8 | 45 | 4 | |
| 2DEM 008 020 S04 | 0.8 | 2 | - | 45 | 4 | |
| 2DEM 009 025 S04 | 0.9 | 2.5 | - | 45 | 4 | |
| 2DEM 010 030 S04 | 1 | 3 | - | 60 | 4 | |
| 2DEM 010 030 045 | 1 | 3 | - | 45 | 4 | |
| 2DEM 010 050 S04 | 1 | 3 | 5 | 60 | 4 | |
| 2DEM 010 100 S04 | 1 | 3 | 10 | 60 | 4 | |
| 2DEM 010 150 S04 | 1 | 3 | 15 | 60 | 4 | |
| 2DEM 010 200 S04 | 1 | 3 | 20 | 60 | 4 | |
| 2DEM 010 250 S04 | 1 | 3 | 25 | 60 | 4 | |
| 2DEM 010 300 S04 | 1 | 3 | 30 | 60 | 4 | |
| 2DEM 015 060 S04 | 1.5 | 6 | - | 60 | 4 | |
| 2DEM 015 100 S04 | 1.5 | 6 | 10 | 60 | 4 | |
| 2DEM 015 150 S04 | 1.5 | 6 | 15 | 60 | 4 | |
| 2DEM 015 200 S04 | 1.5 | 6 | 20 | 60 | 4 | |
| 2DEM 015 250 S04 | 1.5 | 6 | 25 | 60 | 4 | |
| 2DEM 015 300 S04 | 1.5 | 6 | 30 | 60 | 4 | |
| 2DEM 020 060 S04 | 2 | 6 | - | 45 | 4 | |
| 2DEM 020 080 S04 | 2 | 8 | - | 80 | 4 | |
| 2DEM 020 120 S04 | 2 | 8 | 12 | 80 | 4 | |
| 2DEM 020 150 S04 | 2 | 8 | 15 | 80 | 4 | |
| 2DEM 020 200 S04 | 2 | 8 | 20 | 80 | 4 | |
| 2DEM 020 250 S04 | 2 | 8 | 25 | 80 | 4 | |
| 2DEM 020 300 S04 | 2 | 8 | 30 | 80 | 4 | |
| 2DEM 020 400 S04 | 2 | 8 | 40 | 80 | 4 | |
| 2DEM 020 450 S04 | 2 | 8 | 45 | 80 | 4 | |
| 2DEM 020 500 S04 | 2 | 8 | 50 | 80 | 4 | |
| 2DEM 030 090 S06 | 3 | 9 | - | 50 | 6 | |
| 2DEM 030 120 S04 | 3 | 12 | - | 80 | 4 | |
| 2DEM 030 200 S04 | 3 | 12 | 20 | 80 | 4 | |
| 2DEM 030 250 S04 | 3 | 12 | 25 | 80 | 4 | |
| 2DEM 030 300 S04 | 3 | 12 | 30 | 80 | 4 | |
| 2DEM 030 400 S04 | 3 | 12 | 40 | 80 | 4 | |
| 2DEM 030 500 S04 | 3 | 12 | 50 | 80 | 4 | |

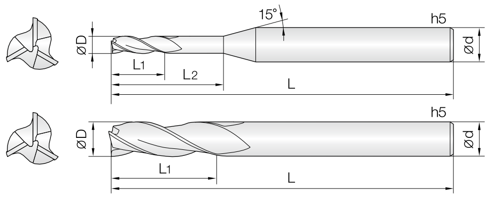
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2DEM 040 120 S06 | 4 | 12 | - | 50 | 6 | |
| 2DEM 040 160 080 | 4 | 16 | - | 80 | 4 | |
| 2DEM 050 150 S06 | 5 | 15 | - | 60 | 6 | |
| 2DEM 050 200 S06 | 5 | 20 | - | 110 | 6 | |
| 2DEM 060 180 S06 | 6 | 18 | - | 60 | 6 | |
| 2DEM 060 250 110 | 6 | 25 | - | 110 | 6 | |
| 2DEM 060 250 150 | 6 | 25 | - | 150 | 6 | |
| 2DEM 080 240 S08 | 8 | 24 | - | 70 | 8 | |
| 2DEM 080 400 150 | 8 | 25 | 40 | 150 | 8 | |
| 2DEM 100 250 S10 | 10 | 25 | - | 80 | 10 | |
| 2DEM 100 500 160 | 10 | 25 | 50 | 160 | 10 | |
| 2DEM 120 250 S12 | 12 | 25 | - | 80 | 12 | |
| 2DEM 120 600 160 | 12 | 25 | 60 | 160 | 12 | |

# 3DEM

## 3 Flutes Diamond Coated End Mills for Graphite

## 3날 흑연가공용 다이아몬드 코팅 엔드밀



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- **Endmills for Graphite, reinforced plastics, carbon fiber, Non-ferrous and non-metallic materials.**
- Excellent wear resistance by applying qualified CVD diamond coating.
- Wide range products prepared for various work shape and excellent performance.

3 | WC 미립자 | DIA. Coating | 30° Helix Angle | Shield Edge | CUTTING DATA 481P

| D Size | D Tolerance |
|---|---|
| ø1 ~ 12 | +0 ~ -0.02mm |

단위 : mm

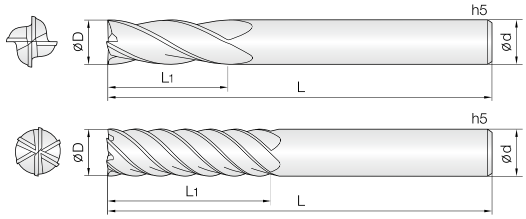
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 3DEM 010 030 S04 | 1 | 3 | - | 45 | 4 | |
| 3DEM 010 050 S04 | 1 | 3 | 5 | 45 | 4 | |
| 3DEM 010 100 S04 | 1 | 3 | 10 | 45 | 4 | |
| 3DEM 010 150 S04 | 1 | 3 | 15 | 45 | 4 | |
| 3DEM 015 060 S04 | 1.5 | 6 | - | 60 | 4 | |
| 3DEM 015 100 S04 | 1.5 | 6 | 10 | 60 | 4 | |
| 3DEM 015 150 S04 | 1.5 | 6 | 15 | 60 | 4 | |
| 3DEM 015 200 S04 | 1.5 | 6 | 20 | 60 | 4 | |
| 3DEM 020 060 S04 | 2 | 6 | - | 45 | 4 | |
| 3DEM 020 100 S04 | 2 | 10 | 10 | 60 | 4 | |
| 3DEM 020 150 S04 | 2 | 10 | 15 | 60 | 4 | |
| 3DEM 020 200 S04 | 2 | 10 | 20 | 60 | 4 | |
| 3DEM 020 250 S04 | 2 | 10 | 25 | 60 | 4 | |
| 3DEM 030 090 S06 | 3 | 9 | - | 50 | 6 | |
| 3DEM 030 150 S03 | 3 | 15 | - | 60 | 3 | |
| 3DEM 030 150 S04 | 3 | 15 | - | 60 | 4 | |
| 3DEM 030 200 S04 | 3 | 15 | 20 | 60 | 4 | |
| 3DEM 030 250 S04 | 3 | 15 | 25 | 60 | 4 | |
| 3DEM 040 120 S06 | 4 | 12 | - | 50 | 6 | |
| 3DEM 040 200 080 | 4 | 20 | - | 80 | 4 | |
| 3DEM 060 180 060 | 6 | 18 | - | 60 | 6 | |
| 3DEM 060 250 110 | 6 | 25 | - | 110 | 6 | |
| 3DEM 060 250 150 | 6 | 25 | - | 150 | 6 | |
| 3DEM 080 240 070 | 8 | 24 | - | 70 | 8 | |
| 3DEM 080 350 110 | 8 | 35 | - | 110 | 8 | |
| 3DEM 080 350 150 | 8 | 35 | - | 150 | 8 | |
| 3DEM 100 250 080 | 10 | 25 | - | 80 | 10 | |
| 3DEM 100 400 110 | 10 | 40 | - | 110 | 10 | |
| 3DEM 100 500 160 | 10 | 50 | - | 160 | 10 | |
| 3DEM 120 250 080 | 12 | 25 | - | 80 | 12 | |
| 3DEM 120 450 110 | 12 | 45 | - | 110 | 12 | |
| 3DEM 120 550 160 | 12 | 55 | - | 160 | 12 | |

FOR GRAPHITE

# 4&6DEM

## 4&6 Flutes Diamond Coated End Mills for Graphite

## 4&6날 흑연가공용 다이아몬드 코팅 엔드밀

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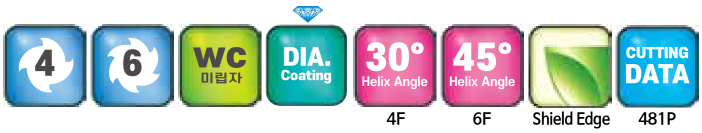



| D Size | D Tolerance |
|---|---|
| ø2 ~ 16 | +0 ~ -0.02mm |

단위 : mm

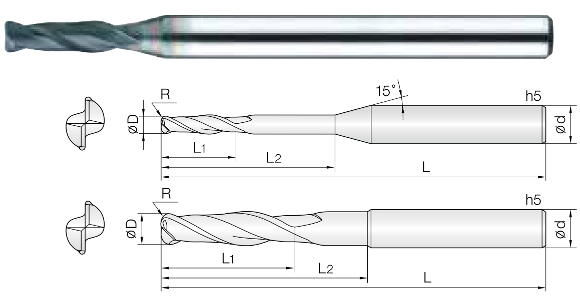
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4DEM 020 060 S04 | 2 | 6 | 45 | 4 | |
| 4DEM 020 100 S04 | 2 | 10 | 60 | 4 | |
| 4DEM 030 090 S06 | 3 | 9 | 50 | 6 | |
| 4DEM 030 150 S03 | 3 | 15 | 60 | 3 | |
| 4DEM 030 150 S04 | 3 | 15 | 60 | 4 | |
| 4DEM 040 120 S06 | 4 | 12 | 50 | 6 | |
| 4DEM 040 200 080 | 4 | 20 | 80 | 4 | |
| 4DEM 040 200 100 | 4 | 20 | 100 | 4 | |
| 4DEM 060 180 060 | 6 | 18 | 60 | 6 | |
| 4DEM 060 250 110 | 6 | 25 | 110 | 6 | |
| 4DEM 060 250 150 | 6 | 25 | 150 | 6 | |
| 4DEM 080 240 070 | 8 | 24 | 70 | 8 | |
| 4DEM 080 350 110 | 8 | 35 | 110 | 8 | |
| 4DEM 080 350 150 | 8 | 35 | 150 | 8 | |
| 4DEM 100 250 080 | 10 | 25 | 80 | 10 | |
| 4DEM 100 400 110 | 10 | 40 | 110 | 10 | |
| 4DEM 100 500 160 | 10 | 50 | 160 | 10 | |
| 4DEM 120 250 080 | 12 | 25 | 80 | 12 | |
| 4DEM 120 450 110 | 12 | 45 | 110 | 12 | |
| 4DEM 120 550 160 | 12 | 55 | 160 | 12 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 6DEM 100 400 110 | 10 | 40 | 110 | 10 | |
| 6DEM 100 400 160 | 10 | 40 | 160 | 10 | |
| 6DEM 120 450 110 | 12 | 45 | 110 | 12 | |
| 6DEM 120 450 160 | 12 | 45 | 160 | 12 | |
| 6DEM 160 500 110 | 16 | 50 | 110 | 16 | |
| 6DEM 160 500 160 | 16 | 50 | 160 | 16 | |
| 6DEM 160 500 200 | 16 | 50 | 200 | 16 | |

# 2DCR

## 2 Flutes Diamond Coated Corner Radius End Mills for Graphite

## 2날 흑연가공용 다이아몬드 코팅 코너 레디우스 엔드밀

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- Wide range products prepared for various work shape and excellent performance.

2 | WC 미립자 | DIA. Coating | R ± 0.01 | 30° Helix Angle | CUTTING DATA

R0.02 ~ 1 | 480P

| D Size | D Tolerance |
|---|---|
| ø0.2 ~ 6 | +0 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2DCR 002 0002 015 | 0.2 X R0.02 | 0.5 | 1.5 | 60 | 4 | |
| 2DCR 003 0002 015 | 0.3 X R0.02 | 0.6 | 1.5 | 60 | 4 | |
| 2DCR 003 0002 030 | 0.3 X R0.02 | 0.6 | 3 | 60 | 4 | |
| 2DCR 003 0002 045 | 0.3 X R0.02 | 0.6 | 4.5 | 60 | 4 | |
| 2DCR 003 0002 060 | 0.3 X R0.02 | 0.6 | 6 | 60 | 4 | |
| 2DCR 004 0002 020 | 0.4 X R0.02 | 0.8 | 2 | 60 | 4 | |
| 2DCR 004 0002 040 | 0.4 X R0.02 | 0.8 | 4 | 60 | 4 | |
| 2DCR 004 0002 060 | 0.4 X R0.02 | 0.8 | 6 | 60 | 4 | |
| 2DCR 004 0002 080 | 0.4 X R0.02 | 0.8 | 8 | 60 | 4 | |
| 2DCR 005 0005 010 | 0.5 X R0.05 | 1 | - | 60 | 4 | |
| 2DCR 005 0005 025 | 0.5 X R0.05 | 1 | 2.5 | 60 | 4 | |
| 2DCR 005 0005 035 | 0.5 X R0.05 | 1 | 3.5 | 60 | 4 | |
| 2DCR 005 0005 050 | 0.5 X R0.05 | 1 | 5 | 60 | 4 | |
| 2DCR 005 0005 075 | 0.5 X R0.05 | 1 | 7.5 | 60 | 4 | |
| 2DCR 005 0005 100 | 0.5 X R0.05 | 1 | 10 | 60 | 4 | |
| 2DCR 006 0005 012 | 0.6 X R0.05 | 1.2 | - | 60 | 4 | |
| 2DCR 006 0005 030 | 0.6 X R0.05 | 1.2 | 3 | 60 | 4 | |
| 2DCR 006 0005 060 | 0.6 X R0.05 | 1.2 | 6 | 60 | 4 | |
| 2DCR 006 0005 090 | 0.6 X R0.05 | 1.2 | 9 | 60 | 4 | |
| 2DCR 006 0005 120 | 0.6 X R0.05 | 1.2 | 12 | 60 | 4 | |
| 2DCR 008 0005 016 | 0.8 X R0.05 | 1.6 | - | 60 | 4 | |
| 2DCR 008 0005 040 | 0.8 X R0.05 | 1.6 | 4 | 60 | 4 | |
| 2DCR 008 0005 080 | 0.8 X R0.05 | 1.6 | 8 | 60 | 4 | |
| 2DCR 008 0005 100 | 0.8 X R0.05 | 1.6 | 10 | 60 | 4 | |
| 2DCR 008 0005 160 | 0.8 X R0.05 | 1.6 | 16 | 60 | 4 | |
| 2DCR 010 0005 020 | 1 X R0.05 | 2 | - | 60 | 4 | |
| 2DCR 010 0005 050 | 1 X R0.05 | 2 | 5 | 60 | 4 | |
| 2DCR 010 0005 100 | 1 X R0.05 | 2 | 10 | 60 | 4 | |
| 2DCR 010 0005 150 | 1 X R0.05 | 2 | 15 | 60 | 4 | |
| 2DCR 010 0005 200 | 1 X R0.05 | 2 | 20 | 60 | 4 | |
| 2DCR 010 001 020 | 1 X R0.1 | 2 | - | 60 | 4 | |
| 2DCR 010 001 050 | 1 X R0.1 | 2 | 5 | 60 | 4 | |
| 2DCR 010 001 100 | 1 X R0.1 | 2 | 10 | 60 | 4 | |
| 2DCR 010 001 150 | 1 X R0.1 | 2 | 15 | 60 | 4 | |
| 2DCR 010 001 200 | 1 X R0.1 | 2 | 20 | 60 | 4 | |
| 2DCR 010 002 020 | 1 X R0.2 | 2 | - | 60 | 4 | |
| 2DCR 010 002 050 | 1 X R0.2 | 2 | 5 | 60 | 4 | |
| 2DCR 010 002 100 | 1 X R0.2 | 2 | 10 | 60 | 4 | |
| 2DCR 010 002 150 | 1 X R0.2 | 2 | 15 | 60 | 4 | |
| 2DCR 010 002 200 | 1 X R0.2 | 2 | 20 | 60 | 4 | |
| 2DCR 015 0005 030 | 1.5 X R0.05 | 3 | - | 60 | 4 | |
| 2DCR 015 0005 050 | 1.5 X R0.05 | 3 | 5 | 60 | 4 | |
| 2DCR 015 0005 100 | 1.5 X R0.05 | 3 | 10 | 60 | 4 | |
| 2DCR 015 0005 150 | 1.5 X R0.05 | 3 | 15 | 60 | 4 | |
| 2DCR 015 0005 200 | 1.5 X R0.05 | 3 | 20 | 60 | 4 | |
| 2DCR 015 001 030 | 1.5 X R0.1 | 3 | - | 60 | 4 | |
| 2DCR 015 001 050 | 1.5 X R0.1 | 3 | 5 | 60 | 4 | |
| 2DCR 015 001 100 | 1.5 X R0.1 | 3 | 10 | 60 | 4 | |
| 2DCR 015 001 150 | 1.5 X R0.1 | 3 | 15 | 60 | 4 | |
| 2DCR 015 001 200 | 1.5 X R0.1 | 3 | 20 | 60 | 4 | |

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2DCR 015 0015 030 | 1.5 X R0.15 | 3 | - | 60 | 4 | |
| 2DCR 015 0015 050 | 1.5 X R0.15 | 3 | 5 | 60 | 4 | |
| 2DCR 015 0015 100 | 1.5 X R0.15 | 3 | 10 | 60 | 4 | |
| 2DCR 015 0015 150 | 1.5 X R0.15 | 3 | 15 | 60 | 4 | |
| 2DCR 015 0015 200 | 1.5 X R0.15 | 3 | 20 | 60 | 4 | |
| 2DCR 015 002 030 | 1.5 X R0.2 | 3 | - | 60 | 4 | |
| 2DCR 015 002 050 | 1.5 X R0.2 | 3 | 5 | 60 | 4 | |
| 2DCR 015 002 100 | 1.5 X R0.2 | 3 | 10 | 60 | 4 | |
| 2DCR 015 002 150 | 1.5 X R0.2 | 3 | 15 | 60 | 4 | |
| 2DCR 015 002 200 | 1.5 X R0.2 | 3 | 20 | 60 | 4 | |
| 2DCR 015 003 030 | 1.5 X R0.3 | 3 | - | 60 | 4 | |
| 2DCR 015 003 050 | 1.5 X R0.3 | 3 | 5 | 60 | 4 | |
| 2DCR 015 003 100 | 1.5 X R0.3 | 3 | 10 | 60 | 4 | |
| 2DCR 015 003 150 | 1.5 X R0.3 | 3 | 15 | 60 | 4 | |
| 2DCR 015 003 200 | 1.5 X R0.3 | 3 | 20 | 60 | 4 | |
| 2DCR 020 0005 035 | 2 X R0.05 | 3.5 | - | 60 | 4 | |
| 2DCR 020 0005 060 | 2 X R0.05 | 3.5 | 6 | 60 | 4 | |
| 2DCR 020 0005 120 | 2 X R0.05 | 3.5 | 12 | 60 | 4 | |
| 2DCR 020 0005 180 | 2 X R0.05 | 3.5 | 18 | 60 | 4 | |
| 2DCR 020 0005 250 | 2 X R0.05 | 3.5 | 25 | 60 | 4 | |
| 2DCR 020 0005 300 | 2 X R0.05 | 3.5 | 30 | 60 | 4 | |
| New 2DCR 020 001 035 | 2 X R0.1 | 3.5 | - | 60 | 4 | |
| New 2DCR 020 001 060 | 2 X R0.1 | 3.5 | 6 | 60 | 4 | |
| New 2DCR 020 001 120 | 2 X R0.1 | 3.5 | 12 | 60 | 4 | |
| New 2DCR 020 001 180 | 2 X R0.1 | 3.5 | 18 | 60 | 4 | |
| New 2DCR 020 001 250 | 2 X R0.1 | 3.5 | 25 | 60 | 4 | |
| New 2DCR 020 001 300 | 2 X R0.1 | 3.5 | 30 | 60 | 4 | |
| 2DCR 020 002 035 | 2 X R0.2 | 3.5 | - | 60 | 4 | |
| 2DCR 020 002 060 | 2 X R0.2 | 3.5 | 6 | 60 | 4 | |
| 2DCR 020 002 120 | 2 X R0.2 | 3.5 | 12 | 60 | 4 | |
| 2DCR 020 002 180 | 2 X R0.2 | 3.5 | 18 | 60 | 4 | |
| 2DCR 020 002 250 | 2 X R0.2 | 3.5 | 25 | 60 | 4 | |
| 2DCR 020 002 300 | 2 X R0.2 | 3.5 | 30 | 60 | 4 | |
| 2DCR 020 003 035 | 2 X R0.3 | 3.5 | - | 60 | 4 | |
| 2DCR 020 003 060 | 2 X R0.3 | 3.5 | 6 | 60 | 4 | |
| 2DCR 020 003 120 | 2 X R0.3 | 3.5 | 12 | 60 | 4 | |
| 2DCR 020 003 180 | 2 X R0.3 | 3.5 | 18 | 60 | 4 | |
| 2DCR 020 003 250 | 2 X R0.3 | 3.5 | 25 | 60 | 4 | |
| 2DCR 020 003 300 | 2 X R0.3 | 3.5 | 30 | 60 | 4 | |
| 2DCR 020 005 035 | 2 X R0.5 | 3.5 | - | 60 | 4 | |
| 2DCR 020 005 060 | 2 X R0.5 | 3.5 | 6 | 60 | 4 | |
| 2DCR 020 005 120 | 2 X R0.5 | 3.5 | 12 | 60 | 4 | |
| 2DCR 020 005 180 | 2 X R0.5 | 3.5 | 18 | 60 | 4 | |
| 2DCR 020 005 250 | 2 X R0.5 | 3.5 | 25 | 60 | 4 | |
| 2DCR 020 005 300 | 2 X R0.5 | 3.5 | 30 | 60 | 4 | |
| 2DCR 030 0005 040 | 3 X R0.05 | 4 | - | 80 | 4 | |
| 2DCR 030 0005 100 | 3 X R0.05 | 4 | 10 | 80 | 4 | |
| 2DCR 030 0005 200 | 3 X R0.05 | 4 | 20 | 80 | 4 | |
| 2DCR 030 0005 300 | 3 X R0.05 | 4 | 30 | 80 | 4 | |
| 2DCR 030 0005 400 | 3 X R0.05 | 4 | 40 | 80 | 4 | |

## 2 Flutes Diamond Coated Corner Radius End Mills for Graphite

## 2날 흑연가공용 다이아몬드 코팅 코너 레디우스 엔드밀



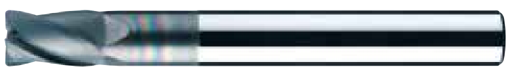
단위 : mm

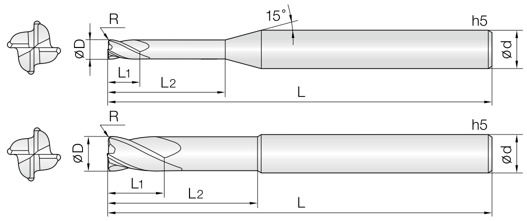
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2DCR 030 002 040 | 3 X R0.2 | 4 | - | 80 | 4 | |
| 2DCR 030 002 100 | 3 X R0.2 | 4 | 10 | 80 | 4 | |
| 2DCR 030 002 200 | 3 X R0.2 | 4 | 20 | 80 | 4 | |
| 2DCR 030 002 300 | 3 X R0.2 | 4 | 30 | 80 | 4 | |
| 2DCR 030 002 400 | 3 X R0.2 | 4 | 40 | 80 | 4 | |
| 2DCR 030 003 040 | 3 X R0.3 | 4 | - | 80 | 4 | |
| 2DCR 030 003 100 | 3 X R0.3 | 4 | 10 | 80 | 4 | |
| 2DCR 030 003 200 | 3 X R0.3 | 4 | 20 | 80 | 4 | |
| 2DCR 030 003 300 | 3 X R0.3 | 4 | 30 | 80 | 4 | |
| 2DCR 030 003 400 | 3 X R0.3 | 4 | 40 | 80 | 4 | |
| 2DCR 030 005 040 | 3 X R0.5 | 4 | - | 80 | 4 | |
| 2DCR 030 005 100 | 3 X R0.5 | 4 | 10 | 80 | 4 | |
| 2DCR 030 005 200 | 3 X R0.5 | 4 | 20 | 80 | 4 | |
| 2DCR 030 005 300 | 3 X R0.5 | 4 | 30 | 80 | 4 | |
| 2DCR 030 005 400 | 3 X R0.5 | 4 | 40 | 80 | 4 | |
| 2DCR 030 010 040 | 3 X R1 | 4 | - | 80 | 4 | |
| 2DCR 030 010 100 | 3 X R1 | 4 | 10 | 80 | 4 | |
| 2DCR 030 010 200 | 3 X R1 | 4 | 20 | 80 | 4 | |
| 2DCR 030 010 300 | 3 X R1 | 4 | 30 | 80 | 4 | |
| 2DCR 030 010 400 | 3 X R1 | 4 | 40 | 80 | 4 | |
| 2DCR 040 0005 050 | 4 X R0.05 | 5 | - | 80 | 4 | |
| 2DCR 040 0005 150 | 4 X R0.05 | 5 | 15 | 80 | 4 | |
| 2DCR 040 0005 250 | 4 X R0.05 | 5 | 25 | 80 | 4 | |
| 2DCR 040 0005 400 | 4 X R0.05 | 5 | 40 | 80 | 4 | |
| 2DCR 040 002 050 | 4 X R0.2 | 5 | - | 80 | 4 | |
| 2DCR 040 002 150 | 4 X R0.2 | 5 | 15 | 80 | 4 | |
| 2DCR 040 002 250 | 4 X R0.2 | 5 | 25 | 80 | 4 | |
| 2DCR 040 002 400 | 4 X R0.2 | 5 | 40 | 80 | 4 | |
| 2DCR 040 005 050 | 4 X R0.5 | 5 | - | 80 | 4 | |
| 2DCR 040 005 150 | 4 X R0.5 | 5 | 15 | 80 | 4 | |
| 2DCR 040 005 250 | 4 X R0.5 | 5 | 25 | 80 | 4 | |
| 2DCR 040 005 400 | 4 X R0.5 | 5 | 40 | 80 | 4 | |
| 2DCR 040 010 050 | 4 X R1 | 5 | - | 80 | 4 | |
| 2DCR 040 010 150 | 4 X R1 | 5 | 15 | 80 | 4 | |
| 2DCR 040 010 250 | 4 X R1 | 5 | 25 | 80 | 4 | |
| 2DCR 040 010 400 | 4 X R1 | 5 | 40 | 80 | 4 | |
| 2DCR 050 0005 060 | 5 X R0.05 | 6 | - | 110 | 6 | |
| 2DCR 050 0005 150 | 5 X R0.05 | 6 | 15 | 110 | 6 | |
| 2DCR 050 0005 300 | 5 X R0.05 | 6 | 30 | 110 | 6 | |
| 2DCR 050 0005 500 | 5 X R0.05 | 6 | 50 | 110 | 6 | |
| 2DCR 050 002 060 | 5 X R0.2 | 6 | - | 110 | 6 | |
| 2DCR 050 002 150 | 5 X R0.2 | 6 | 15 | 110 | 6 | |
| 2DCR 050 002 300 | 5 X R0.2 | 6 | 30 | 110 | 6 | |
| 2DCR 050 002 500 | 5 X R0.2 | 6 | 50 | 110 | 6 | |
| 2DCR 050 005 060 | 5 X R0.2 | 6 | - | 110 | 6 | |
| 2DCR 050 005 150 | 5 X R0.2 | 6 | 15 | 110 | 6 | |
| 2DCR 050 005 300 | 5 X R0.2 | 6 | 30 | 110 | 6 | |
| 2DCR 050 005 500 | 5 X R0.2 | 6 | 50 | 110 | 6 | |
| 2DCR 060 0005 070 | 6 X R0.05 | 7 | - | 110 | 6 | |
| 2DCR 060 0005 200 | 6 X R0.05 | 7 | 20 | 110 | 6 | |
| 2DCR 060 0005 300 | 6 X R0.05 | 7 | 30 | 110 | 6 | |
| 2DCR 060 0005 500 | 6 X R0.05 | 7 | 50 | 110 | 6 | |
| 2DCR 060 002 070 | 6 X R0.2 | 7 | - | 110 | 6 | |
| 2DCR 060 002 200 | 6 X R0.2 | 7 | 20 | 110 | 6 | |
| 2DCR 060 002 300 | 6 X R0.2 | 7 | 30 | 110 | 6 | |
| 2DCR 060 002 500 | 6 X R0.2 | 7 | 50 | 110 | 6 | |
| 2DCR 060 005 070 | 6 X R0.5 | 7 | - | 110 | 6 | |
| 2DCR 060 005 200 | 6 X R0.5 | 7 | 20 | 110 | 6 | |
| 2DCR 060 005 300 | 6 X R0.5 | 7 | 30 | 110 | 6 | |
| 2DCR 060 005 500 | 6 X R0.5 | 7 | 50 | 110 | 6 | |
| 2DCR 060 010 070 | 6 X R1 | 7 | - | 110 | 6 | |
| 2DCR 060 010 200 | 6 X R1 | 7 | 20 | 110 | 6 | |
| 2DCR 060 010 300 | 6 X R1 | 7 | 30 | 110 | 6 | |
| 2DCR 060 010 500 | 6 X R1 | 7 | 50 | 110 | 6 | |

# 4DCR

## 4 Flutes Diamond Coated Corner Radius End Mills for Graphite

## 4날 흑연가공용 다이아몬드 코팅 코너 레디우스 엔드밀






- **그라파이트(흑연), 강화플라스틱, 탄소섬유 등 비철, 비금속 계열의 다양한 피삭재 전용 엔드밀**
- CVD 순수다이아몬드 코팅을 적용하여 내마모성이 우수합니다.
- 다양한 피삭재의 형상에 적용하도록 규격을 다양화하여, 넓은 가공 영역에 뛰어난 수명과 성능을 발휘합니다.

- **Endmills for Graphite, reinforced plastics, carbon fiber, Non-ferrous and non-metallic materials.**
- Excellent wear resistance by applying qualified CVD diamond coating.
- Wide range products prepared for various work shape and excellent performance.

4 | WC 미립자 | DIA. Coating | R ±0.01 | 30° Helix Angle | CUTTING DATA

R0.05 ~ 1 | 480P

| D Size | D Tolerance |
|---|---|
| ø2 ~ 12 | +0 ~ -0.02mm |

단위 : mm

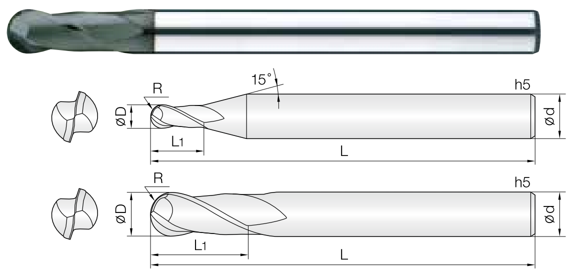
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4DCR 020 0005 035 | 2 X R0.05 | 3.5 | - | 60 | 4 | |
| 4DCR 020 0005 060 | 2 X R0.05 | 3.5 | 6 | 60 | 4 | |
| 4DCR 020 0005 120 | 2 X R0.05 | 3.5 | 12 | 60 | 4 | |
| 4DCR 020 0005 180 | 2 X R0.05 | 3.5 | 18 | 60 | 4 | |
| 4DCR 020 0005 250 | 2 X R0.05 | 3.5 | 25 | 60 | 4 | |
| 4DCR 020 0005 300 | 2 X R0.05 | 3.5 | 30 | 60 | 4 | |
| New 4DCR 020 001 035 | 2 X R0.1 | 3.5 | - | 60 | 4 | |
| New 4DCR 020 001 060 | 2 X R0.1 | 3.5 | 6 | 60 | 4 | |
| New 4DCR 020 001 120 | 2 X R0.1 | 3.5 | 12 | 60 | 4 | |
| New 4DCR 020 001 180 | 2 X R0.1 | 3.5 | 18 | 60 | 4 | |
| New 4DCR 020 001 250 | 2 X R0.1 | 3.5 | 25 | 60 | 4 | |
| New 4DCR 020 001 300 | 2 X R0.1 | 3.5 | 30 | 60 | 4 | |
| 4DCR 020 002 035 | 2 X R0.2 | 3.5 | - | 60 | 4 | |
| 4DCR 020 002 060 | 2 X R0.2 | 3.5 | 6 | 60 | 4 | |
| 4DCR 020 002 120 | 2 X R0.2 | 3.5 | 12 | 60 | 4 | |
| 4DCR 020 002 180 | 2 X R0.2 | 3.5 | 18 | 60 | 4 | |
| 4DCR 020 002 250 | 2 X R0.2 | 3.5 | 25 | 60 | 4 | |
| 4DCR 020 002 300 | 2 X R0.2 | 3.5 | 30 | 60 | 4 | |
| 4DCR 020 003 035 | 2 X R0.3 | 3.5 | - | 60 | 4 | |
| 4DCR 020 003 060 | 2 X R0.3 | 3.5 | 6 | 60 | 4 | |
| 4DCR 020 003 120 | 2 X R0.3 | 3.5 | 12 | 60 | 4 | |
| 4DCR 020 003 180 | 2 X R0.3 | 3.5 | 18 | 60 | 4 | |
| 4DCR 020 003 250 | 2 X R0.3 | 3.5 | 25 | 60 | 4 | |
| 4DCR 020 003 300 | 2 X R0.3 | 3.5 | 30 | 60 | 4 | |
| 4DCR 020 005 035 | 2 X R0.5 | 3.5 | - | 60 | 4 | |
| 4DCR 020 005 060 | 2 X R0.5 | 3.5 | 6 | 60 | 4 | |
| 4DCR 020 005 120 | 2 X R0.5 | 3.5 | 12 | 60 | 4 | |
| 4DCR 020 005 180 | 2 X R0.5 | 3.5 | 18 | 60 | 4 | |
| 4DCR 020 005 250 | 2 X R0.5 | 3.5 | 25 | 60 | 4 | |
| 4DCR 020 005 300 | 2 X R0.5 | 3.5 | 30 | 60 | 4 | |
| 4DCR 030 0005 040 | 3 X R0.05 | 4 | - | 80 | 4 | |
| 4DCR 030 0005 100 | 3 X R0.05 | 4 | 10 | 80 | 4 | |
| 4DCR 030 0005 200 | 3 X R0.05 | 4 | 20 | 80 | 4 | |
| 4DCR 030 0005 300 | 3 X R0.05 | 4 | 30 | 80 | 4 | |
| 4DCR 030 0005 400 | 3 X R0.05 | 4 | 40 | 80 | 4 | |
| New 4DCR 030 001 040 | 3 X R0.1 | 4 | - | 80 | 4 | |
| New 4DCR 030 001 100 | 3 X R0.1 | 4 | 10 | 80 | 4 | |
| New 4DCR 030 001 200 | 3 X R0.1 | 4 | 20 | 80 | 4 | |
| New 4DCR 030 001 300 | 3 X R0.1 | 4 | 30 | 80 | 4 | |
| New 4DCR 030 001 400 | 3 X R0.1 | 4 | 40 | 80 | 4 | |
| 4DCR 030 002 040 | 3 X R0.2 | 4 | - | 80 | 4 | |
| 4DCR 030 002 100 | 3 X R0.2 | 4 | 10 | 80 | 4 | |
| 4DCR 030 002 200 | 3 X R0.2 | 4 | 20 | 80 | 4 | |
| 4DCR 030 002 300 | 3 X R0.2 | 4 | 30 | 80 | 4 | |
| 4DCR 030 002 400 | 3 X R0.2 | 4 | 40 | 80 | 4 | |
| 4DCR 030 003 040 | 3 X R0.3 | 4 | - | 80 | 4 | |
| 4DCR 030 003 100 | 3 X R0.3 | 4 | 10 | 80 | 4 | |
| 4DCR 030 003 200 | 3 X R0.3 | 4 | 20 | 80 | 4 | |
| 4DCR 030 003 300 | 3 X R0.3 | 4 | 30 | 80 | 4 | |
| 4DCR 030 003 400 | 3 X R0.3 | 4 | 40 | 80 | 4 | |

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4DCR 030 005 040 | 3 X R0.5 | 4 | - | 80 | 4 | |
| 4DCR 030 005 100 | 3 X R0.5 | 4 | 10 | 80 | 4 | |
| 4DCR 030 005 200 | 3 X R0.5 | 4 | 20 | 80 | 4 | |
| 4DCR 030 005 300 | 3 X R0.5 | 4 | 30 | 80 | 4 | |
| 4DCR 030 005 400 | 3 X R0.5 | 4 | 40 | 80 | 4 | |
| 4DCR 030 010 040 | 3 X R1 | 4 | - | 80 | 4 | |
| 4DCR 030 010 100 | 3 X R1 | 4 | 10 | 80 | 4 | |
| 4DCR 030 010 200 | 3 X R1 | 4 | 20 | 80 | 4 | |
| 4DCR 030 010 300 | 3 X R1 | 4 | 30 | 80 | 4 | |
| 4DCR 030 010 400 | 3 X R1 | 4 | 40 | 80 | 4 | |
| New 4DCR 040 001 100 | 4 X R0.1 | 6 | 20 | 100 | 4 | |
| New 4DCR 040 002 100 | 4 X R0.2 | 6 | 20 | 100 | 4 | |
| 4DCR 040 003 100 | 4 X R0.3 | 6 | 20 | 100 | 4 | |
| 4DCR 040 005 100 | 4 X R0.5 | 6 | 20 | 100 | 4 | |
| 4DCR 040 010 100 | 4 X R1 | 6 | 20 | 100 | 4 | |
| 4DCR 060 003 110 | 6 X R0.3 | 9 | 25 | 110 | 6 | |
| 4DCR 060 005 110 | 6 X R0.5 | 9 | 25 | 110 | 6 | |
| 4DCR 060 005 150 | 6 X R0.5 | 9 | 30 | 150 | 6 | |
| 4DCR 060 010 110 | 6 X R1 | 9 | 25 | 110 | 6 | |
| 4DCR 060 010 150 | 6 X R1 | 9 | 30 | 150 | 6 | |
| 4DCR 080 003 110 | 8 X R0.3 | 12 | 30 | 110 | 8 | |
| 4DCR 080 005 110 | 8 X R0.5 | 12 | 30 | 110 | 8 | |
| 4DCR 080 005 150 | 8 X R0.5 | 12 | 40 | 150 | 8 | |
| 4DCR 080 010 110 | 8 X R1 | 12 | 30 | 110 | 8 | |
| 4DCR 080 010 150 | 8 X R1 | 12 | 40 | 150 | 8 | |
| 4DCR 100 005 110 | 10 X R0.5 | 15 | 35 | 110 | 10 | |
| 4DCR 100 005 160 | 10 X R0.5 | 15 | 45 | 160 | 10 | |
| 4DCR 100 010 110 | 10 X R1 | 15 | 35 | 110 | 10 | |
| 4DCR 100 010 160 | 10 X R1 | 15 | 45 | 160 | 10 | |
| 4DCR 120 005 110 | 12 X R0.5 | 18 | 40 | 110 | 12 | |
| 4DCR 120 005 160 | 12 X R0.5 | 18 | 45 | 160 | 12 | |
| 4DCR 120 010 110 | 12 X R1 | 18 | 40 | 110 | 12 | |
| 4DCR 120 010 160 | 12 X R1 | 18 | 45 | 160 | 12 | |

# 2CPB

## *2 Flutes Ball End Mills for Composite*

## 2날 복합소재 가공용 볼 엔드밀




- **강화플라스틱(CFRP,GFRP), 유리/탄소섬유 등 비철, 비금속 계열의 다양한 복합소재 전용 엔드밀**
- 다양한 복합소재 가공영역에 뛰어난 성능을 발휘합니다.
- 코팅피막에 경도가 높아 내마모성이 우수합니다.
- 마찰계수가 낮은 다이아몬드 코팅을 적용하여 흡착현상을 최소화 하였습니다.

- **Endmills for CFRP, GFRP, glass/carbon fiber, nonferrous and non-metallic materials**
- Outstanding performance in machining of various composite materials.
- Excellent wear resistance by applying high hardness coating layer.
- Minimize built up edge by low friction diamond coating technology.

2 | WC 미립자 | NANO DIA. Coating | R ± 0.005 (0.25 ~ 0.5R) | R ± 0.01 (0.75 ~ 6R) | 30° Helix Angle | CUTTING DATA 482P

| D Size | D Tolerance |
|---|---|
| Ø 0.5 ~ 1 | +0 ~ -0.01mm |
| Ø 1.5 ~ 12 | -0.005 ~ -0.02mm |

단위 : mm

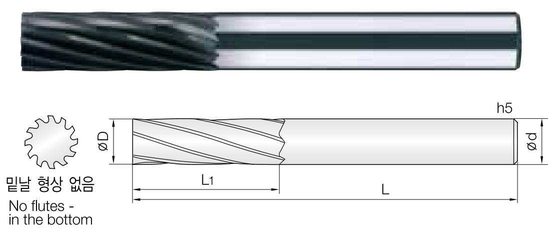
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2CPB 005 010 S04 | 0.25R X 0.5 | 1 | 50 | 4 | |
| 2CPB 006 012 S04 | 0.3R X 0.6 | 1.2 | 50 | 4 | |
| 2CPB 008 020 S04 | 0.4R X 0.8 | 2 | 50 | 4 | |
| 2CPB 010 025 S04 | 0.5R X 1 | 2.5 | 50 | 4 | |
| 2CPB 015 040 S04 | 0.75R X 1.5 | 4 | 50 | 4 | |
| 2CPB 020 050 S04 | 1R X 2 | 5 | 50 | 4 | |
| 2CPB 025 060 S04 | 1.25R X 2.5 | 6 | 50 | 4 | |
| 2CPB 030 080 S06 | 1.5R X 3 | 8 | 60 | 6 | |
| 2CPB 040 080 S06 | 2R X 4 | 8 | 70 | 6 | |
| 2CPB 050 100 S06 | 2.5R X 5 | 10 | 80 | 6 | |
| 2CPB 060 120 080 | 3R X 6 | 12 | 80 | 6 | |
| 2CPB 060 120 110 | 3R X 6 | 12 | 110 | 6 | |

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2CPB 080 140 080 | 4R X 8 | 14 | 80 | 8 | |
| 2CPB 080 140 110 | 4R X 8 | 14 | 110 | 8 | |
| 2CPB 100 180 080 | 5R X 10 | 18 | 80 | 10 | |
| 2CPB 100 180 110 | 5R X 10 | 18 | 110 | 10 | |
| 2CPB 120 220 080 | 6R X 12 | 22 | 80 | 12 | |
| 2CPB 120 220 110 | 6R X 12 | 22 | 110 | 12 | |

# 8~12CPE

## *8~12 Flutes Fin ishing End Mills for Composite*

## 8~12날 복합소재 가공용 정삭 엔드밀




- **강화플라스틱(CFRP,GFRP), 유리/탄소섬유, 그라파이트(흑연) 등 비철 비금속 계열의 다양한 복합소재 전용 엔드밀**
- 다양한 복합소재 가공영역에 뛰어난 성능을 발휘합니다.
- 코팅피막에 경도가 높아 내마모성이 우수합니다.
- 마찰계수가 낮은 다이아몬드 코팅을 적용하여 흡착현상을 최소화 하였습니다.

- **Endmills for CFRP, GFRP, glass/carbon fiber, graphite, non-ferrous and non-metallic materials**
- Outstanding performance in machining of various composite materials.
- Excellent wear resistance by applying high hardness coating layer.
- Minimize built up edge by low friction diamond coating technology.

8 ~ 12 | WC 미립자 | NANO DIA. Coating | 15° Helix Angle | CUTTING DATA 482P

| D Size | D Tolerance |
|---|---|
| Ø 6 ~ 12 | -0.01 ~ -0.025mm |

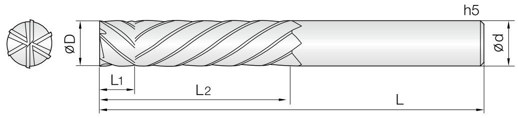
단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 8CPE 060 180 080 | 6 | 18 | 80 | 6 | |
| 10CPE 080 240 080 | 8 | 24 | 80 | 8 | |
| 12CPE 100 300 100 | 10 | 30 | 100 | 10 | |
| 12CPE 120 360 100 | 12 | 36 | 100 | 12 | |

# 3&4&6CPR

*3~6Flutes Compresion Router for Composite*

## 3~6날 복합소재 가공용 라우터




- **강화플라스틱(CFRP,GFRP), 유리/탄소섬유 등 비철, 비금속 계열의 다양한 복합소재 전용 엔드밀**
- 측벽가공시 공작물의 떠올림 현상이 없습니다.
- 피삭재에 버가 발생하지 않습니다.
- 코팅피막의 경도가 높아 내마모성이 우수합니다.
- 마찰계수가 낮은 다이아몬드 코팅을 적용하여 흡착현상을 최소화 하였습니다.

- **Endmills for CFRP, GFRP, glass/carbon fiber, non-ferrous and non-metallic materials.**
- No up-moving work material at wall cutting.
- No burr in work materials.
- Excellent wear resistance by applying high hardness coating layer.
- Minimize built up edge by low friction diamond coating technology.

3 4 6 WC 미립자 | RTAC Coating | NANO DIA. Coating | 30° Helix Angle | Shield Edge | CUTTING DATA

3F | 4F, 6F | Shield Edge | 483P

| D Size | D Tolerance |
|---|---|
| Ø 6 ~ 12 | -0.01 ~ -0.025mm |

단위 : mm

| Order Number<br>RTAC코팅 GTAC Coating | 날경<br>Diameter<br>D | 날장<br>Length of cut<br>L1 | 날장<br>Length of cut<br>L2 | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d | 비고 |
|---|---|---|---|---|---|---|
| 3CPR 060 200 S06 | 6 | 5 | 20 | 70 | 6 | |
| 3CPR 080 250 S08 | 8 | 5 | 25 | 80 | 8 | |
| 3CPR 100 270 S10 | 10 | 6 | 27 | 80 | 10 | |
| 3CPR 120 300 S12 | 12 | 6 | 30 | 80 | 12 | |

| Order Number<br>다이아코팅 DIA Coating | 날경<br>Diameter<br>D | 날장<br>Length of cut<br>L1 | 날장<br>Length of cut<br>L2 | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d | 비고 |
|---|---|---|---|---|---|---|
| 4CPR 060 200 S06 | 6 | 5 | 20 | 70 | 6 | |
| 6CPR 080 250 S08 | 8 | 5 | 25 | 80 | 8 | |
| 6CPR 100 270 S10 | 10 | 6 | 27 | 80 | 10 | |
| 6CPR 120 300 S12 | 12 | 6 | 30 | 80 | 12 | |

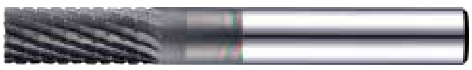
FOR COMPOSITE

# 6~16CPO

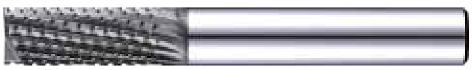
*6~16Flutes Router for Composite*

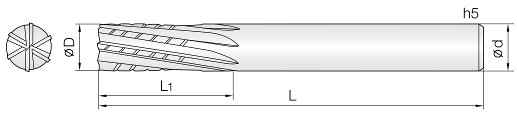
## 6~16날 복합소재 가공용 라우터

A Type End Teeth(6~16F)



B Type End Teeth(2F)






- **강화플라스틱(CFRP,GFRP), 유리/탄소섬유, 그라파이트(흑연)등 비철 비금속 계열의 다양한 복합소재 전용 라우터**
- 다양한 복합소재의 황삭가공시 뛰어난 성능을 발휘합니다
- A type은 밑날의 수가 많아 슬로팅 작업에 최적입니다.
- B type은 밑날이 2날로서 수직 및 수평가공시 탁월한 성능을 발휘합니다.
- 코팅피막의 경도가 높아 내마모성이 우수합니다.
- 마찰계수가 낮은 다이아몬드 코팅을 적용하여 흡착현상을 최소화 하였습니다.

- **Router for CFRP, GFRP, glass/carbon fiber, graphite, non-ferrous and non-metallic materials**
- Outstanding performance in roughing of various composite materials.
- A type has many bottom edges and optimized for slotting.
- B type has two bottom edges and excellent performance in vertical, horizontal machining.
- Excellent wear resistance by applying high hardness coating layer.
- Minimize built up edge by low friction diamond coating technology.

6 ~ 16 WC 미립자 | NANO DIA. Coating | 30° Helix Angle | Shield Edge | CUTTING DATA

Shield Edge | 483P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø2 ~ 5 | +0 ~ -0.01mm | ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.02mm |

단위 : mm

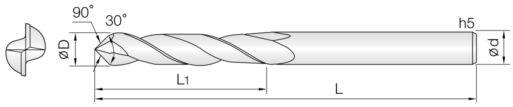
| Order Number | 날경<br>Diameter<br>D | 날장<br>Length of cut<br>L1 | 전장<br>Overall Length<br>L | 타입<br>Type | 생크<br>Shank Dia<br>d | 비고 |
|---|---|---|---|---|---|---|
| 6CPOA 020 070 S04 | 2 | 7 | 40 | A | 4 | |
| 6CPOB 020 070 S04 | 2 | 7 | 40 | B | 4 | |
| 6CPOA 030 120 S04 | 3 | 12 | 50 | A | 4 | |
| 6CPOB 030 120 S04 | 3 | 12 | 50 | B | 4 | |
| 8CPOA 040 160 S04 | 4 | 16 | 60 | A | 4 | |
| 8CPOB 040 160 S04 | 4 | 16 | 60 | B | 4 | |
| 10CPOA 050 200 S06 | 5 | 20 | 60 | A | 6 | |
| 10CPOB 050 200 S06 | 5 | 20 | 60 | B | 6 | |
| 10CPOA 060 200 S06 | 6 | 20 | 70 | A | 6 | |
| 10CPOB 060 200 S06 | 6 | 20 | 70 | B | 6 | |

| Order Number | 날경<br>Diameter<br>D | 날장<br>Length of cut<br>L1 | 전장<br>Overall Length<br>L | 타입<br>Type | 생크<br>Shank Dia<br>d | 비고 |
|---|---|---|---|---|---|---|
| 12CPOA 080 250 S08 | 8 | 25 | 80 | A | 8 | |
| 12CPOB 080 250 S08 | 8 | 25 | 80 | B | 8 | |
| 14CPOA 100 270 S10 | 10 | 27 | 80 | A | 10 | |
| 14CPOB 100 270 S10 | 10 | 27 | 80 | B | 10 | |
| 16CPOA 120 300 S12 | 12 | 30 | 80 | A | 12 | |
| 16CPOB 120 300 S12 | 12 | 30 | 80 | B | 12 | |

# 2DDCA

2 Flutes Diamond Coated Drills for Composite

## 2날 복합소재 가공용 다이아몬드 코팅 드릴




- **강화플라스틱(CFRP,GFRP), 유리/탄소섬유, 동 및 동합금, 그라파이트(흑연) 등 비철, 비금속 계열의 다양한 복합소재 전용 드릴**
- 다양한 복합소재 가공영역에 뛰어난 성능을 발휘합니다.
- 코팅피막에 경도가 높아 내마모성이 우수합니다.
- 마찰계수가 낮은 미립 다이아몬드 코팅을 적용, 흡착현상을 최소화 하였습니다.

- **Endmills for CFRP, GFRP, glass/carbon fiber, graphite, copper, copper alloys, non-ferrous and non-metallic materials**
- Outstanding performance in machining of various composite materials.
- Excellent wear resistance by applying high hardness coating layer.
- Minimize built up edge by low friction diamond coating technology.

2 | WC 미립자 | NANO DIA. Coating | 20° Helix Angle | CUTTING DATA 484P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø2 ~ 5 | +0 ~ -0.01mm | ØD = Ød | Ø4 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DDCA 020 160 S04 | 2 | 16 | 60 | 4 | |
| 2DDCA 023 180 S04 | 2.3 | 18 | 60 | 4 | |
| 2DDCA 025 200 S04 | 2.5 X M3 | 20 | 60 | 4 | |
| 2DDCA 030 220 S04 | 3 | 22 | 60 | 4 | |
| 2DDCA 033 230 S04 | 3.3 X M4 | 23 | 60 | 4 | |
| 2DDCA 035 270 S04 | 3.5 | 27 | 60 | 4 | |
| 2DDCA 040 300 S04 | 4 | 30 | 60 | 4 | |
| 2DDCA 042 300 S06 | 4.2 X M5 | 30 | 80 | 6 | |
| 2DDCA 045 330 S06 | 4.5 | 33 | 80 | 6 | |
| 2DDCA 050 360 S06 | 5 X M6 | 36 | 80 | 6 | |
| 2DDCA 055 380 S06 | 5.5 | 38 | 80 | 6 | |
| 2DDCA 060 380 S06 | 6 | 38 | 80 | 6 | |
| 2DDCA 065 450 S08 | 6.5 | 45 | 90 | 8 | |
| 2DDCA 068 450 S08 | 6.8 X M8 | 45 | 90 | 8 | |
| 2DDCA 070 450 S08 | 7 | 45 | 90 | 8 | |
| 2DDCA 075 480 S08 | 7.5 | 48 | 90 | 8 | |
| 2DDCA 080 480 S08 | 8 | 48 | 90 | 8 | |
| 2DDCA 085 510 S10 | 8.5 X M10 | 51 | 110 | 10 | |
| 2DDCA 090 540 S10 | 9 | 54 | 110 | 10 | |
| 2DDCA 095 540 S10 | 9.5 | 54 | 110 | 10 | |
| 2DDCA 100 600 S10 | 10 | 60 | 110 | 10 | |
| 2DDCA 103 600 S12 | 10.3 X M12 | 60 | 110 | 12 | |
| 2DDCA 105 600 S12 | 10.5 | 60 | 110 | 12 | |
| 2DDCA 110 650 S12 | 11 | 65 | 110 | 12 | |
| 2DDCA 115 650 S12 | 11.5 | 65 | 110 | 12 | |
| 2DDCA 120 700 S12 | 12 | 70 | 120 | 12 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

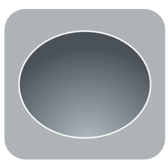
FOR COMPOSITE

## ■ JJTOOLS drills benefit (특장점)

**버 발생을 최소화한 공구 설계**

Minimize burr by the best drill design

Machining Sample



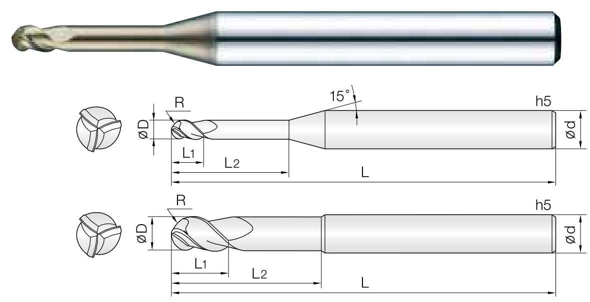
2DDCA type

Other manufacturer

# 3SURB

## 3 Flutes 45°Helix Rib Ball End Mills for SUS

## 3날 45°헬릭스 SUS가공용 리브 볼 엔드밀




- **합금강, SUS계열, Ti/Ni계합금, 인코넬 등 난삭재 가공 엔드밀**
- JCRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 피삭재의 면조도가 향상됩니다.
- 45°헬릭스 형상과 깊은 포켓으로 설계하여 칩배출이 우수하며, 고속·고이송 가공에 적합합니다.
- 항절력이 높은 미립자 초경합금을 채택하여 엔드밀의 파손을 최소화.

- **Endmills for alloy steels, SUS, Ti/Ni base alloys, Inconel and hard-to-cut materials.**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Minimize fracturing by high TRS fine WC grade.
- High speed, feed applicable by 45°degree helix and deep chip pocket design.

3 | WC 미립자 | JCRO Coating | R ± 0.005 0.5 ~ 2.5R | R ± 0.01 3 ~ 6R | 45° Helix Angle | CUTTING DATA 485P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 12 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |

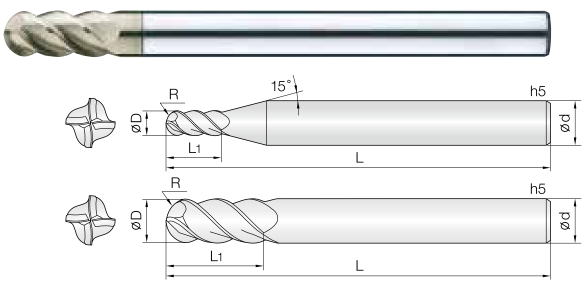
단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 3SURB 010 040 S04 | 0.5R X 1 | 1.5 | 4 | 50 | 4 | |
| 3SURB 010 060 S04 | 0.5R X 1 | 1.5 | 6 | 50 | 4 | |
| 3SURB 010 080 S04 | 0.5R X 1 | 1.5 | 8 | 50 | 4 | |
| 3SURB 010 100 S04 | 0.5R X 1 | 1.5 | 10 | 50 | 4 | |
| 3SURB 010 120 S04 | 0.5R X 1 | 1.5 | 12 | 50 | 4 | |
| 3SURB 010 160 S04 | 0.5R X 1 | 1.5 | 16 | 50 | 4 | |
| 3SURB 010 200 S04 | 0.5R X 1 | 1.5 | 20 | 50 | 4 | |
| 3SURB 012 030 S04 | 0.6R X 1.2 | 1.8 | 3 | 50 | 4 | |
| 3SURB 012 040 S04 | 0.6R X 1.2 | 1.8 | 4 | 50 | 4 | |
| 3SURB 012 060 S04 | 0.6R X 1.2 | 1.8 | 6 | 50 | 4 | |
| 3SURB 012 080 S04 | 0.6R X 1.2 | 1.8 | 8 | 50 | 4 | |
| 3SURB 012 100 S04 | 0.6R X 1.2 | 1.8 | 10 | 50 | 4 | |
| 3SURB 012 120 S04 | 0.6R X 1.2 | 1.8 | 12 | 50 | 4 | |
| 3SURB 015 040 S04 | 0.75R X 1.5 | 2 | 4 | 50 | 4 | |
| 3SURB 015 060 S04 | 0.75R X 1.5 | 2 | 6 | 50 | 4 | |
| 3SURB 015 100 S04 | 0.75R X 1.5 | 2 | 10 | 50 | 4 | |
| 3SURB 015 120 S04 | 0.75R X 1.5 | 2 | 12 | 50 | 4 | |
| 3SURB 015 160 S04 | 0.75R X 1.5 | 2 | 16 | 50 | 4 | |
| 3SURB 015 200 S04 | 0.75R X 1.5 | 2 | 20 | 50 | 4 | |
| 3SURB 020 040 S06 | 1R X 2 | 3 | 4 | 50 | 6 | |
| 3SURB 020 060 S06 | 1R X 2 | 3 | 6 | 50 | 6 | |
| 3SURB 020 100 S06 | 1R X 2 | 3 | 10 | 50 | 6 | |
| 3SURB 020 120 S06 | 1R X 2 | 3 | 12 | 60 | 6 | |
| 3SURB 020 160 S06 | 1R X 2 | 3 | 16 | 60 | 6 | |
| 3SURB 020 200 S06 | 1R X 2 | 3 | 20 | 60 | 6 | |
| 3SURB 020 250 S06 | 1R X 2 | 3 | 25 | 65 | 6 | |
| 3SURB 025 060 S06 | 1.25R X 2.5 | 4 | 6 | 50 | 6 | |
| 3SURB 025 100 S06 | 1.25R X 2.5 | 4 | 10 | 50 | 6 | |
| 3SURB 025 120 S06 | 1.25R X 2.5 | 4 | 12 | 60 | 6 | |
| 3SURB 025 160 S06 | 1.25R X 2.5 | 4 | 16 | 60 | 6 | |
| 3SURB 025 200 S06 | 1.25R X 2.5 | 4 | 20 | 60 | 6 | |
| 3SURB 030 080 S06 | 1.5R X 3 | 4.5 | 8 | 60 | 6 | |
| 3SURB 030 120 S06 | 1.5R X 3 | 4.5 | 12 | 60 | 6 | |
| 3SURB 030 160 S06 | 1.5R X 3 | 4.5 | 16 | 60 | 6 | |
| 3SURB 030 200 S06 | 1.5R X 3 | 4.5 | 20 | 60 | 6 | |
| 3SURB 030 250 S06 | 1.5R X 3 | 4.5 | 25 | 70 | 6 | |
| 3SURB 030 300 S06 | 1.5R X 3 | 4.5 | 30 | 70 | 6 | |
| 3SURB 030 400 S06 | 1.5R X 3 | 4.5 | 40 | 80 | 6 | |
| 3SURB 040 100 S06 | 2R X 4 | 6 | 10 | 60 | 6 | |
| 3SURB 040 160 S06 | 2R X 4 | 6 | 16 | 60 | 6 | |
| 3SURB 040 200 S06 | 2R X 4 | 6 | 20 | 60 | 6 | |
| 3SURB 040 250 S06 | 2R X 4 | 6 | 25 | 70 | 6 | |
| 3SURB 040 300 S06 | 2R X 4 | 6 | 30 | 70 | 6 | |
| 3SURB 040 400 S06 | 2R X 4 | 6 | 40 | 80 | 6 | |
| 3SURB 050 160 S06 | 2.5R X 5 | 8 | 16 | 80 | 6 | |
| 3SURB 050 200 S06 | 2.5R X 5 | 8 | 20 | 80 | 6 | |
| 3SURB 050 300 S06 | 2.5R X 5 | 8 | 30 | 80 | 6 | |
| 3SURB 060 200 S06 | 3R X 6 | 9 | 20 | 90 | 6 | |
| 3SURB 060 400 S06 | 3R X 6 | 9 | 40 | 90 | 6 | |
| 3SURB 080 300 S08 | 4R X 8 | 12 | 30 | 100 | 8 | |
| 3SURB 100 400 S10 | 5R X 10 | 15 | 40 | 100 | 10 | |
| 3SURB 120 500 S12 | 6R X 12 | 18 | 50 | 110 | 12 | |

FOR SUS

# 4 Flutes 45˚Helix Ball End Mills for SUS

# 4날 45˚헬릭스 SUS가공용 볼 엔드밀




- **합금강, SUS계열, Ti/Ni계 합금, 인코넬 등 난삭재 가공 엔드밀**
- JCRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 4날 적용과 깊은 포켓으로 칩배출이 원활하며, 피삭재 면조도가 우수합니다.
- 항절력이 높은 미립자 초경합금을 채택하여 고이송 작업시 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for alloy steels, SUS, Ti/Ni base alloys, Inconel and hard-to-cut materials**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Excellent work surface finish by 4 flute and deep chip pocket.
- Minimize fracturing at high feed by high TRS fine WC grade.

4 | WC 미립자 | JCRO Coating | R ± 0.005 (0.5 ~ 2.5R) | R ± 0.01 (3 ~ 6R) | R ± 0.015 (8R) | 45° Helix Angle | CUTTING DATA (485P)

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

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

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4SUB 010 025 S06 | 0.5R X 1 | 2.5 | 50 | 6 | |
| 4SUB 015 040 S06 | 0.75R X 1.5 | 4 | 50 | 6 | |
| 4SUB 020 060 S06 | 1R X 2 | 6 | 50 | 6 | |
| 4SUB 030 080 S06 | 1.5R X 3 | 8 | 60 | 6 | |
| 4SUB 040 080 S06 | 2R X 4 | 8 | 70 | 6 | |
| 4SUB 050 100 S06 | 2.5R X 5 | 10 | 80 | 6 | |
| 4SUB 060 120 S06 | 3R X 6 | 12 | 90 | 6 | |
| 4SUB 080 140 S08 | 4R X 8 | 14 | 100 | 8 | |
| 4SUB 100 180 S10 | 5R X 10 | 18 | 100 | 10 | |
| 4SUB 120 220 S12 | 6R X 12 | 22 | 110 | 12 | |
| 4SUB 160 300 S16 | 8R X 16 | 30 | 130 | 16 | |

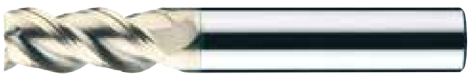
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

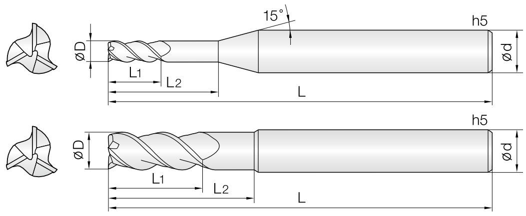
FOR SUS

# 3SUE

## 3 Flutes 45˚Helix End Mills for SUS

## 3날 45˚헬릭스 SUS가공용 엔드밀






- **합금강, SUS계열, Ti/Ni계 합금, 인코넬 등 난삭재 가공 엔드밀**
- J-CRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 3날 적용과 깊은 포켓으로 칩배출이 원활하며, 피삭재 면조도가 우수합니다.
- 45˚헬릭스 형상으로 설계하여 고속,고이송 가공에 적합합니다.
- 항절력이 높은 미립자 초경합금을 채택, 고이송 작업시 엔드밀 파손을 최소화.

- **Endmills for alloy steels, SUS, Ti/Ni base alloys, Inconel and hard-to-cut materials**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Excellent work surface finish by 3 flute and deep chip pocket.
- 45 ˚ degree helix design for high speed, feed condition.
- Minimize fracturing at high feed by high TRS fine WC grade.


| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.5 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø16 ~ 20 | -0.015 ~ -0.03mm |

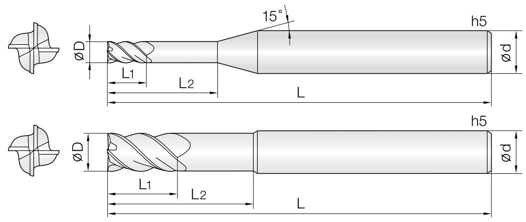
단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 3SUE 005 010 S04 | 0.5 | 1 | - | 45 | 4 | |
| 3SUE 005 020 S04 | 0.5 | 1 | 2 | 45 | 4 | |
| 3SUE 005 030 S04 | 0.5 | 1 | 3 | 45 | 4 | |
| 3SUE 005 040 S04 | 0.5 | 1 | 4 | 45 | 4 | |
| 3SUE 006 012 S04 | 0.6 | 1.2 | - | 45 | 4 | |
| 3SUE 006 030 S04 | 0.6 | 1.2 | 3 | 45 | 4 | |
| 3SUE 006 050 S04 | 0.6 | 1.2 | 5 | 45 | 4 | |
| 3SUE 007 014 S04 | 0.7 | 1.4 | - | 45 | 4 | |
| 3SUE 007 030 S04 | 0.7 | 1.4 | 3 | 45 | 4 | |
| 3SUE 008 020 S04 | 0.8 | 2 | - | 45 | 4 | |
| 3SUE 008 040 S04 | 0.8 | 2 | 4 | 45 | 4 | |
| 3SUE 008 060 S04 | 0.8 | 2 | 6 | 45 | 4 | |
| 3SUE 010 025 S04 | 1 | 2.5 | - | 45 | 4 | |
| 3SUE 010 025 S06 | 1 | 2.5 | - | 45 | 6 | |
| 3SUE 010 040 S06 | 1 | 2.5 | 4 | 45 | 6 | |
| 3SUE 010 060 S06 | 1 | 2.5 | 6 | 45 | 6 | |
| 3SUE 010 080 S06 | 1 | 2.5 | 8 | 45 | 6 | |
| 3SUE 012 030 S04 | 1.2 | 3 | - | 45 | 4 | |
| 3SUE 012 030 S06 | 1.2 | 3 | - | 45 | 6 | |
| 3SUE 012 060 S06 | 1.2 | 3 | 6 | 45 | 6 | |
| 3SUE 012 080 S06 | 1.2 | 3 | 8 | 45 | 6 | |
| 3SUE 015 040 S04 | 1.5 | 4 | - | 45 | 4 | |
| 3SUE 015 040 S06 | 1.5 | 4 | - | 45 | 6 | |
| 3SUE 015 060 S06 | 1.5 | 4 | 6 | 45 | 6 | |
| 3SUE 015 080 S06 | 1.5 | 4 | 8 | 45 | 6 | |
| 3SUE 015 100 S06 | 1.5 | 4 | 10 | 45 | 6 | |
| 3SUE 020 050 S04 | 2 | 5 | - | 45 | 4 | |
| 3SUE 020 050 S06 | 2 | 5 | - | 45 | 6 | |
| 3SUE 020 080 S06 | 2 | 5 | 8 | 45 | 6 | |
| 3SUE 020 100 S06 | 2 | 5 | 10 | 50 | 6 | |
| 3SUE 020 120 S06 | 2 | 5 | 12 | 50 | 6 | |
| 3SUE 025 080 S06 | 2.5 | 8 | - | 45 | 6 | |
| 3SUE 030 080 S04 | 3 | 8 | - | 45 | 4 | |
| 3SUE 030 080 S06 | 3 | 8 | - | 45 | 6 | |
| 3SUE 030 150 S06 | 3 | 8 | 15 | 45 | 6 | |
| 3SUE 030 200 S06 | 3 | 8 | 20 | 60 | 6 | |
| 3SUE 035 100 S06 | 3.5 | 10 | - | 50 | 6 | |
| 3SUE 040 100 S04 | 4 | 10 | - | 50 | 4 | |
| 3SUE 040 100 S06 | 4 | 10 | - | 50 | 6 | |
| 3SUE 040 150 S06 | 4 | 10 | 15 | 50 | 6 | |
| 3SUE 040 200 S06 | 4 | 10 | 20 | 60 | 6 | |
| 3SUE 045 120 S06 | 4.5 | 12 | - | 50 | 6 | |
| 3SUE 050 120 S06 | 5 | 12 | - | 50 | 6 | |
| 3SUE 060 120 S06 | 6 | 12 | - | 60 | 6 | |
| 3SUE 060 200 S06 | 6 | 12 | 20 | 60 | 6 | |
| 3SUE 080 190 S08 | 8 | 19 | - | 60 | 8 | |
| 3SUE 080 260 S08 | 8 | 19 | 26 | 60 | 8 | |
| 3SUE 100 220 S10 | 10 | 22 | - | 70 | 10 | |
| 3SUE 100 320 S10 | 10 | 22 | 32 | 70 | 10 | |
| 3SUE 120 260 S12 | 12 | 26 | - | 80 | 12 | |
| 3SUE 120 380 S12 | 12 | 26 | 38 | 80 | 12 | |
| 3SUE 160 360 S16 | 16 | 36 | - | 100 | 16 | |
| 3SUE 160 450 S16 | 16 | 36 | 45 | 100 | 16 | |
| 3SUE 200 550 S20 | 20 | 38 | 55 | 110 | 20 | |

# 4SURE

## 4 Flutes Rib End Mills for SUS

## 4날 SUS가공용 리브 엔드밀




- **합금강, SUS계열, Ti/Ni계 합금, 인코넬 등 난삭재 가공 엔드밀**
- J-CRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 강력한 채터링방지 설계로 엔드밀의 진동을 최소화하였습니다.
- 4날 적용과 깊은 포켓으로 칩배출이 원활하며, 피삭재 면조도가 우수합니다.
- 항절력이 높은 미립자 초경합금을 채택, 고이송 작업시 엔드밀 파손을 최소화.

- **Endmills for alloy steels, SUS, Ti/Ni base alloys, Inconel and hard-to-cut materials**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Strong design for protection against chattering.
- Excellent work surface finish by 4 flute and deep chip pocket.
- Minimize fracturing at high feed by high TRS fine WC grade.

4 | WC 미립자 | JCRO Coating | 42° Helix Angle | Shield Edge | CUTTING DATA 486P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø16 ~ 20 | -0.015 ~ -0.03mm |

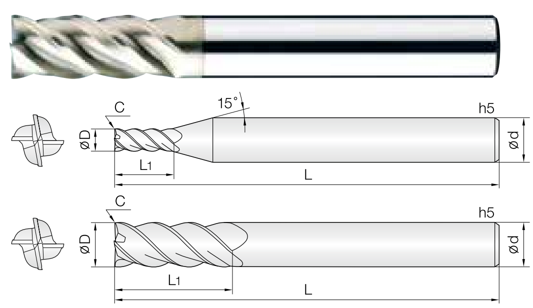
단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4SURE 010 030 S04 | 1 | 1.5 | 3 | 50 | 4 | |
| 4SURE 010 050 S04 | 1 | 1.5 | 5 | 50 | 4 | |
| 4SURE 010 060 S04 | 1 | 1.5 | 6 | 50 | 4 | |
| 4SURE 010 080 S04 | 1 | 1.5 | 8 | 50 | 4 | |
| 4SURE 010 100 S04 | 1 | 1.5 | 10 | 50 | 4 | |
| 4SURE 012 040 S04 | 1.2 | 2 | 4 | 50 | 4 | |
| 4SURE 012 060 S04 | 1.2 | 2 | 6 | 50 | 4 | |
| 4SURE 012 080 S04 | 1.2 | 2 | 8 | 50 | 4 | |
| 4SURE 012 100 S04 | 1.2 | 2 | 10 | 50 | 4 | |
| 4SURE 015 045 S04 | 1.5 | 2.5 | 4.5 | 50 | 4 | |
| 4SURE 015 060 S04 | 1.5 | 2.5 | 6 | 50 | 4 | |
| 4SURE 015 080 S04 | 1.5 | 2.5 | 8 | 50 | 4 | |
| 4SURE 015 100 S04 | 1.5 | 2.5 | 10 | 50 | 4 | |
| 4SURE 015 120 S04 | 1.5 | 2.5 | 12 | 50 | 4 | |
| 4SURE 015 150 S04 | 1.5 | 2.5 | 15 | 60 | 4 | |
| 4SURE 020 060 S04 | 2 | 3 | 6 | 50 | 4 | |
| 4SURE 020 080 S04 | 2 | 3 | 8 | 50 | 4 | |
| 4SURE 020 100 S04 | 2 | 3 | 10 | 50 | 4 | |
| 4SURE 020 120 S04 | 2 | 3 | 12 | 50 | 4 | |
| 4SURE 020 140 S04 | 2 | 3 | 14 | 60 | 4 | |
| 4SURE 020 160 S04 | 2 | 3 | 16 | 60 | 4 | |
| 4SURE 025 075 S04 | 2.5 | 4 | 7.5 | 50 | 4 | |
| 4SURE 025 100 S04 | 2.5 | 4 | 10 | 50 | 4 | |
| 4SURE 025 120 S04 | 2.5 | 4 | 12 | 50 | 4 | |
| 4SURE 025 140 S04 | 2.5 | 4 | 14 | 60 | 4 | |
| 4SURE 025 160 S04 | 2.5 | 4 | 16 | 60 | 4 | |
| 4SURE 030 090 S06 | 3 | 4.5 | 9 | 60 | 6 | |
| 4SURE 030 120 S06 | 3 | 4.5 | 12 | 60 | 6 | |
| 4SURE 030 160 S06 | 3 | 4.5 | 16 | 60 | 6 | |
| 4SURE 030 200 S06 | 3 | 4.5 | 20 | 60 | 6 | |
| 4SURE 030 250 S06 | 3 | 4.5 | 25 | 65 | 6 | |
| 4SURE 030 300 S06 | 3 | 4.5 | 30 | 75 | 6 | |
| 4SURE 040 120 S06 | 4 | 6 | 12 | 60 | 6 | |
| 4SURE 040 160 S06 | 4 | 6 | 16 | 60 | 6 | |
| 4SURE 040 200 S06 | 4 | 6 | 20 | 60 | 6 | |
| 4SURE 040 250 S06 | 4 | 6 | 25 | 65 | 6 | |
| 4SURE 040 300 S06 | 4 | 6 | 30 | 75 | 6 | |
| 4SURE 050 150 S06 | 5 | 7.5 | 15 | 60 | 6 | |
| 4SURE 050 180 100 | 5 | 7.5 | 18 | 100 | 6 | |
| 4SURE 050 200 S06 | 5 | 7.5 | 20 | 60 | 6 | |
| 4SURE 050 250 S06 | 5 | 7.5 | 25 | 65 | 6 | |
| 4SURE 050 300 S06 | 5 | 7.5 | 30 | 70 | 6 | |
| 4SURE 060 200 S06 | 6 | 9 | 20 | 60 | 6 | |
| 4SURE 060 250 100 | 6 | 9 | 25 | 100 | 6 | |
| 4SURE 060 300 S06 | 6 | 9 | 30 | 70 | 6 | |
| 4SURE 080 250 S08 | 8 | 12 | 25 | 70 | 8 | |
| 4SURE 080 350 110 | 8 | 12 | 35 | 110 | 8 | |
| 4SURE 080 400 S08 | 8 | 12 | 40 | 80 | 8 | |
| 4SURE 100 300 S10 | 10 | 15 | 30 | 80 | 10 | |
| 4SURE 100 400 120 | 10 | 15 | 40 | 120 | 10 | |
| 4SURE 100 500 S10 | 10 | 15 | 50 | 100 | 10 | |
| 4SURE 120 360 S12 | 12 | 18 | 36 | 90 | 12 | |
| 4SURE 120 500 130 | 12 | 18 | 50 | 130 | 12 | |
| 4SURE 120 600 S12 | 12 | 18 | 60 | 110 | 12 | |
| 4SURE 160 480 S16 | 16 | 24 | 48 | 110 | 16 | |
| 4SURE 160 700 150 | 16 | 24 | 70 | 150 | 16 | |
| 4SURE 160 800 S16 | 16 | 24 | 80 | 130 | 16 | |
| 4SURE 200 600 130 | 20 | 30 | 60 | 130 | 20 | |
| 4SURE 200 1000 160 | 20 | 30 | 100 | 160 | 20 | |

# 4SUE

## 4 Flutes Non Symmetry End Mills for SUS

## 4날 SUS가공용 엔드밀

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- 강력한 채터링방지 설계로 엔드밀의 진동을 최소화하였습니다.
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- **Endmills for alloy steels, SUS, Ti/Ni base alloys, Inconel and hard-to-cut materials**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Strong design for protection against chattering.
- Excellent work surface finish by 4 flute and deep chip pocket.
- Minimize fracturing at high feed by high TRS fine WC grade.

4 | WC 미립자 | JCRO Coating | 42° Helix Angle | C Cutting | CUTTING DATA 487P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.3 ~ 6 | +0 ~ -0.01mm |
| | Ø7 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 20 | -0.015 ~ -0.03mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 면취량 Chamfer C | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| New 4SUE 003 006 S04 | 0.3 | 0.6 | - | 40 | 4 | |
| New 4SUE 004 008 S04 | 0.4 | 0.8 | - | 40 | 4 | |
| New 4SUE 005 008 S04 | 0.5 | 0.8 | - | 40 | 4 | |
| New 4SUE 005 010 S04 | 0.5 | 1 | - | 40 | 4 | |
| New 4SUE 006 009 S04 | 0.6 | 0.9 | - | 40 | 4 | |
| New 4SUE 006 012 S04 | 0.6 | 1.2 | - | 40 | 4 | |
| New 4SUE 008 012 S04 | 0.8 | 1.2 | - | 40 | 4 | |
| New 4SUE 008 020 S04 | 0.8 | 2 | - | 40 | 4 | |
| 4SUE 010 015 S04 | 1 | 1.5 | 0.01 | 50 | 4 | |
| 4SUE 010 025 S04 | 1 | 2.5 | 0.01 | 50 | 4 | |
| 4SUE 010 035 S04 | 1 | 3.5 | 0.01 | 50 | 4 | |
| 4SUE 010 050 S04 | 1 | 5 | 0.01 | 50 | 4 | |
| 4SUE 010 060 S04 | 1 | 6 | 0.01 | 50 | 4 | |
| 4SUE 012 015 S04 | 1.2 | 1.5 | 0.012 | 50 | 4 | |
| 4SUE 012 030 S04 | 1.2 | 3 | 0.012 | 50 | 4 | |
| 4SUE 012 050 S04 | 1.2 | 5 | 0.012 | 50 | 4 | |
| 4SUE 012 070 S04 | 1.2 | 7 | 0.012 | 50 | 4 | |
| 4SUE 015 025 S04 | 1.5 | 2.5 | 0.015 | 50 | 4 | |
| 4SUE 015 040 S04 | 1.5 | 4 | 0.015 | 50 | 4 | |
| 4SUE 015 055 S04 | 1.5 | 5.5 | 0.015 | 50 | 4 | |
| 4SUE 015 070 S04 | 1.5 | 7 | 0.015 | 50 | 4 | |
| 4SUE 015 085 S04 | 1.5 | 8.5 | 0.015 | 50 | 4 | |
| 4SUE 020 030 S04 | 2 | 3 | 0.02 | 50 | 4 | |
| 4SUE 020 060 S04 | 2 | 6 | 0.02 | 50 | 4 | |
| 4SUE 020 080 S04 | 2 | 8 | 0.02 | 50 | 4 | |
| 4SUE 020 100 S04 | 2 | 10 | 0.02 | 50 | 4 | |
| 4SUE 020 120 S04 | 2 | 12 | 0.02 | 50 | 4 | |
| 4SUE 020 140 S04 | 2 | 14 | 0.02 | 50 | 4 | |
| 4SUE 025 035 S04 | 2.5 | 3.5 | 0.025 | 50 | 4 | |
| 4SUE 025 080 S04 | 2.5 | 8 | 0.025 | 50 | 4 | |
| 4SUE 025 100 S04 | 2.5 | 10 | 0.025 | 50 | 4 | |
| 4SUE 025 120 S04 | 2.5 | 12 | 0.025 | 50 | 4 | |
| 4SUE 025 140 S04 | 2.5 | 14 | 0.025 | 50 | 4 | |
| 4SUE 030 045 S06 | 3 | 4.5 | 0.03 | 60 | 6 | |
| 4SUE 030 100 S06 | 3 | 10 | 0.03 | 60 | 6 | |
| 4SUE 030 120 S06 | 3 | 12 | 0.03 | 60 | 6 | |
| 4SUE 030 150 S06 | 3 | 15 | 0.03 | 60 | 6 | |
| 4SUE 030 200 S06 | 3 | 20 | 0.03 | 70 | 6 | |
| 4SUE 030 250 S06 | 3 | 25 | 0.03 | 70 | 6 | |
| 4SUE 030 300 S06 | 3 | 30 | 0.03 | 75 | 6 | |
| 4SUE 035 055 S06 | 3.5 | 5.5 | 0.035 | 60 | 6 | |
| 4SUE 035 100 S06 | 3.5 | 10 | 0.035 | 60 | 6 | |
| 4SUE 035 150 S06 | 3.5 | 15 | 0.035 | 60 | 6 | |
| 4SUE 035 200 S06 | 3.5 | 20 | 0.035 | 60 | 6 | |
| 4SUE 040 060 S06 | 4 | 6 | 0.04 | 60 | 6 | |
| 4SUE 040 120 S06 | 4 | 12 | 0.04 | 60 | 6 | |
| 4SUE 040 160 S06 | 4 | 16 | 0.04 | 60 | 6 | |
| 4SUE 040 200 S06 | 4 | 20 | 0.04 | 70 | 6 | |
| 4SUE 040 250 S06 | 4 | 25 | 0.04 | 70 | 6 | |
| 4SUE 040 300 S06 | 4 | 30 | 0.04 | 75 | 6 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 면취량 Chamfer C | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4SUE 045 070 S06 | 4.5 | 7 | 0.045 | 60 | 6 | |
| 4SUE 045 130 S06 | 4.5 | 13 | 0.045 | 60 | 6 | |
| 4SUE 045 180 S06 | 4.5 | 18 | 0.045 | 60 | 6 | |
| 4SUE 050 075 S06 | 5 | 7.5 | 0.05 | 60 | 6 | |
| 4SUE 050 150 S06 | 5 | 15 | 0.05 | 60 | 6 | |
| 4SUE 050 200 S06 | 5 | 20 | 0.05 | 70 | 6 | |
| 4SUE 050 250 S06 | 5 | 25 | 0.05 | 70 | 6 | |
| 4SUE 050 300 S06 | 5 | 30 | 0.05 | 75 | 6 | |
| 4SUE 060 090 S06 | 6 | 9 | 0.06 | 60 | 6 | |
| 4SUE 060 150 S06 | 6 | 15 | 0.06 | 60 | 6 | |
| 4SUE 060 180 S06 | 6 | 18 | 0.06 | 65 | 6 | |
| 4SUE 060 250 S06 | 6 | 25 | 0.06 | 70 | 6 | |
| 4SUE 060 300 S06 | 6 | 30 | 0.06 | 70 | 6 | |
| 4SUE 060 400 S06 | 6 | 40 | 0.06 | 80 | 6 | |
| 4SUE 070 110 S08 | 7 | 11 | 0.07 | 70 | 8 | |
| 4SUE 070 180 S08 | 7 | 18 | 0.07 | 70 | 8 | |
| 4SUE 070 210 S08 | 7 | 21 | 0.07 | 70 | 8 | |
| 4SUE 080 120 S08 | 8 | 12 | 0.08 | 70 | 8 | |
| 4SUE 080 200 S08 | 8 | 20 | 0.08 | 70 | 8 | |
| 4SUE 080 240 S08 | 8 | 24 | 0.08 | 70 | 8 | |
| 4SUE 080 300 S08 | 8 | 30 | 0.08 | 80 | 8 | |
| 4SUE 080 400 S08 | 8 | 40 | 0.08 | 90 | 8 | |
| 4SUE 080 500 S08 | 8 | 50 | 0.08 | 100 | 8 | |
| 4SUE 090 140 S10 | 9 | 14 | 0.09 | 80 | 10 | |
| 4SUE 090 220 S10 | 9 | 22 | 0.09 | 80 | 10 | |
| 4SUE 090 270 S10 | 9 | 27 | 0.09 | 80 | 10 | |
| 4SUE 100 150 S10 | 10 | 15 | 0.1 | 80 | 10 | |
| 4SUE 100 250 S10 | 10 | 25 | 0.1 | 80 | 10 | |
| 4SUE 100 300 S10 | 10 | 30 | 0.1 | 80 | 10 | |
| 4SUE 100 400 S10 | 10 | 40 | 0.1 | 90 | 10 | |
| 4SUE 100 500 S10 | 10 | 50 | 0.1 | 100 | 10 | |
| 4SUE 100 600 S10 | 10 | 60 | 0.1 | 110 | 10 | |
| 4SUE 110 170 S12 | 11 | 17 | 0.11 | 90 | 12 | |
| 4SUE 110 220 S12 | 11 | 22 | 0.11 | 90 | 12 | |
| 4SUE 110 330 S12 | 11 | 33 | 0.11 | 90 | 12 | |
| 4SUE 120 180 S12 | 12 | 18 | 0.12 | 90 | 12 | |
| 4SUE 120 300 S12 | 12 | 30 | 0.12 | 90 | 12 | |
| 4SUE 120 360 S12 | 12 | 36 | 0.12 | 90 | 12 | |
| New 4SUE 120 450 S12 | 12 | 45 | 0.12 | 100 | 12 | |
| 4SUE 120 500 S12 | 12 | 50 | 0.12 | 100 | 12 | |
| 4SUE 120 600 S12 | 12 | 60 | 0.12 | 110 | 12 | |
| 4SUE 120 700 S12 | 12 | 70 | 0.12 | 120 | 12 | |
| New 4SUE 140 320 S14 | 14 | 32 | 0.14 | 100 | 14 | |
| New 4SUE 140 450 S14 | 14 | 45 | 0.14 | 100 | 14 | |
| New 4SUE 140 600 S14 | 14 | 60 | 0.14 | 110 | 14 | |
| New 4SUE 140 700 S14 | 14 | 70 | 0.14 | 120 | 14 | |
| 4SUE 160 240 S16 | 16 | 24 | 0.16 | 100 | 16 | |
| 4SUE 160 350 S16 | 16 | 35 | 0.16 | 100 | 16 | |
| 4SUE 160 500 S16 | 16 | 50 | 0.16 | 110 | 16 | |
| 4SUE 160 700 S16 | 16 | 70 | 0.16 | 130 | 16 | |

# 4SUE

4 Flutes Non Symmetry End Mills for SUS

## 4날 SUS가공용 엔드밀

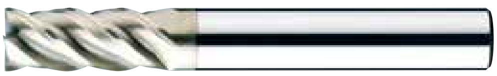
단위 : mm

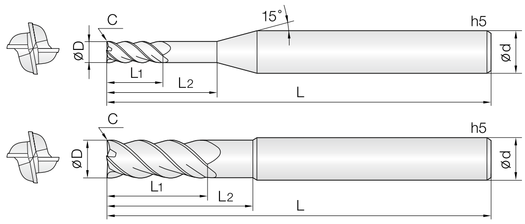
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 면취량 Chamfer C | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4SUE 160 900 S16 | 16 | 90 | 0.16 | 150 | 16 | |
| 4SUE 200 300 S20 | 20 | 30 | 0.2 | 100 | 20 | |
| 4SUE 200 400 S20 | 20 | 40 | 0.2 | 100 | 20 | |
| 4SUE 200 600 S20 | 20 | 60 | 0.2 | 120 | 20 | |
| 4SUE 200 800 S20 | 20 | 80 | 0.2 | 150 | 20 | |
| 4SUE 200 1000 S20 | 20 | 100 | 0.2 | 160 | 20 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 면취량 Chamfer C | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

FOR SUS

# 4SUV
*4 Flutes Variable Helix End Mills for SUS*
## 4날 SUS 강력절삭용 엔드밀






- **합금강, SUS계열, Ti/Ni계 합금, 인코넬 등 난삭재 가공 엔드밀**
- JCRO 코팅 처리하여 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 부등분할 밑날방식과 가변 헬릭스 인선설계로, 채터링이 더욱 감소 하였습니다.
- A타입은 엔드밀의 치핑을 최소화, B타입은 칩배출을 극대화 하였습니다.
- 항절력이 높은 미립자 초경합금을 채택하여, 고이송 작업시 엔드밀의 파손을 최소화.

- **Endmills for alloy steels, SUS, Ti/Ni base alloys, Inconel and hard-to-cut materials**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Minimize chattering during cutting application by unequal index of flute and helix angle to the endmill edge.
- Type A minimizes chipping, Type B maximizes chip emmissins.
- Minimize fracturing at high feed by high TRS fine WC grade.


Shield Edge Sharp Edge 493P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 20 | -0.015 ~ -0.03mm |

단위 : mm

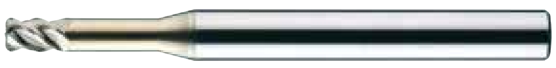
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 면취타입 Type Type | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|
| 4SUVA 010 025 S04 | 1 | 2.5 | - | A | 50 | 4 | |
| 4SUVB 010 025 S04 | 1 | 2.5 | - | B | 50 | 4 | |
| 4SUVA 010 060 S04 | 1 | 2.5 | 6 | A | 50 | 4 | |
| 4SUVA 015 040 S04 | 1.5 | 4 | - | A | 50 | 4 | |
| 4SUVB 015 040 S04 | 1.5 | 4 | - | B | 50 | 4 | |
| 4SUVA 015 100 S04 | 1.5 | 4 | 10 | A | 50 | 4 | |
| 4SUVA 020 050 S04 | 2 | 5 | - | A | 50 | 4 | |
| 4SUVB 020 050 S04 | 2 | 5 | - | B | 50 | 4 | |
| 4SUVA 020 120 S04 | 2 | 5 | 12 | A | 50 | 4 | |
| 4SUVA 030 080 S06 | 3 | 8 | - | A | 60 | 6 | |
| 4SUVB 030 080 S06 | 3 | 8 | - | B | 60 | 6 | |
| 4SUVA 030 180 S06 | 3 | 8 | 18 | A | 60 | 6 | |
| 4SUVA 040 110 S06 | 4 | 11 | - | A | 60 | 6 | |
| 4SUVB 040 110 S06 | 4 | 11 | - | B | 60 | 6 | |
| 4SUVA 040 210 S06 | 4 | 11 | 21 | A | 60 | 6 | |
| 4SUVA 050 130 S06 | 5 | 13 | - | A | 60 | 6 | |
| 4SUVB 050 130 S06 | 5 | 13 | - | B | 60 | 6 | |
| 4SUVA 050 210 S06 | 5 | 13 | 21 | A | 60 | 6 | |
| 4SUVA 060 130 S06 | 6 | 13 | - | A | 60 | 6 | |
| 4SUVB 060 130 S06 | 6 | 13 | - | B | 60 | 6 | |
| 4SUVA 060 210 S06 | 6 | 13 | 21 | A | 60 | 6 | |
| 4SUVA 080 190 S08 | 8 | 19 | - | A | 60 | 8 | |
| 4SUVB 080 190 S08 | 8 | 19 | - | B | 60 | 8 | |
| 4SUVA 080 270 S08 | 8 | 19 | 27 | A | 60 | 8 | |
| 4SUVA 100 220 S10 | 10 | 22 | - | A | 70 | 10 | |
| 4SUVB 100 220 S10 | 10 | 22 | - | B | 70 | 10 | |
| 4SUVA 100 320 S10 | 10 | 22 | 32 | A | 70 | 10 | |
| 4SUVA 120 260 S12 | 12 | 26 | - | A | 80 | 12 | |
| 4SUVB 120 260 S12 | 12 | 26 | - | B | 80 | 12 | |
| 4SUVA 120 380 S12 | 12 | 26 | 38 | A | 80 | 12 | |
| New 4SUVA 140 300 S14 | 14 | 30 | - | A | 90 | 14 | |
| New 4SUVB 140 300 S14 | 14 | 30 | - | B | 90 | 14 | |
| New 4SUVA 140 420 S14 | 14 | 30 | 42 | A | 90 | 14 | |
| 4SUVA 160 320 S16 | 16 | 32 | - | A | 90 | 16 | |
| 4SUVB 160 320 S16 | 16 | 32 | - | B | 90 | 16 | |
| 4SUVA 160 450 S16 | 16 | 32 | 45 | A | 90 | 16 | |
| 4SUVA 200 380 S20 | 20 | 38 | - | A | 100 | 20 | |
| 4SUVB 200 380 S20 | 20 | 38 | - | B | 100 | 20 | |
| 4SUVA 200 550 S20 | 20 | 38 | 55 | A | 100 | 20 | |

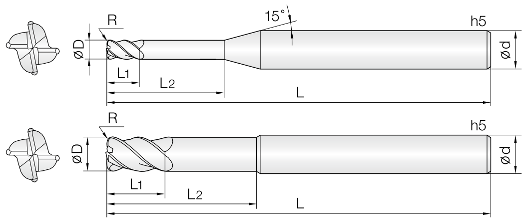
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 면취타입 Type Type | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|

# 4SUCR

## 4 Flutes Rib Corner Radius End Mills for SUS

## 4날 SUS가공용 리브 코너 레디우스 엔드밀






- **합금강, SUS계열, Ti/Ni계 합금, 인코넬 등 난삭재 가공 엔드밀**
- J-CRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 강력한 채터링방지 설계로 엔드밀의 진동을 최소화하였습니다.
- 4날 적용과 깊은 포켓으로 칩배출이 원활하며, 피삭재 면조도가 우수합니다.
- 항절력이 높은 미립자 초경합금을 채택, 고이송 작업시 엔드밀 파손을 최소화.

- **Endmills for alloy steels, SUS, Ti/Ni base alloys, Inconel and hard-to-cut materials.**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Strong design for protection against chattering.
- Excellent work surface finish by 4 flute and deep chip pocket.
- Minimize fracturing at high feed by high TRS fine WC grade.

4 | WC 미립자 | JCRO Coating | R ± 0.005 R0.1 ~ 0.5 | R ± 0.01 R1 ~ 1.5 | R ± 0.015 R2 ~ 5 | 42° Helix Angle | Shield Edge | CUTTING DATA 488P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 20 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |
| | Ø16 ~ 20 | -0.01 ~ -0.02mm |

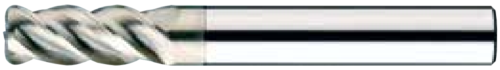
단위 : mm

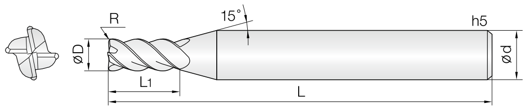
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4SUCR 010 001 050 | 1 X R0.1 | 1.5 | 5 | 60 | 4 | |
| 4SUCR 010 001 060 | 1 X R0.1 | 1.5 | 6 | 60 | 4 | |
| 4SUCR 010 001 080 | 1 X R0.1 | 1.5 | 8 | 60 | 4 | |
| 4SUCR 020 001 100 | 2 X R0.1 | 3 | 10 | 60 | 4 | |
| 4SUCR 020 001 120 | 2 X R0.1 | 3 | 12 | 60 | 4 | |
| 4SUCR 020 001 160 | 2 X R0.1 | 3 | 16 | 60 | 4 | |
| 4SUCR 020 002 100 | 2 X R0.2 | 3 | 10 | 60 | 4 | |
| 4SUCR 020 002 120 | 2 X R0.2 | 3 | 12 | 60 | 4 | |
| 4SUCR 020 002 160 | 2 X R0.2 | 3 | 16 | 60 | 4 | |
| 4SUCR 030 002 150 | 3 X R0.2 | 4.5 | 15 | 65 | 6 | |
| 4SUCR 030 002 200 | 3 X R0.2 | 4.5 | 20 | 70 | 6 | |
| 4SUCR 030 005 150 | 3 X R0.5 | 4.5 | 15 | 65 | 6 | |
| 4SUCR 030 005 200 | 3 X R0.5 | 4.5 | 20 | 70 | 6 | |
| 4SUCR 040 002 200 | 4 X R0.2 | 6 | 20 | 70 | 6 | |
| 4SUCR 040 002 300 | 4 X R0.2 | 6 | 30 | 80 | 6 | |
| 4SUCR 040 005 200 | 4 X R0.5 | 6 | 20 | 70 | 6 | |
| 4SUCR 040 005 300 | 4 X R0.5 | 6 | 30 | 80 | 6 | |
| 4SUCR 040 010 200 | 4 X R1 | 6 | 20 | 70 | 6 | |
| 4SUCR 050 002 250 | 5 X R0.2 | 7.5 | 25 | 70 | 6 | |
| 4SUCR 050 002 360 | 5 X R0.2 | 7.5 | 36 | 80 | 6 | |
| 4SUCR 050 005 250 | 5 X R0.5 | 7.5 | 25 | 70 | 6 | |
| 4SUCR 050 005 360 | 5 X R0.5 | 7.5 | 36 | 80 | 6 | |
| 4SUCR 050 010 250 | 5 X R1 | 7.5 | 25 | 70 | 6 | |
| 4SUCR 060 003 300 | 6 X R0.3 | 9 | 30 | 70 | 6 | |
| 4SUCR 060 003 400 | 6 X R0.3 | 9 | 40 | 80 | 6 | |
| 4SUCR 060 005 300 | 6 X R0.5 | 9 | 30 | 70 | 6 | |
| 4SUCR 060 005 400 | 6 X R0.5 | 9 | 40 | 80 | 6 | |
| 4SUCR 060 010 300 | 6 X R1 | 9 | 30 | 70 | 6 | |
| 4SUCR 060 010 400 | 6 X R1 | 9 | 40 | 80 | 6 | |
| 4SUCR 060 015 300 | 6 X R1.5 | 9 | 30 | 70 | 6 | |
| 4SUCR 070 003 350 | 7 X R0.3 | 10 | 35 | 80 | 8 | |
| 4SUCR 070 005 350 | 7 X R0.5 | 10 | 35 | 80 | 8 | |
| 4SUCR 070 010 350 | 7 X R1 | 10 | 35 | 80 | 8 | |
| 4SUCR 080 003 400 | 8 X R0.3 | 12 | 40 | 80 | 8 | |
| 4SUCR 080 005 400 | 8 X R0.5 | 12 | 40 | 80 | 8 | |
| 4SUCR 080 010 400 | 8 X R1 | 12 | 40 | 80 | 8 | |
| 4SUCR 080 015 400 | 8 X R1.5 | 12 | 40 | 80 | 8 | |
| 4SUCR 080 020 400 | 8 X R2 | 12 | 40 | 80 | 8 | |
| 4SUCR 090 003 450 | 9 X R0.3 | 13 | 45 | 90 | 10 | |
| 4SUCR 090 005 450 | 9 X R0.5 | 13 | 45 | 90 | 10 | |
| 4SUCR 090 010 450 | 9 X R1 | 13 | 45 | 90 | 10 | |
| 4SUCR 100 003 500 | 10 X R0.3 | 15 | 50 | 100 | 10 | |
| 4SUCR 100 005 500 | 10 X R0.5 | 15 | 50 | 100 | 10 | |
| 4SUCR 100 010 500 | 10 X R1 | 15 | 50 | 100 | 10 | |
| 4SUCR 100 015 500 | 10 X R1.5 | 15 | 50 | 100 | 10 | |
| 4SUCR 100 020 500 | 10 X R2 | 15 | 50 | 100 | 10 | |
| 4SUCR 110 003 550 | 11 X R0.3 | 16 | 55 | 100 | 12 | |
| 4SUCR 110 005 550 | 11 X R0.5 | 16 | 55 | 100 | 12 | |
| 4SUCR 110 010 550 | 11 X R1 | 16 | 55 | 100 | 12 | |
| 4SUCR 120 003 600 | 12 X R0.3 | 18 | 60 | 110 | 12 | |
| 4SUCR 120 005 600 | 12 X R0.5 | 18 | 60 | 110 | 12 | |
| 4SUCR 120 010 600 | 12 X R1 | 18 | 60 | 110 | 12 | |
| 4SUCR 120 015 600 | 12 X R1.5 | 18 | 60 | 110 | 12 | |
| 4SUCR 120 020 600 | 12 X R2 | 18 | 60 | 110 | 12 | |
| 4SUCR 120 025 600 | 12 X R2.5 | 18 | 60 | 110 | 12 | |
| 4SUCR 120 030 600 | 12 X R3 | 18 | 60 | 110 | 12 | |
| 4SUCR 160 005 800 | 16 X R0.5 | 24 | 80 | 130 | 16 | |
| 4SUCR 160 010 800 | 16 X R1 | 24 | 80 | 130 | 16 | |
| 4SUCR 160 015 800 | 16 X R1.5 | 24 | 80 | 130 | 16 | |
| 4SUCR 160 020 800 | 16 X R2 | 24 | 80 | 130 | 16 | |
| 4SUCR 160 030 800 | 16 X R3 | 24 | 80 | 130 | 16 | |
| 4SUCR 200 005 1000 | 20 X R0.5 | 30 | 100 | 150 | 20 | |
| 4SUCR 200 010 1000 | 20 X R1 | 30 | 100 | 150 | 20 | |
| 4SUCR 200 015 1000 | 20 X R1.5 | 30 | 100 | 150 | 20 | |
| 4SUCR 200 020 1000 | 20 X R2 | 30 | 100 | 150 | 20 | |
| 4SUCR 200 030 1000 | 20 X R3 | 30 | 100 | 150 | 20 | |
| 4SUCR 200 050 1000 | 20 X R5 | 30 | 100 | 150 | 20 | |

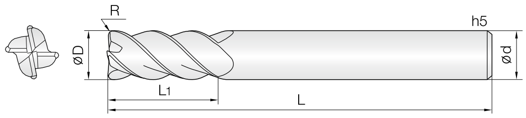
# 4SUC

## 4 Flutes Non Symmetry Corner Radius End Mills for SUS

## 4날 SUS가공용 코너 레디우스 엔드밀






- **합금강, SUS계열, Ti/Ni계 합금, 인코넬 등 난삭재 가공 엔드밀**
- J-CRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 강력한 채터링방지 설계로 엔드밀의 진동을 최소화하였습니다.
- 코너R부 적용으로 밑날 치핑을 방지 하였습니다.
- 항절력이 높은 미립자 초경합금을 채택하여, 고이송 작업시 엔드밀의 파손을 최소화.

- **Endmills for alloy steel, SUS, Ti/Ni base alloy, Inconel and hard-to-cut materials**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Strong design for protection against chattering.
- Preventing bottom edge chipping by corner R.
- Minimize fracturing at high feed by high TRS fine WC grade.

4 | WC 미립자 | JCRO Coating | R ± 0.005 (R0.1 ~ 0.5) | R ± 0.01 (R1 ~ 1.5) | R ± 0.015 (R2 ~ 3) | 42° Helix Angle | CUTTING DATA 487P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 20 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |
| | Ø14 ~ 20 | -0.01 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4SUC 010 001 S04 | 1 X R0.1 | 2.5 | 50 | 4 | |
| 4SUC 010 002 S04 | 1 X R0.2 | 2.5 | 50 | 4 | |
| 4SUC 012 001 S04 | 1.2 X R0.1 | 3 | 50 | 4 | |
| 4SUC 012 002 S04 | 1.2 X R0.2 | 3 | 50 | 4 | |
| 4SUC 015 001 S04 | 1.5 X R0.1 | 4 | 50 | 4 | |
| 4SUC 015 002 S04 | 1.5 X R0.2 | 4 | 50 | 4 | |
| 4SUC 015 003 S04 | 1.5 X R0.3 | 4 | 50 | 4 | |
| 4SUC 020 001 S04 | 2 X R0.1 | 6 | 50 | 4 | |
| 4SUC 020 002 S04 | 2 X R0.2 | 6 | 50 | 4 | |
| 4SUC 020 003 S04 | 2 X R0.3 | 6 | 50 | 4 | |
| 4SUC 020 005 S04 | 2 X R0.5 | 6 | 50 | 4 | |
| 4SUC 025 001 S04 | 2.5 X R0.1 | 7 | 50 | 4 | |
| 4SUC 025 002 S04 | 2.5 X R0.2 | 7 | 50 | 4 | |
| 4SUC 025 003 S04 | 2.5 X R0.3 | 7 | 50 | 4 | |
| 4SUC 030 001 S06 | 3 X R0.1 | 10 | 60 | 6 | |
| 4SUC 030 002 055 | 3 X R0.2 | 6 | 55 | 6 | |
| 4SUC 030 002 S06 | 3 X R0.2 | 10 | 60 | 6 | |
| 4SUC 030 003 S06 | 3 X R0.3 | 10 | 60 | 6 | |
| 4SUC 030 005 055 | 3 X R0.5 | 6 | 55 | 6 | |
| 4SUC 030 005 S06 | 3 X R0.5 | 10 | 60 | 6 | |
| 4SUC 035 002 S06 | 3.5 X R0.2 | 10 | 60 | 6 | |
| 4SUC 040 001 S06 | 4 X R0.1 | 12 | 60 | 6 | |
| 4SUC 040 002 055 | 4 X R0.2 | 8 | 55 | 6 | |
| 4SUC 040 002 S06 | 4 X R0.2 | 12 | 60 | 6 | |
| 4SUC 040 003 S06 | 4 X R0.3 | 12 | 60 | 6 | |
| 4SUC 040 005 055 | 4 X R0.5 | 8 | 55 | 6 | |
| 4SUC 040 005 S06 | 4 X R0.5 | 12 | 60 | 6 | |
| 4SUC 040 010 S06 | 4 X R1 | 12 | 60 | 6 | |
| 4SUC 045 002 S06 | 4.5 X R0.2 | 14 | 60 | 6 | |
| 4SUC 050 002 055 | 5 X R0.2 | 10 | 55 | 6 | |
| 4SUC 050 002 S06 | 5 X R0.2 | 15 | 60 | 6 | |
| 4SUC 050 003 S06 | 5 X R0.3 | 15 | 60 | 6 | |
| 4SUC 050 005 055 | 5 X R0.5 | 10 | 55 | 6 | |
| 4SUC 050 005 S06 | 5 X R0.5 | 15 | 60 | 6 | |
| 4SUC 050 010 S06 | 5 X R1 | 15 | 60 | 6 | |
| 4SUC 055 002 S06 | 5.5 X R0.2 | 15 | 60 | 6 | |
| New 4SUC 060 002 055 | 6 X R0.2 | 12 | 55 | 6 | |
| New 4SUC 060 002 S06 | 6 X R0.2 | 15 | 60 | 6 | |
| 4SUC 060 003 055 | 6 X R0.3 | 12 | 55 | 6 | |
| 4SUC 060 003 S06 | 6 X R0.3 | 15 | 60 | 6 | |
| 4SUC 060 005 055 | 6 X R0.5 | 12 | 55 | 6 | |
| 4SUC 060 005 S06 | 6 X R0.5 | 15 | 60 | 6 | |
| 4SUC 060 010 055 | 6 X R1 | 12 | 55 | 6 | |
| 4SUC 060 010 S06 | 6 X R1 | 15 | 60 | 6 | |
| 4SUC 060 015 S06 | 6 X R1.5 | 15 | 60 | 6 | |
| 4SUC 065 003 S08 | 6.5 X R0.3 | 18 | 60 | 8 | |
| 4SUC 070 003 S08 | 7 X R0.3 | 20 | 80 | 8 | |
| 4SUC 070 005 S08 | 7 X R0.5 | 20 | 80 | 8 | |
| 4SUC 007 010 S08 | 7 X R1 | 20 | 80 | 8 | |
| 4SUC 080 003 070 | 8 X R0.3 | 16 | 70 | 8 | |

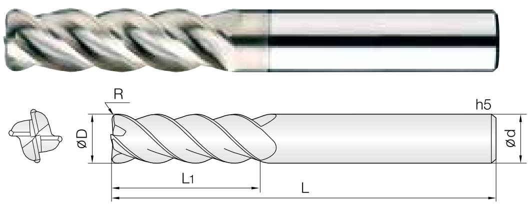
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4SUC 080 003 S08 | 8 X R0.3 | 20 | 80 | 8 | |
| 4SUC 080 005 070 | 8 X R0.5 | 16 | 70 | 8 | |
| 4SUC 080 005 S08 | 8 X R0.5 | 20 | 80 | 8 | |
| 4SUC 080 010 070 | 8 X R1 | 16 | 70 | 8 | |
| 4SUC 080 010 S08 | 8 X R1 | 20 | 80 | 8 | |
| 4SUC 080 015 S08 | 8 X R1.5 | 20 | 80 | 8 | |
| 4SUC 080 020 S08 | 8 X R2 | 20 | 80 | 8 | |
| 4SUC 085 003 S10 | 8.5 X R0.3 | 22 | 80 | 10 | |
| 4SUC 090 003 S10 | 9 X R0.3 | 25 | 80 | 10 | |
| 4SUC 100 003 070 | 10 X R0.3 | 20 | 70 | 10 | |
| 4SUC 100 003 S10 | 10 X R0.3 | 25 | 80 | 10 | |
| 4SUC 100 005 070 | 10 X R0.5 | 20 | 70 | 10 | |
| 4SUC 100 005 S10 | 10 X R0.5 | 25 | 80 | 10 | |
| 4SUC 100 010 070 | 10 X R1 | 20 | 70 | 10 | |
| 4SUC 100 010 S10 | 10 X R1 | 25 | 80 | 10 | |
| 4SUC 100 015 070 | 10 X R1.5 | 20 | 70 | 10 | |
| 4SUC 100 015 S10 | 10 X R1.5 | 25 | 80 | 10 | |
| 4SUC 100 020 070 | 10 X R2 | 20 | 70 | 10 | |
| 4SUC 100 020 S10 | 10 X R2 | 25 | 80 | 10 | |
| 4SUC 100 025 070 | 10 X R2.5 | 20 | 70 | 10 | |
| 4SUC 100 025 S10 | 10 X R2.5 | 25 | 80 | 10 | |
| 4SUC 100 030 070 | 10 X R3 | 20 | 70 | 10 | |
| 4SUC 100 030 S10 | 10 X R3 | 25 | 80 | 10 | |
| 4SUC 110 005 S12 | 11 X R0.5 | 27 | 90 | 12 | |
| 4SUC 110 010 S12 | 11 X R1 | 27 | 90 | 12 | |
| 4SUC 120 003 080 | 12 X R0.3 | 24 | 80 | 12 | |
| 4SUC 120 003 S12 | 12 X R0.3 | 30 | 100 | 12 | |
| 4SUC 120 005 080 | 12 X R0.5 | 24 | 80 | 12 | |
| 4SUC 120 005 S12 | 12 X R0.5 | 30 | 100 | 12 | |
| 4SUC 120 010 080 | 12 X R1 | 24 | 80 | 12 | |
| 4SUC 120 010 S12 | 12 X R1 | 30 | 100 | 12 | |
| 4SUC 120 015 080 | 12 X R1.5 | 24 | 80 | 12 | |
| 4SUC 120 015 S12 | 12 X R1.5 | 30 | 100 | 12 | |
| 4SUC 120 020 080 | 12 X R2 | 24 | 80 | 12 | |
| 4SUC 120 020 S12 | 12 X R2 | 30 | 100 | 12 | |
| 4SUC 120 025 S12 | 12 X R2.5 | 30 | 100 | 12 | |
| 4SUC 120 030 080 | 12 X R3 | 24 | 80 | 12 | |
| 4SUC 120 030 S12 | 12 X R3 | 30 | 100 | 12 | |
| 4SUC 140 005 S14 | 14 X R0.5 | 35 | 100 | 14 | |
| 4SUC 140 010 S14 | 14 X R1 | 35 | 100 | 14 | |
| 4SUC 160 005 100 | 16 X R0.5 | 32 | 100 | 16 | |
| 4SUC 160 005 S16 | 16 X R0.5 | 42 | 110 | 16 | |
| 4SUC 160 010 100 | 16 X R1 | 32 | 100 | 16 | |
| 4SUC 160 010 S16 | 16 X R1 | 42 | 110 | 16 | |
| 4SUC 180 005 S18 | 18 X R0.5 | 45 | 110 | 18 | |
| 4SUC 180 010 S18 | 18 X R1 | 45 | 110 | 18 | |
| 4SUC 200 005 S20 | 20 X R0.5 | 48 | 110 | 20 | |
| 4SUC 200 010 S20 | 20 X R1 | 48 | 110 | 20 | |

FOR SUS

# 4LSUC

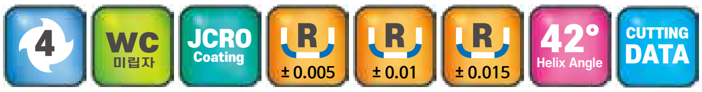
*4 Flutes Long Length Corner Radius End Mills for SUS*

## 4날 SUS가공용 긴길이 코너 레디우스 엔드밀




- **합금강, SUS계열, Ti/Ni계합금, 인코넬 등 난삭재 가공 엔드밀**
- J-CRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 강력한 채터링방지 설계로 엔드밀의 진동을 최소화하였습니다.
- 코너R부 적용으로 밑날 치핑을 방지 하였습니다.
- 항절력이 높은 미립자 초경합금을 채택하여, 고이송 작업시 엔드밀의 파손을 최소화.

- **Endmills for alloy steels, SUS, Ti/Ni base alloys, Inconel and hard-to-cut materials**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Strong design for protection against chattering.
- Preventing bottom edge chipping by corner R.
- Minimize fracturing at high feed by high TRS fine WC grade.




R0.3 ~ 0.5 R1 ~ 1.5 R2 ~ 3 488P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø6 ~ 20 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |
| | Ø14 ~ 20 | -0.01 ~ -0.02mm |

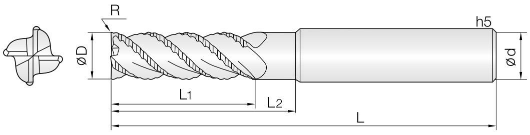
단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4LSUC 060 003 070 | 6 X R0.3 | 30 | 70 | 6 | |
| 4LSUC 060 005 070 | 6 X R0.5 | 30 | 70 | 6 | |
| 4LSUC 060 010 070 | 6 X R1 | 30 | 70 | 6 | |
| 4LSUC 060 015 070 | 6 X R1.5 | 30 | 70 | 6 | |
| 4LSUC 080 003 080 | 8 X R0.3 | 40 | 80 | 8 | |
| 4LSUC 080 005 080 | 8 X R0.5 | 40 | 80 | 8 | |
| 4LSUC 080 010 080 | 8 X R1 | 40 | 80 | 8 | |
| 4LSUC 080 015 080 | 8 X R1.5 | 40 | 80 | 8 | |
| 4LSUC 080 020 080 | 8 X R2 | 40 | 80 | 8 | |
| 4LSUC 100 003 100 | 10 X R0.3 | 50 | 100 | 10 | |
| 4LSUC 100 005 100 | 10 X R0.5 | 50 | 100 | 10 | |
| 4LSUC 100 010 100 | 10 X R1 | 50 | 100 | 10 | |
| 4LSUC 100 015 100 | 10 X R1.5 | 50 | 100 | 10 | |
| 4LSUC 100 020 100 | 10 X R2 | 50 | 100 | 10 | |
| 4LSUC 120 003 120 | 12 X R0.3 | 60 | 120 | 12 | |
| 4LSUC 120 005 120 | 12 X R0.5 | 60 | 120 | 12 | |
| 4LSUC 120 010 120 | 12 X R1 | 60 | 120 | 12 | |
| 4LSUC 120 015 120 | 12 X R1.5 | 60 | 120 | 12 | |
| 4LSUC 120 020 120 | 12 X R2 | 60 | 120 | 12 | |
| 4LSUC 120 025 120 | 12 X R2.5 | 60 | 120 | 12 | |
| 4LSUC 120 030 120 | 12 X R3 | 60 | 120 | 12 | |
| New 4LSUC 140 005 120 | 14 X R0.5 | 70 | 120 | 14 | |
| New 4LSUC 140 010 120 | 14 X R1 | 70 | 120 | 14 | |
| New 4LSUC 140 020 120 | 14 X R2 | 70 | 120 | 14 | |
| New 4LSUC 140 030 120 | 14 X R3 | 70 | 120 | 14 | |
| 4LSUC 160 005 130 | 16 X R0.5 | 80 | 130 | 16 | |
| 4LSUC 160 010 130 | 16 X R1 | 80 | 130 | 16 | |
| 4LSUC 160 015 130 | 16 X R1.5 | 80 | 130 | 16 | |
| 4LSUC 160 020 130 | 16 X R2 | 80 | 130 | 16 | |
| 4LSUC 160 030 130 | 16 X R3 | 80 | 130 | 16 | |
| 4LSUC 200 005 160 | 20 X R0.5 | 100 | 160 | 20 | |
| 4LSUC 200 010 160 | 20 X R1 | 100 | 160 | 20 | |
| 4LSUC 200 015 160 | 20 X R1.5 | 100 | 160 | 20 | |
| 4LSUC 200 020 160 | 20 X R2 | 100 | 160 | 20 | |
| 4LSUC 200 030 160 | 20 X R3 | 100 | 160 | 20 | |

# 3&4&5SUR

3&4&5 Flutes 45°Helix Roughing Corner R End Mills for SUS

## 3&4&5날 45°헬릭스 SUS라핑 코너 R 엔드밀




- **합금강, SUS계열, 인코넬, 일반구조강 등 다양한 난삭재의 황삭가공**
- JCRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 45°헬릭스 적용으로 절삭 저항이 감소 되어 장시간 가공에 적합합니다.
- 파인피치 형상 채택으로 고속, 황삭가공 작업에 적합합니다.

- **Roughing Endmills for alloy steels, SUS, Inconel, Mild steels and various hard-to-cut materials**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- 45 helix Design for minimizing cutting resistance and long time process.
- High speed and roughing work applicable by fine pitch flute.

3 | 4 | 5 | WC 미립자 | JCRO Coating | R ±0.005 | R ±0.01 | R ±0.015 | 45° Helix Angle | CUTTING DATA

R0.2 ~ 0.5 | R1 ~ 1.5 | R2 | 489P

| D Size | D Tolerance |
|---|---|
| Ø3 ~ 9 | -0.02 ~ -0.04mm |
| Ø10 ~ 20 | -0.02 ~ -0.05mm |

단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 3SUR 030 002 S06 | 3 X R0.2 | 8 | - | 50 | 6 | |
| 3SUR 040 002 S06 | 4 X R0.2 | 10 | - | 50 | 6 | |
| 4SUR 050 002 S06 | 5 X R0.2 | 13 | - | 50 | 6 | |
| 4SUR 060 002 200 | 6 X R0.2 | 10 | 20 | 60 | 6 | |
| 4SUR 060 002 S06 | 6 X R0.2 | 13 | - | 60 | 6 | |
| 4SUR 060 005 S06 | 6 X R0.5 | 13 | - | 60 | 6 | |
| 4SUR 070 002 S08 | 7X R0.2 | 18 | - | 70 | 8 | |
| 4SUR 080 002 250 | 8X R0.2 | 12 | 25 | 70 | 8 | |
| 4SUR 080 002 S08 | 8X R0.2 | 19 | - | 70 | 8 | |
| 4SUR 080 010 S08 | 8 X R1 | 19 | - | 70 | 8 | |
| 4SUR 090 003 S10 | 9 X R0.3 | 20 | - | 70 | 10 | |
| 4SUR 100 003 300 | 10 X R0.3 | 15 | 30 | 75 | 10 | |
| 4SUR 100 003 S10 | 10 X R0.3 | 22 | - | 75 | 10 | |
| 4SUR 100 010 S10 | 10 X R1 | 22 | - | 75 | 10 | |
| 4SUR 110 003 S12 | 11 X R0.3 | 25 | - | 80 | 12 | |
| 4SUR 120 003 350 | 12 X R0.3 | 20 | 35 | 80 | 12 | |
| 4SUR 120 003 S12 | 12 X R0.3 | 26 | - | 80 | 12 | |
| 4SUR 120 010 S12 | 12 X R1 | 26 | - | 80 | 12 | |
| 5SUR 140 005 S16 | 14 X R0.5 | 28 | - | 90 | 16 | |
| 5SUR 160 005 100 | 16 X R0.5 | 32 | - | 100 | 16 | |
| 5SUR 160 005 110 | 16 X R0.5 | 42 | - | 110 | 16 | |
| 5SUR 160 015 100 | 16 X R1.5 | 32 | - | 100 | 16 | |
| 5SUR 160 015 110 | 16 X R1.5 | 42 | - | 110 | 16 | |
| 5SUR 200 005 100 | 20 X R0.5 | 38 | - | 100 | 20 | |
| 5SUR 200 005 110 | 20 X R0.5 | 45 | - | 110 | 20 | |
| 5SUR 200 020 100 | 20 X R2 | 38 | - | 100 | 20 | |
| 5SUR 200 020 110 | 20 X R2 | 45 | - | 110 | 20 | |

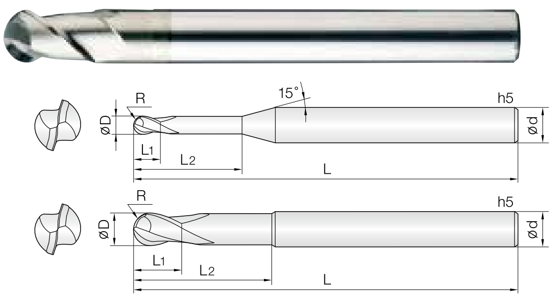
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

FOR SUS

# 2COB

## 2 Flutes 45˚Helix Rib Ball End Mills for Copper

## 2날 45˚헬릭스 동가공 전용 리브 볼 엔드밀




- **동 및 동합금, 알루미늄 합금, 비철합금 가공용 엔드밀**
- JCRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 피삭재의 면조도가 향상됩니다.
- 45˚헬릭스 형상과 깊은 포켓으로 설계하여 칩배출이 우수하며, 고속, 고이송 가공에 적합합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화.

- **Endmills for copper, copper alloys, non-ferrous and non-metallic materials**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.
- High speed, feed applicable by 45˚degree helix and deep chip pocket design

2 | WC 미립자 | JCRO Coating | R ± 0.005 (0.25 ~ 2.5R) | R ± 0.01 (3R ~ 6R) | R ± 0.015 (8R) | 45° Helix Angle | CUTTING DATA (489P)

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.5 ~ 16 | +0 ~ -0.01mm |

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

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2COB 005 010 S04 | 0.25R X 0.5 | 0.7 | 1 | 45 | 4 | |
| 2COB 005 020 S04 | 0.25R X 0.5 | 0.7 | 2 | 45 | 4 | |
| 2COB 005 030 S04 | 0.25R X 0.5 | 0.7 | 3 | 45 | 4 | |
| 2COB 005 040 S04 | 0.25R X 0.5 | 0.7 | 4 | 45 | 4 | |
| 2COB 005 050 S04 | 0.25R X 0.5 | 0.7 | 5 | 45 | 4 | |
| 2COB 005 060 S04 | 0.25R X 0.5 | 0.7 | 6 | 45 | 4 | |
| 2COB 006 020 S04 | 0.3R X 0.6 | 0.9 | 2 | 45 | 4 | |
| 2COB 006 030 S04 | 0.3R X 0.6 | 0.9 | 3 | 45 | 4 | |
| 2COB 006 040 S04 | 0.3R X 0.6 | 0.9 | 4 | 45 | 4 | |
| 2COB 006 050 S04 | 0.3R X 0.6 | 0.9 | 5 | 45 | 4 | |
| 2COB 006 060 S04 | 0.3R X 0.6 | 0.9 | 6 | 45 | 4 | |
| 2COB 006 080 S04 | 0.3R X 0.6 | 0.9 | 8 | 45 | 4 | |
| 2COB 006 100 S04 | 0.3R X 0.6 | 0.9 | 10 | 45 | 4 | |
| 2COB 008 020 S04 | 0.4R X 0.8 | 1.2 | 2 | 45 | 4 | |
| 2COB 008 030 S04 | 0.4R X 0.8 | 1.2 | 3 | 45 | 4 | |
| 2COB 008 040 S04 | 0.4R X 0.8 | 1.2 | 4 | 45 | 4 | |
| 2COB 008 060 S04 | 0.4R X 0.8 | 1.2 | 6 | 45 | 4 | |
| 2COB 008 080 S04 | 0.4R X 0.8 | 1.2 | 8 | 45 | 4 | |
| 2COB 008 100 S04 | 0.4R X 0.8 | 1.2 | 10 | 45 | 4 | |
| 2COB 008 120 S04 | 0.4R X 0.8 | 1.2 | 12 | 45 | 4 | |
| 2COB 010 030 S04 | 0.5R X 1 | 1.5 | 3 | 50 | 4 | |
| 2COB 010 050 S04 | 0.5R X 1 | 1.5 | 5 | 50 | 4 | |
| 2COB 010 080 S04 | 0.5R X 1 | 1.5 | 8 | 50 | 4 | |
| 2COB 010 100 S04 | 0.5R X 1 | 1.5 | 10 | 50 | 4 | |
| 2COB 010 120 S04 | 0.5R X 1 | 1.5 | 12 | 50 | 4 | |
| 2COB 010 160 S04 | 0.5R X 1 | 1.5 | 16 | 50 | 4 | |
| 2COB 010 200 S04 | 0.5R X 1 | 1.5 | 20 | 50 | 4 | |
| 2COB 012 030 S04 | 0.6R X 1.2 | 1.8 | 3 | 50 | 4 | |
| 2COB 012 040 S04 | 0.6R X 1.2 | 1.8 | 4 | 50 | 4 | |
| 2COB 012 060 S04 | 0.6R X 1.2 | 1.8 | 6 | 50 | 4 | |
| 2COB 012 080 S04 | 0.6R X 1.2 | 1.8 | 8 | 50 | 4 | |
| 2COB 012 100 S04 | 0.6R X 1.2 | 1.8 | 10 | 50 | 4 | |
| 2COB 012 120 S04 | 0.6R X 1.2 | 1.8 | 12 | 50 | 4 | |
| 2COB 015 050 S04 | 0.75R X 1.5 | 2 | 5 | 50 | 4 | |
| 2COB 015 080 S04 | 0.75R X 1.5 | 2 | 8 | 50 | 4 | |
| 2COB 015 100 S04 | 0.75R X 1.5 | 2 | 10 | 50 | 4 | |
| 2COB 015 120 S04 | 0.75R X 1.5 | 2 | 12 | 50 | 4 | |
| 2COB 015 160 S04 | 0.75R X 1.5 | 2 | 16 | 50 | 4 | |
| 2COB 015 200 S04 | 0.75R X 1.5 | 2 | 20 | 50 | 4 | |
| 2COB 020 050 S06 | 1R X 2 | 3 | 5 | 50 | 6 | |
| 2COB 020 080 S06 | 1R X 2 | 3 | 8 | 50 | 6 | |
| 2COB 020 100 S06 | 1R X 2 | 3 | 10 | 50 | 6 | |
| 2COB 020 120 S06 | 1R X 2 | 3 | 12 | 60 | 6 | |
| 2COB 020 160 S06 | 1R X 2 | 3 | 16 | 60 | 6 | |
| 2COB 020 200 S06 | 1R X 2 | 3 | 20 | 60 | 6 | |
| 2COB 020 250 S06 | 1R X 2 | 3 | 25 | 65 | 6 | |
| 2COB 025 060 S06 | 1.25R X 2.5 | 4 | 6 | 50 | 6 | |
| 2COB 025 100 S06 | 1.25R X 2.5 | 4 | 10 | 50 | 6 | |
| 2COB 025 120 S06 | 1.25R X 2.5 | 4 | 12 | 60 | 6 | |
| 2COB 025 160 S06 | 1.25R X 2.5 | 4 | 16 | 60 | 6 | |

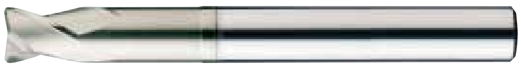
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2COB 025 200 S06 | 1.25R X 2.5 | 4 | 20 | 60 | 6 | |
| 2COB 030 080 S06 | 1.5R X 3 | 4.5 | 8 | 60 | 6 | |
| 2COB 030 120 S06 | 1.5R X 3 | 4.5 | 12 | 60 | 6 | |
| 2COB 030 160 S06 | 1.5R X 3 | 4.5 | 16 | 60 | 6 | |
| 2COB 030 200 S06 | 1.5R X 3 | 4.5 | 20 | 60 | 6 | |
| 2COB 030 250 S06 | 1.5R X 3 | 4.5 | 25 | 70 | 6 | |
| 2COB 030 300 S06 | 1.5R X 3 | 4.5 | 30 | 70 | 6 | |
| 2COB 030 400 S06 | 1.5R X 3 | 4.5 | 40 | 80 | 6 | |
| 2COB 040 100 S06 | 2R X 4 | 6 | 10 | 60 | 6 | |
| 2COB 040 160 S06 | 2R X 4 | 6 | 16 | 60 | 6 | |
| 2COB 040 200 S06 | 2R X 4 | 6 | 20 | 60 | 6 | |
| 2COB 040 250 S06 | 2R X 4 | 6 | 25 | 70 | 6 | |
| 2COB 040 300 S06 | 2R X 4 | 6 | 30 | 70 | 6 | |
| 2COB 040 400 S06 | 2R X 4 | 6 | 40 | 80 | 6 | |
| 2COB 050 160 S06 | 2.5R X 5 | 8 | 16 | 80 | 6 | |
| 2COB 050 200 S06 | 2.5R X 5 | 8 | 20 | 80 | 6 | |
| 2COB 050 250 S06 | 2.5R X 5 | 8 | 25 | 80 | 6 | |
| 2COB 060 150 S06 | 3R X 6 | 9 | 15 | 90 | 6 | |
| 2COB 060 300 S06 | 3R X 6 | 9 | 30 | 90 | 6 | |
| 2COB 060 400 S06 | 3R X 6 | 9 | 40 | 90 | 6 | |
| 2COB 080 200 S08 | 4R X 8 | 12 | 20 | 100 | 8 | |
| 2COB 100 250 S10 | 5R X 10 | 15 | 25 | 100 | 10 | |
| 2COB 120 300 S12 | 6R X 12 | 18 | 30 | 110 | 12 | |
| 2COB 160 600 S16 | 8R X 16 | 30 | 60 | 160 | 16 | |

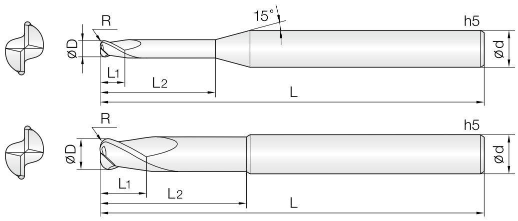
FOR COPPER

# 2COR

## 2 Flutes Rib Corner Radius End Mills for Copper

## 2날 동가공용 리브 코너 레디우스 엔드밀






- **동 및 동합금, 알루미늄 합금, 비철합금 가공용 엔드밀**
- JCRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 피삭재의 면조도가 향상됩니다.
- 깊은 포켓으로 설계하여 칩배출이 원활합니다.
- 항절력이 높은 미립자 초경합금 (0.5㎛)을채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for copper, copper alloys, non-ferrous and non-metallic materials**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Smooth chip outflow by deep chip pocket.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

2 | WC 미립자 | JCRO Coating | R ± 0.005 (R0.1 ~ 0.5) | R ± 0.01 (R1 ~ 1.5) | 30° Helix Angle | CUTTING DATA 490P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø1 ~ 12 | +0 ~ -0.01mm | ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2COR 010 001 040 | 1 X R0.1 | 1.5 | 4 | 50 | 4 | |
| 2COR 010 001 060 | 1 X R0.1 | 1.5 | 6 | 50 | 4 | |
| 2COR 010 001 080 | 1 X R0.1 | 1.5 | 8 | 50 | 4 | |
| 2COR 010 001 100 | 1 X R0.1 | 1.5 | 10 | 50 | 4 | |
| 2COR 010 001 120 | 1 X R0.1 | 1.5 | 12 | 50 | 4 | |
| 2COR 010 001 160 | 1 X R0.1 | 1.5 | 16 | 50 | 4 | |
| 2COR 010 001 200 | 1 X R0.1 | 1.5 | 20 | 50 | 4 | |
| 2COR 010 002 040 | 1 X R0.2 | 1.5 | 4 | 50 | 4 | |
| 2COR 010 002 060 | 1 X R0.2 | 1.5 | 6 | 50 | 4 | |
| 2COR 010 002 080 | 1 X R0.2 | 1.5 | 8 | 50 | 4 | |
| 2COR 010 002 100 | 1 X R0.2 | 1.5 | 10 | 50 | 4 | |
| 2COR 010 002 120 | 1 X R0.2 | 1.5 | 12 | 50 | 4 | |
| 2COR 010 002 160 | 1 X R0.2 | 1.5 | 16 | 50 | 4 | |
| 2COR 010 002 200 | 1 X R0.2 | 1.5 | 20 | 50 | 4 | |
| 2COR 010 003 040 | 1 X R0.3 | 1.5 | 4 | 50 | 4 | |
| 2COR 010 003 060 | 1 X R0.3 | 1.5 | 6 | 50 | 4 | |
| 2COR 010 003 080 | 1 X R0.3 | 1.5 | 8 | 50 | 4 | |
| 2COR 010 003 100 | 1 X R0.3 | 1.5 | 10 | 50 | 4 | |
| 2COR 010 003 120 | 1 X R0.3 | 1.5 | 12 | 50 | 4 | |
| 2COR 010 003 160 | 1 X R0.3 | 1.5 | 16 | 50 | 4 | |
| 2COR 010 003 200 | 1 X R0.3 | 1.5 | 20 | 50 | 4 | |
| 2COR 015 001 060 | 1.5 X R0.1 | 2 | 6 | 50 | 4 | |
| 2COR 015 001 100 | 1.5 X R0.1 | 2 | 10 | 50 | 4 | |
| 2COR 015 001 120 | 1.5 X R0.1 | 2 | 12 | 50 | 4 | |
| 2COR 015 001 160 | 1.5 X R0.1 | 2 | 16 | 50 | 4 | |
| 2COR 015 001 200 | 1.5 X R0.1 | 2 | 20 | 50 | 4 | |
| 2COR 015 001 250 | 1.5 X R0.1 | 2 | 25 | 60 | 4 | |
| 2COR 015 002 060 | 1.5 X R0.2 | 2 | 6 | 50 | 4 | |
| 2COR 015 002 100 | 1.5 X R0.2 | 2 | 10 | 50 | 4 | |
| 2COR 015 002 120 | 1.5 X R0.2 | 2 | 12 | 50 | 4 | |
| 2COR 015 002 160 | 1.5 X R0.2 | 2 | 16 | 50 | 4 | |
| 2COR 015 002 200 | 1.5 X R0.2 | 2 | 20 | 50 | 4 | |
| 2COR 015 002 250 | 1.5 X R0.2 | 2 | 25 | 60 | 4 | |
| 2COR 015 003 060 | 1.5 X R0.3 | 2 | 6 | 50 | 4 | |
| 2COR 015 003 100 | 1.5 X R0.3 | 2 | 10 | 50 | 4 | |
| 2COR 015 003 120 | 1.5 X R0.3 | 2 | 12 | 50 | 4 | |
| 2COR 015 003 160 | 1.5 X R0.3 | 2 | 16 | 50 | 4 | |
| 2COR 015 003 200 | 1.5 X R0.3 | 2 | 20 | 50 | 4 | |
| 2COR 015 003 250 | 1.5 X R0.3 | 2 | 25 | 60 | 4 | |
| 2COR 015 005 060 | 1.5 X R0.5 | 2 | 6 | 50 | 4 | |
| 2COR 015 005 100 | 1.5 X R0.5 | 2 | 10 | 50 | 4 | |
| 2COR 015 005 120 | 1.5 X R0.5 | 2 | 12 | 50 | 4 | |
| 2COR 015 005 160 | 1.5 X R0.5 | 2 | 16 | 50 | 4 | |
| 2COR 015 005 200 | 1.5 X R0.5 | 2 | 20 | 50 | 4 | |
| 2COR 015 005 250 | 1.5 X R0.5 | 2 | 25 | 60 | 4 | |
| 2COR 020 001 060 | 2 X R0.1 | 3 | 6 | 50 | 4 | |
| 2COR 020 001 100 | 2 X R0.1 | 3 | 10 | 50 | 4 | |
| 2COR 020 001 120 | 2 X R0.1 | 3 | 12 | 50 | 4 | |
| 2COR 020 001 160 | 2 X R0.1 | 3 | 16 | 50 | 4 | |
| 2COR 020 001 200 | 2 X R0.1 | 3 | 20 | 50 | 4 | |

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2COR 020 001 250 | 2 X R0.1 | 3 | 25 | 60 | 4 | |
| 2COR 020 002 060 | 2 X R0.2 | 3 | 6 | 50 | 4 | |
| 2COR 020 002 100 | 2 X R0.2 | 3 | 10 | 50 | 4 | |
| 2COR 020 002 120 | 2 X R0.2 | 3 | 12 | 50 | 4 | |
| 2COR 020 002 160 | 2 X R0.2 | 3 | 16 | 50 | 4 | |
| 2COR 020 002 200 | 2 X R0.2 | 3 | 20 | 50 | 4 | |
| 2COR 020 002 250 | 2 X R0.2 | 3 | 25 | 60 | 4 | |
| 2COR 020 003 060 | 2 X R0.3 | 3 | 6 | 50 | 4 | |
| 2COR 020 003 100 | 2 X R0.3 | 3 | 10 | 50 | 4 | |
| 2COR 020 003 120 | 2 X R0.3 | 3 | 12 | 50 | 4 | |
| 2COR 020 003 160 | 2 X R0.3 | 3 | 16 | 50 | 4 | |
| 2COR 020 003 200 | 2 X R0.3 | 3 | 20 | 50 | 4 | |
| 2COR 020 003 250 | 2 X R0.3 | 3 | 25 | 60 | 4 | |
| 2COR 020 005 060 | 2 X R0.5 | 3 | 6 | 50 | 4 | |
| 2COR 020 005 100 | 2 X R0.5 | 3 | 10 | 50 | 4 | |
| 2COR 020 005 120 | 2 X R0.5 | 3 | 12 | 50 | 4 | |
| 2COR 020 005 140 | 2 X R0.5 | 3 | 14 | 50 | 4 | |
| 2COR 020 005 160 | 2 X R0.5 | 3 | 16 | 50 | 4 | |
| 2COR 020 005 200 | 2 X R0.5 | 3 | 20 | 50 | 4 | |
| 2COR 020 005 250 | 2 X R0.5 | 3 | 25 | 60 | 4 | |
| 2COR 025 001 060 | 2.5 X R0.1 | 3.5 | 6 | 50 | 4 | |
| 2COR 025 001 100 | 2.5 X R0.1 | 3.5 | 10 | 50 | 4 | |
| 2COR 025 001 120 | 2.5 X R0.1 | 3.5 | 12 | 50 | 4 | |
| 2COR 025 001 160 | 2.5 X R0.1 | 3.5 | 16 | 50 | 4 | |
| 2COR 025 001 200 | 2.5 X R0.1 | 3.5 | 20 | 50 | 4 | |
| 2COR 025 001 250 | 2.5 X R0.1 | 3.5 | 25 | 60 | 4 | |
| 2COR 025 002 060 | 2.5 X R0.2 | 3.5 | 6 | 50 | 4 | |
| 2COR 025 002 100 | 2.5 X R0.2 | 3.5 | 10 | 50 | 4 | |
| 2COR 025 002 120 | 2.5 X R0.2 | 3.5 | 12 | 50 | 4 | |
| 2COR 025 002 160 | 2.5 X R0.2 | 3.5 | 16 | 50 | 4 | |
| 2COR 025 002 200 | 2.5 X R0.2 | 3.5 | 20 | 50 | 4 | |
| 2COR 025 002 250 | 2.5 X R0.2 | 3.5 | 25 | 60 | 4 | |
| 2COR 025 003 060 | 2.5 X R0.3 | 3.5 | 6 | 50 | 4 | |
| 2COR 025 003 100 | 2.5 X R0.3 | 3.5 | 10 | 50 | 4 | |
| 2COR 025 003 120 | 2.5 X R0.3 | 3.5 | 12 | 50 | 4 | |
| 2COR 025 003 160 | 2.5 X R0.3 | 3.5 | 16 | 50 | 4 | |
| 2COR 025 003 200 | 2.5 X R0.3 | 3.5 | 20 | 50 | 4 | |
| 2COR 025 003 250 | 2.5 X R0.3 | 3.5 | 25 | 60 | 4 | |
| 2COR 025 005 060 | 2.5 X R0.5 | 3.5 | 6 | 50 | 4 | |
| 2COR 025 005 100 | 2.5 X R0.5 | 3.5 | 10 | 50 | 4 | |
| 2COR 025 005 120 | 2.5 X R0.5 | 3.5 | 12 | 50 | 4 | |
| 2COR 025 005 160 | 2.5 X R0.5 | 3.5 | 16 | 50 | 4 | |
| 2COR 025 005 200 | 2.5 X R0.5 | 3.5 | 20 | 50 | 4 | |
| 2COR 025 005 250 | 2.5 X R0.5 | 3.5 | 25 | 60 | 4 | |
| 2COR 030 001 100 | 3 X R0.1 | 4 | 10 | 55 | 6 | |
| 2COR 030 001 120 | 3 X R0.1 | 4 | 12 | 55 | 6 | |
| 2COR 030 001 160 | 3 X R0.1 | 4 | 16 | 55 | 6 | |
| 2COR 030 001 200 | 3 X R0.1 | 4 | 20 | 60 | 6 | |
| 2COR 030 001 250 | 3 X R0.1 | 4 | 25 | 65 | 6 | |
| 2COR 030 001 300 | 3 X R0.1 | 4 | 30 | 70 | 6 | |

## 2 Flutes Rib Corner Radius End Mills for Copper

# 2날 동가공용 리브 코너 레디우스 엔드밀



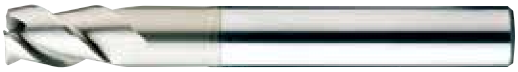
단위 : mm

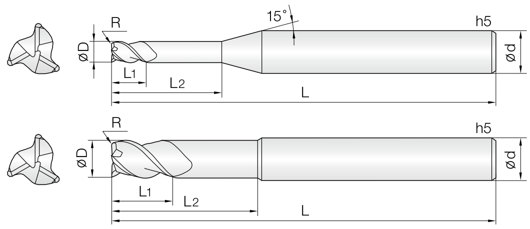
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2COR 030 001 350 | 3 X R0.1 | 4 | 35 | 75 | 6 | |
| 2COR 030 001 400 | 3 X R0.1 | 4 | 40 | 80 | 6 | |
| 2COR 030 002 100 | 3 X R0.2 | 4 | 10 | 55 | 6 | |
| 2COR 030 002 120 | 3 X R0.2 | 4 | 12 | 55 | 6 | |
| 2COR 030 002 160 | 3 X R0.2 | 4 | 16 | 55 | 6 | |
| 2COR 030 002 200 | 3 X R0.2 | 4 | 20 | 60 | 6 | |
| 2COR 030 002 250 | 3 X R0.2 | 4 | 25 | 65 | 6 | |
| 2COR 030 002 300 | 3 X R0.2 | 4 | 30 | 70 | 6 | |
| 2COR 030 002 350 | 3 X R0.2 | 4 | 35 | 75 | 6 | |
| 2COR 030 002 400 | 3 X R0.2 | 4 | 40 | 80 | 6 | |
| 2COR 030 003 100 | 3 X R0.3 | 4 | 10 | 55 | 6 | |
| 2COR 030 003 120 | 3 X R0.3 | 4 | 12 | 55 | 6 | |
| 2COR 030 003 160 | 3 X R0.3 | 4 | 16 | 55 | 6 | |
| 2COR 030 003 200 | 3 X R0.3 | 4 | 20 | 60 | 6 | |
| 2COR 030 003 250 | 3 X R0.3 | 4 | 25 | 65 | 6 | |
| 2COR 030 003 300 | 3 X R0.3 | 4 | 30 | 70 | 6 | |
| 2COR 030 003 350 | 3 X R0.3 | 4 | 35 | 75 | 6 | |
| 2COR 030 003 400 | 3 X R0.3 | 4 | 40 | 80 | 6 | |
| 2COR 030 005 100 | 3 X R0.5 | 4 | 10 | 55 | 6 | |
| 2COR 030 005 120 | 3 X R0.5 | 4 | 12 | 55 | 6 | |
| 2COR 030 005 160 | 3 X R0.5 | 4 | 16 | 55 | 6 | |
| 2COR 030 005 200 | 3 X R0.5 | 4 | 20 | 60 | 6 | |
| 2COR 030 005 250 | 3 X R0.5 | 4 | 25 | 65 | 6 | |
| 2COR 030 005 300 | 3 X R0.5 | 4 | 30 | 70 | 6 | |
| 2COR 030 005 350 | 3 X R0.5 | 4 | 35 | 75 | 6 | |
| 2COR 030 005 400 | 3 X R0.5 | 4 | 40 | 80 | 6 | |
| 2COR 030 010 100 | 3 X R1 | 4 | 10 | 55 | 6 | |
| 2COR 030 010 120 | 3 X R1 | 4 | 12 | 55 | 6 | |
| 2COR 030 010 160 | 3 X R1 | 4 | 16 | 55 | 6 | |
| 2COR 030 010 200 | 3 X R1 | 4 | 20 | 60 | 6 | |
| 2COR 030 010 250 | 3 X R1 | 4 | 25 | 65 | 6 | |
| 2COR 030 010 300 | 3 X R1 | 4 | 30 | 70 | 6 | |
| 2COR 030 010 350 | 3 X R1 | 4 | 35 | 75 | 6 | |
| 2COR 030 010 400 | 3 X R1 | 4 | 40 | 80 | 6 | |
| 2COR 040 001 120 | 4 X R0.1 | 5 | 12 | 55 | 6 | |
| 2COR 040 001 160 | 4 X R0.1 | 5 | 16 | 55 | 6 | |
| 2COR 040 001 200 | 4 X R0.1 | 5 | 20 | 60 | 6 | |
| 2COR 040 001 300 | 4 X R0.1 | 5 | 30 | 70 | 6 | |
| 2COR 040 001 400 | 4 X R0.1 | 5 | 40 | 80 | 6 | |
| 2COR 040 002 120 | 4 X R0.2 | 5 | 12 | 55 | 6 | |
| 2COR 040 002 160 | 4 X R0.2 | 5 | 16 | 55 | 6 | |
| 2COR 040 002 200 | 4 X R0.2 | 5 | 20 | 60 | 6 | |
| 2COR 040 002 300 | 4 X R0.2 | 5 | 30 | 70 | 6 | |
| 2COR 040 002 400 | 4 X R0.2 | 5 | 40 | 80 | 6 | |
| 2COR 040 003 120 | 4 X R0.3 | 5 | 12 | 55 | 6 | |
| 2COR 040 003 160 | 4 X R0.3 | 5 | 16 | 55 | 6 | |
| 2COR 040 003 200 | 4 X R0.3 | 5 | 20 | 60 | 6 | |
| 2COR 040 003 300 | 4 X R0.3 | 5 | 30 | 70 | 6 | |
| 2COR 040 003 400 | 4 X R0.3 | 5 | 40 | 80 | 6 | |
| 2COR 040 005 120 | 4 X R0.5 | 5 | 12 | 55 | 6 | |
| 2COR 040 005 160 | 4 X R0.5 | 5 | 16 | 55 | 6 | |
| 2COR 040 005 200 | 4 X R0.5 | 5 | 20 | 60 | 6 | |
| 2COR 040 005 300 | 4 X R0.5 | 5 | 30 | 70 | 6 | |
| 2COR 040 005 400 | 4 X R0.5 | 5 | 40 | 80 | 6 | |
| 2COR 040 010 120 | 4 X R1 | 5 | 12 | 55 | 6 | |
| 2COR 040 010 160 | 4 X R1 | 5 | 16 | 55 | 6 | |
| 2COR 040 010 200 | 4 X R1 | 5 | 20 | 60 | 6 | |
| 2COR 040 010 300 | 4 X R1 | 5 | 30 | 70 | 6 | |
| 2COR 040 010 400 | 4 X R1 | 5 | 40 | 80 | 6 | |
| 2COR 060 001 200 | 6 X R0.1 | 7 | 20 | 60 | 6 | |
| 2COR 060 002 200 | 6 X R0.2 | 7 | 20 | 60 | 6 | |
| 2COR 060 003 200 | 6 X R0.3 | 7 | 20 | 60 | 6 | |
| 2COR 060 005 200 | 6 X R0.5 | 7 | 20 | 60 | 6 | |
| 2COR 060 010 200 | 6 X R1 | 7 | 20 | 60 | 6 | |
| 2COR 060 015 200 | 6 X R1.5 | 7 | 20 | 60 | 6 | |
| 2COR 080 005 250 | 8 X R0.5 | 9 | 25 | 65 | 8 | |
| 2COR 080 010 250 | 8 X R1 | 9 | 25 | 65 | 8 | |
| 2COR 080 015 250 | 8 X R1.5 | 9 | 25 | 65 | 8 | |
| 2COR 100 005 320 | 10 X R0.5 | 11 | 32 | 70 | 10 | |
| 2COR 100 010 320 | 10 X R1 | 11 | 32 | 70 | 10 | |
| 2COR 100 015 320 | 10 X R1.5 | 11 | 32 | 70 | 10 | |
| 2COR 120 005 380 | 12 X R0.5 | 12 | 38 | 80 | 12 | |
| 2COR 120 010 380 | 12 X R1 | 12 | 38 | 80 | 12 | |
| 2COR 120 015 380 | 12 X R1.5 | 12 | 38 | 80 | 12 | |

# 3COR

## 3 Flutes 45˚Helix Rib Corner Radius End Mills for Copper

## 3날 45˚헬릭스 동가공용 리브 코너 레디우스 엔드밀






- **동 및 동합금, 알루미늄 합금, 비철합금 가공용 엔드밀**
- JCRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 피삭재의 면조도가 향상됩니다.
- 3날 45˚헬릭스 형상과 깊은 포켓으로 설계하여 칩배출이 원활하며, 고속,고이송 작업에 적합합니다.
- 항절력이 높은 미립자 초경합금 (0.5㎛)을 채택, 엔드밀의 파손을 최소화.

- **Endmills for copper, copper alloys, non-ferrous and non-metallic materials**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- High speed, feed applicable by 3 flute 45˚degree helix and deep chip pocket design.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

3 | WC 미립자 | JCRO Coating | R ± 0.005 (R0.1 ~ 0.5) | R ± 0.01 (R1) | 45° Helix Angle | CUTTING DATA 490P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 25 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø3 ~ 12 | -0.005 ~ -0.015mm |
| | Ø12.1 ~ 25 | -0.01 ~ -0.02mm |

단위 : mm

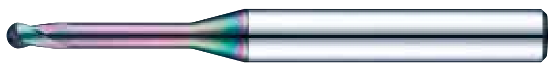
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 3COR 010 001 030 | 1 X R0.1 | 1.5 | 3 | 45 | 4 | |
| 3COR 010 001 060 | 1 X R0.1 | 1.5 | 6 | 45 | 4 | |
| 3COR 010 001 100 | 1 X R0.1 | 1.5 | 10 | 45 | 4 | |
| 3COR 010 002 030 | 1 X R0.2 | 1.5 | 3 | 45 | 4 | |
| 3COR 010 002 060 | 1 X R0.2 | 1.5 | 6 | 45 | 4 | |
| 3COR 010 002 100 | 1 X R0.2 | 1.5 | 10 | 45 | 4 | |
| 3COR 015 001 050 | 1.5 X R0.1 | 2 | 5 | 45 | 4 | |
| 3COR 015 001 080 | 1.5 X R0.1 | 2 | 8 | 45 | 4 | |
| 3COR 015 001 120 | 1.5 X R0.1 | 2 | 12 | 45 | 4 | |
| 3COR 015 002 050 | 1.5 X R0.2 | 2 | 5 | 45 | 4 | |
| 3COR 015 002 080 | 1.5 X R0.2 | 2 | 8 | 45 | 4 | |
| 3COR 015 002 120 | 1.5 X R0.2 | 2 | 12 | 45 | 4 | |
| 3COR 020 001 060 | 2 X R0.1 | 3 | 6 | 45 | 4 | |
| 3COR 020 001 100 | 2 X R0.1 | 3 | 10 | 45 | 4 | |
| 3COR 020 001 140 | 2 X R0.1 | 3 | 14 | 45 | 4 | |
| 3COR 020 002 060 | 2 X R0.2 | 3 | 6 | 45 | 4 | |
| 3COR 020 002 100 | 2 X R0.2 | 3 | 10 | 45 | 4 | |
| 3COR 020 002 140 | 2 X R0.2 | 3 | 14 | 45 | 4 | |
| 3COR 025 001 080 | 2.5 X R0.1 | 3.5 | 8 | 45 | 4 | |
| 3COR 025 001 120 | 2.5 X R0.1 | 3.5 | 12 | 45 | 4 | |
| 3COR 025 001 160 | 2.5 X R0.1 | 3.5 | 16 | 45 | 4 | |
| 3COR 025 002 080 | 2.5 X R0.2 | 3.5 | 8 | 45 | 4 | |
| 3COR 025 002 120 | 2.5 X R0.2 | 3.5 | 12 | 45 | 4 | |
| 3COR 025 002 160 | 2.5 X R0.2 | 3.5 | 16 | 45 | 4 | |
| 3COR 025 005 080 | 2.5 X R0.5 | 3.5 | 8 | 45 | 4 | |
| 3COR 025 005 120 | 2.5 X R0.5 | 3.5 | 12 | 45 | 4 | |
| 3COR 025 005 160 | 2.5 X R0.5 | 3.5 | 16 | 45 | 4 | |
| 3COR 030 002 100 | 3 X R0.2 | 4 | 10 | 50 | 4 | |
| New 3COR 030 002 120 | 3 X R0.2 | 4 | 12 | 50 | 4 | |
| 3COR 030 002 160 | 3 X R0.2 | 4 | 16 | 50 | 4 | |
| 3COR 030 002 200 | 3 X R0.2 | 4 | 20 | 50 | 4 | |
| 3COR 030 003 100 | 3 X R0.3 | 4 | 10 | 50 | 4 | |
| New 3COR 030 003 120 | 3 X R0.3 | 4 | 12 | 50 | 4 | |
| 3COR 030 003 160 | 3 X R0.3 | 4 | 16 | 50 | 4 | |
| 3COR 030 003 200 | 3 X R0.3 | 4 | 20 | 50 | 4 | |
| 3COR 030 005 100 | 3 X R0.5 | 4 | 10 | 50 | 4 | |
| New 3COR 030 005 120 | 3 X R0.5 | 4 | 12 | 50 | 4 | |
| 3COR 030 005 160 | 3 X R0.5 | 4 | 16 | 50 | 4 | |
| 3COR 030 005 200 | 3 X R0.5 | 4 | 20 | 50 | 4 | |
| 3COR 040 002 120 | 4 X R0.2 | 6 | 12 | 50 | 4 | |
| 3COR 040 002 160 | 4 X R0.2 | 6 | 16 | 50 | 4 | |
| 3COR 040 002 200 | 4 X R0.2 | 6 | 20 | 50 | 4 | |
| 3COR 040 003 120 | 4 X R0.3 | 6 | 12 | 50 | 4 | |
| 3COR 040 003 160 | 4 X R0.3 | 6 | 16 | 50 | 4 | |
| 3COR 040 003 200 | 4 X R0.3 | 6 | 20 | 50 | 4 | |
| 3COR 040 005 120 | 4 X R0.5 | 6 | 12 | 50 | 4 | |
| 3COR 040 005 160 | 4 X R0.5 | 6 | 16 | 50 | 4 | |
| 3COR 040 005 200 | 4 X R0.5 | 6 | 20 | 50 | 4 | |
| 3COR 060 003 200 | 6 X R0.3 | 9 | 20 | 55 | 6 | |
| 3COR 060 003 300 | 6 X R0.3 | 9 | 30 | 70 | 6 | |
| 3COR 060 005 200 | 6 X R0.5 | 9 | 20 | 55 | 6 | |
| 3COR 060 005 300 | 6 X R0.5 | 9 | 30 | 70 | 6 | |
| 3COR 060 010 200 | 6 X R1 | 9 | 20 | 55 | 6 | |
| 3COR 060 010 300 | 6 X R1 | 9 | 30 | 70 | 6 | |
| 3COR 080 003 S08 | 8 X R0.3 | 12 | 25 | 65 | 8 | |
| 3COR 080 005 S08 | 8 X R0.5 | 12 | 25 | 65 | 8 | |
| 3COR 080 010 S08 | 8 X R1 | 12 | 25 | 65 | 8 | |
| 3COR 100 005 S10 | 10 X R0.5 | 15 | 30 | 70 | 10 | |
| 3COR 100 010 S10 | 10 X R1 | 15 | 30 | 70 | 10 | |
| 3COR 120 005 S12 | 12 X R0.5 | 20 | 35 | 80 | 12 | |
| 3COR 120 010 S12 | 12 X R1 | 20 | 35 | 80 | 12 | |

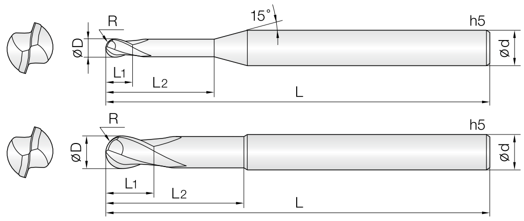
FOR COPPER

# 2DRB

## 2 Flutes R-TAC Coated Rib Ball End Mills for Non-Ferrous Metal

## 2날 비철 가공용 R-TAC코팅 리브 볼 엔드밀






- 알루미늄 및 알루미늄 합금, 동 및 동합금, 강화플라스틱(CFRP), 유리/탄소섬유 등 비철 비금속 계열의 다양한 피삭재 전용 엔드밀
- 코팅피막에 경도가 높고 마찰계수가 낮은 Tetrabond TAC코팅을 적용하여 내마모성이 우수하며, 피삭재의 표면조도가 월등히 우수합니다.
- 고정밀 공차 적용으로 초정밀가공에 적합합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을채택, 엔드밀의 파손을 최소화.

- Endmills for Aluminum, Aluminum alloys, copper, copper alloys, CFRP, glass/carbon fiber, non-ferrous and non-metallic materials
- Tetrabond TAC coating provides excellent work surface finish by high hardness and low friction.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.
- High precise edge tolerance.


0.05 ~ 2.5R　3 ~ 6R　491P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.1 | +0 ~ -0.005mm |
| | Ø0.2 ~ 12 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD =Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

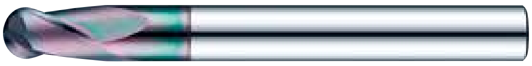
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2DRB 001 003 S04 | 0.05R X 0.1 | 0.3 | - | 45 | 4 | |
| 2DRB 002 005 S04 | 0.1R X 0.2 | 0.5 | - | 45 | 4 | |
| 2DRB 002 010 S04 | 0.1R X 0.2 | 0.2 | 1 | 45 | 4 | |
| 2DRB 002 015 S04 | 0.1R X 0.2 | 0.2 | 1.5 | 45 | 4 | |
| 2DRB 002 020 S04 | 0.1R X 0.2 | 0.2 | 2 | 45 | 4 | |
| 2DRB 003 010 S04 | 0.15R X 0.3 | 0.3 | 1 | 45 | 4 | |
| 2DRB 003 015 S04 | 0.15R X 0.3 | 0.3 | 1.5 | 45 | 4 | |
| 2DRB 003 020 S04 | 0.15R X 0.3 | 0.3 | 2 | 45 | 4 | |
| 2DRB 004 010 S04 | 0.2R X 0.4 | 0.4 | 1 | 45 | 4 | |
| 2DRB 004 020 S04 | 0.2R X 0.4 | 0.4 | 2 | 45 | 4 | |
| 2DRB 004 030 S04 | 0.2R X 0.4 | 0.4 | 3 | 45 | 4 | |
| 2DRB 004 040 S04 | 0.2R X 0.4 | 0.4 | 4 | 45 | 4 | |
| 2DRB 004 050 S04 | 0.2R X 0.4 | 0.4 | 5 | 45 | 4 | |
| 2DRB 005 020 S04 | 0.25R X 0.5 | 0.5 | 2 | 45 | 4 | |
| 2DRB 005 040 S04 | 0.25R X 0.5 | 0.5 | 4 | 45 | 4 | |
| 2DRB 005 060 S04 | 0.25R X 0.5 | 0.5 | 6 | 45 | 4 | |
| 2DRB 005 080 S04 | 0.25R X 0.5 | 0.5 | 8 | 45 | 4 | |
| 2DRB 005 100 S04 | 0.25R X 0.5 | 0.5 | 10 | 45 | 4 | |
| 2DRB 006 020 S04 | 0.3R X 0.6 | 0.6 | 2 | 45 | 4 | |
| New 2DRB 006 030 S04 | 0.3R X 0.6 | 0.6 | 3 | 45 | 4 | |
| 2DRB 006 040 S04 | 0.3R X 0.6 | 0.6 | 4 | 45 | 4 | |
| 2DRB 006 060 S04 | 0.3R X 0.6 | 0.6 | 6 | 45 | 4 | |
| 2DRB 006 080 S04 | 0.3R X 0.6 | 0.6 | 8 | 45 | 4 | |
| 2DRB 006 100 S04 | 0.3R X 0.6 | 0.6 | 10 | 45 | 4 | |
| 2DRB 008 020 S04 | 0.4R X 0.8 | 0.8 | 2 | 45 | 4 | |
| 2DRB 008 040 S04 | 0.4R X 0.8 | 0.8 | 4 | 45 | 4 | |
| 2DRB 008 060 S04 | 0.4R X 0.8 | 0.8 | 6 | 45 | 4 | |
| 2DRB 008 080 S04 | 0.4R X 0.8 | 0.8 | 8 | 45 | 4 | |
| 2DRB 008 100 S04 | 0.4R X 0.8 | 0.8 | 10 | 45 | 4 | |
| 2DRB 008 120 S04 | 0.4R X 0.8 | 0.8 | 12 | 45 | 4 | |
| 2DRB 010 040 S04 | 0.5R X 1 | 1 | 4 | 45 | 4 | |
| 2DRB 010 060 S04 | 0.5R X 1 | 1 | 6 | 45 | 4 | |
| 2DRB 010 080 S04 | 0.5R X 1 | 1 | 8 | 45 | 4 | |
| 2DRB 010 100 S04 | 0.5R X 1 | 1 | 10 | 45 | 4 | |
| 2DRB 010 120 S04 | 0.5R X 1 | 1 | 12 | 45 | 4 | |
| 2DRB 010 160 S04 | 0.5R X 1 | 1 | 16 | 50 | 4 | |
| 2DRB 015 060 S04 | 0.75R X 1.5 | 1.5 | 6 | 45 | 4 | |
| 2DRB 015 080 S04 | 0.75R X 1.5 | 1.5 | 8 | 45 | 4 | |
| 2DRB 015 100 S04 | 0.75R X 1.5 | 1.5 | 10 | 45 | 4 | |
| 2DRB 015 120 S04 | 0.75R X 1.5 | 1.5 | 12 | 45 | 4 | |
| 2DRB 015 160 S04 | 0.75R X 1.5 | 1.5 | 16 | 50 | 4 | |
| 2DRB 015 200 S04 | 0.75R X 1.5 | 1.5 | 20 | 50 | 4 | |
| 2DRB 020 060 S04 | 1R X 2 | 3 | 6 | 45 | 4 | |
| 2DRB 020 080 S04 | 1R X 2 | 3 | 8 | 45 | 4 | |
| 2DRB 020 100 S04 | 1R X 2 | 3 | 10 | 45 | 4 | |
| 2DRB 020 120 S04 | 1R X 2 | 3 | 12 | 45 | 4 | |
| 2DRB 020 160 S04 | 1R X 2 | 3 | 16 | 50 | 4 | |
| 2DRB 020 200 S04 | 1R X 2 | 3 | 20 | 50 | 4 | |
| 2DRB 020 250 S04 | 1R X 2 | 3 | 25 | 60 | 4 | |
| 2DRB 020 300 S04 | 1R X 2 | 3 | 30 | 70 | 4 | |

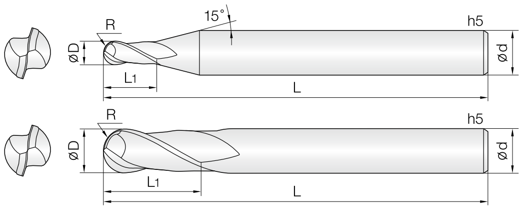
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2DRB 030 120 S06 | 1.5R X 3 | 4 | 12 | 50 | 6 | |
| 2DRB 030 160 S06 | 1.5R X 3 | 4 | 16 | 60 | 6 | |
| 2DRB 030 200 S06 | 1.5R X 3 | 4 | 20 | 60 | 6 | |
| 2DRB 030 250 S06 | 1.5R X 3 | 4 | 25 | 65 | 6 | |
| 2DRB 030 300 S06 | 1.5R X 3 | 4 | 30 | 70 | 6 | |
| 2DRB 030 400 S06 | 1.5R X 3 | 4 | 40 | 80 | 6 | |
| 2DRB 040 120 S06 | 2R X 4 | 5 | 12 | 50 | 6 | |
| 2DRB 040 160 S06 | 2R X 4 | 5 | 16 | 60 | 6 | |
| 2DRB 040 200 S06 | 2R X 4 | 5 | 20 | 60 | 6 | |
| 2DRB 040 250 S06 | 2R X 4 | 5 | 25 | 65 | 6 | |
| 2DRB 040 300 S06 | 2R X 4 | 5 | 30 | 70 | 6 | |
| 2DRB 050 200 S06 | 2.5R X 5 | 6 | 20 | 60 | 6 | |
| 2DRB 050 400 S06 | 2.5R X 5 | 6 | 40 | 80 | 6 | |
| 2DRB 060 200 S06 | 3R X 6 | 8 | 20 | 60 | 6 | |
| 2DRB 060 300 S06 | 3R X 6 | 8 | 30 | 90 | 6 | |
| 2DRB 080 200 S08 | 4R X 8 | 10 | 20 | 70 | 8 | |
| 2DRB 100 250 S10 | 5R X 10 | 12 | 25 | 80 | 10 | |
| 2DRB 120 250 S12 | 6R X 12 | 14 | 25 | 80 | 12 | |

# 2DLB

## 2 Flutes R-TAC Coated Ball End Mills for Non-Ferrous Metal

## 2날 비철 가공용 R-TAC코팅 볼 엔드밀






- **알루미늄 및 알루미늄 합금, 동 및 동합금, 강화플라스틱(CFRP), 유리/탄소섬유 등 비철 비금속 계열의 다양한 피삭재 전용 엔드밀**
- 코팅피막에 경도가 높고 마찰계수가 낮은 Tetrabond TAC코팅을 적용하여 내마모성이 우수하며, 피삭재의 표면조도가 월등히 우수합니다.
- 고정밀 공차 적용으로 초정밀가공에 적합합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을채택, 엔드밀의 파손을 최소화.

- **Endmills for Aluminum, Aluminum alloys, copper, copper alloys, CFRP, glass/carbon fiber, non-ferrous and non-metallic materials**
- Tetrabond TAC coating provides excellent work surface finish by high hardness and low friction.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.
- High precise edge tolerance.

2 | WC 미립자 | RTAC Coating | R ± 0.005 | R ± 0.01 | 30° Helix Angle | CUTTING DATA

0.1 ~ 2.5R | 3 ~ 6R | 491P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.2 ~ 12 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DLB 002 004 S04 | 0.1R X 0.2 | 0.4 | 45 | 4 | |
| 2DLB 003 006 S04 | 0.15R X 0.3 | 0.6 | 45 | 4 | |
| 2DLB 004 008 S04 | 0.2R X 0.4 | 0.8 | 45 | 4 | |
| 2DLB 005 010 S04 | 0.25R X 0.5 | 1 | 45 | 4 | |
| 2DLB 006 012 S04 | 0.3R X 0.6 | 1.2 | 45 | 4 | |
| 2DLB 008 020 S04 | 0.4R X 0.8 | 2 | 50 | 4 | |
| 2DLB 010 025 S04 | 0.5R X 1 | 2.5 | 50 | 4 | |
| 2DLB 012 030 S04 | 0.6R X 1.2 | 3 | 50 | 4 | |
| 2DLB 015 040 S04 | 0.75R X 1.5 | 4 | 50 | 4 | |
| 2DLB 020 050 S04 | 1R X 2 | 5 | 50 | 4 | |
| 2DLB 025 060 S04 | 1.25R X 2.5 | 6 | 50 | 4 | |
| 2DLB 030 080 S06 | 1.5R X 3 | 8 | 60 | 6 | |
| 2DLB 040 080 S06 | 2R X 4 | 8 | 70 | 6 | |
| 2DLB 050 100 S06 | 2.5R X 5 | 10 | 80 | 6 | |
| 2DLB 060 120 090 | 3R X 6 | 12 | 90 | 6 | |
| 2DLB 080 140 100 | 4R X 8 | 14 | 100 | 8 | |
| 2DLB 100 180 100 | 5R X 10 | 18 | 100 | 10 | |
| 2DLB 120 220 110 | 6R X 12 | 22 | 110 | 12 | |

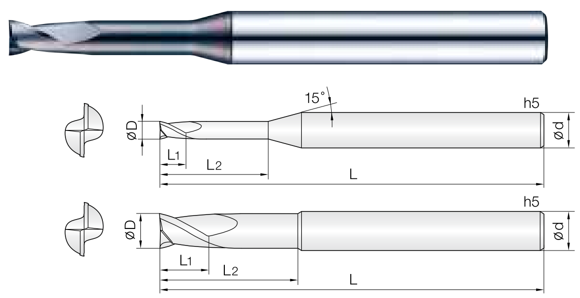
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

R-TAC

# 2DRE

## 2 Flutes R-TAC Coated Rib End Mills for Non-Ferrous Metal

## 2날비철가공용 R-TAC코팅 리브 엔드밀




- **알루미늄 및 알루미늄 합금, 동 및 동합금, 강화플라스틱(CFRP), 유리/탄소섬유 등 비철 비금속 계열의 다양한 피삭재 전용 엔드밀**
- 코팅피막에 경도가 높고 마찰계수가 낮은 Tetrabond TAC코팅을 적용하여 내마모성이 우수하며, 피삭재의 표면조도가 월등히 우수합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 고정밀 공차 적용으로 초정밀가공에 적합합니다.

- **Endmills for Aluminum, Aluminum alloys, copper, copper alloys, CFRP, glass/carbon fiber, non-ferrous and non-metallic materials**
- Tetrabond TAC coating provides excellent work surface finish by high hardness and low friction.
- Reinforced edge design for preventing edge chipping.
- High precise edge tolerance.

2 | WC 미립자 | RTAC Coating | 30° Helix Angle | Sharp Edge | CUTTING DATA 492P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø0.1 ~ 6 | +0 ~ -0.01mm | ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø6 ~ 12 | +0 ~ -0.015mm | | Ø8 ~ 12 | -0.01 ~ -0.025mm |

단위 : mm

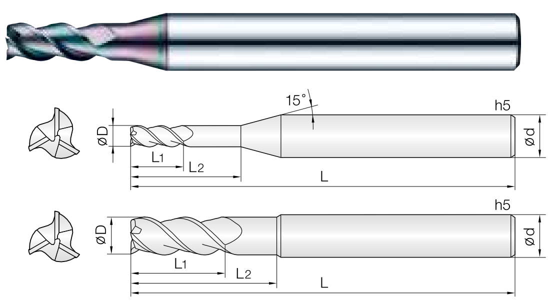
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2DRE 001 003 S04 | 0.1 | 0.3 | - | 45 | 4 | |
| 2DRE 001 005 S04 | 0.1 | 0.5 | - | 45 | 4 | |
| New 2DRE 0015 005 S04 | 0.15 | 0.5 | - | 45 | 4 | |
| New 2DRE 0015 010 S04 | 0.15 | 0.3 | 1 | 45 | 4 | |
| 2DRE 002 005 S04 | 0.2 | 0.5 | - | 45 | 4 | |
| 2DRE 002 010 S04 | 0.2 | 0.3 | 1 | 45 | 4 | |
| 2DRE 002 015 S04 | 0.2 | 0.3 | 1.5 | 45 | 4 | |
| 2DRE 002 020 S04 | 0.2 | 0.3 | 2 | 45 | 4 | |
| 2DRE 003 010 S04 | 0.3 | 0.5 | 1 | 45 | 4 | |
| 2DRE 003 015 S04 | 0.3 | 0.5 | 1.5 | 45 | 4 | |
| 2DRE 003 020 S04 | 0.3 | 0.5 | 2 | 45 | 4 | |
| 2DRE 004 010 S04 | 0.4 | 0.6 | 1 | 45 | 4 | |
| 2DRE 004 020 S04 | 0.4 | 0.6 | 2 | 45 | 4 | |
| 2DRE 004 030 S04 | 0.4 | 0.6 | 3 | 45 | 4 | |
| 2DRE 004 040 S04 | 0.4 | 0.6 | 4 | 45 | 4 | |
| 2DRE 004 050 S04 | 0.4 | 0.6 | 5 | 45 | 4 | |
| 2DRE 005 020 S04 | 0.5 | 0.7 | 2 | 45 | 4 | |
| 2DRE 005 040 S04 | 0.5 | 0.7 | 4 | 45 | 4 | |
| 2DRE 005 060 S04 | 0.5 | 0.7 | 6 | 45 | 4 | |
| 2DRE 005 080 S04 | 0.5 | 0.7 | 8 | 45 | 4 | |
| 2DRE 005 100 S04 | 0.5 | 0.7 | 10 | 45 | 4 | |
| 2DRE 006 020 S04 | 0.6 | 0.9 | 2 | 45 | 4 | |
| 2DRE 006 040 S04 | 0.6 | 0.9 | 4 | 45 | 4 | |
| 2DRE 006 060 S04 | 0.6 | 0.9 | 6 | 45 | 4 | |
| 2DRE 006 080 S04 | 0.6 | 0.9 | 8 | 45 | 4 | |
| 2DRE 006 100 S04 | 0.6 | 0.9 | 10 | 45 | 4 | |
| 2DRE 008 020 S04 | 0.8 | 1.2 | 2 | 45 | 4 | |
| 2DRE 008 040 S04 | 0.8 | 1.2 | 4 | 45 | 4 | |
| 2DRE 008 060 S04 | 0.8 | 1.2 | 6 | 45 | 4 | |
| 2DRE 008 080 S04 | 0.8 | 1.2 | 8 | 45 | 4 | |
| 2DRE 008 100 S04 | 0.8 | 1.2 | 10 | 45 | 4 | |
| 2DRE 008 120 S04 | 0.8 | 1.2 | 12 | 45 | 4 | |
| 2DRE 010 040 S04 | 1 | 1.5 | 4 | 45 | 4 | |
| 2DRE 010 060 S04 | 1 | 1.5 | 6 | 45 | 4 | |
| 2DRE 010 080 S04 | 1 | 1.5 | 8 | 45 | 4 | |
| 2DRE 010 100 S04 | 1 | 1.5 | 10 | 45 | 4 | |
| 2DRE 010 120 S04 | 1 | 1.5 | 12 | 45 | 4 | |
| 2DRE 010 160 S04 | 1 | 1.5 | 16 | 50 | 4 | |
| 2DRE 015 060 S04 | 1.5 | 2.3 | 6 | 45 | 4 | |
| 2DRE 015 080 S04 | 1.5 | 2.3 | 8 | 45 | 4 | |
| 2DRE 015 100 S04 | 1.5 | 2.3 | 10 | 45 | 4 | |
| 2DRE 015 120 S04 | 1.5 | 2.3 | 12 | 45 | 4 | |
| 2DRE 015 160 S04 | 1.5 | 2.3 | 16 | 50 | 4 | |
| 2DRE 015 200 S04 | 1.5 | 2.3 | 20 | 50 | 4 | |
| 2DRE 020 060 S04 | 2 | 3 | 6 | 45 | 4 | |
| 2DRE 020 080 S04 | 2 | 3 | 8 | 45 | 4 | |
| 2DRE 020 100 S04 | 2 | 3 | 10 | 45 | 4 | |
| 2DRE 020 120 S04 | 2 | 3 | 12 | 45 | 4 | |
| 2DRE 020 160 S04 | 2 | 3 | 16 | 50 | 4 | |
| 2DRE 020 200 S04 | 2 | 3 | 20 | 50 | 4 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2DRE 030 120 S06 | 3 | 4.5 | 12 | 50 | 6 | |
| 2DRE 030 160 S06 | 3 | 4.5 | 16 | 60 | 6 | |
| 2DRE 030 200 S06 | 3 | 4.5 | 20 | 60 | 6 | |
| 2DRE 030 250 S06 | 3 | 4.5 | 25 | 65 | 6 | |
| 2DRE 030 300 S06 | 3 | 4.5 | 30 | 70 | 6 | |
| 2DRE 030 400 S06 | 3 | 4.5 | 40 | 80 | 6 | |
| 2DRE 040 120 S06 | 4 | 6 | 12 | 50 | 6 | |
| 2DRE 040 160 S06 | 4 | 6 | 16 | 60 | 6 | |
| 2DRE 040 200 S06 | 4 | 6 | 20 | 60 | 6 | |
| 2DRE 040 250 S06 | 4 | 6 | 25 | 65 | 6 | |
| 2DRE 040 300 S06 | 4 | 6 | 30 | 70 | 6 | |
| 2DRE 040 400 S06 | 4 | 6 | 40 | 80 | 6 | |
| 2DRE 050 200 S06 | 5 | 6 | 20 | 60 | 6 | |
| 2DRE 050 400 S06 | 5 | 6 | 40 | 80 | 6 | |
| 2DRE 060 200 S06 | 6 | 8 | 20 | 60 | 6 | |
| 2DRE 060 300 S06 | 6 | 8 | 30 | 90 | 6 | |
| 2DRE 080 200 S08 | 8 | 12 | 20 | 70 | 8 | |
| 2DRE 100 250 S10 | 10 | 15 | 25 | 80 | 10 | |
| 2DRE 120 300 S12 | 12 | 18 | 30 | 80 | 12 | |

# 3DRE

3 Flutes 45˚Helix R-TAC Coated Rib End Mills for Non-Ferrous Metal

## 3날 45˚헬릭스 비철 가공용 R-TAC코팅 리브 엔드밀




- **알루미늄 및 알루미늄 합금, 동 및 동합금, 강화플라스틱(CFRP), 유리/탄소섬유 등 비철 비금속 계열의 다양한 피삭재 전용 엔드밀**
- 코팅 피막에 경도가 높고 마찰계수가 낮은 Tetrabond TAC코팅을 적용하여 내마모성이 우수하며, 피삭재의 표면조도가 월등히 우수합니다.
- 3날45˚헬릭스 형상과 깊은 포켓으로 설계하여 칩배출이 원활하며, 고속,고이송 작업에 적합합니다.

- **Endmills for Aluminum, Aluminum alloys, copper, copper alloys, CFRP, glass/carbon fiber, non-ferrous and non-metallic materials**
- Tetrabond TAC coating provides excellent work surface finish by high hardness and low friction.
- High speed, feed applicable by 3 flute 45˚degree helix and deep chip pocket design.

3 | WC 미립자 | RTAC Coating | 45° Helix Angle | Sharp Edge | CUTTING DATA 492P

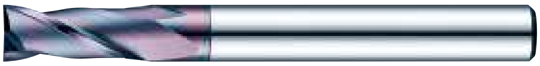
| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| øD ≠ ød | ø1 ~ 6 | +0 ~ -0.01mm | øD = ød | ø6 | -0.005 ~ -0.015mm |
| | ø8 ~ 12 | +0 ~ -0.015mm | | ø8 ~ 12 | -0.01 ~ -0.025mm |

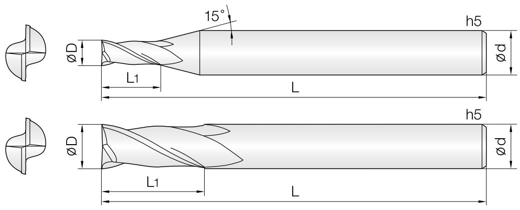
단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 3DRE 010 030 S04 | 1 | 2 | 3 | 50 | 4 | |
| 3DRE 015 045 S04 | 1.5 | 3 | 4.5 | 50 | 4 | |
| 3DRE 020 060 S04 | 2 | 4 | 6 | 50 | 4 | |
| 3DRE 025 075 S04 | 2.5 | 5 | 7.5 | 50 | 4 | |
| 3DRE 030 090 S06 | 3 | 6 | 9 | 60 | 6 | |
| 3DRE 040 120 S06 | 4 | 9 | 12 | 60 | 6 | |
| 3DRE 050 150 S06 | 5 | 10 | 15 | 70 | 6 | |
| 3DRE 060 180 S06 | 6 | 12 | 18 | 70 | 6 | |
| 3DRE 080 240 S08 | 8 | 16 | 24 | 80 | 8 | |
| 3DRE 100 300 S10 | 10 | 20 | 30 | 90 | 10 | |
| 3DRE 120 360 S12 | 12 | 24 | 36 | 100 | 12 | |

## 2 Flutes R-TAC Coated End Mills for Non-Ferrous Metal

# 2날 비철 가공용 R-TAC코팅 엔드밀



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- 코팅 피막에 경도가 높고 마찰계수가 낮은 Tetrabond TAC코팅을 적용하여 내마모성이 우수하며, 피삭재의 표면조도가 월등히 우수합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 고정밀 공차 적용으로 초정밀가공에 적합합니다.

- **Endmills for Aluminum, Aluminum alloys, copper, copper alloys, CFRP, glass/carbon fiber, non-ferrous and non-metallic materials**
- Tetrabond TAC coating provides excellent work surface finish by high hardness and low friction.
- Reinforced edge design for preventing edge chipping.
- High precise edge tolerance.


Sharp Edge 492P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.4 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 12 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |

단위 : mm

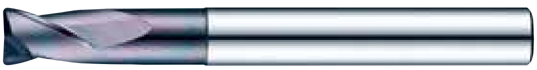
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DLE 004 008 S04 | 0.4 | 0.8 | 45 | 4 | |
| 2DLE 005 010 S04 | 0.5 | 1 | 45 | 4 | |
| 2DLE 006 012 S04 | 0.6 | 1.2 | 45 | 4 | |
| 2DLE 007 014 S04 | 0.7 | 1.4 | 45 | 4 | |
| 2DLE 008 016 S04 | 0.8 | 1.6 | 45 | 4 | |
| 2DLE 010 025 S04 | 1 | 2.5 | 45 | 4 | |
| 2DLE 010 040 S04 | 1 | 4 | 45 | 4 | |
| 2DLE 012 040 S04 | 1.2 | 4 | 45 | 4 | |
| 2DLE 015 040 S04 | 1.5 | 4 | 45 | 4 | |
| 2DLE 020 060 S04 | 2 | 6 | 45 | 4 | |
| 2DLE 020 080 S04 | 2 | 8 | 45 | 4 | |
| 2DLE 025 080 S04 | 2.5 | 8 | 50 | 4 | |
| 2DLE 030 100 S06 | 3 | 10 | 50 | 6 | |
| 2DLE 030 120 S06 | 3 | 12 | 50 | 6 | |
| 2DLE 035 100 S06 | 3.5 | 10 | 50 | 6 | |
| 2DLE 040 120 S06 | 4 | 12 | 60 | 6 | |
| 2DLE 050 150 S06 | 5 | 15 | 60 | 6 | |
| 2DLE 060 150 S06 | 6 | 15 | 60 | 6 | |
| 2DLE 060 240 S06 | 6 | 24 | 60 | 6 | |
| 2DLE 080 200 S08 | 8 | 20 | 65 | 8 | |
| 2DLE 100 250 S10 | 10 | 25 | 70 | 10 | |
| 2DLE 120 300 S12 | 12 | 30 | 80 | 12 | |

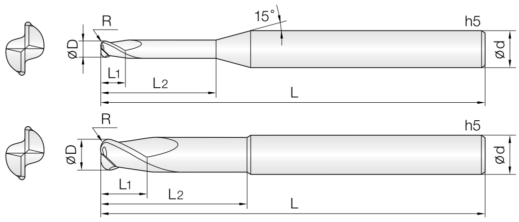
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 2DLC

2 Flutes R-TAC Coated Coner Radius End Mills for Non-Ferrous Metal

## 2날 비철 가공용 R-TAC코팅 코너 레디우스 엔드밀






- **알루미늄 및 알루미늄 합금, 동 및 동합금, 강화플라스틱(CFRP), 유리/탄소섬유 등 비철 비금속 계열의 다양한 피삭재 전용 엔드밀**
- 코팅피막에 경도가 높고 마찰계수가 낮은 Tetrabond TAC코팅을 적용하여 내마모성이 우수하며, 피삭재의 표면조도가 월등히 우수합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 안정적인 고정밀 공차 적용으로 초정밀가공에 적합합니다.

- **Endmills for Aluminum, Aluminum alloys, copper, copper alloys, CFRP, glass/carbon fiber, non-ferrous and non-metallic materials.**
- Tetrabond TAC coating provides excellent work surface finish by high hardness and low friction.
- Reinforced edge design for preventing edge chipping.
- High precise edge tolerance.

2 | WC 미립자 | RTAC Coating | R ± 0.005 | R ± 0.01 | 30° Helix Angle | CUTTING DATA

R0.1 ~ 0.5 | R1 | 493P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø0.2 ~ 12 | +0 ~ -0.01mm | ØD = Ød | Ø6 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| New 2DLC 002 0002 005 | 0.2 X R0.02 | 0.3 | 0.5 | 45 | 4 | |
| New 2DLC 002 0002 010 | 0.2 X R0.02 | 0.3 | 1 | 45 | 4 | |
| New 2DLC 002 0002 015 | 0.2 X R0.02 | 0.3 | 1.5 | 45 | 4 | |
| New 2DLC 002 0005 005 | 0.2 X R0.05 | 0.3 | 0.5 | 45 | 4 | |
| New 2DLC 002 0005 010 | 0.2 X R0.05 | 0.3 | 1 | 45 | 4 | |
| New 2DLC 002 0005 015 | 0.2 X R0.05 | 0.3 | 1.5 | 45 | 4 | |
| New 2DLC 003 0002 010 | 0.3 X R0.02 | 0.5 | 1 | 45 | 4 | |
| New 2DLC 003 0002 015 | 0.3 X R0.02 | 0.5 | 1.5 | 45 | 4 | |
| New 2DLC 003 0002 020 | 0.3 X R0.02 | 0.5 | 2 | 45 | 4 | |
| New 2DLC 003 0005 010 | 0.3 X R0.05 | 0.5 | 1 | 45 | 4 | |
| New 2DLC 003 0005 015 | 0.3 X R0.05 | 0.5 | 1.5 | 45 | 4 | |
| New 2DLC 003 0005 020 | 0.3 X R0.05 | 0.5 | 2 | 45 | 4 | |
| New 2DLC 004 0002 010 | 0.4 X R0.02 | 0.6 | 1 | 45 | 4 | |
| New 2DLC 004 0002 020 | 0.4 X R0.02 | 0.6 | 2 | 45 | 4 | |
| New 2DLC 004 0002 030 | 0.4 X R0.02 | 0.6 | 3 | 45 | 4 | |
| New 2DLC 004 0002 040 | 0.4 X R0.02 | 0.6 | 4 | 45 | 4 | |
| New 2DLC 004 0005 010 | 0.4 X R0.05 | 0.6 | 1 | 45 | 4 | |
| New 2DLC 004 0005 020 | 0.4 X R0.05 | 0.6 | 2 | 45 | 4 | |
| New 2DLC 004 0005 030 | 0.4 X R0.05 | 0.6 | 3 | 45 | 4 | |
| New 2DLC 004 0005 040 | 0.4 X R0.05 | 0.6 | 4 | 45 | 4 | |
| New 2DLC 004 001 010 | 0.4 X R0.1 | 0.6 | 1 | 45 | 4 | |
| New 2DLC 004 001 020 | 0.4 X R0.1 | 0.6 | 2 | 45 | 4 | |
| New 2DLC 004 001 030 | 0.4 X R0.1 | 0.6 | 3 | 45 | 4 | |
| New 2DLC 004 001 040 | 0.4 X R0.1 | 0.6 | 4 | 45 | 4 | |
| New 2DLC 005 0002 020 | 0.5 X R0.02 | 0.8 | 2 | 45 | 4 | |
| New 2DLC 005 0002 030 | 0.5 X R0.02 | 0.8 | 3 | 45 | 4 | |
| New 2DLC 005 0002 040 | 0.5 X R0.02 | 0.8 | 4 | 45 | 4 | |
| New 2DLC 005 0002 050 | 0.5 X R0.02 | 0.8 | 5 | 45 | 4 | |
| New 2DLC 005 0005 020 | 0.5 X R0.05 | 0.8 | 2 | 45 | 4 | |
| New 2DLC 005 0005 030 | 0.5 X R0.05 | 0.8 | 3 | 45 | 4 | |
| New 2DLC 005 0005 040 | 0.5 X R0.05 | 0.8 | 4 | 45 | 4 | |
| New 2DLC 005 0005 050 | 0.5 X R0.05 | 0.8 | 5 | 45 | 4 | |
| New 2DLC 005 001 020 | 0.5 X R0.1 | 0.8 | 2 | 45 | 4 | |
| New 2DLC 005 001 030 | 0.5 X R0.1 | 0.8 | 3 | 45 | 4 | |
| New 2DLC 005 001 040 | 0.5 X R0.1 | 0.8 | 4 | 45 | 4 | |
| New 2DLC 005 001 050 | 0.5 X R0.1 | 0.8 | 5 | 45 | 4 | |
| New 2DLC 006 0002 020 | 0.6 X R0.02 | 1 | 2 | 45 | 4 | |
| New 2DLC 006 0002 030 | 0.6 X R0.02 | 1 | 3 | 45 | 4 | |
| New 2DLC 006 0002 040 | 0.6 X R0.02 | 1 | 4 | 45 | 4 | |
| New 2DLC 006 0002 060 | 0.6 X R0.02 | 1 | 6 | 45 | 4 | |
| New 2DLC 006 0005 020 | 0.6 X R0.05 | 1 | 2 | 45 | 4 | |
| New 2DLC 006 0005 030 | 0.6 X R0.05 | 1 | 3 | 45 | 4 | |
| New 2DLC 006 0005 040 | 0.6 X R0.05 | 1 | 4 | 45 | 4 | |
| New 2DLC 006 0005 060 | 0.6 X R0.05 | 1 | 6 | 45 | 4 | |
| New 2DLC 006 001 020 | 0.6 X R0.1 | 1 | 2 | 45 | 4 | |
| New 2DLC 006 001 030 | 0.6 X R0.1 | 1 | 3 | 45 | 4 | |
| New 2DLC 006 001 040 | 0.6 X R0.1 | 1 | 4 | 45 | 4 | |
| New 2DLC 006 001 060 | 0.6 X R0.1 | 1 | 6 | 45 | 4 | |
| New 2DLC 008 0002 040 | 0.8 X R0.02 | 1.2 | 4 | 45 | 4 | |
| New 2DLC 008 0002 060 | 0.8 X R0.02 | 1.2 | 6 | 45 | 4 | |
| New 2DLC 008 0002 080 | 0.8 X R0.02 | 1.2 | 8 | 45 | 4 | |
| New 2DLC 008 0005 040 | 0.8 X R0.05 | 1.2 | 4 | 45 | 4 | |
| New 2DLC 008 0005 060 | 0.8 X R0.05 | 1.2 | 6 | 45 | 4 | |
| New 2DLC 008 0005 080 | 0.8 X R0.05 | 1.2 | 8 | 45 | 4 | |
| New 2DLC 008 001 040 | 0.8 X R0.1 | 1.2 | 4 | 45 | 4 | |
| New 2DLC 008 001 060 | 0.8 X R0.1 | 1.2 | 6 | 45 | 4 | |
| New 2DLC 008 001 080 | 0.8 X R0.1 | 1.2 | 8 | 45 | 4 | |
| New 2DLC 010 0005 040 | 1 X R0.05 | 1.5 | 4 | 45 | 4 | |
| New 2DLC 010 0005 060 | 1 X R0.05 | 1.5 | 6 | 45 | 4 | |
| New 2DLC 010 0005 080 | 1 X R0.05 | 1.5 | 8 | 45 | 4 | |
| New 2DLC 010 0005 100 | 1 X R0.05 | 1.5 | 10 | 45 | 4 | |
| 2DLC 010 001 040 | 1 X R0.1 | 1.5 | 4 | 45 | 4 | |
| 2DLC 010 001 060 | 1 X R0.1 | 1.5 | 6 | 45 | 4 | |
| 2DLC 010 001 080 | 1 X R0.1 | 1.5 | 8 | 45 | 4 | |
| 2DLC 010 001 100 | 1 X R0.1 | 1.5 | 10 | 45 | 4 | |
| 2DLC 010 002 040 | 1 X R0.2 | 1.5 | 4 | 45 | 4 | |
| 2DLC 010 002 060 | 1 X R0.2 | 1.5 | 6 | 45 | 4 | |
| 2DLC 010 002 080 | 1 X R0.2 | 1.5 | 8 | 45 | 4 | |
| 2DLC 010 002 100 | 1 X R0.2 | 1.5 | 10 | 45 | 4 | |
| 2DLC 015 001 060 | 1.5 X R0.1 | 2.3 | 6 | 45 | 4 | |
| 2DLC 015 001 080 | 1.5 X R0.1 | 2.3 | 8 | 45 | 4 | |
| 2DLC 015 001 100 | 1.5 X R0.1 | 2.3 | 10 | 45 | 4 | |
| 2DLC 015 001 120 | 1.5 X R0.1 | 2.3 | 12 | 50 | 4 | |
| 2DLC 015 002 060 | 1.5 X R0.2 | 2.3 | 6 | 45 | 4 | |
| 2DLC 015 002 080 | 1.5 X R0.2 | 2.3 | 8 | 45 | 4 | |
| 2DLC 015 002 100 | 1.5 X R0.2 | 2.3 | 10 | 45 | 4 | |
| 2DLC 015 002 120 | 1.5 X R0.2 | 2.3 | 12 | 50 | 4 | |
| New 2DLC 020 001 080 | 2 X R0.1 | 3 | 8 | 45 | 4 | |
| New 2DLC 020 001 100 | 2 X R0.1 | 3 | 10 | 45 | 4 | |
| New 2DLC 020 001 120 | 2 X R0.1 | 3 | 12 | 50 | 4 | |
| New 2DLC 020 001 160 | 2 X R0.1 | 3 | 16 | 50 | 4 | |
| 2DLC 020 002 080 | 2 X R0.2 | 3 | 8 | 45 | 4 | |
| 2DLC 020 002 100 | 2 X R0.2 | 3 | 10 | 45 | 4 | |
| 2DLC 020 002 120 | 2 X R0.2 | 3 | 12 | 50 | 4 | |
| 2DLC 020 002 160 | 2 X R0.2 | 3 | 16 | 50 | 4 | |
| New 2DLC 020 003 080 | 2 X R0.3 | 3 | 8 | 45 | 4 | |
| New 2DLC 020 003 100 | 2 X R0.3 | 3 | 10 | 45 | 4 | |
| New 2DLC 020 003 120 | 2 X R0.3 | 3 | 12 | 50 | 4 | |
| New 2DLC 020 003 160 | 2 X R0.3 | 3 | 16 | 50 | 4 | |
| 2DLC 020 005 080 | 2 X R0.5 | 3 | 8 | 45 | 4 | |
| 2DLC 020 005 100 | 2 X R0.5 | 3 | 10 | 45 | 4 | |
| 2DLC 020 005 120 | 2 X R0.5 | 3 | 12 | 50 | 4 | |
| 2DLC 020 005 160 | 2 X R0.5 | 3 | 16 | 50 | 4 | |
| New 2DLC 030 001 100 | 3 X R0.1 | 4.5 | 10 | 50 | 6 | |
| New 2DLC 030 001 120 | 3 X R0.1 | 4.5 | 12 | 50 | 6 | |
| New 2DLC 030 001 160 | 3 X R0.1 | 4.5 | 16 | 60 | 6 | |
| New 2DLC 030 001 200 | 3 X R0.1 | 4.5 | 20 | 60 | 6 | |
| New 2DLC 030 001 250 | 3 X R0.1 | 4.5 | 25 | 65 | 6 | |
| New 2DLC 030 001 300 | 3 X R0.1 | 4.5 | 30 | 70 | 6 | |
| 2DLC 030 002 100 | 3 X R0.2 | 4.5 | 10 | 50 | 6 | |

# 2날 비철 가공용 R-TAC코팅 코너 레디우스 엔드밀

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2DLC 030 002 120 | 3 X R0.2 | 4.5 | 12 | 50 | 6 | |
| 2DLC 030 002 160 | 3 X R0.2 | 4.5 | 16 | 60 | 6 | |
| 2DLC 030 002 200 | 3 X R0.2 | 4.5 | 20 | 60 | 6 | |
| 2DLC 030 002 250 | 3 X R0.2 | 4.5 | 25 | 65 | 6 | |
| 2DLC 030 002 300 | 3 X R0.2 | 4.5 | 30 | 70 | 6 | |
| 2DLC 030 003 100 | 3 X R0.3 | 4.5 | 10 | 50 | 6 | |
| 2DLC 030 003 120 | 3 X R0.3 | 4.5 | 12 | 50 | 6 | |
| 2DLC 030 003 160 | 3 X R0.3 | 4.5 | 16 | 60 | 6 | |
| 2DLC 030 003 200 | 3 X R0.3 | 4.5 | 20 | 60 | 6 | |
| 2DLC 030 003 250 | 3 X R0.3 | 4.5 | 25 | 65 | 6 | |
| 2DLC 030 003 300 | 3 X R0.3 | 4.5 | 30 | 70 | 6 | |
| 2DLC 030 005 100 | 3 X R0.5 | 4.5 | 10 | 50 | 6 | |
| 2DLC 030 005 120 | 3 X R0.5 | 4.5 | 12 | 50 | 6 | |
| 2DLC 030 005 160 | 3 X R0.5 | 4.5 | 16 | 60 | 6 | |
| 2DLC 030 005 200 | 3 X R0.5 | 4.5 | 20 | 60 | 6 | |
| 2DLC 030 005 250 | 3 X R0.5 | 4.5 | 25 | 65 | 6 | |
| 2DLC 030 005 300 | 3 X R0.5 | 4.5 | 30 | 70 | 6 | |
| 2DLC 040 002 120 | 4 X R0.2 | 6 | 12 | 50 | 6 | |
| 2DLC 040 002 160 | 4 X R0.2 | 6 | 16 | 60 | 6 | |
| 2DLC 040 002 200 | 4 X R0.2 | 6 | 20 | 60 | 6 | |
| 2DLC 040 005 120 | 4 X R0.5 | 6 | 12 | 50 | 6 | |
| 2DLC 040 005 160 | 4 X R0.5 | 6 | 16 | 60 | 6 | |
| 2DLC 040 005 200 | 4 X R0.5 | 6 | 20 | 60 | 6 | |
| 2DLC 040 005 250 | 4 X R0.5 | 6 | 25 | 65 | 6 | |
| 2DLC 040 005 300 | 4 X R0.5 | 6 | 30 | 70 | 6 | |
| 2DLC 040 010 120 | 4 X R1 | 6 | 12 | 50 | 6 | |
| 2DLC 040 010 160 | 4 X R1 | 6 | 16 | 60 | 6 | |
| 2DLC 040 010 200 | 4 X R1 | 6 | 20 | 60 | 6 | |
| 2DLC 040 010 250 | 4 X R1 | 6 | 25 | 65 | 6 | |
| 2DLC 040 010 300 | 4 X R1 | 6 | 30 | 70 | 6 | |
| New 2DLC 060 002 200 | 6 X R0.2 | 9 | 20 | 60 | 6 | |
| 2DLC 060 003 200 | 6 X R0.3 | 9 | 20 | 60 | 6 | |
| 2DLC 060 005 200 | 6 X R0.5 | 9 | 20 | 60 | 6 | |
| 2DLC 060 010 200 | 6 X R1 | 9 | 20 | 60 | 6 | |
| 2DLC 080 003 250 | 8 X R0.3 | 12 | 25 | 65 | 8 | |
| 2DLC 080 005 250 | 8 X R0.5 | 12 | 25 | 65 | 8 | |
| 2DLC 080 010 250 | 8 X R1 | 12 | 25 | 65 | 8 | |
| 2DLC 100 005 300 | 10 X R0.5 | 15 | 30 | 70 | 10 | |
| 2DLC 100 010 300 | 10 X R1 | 15 | 30 | 70 | 10 | |
| 2DLC 120 005 320 | 12 X R0.5 | 18 | 32 | 80 | 12 | |
| 2DLC 120 010 320 | 12 X R1 | 18 | 32 | 80 | 12 | |

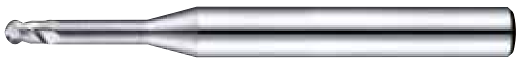
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

R-TAC

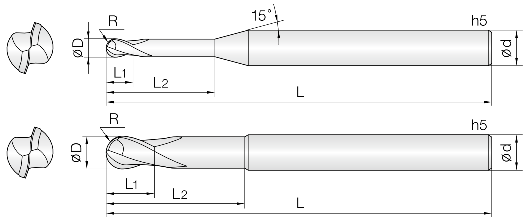
# 2ALB 2 Flutes 45˚Helix Ball End Mills for Aluminum

## 2날 45˚헬릭스 알루미늄 전용 볼 엔드밀

New



- **알루미늄, 알루미늄 합금, 동 및 동합금 등 비철 비금속 계열 전용 엔드밀**
- 날부인선을 고광면 설계하여 절삭시 피삭재의 표면조도가 우수합니다.
- 45˚헬릭스 형상과 깊은 포켓으로 설계하여 칩배출이 우수하며, 고속, 고이송 가공에 적합합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화.




- **Endmills for Aluminum, AL alloys, copper, copper alloys, non-ferrous and non-metallic materials.**
- Applied fine WC grade for excellent surface finish.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.
- High speed, feed applicable by 45˚degree helix and deep chip pocket design

2 | WC 미립자 | R ± 0.005 | R ± 0.01 | R ± 0.015 | 45˚ Helix Angle | CUTTING DATA

0.25 ~ 2.5R | 3R ~ 6R | 8R | 494P

| D Size | D Tolerance |
|---|---|
| Ø 0.5 ~ 5 | +0 ~ -0.01mm |
| Ø 6 ~ 12 | -0.005 ~ -0.015mm |
| Ø 16 | -0.01 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2ALB 005 010 S04 | 0.25R X 0.5 | 0.7 | 1 | 45 | 4 | |
| 2ALB 005 020 S04 | 0.25R X 0.5 | 0.7 | 2 | 45 | 4 | |
| 2ALB 005 030 S04 | 0.25R X 0.5 | 0.7 | 3 | 45 | 4 | |
| 2ALB 005 040 S04 | 0.25R X 0.5 | 0.7 | 4 | 45 | 4 | |
| 2ALB 005 050 S04 | 0.25R X 0.5 | 0.7 | 5 | 45 | 4 | |
| 2ALB 005 060 S04 | 0.25R X 0.5 | 0.7 | 6 | 45 | 4 | |
| 2ALB 006 020 S04 | 0.3R X 0.6 | 0.9 | 2 | 45 | 4 | |
| 2ALB 006 030 S04 | 0.3R X 0.6 | 0.9 | 3 | 45 | 4 | |
| 2ALB 006 040 S04 | 0.3R X 0.6 | 0.9 | 4 | 45 | 4 | |
| 2ALB 006 050 S04 | 0.3R X 0.6 | 0.9 | 5 | 45 | 4 | |
| 2ALB 006 060 S04 | 0.3R X 0.6 | 0.9 | 6 | 45 | 4 | |
| 2ALB 006 080 S04 | 0.3R X 0.6 | 0.9 | 8 | 45 | 4 | |
| 2ALB 006 100 S04 | 0.3R X 0.6 | 0.9 | 10 | 45 | 4 | |
| 2ALB 008 020 S04 | 0.4R X 0.8 | 1.2 | 2 | 45 | 4 | |
| 2ALB 008 030 S04 | 0.4R X 0.8 | 1.2 | 3 | 45 | 4 | |
| 2ALB 008 040 S04 | 0.4R X 0.8 | 1.2 | 4 | 45 | 4 | |
| 2ALB 008 060 S04 | 0.4R X 0.8 | 1.2 | 6 | 45 | 4 | |
| 2ALB 008 080 S04 | 0.4R X 0.8 | 1.2 | 8 | 45 | 4 | |
| 2ALB 008 100 S04 | 0.4R X 0.8 | 1.2 | 10 | 45 | 4 | |
| 2ALB 008 120 S04 | 0.4R X 0.8 | 1.2 | 12 | 45 | 4 | |
| 2ALB 010 030 S04 | 0.5R X 1 | 1.5 | 3 | 50 | 4 | |
| 2ALB 010 050 S04 | 0.5R X 1 | 1.5 | 5 | 50 | 4 | |
| 2ALB 010 080 S04 | 0.5R X 1 | 1.5 | 8 | 50 | 4 | |
| 2ALB 010 100 S04 | 0.5R X 1 | 1.5 | 10 | 50 | 4 | |
| 2ALB 010 120 S04 | 0.5R X 1 | 1.5 | 12 | 50 | 4 | |
| 2ALB 010 160 S04 | 0.5R X 1 | 1.5 | 16 | 50 | 4 | |
| 2ALB 010 200 S04 | 0.5R X 1 | 1.5 | 20 | 50 | 4 | |
| 2ALB 012 030 S04 | 0.6R X 1.2 | 1.8 | 3 | 50 | 4 | |
| 2ALB 012 040 S04 | 0.6R X 1.2 | 1.8 | 4 | 50 | 4 | |
| 2ALB 012 060 S04 | 0.6R X 1.2 | 1.8 | 6 | 50 | 4 | |
| 2ALB 012 080 S04 | 0.6R X 1.2 | 1.8 | 8 | 50 | 4 | |
| 2ALB 012 100 S04 | 0.6R X 1.2 | 1.8 | 10 | 50 | 4 | |
| 2ALB 012 120 S04 | 0.6R X 1.2 | 1.8 | 12 | 50 | 4 | |
| 2ALB 015 050 S04 | 0.75R X 1.5 | 2 | 5 | 50 | 4 | |
| 2ALB 015 080 S04 | 0.75R X 1.5 | 2 | 8 | 50 | 4 | |
| 2ALB 015 100 S04 | 0.75R X 1.5 | 2 | 10 | 50 | 4 | |
| 2ALB 015 120 S04 | 0.75R X 1.5 | 2 | 12 | 50 | 4 | |
| 2ALB 015 160 S04 | 0.75R X 1.5 | 2 | 16 | 50 | 4 | |
| 2ALB 015 200 S04 | 0.75R X 1.5 | 2 | 20 | 50 | 4 | |
| 2ALB 020 050 S06 | 1R X 2 | 3 | 5 | 50 | 6 | |
| 2ALB 020 080 S06 | 1R X 2 | 3 | 8 | 50 | 6 | |
| 2ALB 020 100 S06 | 1R X 2 | 3 | 10 | 50 | 6 | |
| 2ALB 020 120 S06 | 1R X 2 | 3 | 12 | 60 | 6 | |
| 2ALB 020 160 S06 | 1R X 2 | 3 | 16 | 60 | 6 | |
| 2ALB 020 200 S06 | 1R X 2 | 3 | 20 | 60 | 6 | |
| 2ALB 020 250 S06 | 1R X 2 | 3 | 25 | 65 | 6 | |
| 2ALB 025 060 S06 | 1.25R X 2.5 | 4 | 6 | 50 | 6 | |
| 2ALB 025 100 S06 | 1.25R X 2.5 | 4 | 10 | 50 | 6 | |
| 2ALB 025 120 S06 | 1.25R X 2.5 | 4 | 12 | 60 | 6 | |
| 2ALB 025 160 S06 | 1.25R X 2.5 | 4 | 16 | 60 | 6 | |

# 2날 45˚헬릭스 알루미늄 전용 볼 엔드밀

New

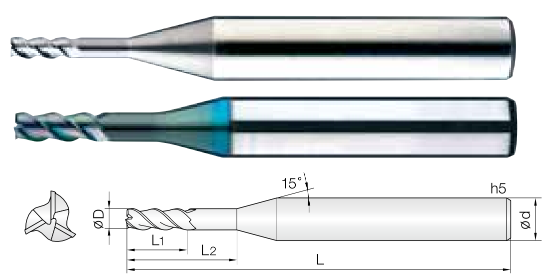
단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2ALB 025 200 S06 | 1.25R X 2.5 | 4 | 20 | 60 | 6 | |
| 2ALB 030 080 S06 | 1.5R X 3 | 4.5 | 8 | 60 | 6 | |
| 2ALB 030 120 S06 | 1.5R X 3 | 4.5 | 12 | 60 | 6 | |
| 2ALB 030 160 S06 | 1.5R X 3 | 4.5 | 16 | 60 | 6 | |
| 2ALB 030 200 S06 | 1.5R X 3 | 4.5 | 20 | 60 | 6 | |
| 2ALB 030 250 S06 | 1.5R X 3 | 4.5 | 25 | 70 | 6 | |
| 2ALB 030 300 S06 | 1.5R X 3 | 4.5 | 30 | 70 | 6 | |
| 2ALB 030 400 S06 | 1.5R X 3 | 4.5 | 40 | 80 | 6 | |
| 2ALB 040 100 S06 | 2R X 4 | 6 | 10 | 60 | 6 | |
| 2ALB 040 160 S06 | 2R X 4 | 6 | 16 | 60 | 6 | |
| 2ALB 040 200 S06 | 2R X 4 | 6 | 20 | 60 | 6 | |
| 2ALB 040 250 S06 | 2R X 4 | 6 | 25 | 70 | 6 | |
| 2ALB 040 300 S06 | 2R X 4 | 6 | 30 | 70 | 6 | |
| 2ALB 040 400 S06 | 2R X 4 | 6 | 40 | 80 | 6 | |
| 2ALB 050 160 S06 | 2.5R X 5 | 8 | 16 | 80 | 6 | |
| 2ALB 050 200 S06 | 2.5R X 5 | 8 | 20 | 80 | 6 | |
| 2ALB 050 250 S06 | 2.5R X 5 | 8 | 25 | 80 | 6 | |
| 2ALB 060 150 S06 | 3R X 6 | 9 | 15 | 90 | 6 | |
| 2ALB 060 300 S06 | 3R X 6 | 9 | 30 | 90 | 6 | |
| 2ALB 060 400 S06 | 3R X 6 | 9 | 40 | 90 | 6 | |
| 2ALB 080 200 S08 | 4R X 8 | 12 | 20 | 100 | 8 | |
| 2ALB 100 250 S10 | 5R X 10 | 15 | 25 | 100 | 10 | |
| 2ALB 120 300 S12 | 6R X 12 | 18 | 30 | 110 | 12 | |
| 2ALB 160 600 S16 | 8R X 16 | 30 | 60 | 160 | 16 | |

# 3ALR

## 3 Flutes 45˚Helix Rib End Mills for Aluminum

## 3날 45˚헬릭스 알루미늄 전용 리브 엔드밀




- **알루미늄, 알루미늄 합금 등 비철 비금속 계열 전용 엔드밀**
- 날부인선을 고광면 설계하여 절삭시 피삭재의 표면조도가 우수합니다.
- 다양한 작업에 맞추어 짧은 날장에 유효장을 적용하였습니다.
- 코팅피막에 경도가 높고 마찰계수가 낮은 Tetrabond TAC코팅을 적용하여 내마모성이 우수하며, 피삭재의 표면조도가 월등히 우수합니다.
- 2중 인선과 홈포켓을 깊게 설계하여 흡착현상을 최소화 하였습니다.

- **Endmills for Aluminum, AL alloys, non-ferrous and non-metallic materials.**
- Applied fine WC grade for excellent surface finish.
- Applied short flute length for various applications.
- Tetrabond TAC coating provides excellent work surface finish by high hardness and low friction.
- Minimize built up edge by double edge and deep pocket design.

3 | WC 미립자 | RTAC Coating | 45° Helix Angle | Shield Edge | CUTTING DATA 499P

| D Size | D Tolerance |
|---|---|
| Ø 0.8 ~ 20 | +0 ~ -0.01mm |

단위 : mm

| Order Number 비코팅 Un coated | RTAC 코팅 RTAC Coated | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 비코팅 Un coated | 비고 코팅 Coated |
|---|---|---|---|---|---|---|---|---|
| 3ALR 008 016 S04 | 3ALRC 008 016 S04 | 0.8 | 1.6 | - | 50 | 4 | | |
| 3ALR 008 030 S04 | 3ALRC 008 030 S04 | 0.8 | 1.6 | 3 | 50 | 4 | | |
| 3ALR 008 040 S04 | 3ALRC 008 040 S04 | 0.8 | 1.6 | 4 | 50 | 4 | | |
| 3ALR 008 050 S04 | 3ALRC 008 050 S04 | 0.8 | 1.6 | 5 | 50 | 4 | | |
| 3ALR 008 060 S04 | 3ALRC 008 060 S04 | 0.8 | 1.6 | 6 | 50 | 4 | | |
| 3ALR 008 080 S04 | 3ALRC 008 080 S04 | 0.8 | 1.6 | 8 | 50 | 4 | | |
| 3ALR 008 100 S04 | 3ALRC 008 100 S04 | 0.8 | 1.6 | 10 | 50 | 4 | | |
| 3ALR 008 120 S04 | 3ALRC 008 120 S04 | 0.8 | 1.6 | 12 | 50 | 4 | | |
| 3ALR 010 020 S06 | 3ALRC 010 020 S06 | 1 | 2 | - | 60 | 6 | | |
| 3ALR 010 040 S06 | 3ALRC 010 040 S06 | 1 | 2 | 4 | 60 | 6 | | |
| 3ALR 010 060 S06 | 3ALRC 010 060 S06 | 1 | 2 | 6 | 60 | 6 | | |
| 3ALR 010 080 S06 | 3ALRC 010 080 S06 | 1 | 2 | 8 | 60 | 6 | | |
| 3ALR 010 100 S06 | 3ALRC 010 100 S06 | 1 | 2 | 10 | 60 | 6 | | |
| 3ALR 010 120 S06 | 3ALRC 010 120 S06 | 1 | 2 | 12 | 60 | 6 | | |
| 3ALR 010 140 S06 | 3ALRC 010 140 S06 | 1 | 2 | 14 | 60 | 6 | | |
| 3ALR 010 160 S06 | 3ALRC 010 160 S06 | 1 | 2 | 16 | 60 | 6 | | |
| 3ALR 010 180 S06 | | 1 | 2 | 18 | 60 | 6 | | |
| 3ALR 010 200 S06 | | 1 | 2 | 20 | 60 | 6 | | |
| 3ALR 015 030 S06 | 3ALRC 015 030 S06 | 1.5 | 3 | - | 60 | 6 | | |
| 3ALR 015 060 S06 | 3ALRC 015 060 S06 | 1.5 | 3 | 6 | 60 | 6 | | |
| 3ALR 015 080 S06 | 3ALRC 015 080 S06 | 1.5 | 3 | 8 | 60 | 6 | | |
| 3ALR 015 100 S06 | 3ALRC 015 100 S06 | 1.5 | 3 | 10 | 60 | 6 | | |
| 3ALR 015 120 S06 | 3ALRC 015 120 S06 | 1.5 | 3 | 12 | 60 | 6 | | |
| 3ALR 015 140 S06 | 3ALRC 015 140 S06 | 1.5 | 3 | 14 | 60 | 6 | | |
| 3ALR 015 160 S06 | 3ALRC 015 160 S06 | 1.5 | 3 | 16 | 60 | 6 | | |
| 3ALR 015 180 S06 | 3ALRC 015 180 S06 | 1.5 | 3 | 18 | 60 | 6 | | |
| 3ALR 015 200 S06 | 3ALRC 015 200 S06 | 1.5 | 3 | 20 | 60 | 6 | | |
| 3ALR 015 220 S06 | | 1.5 | 3 | 22 | 65 | 6 | | |
| 3ALR 015 250 S06 | | 1.5 | 3 | 25 | 65 | 6 | | |
| 3ALR 020 040 S06 | 3ALRC 020 040 S06 | 2 | 4 | - | 60 | 6 | | |
| 3ALR 020 080 S06 | 3ALRC 020 080 S06 | 2 | 4 | 8 | 60 | 6 | | |
| 3ALR 020 100 S06 | 3ALRC 020 100 S06 | 2 | 4 | 10 | 60 | 6 | | |
| 3ALR 020 120 S06 | 3ALRC 020 120 S06 | 2 | 4 | 12 | 60 | 6 | | |
| 3ALR 020 140 S06 | 3ALRC 020 140 S06 | 2 | 4 | 14 | 60 | 6 | | |
| 3ALR 020 160 S06 | 3ALRC 020 160 S06 | 2 | 4 | 16 | 60 | 6 | | |
| 3ALR 020 200 S06 | 3ALRC 020 200 S06 | 2 | 4 | 20 | 60 | 6 | | |
| 3ALR 020 220 S06 | 3ALRC 020 220 S06 | 2 | 4 | 22 | 60 | 6 | | |
| 3ALR 020 250 S06 | 3ALRC 020 250 S06 | 2 | 4 | 25 | 65 | 6 | | |
| 3ALR 020 280 S06 | | 2 | 4 | 28 | 70 | 6 | | |
| 3ALR 020 300 S06 | | 2 | 4 | 30 | 70 | 6 | | |
| 3ALR 025 050 S06 | 3ALRC 025 050 S06 | 2.5 | 5 | - | 60 | 6 | | |
| 3ALR 025 100 S06 | 3ALRC 025 100 S06 | 2.5 | 5 | 10 | 60 | 6 | | |
| 3ALR 025 150 S06 | 3ALRC 025 150 S06 | 2.5 | 5 | 15 | 60 | 6 | | |
| 3ALR 025 200 S06 | 3ALRC 025 200 S06 | 2.5 | 5 | 20 | 60 | 6 | | |
| 3ALR 025 250 S06 | 3ALRC 025 250 S06 | 2.5 | 5 | 25 | 65 | 6 | | |
| 3ALR 025 300 S06 | 3ALRC 025 300 S06 | 2.5 | 5 | 30 | 70 | 6 | | |
| 3ALR 025 350 S06 | | 2.5 | 5 | 35 | 80 | 6 | | |
| 3ALR 025 400 S06 | | 2.5 | 5 | 40 | 90 | 6 | | |
| 3ALR 030 060 S06 | 3ALRC 030 060 S06 | 3 | 6 | - | 60 | 6 | | |
| 3ALR 030 100 S06 | 3ALRC 030 100 S06 | 3 | 6 | 10 | 60 | 6 | | |

# 3날 45˚헬릭스 알루미늄 전용 리브 엔드밀

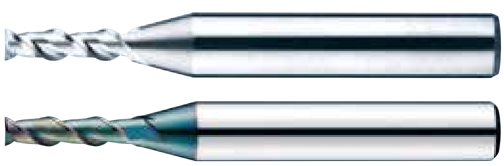
단위 : mm

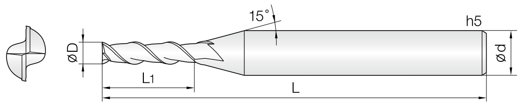
| Order Number 비코팅 Un coated | Order Number RTAC 코팅 RTAC Coated | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 비코팅 Un coated | 비고 코팅 Coated |
|---|---|---|---|---|---|---|---|---|
| 3ALR 030 150 S06 | 3ALRC 030 150 S06 | 3 | 6 | 15 | 60 | 6 | | |
| 3ALR 030 200 S06 | 3ALRC 030 200 S06 | 3 | 6 | 20 | 70 | 6 | | |
| 3ALR 030 250 S06 | 3ALRC 030 250 S06 | 3 | 6 | 25 | 70 | 6 | | |
| 3ALR 030 300 S06 | 3ALRC 030 300 S06 | 3 | 6 | 30 | 80 | 6 | | |
| 3ALR 030 350 S06 | 3ALRC 030 350 S06 | 3 | 6 | 35 | 80 | 6 | | |
| 3ALR 030 400 S06 | 3ALRC 030 400 S06 | 3 | 6 | 40 | 90 | 6 | | |
| 3ALR 030 450 S06 | | 3 | 6 | 45 | 90 | 6 | | |
| 3ALR 030 500 S06 | | 3 | 6 | 50 | 100 | 6 | | |
| 3ALR 040 080 S06 | 3ALRC 040 080 S06 | 4 | 8 | – | 70 | 6 | | |
| 3ALR 040 100 S06 | 3ALRC 040 100 S06 | 4 | 8 | 10 | 70 | 6 | | |
| 3ALR 040 150 S06 | 3ALRC 040 150 S06 | 4 | 8 | 15 | 70 | 6 | | |
| 3ALR 040 200 S06 | 3ALRC 040 200 S06 | 4 | 8 | 20 | 70 | 6 | | |
| 3ALR 040 250 S06 | 3ALRC 040 250 S06 | 4 | 8 | 25 | 70 | 6 | | |
| 3ALR 040 300 S06 | 3ALRC 040 300 S06 | 4 | 8 | 30 | 80 | 6 | | |
| 3ALR 040 350 S06 | 3ALRC 040 350 S06 | 4 | 8 | 35 | 80 | 6 | | |
| 3ALR 040 400 S06 | 3ALRC 040 400 S06 | 4 | 8 | 40 | 90 | 6 | | |
| 3ALR 040 450 S06 | | 4 | 8 | 45 | 90 | 6 | | |
| 3ALR 040 500 S06 | | 4 | 8 | 50 | 100 | 6 | | |
| 3ALR 050 100 S06 | 3ALRC 050 100 S06 | 5 | 10 | – | 80 | 6 | | |
| 3ALR 050 200 S06 | 3ALRC 050 200 S06 | 5 | 10 | 20 | 80 | 6 | | |
| 3ALR 050 300 S06 | 3ALRC 050 300 S06 | 5 | 10 | 30 | 80 | 6 | | |
| 3ALR 050 400 S06 | 3ALRC 050 400 S06 | 5 | 10 | 40 | 90 | 6 | | |
| 3ALR 050 500 S06 | 3ALRC 050 500 S06 | 5 | 10 | 50 | 100 | 6 | | |
| 3ALR 050 600 S06 | | 5 | 10 | 60 | 110 | 6 | | |
| 3ALR 060 200 S06 | 3ALRC 060 200 S06 | 6 | 12 | 20 | 80 | 6 | | |
| 3ALR 060 400 S06 | 3ALRC 060 400 S06 | 6 | 12 | 40 | 80 | 6 | | |
| 3ALR 060 600 110 | 3ALRC 060 600 110 | 6 | 12 | 60 | 110 | 6 | | |
| 3ALR 060 800 120 | | 6 | 12 | 80 | 120 | 6 | | |
| 3ALR 080 400 S08 | 3ALRC 080 400 S08 | 8 | 16 | 40 | 100 | 8 | | |
| 3ALR 080 600 110 | 3ALRC 080 600 110 | 8 | 16 | 60 | 110 | 8 | | |
| 3ALR 080 800 120 | | 8 | 16 | 80 | 120 | 8 | | |
| 3ALR 100 500 S10 | 3ALRC 100 500 S10 | 10 | 20 | 50 | 110 | 10 | | |
| 3ALR 100 700 120 | 3ALRC 100 700 120 | 10 | 20 | 70 | 120 | 10 | | |
| 3ALR 100 900 150 | | 10 | 20 | 90 | 150 | 10 | | |
| 3ALR 120 500 S12 | 3ALRC 120 500 S12 | 12 | 24 | 50 | 110 | 12 | | |
| 3ALR 120 700 130 | 3ALRC 120 700 130 | 12 | 24 | 70 | 130 | 12 | | |
| 3ALR 120 900 150 | | 12 | 24 | 90 | 150 | 12 | | |
| 3ALR 140 600 110 | | 14 | 28 | 60 | 110 | 14 | | |
| 3ALR 140 800 120 | | 14 | 28 | 80 | 120 | 14 | | |
| 3ALR 160 800 130 | | 16 | 32 | 80 | 130 | 16 | | |
| 3ALR 160 1000 160 | | 16 | 32 | 100 | 160 | 16 | | |
| 3ALR 200 800 130 | | 20 | 40 | 80 | 130 | 20 | | |
| 3ALR 200 1200 160 | | 20 | 40 | 120 | 160 | 20 | | |
| 3ALR 200 1500 200 | | 20 | 40 | 150 | 200 | 20 | | |

# 2ALE

## 2 Flutes 45˚Helix End Mills for Aluminum

## 2날45˚헬릭스 알루미늄 전용 엔드밀






- **알루미늄, 알루미늄 합금 등 비철 비금속 계열 전용 엔드밀**
- 날부 인선을 고광면 설계하여 절삭시 피삭재의 표면조도가 우수합니다.
- 다양한 날장(S, L, Exl, Etc) 선택으로 맞춤 가공이 가능합니다.
- 코팅피막에 경도가 높고 마찰계수가 낮은 Tetrabond TAC코팅을 적용하여 내마모성이 우수하며, 피삭재의 표면조도가 월등히 우수합니다.
- 2중 인선과 홈포켓을 깊게 설계하여 흡착현상을 최소화 하였습니다.

- **Endmills for Aluminum, AL alloys, non-ferrous and non-metallic materials**
- Applied fine WC grade for excellent surface finish.
- Various flute length design for covering wide range application.
- Tetrabond TAC coating provides excellent work surface finish by high hardness and low friction.
- Minimize built up edge by double edge and deep pocket design.

2 | WC 미립자 | RTAC Coating | 45° Helix Angle | Shield Edge | CUTTING DATA 500P

| D Size | D Tolerance |
|---|---|
| Ø0.5 ~ 20 | +0 ~ -0.01mm |

단위 : mm

| Order Number | | 날경 Diameter | 날장 Length of cut | 전장 Overall Length | 생크 Shank Dia | 비고 | |
|---|---|---|---|---|---|---|---|
| 비코팅 Un coated | RTAC 코팅 RTAC Coated | D | L1 | L | d | 비코팅 Un coated | 코팅 Coated |
| 2ALE 005 005 S04 | 2ALEC 005 005 S04 | 0.5 | 0.5 | 40 | 4 | | |
| 2ALE 005 010 S04 | 2ALEC 005 010 S04 | 0.5 | 1 | 40 | 4 | | |
| 2ALE 005 015 S04 | 2ALEC 005 015 S04 | 0.5 | 1.5 | 40 | 4 | | |
| 2ALE 005 020 S04 | 2ALEC 005 020 S04 | 0.5 | 2 | 40 | 4 | | |
| 2ALE 005 025 S04 | | 0.5 | 2.5 | 40 | 4 | | |
| 2ALE 005 030 S04 | | 0.5 | 3 | 40 | 4 | | |
| 2ALE 006 006 S04 | 2ALEC 006 006 S04 | 0.6 | 0.6 | 40 | 4 | | |
| 2ALE 006 012 S04 | 2ALEC 006 012 S04 | 0.6 | 1.2 | 40 | 4 | | |
| 2ALE 006 020 S04 | 2ALEC 006 020 S04 | 0.6 | 2 | 40 | 4 | | |
| 2ALE 006 030 S04 | | 0.6 | 3 | 40 | 4 | | |
| 2ALE 006 040 S04 | | 0.6 | 4 | 40 | 4 | | |
| 2ALE 007 007 S04 | 2ALEC 007 007 S04 | 0.7 | 0.7 | 40 | 4 | | |
| 2ALE 007 014 S04 | 2ALEC 007 014 S04 | 0.7 | 1.4 | 40 | 4 | | |
| 2ALE 007 020 S04 | 2ALEC 007 020 S04 | 0.7 | 2 | 40 | 4 | | |
| 2ALE 007 030 S04 | | 0.7 | 3 | 40 | 4 | | |
| 2ALE 007 040 S04 | | 0.7 | 4 | 40 | 4 | | |
| 2ALE 008 008 S04 | 2ALEC 008 008 S04 | 0.8 | 0.8 | 40 | 4 | | |
| 2ALE 008 016 S04 | 2ALEC 008 016 S04 | 0.8 | 1.6 | 40 | 4 | | |
| 2ALE 008 020 S04 | 2ALEC 008 020 S04 | 0.8 | 2 | 40 | 4 | | |
| 2ALE 008 030 S04 | | 0.8 | 3 | 40 | 4 | | |
| 2ALE 008 040 S04 | | 0.8 | 4 | 40 | 4 | | |
| 2ALE 009 009 S04 | 2ALEC 009 009 S04 | 0.9 | 0.9 | 40 | 4 | | |
| 2ALE 009 018 S04 | 2ALEC 009 018 S04 | 0.9 | 1.8 | 40 | 4 | | |
| 2ALE 009 025 S04 | 2ALEC 009 025 S04 | 0.9 | 2.5 | 40 | 4 | | |
| 2ALE 009 040 S04 | | 0.9 | 4 | 40 | 4 | | |
| 2ALE 010 015 S04 | 2ALEC 010 015 S04 | 1 | 1.5 | 40 | 4 | | |
| 2ALE 010 015 S06 | 2ALEC 010 015 S06 | 1 | 1.5 | 40 | 6 | | |
| 2ALE 010 025 S04 | 2ALEC 010 025 S04 | 1 | 2.5 | 40 | 4 | | |
| 2ALE 010 025 S06 | 2ALEC 010 025 S06 | 1 | 2.5 | 40 | 6 | | |
| 2ALE 010 035 S04 | 2ALEC 010 035 S04 | 1 | 3.5 | 40 | 4 | | |
| 2ALE 010 035 S06 | 2ALEC 010 035 S06 | 1 | 3.5 | 40 | 6 | | |
| 2ALE 010 050 S06 | 2ALEC 010 050 S06 | 1 | 5 | 45 | 6 | | |
| 2ALE 010 060 S06 | 2ALEC 010 060 S06 | 1 | 6 | 45 | 6 | | |
| 2ALE 010 080 S06 | 2ALEC 010 080 S06 | 1 | 8 | 45 | 6 | | |
| 2ALE 010 100 S06 | 2ALEC 010 100 S06 | 1 | 10 | 45 | 6 | | |
| 2ALE 010 120 S06 | | 1 | 12 | 45 | 6 | | |
| 2ALE 012 030 S06 | 2ALEC 012 030 S06 | 1.2 | 3 | 40 | 6 | | |
| 2ALE 012 040 S06 | 2ALEC 012 040 S06 | 1.2 | 4 | 40 | 6 | | |
| 2ALE 012 060 S06 | 2ALEC 012 060 S06 | 1.2 | 6 | 40 | 6 | | |
| 2ALE 012 080 S06 | | 1.2 | 8 | 45 | 6 | | |
| 2ALE 012 100 S06 | | 1.2 | 10 | 45 | 6 | | |
| 2ALE 015 040 S06 | 2ALEC 015 040 S06 | 1.5 | 4 | 40 | 6 | | |
| 2ALE 015 060 S06 | 2ALEC 015 060 S06 | 1.5 | 6 | 40 | 6 | | |
| 2ALE 015 080 S06 | 2ALEC 015 080 S06 | 1.5 | 8 | 45 | 6 | | |
| 2ALE 015 100 S06 | 2ALEC 015 100 S06 | 1.5 | 10 | 50 | 6 | | |
| 2ALE 015 120 S06 | 2ALEC 015 120 S06 | 1.5 | 12 | 50 | 6 | | |
| 2ALE 015 150 S06 | 2ALEC 015 150 S06 | 1.5 | 15 | 55 | 6 | | |
| 2ALE 015 180 S06 | | 1.5 | 18 | 60 | 6 | | |
| 2ALE 020 050 S06 | 2ALEC 020 050 S06 | 2 | 5 | 45 | 6 | | |
| 2ALE 020 070 S06 | 2ALEC 020 070 S06 | 2 | 7 | 45 | 6 | | |

# 2날 45˚헬릭스 알루미늄 전용 엔드밀

단위 : mm

| Order Number 비코팅 Un coated | RTAC 코팅 RTAC Coated | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 비코팅 Un coated | 코팅 Coated |
|---|---|---|---|---|---|---|---|
| 2ALE 020 100 S06 | 2ALEC 020 100 S06 | 2 | 10 | 50 | 6 | | |
| 2ALE 020 120 S06 | 2ALEC 020 120 S06 | 2 | 12 | 50 | 6 | | |
| 2ALE 020 140 S06 | 2ALEC 020 140 S06 | 2 | 14 | 50 | 6 | | |
| 2ALE 020 160 S06 | 2ALEC 020 160 S06 | 2 | 16 | 60 | 6 | | |
| 2ALE 020 180 S06 | | 2 | 18 | 60 | 6 | | |
| 2ALE 020 200 S06 | | 2 | 20 | 60 | 6 | | |
| 2ALE 025 080 S06 | 2ALEC 025 080 S06 | 2.5 | 8 | 45 | 6 | | |
| 2ALE 025 120 S06 | 2ALEC 025 120 S06 | 2.5 | 12 | 50 | 6 | | |
| 2ALE 025 150 S06 | 2ALEC 025 150 S06 | 2.5 | 15 | 60 | 6 | | |
| 2ALE 025 180 S06 | | 2.5 | 18 | 60 | 6 | | |
| 2ALE 025 200 S06 | | 2.5 | 20 | 60 | 6 | | |
| 2ALE 030 080 S06 | 2ALEC 030 080 S06 | 3 | 8 | 45 | 6 | | |
| 2ALE 030 100 S06 | 2ALEC 030 100 S06 | 3 | 10 | 45 | 6 | | |
| 2ALE 030 120 S06 | 2ALEC 030 120 S06 | 3 | 12 | 50 | 6 | | |
| 2ALE 030 150 S06 | 2ALEC 030 150 S06 | 3 | 15 | 50 | 6 | | |
| 2ALE 030 200 S06 | 2ALEC 030 200 S06 | 3 | 20 | 60 | 6 | | |
| 2ALE 030 250 S06 | 2ALEC 030 250 S06 | 3 | 25 | 65 | 6 | | |
| 2ALE 030 300 S06 | | 3 | 30 | 70 | 6 | | |
| 2ALE 035 100 S06 | 2ALEC 035 100 S06 | 3.5 | 10 | 45 | 6 | | |
| 2ALE 035 150 S06 | 2ALEC 035 150 S06 | 3.5 | 15 | 50 | 6 | | |
| 2ALE 035 200 S06 | | 3.5 | 20 | 60 | 6 | | |
| 2ALE 040 120 S06 | 2ALEC 040 120 S06 | 4 | 12 | 50 | 6 | | |
| 2ALE 040 150 S06 | 2ALEC 040 150 S06 | 4 | 15 | 55 | 6 | | |
| 2ALE 040 180 S06 | 2ALEC 040 180 S06 | 4 | 18 | 55 | 6 | | |
| 2ALE 040 250 S06 | 2ALEC 040 250 S06 | 4 | 25 | 65 | 6 | | |
| 2ALE 040 300 S06 | 2ALEC 040 300 S06 | 4 | 30 | 70 | 6 | | |
| 2ALE 040 350 S06 | | 4 | 35 | 75 | 6 | | |
| 2ALE 040 400 S06 | | 4 | 40 | 80 | 6 | | |
| 2ALE 045 120 S06 | 2ALEC 045 120 S06 | 4.5 | 12 | 50 | 6 | | |
| 2ALE 045 180 S06 | 2ALEC 045 180 S06 | 4.5 | 18 | 55 | 6 | | |
| 2ALE 045 220 S06 | | 4.5 | 22 | 65 | 6 | | |
| 2ALE 045 250 S06 | | 4.5 | 25 | 70 | 6 | | |
| 2ALE 050 150 S06 | 2ALEC 050 150 S06 | 5 | 15 | 50 | 6 | | |
| 2ALE 050 200 S06 | 2ALEC 050 200 S06 | 5 | 20 | 60 | 6 | | |
| 2ALE 050 250 S06 | 2ALEC 050 250 S06 | 5 | 25 | 65 | 6 | | |
| 2ALE 050 300 S06 | 2ALEC 050 300 S06 | 5 | 30 | 70 | 6 | | |
| 2ALE 050 400 S06 | | 5 | 40 | 80 | 6 | | |
| 2ALE 055 150 S06 | 2ALEC 055 150 S06 | 5.5 | 15 | 50 | 6 | | |
| 2ALE 060 150 S06 | 2ALEC 060 150 S06 | 6 | 15 | 50 | 6 | | |
| 2ALE 060 200 S06 | 2ALEC 060 200 S06 | 6 | 20 | 60 | 6 | | |
| 2ALE 060 250 S06 | 2ALEC 060 250 S06 | 6 | 25 | 65 | 6 | | |
| 2ALE 060 300 S06 | 2ALEC 060 300 S06 | 6 | 30 | 70 | 6 | | |
| 2ALE 060 350 S06 | 2ALEC 060 350 S06 | 6 | 35 | 75 | 6 | | |
| 2ALE 060 400 S06 | 2ALEC 060 400 S06 | 6 | 40 | 80 | 6 | | |
| 2ALE 060 450 S06 | | 6 | 45 | 90 | 6 | | |
| 2ALE 060 500 S06 | | 6 | 50 | 100 | 6 | | |
| 2ALE 070 200 S08 | 2ALEC 070 200 S08 | 7 | 20 | 60 | 8 | | |
| 2ALE 070 300 S08 | 2ALEC 070 300 S08 | 7 | 30 | 70 | 8 | | |
| 2ALE 080 200 S08 | 2ALEC 080 200 S08 | 8 | 20 | 60 | 8 | | |
| 2ALE 080 250 S08 | 2ALEC 080 250 S08 | 8 | 25 | 65 | 8 | | |

# 2날 45°헬릭스 알루미늄 전용 엔드밀

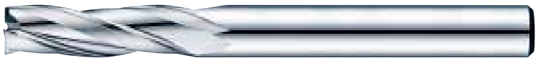
단위 : mm

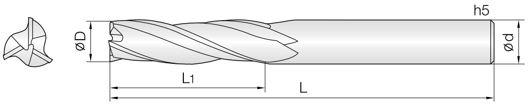
| Order Number 비코팅 Un coated | RTAC 코팅 RTAC Coated | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 비코팅 Un coated | 코팅 Coated |
|---|---|---|---|---|---|---|---|
| 2ALE 080 300 S08 | 2ALEC 080 300 S08 | 8 | 30 | 70 | 8 | | |
| 2ALE 080 400 S08 | 2ALEC 080 400 S08 | 8 | 40 | 80 | 8 | | |
| 2ALE 080 450 S08 | 2ALEC 080 450 S08 | 8 | 45 | 90 | 8 | | |
| 2ALE 080 500 S08 | | 8 | 50 | 100 | 8 | | |
| 2ALE 100 250 S10 | 2ALEC 100 250 S10 | 10 | 25 | 70 | 10 | | |
| 2ALE 100 300 S10 | 2ALEC 100 300 S10 | 10 | 30 | 75 | 10 | | |
| 2ALE 100 350 S10 | 2ALEC 100 350 S10 | 10 | 35 | 80 | 10 | | |
| 2ALE 100 450 S10 | 2ALEC 100 450 S10 | 10 | 45 | 90 | 10 | | |
| 2ALE 100 500 S10 | 2ALEC 100 500 S10 | 10 | 50 | 100 | 10 | | |
| 2ALE 100 600 S10 | | 10 | 60 | 110 | 10 | | |
| 2ALE 120 300 S12 | 2ALEC 120 300 S12 | 12 | 30 | 75 | 12 | | |
| 2ALE 120 350 S12 | 2ALEC 120 350 S12 | 12 | 35 | 80 | 12 | | |
| 2ALE 120 400 S12 | 2ALEC 120 400 S12 | 12 | 40 | 90 | 12 | | |
| 2ALE 120 450 S12 | 2ALEC120 450 S12 | 12 | 45 | 100 | 12 | | |
| 2ALE 120 500 S12 | 2ALEC 120 500 S12 | 12 | 50 | 100 | 12 | | |
| 2ALE 120 600 S12 | 2ALEC 120 600 S12 | 12 | 60 | 110 | 12 | | |
| 2ALE 120 700 S12 | | 12 | 70 | 120 | 12 | | |
| 2ALE 140 300 S14 | 2ALEC 140 300 S14 | 14 | 30 | 80 | 14 | | |
| 2ALE 140 500 S14 | | 14 | 50 | 90 | 14 | | |
| 2ALE 140 600 S14 | | 14 | 60 | 110 | 14 | | |
| 2ALE 160 400 S16 | 2ALEC 160 400 S16 | 16 | 40 | 90 | 16 | | |
| 2ALE 160 550 S16 | 2ALEC 160 550 S16 | 16 | 55 | 110 | 16 | | |
| 2ALE 160 700 S16 | 2ALEC 160 700 S16 | 16 | 70 | 120 | 16 | | |
| 2ALE 160 900 S16 | | 16 | 90 | 150 | 16 | | |
| 2ALE 200 450 S20 | 2ALEC 200 450 S20 | 20 | 45 | 100 | 20 | | |
| 2ALE 200 650 S20 | 2ALEC 200 650 S20 | 20 | 65 | 120 | 20 | | |
| 2ALE 200 800 S20 | 2ALEC 200 800 S20 | 20 | 80 | 135 | 20 | | |
| 2ALE 200 1000 S20 | | 20 | 100 | 160 | 20 | | |

# 3FALE

3 Flutes Mirror Finishing Cutting End Mills for Aluminum

## 3날 알루미늄 전용 고광택 정삭 엔드밀






- **알루미늄, 알루미늄 합금 등 비철 비금속 계열 전용 엔드밀**
- 25도 헬릭스 설계된 날부 인선을 고광면 설계와 후공정 처리하여 밀링 가공시 피삭재의 월등한 경면 사상을 가능하게 합니다.
- 항절력이 높은 미립자 초경합금 (0.5㎛)을채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for Aluminum, AL alloys, non-ferrous and non-metallic materials.**
- By 25-degree helix flute edge design with the after-treatment process, when milling workpiece, it enables superior mirror surface milling.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.


| D Size | D Tolerance |
|---|---|
| Ø6 ~ 16 | +0 ~ -0.01mm |

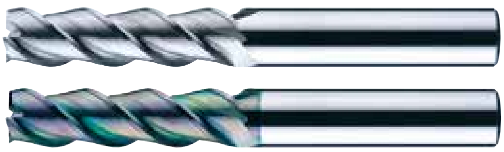
단위 : mm

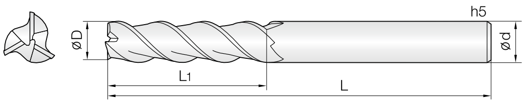
| | Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| New | 3FALE 040 130 S04 | 4 | 13 | 55 | 4 | |
| New | 3FALE 040 180 S04 | 4 | 18 | 60 | 4 | |
| | 3FALE 060 170 S06 | 6 | 17 | 60 | 6 | |
| | 3FALE 060 220 S06 | 6 | 22 | 65 | 6 | |
| | 3FALE 080 260 S08 | 8 | 26 | 70 | 8 | |
| | 3FALE 080 360 S08 | 8 | 36 | 80 | 8 | |
| | 3FALE 100 310 S10 | 10 | 31 | 90 | 10 | |
| | 3FALE 100 410 S10 | 10 | 41 | 90 | 10 | |
| | 3FALE 120 360 S12 | 12 | 36 | 90 | 12 | |
| | 3FALE 120 460 S12 | 12 | 46 | 100 | 12 | |
| | 3FALE 160 460 S16 | 16 | 46 | 100 | 16 | |
| | 3FALE 160 660 S16 | 16 | 66 | 120 | 16 | |

# 3ALE

## 3 Flutes 45°Helix End Mills for Aluminum

## 3날 45°헬릭스 알루미늄 전용 엔드밀






- **알루미늄, 알루미늄 합금 등 비철 비금속 계열 전용 엔드밀**
- 날부 인선을 고광면 설계하여 절삭시 피삭재의 표면조도가 우수합니다.
- 다양한 날장(S, L, Exl, Etc) 선택으로 맞춤 가공이 가능합니다.
- 코팅 피막에 경도가 높고 마찰계수가 낮은 Tetrabond TAC코팅을 적용하여 내마모성이 우수하며, 피삭재의 표면조도가 월등히 우수합니다.
- 2중 인선과 홈포켓을 깊게 설계하여 흡착현상을 최소화 하였습니다.

- **Endmills for Aluminum, AL alloys, non-ferrous and non-metallic materials**
- Applied fine WC grade for excellent surface finish.
- Various flute length design for covering wide range application.
- Tetrabond TAC coating provides excellent work surface finish by high hardness and low friction.
- Minimize built up edge by double edge and deep pocket design.

3 | WC 미립자 | RTAC Coating | 45° Helix Angle | Shield Edge | CUTTING DATA 493P

| D Size | D Tolerance |
|---|---|
| Ø 0.8 ~ 20 | +0 ~ -0.01mm |

단위 : mm

| Order Number 비코팅 Un coated | Order Number RTAC 코팅 RTAC Coated | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 비코팅 Un coated | 비고 코팅 Coated |
|---|---|---|---|---|---|---|---|
| 3ALE 008 012 S04 | | 0.8 | 1.2 | 40 | 4 | | |
| 3ALE 008 020 S04 | | 0.8 | 2 | 40 | 4 | | |
| 3ALE 008 030 S04 | | 0.8 | 3 | 40 | 4 | | |
| 3ALE 008 040 S04 | | 0.8 | 4 | 40 | 4 | | |
| 3ALE 010 015 S06 | 3ALEC 010 015 S06 | 1 | 1.5 | 40 | 6 | | |
| 3ALE 010 030 S06 | 3ALEC 010 030 S06 | 1 | 3 | 40 | 6 | | |
| 3ALE 010 050 S06 | 3ALEC 010 050 S06 | 1 | 5 | 45 | 6 | | |
| 3ALE 010 060 S06 | 3ALEC 010 060 S06 | 1 | 6 | 45 | 6 | | |
| 3ALE 010 080 S06 | 3ALEC 010 080 S06 | 1 | 8 | 45 | 6 | | |
| 3ALE 010 100 S06 | 3ALEC 010 100 S06 | 1 | 10 | 45 | 6 | | |
| 3ALE 010 120 S06 | | 1 | 12 | 50 | 6 | | |
| 3ALE 010 140 S06 | | 1 | 14 | 50 | 6 | | |
| 3ALE 012 030 S06 | 3ALEC 012 030 S06 | 1.2 | 3 | 40 | 6 | | |
| 3ALE 012 040 S06 | 3ALEC 012 040 S06 | 1.2 | 4 | 40 | 6 | | |
| 3ALE 012 060 S06 | 3ALEC 012 060 S06 | 1.2 | 6 | 45 | 6 | | |
| 3ALE 012 080 S06 | | 1.2 | 8 | 45 | 6 | | |
| 3ALE 012 100 S06 | | 1.2 | 10 | 45 | 6 | | |
| 3ALE 012 120 S06 | | 1.2 | 12 | 50 | 6 | | |
| 3ALE 015 025 S06 | 3ALEC 015 025 S06 | 1.5 | 2.5 | 40 | 6 | | |
| 3ALE 015 040 S06 | 3ALEC 015 040 S06 | 1.5 | 4 | 40 | 6 | | |
| 3ALE 015 060 S06 | 3ALEC 015 060 S06 | 1.5 | 6 | 45 | 6 | | |
| 3ALE 015 080 S06 | 3ALEC 015 080 S06 | 1.5 | 8 | 45 | 6 | | |
| 3ALE 015 100 S06 | 3ALEC 015 100 S06 | 1.5 | 10 | 50 | 6 | | |
| 3ALE 015 120 S06 | 3ALEC 015 120 S06 | 1.5 | 12 | 50 | 6 | | |
| 3ALE 015 150 S06 | 3ALEC 015 150 S06 | 1.5 | 15 | 50 | 6 | | |
| 3ALE 015 180 S06 | | 1.5 | 18 | 60 | 6 | | |
| 3ALE 015 200 S06 | | 1.5 | 20 | 60 | 6 | | |
| 3ALE 020 030 S06 | 3ALEC 020 030 S06 | 2 | 3 | 45 | 6 | | |
| 3ALE 020 050 S06 | 3ALEC 020 050 S06 | 2 | 5 | 45 | 6 | | |
| 3ALE 020 070 S06 | 3ALEC 020 070 S06 | 2 | 7 | 45 | 6 | | |
| 3ALE 020 100 S06 | 3ALEC 020 100 S06 | 2 | 10 | 50 | 6 | | |
| 3ALE 020 120 S06 | 3ALEC 020 120 S06 | 2 | 12 | 50 | 6 | | |
| 3ALE 020 140 S06 | 3ALEC 020 140 S06 | 2 | 14 | 60 | 6 | | |
| 3ALE 020 160 S06 | 3ALEC 020 160 S06 | 2 | 16 | 60 | 6 | | |
| 3ALE 020 180 S06 | 3ALEC 020 180 S06 | 2 | 18 | 60 | 6 | | |
| 3ALE 020 200 S06 | 3ALEC 020 200 S06 | 2 | 20 | 60 | 6 | | |
| 3ALE 020 220 S06 | | 2 | 22 | 60 | 6 | | |
| 3ALE 020 250 S06 | | 2 | 25 | 65 | 6 | | |
| 3ALE 025 040 S06 | 3ALEC 025 040 S06 | 2.5 | 4 | 45 | 6 | | |
| 3ALE 025 080 S06 | 3ALEC 025 080 S06 | 2.5 | 8 | 45 | 6 | | |
| 3ALE 025 120 S06 | 3ALEC 025 120 S06 | 2.5 | 12 | 50 | 6 | | |
| 3ALE 025 150 S06 | 3ALEC 025 150 S06 | 2.5 | 15 | 60 | 6 | | |
| 3ALE 025 200 S06 | | 2.5 | 20 | 60 | 6 | | |
| 3ALE 025 250 S06 | | 2.5 | 25 | 65 | 6 | | |
| 3ALE 030 045 S06 | 3ALEC 030 045 S06 | 3 | 4.5 | 45 | 6 | | |
| 3ALE 030 080 S06 | 3ALEC 030 080 S06 | 3 | 8 | 45 | 6 | | |
| 3ALE 030 120 S06 | 3ALEC 030 120 S06 | 3 | 12 | 50 | 6 | | |
| 3ALE 030 150 S06 | 3ALEC 030 150 S06 | 3 | 15 | 50 | 6 | | |
| 3ALE 030 200 S06 | 3ALEC 030 200 S06 | 3 | 20 | 55 | 6 | | |
| 3ALE 030 250 S06 | 3ALEC 030 250 S06 | 3 | 25 | 60 | 6 | | |

FOR ALUMINUM

# 3ALE

## 3 Flutes 45˚Helix End Mills for Aluminum

## 3날 45˚헬릭스 알루미늄 전용 엔드밀

단위 : mm

| Order Number | | 날경 | 날장 | 전장 | 생크 | 비고 | |
|---|---|---|---|---|---|---|---|
| 비코팅 Un coated | RTAC 코팅 RTAC Coated | Diameter D | Length of cut L1 | Overall Length L | Shank Dia d | 비코팅 Un coated | 코팅 Coated |
| 3ALE 030 300 S06 | 3ALEC 030 300 S06 | 3 | 30 | 65 | 6 | | |
| 3ALE 030 350 S06 | | 3 | 35 | 75 | 6 | | |
| 3ALE 030 400 S06 | | 3 | 40 | 80 | 6 | | |
| 3ALE 035 055 S06 | 3ALEC 035 055 S06 | 3.5 | 5.5 | 45 | 6 | | |
| 3ALE 035 100 S06 | 3ALEC 035 100 S06 | 3.5 | 10 | 45 | 6 | | |
| 3ALE 035 150 S06 | 3ALEC 035 150 S06 | 3.5 | 15 | 50 | 6 | | |
| 3ALE 035 200 S06 | 3ALEC 035 200 S06 | 3.5 | 20 | 55 | 6 | | |
| 3ALE 035 250 S06 | 3ALEC 035 250 S06 | 3.5 | 25 | 60 | 6 | | |
| 3ALE 035 300 S06 | 3ALEC 035 300 S06 | 3.5 | 30 | 65 | 6 | | |
| 3ALE 035 350 S06 | | 3.5 | 35 | 75 | 6 | | |
| 3ALE 040 060 S06 | 3ALEC 040 060 S06 | 4 | 6 | 45 | 6 | | |
| 3ALE 040 110 S06 | 3ALEC 040 110 S06 | 4 | 11 | 45 | 6 | | |
| 3ALE 040 160 S06 | 3ALEC 040 160 S06 | 4 | 16 | 50 | 6 | | |
| 3ALE 040 200 S06 | 3ALEC 040 200 S06 | 4 | 20 | 55 | 6 | | |
| 3ALE 040 250 S06 | 3ALEC 040 250 S06 | 4 | 25 | 60 | 6 | | |
| 3ALE 040 300 S06 | 3ALEC 040 300 S06 | 4 | 30 | 65 | 6 | | |
| 3ALE 040 350 S06 | | 4 | 35 | 75 | 6 | | |
| 3ALE 040 400 S06 | | 4 | 40 | 80 | 6 | | |
| 3ALE 045 120 S06 | 3ALEC 045 120 S06 | 4.5 | 12 | 50 | 6 | | |
| 3ALE 045 180 S06 | 3ALEC 045 180 S06 | 4.5 | 18 | 55 | 6 | | |
| 3ALE 045 250 S06 | 3ALEC 045 250 S06 | 4.5 | 25 | 60 | 6 | | |
| 3ALE 045 300 S06 | 3ALEC 045 300 S06 | 4.5 | 30 | 65 | 6 | | |
| 3ALE 050 075 S06 | 3ALEC 050 075 S06 | 5 | 7.5 | 50 | 6 | | |
| 3ALE 050 130 S06 | 3ALEC 050 130 S06 | 5 | 13 | 50 | 6 | | |
| 3ALE 050 200 S06 | 3ALEC 050 200 S06 | 5 | 20 | 55 | 6 | | |
| 3ALE 050 250 S06 | 3ALEC 050 250 S06 | 5 | 25 | 60 | 6 | | |
| 3ALE 050 300 S06 | 3ALEC 050 300 S06 | 5 | 30 | 65 | 6 | | |
| 3ALE 050 350 S06 | 3ALEC 050 350 S06 | 5 | 35 | 70 | 6 | | |
| 3ALE 050 400 S06 | 3ALEC 050 400 S06 | 5 | 40 | 75 | 6 | | |
| 3ALE 050 450 S06 | | 5 | 45 | 80 | 6 | | |
| 3ALE 055 150 S06 | 3ALEC 055 150 S06 | 5.5 | 15 | 50 | 6 | | |
| 3ALE 055 200 S06 | 3ALEC 055 200 S06 | 5.5 | 20 | 55 | 6 | | |
| 3ALE 055 250 S06 | 3ALEC 055 250 S06 | 5.5 | 25 | 60 | 6 | | |
| 3ALE 060 090 050 | 3ALEC 060 090 050 | 6 | 9 | 50 | 6 | | |
| 3ALE 060 150 050 | 3ALEC 060 150 050 | 6 | 15 | 50 | 6 | | |
| 3ALE 060 200 055 | 3ALEC 060 200 055 | 6 | 20 | 55 | 6 | | |
| 3ALE 060 250 060 | 3ALEC 060 250 060 | 6 | 25 | 60 | 6 | | |
| 3ALE 060 300 070 | 3ALEC 060 300 070 | 6 | 30 | 70 | 6 | | |
| 3ALE 060 350 070 | 3ALEC 060 350 070 | 6 | 35 | 70 | 6 | | |
| 3ALE 060 400 075 | 3ALEC 060 400 075 | 6 | 40 | 75 | 6 | | |
| 3ALE 060 450 080 | 3ALEC 060 450 080 | 6 | 45 | 80 | 6 | | |
| 3ALE 060 500 090 | 3ALEC 060 500 090 | 6 | 50 | 90 | 6 | | |
| 3ALE 070 200 060 | 3ALEC 070 200 060 | 7 | 20 | 60 | 8 | | |
| 3ALE 070 300 075 | 3ALEC 070 300 075 | 7 | 30 | 75 | 8 | | |
| 3ALE 070 400 090 | 3ALEC 070 400 090 | 7 | 40 | 90 | 8 | | |
| 3ALE 080 120 060 | 3ALEC 080 120 060 | 8 | 12 | 60 | 8 | | |
| 3ALE 080 200 060 | 3ALEC 080 200 060 | 8 | 20 | 60 | 8 | | |
| 3ALE 080 250 065 | 3ALEC 080 250 065 | 8 | 25 | 65 | 8 | | |
| 3ALE 080 300 070 | 3ALEC 080 300 070 | 8 | 30 | 70 | 8 | | |
| 3ALE 080 350 075 | 3ALEC 080 350 075 | 8 | 35 | 75 | 8 | | |

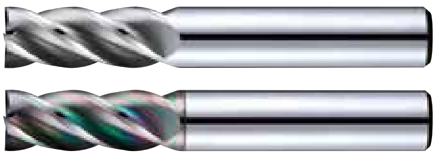
단위 : mm

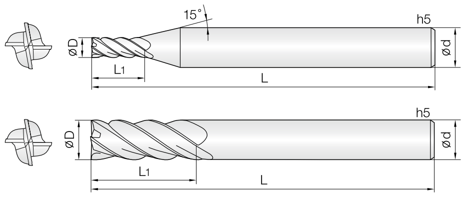
| Order Number 비코팅 Un coated | Order Number RTAC 코팅 RTAC Coated | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 비코팅 Un coated | 비고 코팅 Coated |
|---|---|---|---|---|---|---|---|
| 3ALE 080 400 080 | 3ALEC 080 400 080 | 8 | 40 | 80 | 8 | | |
| 3ALE 080 450 090 | 3ALEC 080 450 090 | 8 | 45 | 90 | 8 | | |
| 3ALE 080 500 090 | 3ALEC 080 500 090 | 8 | 50 | 90 | 8 | | |
| 3ALE 080 550 100 | 3ALEC 080 550 100 | 8 | 55 | 100 | 8 | | |
| 3ALE 080 600 110 | 3ALEC 080 600 110 | 8 | 60 | 110 | 8 | | |
| 3ALE 080 700 120 | 3ALEC 080 700 120 | 8 | 70 | 120 | 8 | | |
| 3ALE 100 150 070 | 3ALEC 100 150 070 | 10 | 15 | 70 | 10 | | |
| 3ALE 100 250 070 | 3ALEC 100 250 070 | 10 | 25 | 70 | 10 | | |
| 3ALE 100 300 075 | 3ALEC 100 300 075 | 10 | 30 | 75 | 10 | | |
| 3ALE 100 350 080 | 3ALEC 100 350 080 | 10 | 35 | 80 | 10 | | |
| 3ALE 100 400 090 | 3ALEC 100 400 090 | 10 | 40 | 90 | 10 | | |
| 3ALE 100 450 090 | 3ALEC 100 450 090 | 10 | 45 | 90 | 10 | | |
| 3ALE 100 500 100 | 3ALEC 100 500 100 | 10 | 50 | 100 | 10 | | |
| 3ALE 100 550 100 | 3ALEC 100 550 100 | 10 | 55 | 100 | 10 | | |
| 3ALE 100 600 110 | 3ALEC 100 600 110 | 10 | 60 | 110 | 10 | | |
| 3ALE 100 650 110 | 3ALEC 100 650 110 | 10 | 65 | 110 | 10 | | |
| 3ALE 100 700 120 | 3ALEC 100 700 120 | 10 | 70 | 120 | 10 | | |
| 3ALE 100 800 130 | 3ALEC 100 800 130 | 10 | 80 | 130 | 10 | | |
| 3ALE 120 180 075 | 3ALEC 120 180 075 | 12 | 18 | 75 | 12 | | |
| 3ALE 120 260 075 | 3ALEC 120 260 075 | 12 | 26 | 75 | 12 | | |
| 3ALE 120 350 080 | 3ALEC 120 350 080 | 12 | 35 | 80 | 12 | | |
| 3ALE 120 400 090 | 3ALEC 120 400 090 | 12 | 40 | 90 | 12 | | |
| 3ALE 120 450 090 | 3ALEC 120 450 090 | 12 | 45 | 90 | 12 | | |
| 3ALE 120 500 100 | 3ALEC 120 500 100 | 12 | 50 | 100 | 12 | | |
| 3ALE 120 550 100 | 3ALEC 120 550 100 | 12 | 55 | 100 | 12 | | |
| 3ALE 120 650 110 | 3ALEC 120 650 110 | 12 | 65 | 110 | 12 | | |
| 3ALE 120 700 120 | 3ALEC 120 700 120 | 12 | 70 | 120 | 12 | | |
| 3ALE 120 800 130 | 3ALEC 120 800 130 | 12 | 80 | 130 | 12 | | |
| 3ALE 140 300 080 | 3ALEC 140 300 080 | 14 | 30 | 80 | 14 | | |
| 3ALE 140 450 110 | 3ALEC 140 450 110 | 14 | 45 | 110 | 14 | | |
| 3ALE 140 600 120 | | 14 | 60 | 120 | 14 | | |
| 3ALE 160 300 090 | 3ALEC 160 300 090 | 16 | 30 | 90 | 16 | | |
| 3ALE 160 500 110 | 3ALEC 160 500 110 | 16 | 50 | 110 | 16 | | |
| 3ALE 160 650 120 | 3ALEC 160 650 120 | 16 | 65 | 120 | 16 | | |
| 3ALE 160 800 130 | 3ALEC 160 800 130 | 16 | 80 | 130 | 16 | | |
| 3ALE 160 1000 160 | 3ALEC 160 1000 160 | 16 | 100 | 160 | 16 | | |
| 3ALE 200 500 100 | 3ALEC 200 500 100 | 20 | 50 | 100 | 20 | | |
| 3ALE 200 750 130 | 3ALEC 200 750 130 | 20 | 75 | 130 | 20 | | |
| 3ALE 200 1000 160 | 3ALEC 200 1000 160 | 20 | 100 | 160 | 20 | | |
| 3ALE 200 1300 200 | 3ALEC 200 1300 200 | 20 | 130 | 200 | 20 | | |
| 3ALE 200 1500 220 | 3ALEC 200 1500 220 | 20 | 150 | 220 | 20 | | |

# 4ALE 4 Flutes High Speed End Mills for Aluminum

## 4날 알루미늄 고이송 전용 엔드밀

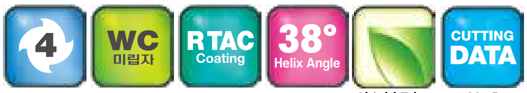
New






- 알루미늄, 알루미늄 합금 등 비철 비금속 계열 전용 엔드밀
- 강력한 채터링 방지 설계로 측벽 가공 시 엔드밀의 진동을 최소화하였습니다.
- 2중 인선을 적용하여 중, 황삭 가공 시 뛰어난 성능을 발휘합니다.
- 코팅 피막에 경도가 높고 마찰계수가 낮은 Tetrabond TAC코팅을 적용하여 내마모성이 우수하며, 피삭재의 표면조도가 월등히 우수합니다.
- 홈포켓을 깊게 설계하여 흡착현상을 최소화 하였습니다.

- Endmills for Aluminum, AL alloys, non-ferrous and non-metallic materials
- The powerful anti-chattering design minimizes the vibration of the endmill during side milling.
- Excellent performance in semi-finishing and roughing by applying a double cutting edge.
- the poket is deeply designed to adsorption.




Shield Edge 495P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø3 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø16 ~ 20 | -0.015 ~ -0.03mm |

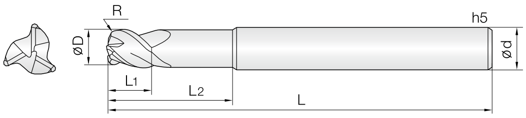
단위 : mm

| Order Number 비코팅 Un coated | RTAC 코팅 RTAC Coated | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 비코팅 Un coated | 비고 코팅 Coated |
|---|---|---|---|---|---|---|---|
| 4ALE 030 120 S06 | 4ALEC 030 120 S06 | 3 | 12 | 50 | 6 | | |
| 4ALE 030 150 S06 | 4ALEC 030 150 S06 | 3 | 15 | 50 | 6 | | |
| 4ALE 030 150 070 | 4ALEC 030 150 070 | 3 | 15 | 70 | 6 | | |
| 4ALE 030 200 S06 | 4ALEC 030 200 S06 | 3 | 20 | 55 | 6 | | |
| 4ALE 040 110 S06 | 4ALEC 040 110 S06 | 4 | 11 | 50 | 6 | | |
| 4ALE 040 160 S06 | 4ALEC 040 160 S06 | 4 | 16 | 50 | 6 | | |
| 4ALE 040 160 070 | 4ALEC 040 160 070 | 4 | 16 | 70 | 6 | | |
| 4ALE 040 200 S06 | 4ALEC 040 200 S06 | 4 | 20 | 55 | 6 | | |
| 4ALE 050 130 S06 | 4ALEC 050 130 S06 | 5 | 13 | 50 | 6 | | |
| 4ALE 050 200 S06 | 4ALEC 050 200 S06 | 5 | 20 | 55 | 6 | | |
| 4ALE 050 200 080 | 4ALEC 050 200 080 | 5 | 20 | 80 | 6 | | |
| 4ALE 050 250 S06 | 4ALEC 050 250 S06 | 5 | 25 | 60 | 6 | | |
| 4ALE 060 150 S06 | 4ALEC 060 150 S06 | 6 | 15 | 50 | 6 | | |
| 4ALE 060 200 S06 | 4ALEC 060 200 S06 | 6 | 20 | 55 | 6 | | |
| 4ALE 060 200 080 | 4ALEC 060 200 080 | 6 | 20 | 80 | 6 | | |
| 4ALE 060 250 S06 | 4ALEC 060 250 S06 | 6 | 25 | 60 | 6 | | |
| 4ALE 060 300 S06 | 4ALEC 060 300 S06 | 6 | 30 | 70 | 6 | | |
| 4ALE 080 200 S08 | 4ALEC 080 200 S08 | 8 | 20 | 60 | 8 | | |
| 4ALE 080 250 S08 | 4ALEC 080 250 S08 | 8 | 25 | 65 | 8 | | |
| 4ALE 080 250 090 | 4ALEC 080 250 090 | 8 | 25 | 90 | 8 | | |
| 4ALE 080 300 S08 | 4ALEC 080 300 S08 | 8 | 30 | 70 | 8 | | |
| 4ALE 080 350 S08 | 4ALEC 080 350 S08 | 8 | 35 | 75 | 8 | | |
| 4ALE 100 250 S10 | 4ALEC 100 250 S10 | 10 | 25 | 70 | 10 | | |
| 4ALE 100 300 S10 | 4ALEC 100 300 S10 | 10 | 30 | 75 | 10 | | |
| 4ALE 100 300 100 | 4ALEC 100 300 100 | 10 | 30 | 100 | 10 | | |
| 4ALE 100 350 S10 | 4ALEC 100 350 S10 | 10 | 35 | 80 | 10 | | |
| 4ALE 100 400 S10 | 4ALEC 100 400 S10 | 10 | 40 | 90 | 10 | | |
| 4ALE 120 260 S12 | 4ALEC 120 260 S12 | 12 | 26 | 75 | 12 | | |
| 4ALE 120 350 S12 | 4ALEC 120 350 S12 | 12 | 35 | 80 | 12 | | |
| 4ALE 120 350 110 | 4ALEC 120 350 110 | 12 | 35 | 110 | 12 | | |
| 4ALE 120 400 S12 | 4ALEC 120 400 S12 | 12 | 40 | 90 | 12 | | |
| 4ALE 120 450 S12 | 4ALEC 120 450 S12 | 12 | 45 | 90 | 12 | | |
| 4ALE 160 300 S16 | 4ALEC 160 300 S16 | 16 | 30 | 90 | 16 | | |
| 4ALE 160 500 S16 | 4ALEC 160 500 S16 | 16 | 50 | 110 | 16 | | |
| 4ALE 160 500 150 | 4ALEC 160 500 150 | 16 | 50 | 150 | 16 | | |
| 4ALE 160 650 S16 | 4ALEC 160 650 S16 | 16 | 65 | 120 | 16 | | |
| 4ALE 160 800 S16 | 4ALEC 160 800 S16 | 16 | 80 | 130 | 16 | | |
| 4ALE 200 500 S20 | 4ALEC 200 500 S20 | 20 | 50 | 110 | 20 | | |
| 4ALE 200 750 S20 | 4ALEC 200 750 S20 | 20 | 75 | 130 | 20 | | |
| 4ALE 200 750 160 | 4ALEC 200 750 160 | 20 | 75 | 160 | 20 | | |
| 4ALE 200 1000 S20 | 4ALEC 200 1000 S20 | 20 | 100 | 160 | 20 | | |

# 3ALC

*3 Flutes 45˚Helix Coner Radius End Mills for Aluminum*

## 3날 45˚헬릭스 알루미늄 전용 코너 레디우스 엔드밀




- **알루미늄, 알루미늄 합금 등 비철 비금속 계열 전용 엔드밀**
- 날부 인선을 고광면 설계하여 절삭시 피삭재의 표면조도가 우수합니다.
- 2중 인선과 홈포켓을 깊게 설계하여 흡착현상을 최소화 하였습니다.
- 코팅피막에 경도가 높고 마찰계수가 낮은 Tetrabond TAC코팅을 적용하여 내마모성이 우수하며, 피삭재의 표면조도가 월등히 우수합니다.
- 3날45˚헬릭스의 짧은 날장으로 설계, 고속 고이송 작업에 적합합니다.

- **Endmills for Aluminum, AL alloys, non-ferrous and non-metallic materials**
- Applied fine WC grade for excellent surface finish.
- Minimize built up edge by double edge and deep pocket design.
- Tetrabond TAC coating provides excellent work surface finish by high hardness and low friction.
- High speed, feed applicable by 3 flute 45˚degree helix and short flute design.

3 | WC 미립자 | RTAC Coating | R ±0.005 | R ±0.01 | R ±0.015 | 45° Helix Angle | CUTTING DATA

R0.5 | R1 ~ 1.5 | R2 ~ 5 | 502P

| D Size | D Tolerance |
|---|---|
| Ø3 ~ 20 | +0 ~ -0.015mm |

단위 : mm

| Order Number 비코팅 Un coated | Order Number RTAC 코팅 RTAC Coated | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 비코팅 Un coated | 비고 코팅 Coated |
|---|---|---|---|---|---|---|---|---|
| New 3ALC 010 001 050 | New 3ALCC 010 001 050 | 1 X R0.1 | 3 | - | 50 | 6 | | |
| New 3ALC 015 001 050 | New 3ALCC 015 001 050 | 1.5 X R0.1 | 5 | - | 50 | 6 | | |
| New 3ALC 020 001 050 | New 3ALCC 020 001 050 | 2 X R0.1 | 6 | - | 50 | 6 | | |
| New 3ALC 025 002 050 | New 3ALCC 025 002 050 | 2.5 X R0.2 | 10 | - | 50 | 6 | | |
| New 3ALC 030 002 050 | New 3ALCC 030 002 050 | 3 X R0.2 | 10 | - | 50 | 6 | | |
| New 3ALC 030 002 060 | New 3ALCC 030 002 060 | 3 X R0.2 | 10 | 15 | 60 | 6 | | |
| 3ALC 030 005 050 | 3ALCC 030 005 050 | 3 X R0.5 | 10 | - | 50 | 6 | | |
| 3ALC 030 005 060 | 3ALCC 030 005 060 | 3 X R0.5 | 10 | 15 | 60 | 6 | | |
| 3ALC 030 010 050 | 3ALCC 030 010 050 | 3 X R1 | 10 | - | 50 | 6 | | |
| 3ALC 030 010 060 | 3ALCC 030 010 060 | 3 X R1 | 10 | 15 | 60 | 6 | | |
| New 3ALC 040 002 050 | New 3ALCC 040 002 050 | 4 X R0.2 | 12 | - | 50 | 6 | | |
| New 3ALC 040 002 060 | New 3ALCC 040 002 060 | 4 X R0.2 | 12 | 20 | 60 | 6 | | |
| 3ALC 040 005 050 | 3ALCC 040 005 050 | 4 X R0.5 | 12 | - | 50 | 6 | | |
| 3ALC 040 005 060 | 3ALCC 040 005 060 | 4 X R0.5 | 12 | 20 | 60 | 6 | | |
| 3ALC 040 010 050 | 3ALCC 040 010 050 | 4 X R1 | 12 | - | 50 | 6 | | |
| 3ALC 040 010 060 | 3ALCC 040 010 060 | 4 X R1 | 12 | 20 | 60 | 6 | | |
| New 3ALC 050 002 050 | New 3ALCC 050 002 050 | 5 X R0.2 | 15 | - | 50 | 6 | | |
| New 3ALC 050 002 060 | New 3ALCC 050 002 060 | 5 X R0.2 | 15 | 20 | 60 | 6 | | |
| 3ALC 050 005 050 | 3ALCC 050 005 050 | 5 X R0.5 | 15 | - | 50 | 6 | | |
| 3ALC 050 005 060 | 3ALCC 050 005 060 | 5 X R0.5 | 15 | 20 | 60 | 6 | | |
| 3ALC 050 010 050 | 3ALCC 050 010 050 | 5 X R1 | 15 | - | 50 | 6 | | |
| 3ALC 050 010 060 | 3ALCC 050 010 060 | 5 X R1 | 15 | 20 | 60 | 6 | | |
| New 3ALC 060 003 050 | New 3ALCC 060 003 050 | 6 X R0.3 | 15 | - | 50 | 6 | | |
| New 3ALC 060 003 070 | New 3ALCC 060 003 070 | 6 X R0.3 | 7 | 20 | 70 | 6 | | |
| 3ALC 060 005 050 | 3ALCC 060 005 050 | 6 X R0.5 | 15 | - | 50 | 6 | | |
| 3ALC 060 005 070 | 3ALCC 060 005 070 | 6 X R0.5 | 7 | 20 | 70 | 6 | | |
| 3ALC 060 010 050 | 3ALCC 060 010 050 | 6 X R1 | 15 | - | 50 | 6 | | |
| 3ALC 060 010 070 | 3ALCC 060 010 070 | 6 X R1 | 7 | 20 | 70 | 6 | | |
| New 3ALC 080 003 060 | New 3ALCC 080 003 060 | 8 X R0.3 | 20 | - | 60 | 8 | | |
| New 3ALC 080 003 080 | New 3ALCC 080 003 080 | 8 X R0.3 | 9 | 25 | 80 | 8 | | |
| 3ALC 080 005 060 | 3ALCC 080 005 060 | 8 X R0.5 | 20 | - | 60 | 8 | | |
| 3ALC 080 005 080 | 3ALCC 080 005 080 | 8 X R0.5 | 9 | 25 | 80 | 8 | | |
| 3ALC 080 010 060 | 3ALCC 080 010 060 | 8 X R1 | 20 | - | 60 | 8 | | |
| 3ALC 080 010 080 | 3ALCC 080 010 080 | 8 X R1 | 9 | 25 | 80 | 8 | | |
| 3ALC 080 020 060 | 3ALCC 080 020 060 | 8 X R2 | 20 | - | 60 | 8 | | |
| 3ALC 080 020 080 | 3ALCC 080 020 080 | 8 X R2 | 9 | 25 | 80 | 8 | | |
| 3ALC 080 025 080 | 3ALCC 080 025 080 | 8 X R2.5 | 9 | 25 | 80 | 8 | | |
| New 3ALC 100 003 070 | New 3ALCC 100 003 070 | 10 X R0.3 | 25 | - | 70 | 10 | | |
| New 3ALC 100 003 100 | New 3ALCC 100 003 100 | 10 X R0.3 | 11 | 30 | 100 | 10 | | |
| 3ALC 100 005 070 | 3ALCC 100 005 070 | 10 X R0.5 | 25 | - | 70 | 10 | | |
| 3ALC 100 005 100 | 3ALCC 100 005 100 | 10 X R0.5 | 11 | 30 | 100 | 10 | | |
| 3ALC 100 010 070 | 3ALCC 100 010 070 | 10 X R1 | 25 | - | 70 | 10 | | |
| 3ALC 100 010 100 | 3ALCC 100 010 100 | 10 X R1 | 11 | 30 | 100 | 10 | | |
| 3ALC 100 015 070 | 3ALCC 100 015 070 | 10 X R1.5 | 25 | - | 70 | 10 | | |
| 3ALC 100 015 100 | 3ALCC 100 015 100 | 10 X R1.5 | 11 | 30 | 100 | 10 | | |
| 3ALC 100 020 070 | 3ALCC 100 020 070 | 10 X R2 | 25 | - | 70 | 10 | | |
| 3ALC 100 020 100 | 3ALCC 100 020 100 | 10 X R2 | 11 | 30 | 100 | 10 | | |
| New 3ALC 100 025 070 | New 3ALCC 100 025 070 | 10 X R2.5 | 25 | - | 70 | 10 | | |
| 3ALC 100 025 100 | 3ALCC 100 025 100 | 10 X R2.5 | 11 | 30 | 100 | 10 | | |
| New 3ALC 100 030 070 | New 3ALCC 100 030 070 | 10 X R3 | 25 | - | 70 | 10 | | |

단위 : mm

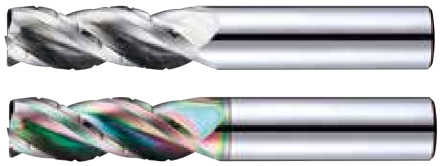
| Order Number 비코팅 Un coated | Order Number RTAC 코팅 RTAC Coated | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 비코팅 Un coated | 비고 코팅 Coated |
|---|---|---|---|---|---|---|---|---|
| New 3ALC 100 030 100 | New 3ALCC 100 030 100 | 10 X R3 | 11 | 30 | 100 | 10 | | |
| 3ALC 120 005 075 | 3ALCC 120 005 075 | 12 X R0.5 | 30 | – | 75 | 12 | | |
| 3ALC 120 005 110 | 3ALCC 120 005 110 | 12 X R0.5 | 13 | 36 | 110 | 12 | | |
| 3ALC 120 010 075 | 3ALCC 120 010 075 | 12 X R1 | 30 | – | 75 | 12 | | |
| 3ALC 120 010 110 | 3ALCC 120 010 110 | 12 X R1 | 13 | 36 | 110 | 12 | | |
| 3ALC 120 015 075 | 3ALCC 120 015 075 | 12 X R1.5 | 30 | – | 75 | 12 | | |
| 3ALC 120 015 110 | 3ALCC 120 015 110 | 12 X R1.5 | 13 | 36 | 110 | 12 | | |
| 3ALC 120 020 075 | 3ALCC 120 020 075 | 12 X R2 | 30 | – | 75 | 12 | | |
| 3ALC 120 020 110 | 3ALCC 120 020 110 | 12 X R2 | 13 | 36 | 110 | 12 | | |
| New 3ALC 120 025 075 | New 3ALCC 120 025 075 | 12 X R2.5 | 30 | – | 75 | 12 | | |
| 3ALC 120 025 110 | 3ALCC 120 025 110 | 12 X R2.5 | 13 | 36 | 110 | 12 | | |
| 3ALC 120 030 075 | 3ALCC 120 030 075 | 12 X R3 | 30 | – | 75 | 12 | | |
| 3ALC 120 030 110 | 3ALCC 120 030 110 | 12 X R3 | 13 | 36 | 110 | 12 | | |
| 3ALC 120 040 075 | 3ALCC 120 040 075 | 12 X R4 | 30 | – | 75 | 12 | | |
| 3ALC 120 040 110 | 3ALCC 120 040 110 | 12 X R4 | 13 | 36 | 110 | 12 | | |
| New 3ALC 160 005 090 | New 3ALCC 160 005 090 | 16 X R0.5 | 35 | – | 90 | 16 | | |
| 3ALC 160 005 130 | 3ALCC 160 005 130 | 16 X R0.5 | 17 | 50 | 130 | 16 | | |
| 3ALC 160 010 090 | 3ALCC 160 010 090 | 16 X R1 | 35 | – | 90 | 16 | | |
| 3ALC 160 010 130 | 3ALCC 160 010 130 | 16 X R1 | 17 | 50 | 130 | 16 | | |
| New 3ALC 160 015 090 | New 3ALCC 160 015 090 | 16 X R1.5 | 35 | – | 90 | 16 | | |
| New 3ALC 160 015 130 | New 3ALCC 160 015 130 | 16 X R1.5 | 17 | 50 | 130 | 16 | | |
| 3ALC 160 020 090 | 3ALCC 160 020 090 | 16 X R2 | 35 | – | 90 | 16 | | |
| 3ALC 160 020 130 | 3ALCC 160 020 130 | 16 X R2 | 17 | 50 | 130 | 16 | | |
| New 3ALC 160 025 090 | New 3ALCC 160 025 090 | 16 X R2.5 | 35 | – | 90 | 16 | | |
| 3ALC 160 025 130 | 3ALCC 160 025 130 | 16 X R2.5 | 17 | 50 | 130 | 16 | | |
| 3ALC 160 030 090 | 3ALCC 160 030 090 | 16 X R3 | 35 | – | 90 | 16 | | |
| 3ALC 160 030 130 | 3ALCC 160 030 130 | 16 X R3 | 17 | 50 | 130 | 16 | | |
| 3ALC 160 040 090 | 3ALCC 160 040 090 | 16 X R4 | 35 | – | 90 | 16 | | |
| 3ALC 160 040 130 | 3ALCC 160 040 130 | 16 X R4 | 17 | 50 | 130 | 16 | | |
| 3ALC 160 050 090 | 3ALCC 160 050 090 | 16 X R5 | 35 | – | 90 | 16 | | |
| New 3ALC 160 050 130 | New 3ALCC 160 050 130 | 16 X R5 | 17 | 50 | 130 | 16 | | |
| New 3ALC 200 005 100 | New 3ALCC 200 005 100 | 20 X R0.5 | 45 | – | 100 | 20 | | |
| 3ALC 200 005 150 | 3ALCC 200 005 150 | 20 X R0.5 | 21 | 60 | 150 | 20 | | |
| New 3ALC 200 010 100 | New 3ALCC 200 010 100 | 20 X R1 | 45 | – | 100 | 20 | | |
| 3ALC 200 010 150 | 3ALCC 200 010 150 | 20 X R1 | 21 | 60 | 150 | 20 | | |
| New 3ALC 200 015 100 | New 3ALCC 200 015 100 | 20 X R1.5 | 45 | – | 100 | 20 | | |
| New 3ALC 200 015 150 | New 3ALCC 200 015 150 | 20 X R1.5 | 21 | 60 | 150 | 20 | | |
| New 3ALC 200 020 100 | New 3ALCC 200 020 100 | 20 X R2 | 45 | – | 100 | 20 | | |
| 3ALC 200 020 150 | 3ALCC 200 020 150 | 20 X R2 | 21 | 60 | 150 | 20 | | |
| New 3ALC 200 025 100 | New 3ALCC 200 025 100 | 20 X R2.5 | 45 | – | 100 | 20 | | |
| 3ALC 200 025 150 | 3ALCC 200 025 150 | 20 X R2.5 | 21 | 60 | 150 | 20 | | |
| New 3ALC 200 030 100 | New 3ALCC 200 030 100 | 20 X R3 | 45 | – | 100 | 20 | | |
| 3ALC 200 030 150 | 3ALCC 200 030 150 | 20 X R3 | 21 | 60 | 150 | 20 | | |
| New 3ALC 200 040 100 | New 3ALCC 200 040 100 | 20 X R4 | 45 | – | 100 | 20 | | |
| 3ALC 200 040 150 | 3ALCC 200 040 150 | 20 X R4 | 21 | 60 | 150 | 20 | | |
| New 3ALC 200 050 100 | New 3ALCC 200 050 100 | 20 X R5 | 45 | – | 100 | 20 | | |
| New 3ALC 200 050 150 | New 3ALCC 200 050 150 | 20 X R5 | 21 | 60 | 150 | 20 | | |

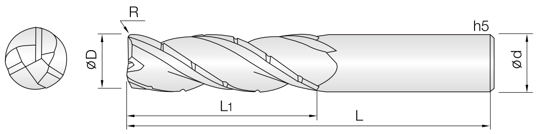
# 3ALCB

## 3 Flutes High Speed Roughing End Mills for Aluminum

## 3날 알루미늄 고이송 황삭 전용 엔드밀

New






- **알루미늄, 알루미늄 합금 등 비철 비금속 계열 전용 엔드밀**
- 칩 브레이커와 홈포켓을 깊게 설계하여 흡착현상을 최소화하며, 중삭 및 황삭의 고속 작업시 우수한 성능을 보입니다.
- 코팅 피막에 경도가 높고 마찰계수가 낮은 Tetrabond TAC코팅을 적용하여 내마모성이 우수합니다
- 일반 알루미늄 라핑과 다르게 피삭재의 가공면이 깨끗합니다.
- 항절력이 높은 미립자 초경합금을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for Aluminum, AL alloys, non-ferrous and non-metallic materials**
- Minimize built up edge by chip braker and deep pocket design.
- Tetrabond TAC coating provides high hardness and low friction on the coating layer
- Good surface integrity differently from competitor's AL roughing endmills.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.


R0.2 502P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø3 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 20 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø16 ~ 20 | -0.015 ~ -0.03mm |

단위 : mm

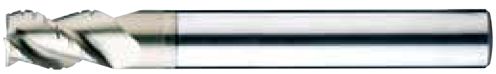
| Order Number 비코팅 Un coated | Order Number RTAC 코팅 RTAC Coated | 날경 Diameter D × R | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 비코팅 Un coated | 비고 코팅 Coated |
|---|---|---|---|---|---|---|---|
| 3ALCB 030 080 S06 | 3ALCBC 030 080 S06 | 3 X R0.2 | 8 | 55 | 6 | | |
| 3ALCB 030 110 S06 | 3ALCBC 030 110 S06 | 3 X R0.2 | 11 | 55 | 6 | | |
| 3ALCB 040 100 S06 | 3ALCBC 040 100 S06 | 4 X R0.2 | 10 | 55 | 6 | | |
| 3ALCB 040 130 S06 | 3ALCBC 040 130 S06 | 4 X R0.2 | 13 | 55 | 6 | | |
| 3ALCB 050 120 S06 | 3ALCBC 050 120 S06 | 5 X R0.2 | 12 | 55 | 6 | | |
| 3ALCB 050 170 S06 | 3ALCBC 050 170 S06 | 5 X R0.2 | 17 | 55 | 6 | | |
| 3ALCB 060 170 S06 | 3ALCBC 060 170 S06 | 6 X R0.2 | 17 | 60 | 6 | | |
| 3ALCB 060 250 S06 | 3ALCBC 060 250 S06 | 6 X R0.2 | 25 | 80 | 6 | | |
| 3ALCB 080 220 S08 | 3ALCBC 080 220 S08 | 8 X R0.2 | 22 | 70 | 8 | | |
| 3ALCB 080 300 S08 | 3ALCBC 080 300 S08 | 8 X R0.2 | 30 | 90 | 8 | | |
| 3ALCB 100 270 S10 | 3ALCBC 100 270 S10 | 10 X R0.2 | 27 | 75 | 10 | | |
| 3ALCB 100 400 S10 | 3ALCBC 100 400 S10 | 10 X R0.2 | 40 | 100 | 10 | | |
| 3ALCB 120 350 S12 | 3ALCBC 120 350 S12 | 12 X R0.2 | 35 | 80 | 12 | | |
| 3ALCB 120 500 S12 | 3ALCBC 120 500 S12 | 12 X R0.2 | 50 | 110 | 12 | | |
| 3ALCB 160 420 S16 | 3ALCBC 160 420 S16 | 16 X R0.2 | 42 | 100 | 16 | | |
| 3ALCB 160 520 S16 | 3ALCBC 160 520 S16 | 16 X R0.2 | 52 | 150 | 16 | | |
| 3ALCB 200 480 S20 | 3ALCBC 200 480 S20 | 20 X R0.2 | 48 | 100 | 20 | | |
| 3ALCB 200 550 S20 | 3ALCBC 200 550 S20 | 20 X R0.2 | 55 | 160 | 20 | | |

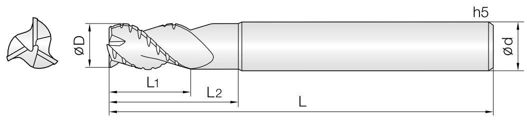
FOR ALUMINUM

# 3ARE

## 3 Flutes Semi-Finishing & Roughing End Mills for Aluminum

## 3날 알루미늄 세미 피니싱 & 라핑 엔드밀






- **알루미늄, 알루미늄 합금 등 비철 비금속 계열 전용 엔드밀**
- JCRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 칩 브레이커와 홈포켓을 깊게 설계하여 흡착현상을 최소화하며, 중삭 및 황삭의 고속 작업시 우수한 성능을 보입니다.
- 일반 알루미늄 라핑과 다르게 피삭재의 가공면이 깨끗합니다.
- 항절력이 높은 미립자 초경합금을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **High speed semi finishing and roughing Endmills for Aluminum, AL alloys, non-ferrous and non-metallic materials.**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Minimize built up edge by chip braker and deep pocket design.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.
- Good surface integrity differently from competitor's AL roughing endmills.

3 | WC 미립자 | JCRO Coating | 45° Helix Angle | Shield Edge | CUTTING DATA 497P

| D Size | D Tolerance |
|---|---|
| Ø 6 ~ 8 | -0.02 ~ -0.04mm |
| Ø 10 ~ 20 | -0.02 ~ -0.05mm |

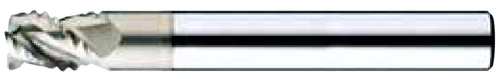
단위 : mm

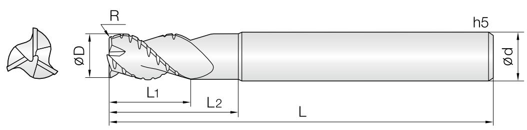
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 3ARE 060 150 S06 | 6 | 10 | 15 | 50 | 6 | |
| 3ARE 060 200 S06 | 6 | 15 | 20 | 70 | 6 | |
| 3ARE 080 200 S08 | 8 | 15 | 20 | 60 | 8 | |
| 3ARE 080 250 S08 | 8 | 20 | 25 | 80 | 8 | |
| 3ARE 100 250 S10 | 10 | 18 | 25 | 70 | 10 | |
| 3ARE 100 300 S10 | 10 | 23 | 30 | 90 | 10 | |
| 3ARE 120 300 S12 | 12 | 20 | 30 | 80 | 12 | |
| 3ARE 120 400 S12 | 12 | 30 | 40 | 100 | 12 | |
| 3ARE 160 350 S16 | 16 | 25 | 35 | 110 | 16 | |
| 3ARE 160 500 S16 | 16 | 35 | 50 | 120 | 16 | |
| 3ARE 200 500 S20 | 20 | 35 | 50 | 110 | 20 | |
| 3ARE 200 600 S20 | 20 | 45 | 60 | 120 | 20 | |

# 3ARC

## 3 Flutes Semi-Finishing & Roughing Corner Radius End Mills for Aluminum

## 3날 알루미늄 세미 피니싱 & 라핑 코너 레디우스 엔드밀






- **알루미늄, 알루미늄 합금 등 비철 비금속 계열 전용 엔드밀**
- JCRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 칩 브레이커와 홈포켓을 깊게 설계하여 흡착현상을 최소화하며, 중삭 및 황삭의 고속 작업시 우수한 성능을 보입니다.
- 일반 알루미늄 라핑과 다르게 피삭재의 가공면이 깨끗합니다.
- 항절력이 높은 미립자 초경합금을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **High speed semi finishing and roughing End Mills for Aluminum, AL alloys, non-ferrous and non-metallic materials**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Minimize built up edge by chip braker and deep pocket design.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.
- Good surface integrity differently from competitor's AL roughing endmills.

3 | WC 미립자 | JCRO Coating | R ± 0.005 R0.5 | R ± 0.01 R1 | R ± 0.015 R02 ~ 3 | 45° Helix Angle | CUTTING DATA 497P

| D Size | D Tolerance |
|---|---|
| Ø 6 ~ 8 | -0.02 ~ -0.04mm |
| Ø 10 ~ 20 | -0.02 ~ -0.05mm |

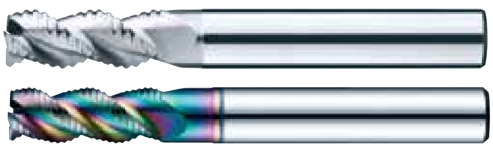
단위 : mm

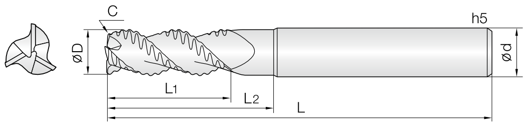
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 3ARC 060 005 S06 | 6 X R0.5 | 9 | 15 | 65 | 6 | |
| 3ARC 060 010 S06 | 6 X R1 | 9 | 15 | 65 | 6 | |
| 3ARC 080 005 S08 | 8 X R0.5 | 12 | 20 | 70 | 8 | |
| 3ARC 080 010 S08 | 8 X R1 | 12 | 20 | 70 | 8 | |
| 3ARC 100 010 S10 | 10 X R1 | 15 | 25 | 75 | 10 | |
| 3ARC 100 020 S10 | 10 X R2 | 15 | 25 | 75 | 10 | |
| 3ARC 120 010 S12 | 12 X R1 | 20 | 30 | 80 | 12 | |
| 3ARC 120 020 S12 | 12 X R2 | 20 | 30 | 80 | 12 | |
| 3ARC 120 030 S12 | 12 X R3 | 20 | 30 | 80 | 12 | |
| 3ARC 160 010 S16 | 16 X R1 | 25 | 35 | 110 | 16 | |
| 3ARC 160 020 S16 | 16 X R2 | 25 | 35 | 110 | 16 | |
| 3ARC 160 030 S16 | 16 X R3 | 25 | 35 | 110 | 16 | |
| 3ARC 200 020 S20 | 20 X R2 | 30 | 50 | 110 | 20 | |
| 3ARC 200 030 S20 | 20 X R3 | 30 | 50 | 110 | 20 | |

# 3ARO

## 3 Flutes 45°Helix Roughing End Mills for Aluminum

## 3날 45°헬릭스 알루미늄 전용 라핑 엔드밀






- **알루미늄, 알루미늄 합금 등 비철 비금속 계열의 고속 중삭 및 황삭**
- 칩 브레이커와 홈포켓을 깊게 설계하여 흡착현상을 최소화하며, 중삭 및 황삭의 고속 작업시 우수한 성능을 보입니다.
- 코팅피막에 경도가 높고 마찰계수가 낮은 Tetrabond TAC코팅을 적용하여 내마모성이 우수하며, 피삭재의 표면조도가 월등히 우수합니다.
- 항절력이 높은 미립자 초경합금을 채택하여 고이송 작업시 엔드밀의 파손을 최소화 하였습니다.

- **High speed semi finishing and roughing Endmills for Aluminum, AL alloys, non-ferrous and non-metallic materials**
- Minimize built up edge by chip braker and deep pocket design.
- Tetrabond TAC coating provides excellent work surface finish by high hardness and low friction.
- Minimize fracturing at high feed by high TRS fine WC grade.

3 | WC 미립자 | RTAC Coating | 45° Helix Angle | Shield Edge | CUTTING DATA 497P

| D Size | D Tolerance |
|---|---|
| Ø 4 ~ 8 | -0.02 ~ -0.04mm |
| Ø 10 ~ 20 | -0.02 ~ -0.05mm |

단위 : mm

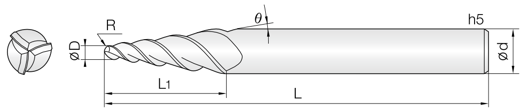
| Order Number<br>비코팅 Un coated | Order Number<br>RTAC 코팅 RTAC Coated | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 비코팅 Un coated | 비고 코팅 Coated |
|---|---|---|---|---|---|---|---|---|
| 3ARO 040 080 S06 | 3AROC 040 080 S06 | 4 | 8 | - | 50 | 6 | | |
| 3ARO 040 150 S06 | 3AROC 040 150 S06 | 4 | 10 | 15 | 60 | 6 | | |
| 3ARO 050 100 S06 | 3AROC 050 100 S06 | 5 | 10 | - | 60 | 6 | | |
| 3ARO 050 200 S06 | 3AROC 050 200 S06 | 5 | 15 | 20 | 60 | 6 | | |
| 3ARO 060 120 S06 | 3AROC 060 120 S06 | 6 | 12 | - | 60 | 6 | | |
| New 3ARO 060 150 S06 | New 3AROC 060 150 S06 | 6 | 15 | - | 60 | 6 | | |
| 3ARO 060 210 S06 | 3AROC 060 210 S06 | 6 | 16 | 21 | 65 | 6 | | |
| New 3ARO 060 250 080 | New 3AROC 060 250 080 | 6 | 25 | - | 80 | 6 | | |
| 3ARO 080 160 S08 | 3AROC 080 160 S08 | 8 | 16 | - | 70 | 8 | | |
| New 3ARO 080 200 S08 | New 3AROC 080 200 S08 | 8 | 20 | - | 70 | 8 | | |
| 3ARO 080 270 S08 | 3AROC 080 270 S08 | 8 | 21 | 27 | 70 | 8 | | |
| New 3ARO 080 300 S08 | New 3AROC 080 300 S08 | 8 | 30 | - | 90 | 8 | | |
| 3ARO 100 200 S10 | 3AROC 100 200 S10 | 10 | 20 | - | 70 | 10 | | |
| New 3ARO 100 250 S10 | New 3AROC 100 250 S10 | 10 | 25 | - | 70 | 10 | | |
| 3ARO 100 310 S10 | 3AROC 100 310 S10 | 10 | 26 | 31 | 75 | 10 | | |
| New 3ARO 100 400 S10 | New 3AROC 100 400 S10 | 10 | 40 | - | 100 | 10 | | |
| 3ARO 120 240 S12 | 3AROC 120 240 S12 | 12 | 24 | - | 75 | 12 | | |
| New 3ARO 120 300 S12 | New 3AROC 120 300 S12 | 12 | 30 | - | 80 | 12 | | |
| 3ARO 120 380 S12 | 3AROC 120 380 S12 | 12 | 30 | 38 | 80 | 12 | | |
| New 3ARO 120 500 S12 | New 3AROC 120 500 S12 | 12 | 50 | - | 110 | 12 | | |
| New 3ARO 140 350 S14 | New 3AROC 140 350 S14 | 14 | 35 | - | 90 | 14 | | |
| 3ARO 160 320 S16 | 3AROC 160 320 S16 | 16 | 32 | - | 100 | 16 | | |
| New 3ARO 160 420 S16 | New 3AROC 160 420 S16 | 16 | 42 | - | 100 | 16 | | |
| 3ARO 160 450 S16 | 3AROC 160 450 S16 | 16 | 36 | 45 | 100 | 16 | | |
| New 3ARO 160 520 S16 | New 3AROC 160 520 S16 | 16 | 52 | - | 150 | 16 | | |
| New 3ARO 180 450 S18 | New 3AROC 180 450 S18 | 18 | 45 | - | 100 | 18 | | |
| New 3ARO 200 480 S20 | New 3AROC 200 480 S20 | 20 | 48 | - | 100 | 20 | | |
| 3ARO 200 550 S20 | 3AROC 200 550 S20 | 20 | 41 | 55 | 110 | 20 | | |
| New 3ARO 200 550 160 | New 3AROC 200 550 160 | 20 | 55 | - | 160 | 20 | | |

FOR ALUMINUM

# 3TBIC

## 3 Flutes Taper Ball End Mills for Impellers

## 3날 임펠라 가공용 테이퍼 볼 엔드밀




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

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

3 | WC 미립자 | JCRO Coating | R ± 0.005 (0.5R ~ 1R) | R ± 0.01 (2R ~ 3R) | 35° Helix Angle | CUTTING DATA (498P)

단위 : mm

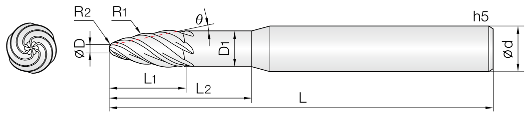
| Order Number | 날경 Diameter R × D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 3TBIC 010 010 120 | R0.5 X 1 | 1° | 12 | 50 | 6 | |
| 3TBIC 010 010 200 | R0.5 X 1 | 1° | 20 | 60 | 6 | |
| 3TBIC 010 020 150 | R0.5 X 1 | 2° | 15 | 55 |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

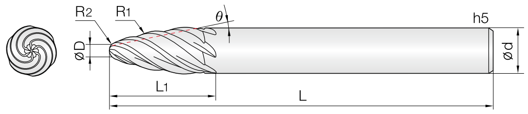
TAPER

# 4&6CTDB

## 4&6 Flutes 5 Axies Taper Double Ball End Mills

## 4&6날 5축 테이퍼 더블 볼 엔드밀




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

- **Pre-hardened steels, Cast irons, Non-metallic materials**
- HR coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Suitable for special components with 3 axes and 5 axes sector such as impellers, blisks, tire profiles, turbine blades.
- Available for simultaneous machining of roughing and finishing with only one tool.


0.5 ~ 1.5R  2 ~ 4R  499P

단위 : mm

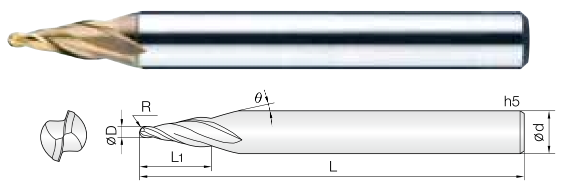
| Order Number | 날경 Diameter R × D | 옆날 R1 | 옆날 R2 | 각도 Angle θ | 목부경 Neck Diameter D1 | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|---|---|---|
| 4CTDB 010 013 047 | 0.5R X 1 | 13 | 0.5 | 10 | 2.4 | 4.7 | 10 | 50 | 4 | |
| 4CTDB 015 020 071 | 0.75R X 1.5 | 20 | 0.75 | 10 | 3.6 | 7.1 | 15 | 50 | 4 | |
| 4CTDB 020 025 094 | 1R X 2 | 25 | 1 | 10 | 4.8 | 9.4 | 20 | 60 | 6 | |
| 4CTDB 020 350 116 | 1R X 2 | 350 | 1 | 15 | 7 | 11.6 | 18 | 80 | 8 | |
| 4CTDB 030 040 141 | 1.5R X 3 | 40 | 1.5 | 10 | 7.3 | 14.1 | 30 | 80 | 8 | |
| 6CTDB 040 050 187 | 2R X 4 | 50 | 2 | 10 | 9.5 | 18.7 | 40 | 100 | 12 | |
| 6CTDB 040 750 124 | 2R X 4 | 750 | 2 | 30 | - | 12.4 | - | 110 | 16 | |
| 6CTDB 060 075 200 | 3R X 6 | 75 | 3 | 10 | - | 20 | - | 100 | 12 | |
| 6CTDB 060 1000 167 | 3R X 6 | 1,000 | 3 | 20 | - | 16.7 | - | 110 | 16 | |
| 6CTDB 080 135 268 | 4R X 8 | 135 | 4 | 5 | - | 26.8 | - | 110 | 12 | |
| 6CTDB 080 1000 267 | 4R X 8 | 1,000 | 4 | 10 | - | 26.7 | - | 110 | 16 | |

TAPER

# 2CTB

*2 Flutes Taper Ball End Mills*

## 2날 고속가공용 테이퍼 볼 엔드밀




- **고경도강(HRc52이하), 프리하든강 계열의 고정밀 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 날부 인선의 조도가 뛰어나 피삭재의 면조도가 우수합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for pre-hardened and hardened steels(~HRc52)**
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Very nice work surface finish.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

2 | WC 미립자 | TISIN Coating | R ± 0.005 (0.1 ~ 1.5R) | R ± 0.01 (1.5 ~ 3R) | 30° Helix Angle | CUTTING DATA 500P

단위 : mm

| Order Number | 날경 Diameter R × D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CTB 002 010 015 | 0.1R X 0.2 | 1° | 1.5 | 40 | 4 | |
| 2CTB 002 020 015 | 0.1R X 0.2 | 2° | 1.5 | 40 | 4 | |
| 2CTB 002 030 015 | 0.1R X 0.2 | 3° | 1.5 | 40 | 4 | |
| 2CTB 002 050 015 | 0.1R X 0.2 | 5° | 1.5 | 40 | 4 | |
| 2CTB 002 070 015 | 0.1R X 0.2 | 7° | 1.5 | 40 | 4 | |
| 2CTB 002 100 015 | 0.1R X 0.2 | 10° | 1.5 | 40 | 4 | |
| 2CTB 003 010 020 | 0.15R X 0.3 | 1° | 2 | 40 | 4 | |
| 2CTB 003 020 020 | 0.15R X 0.3 | 2° | 2 | 40 | 4 | |
| 2CTB 003 030 020 | 0.15R X 0.3 | 3° | 2 | 40 | 4 | |
| 2CTB 003 050 020 | 0.15R X 0.3 | 5° | 2 | 40 | 4 | |
| 2CTB 003 070 020 | 0.15R X 0.3 | 7° | 2 | 40 | 4 | |
| 2CTB 003 100 020 | 0.15R X 0.3 | 10° | 2 | 40 | 4 | |
| 2CTB 003 150 020 | 0.15R X 0.3 | 15° | 2 | 40 | 4 | |
| 2CTB 004 010 030 | 0.2R X 0.4 | 1° | 3 | 40 | 4 | |
| 2CTB 004 020 030 | 0.2R X 0.4 | 2° | 3 | 40 | 4 | |
| 2CTB 004 030 030 | 0.2R X 0.4 | 3° | 3 | 40 | 4 | |
| 2CTB 004 040 030 | 0.2R X 0.4 | 4° | 3 | 40 | 4 | |
| 2CTB 004 050 030 | 0.2R X 0.4 | 5° | 3 | 40 | 4 | |
| 2CTB 004 070 030 | 0.2R X 0.4 | 7° | 3 | 40 | 4 | |
| 2CTB 004 100 030 | 0.2R X 0.4 | 10° | 3 | 40 | 4 | |
| 2CTB 004 150 030 | 0.2R X 0.4 | 15° | 3 | 40 | 4 | |
| 2CTB 005 010 030 | 0.25R X 0.5 | 1° | 3 | 40 | 4 | |
| 2CTB 005 020 030 | 0.25R X 0.5 | 2° | 3 | 40 | 4 | |
| 2CTB 005 030 030 | 0.25R X 0.5 | 3° | 3 | 40 | 4 | |
| 2CTB 005 040 035 | 0.25R X 0.5 | 4° | 3.5 | 40 | 4 | |
| 2CTB 005 050 035 | 0.25R X 0.5 | 5° | 3.5 | 40 | 4 | |
| 2CTB 005 070 035 | 0.25R X 0.5 | 7° | 3.5 | 40 | 4 | |
| 2CTB 005 100 035 | 0.25R X 0.5 | 10° | 3.5 | 40 | 4 | |
| 2CTB 005 150 035 | 0.25R X 0.5 | 15° | 3.5 | 40 | 4 | |
| 2CTB 006 010 030 | 0.3R X 0.6 | 1° | 3 | 40 | 4 | |
| 2CTB 006 020 030 | 0.3R X 0.6 | 2° | 3 | 40 | 4 | |
| 2CTB 006 030 030 | 0.3R X 0.6 | 3° | 3 | 40 | 4 | |
| 2CTB 006 040 035 | 0.3R X 0.6 | 4° | 3.5 | 40 | 4 | |
| 2CTB 006 050 035 | 0.3R X 0.6 | 5° | 3.5 | 40 | 4 | |
| 2CTB 006 070 035 | 0.3R X 0.6 | 7° | 3.5 | 40 | 4 | |
| 2CTB 006 100 035 | 0.3R X 0.6 | 10° | 3.5 | 40 | 4 | |
| 2CTB 006 150 035 | 0.3R X 0.6 | 15° | 3.5 | 40 | 4 | |
| 2CTB 007 010 030 | 0.35R X 0.7 | 1° | 3 | 40 | 4 | |
| 2CTB 007 020 030 | 0.35R X 0.7 | 2° | 3 | 40 | 4 | |
| 2CTB 007 030 040 | 0.35R X 0.7 | 3° | 4 | 40 | 4 | |
| 2CTB 007 050 040 | 0.35R X 0.7 | 5° | 4 | 40 | 4 | |
| 2CTB 007 070 040 | 0.35R X 0.7 | 7° | 4 | 40 | 4 | |
| 2CTB 007 100 040 | 0.35R X 0.7 | 10° | 4 | 40 | 4 | |
| 2CTB 007 150 040 | 0.35R X 0.7 | 15° | 4 | 40 | 4 | |
| 2CTB 008 010 030 | 0.4R X 0.8 | 1° | 3 | 40 | 4 | |
| 2CTB 008 020 030 | 0.4R X 0.8 | 2° | 3 | 40 | 4 | |
| 2CTB 008 030 030 | 0.4R X 0.8 | 3° | 3 | 40 | 4 | |
| 2CTB 008 040 040 | 0.4R X 0.8 | 4° | 4 | 40 | 4 | |
| 2CTB 008 050 040 | 0.4R X 0.8 | 5° | 4 | 40 | 4 | |
| 2CTB 008 070 040 | 0.4R X 0.8 | 7° | 4 | 40 | 4 | |
| 2CTB 008 100 040 | 0.4R X 0.8 | 10° | 4 | 40 | 4 | |
| 2CTB 008 150 040 | 0.4R X 0.8 | 15° | 4 | 40 | 4 | |
| 2CTB 010 003 030 | 0.5R X 1 | 0°30 | 3 | 40 | 4 | |
| 2CTB 010 010 030 | 0.5R X 1 | 1° | 3 | 40 | 4 | |
| 2CTB 010 013 040 | 0.5R X 1 | 1°30 | 4 | 40 | 4 | |
| 2CTB 010 020 040 | 0.5R X 1 | 2° | 4 | 40 | 4 | |
| 2CTB 010 030 040 | 0.5R X 1 | 3° | 4 | 40 | 4 | |
| 2CTB 010 040 060 | 0.5R X 1 | 4° | 6 | 45 | 4 | |
| 2CTB 010 050 060 | 0.5R X 1 | 5° | 6 | 45 | 4 | |
| 2CTB 010 070 060 | 0.5R X 1 | 7° | 6 | 45 | 4 | |
| 2CTB 010 100 060 | 0.5R X 1 | 10° | 6 | 45 | 4 | |
| 2CTB 010 150 056 | 0.5R X 1 | 15° | 5.6 | 45 | 4 | |
| 2CTB 012 003 030 | 0.6R X 1.2 | 0°30 | 3 | 40 | 4 | |
| 2CTB 012 010 030 | 0.6R X 1.2 | 1° | 3 | 40 | 4 | |
| 2CTB 012 013 040 | 0.6R X 1.2 | 1°30 | 4 | 40 | 4 | |
| 2CTB 012 020 040 | 0.6R X 1.2 | 2° | 4 | 40 | 4 | |
| 2CTB 012 030 040 | 0.6R X 1.2 | 3° | 4 | 40 | 4 | |
| 2CTB 012 040 060 | 0.6R X 1.2 | 4° | 6 | 45 | 4 | |
| 2CTB 012 050 060 | 0.6R X 1.2 | 5° | 6 | 45 | 4 | |
| 2CTB 012 070 060 | 0.6R X 1.2 | 7° | 6 | 45 | 4 | |
| 2CTB 012 100 060 | 0.6R X 1.2 | 10° | 6 | 45 | 4 | |
| 2CTB 012 150 050 | 0.6R X 1.2 | 15° | 5 | 45 | 4 | |
| 2CTB 015 003 060 | 0.75R X 1.5 | 0°30 | 6 | 45 | 4 | |
| 2CTB 015 010 060 | 0.75R X 1.5 | 1° | 6 | 45 | 4 | |
| 2CTB 015 013 060 | 0.75R X 1.5 | 1°30 | 6 | 45 | 4 | |
| 2CTB 015 020 060 | 0.75R X 1.5 | 2° | 6 | 45 | 4 | |
| 2CTB 015 030 060 | 0.75R X 1.5 | 3° | 6 | 45 | 4 | |
| 2CTB 015 040 060 | 0.75R X 1.5 | 4° | 6 | 45 | 4 | |
| 2CTB 015 050 060 | 0.75R X 1.5 | 5° | 6 | 45 | 4 | |
| 2CTB 015 070 060 | 0.75R X 1.5 | 7° | 6 | 45 | 4 | |
| 2CTB 015 100 060 | 0.75R X 1.5 | 10° | 6 | 45 | 4 | |
| 2CTB 015 150 060 | 0.75R X 1.5 | 15° | 6 | 50 | 6 | |
| 2CTB 020 003 080 | 1R X 2 | 0°30 | 8 | 45 | 4 | |
| 2CTB 020 010 080 | 1R X 2 | 1° | 8 | 45 | 4 | |
| 2CTB 020 013 080 | 1R X 2 | 1°30 | 8 | 45 | 4 | |
| 2CTB 020 020 080 | 1R X 2 | 2° | 8 | 45 | 4 | |
| 2CTB 020 030 080 | 1R X 2 | 3° | 8 | 45 | 4 | |
| 2CTB 020 040 080 | 1R X 2 | 4° | 8 | 45 | 4 | |
| 2CTB 020 050 080 | 1R X 2 | 5° | 8 | 45 | 4 | |
| 2CTB 020 070 080 | 1R X 2 | 7° | 8 | 45 | 4 | |
| 2CTB 020 100 080 | 1R X 2 | 10° | 8 | 50 | 6 | |
| 2CTB 020 150 080 | 1R X 2 | 15° | 8 | 50 | 6 | |
| 2CTB 030 003 120 | 1.5R X 3 | 0°30 | 12 | 60 | 6 | |
| 2CTB 030 010 120 | 1.5R X 3 | 1° | 12 | 60 | 6 | |
| 2CTB 030 013 120 | 1.5R X 3 | 1°30 | 12 | 60 | 6 | |
| 2CTB 030 020 120 | 1.5R X 3 | 2° | 12 | 60 | 6 | |
| 2CTB 030 030 120 | 1.5R X 3 | 3° | 12 | 60 | 6 | |
| 2CTB 030 040 120 | 1.5R X 3 | 4° | 12 | 60 | 6 | |
| 2CTB 030 050 120 | 1.5R X 3 | 5° | 12 | 60 | 6 | |
| 2CTB 030 070 120 | 1.5R X 3 | 7° | 12 | 60 | 6 | |

# 2날 고속가공용 테이퍼 볼 엔드밀

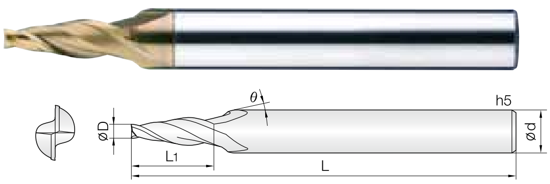
단위 : mm

| Order Number | 날경 Diameter R × D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CTB 030 100 120 | 1.5R X 3 | 10° | 12 | 60 | 8 | |
| 2CTB 030 150 120 | 1.5R X 3 | 15° | 12 | 70 | 10 | |
| 2CTB 040 003 160 | 2R X 4 | 0°30 | 16 | 70 | 8 | |
| 2CTB 040 010 160 | 2R X 4 | 1° | 16 | 70 | 8 | |
| 2CTB 040 013 160 | 2R X 4 | 1°30 | 16 | 70 | 8 | |
| 2CTB 040 020 160 | 2R X 4 | 2° | 16 | 70 | 8 | |
| 2CTB 040 030 160 | 2R X 4 | 3° | 16 | 70 | 8 | |
| 2CTB 040 040 160 | 2R X 4 | 4° | 16 | 70 | 8 | |
| 2CTB 040 050 160 | 2R X 4 | 5° | 16 | 70 | 8 | |
| 2CTB 040 070 160 | 2R X 4 | 7° | 16 | 70 | 8 | |
| 2CTB 040 100 160 | 2R X 4 | 10° | 16 | 70 | 10 | |
| 2CTB 040 150 160 | 2R X 4 | 15° | 16 | 80 | 12 | |
| 2CTB 050 003 200 | 2.5R X 5 | 0°30 | 20 | 75 | 8 | |
| 2CTB 050 010 200 | 2.5R X 5 | 1° | 20 | 75 | 8 | |
| 2CTB 050 013 200 | 2.5R X 5 | 1°30 | 20 | 75 | 8 | |
| 2CTB 050 020 200 | 2.5R X 5 | 2° | 20 | 75 | 8 | |
| 2CTB 050 030 200 | 2.5R X 5 | 3° | 20 | 75 | 8 | |
| 2CTB 050 040 200 | 2.5R X 5 | 4° | 20 | 75 | 8 | |
| 2CTB 050 050 200 | 2.5R X 5 | 5° | 20 | 80 | 10 | |
| 2CTB 050 070 200 | 2.5R X 5 | 7° | 20 | 80 | 10 | |
| 2CTB 060 003 240 | 3R X 6 | 0°30 | 24 | 80 | 10 | |
| 2CTB 060 010 240 | 3R X 6 | 1° | 24 | 80 | 10 | |
| 2CTB 060 013 240 | 3R X 6 | 1°30 | 24 | 80 | 10 | |
| 2CTB 060 020 240 | 3R X 6 | 2° | 24 | 80 | 10 | |
| 2CTB 060 030 240 | 3R X 6 | 3° | 24 | 80 | 10 | |
| 2CTB 060 040 240 | 3R X 6 | 4° | 24 | 80 | 10 | |
| 2CTB 060 050 240 | 3R X 6 | 5° | 24 | 90 | 12 | |
| 2CTB 060 070 240 | 3R X 6 | 7° | 24 | 90 | 12 | |

# 2CTE

*2 Flutes Taper End Mills*

## 2날 고속가공용 테이퍼 엔드밀




- **고경도강(HRc52이하), 프리하든강 계열의 고정밀 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 날부 인선의 조도가 뛰어나 피삭재의 면조도가 우수합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for pre-hardened and hardened steels(~HRc52)**
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Very nice work surface finish.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

2 | WC 미립자 | TiSIN Coating | 30° Helix Angle | Shield Edge | CUTTING DATA 500P

| D Size | D Tolerance |
|---|---|
| Ø0.2 ~ 4 | +0 ~ -0.01mm |
| Ø6 ~ 8 | -0.01 ~ -0.025mm |

단위 : mm

| Order Number | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CTE 002 003 010 | 0.2 | 0°30 | 1 | 40 | 4 | |
| 2CTE 002 010 010 | 0.2 | 1° | 1 | 40 | 4 | |
| 2CTE 002 013 010 | 0.2 | 1°30 | 1 | 40 | 4 | |
| 2CTE 002 020 010 | 0.2 | 2° | 1 | 40 | 4 | |
| 2CTE 002 030 010 | 0.2 | 3° | 1 | 40 | 4 | |
| 2CTE 002 050 010 | 0.2 | 5° | 1 | 40 | 4 | |
| 2CTE 002 070 010 | 0.2 | 7° | 1 | 40 | 4 | |
| 2CTE 002 100 010 | 0.2 | 10° | 1 | 40 | 4 | |
| 2CTE 002 150 010 | 0.2 | 15° | 1 | 40 | 4 | |
| 2CTE 003 003 012 | 0.3 | 0°30 | 1.2 | 40 | 4 | |
| 2CTE 003 010 012 | 0.3 | 1° | 1.2 | 40 | 4 | |
| 2CTE 003 013 012 | 0.3 | 1°30 | 1.2 | 40 | 4 | |
| 2CTE 003 020 012 | 0.3 | 2° | 1.2 | 40 | 4 | |
| 2CTE 003 030 012 | 0.3 | 3° | 1.2 | 40 | 4 | |
| 2CTE 003 050 012 | 0.3 | 5° | 1.2 | 40 | 4 | |
| 2CTE 003 070 015 | 0.3 | 7° | 1.5 | 40 | 4 | |
| 2CTE 003 100 015 | 0.3 | 10° | 1.5 | 40 | 4 | |
| 2CTE 003 150 015 | 0.3 | 15° | 1.5 | 40 | 4 | |
| 2CTE 004 003 016 | 0.4 | 0°30 | 1.6 | 40 | 4 | |
| 2CTE 004 010 016 | 0.4 | 1° | 1.6 | 40 | 4 | |
| 2CTE 004 013 016 | 0.4 | 1°30 | 1.6 | 40 | 4 | |
| 2CTE 004 020 016 | 0.4 | 2° | 1.6 | 40 | 4 | |
| 2CTE 004 030 016 | 0.4 | 3° | 1.6 | 40 | 4 | |
| 2CTE 004 050 016 | 0.4 | 5° | 1.6 | 40 | 4 | |
| 2CTE 004 070 020 | 0.4 | 7° | 2 | 40 | 4 | |
| 2CTE 004 100 020 | 0.4 | 10° | 2 | 40 | 4 | |
| 2CTE 004 150 020 | 0.4 | 15° | 2 | 40 | 4 | |
| 2CTE 005 003 020 | 0.5 | 0°30 | 2 | 40 | 4 | |
| 2CTE 005 010 020 | 0.5 | 1° | 2 | 40 | 4 | |
| 2CTE 005 013 020 | 0.5 | 1°30 | 2 | 40 | 4 | |
| 2CTE 005 020 020 | 0.5 | 2° | 2 | 40 | 4 | |
| 2CTE 005 030 020 | 0.5 | 3° | 2 | 40 | 4 | |
| 2CTE 005 050 020 | 0.5 | 5° | 2 | 40 | 4 | |
| 2CTE 005 070 025 | 0.5 | 7° | 2.5 | 40 | 4 | |
| 2CTE 005 100 025 | 0.5 | 10° | 2.5 | 40 | 4 | |
| 2CTE 005 150 025 | 0.5 | 15° | 2.5 | 40 | 4 | |
| 2CTE 005 200 025 | 0.5 | 20° | 2.5 | 40 | 4 | |
| 2CTE 006 003 020 | 0.6 | 0°30 | 2 | 40 | 4 | |
| 2CTE 006 010 020 | 0.6 | 1° | 2 | 40 | 4 | |
| 2CTE 006 013 020 | 0.6 | 1°30 | 2 | 40 | 4 | |
| 2CTE 006 020 020 | 0.6 | 2° | 2 | 40 | 4 | |
| 2CTE 006 030 020 | 0.6 | 3° | 2 | 40 | 4 | |
| 2CTE 006 050 020 | 0.6 | 5° | 2 | 40 | 4 | |
| 2CTE 006 070 025 | 0.6 | 7° | 2.5 | 40 | 4 | |
| 2CTE 006 100 025 | 0.6 | 10° | 2.5 | 40 | 4 | |
| 2CTE 006 150 025 | 0.6 | 15° | 2.5 | 40 | 4 | |
| 2CTE 006 200 025 | 0.6 | 20° | 2.5 | 40 | 4 | |
| 2CTE 007 010 025 | 0.7 | 1° | 2.5 | 40 | 4 | |
| 2CTE 007 013 025 | 0.7 | 1°30 | 2.5 | 40 | 4 | |
| 2CTE 007 020 025 | 0.7 | 2° | 2.5 | 40 | 4 | |

| Order Number | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CTE 007 030 025 | 0.7 | 3° | 2.5 | 40 | 4 | |
| 2CTE 007 050 025 | 0.7 | 5° | 2.5 | 40 | 4 | |
| 2CTE 007 070 030 | 0.7 | 7° | 3 | 40 | 4 | |
| 2CTE 007 100 030 | 0.7 | 10° | 3 | 40 | 4 | |
| 2CTE 007 150 030 | 0.7 | 15° | 3 | 40 | 4 | |
| 2CTE 007 200 030 | 0.7 | 20° | 3 | 40 | 4 | |
| 2CTE 008 003 030 | 0.8 | 0°30 | 3 | 40 | 4 | |
| 2CTE 008 010 030 | 0.8 | 1° | 3 | 40 | 4 | |
| 2CTE 008 013 030 | 0.8 | 1°30 | 3 | 40 | 4 | |
| 2CTE 008 020 030 | 0.8 | 2° | 3 | 40 | 4 | |
| 2CTE 008 030 030 | 0.8 | 3° | 3 | 40 | 4 | |
| 2CTE 008 050 030 | 0.8 | 5° | 3 | 40 | 4 | |
| 2CTE 008 070 030 | 0.8 | 7° | 3 | 40 | 4 | |
| 2CTE 008 100 030 | 0.8 | 10° | 3 | 40 | 4 | |
| 2CTE 008 150 030 | 0.8 | 15° | 3 | 40 | 4 | |
| 2CTE 008 200 030 | 0.8 | 20° | 3 | 40 | 4 | |
| 2CTE 010 003 040 | 1 | 0°30 | 4 | 45 | 4 | |
| 2CTE 010 010 040 | 1 | 1° | 4 | 45 | 4 | |
| 2CTE 010 013 040 | 1 | 1°30 | 4 | 45 | 4 | |
| 2CTE 010 020 040 | 1 | 2° | 4 | 45 | 4 | |
| 2CTE 010 030 040 | 1 | 3° | 4 | 45 | 4 | |
| 2CTE 010 050 040 | 1 | 5° | 4 | 45 | 4 | |
| 2CTE 010 070 040 | 1 | 7° | 4 | 45 | 4 | |
| 2CTE 010 100 040 | 1 | 10° | 4 | 45 | 4 | |
| 2CTE 010 150 040 | 1 | 15° | 4 | 50 | 6 | |
| 2CTE 010 200 040 | 1 | 20° | 4 | 50 | 6 | |
| 2CTE 015 003 050 | 1.5 | 0°30 | 5 | 45 | 4 | |
| 2CTE 015 010 050 | 1.5 | 1° | 5 | 45 | 4 | |
| 2CTE 015 013 060 | 1.5 | 1°30 | 6 | 45 | 4 | |
| 2CTE 015 020 070 | 1.5 | 2° | 7 | 45 | 4 | |
| 2CTE 015 030 080 | 1.5 | 3° | 8 | 45 | 4 | |
| 2CTE 015 050 100 | 1.5 | 5° | 10 | 50 | 4 | |
| 2CTE 015 070 100 | 1.5 | 7° | 10 | 50 | 4 | |
| 2CTE 015 100 100 | 1.5 | 10° | 10 | 50 | 6 | |
| 2CTE 015 150 060 | 1.5 | 15° | 6 | 50 | 6 | |
| 2CTE 015 200 060 | 1.5 | 20° | 6 | 50 | 6 | |
| 2CTE 020 003 060 | 2 | 0°30 | 6 | 45 | 4 | |
| 2CTE 020 010 060 | 2 | 1° | 6 | 45 | 4 | |
| 2CTE 020 013 060 | 2 | 1°30 | 6 | 45 | 4 | |
| 2CTE 020 020 080 | 2 | 2° | 8 | 45 | 4 | |
| 2CTE 020 030 100 | 2 | 3° | 10 | 50 | 4 | |
| 2CTE 020 050 100 | 2 | 5° | 10 | 50 | 4 | |
| 2CTE 020 070 100 | 2 | 7° | 10 | 50 | 6 | |
| 2CTE 020 100 110 | 2 | 10° | 11 | 50 | 6 | |
| 2CTE 020 150 070 | 2 | 15° | 7 | 50 | 6 | |
| 2CTE 020 200 070 | 2 | 20° | 7 | 50 | 8 | |
| 2CTE 025 003 080 | 2.5 | 0°30 | 8 | 45 | 6 | |
| 2CTE 025 010 100 | 2.5 | 1° | 10 | 50 | 6 | |
| 2CTE 025 013 100 | 2.5 | 1°30 | 10 | 50 | 6 | |
| 2CTE 025 020 120 | 2.5 | 2° | 12 | 50 | 6 | |

단위 : mm

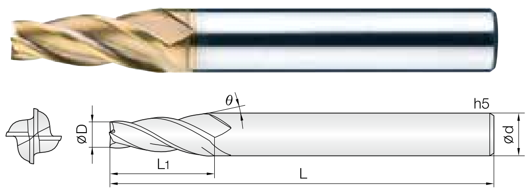
| Order Number | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CTE 025 030 120 | 2.5 | 3° | 12 | 50 | 6 | |
| 2CTE 025 050 120 | 2.5 | 5° | 12 | 50 | 6 | |
| 2CTE 025 070 120 | 2.5 | 7° | 12 | 50 | 6 | |
| 2CTE 025 100 100 | 2.5 | 10° | 10 | 50 | 6 | |
| 2CTE 025 150 100 | 2.5 | 15° | 10 | 60 | 8 | |
| 2CTE 025 200 100 | 2.5 | 20° | 10 | 70 | 10 | |
| 2CTE 030 003 120 | 3 | 0°30 | 12 | 50 | 6 | |
| 2CTE 030 010 120 | 3 | 1° | 12 | 50 | 6 | |
| 2CTE 030 013 120 | 3 | 1°30 | 12 | 50 | 6 | |
| 2CTE 030 020 120 | 3 | 2° | 12 | 50 | 6 | |
| 2CTE 030 030 120 | 3 | 3° | 12 | 50 | 6 | |
| 2CTE 030 050 120 | 3 | 5° | 12 | 50 | 6 | |
| 2CTE 030 070 120 | 3 | 7° | 12 | 50 | 6 | |
| 2CTE 030 100 080 | 3 | 10° | 8 | 50 | 6 | |
| 2CTE 030 150 090 | 3 | 15° | 9 | 60 | 8 | |
| 2CTE 030 200 090 | 3 | 20° | 9 | 70 | 10 | |
| 2CTE 040 003 150 | 4 | 0°30 | 15 | 60 | 6 | |
| 2CTE 040 010 150 | 4 | 1° | 15 | 60 | 6 | |
| 2CTE 040 013 150 | 4 | 1°30 | 15 | 60 | 6 | |
| 2CTE 040 020 150 | 4 | 2° | 15 | 60 | 6 | |
| 2CTE 040 030 180 | 4 | 3° | 18 | 60 | 6 | |
| 2CTE 040 050 230 | 4 | 5° | 23 | 65 | 8 | |
| 2CTE 040 070 240 | 4 | 7° | 24 | 75 | 10 | |
| 2CTE 040 100 220 | 4 | 10° | 22 | 75 | 12 | |
| 2CTE 060 003 200 | 6 | 0°30 | 20 | 65 | 8 | |
| 2CTE 060 010 200 | 6 | 1° | 20 | 65 | 8 | |
| 2CTE 060 013 200 | 6 | 1°30 | 20 | 65 | 8 | |
| 2CTE 060 020 200 | 6 | 2° | 20 | 65 | 8 | |
| 2CTE 060 030 190 | 6 | 3° | 19 | 65 | 8 | |
| 2CTE 060 050 230 | 6 | 5° | 23 | 75 | 10 | |
| 2CTE 060 070 240 | 6 | 7° | 24 | 75 | 12 | |
| 2CTE 060 100 170 | 6 | 10° | 17 | 75 | 12 | |
| 2CTE 070 003 250 | 7 | 0°30 | 25 | 70 | 8 | |
| 2CTE 070 010 250 | 7 | 1° | 25 | 70 | 8 | |
| 2CTE 070 013 250 | 7 | 1°30 | 25 | 70 | 10 | |
| 2CTE 070 030 280 | 7 | 3° | 28 | 80 | 10 | |
| 2CTE 070 050 280 | 7 | 5° | 28 | 80 | 12 | |
| 2CTE 080 003 320 | 8 | 0°30 | 32 | 90 | 10 | |
| 2CTE 080 010 350 | 8 | 1° | 35 | 90 | 10 | |
| 2CTE 080 013 350 | 8 | 1°30 | 35 | 90 | 10 | |
| 2CTE 080 020 280 | 8 | 2° | 28 | 75 | 10 | |
| 2CTE 080 030 350 | 8 | 3° | 35 | 90 | 12 | |
| 2CTE 080 050 450 | 8 | 5° | 45 | 100 | 16 | |
| 2CTE 080 070 320 | 8 | 7° | 32 | 90 | 16 | |
| 2CTE 080 100 340 | 8 | 10° | 34 | 100 | 20 | |

TAPER

# 4CTE

*4 Flutes Taper End Mills*

## 4날 고속가공용 테이퍼 엔드밀




- **고경도강(HRc52이하), 프리하든강 계열의 고정밀 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 날부 인선의 조도가 뛰어나 피삭재의 면조도가 우수합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for pre-hardened and hardened steels(~HRc52)**
- Good wear resistance by high quality Si-based PVD coating.
- High precise edge tolerance.
- Very nice work surface finish.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

Shield Edge 501P

| D Size | D Tolerance |
|---|---|
| Ø0.3 ~ 5 | +0 ~ -0.01mm |
| Ø6 ~ 8 | -0.01 ~ -0.025mm |

단위 : mm

| Order Number | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4CTE 030 003 110 | 3 | 0°30 | 11 | 50 | 6 | |
| 4CTE 030 010 110 | 3 | 1° | 11 | 50 | 6 | |
| 4CTE 030 013 110 | 3 | 1°30 | 11 | 50 | 6 | |
| 4CTE 030 020 150 | 3 | 2° | 15 | 60 | 6 | |
| 4CTE 030 023 150 | 3 | 2°30 | 15 | 60 | 6 | |
| 4CTE 030 030 150 | 3 | 3° | 15 | 60 | 6 | |
| 4CTE 030 050 150 | 3 | 5° | 15 | 60 | 6 | |
| 4CTE 030 070 120 | 3 | 7° | 12 | 60 | 6 | |
| 4CTE 030 100 190 | 3 | 10° | 19 | 80 | 10 | |
| 4CTE 040 003 150 | 4 | 0°30 | 15 | 60 | 6 | |
| 4CTE 040 010 150 | 4 | 1° | 15 | 60 | 6 | |
| 4CTE 040 013 150 | 4 | 1°30 | 15 | 60 | 6 | |
| 4CTE 040 020 180 | 4 | 2° | 18 | 60 | 6 | |
| 4CTE 040 023 180 | 4 | 2°30 | 18 | 60 | 6 | |
| 4CTE 040 030 180 | 4 | 3° | 18 | 60 | 6 | |
| 4CTE 040 050 230 | 4 | 5° | 23 | 65 | 8 | |
| 4CTE 040 070 250 | 4 | 7° | 25 | 75 | 10 | |
| 4CTE 050 003 180 | 5 | 0°30 | 18 | 60 | 6 | |
| 4CTE 050 010 180 | 5 | 1° | 18 | 60 | 6 | |
| 4CTE 050 013 180 | 5 | 1°30 | 18 | 60 | 6 | |
| 4CTE 050 020 150 | 5 | 2° | 15 | 60 | 6 | |
| 4CTE 050 023 200 | 5 | 2°30 | 20 | 65 | 8 | |
| 4CTE 050 030 210 | 5 | 3° | 21 | 65 | 8 | |
| 4CTE 050 050 280 | 5 | 5° | 28 | 80 | 10 | |
| 4CTE 050 070 280 | 5 | 7° | 28 | 80 | 12 | |
| 4CTE 052 0147 120 | 5.2 | 1°47 | 12 | 60 | 6 | |
| 4CTE 060 003 200 | 6 | 0°30 | 20 | 65 | 8 | |
| 4CTE 060 010 200 | 6 | 1° | 20 | 65 | 8 | |
| 4CTE 060 013 200 | 6 | 1°30 | 20 | 65 | 8 | |
| 4CTE 060 020 200 | 6 | 2° | 20 | 65 | 8 | |
| 4CTE 060 023 200 | 6 | 2°30 | 20 | 65 | 8 | |
| 4CTE 060 030 260 | 6 | 3° | 26 | 75 | 10 | |
| 4CTE 060 050 230 | 6 | 5° | 23 | 75 | 10 | |
| 4CTE 060 070 240 | 6 | 7° | 24 | 80 | 12 | |
| 4CTE 060 100 390 | 6 | 10° | 39 | 110 | 20 | |
| 4CTE 080 003 250 | 8 | 0°30 | 25 | 75 | 10 | |
| 4CTE 080 010 250 | 8 | 1° | 25 | 75 | 10 | |
| 4CTE 080 013 250 | 8 | 1°30 | 25 | 75 | 10 | |
| 4CTE 080 020 250 | 8 | 2° | 25 | 75 | 10 | |
| 4CTE 080 023 230 | 8 | 2°30 | 23 | 75 | 10 | |
| 4CTE 080 030 300 | 8 | 3° | 30 | 80 | 12 | |
| 4CTE 080 050 230 | 8 | 5° | 23 | 85 | 12 | |
| 4CTE 085 0147 240 | 8.5 | 1°47 | 24 | 75 | 10 | |
| 4CTE 100 003 300 | 10 | 0°30 | 30 | 80 | 12 | |
| 4CTE 100 010 300 | 10 | 1° | 30 | 80 | 12 | |
| 4CTE 100 013 300 | 10 | 1°30 | 30 | 80 | 12 | |
| 4CTE 100 0147 320 | 10 | 1°47 | 32 | 85 | 12 | |
| 4CTE 100 020 280 | 10 | 2° | 28 | 80 | 12 | |
| 4CTE 100 030 400 | 10 | 3° | 40 | 100 | 16 | |
| 4CTE 100 050 340 | 10 | 5° | 34 | 100 | 16 | |

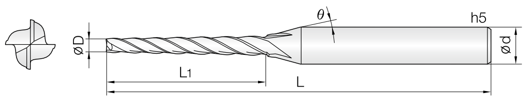
| Order Number | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

TAPER

# 4RTE

## 4 Flutes Rib Taper End Mills

## 4날 고속가공용 리브 테이퍼 엔드밀




End point(2F)

- **고경도강(HRc52이하), 프리하든강 계열의 고정밀 가공 엔드밀**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 밑날2날 형상과 옆날4날 형상으로 깊은 홈 가공시 적합합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 날부인선의 조도가 뛰어나 피삭재의 면조도가 우수합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for pre-hardened and hardened steels(~HRc52)**
- Good wear resistance by Si-based PVD coating.
- Optimum for deep grooving by 2bottom edge with 4flutes.
- High precise edge tolerance.
- Very nice work surface finish.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

4 | WC 미립자 | TISIN Coating | 30° Helix Angle | Shield Edge | CUTTING DATA 501P

| D Size | D Tolerance |
|---|---|
| Ø 0.5 ~ 2.5 | +0 ~ -0.01mm |

단위 : mm

| Order Number | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4RTE 005 030 040 | 0.5 | 0°30 | 4 | 45 | 4 | |
| 4RTE 005 030 060 | 0.5 | 0°30 | 6 | 45 | 4 | |
| 4RTE 005 045 040 | 0.5 | 0°45 | 4 | 45 | 4 | |
| 4RTE 005 045 060 | 0.5 | 0°45 | 6 | 45 | 4 | |
| 4RTE 005 100 040 | 0.5 | 1° | 4 | 45 | 4 | |
| 4RTE 005 100 060 | 0.5 | 1° | 6 | 45 | 4 | |
| 4RTE 006 030 040 | 0.6 | 0°30 | 4 | 45 | 4 | |
| 4RTE 006 030 060 | 0.6 | 0°30 | 6 | 45 | 4 | |
| 4RTE 006 045 040 | 0.6 | 0°45 | 4 | 45 | 4 | |
| 4RTE 006 045 060 | 0.6 | 0°45 | 6 | 45 | 4 | |
| 4RTE 006 100 040 | 0.6 | 1° | 4 | 45 | 4 | |
| 4RTE 006 100 060 | 0.6 | 1° | 6 | 45 | 4 | |
| 4RTE 007 030 060 | 0.7 | 0°30 | 6 | 45 | 4 | |
| 4RTE 007 030 080 | 0.7 | 0°30 | 8 | 45 | 4 | |
| 4RTE 007 045 060 | 0.7 | 0°45 | 6 | 45 | 4 | |
| 4RTE 007 045 080 | 0.7 | 0°45 | 8 | 45 | 4 | |
| 4RTE 007 100 060 | 0.7 | 1° | 6 | 45 | 4 | |
| 4RTE 007 100 080 | 0.7 | 1° | 8 | 45 | 4 | |
| 4RTE 008 030 060 | 0.8 | 0°30 | 6 | 45 | 4 | |
| 4RTE 008 030 080 | 0.8 | 0°30 | 8 | 45 | 4 | |
| 4RTE 008 030 100 | 0.8 | 0°30 | 10 | 45 | 4 | |
| 4RTE 008 045 060 | 0.8 | 0°45 | 6 | 45 | 4 | |
| 4RTE 008 045 080 | 0.8 | 0°45 | 8 | 45 | 4 | |
| 4RTE 008 045 100 | 0.8 | 0°45 | 10 | 45 | 4 | |
| 4RTE 008 100 060 | 0.8 | 1° | 6 | 45 | 4 | |
| 4RTE 008 100 080 | 0.8 | 1° | 8 | 45 | 4 | |
| 4RTE 008 100 100 | 0.8 | 1° | 10 | 45 | 4 | |
| 4RTE 009 030 060 | 0.9 | 0°30 | 6 | 45 | 4 | |
| 4RTE 009 030 080 | 0.9 | 0°30 | 8 | 45 | 4 | |
| 4RTE 009 030 100 | 0.9 | 0°30 | 10 | 45 | 4 | |
| 4RTE 009 045 060 | 0.9 | 0°45 | 6 | 45 | 4 | |
| 4RTE 009 045 080 | 0.9 | 0°45 | 8 | 45 | 4 | |
| 4RTE 009 045 100 | 0.9 | 0°45 | 10 | 45 | 4 | |
| 4RTE 009 100 060 | 0.9 | 1° | 6 | 45 | 4 | |
| 4RTE 009 100 080 | 0.9 | 1° | 8 | 45 | 4 | |
| 4RTE 009 100 100 | 0.9 | 1° | 10 | 45 | 4 | |
| 4RTE 010 030 080 | 1 | 0°30 | 8 | 45 | 4 | |
| 4RTE 010 030 100 | 1 | 0°30 | 10 | 45 | 4 | |
| 4RTE 010 030 120 | 1 | 0°30 | 12 | 45 | 4 | |
| 4RTE 010 045 080 | 1 | 0°45 | 8 | 45 | 4 | |
| 4RTE 010 045 100 | 1 | 0°45 | 10 | 45 | 4 | |
| 4RTE 010 045 120 | 1 | 0°45 | 12 | 45 | 4 | |
| 4RTE 010 100 080 | 1 | 1° | 8 | 45 | 4 | |
| 4RTE 010 100 100 | 1 | 1° | 10 | 45 | 4 | |
| 4RTE 010 100 120 | 1 | 1° | 12 | 45 | 4 | |
| 4RTE 012 030 080 | 1.2 | 0°30 | 8 | 45 | 4 | |
| 4RTE 012 030 100 | 1.2 | 0°30 | 10 | 45 | 4 | |
| 4RTE 012 030 120 | 1.2 | 0°30 | 12 | 45 | 4 | |
| 4RTE 012 030 160 | 1.2 | 0°30 | 16 | 50 | 4 | |
| 4RTE 012 045 080 | 1.2 | 0°45 | 8 | 45 | 4 | |

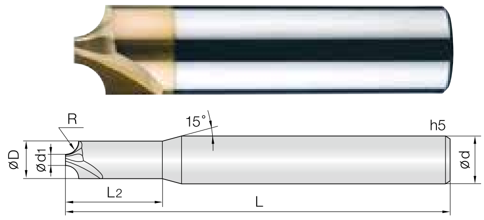
| Order Number | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4RTE 012 045 100 | 1.2 | 0°45 | 10 | 45 | 4 | |
| 4RTE 012 045 120 | 1.2 | 0°45 | 12 | 45 | 4 | |
| 4RTE 012 045 160 | 1.2 | 0°45 | 16 | 50 | 4 | |
| 4RTE 012 100 080 | 1.2 | 1° | 8 | 45 | 4 | |
| 4RTE 012 100 100 | 1.2 | 1° | 10 | 45 | 4 | |
| 4RTE 012 100 120 | 1.2 | 1° | 12 | 45 | 4 | |
| 4RTE 012 100 160 | 1.2 | 1° | 16 | 50 | 4 | |
| 4RTE 015 030 060 | 1.5 | 0°30 | 6 | 45 | 4 | |
| 4RTE 015 030 100 | 1.5 | 0°30 | 10 | 45 | 4 | |
| 4RTE 015 030 160 | 1.5 | 0°30 | 16 | 50 | 4 | |
| 4RTE 015 030 200 | 1.5 | 0°30 | 20 | 60 | 4 | |
| 4RTE 015 100 060 | 1.5 | 1° | 6 | 45 | 4 | |
| 4RTE 015 100 100 | 1.5 | 1° | 10 | 45 | 4 | |
| 4RTE 015 100 160 | 1.5 | 1° | 16 | 50 | 4 | |
| 4RTE 015 100 200 | 1.5 | 1° | 20 | 60 | 4 | |
| 4RTE 015 100 250 | 1.5 | 1° | 25 | 60 | 4 | |
| 4RTE 015 130 060 | 1.5 | 1°30 | 6 | 45 | 4 | |
| 4RTE 015 130 100 | 1.5 | 1°30 | 10 | 45 | 4 | |
| 4RTE 015 130 160 | 1.5 | 1°30 | 16 | 50 | 4 | |
| 4RTE 015 130 200 | 1.5 | 1°30 | 20 | 60 | 4 | |
| 4RTE 015 130 250 | 1.5 | 1°30 | 25 | 60 | 4 | |
| 4RTE 020 030 100 | 2 | 0°30 | 10 | 45 | 4 | |
| 4RTE 020 030 160 | 2 | 0°30 | 16 | 50 | 4 | |
| 4RTE 020 030 200 | 2 | 0°30 | 20 | 60 | 4 | |
| 4RTE 020 030 250 | 2 | 0°30 | 25 | 60 | 4 | |
| 4RTE 020 100 100 | 2 | 1° | 10 | 45 | 4 | |
| 4RTE 020 100 160 | 2 | 1° | 16 | 50 | 4 | |
| 4RTE 020 100 200 | 2 | 1° | 20 | 60 | 4 | |
| 4RTE 020 100 250 | 2 | 1° | 25 | 60 | 4 | |
| 4RTE 020 130 100 | 2 | 1°30 | 10 | 45 | 4 | |
| 4RTE 020 130 160 | 2 | 1°30 | 16 | 50 | 4 | |
| 4RTE 020 130 200 | 2 | 1°30 | 20 | 60 | 4 | |
| 4RTE 020 130 250 | 2 | 1°30 | 25 | 60 | 4 | |
| 4RTE 025 030 100 | 2.5 | 0°30 | 10 | 45 | 4 | |
| 4RTE 025 030 160 | 2.5 | 0°30 | 16 | 50 | 4 | |
| 4RTE 025 030 200 | 2.5 | 0°30 | 20 | 60 | 4 | |
| 4RTE 025 030 250 | 2.5 | 0°30 | 25 | 60 | 4 | |
| 4RTE 025 100 100 | 2.5 | 1° | 10 | 45 | 4 | |
| 4RTE 025 100 160 | 2.5 | 1° | 16 | 50 | 4 | |
| 4RTE 025 100 200 | 2.5 | 1° | 20 | 60 | 4 | |
| 4RTE 025 100 250 | 2.5 | 1° | 25 | 60 | 4 | |
| 4RTE 025 130 100 | 2.5 | 1°30 | 10 | 45 | 4 | |
| 4RTE 025 130 160 | 2.5 | 1°30 | 16 | 50 | 4 | |
| 4RTE 025 130 200 | 2.5 | 1°30 | 20 | 60 | 4 | |
| 4RTE 025 130 250 | 2.5 | 1°30 | 25 | 60 | 4 | |

TAPER

# 2CRC

## 2 Flutes Corner Rounding Cutters

## 2날 코너 역 R 커터




- **HRc52이하의 고경도강, 프리하든강, 공구강, 주철 등 피삭재 가공**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 날부인선의 조도가 뛰어나 피삭재의 면조도가 우수합니다.
- 항절력이 높은 미립자 초경합금(0.5㎛)을 채택, 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials, hardened steels (HRc~52), pre-hardened steels, tool steels and cast irons**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- Very nice work surface finish.
- Minimize fracturing by high TRS fine(0.5㎛) WC grade.

2 | WC 미립자 | TISIN Coating | R ±0.01 (0.1 ~ 2.5R) | R ±0.02 (3 ~ 8R) | 0° Helix Angle | CUTTING DATA 502P

| D Size | D Tolerance | d1 Size | d1 Tolerance |
|---|---|---|---|
| Ø0.8 ~ 6 | +0 ~ -0.01mm | Ø0.5 ~ 0.9 | +0 ~ -0.01mm |
| Ø7 ~ 20 | +0 ~ -0.015mm | Ø1.4 ~ 5.9 | +0 ~ -0.02mm |

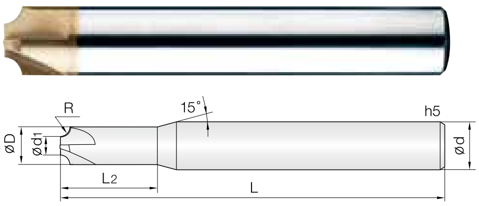
단위 : mm

| Order Number | 선단경 Diameter d1× R | 외경 Length of cut D | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CRC 005 001 S04 | 0.5 X R0.1 | 0.8 | 2.5 | 45 | 4 | |
| 2CRC 005 0015 S04 | 0.5 X R0.15 | 0.9 | 2.5 | 45 | 4 | |
| 2CRC 005 002 S04 | 0.5 X R0.2 | 1 | 2.5 | 45 | 4 | |
| 2CRC 005 0025 S04 | 0.5 X R0.25 | 1.1 | 2.5 | 45 | 4 | |
| 2CRC 005 003 S04 | 0.5 X R0.3 | 1.2 | 2.5 | 45 | 4 | |
| 2CRC 005 0035 S04 | 0.5 X R0.35 | 1.3 | 2.5 | 45 | 4 | |
| 2CRC 005 004 S04 | 0.5 X R0.4 | 1.4 | 2.5 | 45 | 4 | |
| 2CRC 005 0045 S04 | 0.5 X R0.45 | 1.5 | 2.5 | 45 | 4 | |
| 2CRC 005 005 S04 | 0.5 X R0.5 | 1.6 | 2.5 | 45 | 4 | |
| 2CRC 009 005 S04 | 0.9 X R0.5 | 2 | 3 | 45 | 4 | |
| 2CRC 049 005 S06 | 4.9 X R0.5 | 6 | - | 50 | 6 | |
| 2CRC 005 0055 S04 | 0.5 X R0.55 | 1.7 | 3 | 45 | 4 | |
| 2CRC 005 006 S04 | 0.5 X R0.6 | 1.8 | 3 | 45 | 4 | |
| 2CRC 005 0065 S04 | 0.5 X R0.65 | 1.9 | 3 | 45 | 4 | |
| 2CRC 005 007 S04 | 0.5 X R0.7 | 2 | 3 | 45 | 4 | |
| 2CRC 009 0075 S04 | 0.9 X R0.75 | 2.5 | 4 | 45 | 4 | |
| 2CRC 009 008 S04 | 0.9 X R0.8 | 2.6 | 4 | 45 | 4 | |
| 2CRC 009 0085 S04 | 0.9 X R0.85 | 2.7 | 4 | 45 | 4 | |
| 2CRC 009 009 S04 | 0.9 X R0.9 | 2.8 | 4 | 45 | 4 | |
| 2CRC 009 0095 S04 | 0.9 X R0.95 | 2.9 | 4 | 45 | 4 | |
| 2CRC 009 010 S06 | 0.9 X R1 | 3 | 5 | 50 | 6 | |
| 2CRC 039 010 S06 | 3.9 X R1 | 6 | - | 50 | 6 | |
| 2CRC 059 010 S08 | 5.9 X R1 | 8 | - | 60 | 8 | |
| 2CRC 009 0125 S06 | 0.9 X R1.25 | 3.5 | 5 | 50 | 6 | |
| 2CRC 034 0125 S06 | 3.4 X R1.25 | 6 | - | 50 | 6 | |
| 2CRC 014 015 S06 | 1.4 X R1.5 | 4.5 | 8 | 50 | 6 | |
| 2CRC 049 015 S08 | 4.9 X R1.5 | 8 | - | 60 | 8 | |
| 2CRC 014 020 S06 | 1.4 X R2 | 5.5 | 10 | 50 | 6 | |
| 2CRC 039 020 S08 | 3.9 X R2 | 8 | - | 60 | 8 | |
| 2CRC 019 025 S08 | 1.9 X R2.5 | 7 | 13 | 60 | 8 | |
| 2CRC 019 030 S08 | 1.9 X R3 | 8 | - | 60 | 8 | |
| 2CRC 019 035 S10 | 1.9 X R3.5 | 9 | 13 | 70 | 10 | |
| 2CRC 019 040 S10 | 1.9 X R4 | 10 | - | 70 | 10 | |
| 2CRC 019 045 S12 | 1.9 X R4.5 | 11 | 13 | 80 | 12 | |
| 2CRC 019 050 S12 | 1.9 X R5 | 12 | - | 80 | 12 | |
| 2CRC 039 060 S16 | 3.9 X R6 | 16 | - | 90 | 16 | |
| 2CRC 059 070 S20 | 5.9 X R7 | 20 | - | 90 | 20 | |
| 2CRC 039 080 S20 | 3.9 X R8 | 20 | - | 90 | 20 | |

# 4CRC

## 4 Flutes Corner Rounding Cutters

## 4날 코너 역 R 커터




- **HRc52이하의고경도강, 프리하든강, 공구강, 주철 등 피삭재 가공**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 날부인선의 조도가 뛰어나 피삭재의 면조도가 우수합니다.
- 항절력이 높은 미립자 초경합금을 채택, 고이송 작업시 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials, hardened steels (~HRc52), pre-hardened steels, tool steels and cast irons**
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- Very nice work surface finish.
- Minimize fracturing at high feed by high TRS fine WC grade.

4 | WC 미립자 | TISIN Coating | R ±0.01 (0.5 ~ 2.5R) | R ±0.02 (3 ~ 6R) | 0° Helix Angle | CUTTING DATA (502P)

| D Size | D Tolerance |
|---|---|
| Ø4 ~ 6 | +0 ~ -0.01mm |
| Ø8 ~ 16 | +0 ~ -0.015mm |

| d1 Size | d1 Tolerance |
|---|---|
| Ø2.9 ~ 5.9 | +0 ~ -0.02mm |

단위 : mm

| Order Number | 선단경 Diameter d1× R | 외경 Length of cut D | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4CRC 029 005 S04 | 2.9 X R0.5 | 4 | - | 50 | 4 | |
| 4CRC 024 0075 S04 | 2.4 X R0.75 | 4 | - | 50 | 4 | |
| 4CRC 019 010 S04 | 1.9 X R1 | 4 | - | 50 | 4 | |
| 4CRC 014 0125 S06 | 1.4 X R1.25 | 4 | 8 | 50 | 6 | |
| 4CRC 049 005 S06 | 4.9 X R0.5 | 6 | - | 50 | 6 | |
| 4CRC 044 0075 S06 | 4.4 X R0.75 | 6 | - | 50 | 6 | |
| 4CRC 039 010 S06 | 3.9 X R1 | 6 | - | 50 | 6 | |
| 4CRC 059 010 S08 | 5.9 X R1 | 8 | - | 60 | 8 | |
| 4CRC 054 0125 S08 | 5.4 X R1.25 | 8 | - | 60 | 8 | |
| 4CRC 049 015 S08 | 4.9 X R1.5 | 8 | - | 60 | 8 | |
| 4CRC 039 020 S08 | 3.9 X R2 | 8 | - | 60 | 8 | |
| 4CRC 059 020 S10 | 5.9 X R2 | 10 | - | 70 | 10 | |
| 4CRC 049 025 S10 | 4.9 X R2.5 | 10 | - | 70 | 10 | |
| 4CRC 039 030 S10 | 3.9 X R3 | 10 | - | 70 | 10 | |
| 4CRC 059 030 S12 | 5.9 X R3 | 12 | - | 75 | 12 | |
| 4CRC 039 040 S12 | 3.9 X R4 | 12 | - | 75 | 12 | |
| 4CRC 059 050 S16 | 5.9 X R5 | 16 | - | 80 | 16 | |
| 4CRC 039 060 S16 | 3.9 X R6 | 16 | - | 80 | 16 | |

| Order Number | 선단경 Diameter d1× R | 외경 Length of cut D | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

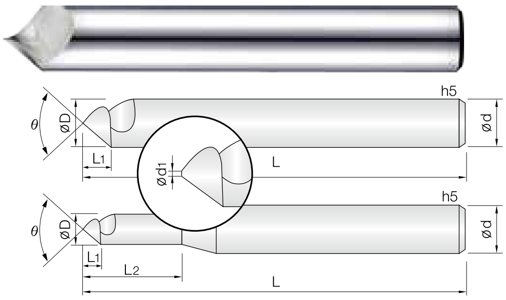
GENERAL PURPOSE

# 1HTE

## 1 Flutes 45° Helix Taper Endmills

## 1날 45°헬릭스 테이퍼 엔드밀

New




- 알루미늄 합금, 동합금, 플라스틱 등 연질 피삭재 가공
- 뛰어난 표면 조도와 버를 최소화 합니다.
- 헬릭스 타입 1날 적용하여 공구 센터의 절삭력이 뛰어납니다.
- 하나의 공구로 모든 면취가 가능하며 우수한 성능을 발휘합니다.

- Processing of soft cutting materials such as aluminum alloys, brass alloys, and plastics
- Achieves excellent surface finish and minimizes burrs.
- Applying single-flute helix type ensures outstanding cutting force at the tool center.
- Capable of all chamfering with a single tool and demonstrates excellent performance.

1 | WC 미립자 | RTAC Coating | 45° Helix Angle | CUTTING DATA 503P

| D Size | D Tolerance |
|---|---|
| ø1.2 ~ 6 | +0 ~ -0.01mm |
| ø8 ~ 16 | +0 ~ -0.015mm |

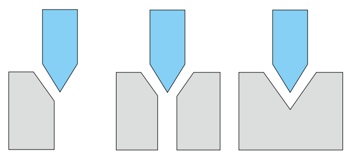
| d1 Size | d1 Tolerance |
|---|---|
| ø0 | +0.05 ~ -0mm |

단위 : mm

| Order Number 비코팅 Un coated | Order Number RTAC 코팅 RTAC Coated | 날경 Diameter D | 선단경 Neck Diameter d1 | 각도 Angle θ | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|---|---|
| 1HTE 012 600 S03 | 1HTEC 012 600 S03 | 1.2 | 0 | 60° | 1 | 3.6 | 40 | 3 | |
| 1HTE 012 900 S03 | 1HTEC 012 900 S03 | 1.2 | 0 | 90° | 0.6 | 3.6 | 40 | 3 | |
| 1HTE 020 600 S03 | 1HTEC 020 600 S03 | 2 | 0 | 60° | 1.7 | 6 | 40 | 3 | |
| 1HTE 020 900 S03 | 1HTEC 020 900 S03 | 2 | 0 | 90° | 1 | 6 | 40 | 3 | |
| 1HTE 030 600 S03 | 1HTEC 030 600 S03 | 3 | 0 | 60° | 2.5 | - | 40 | 3 | |
| 1HTE 030 900 S03 | 1HTEC 030 900 S03 | 3 | 0 | 90° | 1.5 | - | 40 | 3 | |
| 1HTE 030 900 100 | 1HTEC 030 900 100 | 3 | 0 | 90° | 1.5 | - | 100 | 3 | |
| 1HTE 040 600 S04 | 1HTEC 040 600 S04 | 4 | 0 | 60° | 3.4 | - | 40 | 4 | |
| 1HTE 040 900 S04 | 1HTEC 040 900 S04 | 4 | 0 | 90° | 2 | - | 40 | 4 | |
| 1HTE 040 900 100 | 1HTEC 040 900 100 | 4 | 0 | 90° | 2 | - | 100 | 4 | |
| 1HTE 060 600 S06 | 1HTEC 060 600 S06 | 6 | 0 | 60° | 5.1 | - | 50 | 6 | |
| 1HTE 060 900 S06 | 1HTEC 060 900 S06 | 6 | 0 | 90° | 3 | - | 50 | 6 | |
| 1HTE 060 900 100 | 1HTEC 060 900 100 | 6 | 0 | 90° | 3 | - | 100 | 6 | |
| 1HTE 080 600 S08 | 1HTEC 080 600 S08 | 8 | 0 | 60° | 6.9 | - | 60 | 8 | |
| 1HTE 080 900 S08 | 1HTEC 080 900 S08 | 8 | 0 | 90° | 4 | - | 60 | 8 | |
| 1HTE 080 900 150 | 1HTEC 080 900 150 | 8 | 0 | 90° | 4 | - | 150 | 8 | |
| 1HTE 100 600 S10 | 1HTEC 100 600 S10 | 10 | 0 | 60° | 8.6 | - | 70 | 10 | |
| 1HTE 100 900 S10 | 1HTEC 100 900 S10 | 10 | 0 | 90° | 5 | - | 70 | 10 | |
| 1HTE 100 900 150 | 1HTEC 100 900 150 | 10 | 0 | 90° | 5 | - | 150 | 10 | |
| 1HTE 120 600 S12 | 1HTEC 120 600 S12 | 12 | 0 | 60° | 10.3 | - | 75 | 12 | |
| 1HTE 120 900 S12 | 1HTEC 120 900 S12 | 12 | 0 | 90° | 6 | - | 75 | 12 | |
| 1HTE 120 900 150 | 1HTEC 120 900 150 | 12 | 0 | 90° | 6 | - | 150 | 12 | |
| 1HTE 160 600 S16 | 1HTEC 160 600 S16 | 16 | 0 | 60° | 13.8 | - | 80 | 16 | |
| 1HTE 160 900 S16 | 1HTEC 160 900 S16 | 16 | 0 | 90° | 8 | - | 80 | 16 | |

* 각 제품의 선단경(d1)은 완전한 ø0이 아니므로 면취 작업시 날장의 약98%만 사용하십시오.
* As the cutting edge diameter of each product(d1) is not 0, please use only 95% of the blade length during chamfering operations.

### ■ 가공형상에따른절삭가능여부
### Available Cutting Shape

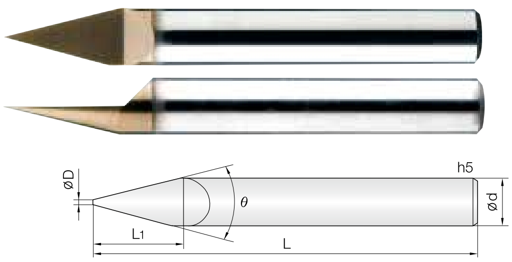


가능 (O)

# 1STE

*1 Flute Straight Flute Taper End Mills*

## 1날 직선 날 테이퍼 엔드밀




- HRc50이하의 고경도강, 프리하든강, 공구강, 주철 등 피삭재 가공
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 직선날 타입 1날을 적용하여 조각NC 작업에 적합합니다.
- 다양한 날경의 적용으로 조각 작업시 효율성을 최대화 하였습니다.

- Endmills for various work materials, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons
- Good wear resistance by Si-based PVD coating.
- Optimum for NC engraving by straight type one edge.
- Maximize engraving efficiency by various edge diameter.

504P

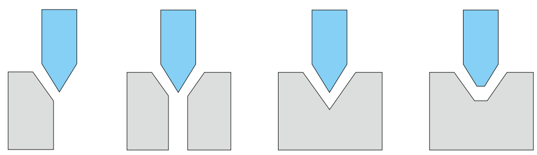
| D Size | D Tolerance |
|---|---|
| Ø 0 | +0.05 ~ -0mm |
| Ø 0.05 ~ 0.3 | 0 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 1STE 000 200 S04 | 0 | 20° | 5 | 40 | 4 | |
| 1STE 000 300 S04 | 0 | 30° | 5 | 40 | 4 | |
| 1STE 000 900 S04 | 0 | 90° | 2 | 40 | 4 | |
| 1STE 000 200 S06 | 0 | 20° | 5 | 50 | 6 | |
| 1STE 000 300 S06 | 0 | 30° | 5 | 50 | 6 | |
| 1STE 000 900 S06 | 0 | 90° | 3 | 50 | 6 | |
| 1STE 000 1200 S06 | 0 | 120° | 1.73 | 50 | 6 | |
| 1STE 0005 200 S04 | 0.05 | 20° | 5 | 40 | 4 | |
| 1STE 0005 300 S04 | 0.05 | 30° | 5 | 40 | 4 | |
| 1STE 0005 900 S04 | 0.05 | 90° | 1.97 | 40 | 4 | |
| 1STE 0005 200 S06 | 0.05 | 20° | 5 | 50 | 6 | |
| 1STE 0005 300 S06 | 0.05 | 30° | 5 | 50 | 6 | |
| 1STE 0005 900 S06 | 0.05 | 90° | 2.97 | 50 | 6 | |
| 1STE 0005 1200 S06 | 0.05 | 120° | 1.71 | 50 | 6 | |
| 1STE 001 200 S04 | 0.1 | 20° | 5 | 40 | 4 | |
| 1STE 001 300 S04 | 0.1 | 30° | 5 | 40 | 4 | |
| 1STE 001 600 S04 | 0.1 | 60° | 3.37 | 40 | 4 | |
| 1STE 001 900 S04 | 0.1 | 90° | 1.95 | 40 | 4 | |
| 1STE 001 200 S06 | 0.1 | 20° | 5 | 50 | 6 | |
| 1STE 001 300 S06 | 0.1 | 30° | 5 | 50 | 6 | |
| 1STE 001 900 S06 | 0.1 | 90° | 2.95 | 50 | 6 | |
| 1STE 001 1200 S06 | 0.1 | 120° | 1.7 | 50 | 6 | |
| 1STE 0015 200 S04 | 0.15 | 20° | 5 | 40 | 4 | |
| 1STE 0015 300 S04 | 0.15 | 30° | 5 | 40 | 4 | |
| 1STE 0015 600 S04 | 0.15 | 60° | 3.33 | 40 | 4 | |
| 1STE 0015 900 S04 | 0.15 | 90° | 1.92 | 40 | 4 | |
| 1STE 0015 200 S06 | 0.15 | 20° | 5 | 50 | 6 | |
| 1STE 0015 300 S06 | 0.15 | 30° | 5 | 50 | 6 | |
| 1STE 0015 900 S06 | 0.15 | 90° | 2.92 | 50 | 6 | |
| 1STE 0015 1200 S06 | 0.15 | 120° | 1.68 | 50 | 6 | |
| 1STE 002 200 S04 | 0.2 | 20° | 5 | 40 | 4 | |
| 1STE 002 300 S04 | 0.2 | 30° | 5 | 40 | 4 | |
| 1STE 002 600 S04 | 0.2 | 60° | 3.29 | 40 | 4 | |
| 1STE 002 900 S04 | 0.2 | 90° | 1.9 | 40 | 4 | |
| 1STE 002 200 S06 | 0.2 | 20° | 5 | 50 | 6 | |
| 1STE 002 300 S06 | 0.2 | 30° | 5 | 50 | 6 | |
| 1STE 002 900 S06 | 0.2 | 90° | 2.9 | 50 | 6 | |
| 1STE 002 1200 S06 | 0.2 | 120° | 1.67 | 50 | 6 | |

| Order Number | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 1STE 003 200 S04 | 0.3 | 20° | 5 | 40 | 4 | |
| 1STE 003 300 S04 | 0.3 | 30° | 5 | 40 | 4 | |
| 1STE 003 600 S04 | 0.3 | 60° | 3.2 | 40 | 4 | |
| 1STE 003 900 S04 | 0.3 | 90° | 1.85 | 40 | 4 | |

### ■ 가공형상에따른절삭가능여부
Available Cutting Shape

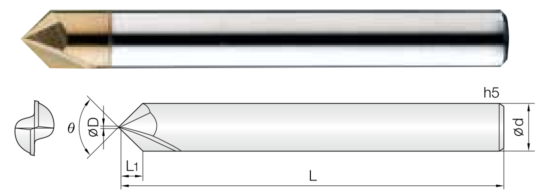


가능 (O)

GENERAL PURPOSE

# 2STE

## 2 Flutes Straight Flute Taper End Mills
## 2날 직선 날 테이퍼 엔드밀




- **HRc50이하의 고경도강, 프리하든강, 공구강, 주철 등 피삭재 가공**
- 실리콘계 코팅(Si)처리하여 내마모성이 우수합니다.
- 직선날 타입 2날을 적용하여 조각NC 작업, 피삭재 모서리 면취, 센터링 작업에 적합합니다.
- 코팅과 비코팅으로 구분하여 수지, 아크릴 등의 가공도 가능합니다.

- **Endmills for various work materials, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons**
- Good wear resistance by Si-based PVD coating.
- Optimum for NC engraving, chamfering and centering with straight 2flutes.
- Resin, plastic machining applicable witn coated or non coated endmill.

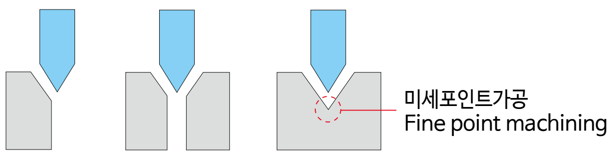
504P

| D Size | D Tolerance |
|---|---|
| ø 0 | +0.05 ~ -0mm |

단위 : mm

| Order Number 비코팅 Un coated | Order Number 코팅 Coated | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 비코팅 Un coated | 비고 코팅 Coated |
|---|---|---|---|---|---|---|---|---|
| 2STE 000 300 S03 | 2STEC 000 300 S03 | 0 | 30° | 5.5 | 60 | 3 | | |
| 2STE 000 600 S03 | 2STEC 000 600 S03 | 0 | 60° | 2.5 | 60 | 3 | | |
| 2STE 000 900 S03 | 2STEC 000 900 S03 | 0 | 90° | 1.5 | 60 | 3 | | |
| | 2STEC 000 900 080 | 0 | 90° | 1.5 | 80 | 3 | | |
| 2STE 000 1200 S03 | 2STEC 000 1200 S03 | 0 | 120° | 0.86 | 60 | 3 | | |
| 2STE 000 300 S04 | 2STEC 000 300 S04 | 0 | 30° | 7.4 | 60 | 4 | | |
| 2STE 000 600 S04 | 2STEC 000 600 S04 | 0 | 60° | 3.4 | 60 | 4 | | |
| 2STE 000 900 S04 | 2STEC 000 900 S04 | 0 | 90° | 2 | 60 | 4 | | |
| | 2STEC 000 900 100 | 0 | 90° | 2 | 100 | 4 | | |
| 2STE 000 1200 S04 | 2STEC 000 1200 S04 | 0 | 120° | 1.15 | 60 | 4 | | |
| 2STE 000 300 S06 | 2STEC 000 300 S06 | 0 | 30° | 11.1 | 60 | 6 | | |
| 2STE 000 600 S06 | 2STEC 000 600 S06 | 0 | 60° | 5.1 | 60 | 6 | | |
| 2STE 000 900 S06 | 2STEC 000 900 S06 | 0 | 90° | 3 | 60 | 6 | | |
| | 2STEC 000 900 110 | 0 | 90° | 3 | 110 | 6 | | |
| 2STE 000 1200 S06 | 2STEC 0001200 S06 | 0 | 120° | 1.73 | 60 | 6 | | |
| 2STE 000 600 S08 | 2STEC 000 600 S08 | 0 | 60° | 6.9 | 65 | 8 | | |
| 2STE 000 900 S08 | 2STEC 000 900 S08 | 0 | 90° | 4 | 65 | 8 | | |
| | 2STEC 000 900 120 | 0 | 90° | 4 | 120 | 8 | | |
| 2STE 000 1200 S08 | 2STEC 000 1200 S08 | 0 | 120° | 2.3 | 65 | 8 | | |
| 2STE 000 600 S10 | 2STEC 000 600 S10 | 0 | 60° | 8.6 | 70 | 10 | | |
| 2STE 000 900 S10 | 2STEC 000 900 S10 | 0 | 90° | 5 | 70 | 10 | | |
| | 2STEC 000 900 150 | 0 | 90° | 5 | 150 | 10 | | |
| 2STE 000 1200 S10 | 2STEC 000 1200 S10 | 0 | 120° | 2.88 | 70 | 10 | | |
| 2STE 000 600 S12 | 2STEC 000 600 S12 | 0 | 60° | 10.3 | 75 | 12 | | |
| 2STE 000 900 S12 | 2STEC 000 900 S12 | 0 | 90° | 6 | 75 | 12 | | |
| | 2STEC 000 900 160 | 0 | 90° | 6 | 160 | 12 | | |
| 2STE 000 1200 S12 | 2STEC 000 1200 S12 | 0 | 120° | 3.46 | 75 | 12 | | |

## ■ 가공형상에따른절삭가능여부
Available Cutting Shape

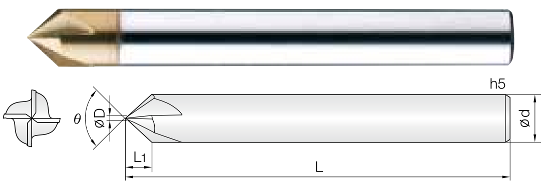



가능 (O) 가능 (O) 가능 (△)

# 4STE

## 4 Flutes Straight Flute Taper End Mills

## 4날 직선 날 테이퍼 엔드밀




- **HRc52이하의고경도강, 프리하든강, 공구강, 주철 등 피삭재 가공**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 직선날 타입 4날을 적용하여 조각NC 작업, 피삭재 모서리 면취, 센터링 작업에 최고의 성능을 발휘합니다.
- 항절력이 높은 미립자 초경합금을 채택, 고이송 작업시 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons**
- Good wear resistance by Si-based PVD coating.
- Optimum for NC engraving, chamfering and centering with straight 4flutes.
- Minimize fracturing at high feed by high TRS fine WC grade.

504P

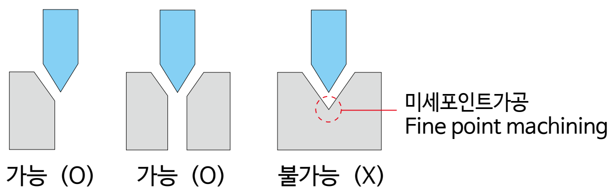
| D Size | D Tolerance |
|---|---|
| Ø0 | +0.05 ~ -0mm |

단위 : mm

| Order Number | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 4STE 000 600 S03 | 0 | 60° | 2.5 | 50 | 3 | |
| 4STE 000 900 S03 | 0 | 90° | 1.5 | 50 | 3 | |
| 4STE 000 600 S04 | 0 | 60° | 3.4 | 50 | 4 | |
| 4STE 000 900 S04 | 0 | 90° | 2 | 50 | 4 | |
| 4STE 000 600 S06 | 0 | 60° | 5.1 | 60 | 6 | |
| 4STE 000 900 S06 | 0 | 90° | 3 | 60 | 6 | |
| 4STE 000 900 030 | 0 | 90° | 3 | 100 | 6 | |
| 4STE 000 600 S08 | 0 | 60° | 6.9 | 65 | 8 | |
| 4STE 000 900 S08 | 0 | 90° | 4 | 65 | 8 | |
| 4STE 000 900 040 | 0 | 90° | 4 | 100 | 8 | |
| 4STE 000 600 S10 | 0 | 60° | 8.6 | 75 | 10 | |
| 4STE 000 900 S10 | 0 | 90° | 5 | 75 | 10 | |
| 4STE 000 900 050 | 0 | 90° | 5 | 100 | 10 | |
| 4STE 000 600 S12 | 0 | 60° | 10.3 | 80 | 12 | |
| 4STE 000 900 S12 | 0 | 90° | 6 | 80 | 12 | |
| 4STE 000 900 080 | 0 | 90° | 8 | 100 | 16 | |

GENERAL PURPOSE

### ■ 가공형상에따른절삭가능여부
Available Cutting Shape

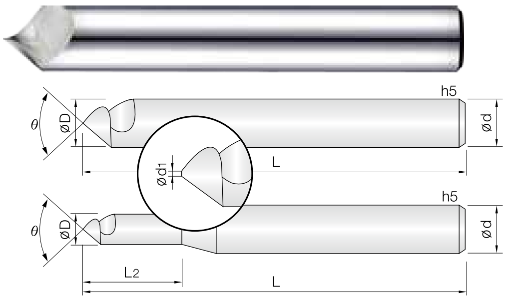


# 1CHA

1 Flutes 90˚Chamfering Cutters

## 1날 90˚면취 커터

New




- 알루미늄 합금, 동합금, 플라스틱 등 연질 피삭재 가공
- 뛰어난 표면 조도와 버를 최소화 합니다.
- 헬릭스 타입 1날 적용하여 공구 센터의 절삭력이 뛰어납니다.
- 하나의 공구로 모든 면취가 가능하며 우수한 성능을 발휘합니다.

- Processing of soft cutting materials such as aluminum alloys, brass alloys, and plastics
- Achieves excellent surface finish and minimizes burrs.
- Applying single-flute helix type ensures outstanding cutting force at the tool center.
- Capable of all chamfering with a single tool and demonstrates excellent performance.


503P

| D Size | D Tolerance |
|---|---|
| Ø 0.9 ~ 6 | +0 ~ -0.01mm |
| Ø 8 ~ 16 | +0 ~ -0.015mm |

| d1 Size | d1 Tolerance |
|---|---|
| Ø 0.3 ~ 4 | +0 ~ -0.02mm |

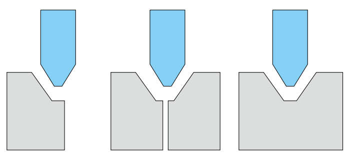
단위 : mm

| Order Number 비코팅 Un coated | Order Number RTAC 코팅 RTAC Coated | 날경 Diameter D | 선단경 Neck Diameter d1 | 각도 Angle θ | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|---|---|
| 1CHA 009 900 S03 | 1CHAC 009 900 S03 | 0.9 | 0.3 | 90˚ | 0.3 | 2.7 | 40 | 3 | |
| 1CHA 012 900 S03 | 1CHAC 012 900 S03 | 1.2 | 0.4 | 90˚ | 0.4 | 3.6 | 40 | 3 | |
| 1CHA 020 900 S03 | 1CHAC 020 900 S03 | 2 | 0.6 | 90˚ | 0.7 | 6 | 40 | 3 | |
| 1CHA 030 900 S03 | 1CHAC 030 900 S03 | 3 | 0.8 | 90˚ | 1.1 | - | 40 | 3 | |
| 1CHA 040 900 S04 | 1CHAC 040 900 S04 | 4 | 1 | 90˚ | 1.5 | - | 40 | 4 | |
| 1CHA 060 900 S06 | 1CHAC 060 900 S06 | 6 | 1.5 | 90˚ | 2.25 | - | 50 | 6 | |
| 1CHA 080 900 S08 | 1CHAC 080 900 S08 | 8 | 2 | 90˚ | 3 | - | 60 | 8 | |
| 1CHA 100 900 S10 | 1CHAC 100 900 S10 | 10 | 2.5 | 90˚ | 3.75 | - | 70 | 10 | |
| 1CHA 120 900 S12 | 1CHAC 120 900 S12 | 12 | 3 | 90˚ | 4.5 | - | 75 | 12 | |
| 1CHA 160 900 S16 | 1CHAC 160 900 S16 | 16 | 4 | 90˚ | 6 | - | 80 | 16 | |

GENERAL PURPOSE

■ 가공형상에따른절삭가능여부

Available Cutting Shape

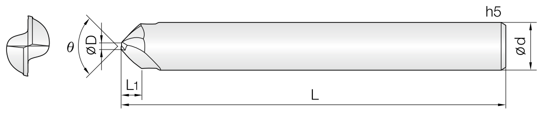


가능 (O)

# 2CHA

*2 Flutes 90˚Chamfering Cutters*

## 2날 90˚면취 커터




- **HRc50이하의 고경도강, 프리하든강, 공구강, 주철 등 피삭재 가공**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 헬릭스 타입 2날을 적용하여 모서리 면취 가공시 절삭력이 좋으며, 피삭재의 조도가 우수합니다.
- 항절력이 높은 미립자 초경합금을 채택, 고이송 작업시 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons**
- Good wear resistance by Si-based PVD coating.
- Applied helix 2flutes design for better performance in corner chamfering.
- Minimize fracturing at high feed by high TRS fine WC grade.

2 | WC 미립자 | TISIN Coating | 30° Helix Angle | CUTTING DATA 504P

| D Size | D Tolerance |
|---|---|
| Ø 0.8 ~ 1 | +0 ~ -0.02mm |

단위 : mm

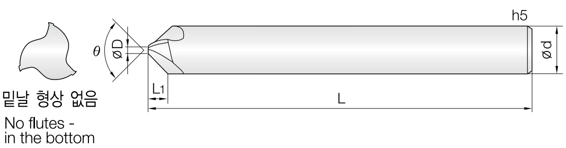
| Order Number | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CHA 008 900 011 | 0.8 | 90˚ | 1.1 | 50 | 3 | |
| 2CHA 008 900 016 | 0.8 | 90˚ | 1.6 | 50 | 4 | |
| 2CHA 010 900 025 | 1 | 90˚ | 2.5 | 60 | 6 | |
| 2CHA 010 900 035 | 1 | 90˚ | 3.5 | 70 | 8 | |
| 2CHA 010 900 045 | 1 | 90˚ | 4.5 | 80 | 10 | |
| 2CHA 010 900 055 | 1 | 90˚ | 5.5 | 90 | 12 | |

| Order Number | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

# 3CHA

*3 Flutes 90˚Chamfering Cutters*

## 3날 90˚면취 커터




- **HRc50이하의 고경도강, 프리하든강, 공구강, 주철 등 피삭재 가공**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 헬릭스 타입 3날을 적용하여 모서리 면취 가공시 절삭력이 좋으며, 피삭재의 조도가 우수합니다.
- 항절력이 높은 미립자 초경합금을 채택, 고이송 작업시 엔드밀의 파손을 최소화 하였습니다.

- **Endmills for various work materials, hardened steels (HRc ~50), pre-hardened steels, tool steels and cast irons**
- Good wear resistance by Si-based PVD coating.
- Applied helix 2flutes design for better performance in corner chamfering.
- Minimize fracturing at high feed by high TRS fine WC grade.

3 | WC 미립자 | TISIN Coating | 30° Helix Angle | CUTTING DATA 504P

| D Size | D Tolerance |
|---|---|
| Ø 0.8 ~ 2 | +0 ~ -0.02mm |

단위 : mm

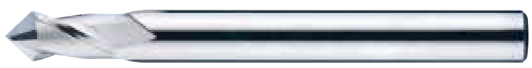
| Order Number | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 3CHA 008 900 011 | 0.8 | 90˚ | 1.1 | 50 | 3 | |
| 3CHA 008 900 016 | 0.8 | 90˚ | 1.6 | 50 | 4 | |
| 3CHA 010 900 025 | 1 | 90˚ | 2.5 | 60 | 6 | |
| 3CHA 010 900 035 | 1 | 90˚ | 3.5 | 65 | 8 | |
| 3CHA 020 900 040 | 2 | 90˚ | 4.0 | 75 | 10 | |
| 3CHA 020 900 050 | 2 | 90˚ | 5.0 | 80 | 12 | |

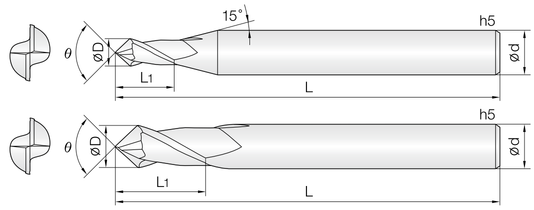
| Order Number | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

# 2CEN

## 2 Flutes Centering End Mills

## 2날 센터링 엔드밀






- 비코팅 : 아크릴, ABS, 알류미늄 등 비철, 비금속 피삭재 가공
- 코팅 : 프리하든강, 일반강, 주물 비철합금 가공엔드밀
- 센터링 작업 및 모서리 면취와 측면절삭을 동시에 할 수 있는 다기능 엔드밀.
- 미립자 초경합금을 채택, 다양한 비철합금과 목업의 피삭재에 적용 가능합니다.
- JCRO 코팅과 비코팅을 구분하여 HRc50이하의 고경도강, 프리하든강, 주철 등 다양한 피삭재 가공이 가능합니다.

- Non coating : acryl, A.B.S, aluminum, non-ferrous and non-metallic materials
- Coating : pre-hardened steels, cast irons, non-metallic materials
- Multi function endmill for corner chamfering, side wall and centering.
- Applied fine WC grade optimized for various non-ferrous and nonmetallic work materials.
- Endmills for various work materials, hardened steel(HRc ~50), pre-hardened steel, tool steel and cast iron.

2 | WC 미립자 | JCRO Coating | 30° Helix Angle | CUTTING DATA 506P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.2 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 16 | +0 ~ -0.015mm |

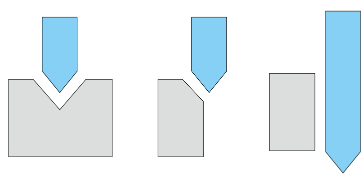
| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø3 ~ 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø14 ~ 16 | -0.015 ~ -0.03mm |

단위 : mm

| Order Number 비코팅 Un coated | Order Number 코팅 Coated | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 비코팅 Un coated | 비고 코팅 Coated |
|---|---|---|---|---|---|---|---|---|
| 2CEN 002 600 S03 | 2CENC 002 600 S03 | 0.2 | 60° | 0.4 | 40 | 3 | | |
| 2CEN 002 900 S03 | 2CENC 002 900 S03 | 0.2 | 90° | 0.4 | 40 | 3 | | |
| New 2CEN 002 1200 S03 | New 2CENC 002 1200 S03 | 0.2 | 120° | 0.4 | 40 | 3 | | |
| 2CEN 003 600 S03 | 2CENC 003 600 S03 | 0.3 | 60° | 0.6 | 45 | 3 | | |
| 2CEN 003 900 S03 | 2CENC 003 900 S03 | 0.3 | 90° | 0.6 | 45 | 3 | | |
| New 2CEN 003 1200 S03 | New 2CENC 003 1200 S03 | 0.3 | 120° | 0.6 | 45 | 3 | | |
| 2CEN 005 600 S03 | 2CENC 005 600 S03 | 0.5 | 60° | 1 | 50 | 3 | | |
| 2CEN 005 900 S03 | 2CENC 005 900 S03 | 0.5 | 90° | 1 | 50 | 3 | | |
| New 2CEN 005 1200 S03 | New 2CENC 005 1200 S03 | 0.5 | 120° | 1 | 50 | 3 | | |
| 2CEN 008 600 S03 | 2CENC 008 600 S03 | 0.8 | 60° | 1.6 | 50 | 3 | | |
| 2CEN 008 900 S03 | 2CENC 008 900 S03 | 0.8 | 90° | 1.6 | 50 | 3 | | |
| New 2CEN 008 1200 S03 | New 2CENC 008 1200 S03 | 0.8 | 120° | 1.6 | 50 | 3 | | |
| 2CEN 010 600 S03 | 2CENC 010 600 S03 | 1 | 60° | 2 | 50 | 3 | | |
| 2CEN 010 900 S03 | 2CENC 010 900 S03 | 1 | 90° | 2 | 50 | 3 | | |
| New 2CEN 010 1200 S03 | New 2CENC 010 1200 S03 | 1 | 120° | 2 | 50 | 3 | | |
| 2CEN 015 600 S03 | 2CENC 015 600 S03 | 1.5 | 60° | 3 | 50 | 3 | | |
| 2CEN 015 900 S03 | 2CENC 015 900 S03 | 1.5 | 90° | 3 | 50 | 3 | | |
| New 2CEN 015 1200 S03 | New 2CENC 015 1200 S03 | 1.5 | 120° | 3 | 50 | 3 | | |
| 2CEN 020 600 S03 | 2CENC 020 600 S03 | 2 | 60° | 4 | 50 | 3 | | |
| 2CEN 020 900 S03 | 2CENC 020 900 S03 | 2 | 90° | 4 | 50 | 3 | | |
| New 2CEN 020 1200 S03 | New 2CENC 020 1200 S03 | 2 | 120° | 4 | 50 | 3 | | |
| 2CEN 030 600 S03 | 2CENC 030 600 S03 | 3 | 60° | 6 | 50 | 3 | | |
| 2CEN 030 900 S03 | 2CENC 030 900 S03 | 3 | 90° | 6 | 50 | 3 | | |
| 2CEN 030 600 S06 | 2CENC 030 600 S06 | 3 | 60° | 6 | 50 | 6 | | |
| 2CEN 030 900 S06 | 2CENC 030 900 S06 | 3 | 90° | 6 | 50 | 6 | | |
| New 2CEN 030 1200 S03 | New 2CENC 030 1200 S03 | 3 | 120° | 6 | 50 | 3 | | |
| New 2CEN 030 1200 S06 | New 2CENC 030 1200 S06 | 3 | 120° | 6 | 50 | 6 | | |
| 2CEN 040 600 S06 | 2CENC 040 600 S06 | 4 | 60° | 8 | 50 | 6 | | |
| 2CEN 040 900 S06 | 2CENC 040 900 S06 | 4 | 90° | 8 | 50 | 6 | | |
| New 2CEN 040 1200 S06 | New 2CENC 040 1200 S06 | 4 | 120° | 8 | 50 | 6 | | |
| 2CEN 050 600 S06 | 2CENC 050 600 S06 | 5 | 60° | 10 | 50 | 6 | | |
| 2CEN 050 900 S06 | 2CENC 050 900 S06 | 5 | 90° | 10 | 50 | 6 | | |
| New 2CEN 050 1200 S06 | New 2CENC 050 1200 S06 | 5 | 120° | 10 | 50 | 6 | | |
| 2CEN 060 600 S06 | 2CENC 060 600 S06 | 6 | 60° | 12 | 60 | 6 | | |
| 2CEN 060 900 S06 | 2CENC 060 900 S06 | 6 | 90° | 12 | 60 | 6 | | |
| New 2CEN 060 1200 S06 | New 2CENC 060 1200 S06 | 6 | 120° | 12 | 60 | 6 | | |
| New 2CEN 070 600 S08 | New 2CENC 070 600 S08 | 7 | 60° | 14 | 70 | 8 | | |
| New 2CEN 070 900 S08 | New 2CENC 070 900 S08 | 7 | 90° | 14 | 70 | 8 | | |

### ■ 가공형상에따른절삭가능여부

Available Cutting Shape



가능 (△) 가능 (O) 가능 (0)

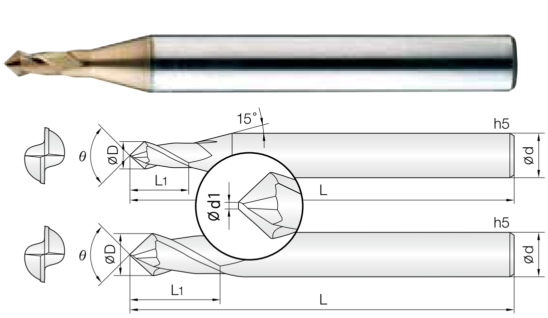
단위 : mm

| Order Number 비코팅 Un coated | Order Number 코팅 Coated | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 비코팅 Un coated | 비고 코팅 Coated |
|---|---|---|---|---|---|---|---|---|
| New 2CEN 070 1200 S08 | New 2CENC 070 1200 S08 | 7 | 120° | 14 | 70 | 8 | | |
| 2CEN 080 600 S08 | 2CENC 080 600 S08 | 8 | 60° | 16 | 70 | 8 | | |
| 2CEN 080 900 S08 | 2CENC 080 900 S08 | 8 | 90° | 16 | 70 | 8 | | |
| New 2CEN 080 1200 S08 | New 2CENC 080 1200 S08 | 8 | 120° | 16 | 70 | 8 | | |
| New 2CEN 090 600 S10 | New 2CENC 090 600 S10 | 9 | 60° | 17 | 70 | 10 | | |
| New 2CEN 090 900 S10 | New SCENC 090 900 S10 | 9 | 90° | 17 | 70 | 10 | | |
| New 2CEN 090 1200 S10 | New 2CENC 090 1200 S10 | 9 | 120° | 17 | 70 | 10 | | |
| 2CEN 100 600 S10 | 2CENC 100 600 S10 | 10 | 60° | 18 | 70 | 10 | | |
| 2CEN 100 900 S10 | 2CENC 100 900 S10 | 10 | 90° | 18 | 70 | 10 | | |
| New 2CEN 100 1200 S10 | New 2CENC 100 1200 S10 | 10 | 120° | 18 | 70 | 10 | | |
| 2CEN 120 600 S12 | 2CENC 120 600 S12 | 12 | 60° | 20 | 75 | 12 | | |
| 2CEN 120 900 S12 | 2CENC 120 900 S12 | 12 | 90° | 20 | 75 | 12 | | |
| New 2CEN 120 1200 S12 | New 2CENC 120 1200 S12 | 12 | 120° | 20 | 75 | 12 | | |
| 2CEN 140 600 S14 | 2CENC 140 600 S14 | 14 | 60° | 26 | 80 | 14 | | |
| 2CEN 140 900 S14 | 2CENC 140 900 S14 | 14 | 90° | 26 | 80 | 14 | | |
| New 2CEN 140 1200 S14 | New 2CENC 140 1200 S14 | 14 | 120° | 26 | 80 | 14 | | |
| 2CEN 160 600 S16 | 2CENC 160 600 S16 | 16 | 60° | 32 | 100 | 16 | | |
| 2CEN 160 900 S16 | 2CENC 160 900 S16 | 16 | 90° | 32 | 100 | 16 | | |
| New 2CEN 160 1200 S16 | New 2CENC 160 1200 S16 | 16 | 120° | 32 | 100 | 16 | | |

# 2CENE

2 Flutes Miniature Chamfering End Mills

## 2날 소경 면취 엔드밀




- **프리하든강, 일반강, 주물 비철합금 가공 엔드밀**
- 센터링 작업 및 모서리 면취와 측면절삭을 동시에 가공할 수 있는 다기능 엔드밀 입니다.
- 미립자 초경합금을 채택, 다양한 비철합금과 목업의 피삭재에 적용 가능합니다.
- JCRO 코팅을 적용하여 HRc50이하의 고경도강, 프리하든강, 주철 등 다양한 피삭재 가공이 가능합니다.

- **Pre-hardened steels, Cast irons, Non-metallic materials**
- Multi function endmill for corner chamfering, side wall and centering.
- Applied fine WC grade optimized for various non-ferrous and non-metallic work materials.
- Endmills for various work materials, hardened steel (HRc ~50), pre-hardened steel, tool steel and cast iron.


506P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.5 ~ 3 | +0 ~ -0.01mm |

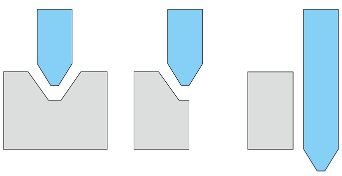
| Condition | D Size | D Tolerance | d1 Size | d1 Tolerance |
|---|---|---|---|---|
| ØD = Ød | Ø3 | -0.005 ~ -0.015mm | Ø 0.05 ~ 0.2 | +0 ~ -0.01mm |

단위 : mm

| Order Number | 날경 Diameter D | 선단경 Neck Diameter ød1 | 각도 Angle θ | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|
| 2CENE 005 0005 090 | 0.5 | 0.05 | 90° | 1 | 40 | 3 | |
| 2CENE 006 0005 090 | 0.6 | 0.05 | 90° | 1.2 | 40 | 3 | |
| 2CENE 007 0005 090 | 0.7 | 0.05 | 90° | 1.4 | 40 | 3 | |
| 2CENE 008 0005 090 | 0.8 | 0.05 | 90° | 1.6 | 40 | 3 | |
| 2CENE 010 0005 090 | 1 | 0.05 | 90° | 2 | 40 | 3 | |
| 2CENE 010 001 090 | 1 | 0.1 | 90° | 2 | 40 | 3 | |
| 2CENE 010 001 120 | 1 | 0.1 | 120° | 2 | 40 | 3 | |
| 2CENE 012 001 090 | 1.2 | 0.1 | 90° | 2.4 | 40 | 3 | |
| 2CENE 015 001 090 | 1.5 | 0.1 | 90° | 3 | 40 | 3 | |
| 2CENE 015 001 120 | 1.5 | 0.1 | 120° | 3 | 40 | 3 | |
| 2CENE 020 001 090 | 2 | 0.1 | 90° | 4 | 40 | 3 | |
| 2CENE 020 002 090 | 2 | 0.2 | 90° | 4 | 40 | 3 | |
| 2CENE 020 002 120 | 2 | 0.2 | 120° | 4 | 40 | 3 | |
| 2CENE 025 002 090 | 2.5 | 0.2 | 90° | 5 | 40 | 3 | |
| 2CENE 030 002 090 | 3 | 0.2 | 90° | 6 | 40 | 3 | |
| 2CENE 030 002 120 | 3 | 0.2 | 120° | 6 | 40 | 3 | |

### ■ 가공형상에따른절삭가능여부

Available Cutting Shape

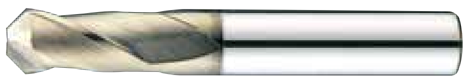


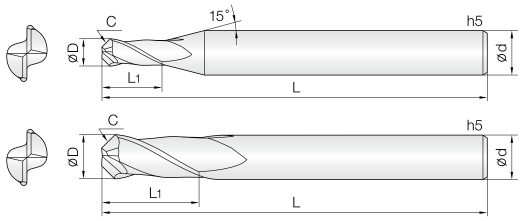
가능 (O)　가능 (O)　가능 (0)

# 2CCMC

*2 Flutes Coner C End Mills*

## 2날 코너45도 면취 엔드밀






- **프리하든강, 일반강, 주물 비철합금 가공 엔드밀**
- 모서리 면취와 측면절삭을 동시에 가공할 수 있는 다기능 엔드밀 입니다.
- 엔드밀의 인선을 면취설계하여 엔드밀의 치핑을 최소화 하였습니다.
- JCRO코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 다양한 피삭재 가공이 가능합니다.

- **Pre-hardened steels, Cast iron, Non-metallic materials**
- Multi function endmill for corner chamfering, side wall.
- Minimize edge chipping by applying edge chamfering design.
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Endmills for various work materials.

2 | WC 미립자 | JCRO Coating | 30° Helix Angle | CUTTING DATA 506P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø1 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 12 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |

단위 : mm

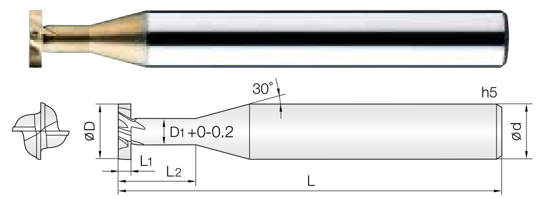
| Order Number | 날경 Diameter D | 면취량 Chamfer C | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CCMC 010 0002 S04 | 1 | 0.02 | 2.5 | 45 | 4 | |
| 2CCMC 010 0005 S04 | 1 | 0.05 | 2.5 | 45 | 4 | |
| 2CCMC 010 001 S04 | 1 | 0.1 | 2.5 | 45 | 4 | |
| 2CCMC 010 002 S04 | 1 | 0.2 | 2.5 | 45 | 4 | |
| 2CCMC 010 003 S04 | 1 | 0.3 | 2.5 | 45 | 4 | |
| 2CCMC 015 0005 S04 | 1.5 | 0.05 | 4 | 45 | 4 | |
| 2CCMC 015 001 S04 | 1.5 | 0.1 | 4 | 45 | 4 | |
| 2CCMC 015 002 S04 | 1.5 | 0.2 | 4 | 45 | 4 | |
| 2CCMC 015 003 S04 | 1.5 | 0.3 | 4 | 45 | 4 | |
| 2CCMC 015 005 S04 | 1.5 | 0.5 | 4 | 45 | 4 | |
| 2CCMC 020 0005 S04 | 2 | 0.05 | 6 | 45 | 4 | |
| 2CCMC 020 001 S04 | 2 | 0.1 | 6 | 45 | 4 | |
| 2CCMC 020 002 S04 | 2 | 0.2 | 6 | 45 | 4 | |
| 2CCMC 020 003 S04 | 2 | 0.3 | 6 | 45 | 4 | |
| 2CCMC 020 004 S04 | 2 | 0.4 | 6 | 45 | 4 | |
| 2CCMC 020 005 S04 | 2 | 0.5 | 6 | 45 | 4 | |
| 2CCMC 030 0005 S06 | 3 | 0.05 | 8 | 50 | 6 | |
| 2CCMC 030 001 S06 | 3 | 0.1 | 8 | 50 | 6 | |
| 2CCMC 030 002 S06 | 3 | 0.2 | 8 | 50 | 6 | |
| 2CCMC 030 003 S06 | 3 | 0.3 | 8 | 50 | 6 | |
| 2CCMC 030 005 S06 | 3 | 0.5 | 8 | 50 | 6 | |
| 2CCMC 030 010 S06 | 3 | 1 | 8 | 50 | 6 | |
| 2CCMC 040 0005 S06 | 4 | 0.05 | 11 | 50 | 6 | |
| 2CCMC 040 001 S06 | 4 | 0.1 | 11 | 50 | 6 | |
| 2CCMC 040 002 S06 | 4 | 0.2 | 11 | 50 | 6 | |
| 2CCMC 040 003 S06 | 4 | 0.3 | 11 | 50 | 6 | |
| 2CCMC 040 005 S06 | 4 | 0.5 | 11 | 50 | 6 | |
| 2CCMC 040 010 S06 | 4 | 1 | 11 | 50 | 6 | |
| 2CCMC 040 015 S06 | 4 | 1.5 | 11 | 50 | 6 | |
| 2CCMC 050 001 S06 | 5 | 0.1 | 13 | 60 | 6 | |
| 2CCMC 050 002 S06 | 5 | 0.2 | 13 | 60 | 6 | |
| 2CCMC 050 005 S06 | 5 | 0.5 | 13 | 60 | 6 | |
| 2CCMC 050 010 S06 | 5 | 1 | 13 | 60 | 6 | |
| 2CCMC 050 015 S06 | 5 | 1.5 | 13 | 60 | 6 | |
| 2CCMC 050 020 S06 | 5 | 2 | 13 | 60 | 6 | |
| 2CCMC 060 0005 S06 | 6 | 0.05 | 13 | 60 | 6 | |
| 2CCMC 060 001 S06 | 6 | 0.1 | 13 | 60 | 6 | |
| 2CCMC 060 002 S06 | 6 | 0.2 | 13 | 60 | 6 | |
| 2CCMC 060 003 S06 | 6 | 0.3 | 13 | 60 | 6 | |
| 2CCMC 060 005 S06 | 6 | 0.5 | 13 | 60 | 6 | |
| 2CCMC 060 010 S06 | 6 | 1 | 13 | 60 | 6 | |
| 2CCMC 060 015 S06 | 6 | 1.5 | 13 | 60 | 6 | |
| 2CCMC 060 020 S06 | 6 | 2 | 13 | 60 | 6 | |
| 2CCMC 060 025 S06 | 6 | 2.5 | 13 | 60 | 6 | |
| 2CCMC 080 001 S08 | 8 | 0.1 | 19 | 70 | 8 | |
| 2CCMC 080 002 S08 | 8 | 0.2 | 19 | 70 | 8 | |
| 2CCMC 080 005 S08 | 8 | 0.5 | 19 | 70 | 8 | |
| 2CCMC 080 010 S08 | 8 | 1 | 19 | 70 | 8 | |
| 2CCMC 080 015 S08 | 8 | 1.5 | 19 | 70 | 8 | |
| 2CCMC 080 020 S08 | 8 | 2 | 19 | 70 | 8 | |

| Order Number | 날경 Diameter D | 면취량 Chamfer C | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CCMC 080 025 S08 | 8 | 2.5 | 19 | 70 | 8 | |
| 2CCMC 080 030 S08 | 8 | 3 | 19 | 70 | 8 | |
| 2CCMC 100 001 S10 | 10 | 0.1 | 22 | 75 | 10 | |
| 2CCMC 100 002 S10 | 10 | 0.2 | 22 | 75 | 10 | |
| 2CCMC 100 005 S10 | 10 | 0.5 | 22 | 75 | 10 | |
| 2CCMC 100 010 S10 | 10 | 1 | 22 | 75 | 10 | |
| 2CCMC 100 015 S10 | 10 | 1.5 | 22 | 75 | 10 | |
| 2CCMC 100 020 S10 | 10 | 2 | 22 | 75 | 10 | |
| 2CCMC 100 030 S10 | 10 | 3 | 22 | 75 | 10 | |
| 2CCMC 100 040 S10 | 10 | 4 | 22 | 75 | 10 | |
| 2CCMC 120 001 S12 | 12 | 0.1 | 26 | 80 | 12 | |
| 2CCMC 120 002 S12 | 12 | 0.2 | 26 | 80 | 12 | |
| 2CCMC 120 005 S12 | 12 | 0.5 | 26 | 80 | 12 | |
| 2CCMC 120 010 S12 | 12 | 1 | 26 | 80 | 12 | |
| 2CCMC 120 015 S12 | 12 | 1.5 | 26 | 80 | 12 | |
| 2CCMC 120 020 S12 | 12 | 2 | 26 | 80 | 12 | |
| 2CCMC 120 030 S12 | 12 | 3 | 26 | 80 | 12 | |
| 2CCMC 120 040 S12 | 12 | 4 | 26 | 80 | 12 | |
| 2CCMC 120 050 S12 | 12 | 5 | 26 | 80 | 12 | |

# 4TES

*4 Flutes T-Slot Cutters*

## 4날 T 커터




- **HRc50이하의 고경도강, 프리하든강, 공구강, 주철 등 피삭재 가공**
- JCRO코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 4날을 적용하여 인선부 치핑을 최소화 하였습니다.
- 다양한 형상과 유효장으로 공작물 간섭을 최소화하여 작업효율이 향상됩니다.
- 코팅과 비코팅으로 구분하여 수지, 아크릴 등의 가공도 가능합니다.

- **Endmills for various work materials, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Minimize edge chipping by applying 4flutes design.
- Various shapes and length provides optimum efficiency.
- Resin, plastic machining applicable witn coated or non coated endmill.


Ø2 ~ Ø5　Ø6 ~ Ø10　505P

| D Size | D Tolerance |
|---|---|
| Ø2 ~ 5 | +0 ~ -0.02mm |
| Ø6 ~ 10 | -0.01 ~ -0.03mm |

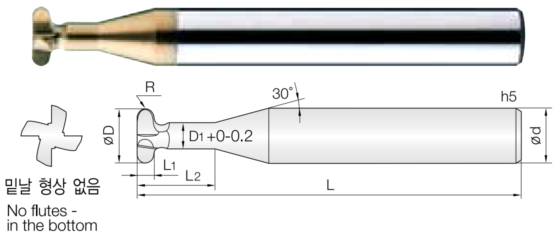
단위 : mm

| Order Number | | 날경 Diameter | 날장 Length of cut | 유효장 Effective Length | 목부경 Neck Diameter | 전장 Overall Length | 생크 Shank Dia | 비고 | |
|---|---|---|---|---|---|---|---|---|---|
| 비코팅 Un coated | 코팅 Coated | D | L1 | L2 | D1 | L | d | 비코팅 Un coated | 코팅 Coated |
| 4TES 020 003 040 | 4TESC 020 003 040 | 2 | 0.3 | 4 | 1 | 50 | 6 | | |
| 4TES 020 005 040 | 4TESC 020 005 040 | 2 | 0.5 | 4 | 1 | 50 | 6 | | |
| 4TES 030 003 045 | 4TESC 030 003 045 | 3 | 0.3 | 4.5 | 1.5 | 50 | 6 | | |
| 4TES 030 005 045 | 4TESC 030 005 045 | 3 | 0.5 | 4.5 | 1.5 | 50 | 6 | | |
| 4TES 030 010 045 | 4TESC 030 010 045 | 3 | 1 | 4.5 | 1.5 | 50 | 6 | | |
| 4TES 040 003 050 | 4TESC 040 003 050 | 4 | 0.3 | 5 | 2 | 50 | 6 | | |
| 4TES 040 005 050 | 4TESC 040 005 050 | 4 | 0.5 | 5 | 2 | 50 | 6 | | |
| 4TES 040 010 050 | 4TESC 040 010 050 | 4 | 1 | 5 | 2 | 50 | 6 | | |
| 4TES 050 005 045 | 4TESC 050 005 045 | 5 | 0.5 | 4.5 | 2.5 | 50 | 6 | | |
| 4TES 050 010 050 | 4TESC 050 010 050 | 5 | 1 | 5 | 2.5 | 50 | 6 | | |
| 4TES 050 015 055 | 4TESC 050 015 055 | 5 | 1.5 | 5.5 | 2.5 | 50 | 6 | | |
| 4TES 050 020 060 | 4TESC 050 020 060 | 5 | 2 | 6 | 2.5 | 50 | 6 | | |
| 4TES 060 005 045 | 4TESC 060 005 045 | 6 | 0.5 | 4.5 | 3 | 60 | 6 | | |
| 4TES 060 010 050 | 4TESC 060 010 050 | 6 | 1 | 5 | 3 | 60 | 6 | | |
| 4TES 060 015 055 | 4TESC 060 015 055 | 6 | 1.5 | 5.5 | 3 | 60 | 6 | | |
| 4TES 060 020 060 | 4TESC 060 020 060 | 6 | 2 | 6 | 3 | 60 | 6 | | |
| 4TES 080 005 045 | 4TESC 080 005 045 | 8 | 0.5 | 4.5 | 4 | 60 | 8 | | |
| 4TES 080 010 050 | 4TESC 080 010 050 | 8 | 1 | 5 | 4 | 60 | 8 | | |
| 4TES 080 015 055 | 4TESC 080 015 055 | 8 | 1.5 | 5.5 | 4 | 60 | 8 | | |
| 4TES 080 020 060 | 4TESC 080 020 060 | 8 | 2 | 6 | 4 | 60 | 8 | | |
| 4TES 080 030 070 | 4TESC 080 030 070 | 8 | 3 | 7 | 4 | 60 | 8 | | |
| 4TES 100 010 070 | 4TESC 100 010 070 | 10 | 1 | 7 | 5 | 70 | 10 | | |
| 4TES 100 020 080 | 4TESC 100 020 080 | 10 | 2 | 8 | 5 | 70 | 10 | | |
| 4TES 100 030 090 | 4TESC 100 030 090 | 10 | 3 | 9 | 5 | 70 | 10 | | |

# 4TRS

## 4 Flutes T-R Slot Cutters

## 4날 T-R 커터




- **HRc50이하의 고경도강, 프리하든강, 공구강, 주철 등 피삭재 가공**
- JCRO코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 직선날 타입 4날을 적용하여 인선부 치핑을 최소화 하였습니다.
- 다양한 형상과 유효장으로 공작물 간섭을 최소화하여 작업효율이 향상됩니다.

- **Endmills for various work materials, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Minimize edge chipping by applying straight 4flutes design.
- Various shapes and length provides optimum efficiency.

4 | WC 미립자 | JCRO Coating | R ± 0.02 (0.25R ~ 3R) | L1 ± 0.03 (Ø4 ~ 5) | L1 ± 0.05 (Ø6 ~12) | 0° Helix Angle | CUTTING DATA (505P)

| D Size | D Tolerance |
|---|---|
| Ø4 | +0 ~ -0.02mm |
| Ø5 ~ 12 | -0.01 ~ -0.025mm |

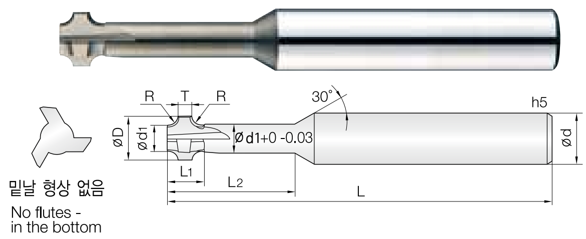
단위 : mm

| | Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 목부경 Neck Diameter D1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|---|
| New | 4TRS 040 005 040 | 4 X 0.25R | 0.5 | 4 | 2 | 50 | 6 | |
| New | 4TRS 040 010 040 | 4 X 0.5R | 1 | 4 | 2 | 50 | 6 | |
| | 4TRS 050 010 045 | 5 X 0.5R | 1 | 4.5 | 2.5 | 50 | 6 | |
| | 4TRS 050 010 070 | 5 X 0.5R | 1 | 7 | 2.5 | 50 | 6 | |
| | 4TRS 050 020 055 | 5 X 1R | 2 | 5.5 | 2.5 | 50 | 6 | |
| | 4TRS 060 010 050 | 6 X 0.5R | 1 | 5 | 3 | 50 | 6 | |
| | 4TRS 060 010 080 | 6 X 0.5R | 1 | 8 | 3 | 50 | 6 | |
| | 4TRS 060 015 055 | 6 X 0.75R | 1.5 | 5.5 | 3 | 50 | 6 | |
| | 4TRS 060 020 060 | 6 X 1R | 2 | 6 | 3 | 50 | 6 | |
| | 4TRS 060 020 100 | 6 X 1R | 2 | 10 | 3 | 50 | 6 | |
| New | 4TRS 080 010 070 | 8 X 0.5R | 1 | 7 | 4 | 60 | 8 | |
| New | 4TRS 080 010 130 | 8 X 0.5R | 1 | 13 | 4 | 60 | 8 | |
| | 4TRS 080 020 070 | 8 X 1R | 2 | 7 | 4 | 60 | 8 | |
| | 4TRS 080 020 130 | 8 X 1R | 2 | 13 | 4 | 60 | 8 | |
| | 4TRS 080 030 080 | 8 X 1.5R | 3 | 8 | 4 | 60 | 8 | |
| New | 4TRS 100 030 100 | 10 X 1.5R | 3 | 10 | 4.5 | 70 | 10 | |
| New | 4TRS 100 030 160 | 10 X 1.5R | 3 | 16 | 4.5 | 70 | 10 | |
| | 4TRS 100 040 100 | 10 X 2R | 4 | 10 | 4.5 | 70 | 10 | |
| | 4TRS 100 040 160 | 10 X 2R | 4 | 16 | 4.5 | 70 | 10 | |
| New | 4TRS 120 030 150 | 12 X 1.5R | 3 | 15 | 5 | 75 | 12 | |
| New | 4TRS 120 030 210 | 12 X 1.5R | 3 | 21 | 5 | 75 | 12 | |
| New | 4TRS 120 040 150 | 12 X 2R | 4 | 15 | 5 | 75 | 12 | |
| New | 4TRS 120 040 210 | 12 X 2R | 4 | 21 | 5 | 75 | 12 | |
| | 4TRS 120 060 150 | 12 X 3R | 6 | 15 | 5 | 75 | 12 | |
| | 4TRS 120 060 210 | 12 X 3R | 6 | 21 | 5 | 75 | 12 | |

# 3TRC

*3 Flutes T-Double Corner Rounding Cutters*

## 3날 T- 더블R 커터




- **HRc50이하의 고경도강, 프리하든강, 공구강, 주철 등 피삭재 가공**
- JCRO코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 직선날 타입 3날을 적용하여 인선부 치핑을 최소화 하였습니다.
- 다양한 형상과 유효장으로 공작물 간섭을 최소화하여 작업효율이 향상됩니다.

- **Endmills for various work materials, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Minimize edge chipping by applying straight 3flutes design.
- Various shapes and length provides optimum efficiency.

3 | WC 미립자 | JCRO Coating | R ± 0.02 | 0° Helix Angle | CUTTING DATA

0.2R ~ 3R | 505P

| D Size | D Tolerance |
|---|---|
| Ø 1.9 ~ 11.9 | +0 ~ -0.03mm |

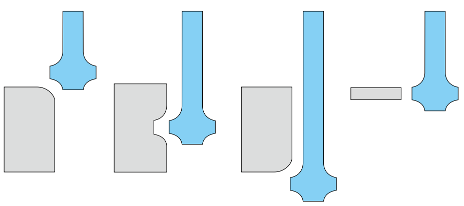
| d1 Size | d1 Tolerance |
|---|---|
| Ø 1.45 ~ 5.8 | +0 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter D×R | 선단경 Front Diameter ød1 | 두께 Thickness T | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|---|
| 3TRC 019 002 080 | 1.9 X R0.2 | 1.45 | 0.9 | 1.45 | 8 | 60 | 4 | |
| 3TRC 024 003 090 | 2.4 X R0.3 | 1.75 | 1.2 | 1.95 | 9 | 60 | 4 | |
| 3TRC 026 004 100 | 2.6 X R0.4 | 1.75 | 1.5 | 2.5 | 10 | 60 | 4 | |
| 3TRC 029 005 120 | 2.9 X R0.5 | 1.85 | 1.8 | 3 | 12 | 60 | 4 | |
| 3TRC 049 005 150 | 4.9 X R0.5 | 3.8 | 2 | 3.3 | 15 | 80 | 6 | |
| 3TRC 068 010 200 | 6.8 X R1 | 4.7 | 2.2 | 4.3 | 20 | 80 | 8 | |
| 3TRC 079 015 250 | 7.9 X R1.5 | 4.7 | 2.5 | 5.8 | 25 | 80 | 8 | |
| 3TRC 099 020 300 | 9.9 X R2 | 5.8 | 2.8 | 6.8 | 30 | 80 | 10 | |
| 3TRC 119 030 350 | 11.9 X R3 | 5.8 | 3 | 8.8 | 35 | 80 | 12 | |

### ■ 가공형상에따른절삭가능여부

**Available Cutting Shape**

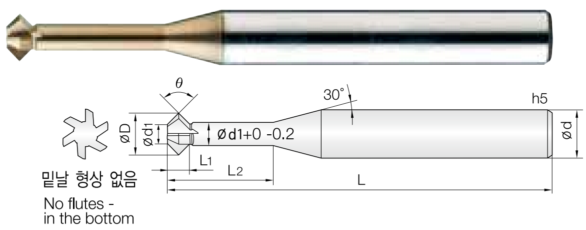


가능 (O) 가능 (O) 가능 (O) 가능 (O)

# 4&6TDA

## 4&6 Flutes T-Double Angular Cutters

## 4&6날 T- 더블 앵글 커터




- **HRc50이하의 고경도강, 프리하든강, 공구강, 주철 등 피삭재 가공**
- JCRO코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 직선날 타입 4날을 적용하여 인선부 치핑을 최소화 하였습니다.
- 다양한 형상과 유효장으로 공작물 간섭을 최소화하여 작업효율이 향상됩니다.

- **Endmills for various work materials, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Minimize edge chipping by applying straight 4flutes design.
- Various shapes and length provides optimum efficiency.

4 | 6 | WC 미립자 | JCRO Coating | L1 ± 0.03 (ø1~5) | L1 ± 0.05 (ø6~12) | 0° Helix Angle | CUTTING DATA 505P

| D Size | D Tolerance |
|---|---|
| ø1 ~ 5 | +0 ~ -0.02mm |
| ø6 ~ 12 | -0.01 ~ -0.03mm |

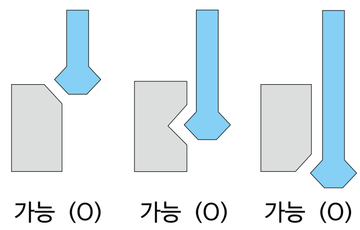
| d1 Size | d1 Tolerance |
|---|---|
| ø0.75 ~ 6 | +0 ~ -0.02mm |

단위 : mm

| | Order Number | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 유효장 Effective Length L2 | 선단경 Neck Diameter ød1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|---|---|
| New | 4TDA 010 600 013 | 1 | 60° | 0.28 | 1.3 | 0.5 | 45 | 4 | |
| New | 4TDA 010 600 020 | 1 | 60° | 0.28 | 2 | 0.5 | 45 | 4 | |
| New | 4TDA 010 900 013 | 1 | 90° | 0.5 | 1.3 | 0.5 | 45 | 4 | |
| New | 4TDA 010 900 020 | 1 | 90° | 0.5 | 2 | 0.5 | 45 | 4 | |
| New | 4TDA 015 600 019 | 1.5 | 60° | 0.43 | 1.9 | 0.75 | 45 | 4 | |
| | 4TDA 015 600 030 | 1.5 | 60° | 0.43 | 3 | 0.75 | 45 | 4 | |
| New | 4TDA 015 900 019 | 1.5 | 90° | 0.75 | 1.9 | 0.75 | 45 | 4 | |
| | 4TDA 015 900 030 | 1.5 | 90° | 0.75 | 3 | 0.75 | 45 | 4 | |
| New | 4TDA 020 600 032 | 2 | 60° | 0.57 | 3.2 | 1 | 50 | 4 | |
| | 4TDA 020 600 050 | 2 | 60° | 0.57 | 5 | 1 | 50 | 4 | |
| New | 4TDA 020 900 032 | 2 | 90° | 1 | 3.2 | 1 | 50 | 4 | |
| | 4TDA 020 900 050 | 2 | 90° | 1 | 5 | 1 | 50 | 4 | |
| New | 4TDA 025 600 038 | 2.5 | 60° | 0.75 | 3.8 | 1.2 | 50 | 4 | |
| | 4TDA 025 600 060 | 2.5 | 60° | 0.75 | 6 | 1.2 | 50 | 4 | |
| New | 4TDA 025 900 038 | 2.5 | 90° | 1.3 | 3.8 | 1.2 | 50 | 4 | |
| | 4TDA 025 900 060 | 2.5 | 90° | 1.3 | 6 | 1.2 | 50 | 4 | |
| | 4TDA 030 600 075 | 3 | 60° | 0.86 | 7.5 | 1.5 | 50 | 4 | |
| | 4TDA 030 600 120 | 3 | 60° | 0.86 | 12 | 1.5 | 50 | 4 | |
| | 4TDA 030 900 075 | 3 | 90° | 1.5 | 7.5 | 1.5 | 50 | 4 | |
| | 4TDA 030 900 120 | 3 | 90° | 1.5 | 12 | 1.5 | 50 | 4 | |
| | 4TDA 040 600 100 | 4 | 60° | 1.15 | 10 | 2 | 50 | 4 | |
| | 4TDA 040 600 160 | 4 | 60° | 1.15 | 16 | 2 | 50 | 4 | |
| | 4TDA 040 900 100 | 4 | 90° | 2 | 10 | 2 | 50 | 4 | |
| | 4TDA 040 900 160 | 4 | 90° | 2 | 16 | 2 | 50 | 4 | |
| | 4TDA 050 600 125 | 5 | 60° | 1.44 | 12.5 | 2.5 | 60 | 6 | |
| | 4TDA 050 600 200 | 5 | 60° | 1.44 | 20 | 2.5 | 60 | 6 | |
| | 4TDA 050 900 125 | 5 | 90° | 2.4 | 12.5 | 2.5 | 60 | 6 | |
| | 4TDA 050 900 200 | 5 | 90° | 2.4 | 20 | 2.5 | 60 | 6 | |
| | 4TDA 060 600 150 | 6 | 60° | 1.73 | 15 | 3 | 60 | 6 | |
| | 4TDA 060 600 250 | 6 | 60° | 1.73 | 25 | 3 | 60 | 6 | |
| | 4TDA 060 900 150 | 6 | 90° | 2.8 | 15 | 3 | 60 | 6 | |
| | 4TDA 060 900 250 | 6 | 90° | 2.8 | 25 | 3 | 60 | 6 | |
| | 6TDA 080 600 200 | 8 | 60° | 2.3 | 20 | 4 | 70 | 8 | |
| | 6TDA 080 600 280 | 8 | 60° | 2.3 | 28 | 4 | 70 | 8 | |
| | 6TDA 080 900 200 | 8 | 90° | 3.8 | 20 | 4 | 70 | 8 | |
| | 6TDA 080 900 280 | 8 | 90° | 3.8 | 28 | 4 | 70 | 8 | |
| | 6TDA 100 600 250 | 10 | 60° | 2.8 | 25 | 5 | 75 | 10 | |
| | 6TDA 100 600 350 | 10 | 60° | 2.8 | 35 | 5 | 75 | 10 | |

### ■ 가공형상에따른절삭가능여부

Available Cutting Shape



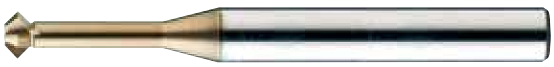
단위 : mm

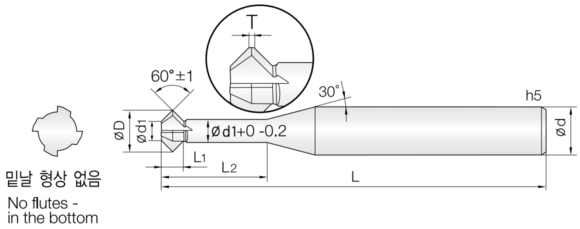
| Order Number | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 유효장 Effective Length L2 | 선단경 Neck Diameter ød1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|---|
| 6TDA 100 900 250 | 10 | 90˚ | 4.8 | 25 | 5 | 80 | 10 | |
| 6TDA 100 900 350 | 10 | 90˚ | 4.8 | 35 | 5 | 80 | 10 | |
| 6TDA 120 600 300 | 12 | 60˚ | 3.4 | 30 | 6 | 80 | 12 | |
| 6TDA 120 600 420 | 12 | 60˚ | 3.4 | 42 | 6 | 80 | 12 | |
| 6TDA 120 900 300 | 12 | 90˚ | 5.8 | 30 | 6 | 80 | 12 | |
| 6TDA 120 900 420 | 12 | 90˚ | 5.8 | 42 | 6 | 80 | 12 | |

# 3&4THC

3&4 Flutes Thread Milling Cutters

## 3&4날 홈 가공용 커터






- **HRc50이하의 고경도강, 프리하든강, 공구강, 주철 등 피삭재 가공**
- JCRO코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 나사홈 가공에 적합한 직선날 형상을 설계하여, 나사홈 가공시의 인선부 치핑을 최소화 하였습니다.
- 다양한 형상과 유효장으로 공작물 간섭을 최소화하여 작업효율이 향상됩니다.

- **Endmills for various work materials, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Minimize edge chipping and fracturing by applying straight flutes design which is appropriate to screw groove cutting.
- Various shapes and length provides optimum efficiency.


Ø0.01 ~ 0.09 505P

| D Size | D Tolerance |
|---|---|
| Ø0.57 ~ 4.8 | +0 ~ -0.02mm |
| Ø6.8 ~ 7.9 | -0.01 ~ -0.03mm |

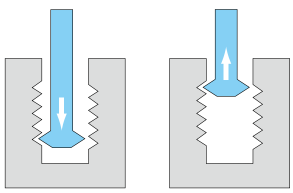
| d1 Size | d1 Tolerance |
|---|---|
| Ø0.3 ~ 6.1 | +0 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter D | 두께 Thickness T | 날장 Length of cut L1 | 유효장 Effective Length L2 | 선단경 Neck Diameter ød1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|---|
| 3THC 0057 025 M008 | 0.57 | 0.01 | 0.16 | 2.5 | 0.3 | 40 | 4 | |
| 3THC 0065 028 M009 | 0.65 | 0.01 | 0.18 | 2.8 | 0.35 | 40 | 4 | |
| 3THC 007 030 M01 | 0.7 | 0.015 | 0.19 | 3 | 0.4 | 40 | 4 | |
| 3THC 009 036 M012 | 0.9 | 0.015 | 0.2 | 3.6 | 0.57 | 40 | 4 | |
| 3THC 0105 045 M014 | 1.05 | 0.02 | 0.24 | 4.5 | 0.66 | 40 | 4 | |
| 3THC 012 050 M016 | 1.2 | 0.02 | 0.28 | 5 | 0.75 | 40 | 4 | |
| 4THC 015 060 M02 | 1.5 | 0.025 | 0.31 | 6 | 1 | 45 | 4 | |
| 4THC 019 070 M025 | 1.9 | 0.025 | 0.34 | 7 | 1.35 | 45 | 4 | |
| 4THC 023 090 M03 | 2.3 | 0.03 | 0.43 | 9 | 1.6 | 65 | 6 | |
| 4THC 031 120 M04 | 3.1 | 0.04 | 0.56 | 12 | 2.2 | 65 | 6 | |
| 4THC 040 150 M05 | 4 | 0.05 | 0.62 | 15 | 3 | 65 | 6 | |
| 4THC 048 180 M06 | 4.8 | 0.07 | 0.79 | 18 | 3.55 | 75 | 6 | |
| 4THC 065 230 M08 | 6.5 | 0.08 | 0.94 | 23 | 5 | 80 | 8 | |
| 4THC 079 260 M10 | 7.9 | 0.09 | 1.13 | 26 | 6.1 | 80 | 8 | |

### ■ 가공형상에따른절삭가능여부

Available Cutting Shape

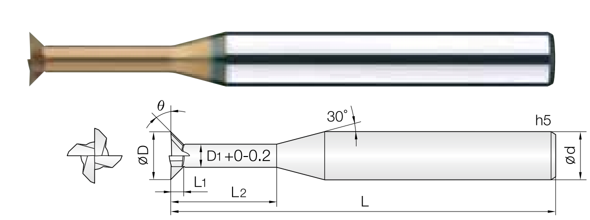


가능 (O) 가능 (O)

# 4&6TAC

4&6 Flutes T-Angular Cutters

## 4&6날 T- 앵글 커터




- **HRc50이하의 고경도강, 프리하든강, 공구강, 주철 등 피삭재 가공**
- JCRO코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 직선날 타입 4날을 적용하여 인선부 치핑을 최소화 하였습니다.
- 다양한 형상과 유효장으로 공작물 간섭을 최소화하여 작업효율이 향상됩니다.

- **Endmills for various work materials, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons**
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Minimize edge chipping by applying straight 4flutes design.
- Various shapes and length provides optimum efficiency.


Ø1.5 ~ 5 Ø6 ~12 505P

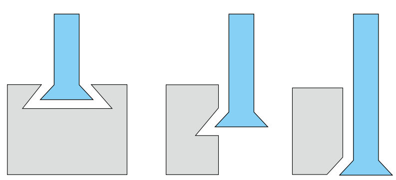
| D Size | D Tolerance |
|---|---|
| Ø1.5 ~ 5 | +0 ~ -0.02mm |
| Ø6 ~ 12 | -0.01 ~ -0.03mm |

단위 : mm

| Order Number | 날경 Diameter D | 각도 Angle θ | 날장 Length of cut L1 | 유효장 Effective Length L2 | 목부경 Neck Diameter D1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|---|
| 4TAC 015 300 030 | 1.5 | 30° | 0.21 | 3 | 0.75 | 45 | 4 | |
| 4TAC 015 450 030 | 1.5 | 45° | 0.37 | 3 | 0.75 | 45 | 4 | |
| 4TAC 020 300 050 | 2 | 30° | 0.28 | 5 | 1 | 50 | 4 | |
| 4TAC 020 450 050 | 2 | 45° | 0.5 | 5 | 1 | 50 | 4 | |
| 4TAC 025 300 060 | 2.5 | 30° | 0.37 | 6 | 1.2 | 50 | 4 | |
| 4TAC 025 450 060 | 2.5 | 45° | 0.65 | 6 | 1.2 | 50 | 4 | |
| 4TAC 030 300 075 | 3 | 30° | 0.43 | 7.5 | 1.5 | 50 | 4 | |
| 4TAC 030 300 120 | 3 | 30° | 0.43 | 12 | 1.5 | 50 | 4 | |
| 4TAC 030 450 075 | 3 | 45° | 0.75 | 7.5 | 1.5 | 50 | 4 | |
| 4TAC 030 450 120 | 3 | 45° | 0.75 | 12 | 1.5 | 50 | 4 | |
| 4TAC 040 300 100 | 4 | 30° | 0.57 | 10 | 2 | 50 | 4 | |
| 4TAC 040 300 160 | 4 | 30° | 0.57 | 16 | 2 | 50 | 4 | |
| 4TAC 040 450 100 | 4 | 45° | 1 | 10 | 2 | 50 | 4 | |
| 4TAC 040 450 160 | 4 | 45° | 1 | 16 | 2 | 50 | 4 | |
| 4TAC 050 300 125 | 5 | 30° | 0.72 | 12.5 | 2.5 | 60 | 6 | |
| 4TAC 050 450 125 | 5 | 45° | 1.25 | 12.5 | 2.5 | 60 | 6 | |
| 4TAC 060 300 150 | 6 | 30° | 0.86 | 15 | 3 | 60 | 6 | |
| 4TAC 060 300 240 | 6 | 30° | 0.86 | 24 | 3 | 60 | 6 | |
| 4TAC 060 450 150 | 6 | 45° | 1.5 | 15 | 3 | 60 | 6 | |
| 4TAC 060 450 240 | 6 | 45° | 1.5 | 24 | 3 | 60 | 6 | |
| 6TAC 080 300 200 | 8 | 30° | 1.15 | 20 | 4 | 70 | 8 | |
| 6TAC 080 300 280 | 8 | 30° | 1.15 | 28 | 4 | 70 | 8 | |
| 6TAC 080 450 200 | 8 | 45° | 2 | 20 | 4 | 70 | 8 | |
| 6TAC 080 450 280 | 8 | 45° | 2 | 28 | 4 | 70 | 8 | |
| 6TAC 100 300 250 | 10 | 30° | 1.44 | 25 | 5 | 75 | 10 | |
| 6TAC 100 300 350 | 10 | 30° | 1.44 | 35 | 5 | 75 | 10 | |
| 6TAC 100 450 250 | 10 | 45° | 2.5 | 25 | 5 | 75 | 10 | |
| 6TAC 100 450 350 | 10 | 45° | 2.5 | 35 | 5 | 75 | 10 | |
| 6TAC 120 300 300 | 12 | 30° | 1.73 | 30 | 6 | 80 | 12 | |
| 6TAC 120 300 420 | 12 | 30° | 1.73 | 42 | 6 | 80 | 12 | |
| 6TAC 120 450 300 | 12 | 45° | 3 | 30 | 6 | 80 | 12 | |
| 6TAC 120 450 420 | 12 | 45° | 3 | 42 | 6 | 80 | 12 | |

### ■ 가공형상에따른절삭가능여부

Available Cutting Shape

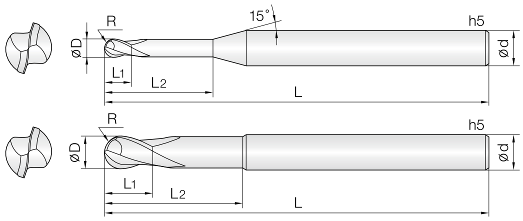


가능 (O) 가능 (O) 가능 (O)

# 2MRB

## 2 Flutes Micro Rib Ball End Mills

## 2날 범용 마이크로 리브 볼 엔드밀




- **아크릴, ABS, 목업, 알루미늄 등 비철, 비금속 피삭재 가공**
- 짧은 날장 채택으로 떨림을 최소화 하였습니다.
- 고속, 고이송 작업시 짧은 날장을 채택하여 공구의 강성이 우수합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 미립자 초경합금을 채택하여 내마모성이 좋습니다.

- **Endmills for Acryl, A.B.S, Aluminum, non-ferrous and non-metallic materials**
- Minimize chattering by short flute design.
- Excellent tool rigidity by short flute design at high speed, feed machining.
- Reinforced edge design for preventing edge chipping.
- Excellent wear resistance by applying fine WC grade.

2 | WC 미립자 | R ± 0.005 | R ± 0.01 | 30° Helix Angle | CUTTING DATA

0.1 ~ 2.5R | 3R | 507P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø0.2 ~ 6 | +0 ~ -0.01mm | ØD = Ød | Ø6 | -0.005 ~ -0.015mm |

단위 : mm

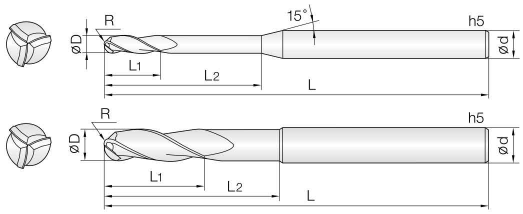
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2MRB 002 005 S04 | 0.1R X 0.2 | 0.3 | 0.5 | 40 | 4 | |
| 2MRB 002 010 S04 | 0.1R X 0.2 | 0.3 | 1 | 40 | 4 | |
| 2MRB 002 015 S04 | 0.1R X 0.2 | 0.3 | 1.5 | 40 | 4 | |
| 2MRB 002 020 S04 | 0.1R X 0.2 | 0.3 | 2 | 40 | 4 | |
| 2MRB 003 010 S04 | 0.15R X 0.3 | 0.45 | 1 | 40 | 4 | |
| 2MRB 003 020 S04 | 0.15R X 0.3 | 0.45 | 2 | 40 | 4 | |
| 2MRB 003 030 S04 | 0.15R X 0.3 | 0.45 | 3 | 40 | 4 | |
| 2MRB 003 050 S04 | 0.15R X 0.3 | 0.45 | 5 | 40 | 4 | |
| 2MRB 004 020 S04 | 0.2R X 0.4 | 0.6 | 2 | 40 | 4 | |
| 2MRB 004 030 S04 | 0.2R X 0.4 | 0.6 | 3 | 40 | 4 | |
| 2MRB 004 040 S04 | 0.2R X 0.4 | 0.6 | 4 | 40 | 4 | |
| 2MRB 004 050 S04 | 0.2R X 0.4 | 0.6 | 5 | 40 | 4 | |
| 2MRB 004 060 S04 | 0.2R X 0.4 | 0.6 | 6 | 40 | 4 | |
| 2MRB 005 020 S04 | 0.25R X 0.5 | 1 | 2 | 45 | 4 | |
| 2MRB 005 040 S04 | 0.25R X 0.5 | 1 | 4 | 45 | 4 | |
| 2MRB 005 060 S04 | 0.25R X 0.5 | 1 | 6 | 45 | 4 | |
| 2MRB 005 080 S04 | 0.25R X 0.5 | 1 | 8 | 45 | 4 | |
| 2MRB 005 100 S04 | 0.25R X 0.5 | 1 | 10 | 45 | 4 | |
| 2MRB 006 020 S04 | 0.3R X 0.6 | 1.2 | 2 | 45 | 4 | |
| 2MRB 006 040 S04 | 0.3R X 0.6 | 1.2 | 4 | 45 | 4 | |
| 2MRB 006 060 S04 | 0.3R X 0.6 | 1.2 | 6 | 45 | 4 | |
| 2MRB 006 080 S04 | 0.3R X 0.6 | 1.2 | 8 | 45 | 4 | |
| 2MRB 006 100 S04 | 0.3R X 0.6 | 1.2 | 10 | 45 | 4 | |
| 2MRB 007 040 S04 | 0.35R X 0.7 | 1.4 | 4 | 45 | 4 | |
| 2MRB 007 060 S04 | 0.35R X 0.7 | 1.4 | 6 | 45 | 4 | |
| 2MRB 007 080 S04 | 0.35R X 0.7 | 1.4 | 8 | 45 | 4 | |
| 2MRB 007 100 S04 | 0.35R X 0.7 | 1.4 | 10 | 45 | 4 | |
| 2MRB 008 040 S04 | 0.4R X 0.8 | 1.6 | 4 | 45 | 4 | |
| 2MRB 008 060 S04 | 0.4R X 0.8 | 1.6 | 6 | 45 | 4 | |
| 2MRB 008 080 S04 | 0.4R X 0.8 | 1.6 | 8 | 45 | 4 | |
| 2MRB 008 100 S04 | 0.4R X 0.8 | 1.6 | 10 | 45 | 4 | |
| 2MRB 008 120 S04 | 0.4R X 0.8 | 1.6 | 12 | 45 | 4 | |
| 2MRB 009 060 S04 | 0.45R X 0.9 | 1.8 | 6 | 45 | 4 | |
| 2MRB 009 100 S04 | 0.45R X 0.9 | 1.8 | 10 | 45 | 4 | |
| 2MRB 009 120 S04 | 0.45R X 0.9 | 1.8 | 12 | 45 | 4 | |
| 2MRB 010 060 S04 | 0.5R X 1 | 2 | 6 | 50 | 4 | |
| 2MRB 010 080 S04 | 0.5R X 1 | 2 | 8 | 50 | 4 | |
| 2MRB 010 100 S04 | 0.5R X 1 | 2 | 10 | 50 | 4 | |
| 2MRB 010 120 S04 | 0.5R X 1 | 2 | 12 | 50 | 4 | |
| 2MRB 010 160 S04 | 0.5R X 1 | 2 | 16 | 50 | 4 | |
| 2MRB 010 200 S04 | 0.5R X 1 | 2 | 20 | 60 | 4 | |
| 2MRB 010 250 S04 | 0.5R X 1 | 2 | 25 | 60 | 4 | |
| 2MRB 012 060 S04 | 0.6R X 1.2 | 2.4 | 6 | 50 | 4 | |
| 2MRB 012 080 S04 | 0.6R X 1.2 | 2.4 | 8 | 50 | 4 | |
| 2MRB 012 100 S04 | 0.6R X 1.2 | 2.4 | 10 | 50 | 4 | |
| 2MRB 012 120 S04 | 0.6R X 1.2 | 2.4 | 12 | 50 | 4 | |
| 2MRB 012 160 S04 | 0.6R X 1.2 | 2.4 | 16 | 50 | 4 | |
| 2MRB 014 060 S04 | 0.7R X 1.4 | 2.8 | 6 | 50 | 4 | |
| 2MRB 014 100 S04 | 0.7R X 1.4 | 2.8 | 10 | 50 | 4 | |
| 2MRB 014 160 S04 | 0.7R X 1.4 | 2.8 | 16 | 50 | 4 | |

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2MRB 015 060 S04 | 0.75R X 1.5 | 3 | 6 | 50 | 4 | |
| 2MRB 015 100 S04 | 0.75R X 1.5 | 3 | 10 | 50 | 4 | |
| 2MRB 015 140 S04 | 0.75R X 1.5 | 3 | 14 | 50 | 4 | |
| 2MRB 015 160 S04 | 0.75R X 1.5 | 3 | 16 | 50 | 4 | |
| 2MRB 015 200 S04 | 0.75R X 1.5 | 3 | 20 | 60 | 4 | |
| 2MRB 015 250 S04 | 0.75R X 1.5 | 3 | 25 | 60 | 4 | |
| 2MRB 015 300 S04 | 0.75R X 1.5 | 3 | 30 | 70 | 4 | |
| 2MRB 016 060 S04 | 0.8R X 1.6 | 3.2 | 6 | 50 | 4 | |
| 2MRB 020 080 S04 | 1R X 2 | 4 | 8 | 50 | 4 | |
| 2MRB 020 100 S04 | 1R X 2 | 4 | 10 | 50 | 4 | |
| 2MRB 020 120 S04 | 1R X 2 | 4 | 12 | 50 | 4 | |
| 2MRB 020 140 S04 | 1R X 2 | 4 | 14 | 50 | 4 | |
| 2MRB 020 160 S04 | 1R X 2 | 4 | 16 | 50 | 4 | |
| 2MRB 020 180 S04 | 1R X 2 | 4 | 18 | 50 | 4 | |
| 2MRB 020 200 S04 | 1R X 2 | 4 | 20 | 60 | 4 | |
| 2MRB 020 250 S04 | 1R X 2 | 4 | 25 | 60 | 4 | |
| 2MRB 020 300 S04 | 1R X 2 | 4 | 30 | 70 | 4 | |
| 2MRB 020 350 S04 | 1R X 2 | 4 | 35 | 80 | 4 | |
| 2MRB 020 400 S04 | 1R X 2 | 4 | 40 | 80 | 4 | |
| 2MRB 025 120 S04 | 1.25R X 2.5 | 5 | 12 | 60 | 4 | |
| 2MRB 025 200 S04 | 1.25R X 2.5 | 5 | 20 | 60 | 4 | |
| 2MRB 030 080 S06 | 1.5R X 3 | 6 | 8 | 70 | 6 | |
| 2MRB 030 120 S06 | 1.5R X 3 | 6 | 12 | 70 | 6 | |
| 2MRB 030 160 S06 | 1.5R X 3 | 6 | 16 | 70 | 6 | |
| 2MRB 030 200 S06 | 1.5R X 3 | 6 | 20 | 70 | 6 | |
| 2MRB 030 250 S06 | 1.5R X 3 | 6 | 25 | 70 | 6 | |
| 2MRB 030 300 S06 | 1.5R X 3 | 6 | 30 | 80 | 6 | |
| 2MRB 030 400 S06 | 1.5R X 3 | 6 | 40 | 90 | 6 | |
| 2MRB 030 450 S06 | 1.5R X 3 | 6 | 45 | 90 | 6 | |
| 2MRB 040 120 S06 | 2R X 4 | 8 | 12 | 70 | 6 | |
| 2MRB 040 160 S06 | 2R X 4 | 8 | 16 | 70 | 6 | |
| 2MRB 040 200 S06 | 2R X 4 | 8 | 20 | 70 | 6 | |
| 2MRB 040 250 S06 | 2R X 4 | 8 | 25 | 70 | 6 | |
| 2MRB 040 300 S06 | 2R X 4 | 8 | 30 | 70 | 6 | |
| 2MRB 040 350 S06 | 2R X 4 | 8 | 35 | 80 | 6 | |
| 2MRB 040 400 S06 | 2R X 4 | 8 | 40 | 80 | 6 | |
| 2MRB 040 500 S06 | 2R X 4 | 8 | 50 | 100 | 6 | |
| 2MRB 050 160 S06 | 2.5R X 5 | 10 | 16 | 80 | 6 | |
| 2MRB 050 250 S06 | 2.5R X 5 | 10 | 25 | 80 | 6 | |
| 2MRB 050 350 S06 | 2.5R X 5 | 10 | 35 | 80 | 6 | |
| 2MRB 060 250 S06 | 3R X 6 | 12 | 25 | 80 | 6 | |
| 2MRB 060 350 S06 | 3R X 6 | 12 | 35 | 80 | 6 | |
| 2MRB 060 500 S06 | 3R X 6 | 12 | 50 | 120 | 6 | |
| 2MRB 060 600 S06 | 3R X 6 | 12 | 60 | 120 | 6 | |

# 3MRB

## 3 Flutes Micro Rib Ball End Mills

## 3날 범용 마이크로 리브 볼 엔드밀




- **아크릴, ABS, 목업, 알루미늄 등 비철, 비금속 피삭재 가공**
- 짧은 날장 채택으로 떨림을 최소화 하였습니다.
- 고속, 고이송 작업시 짧은 날장을 채택하여 공구의 강성이 우수합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 미립자 초경합금을 채택하여 내마모성이 좋습니다.

- **Endmills for Acryl, A.B.S, Aluminum, non-ferrous and non-metallic materials**
- Minimize chattering by short flute design.
- Excellent tool rigidity by short flute design at high speed, feed machining.
- Reinforced edge design for preventing edge chipping.
- Excellent wear resistance by applying fine WC grade.

3 | WC 미립자 | R ± 0.005 (0.5 ~ 2R) | R ± 0.01 (3 ~ 6R) | R ± 0.015 (8R) | 30° Helix Angle | CUTTING DATA (507P)

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.1 ~ 0.19 | +0 ~ -0.005mm |
| | Ø0.2 ~ 25 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø3 ~ 12 | -0.005 ~ -0.015mm |
| | Ø12.1 ~ 25 | -0.01 ~ -0.02mm |

단위 : mm

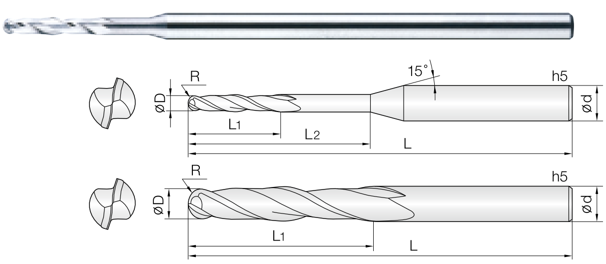
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 3MRB 010 050 S04 | 0.5R X 1 | 3 | 5 | 70 | 4 | |
| 3MRB 010 100 S04 | 0.5R X 1 | 3 | 10 | 70 | 4 | |
| 3MRB 010 150 S04 | 0.5R X 1 | 3 | 15 | 70 | 4 | |
| 3MRB 010 200 S04 | 0.5R X 1 | 3 | 20 | 70 | 4 | |
| 3MRB 010 250 S04 | 0.5R X 1 | 3 | 25 | 70 | 4 | |
| 3MRB 015 100 S04 | 0.75R X 1.5 | 4.5 | 10 | 70 | 4 | |
| 3MRB 015 150 S04 | 0.75R X 1.5 | 4.5 | 15 | 70 | 4 | |
| 3MRB 015 200 S04 | 0.75R X 1.5 | 4.5 | 20 | 70 | 4 | |
| 3MRB 015 250 S04 | 0.75R X 1.5 | 4.5 | 25 | 70 | 4 | |
| 3MRB 015 300 S04 | 0.75R X 1.5 | 4.5 | 30 | 70 | 4 | |
| 3MRB 020 100 S04 | 1R X 2 | 6 | 10 | 70 | 4 | |
| 3MRB 020 150 S04 | 1R X 2 | 6 | 15 | 70 | 4 | |
| 3MRB 020 200 S04 | 1R X 2 | 6 | 20 | 70 | 4 | |
| 3MRB 020 250 S04 | 1R X 2 | 6 | 25 | 70 | 4 | |
| 3MRB 020 300 S04 | 1R X 2 | 6 | 30 | 70 | 4 | |
| 3MRB 030 200 080 | 1.5R X 3 | 15 | 20 | 80 | 3 | |
| 3MRB 030 200 S04 | 1.5R X 3 | 9 | 20 | 80 | 4 | |
| 3MRB 030 300 100 | 1.5R X 3 | 15 | 30 | 100 | 3 | |
| 3MRB 030 300 S04 | 1.5R X 3 | 9 | 30 | 80 | 4 | |
| 3MRB 040 200 080 | 2R X 4 | 12 | 20 | 80 | 4 | |
| 3MRB 040 300 100 | 2R X 4 | 12 | 30 | 100 | 4 | |
| 3MRB 060 300 100 | 3R X 6 | 18 | 30 | 100 | 6 | |
| 3MRB 060 400 150 | 3R X 6 | 18 | 40 | 150 | 6 | |
| 3MRB 080 400 120 | 4R X 8 | 24 | 40 | 120 | 8 | |
| 3MRB 080 500 150 | 4R X 8 | 24 | 50 | 150 | 8 | |
| 3MRB 100 500 120 | 5R X 10 | 30 | 50 | 120 | 10 | |
| 3MRB 100 600 150 | 5R X 10 | 30 | 60 | 150 | 10 | |
| 3MRB 120 600 150 | 6R X 12 | 36 | 60 | 150 | 12 | |
| 3MRB 160 700 160 | 8R X 16 | 54 | 70 | 160 | 16 | |

FOR A.B.S

# 2MLB

## 2 Flutes Micro Long Ball End Mills

## 2날 ABS수지 가공용 마이크로 롱 볼 엔드밀




- **아크릴, ABS, 목업, 알루미늄 등 비철, 비금속 피삭재 전용 엔드밀**
- 균일한 런아웃 공차관리로 떨림을 최소화 하였습니다.
- 깊은 피삭재 가공시 긴 날장을 채택하여 가공이 용이하며, 칩배출이 좋습니다.
- 미립자 초경합금을 채택하여 내마모성이 좋습니다.

- **Endmills for Acryl, A.B.S, Aluminum, non-ferrous and non-metallic materials**
- Minimize chattering by even run-out and tolerance control.
- Long flute helps chip control in deep groove machining.
- Excellent wear resistance by applying fine WC grade.

2 | WC 미립자 | R ± 0.005 | R ± 0.01 | R ± 0.015 | 30° Helix Angle | CUTTING DATA

0.1 ~ 2.5R | 3 ~ 6R | 8R | 508P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.2 ~ 6 | +0 ~ −0.01mm |
| | Ø8 ~ 16 | +0 ~ −0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø3 ~ 6 | −0.005 ~ −0.015mm |
| | Ø8 ~ 12 | −0.01 ~ −0.025mm |
| | Ø16 | −0.015 ~ −0.03mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2MLB 002 010 S03 | 0.1R X 0.2 | 0.4 | 1 | 40 | 3 | |
| 2MLB 002 015 S03 | 0.1R X 0.2 | 0.4 | 1.5 | 40 | 3 | |
| 2MLB 002 020 S03 | 0.1R X 0.2 | 0.4 | 2 | 40 | 3 | |
| 2MLB 003 010 S03 | 0.15R X 0.3 | 1 | – | 45 | 3 | |
| 2MLB 003 015 S03 | 0.15R X 0.3 | 1 | 1.5 | 45 | 3 | |
| 2MLB 003 018 S03 | 0.15R X 0.3 | 1.8 | – | 45 | 3 | |
| 2MLB 003 020 S03 | 0.15R X 0.3 | 1 | 2 | 45 | 3 | |
| 2MLB 003 025 S03 | 0.15R X 0.3 | 1 | 2.5 | 45 | 3 | |
| 2MLB 003 030 S03 | 0.15R X 0.3 | 1 | 3 | 45 | 3 | |
| 2MLB 003 040 S03 | 0.15R X 0.3 | 1 | 4 | 45 | 3 | |
| 2MLB 004 012 S03 | 0.2R X 0.4 | 1.2 | – | 45 | 3 | |
| 2MLB 004 020 S03 | 0.2R X 0.4 | 2 | – | 45 | 3 | |
| 2MLB 004 030 S03 | 0.2R X 0.4 | 1.2 | 3 | 45 | 3 | |
| 2MLB 004 040 S03 | 0.2R X 0.4 | 1.2 | 4 | 45 | 3 | |
| 2MLB 004 050 S03 | 0.2R X 0.4 | 1.2 | 5 | 45 | 3 | |
| 2MLB 005 015 S03 | 0.25R X 0.5 | 1.5 | – | 50 | 3 | |
| 2MLB 005 020 S03 | 0.25R X 0.5 | 2 | – | 50 | 3 | |
| 2MLB 005 030 S03 | 0.25R X 0.5 | 1.5 | 3 | 50 | 3 | |
| 2MLB 005 040 S03 | 0.25R X 0.5 | 1.5 | 4 | 50 | 3 | |
| 2MLB 005 050 S03 | 0.25R X 0.5 | 1.5 | 5 | 50 | 3 | |
| 2MLB 005 060 S03 | 0.25R X 0.5 | 1.5 | 6 | 50 | 3 | |
| 2MLB 005 080 S03 | 0.25R X 0.5 | 1.5 | 8 | 50 | 3 | |
| 2MLB 005 100 S03 | 0.25R X 0.5 | 1.5 | 10 | 50 | 3 | |
| 2MLB 006 030 S03 | 0.3R X 0.6 | 3 | – | 50 | 3 | |
| 2MLB 006 060 S03 | 0.3R X 0.6 | 3 | 6 | 50 | 3 | |
| 2MLB 006 080 S03 | 0.3R X 0.6 | 3 | 8 | 50 | 3 | |
| 2MLB 006 100 S03 | 0.3R X 0.6 | 3 | 10 | 50 | 3 | |
| 2MLB 007 030 S03 | 0.35R X 0.7 | 3 | – | 50 | 3 | |
| 2MLB 007 070 S03 | 0.35R X 0.7 | 3 | 7 | 50 | 3 | |
| 2MLB 007 100 S03 | 0.35R X 0.7 | 3 | 10 | 50 | 3 | |
| 2MLB 007 120 S03 | 0.35R X 0.7 | 3 | 12 | 50 | 3 | |
| 2MLB 008 040 S03 | 0.4R X 0.8 | 4 | – | 50 | 3 | |
| 2MLB 008 080 S03 | 0.4R X 0.8 | 4 | 8 | 50 | 3 | |
| 2MLB 008 100 S03 | 0.4R X 0.8 | 4 | 10 | 50 | 3 | |
| 2MLB 008 120 S03 | 0.4R X 0.8 | 4 | 12 | 50 | 3 | |
| 2MLB 009 040 S03 | 0.45R X 0.9 | 4 | – | 50 | 3 | |
| 2MLB 009 060 S03 | 0.45R X 0.9 | 4 | 6 | 50 | 3 | |
| 2MLB 009 080 S03 | 0.45R X 0.9 | 4 | 8 | 50 | 3 | |
| 2MLB 009 100 S03 | 0.45R X 0.9 | 4 | 10 | 50 | 3 | |
| 2MLB 010 050 S03 | 0.5R X 1 | 5 | – | 80 | 3 | |
| 2MLB 010 050 S04 | 0.5R X 1 | 5 | – | 80 | 4 | |
| 2MLB 010 100 S03 | 0.5R X 1 | 5 | 10 | 80 | 3 | |
| 2MLB 010 100 S04 | 0.5R X 1 | 5 | 10 | 80 | 4 | |
| 2MLB 010 150 S03 | 0.5R X 1 | 5 | 15 | 80 | 3 | |
| 2MLB 010 150 S04 | 0.5R X 1 | 5 | 15 | 80 | 4 | |
| 2MLB 010 200 S03 | 0.5R X 1 | 5 | 20 | 80 | 3 | |
| 2MLB 010 200 S04 | 0.5R X 1 | 5 | 20 | 80 | 4 | |
| 2MLB 010 250 S03 | 0.5R X 1 | 5 | 25 | 80 | 3 | |
| 2MLB 010 250 S04 | 0.5R X 1 | 5 | 25 | 80 | 4 | |
| 2MLB 010 300 S03 | 0.5R X 1 | 5 | 30 | 80 | 3 | |

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2MLB 010 300 S04 | 0.5R X 1 | 5 | 30 | 80 | 4 | |
| 2MLB 010 350 S04 | 0.5R X 1 | 5 | 35 | 100 | 4 | |
| 2MLB 010 400 S04 | 0.5R X 1 | 5 | 40 | 100 | 4 | |
| 2MLB 015 100 S03 | 0.75R X 1.5 | 10 | – | 80 | 3 | |
| 2MLB 015 100 S04 | 0.75R X 1.5 | 10 | – | 80 | 4 | |
| 2MLB 015 150 S03 | 0.75R X 1.5 | 10 | 15 | 80 | 3 | |
| 2MLB 015 150 S04 | 0.75R X 1.5 | 10 | 15 | 80 | 4 | |
| 2MLB 015 200 S03 | 0.75R X 1.5 | 10 | 20 | 80 | 3 | |
| 2MLB 015 200 S04 | 0.75R X 1.5 | 10 | 20 | 80 | 4 | |
| 2MLB 015 250 S03 | 0.75R X 1.5 | 10 | 25 | 80 | 3 | |
| 2MLB 015 250 S04 | 0.75R X 1.5 | 10 | 25 | 80 | 4 | |
| 2MLB 015 300 S03 | 0.75R X 1.5 | 10 | 30 | 80 | 3 | |
| 2MLB 015 300 S04 | 0.75R X 1.5 | 10 | 30 | 80 | 4 | |
| 2MLB 015 350 S04 | 0.75R X 1.5 | 10 | 35 | 100 | 4 | |
| 2MLB 015 400 S04 | 0.75R X 1.5 | 10 | 40 | 100 | 4 | |
| 2MLB 020 100 S03 | 1R X 2 | 10 | – | 80 | 3 | |
| 2MLB 020 100 S04 | 1R X 2 | 10 | – | 80 | 4 | |
| 2MLB 020 150 S03 | 1R X 2 | 10 | 15 | 80 | 3 | |
| 2MLB 020 150 S04 | 1R X 2 | 10 | 15 | 80 | 4 | |
| 2MLB 020 200 S03 | 1R X 2 | 10 | 20 | 80 | 3 | |
| 2MLB 020 200 S04 | 1R X 2 | 10 | 20 | 80 | 4 | |
| 2MLB 020 250 S03 | 1R X 2 | 10 | 25 | 80 | 3 | |
| 2MLB 020 250 S04 | 1R X 2 | 10 | 25 | 80 | 4 | |
| 2MLB 020 300 S03 | 1R X 2 | 10 | 30 | 80 | 3 | |
| 2MLB 020 300 S04 | 1R X 2 | 10 | 30 | 80 | 4 | |
| 2MLB 020 350 S03 | 1R X 2 | 10 | 35 | 80 | 3 | |
| 2MLB 020 350 S04 | 1R X 2 | 10 | 35 | 100 | 4 | |
| 2MLB 020 400 S03 | 1R X 2 | 10 | 40 | 80 | 3 | |
| 2MLB 020 400 S04 | 1R X 2 | 10 | 40 | 100 | 4 | |
| 2MLB 025 100 S03 | 1.25R X 2.5 | 10 | – | 80 | 3 | |
| 2MLB 025 150 S03 | 1.25R X 2.5 | 15 | – | 80 | 3 | |
| 2MLB 025 200 S03 | 1.25R X 2.5 | 15 | 20 | 80 | 3 | |
| 2MLB 030 100 060 | 1.5R X 3 | 10 | – | 60 | 3 | |
| 2MLB 030 200 080 | 1.5R X 3 | 20 | – | 80 | 3 | |
| 2MLB 030 200 100 | 1.5R X 3 | 20 | – | 100 | 3 | |
| 2MLB 030 200 120 | 1.5R X 3 | 20 | – | 120 | 3 | |
| 2MLB 030 150 S06 | 1.5R X 3 | 15 | – | 100 | 6 | |
| 2MLB 030 200 S06 | 1.5R X 3 | 15 | 20 | 100 | 6 | |
| 2MLB 030 250 S06 | 1.5R X 3 | 15 | 25 | 100 | 6 | |
| 2MLB 030 300 S06 | 1.5R X 3 | 15 | 30 | 100 | 6 | |
| 2MLB 030 400 S06 | 1.5R X 3 | 15 | 40 | 100 | 6 | |
| 2MLB 040 200 080 | 2R X 4 | 20 | – | 80 | 4 | |
| 2MLB 040 200 100 | 2R X 4 | 20 | – | 100 | 4 | |
| 2MLB 040 200 130 | 2R X 4 | 20 | – | 130 | 4 | |
| 2MLB 040 200 S06 | 2R X 4 | 20 | – | 100 | 6 | |
| 2MLB 040 250 S06 | 2R X 4 | 20 | 25 | 100 | 6 | |
| 2MLB 040 300 S06 | 2R X 4 | 20 | 30 | 100 | 6 | |
| 2MLB 040 400 S06 | 2R X 4 | 20 | 40 | 120 | 6 | |
| 2MLB 040 500 S06 | 2R X 4 | 20 | 50 | 120 | 6 | |
| 2MLB 050 300 100 | 2.5R X 5 | 30 | – | 100 | 5 | |

FOR A.B.S

# 2날 ABS수지 가공용 마이크로 롱 볼 엔드밀

단위 : mm

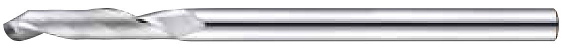
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2MLB 050 300 120 | 2.5R X 5 | 30 | - | 120 | 5 | |
| 2MLB 060 300 080 | 3R X 6 | 30 | - | 80 | 6 | |
| 2MLB 060 400 100 | 3R X 6 | 40 | - | 100 | 6 | |
| 2MLB 060 400 120 | 3R X 6 | 40 | - | 120 | 6 | |
| 2MLB 060 400 150 | 3R X 6 | 40 | - | 150 | 6 | |
| 2MLB 080 450 120 | 4R X 8 | 45 | - | 120 | 8 | |
| 2MLB 080 450 150 | 4R X 8 | 45 | - | 150 | 8 | |
| 2MLB 100 500 120 | 5R X 10 | 50 | - | 120 | 10 | |
| 2MLB 100 500 150 | 5R X 10 | 50 | - | 150 | 10 | |
| 2MLB 120 550 130 | 6R X 12 | 55 | - | 130 | 12 | |
| 2MLB 120 550 150 | 6R X 12 | 55 | - | 150 | 12 | |
| 2MLB 160 700 160 | 8R X 16 | 70 | - | 160 | 16 | |

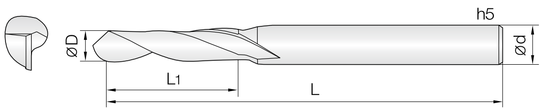
# 1MBE

## 1 Flute Ball End Mills

## 1날 볼 엔드밀

New






- **아크릴, ABS, 목업, 알루미늄 등 비철, 비금속 피삭재 가공**
- 헬릭스 1날 타입으로 칩 배출이 우수하여 비철,비금속 피삭재의 절단 작업 및 측벽 작업에 적합합니다.
- 미립자 초경합금을 채택하여 내마모성이 좋습니다.

- **Endmills for Acryl, A.B.S, Aluminum, non-ferrous and non-metallic materials.**
- Excellent chip removing by a helix 1flute design. Optimum for cut-off and wall machining.
- Excellent wear resistance by applying fine WC grade.

1 | WC 미립자 | R ± 0.005 (0.5 ~ 2.5R) | R ± 0.01 (3 ~ 6R) | R ± 0.015 (8R) | 30° Helix Angle | CUTTING DATA (508P)

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø2 ~ 16 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø3 ~ 12 | -0.005 ~ -0.015mm |
| | Ø16 | -0.01 ~ -0.02mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 1MBE 010 040 S03 | 0.5R X 1 | 4 | 40 | 3 | |
| 1MBE 015 060 S03 | 0.75R X 1.5 | 6 | 40 | 3 | |
| 1MBE 020 060 S03 | 1R X 2 | 6 | 40 | 3 | |
| 1MBE 020 100 S06 | 1R X 2 | 10 | 60 | 6 | |
| 1MBE 020 120 S06 | 1R X 2 | 12 | 60 | 6 | |
| 1MBE 030 120 040 | 1.5R X 3 | 12 | 40 | 3 | |
| 1MBE 030 120 S06 | 1.5R X 3 | 12 | 60 | 6 | |
| 1MBE 030 150 S06 | 1.5R X 3 | 15 | 60 | 6 | |
| 1MBE 040 150 S60 | 2R X4 | 15 | 60 | 6 | |
| 1MBE 040 150 080 | 2R X 4 | 15 | 80 | 6 | |
| 1MBE 050 160 S06 | 2.5R X 5 | 16 | 60 | 6 | |
| 1MBE 060 200 060 | 3R X 6 | 20 | 60 | 6 | |
| 1MBE 060 250 080 | 3R X 6 | 25 | 80 | 6 | |
| 1MBE 060 300 100 | 3R X 6 | 30 | 100 | 6 | |
| 1MBE 080 300 080 | 4R X 8 | 30 | 80 | 8 | |
| 1MBE 080 350 120 | 4R X 8 | 35 | 120 | 8 | |
| 1MBE 100 350 100 | 5R X 10 | 35 | 100 | 10 | |
| 1MBE 100 450 120 | 5R X 10 | 45 | 120 | 10 | |
| 1MBE 100 550 150 | 5R X 10 | 55 | 150 | 10 | |
| 1MBE 120 450 110 | 6R X 12 | 45 | 110 | 12 | |
| 1MBE 120 550 130 | 6R X 12 | 55 | 130 | 12 | |
| 1MBE 120 600 150 | 6R X 12 | 60 | 150 | 12 | |
| 1MBE 160 550 160 | 8R X 16 | 55 | 160 | 16 | |
| 1MBE 160 650 200 | 8R X 16 | 65 | 200 | 16 | |

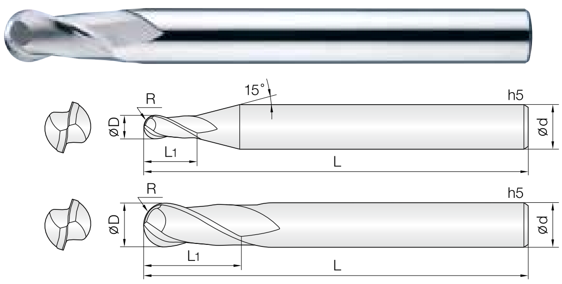
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

FOR A.B.S

# 2MBE

## 2 Flutes Ball End Mills

## 2날 범용 볼 엔드밀




- **일반강, 아크릴, ABS, 목업, 알루미늄 등 비철, 비금속 피삭재 가공**
- 균일한 런아웃 공차관리로 떨림을 최소화 하였습니다.
- 날부인선의 조도가 뛰어나 피삭재의 면조도가 우수합니다.
- 미립자 초경합금을 채택하여 내마모성이 좋습니다.

- **Endmills for Mild steel, Acryl, A.B.S, Aluminum, non-ferrous and non-metallic materials.**
- Minimize chattering by even run-out and tolerance control.
- Very nice work surface finish.
- Excellent wear resistance by applying fine WC grade.

2 | WC 미립자 | R ± 0.005 | R ± 0.01 | 30° Helix Angle | CUTTING DATA

0.05 ~ 2.5R | 3 ~ 6R | 509P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.1 ~ 0.15 | +0 ~ -0.005mm |
| | Ø0.2 ~ 12 | +0 ~ -0.01mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø3 ~ 12 | -0.005 ~ -0.015mm |

단위 : mm

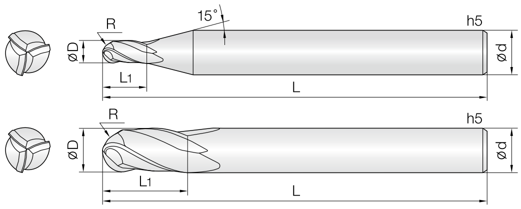
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2MBE 001 002 S03 | 0.05R X 0.1 | 0.2 | 40 | 3 | |
| 2MBE 0015 003 S03 | 0.075R X 0.15 | 0.3 | 40 | 3 | |
| 2MBE 002 004 S03 | 0.1R X 0.2 | 0.4 | 40 | 3 | |
| 2MBE 003 006 S03 | 0.15R X 0.3 | 0.6 | 40 | 3 | |
| 2MBE 004 008 S03 | 0.2R X 0.4 | 0.8 | 40 | 3 | |
| 2MBE 005 010 S03 | 0.25R X 0.5 | 1 | 40 | 3 | |
| 2MBE 006 012 S03 | 0.3R X 0.6 | 1.2 | 40 | 3 | |
| 2MBE 007 014 S03 | 0.35R X 0.7 | 1.4 | 40 | 3 | |
| 2MBE 008 016 S03 | 0.4R X 0 .8 | 1.6 | 40 | 3 | |
| 2MBE 009 018 S03 | 0.45R X 0.9 | 1.8 | 40 | 3 | |
| 2MBE 010 025 S03 | 0.5R X 1 | 2.5 | 50 | 3 | |
| 2MBE 010 025 S06 | 0.5R X 1 | 2.5 | 50 | 6 | |
| 2MBE 010 025 100 | 0.5R X 1 | 2.5 | 100 | 6 | |
| 2MBE 011 025 S03 | 0.55R X 1.1 | 2.5 | 50 | 3 | |
| 2MBE 012 030 S03 | 0.6R X 1.2 | 3 | 50 | 3 | |
| 2MBE 015 040 S03 | 0.75R X 1.5 | 4 | 50 | 3 | |
| 2MBE 015 040 100 | 0.75R X 1.5 | 4 | 100 | 6 | |
| 2MBE 020 050 S03 | 1R X 2 | 5 | 50 | 3 | |
| 2MBE 020 050 S06 | 1R X 2 | 5 | 50 | 6 | |
| 2MBE 020 050 100 | 1R X 2 | 5 | 100 | 6 | |
| 2MBE 025 060 S03 | 1.25R X 2.5 | 6 | 50 | 3 | |
| 2MBE 025 060 100 | 1.25R X 2.5 | 6 | 100 | 6 | |
| 2MBE 030 080 S03 | 1.5R X 3 | 8 | 60 | 3 | |
| 2MBE 030 080 S06 | 1.5R X 3 | 8 | 60 | 6 | |
| 2MBE 030 080 100 | 1.5R X 3 | 8 | 100 | 6 | |
| 2MBE 035 080 S06 | 1.75R X 3.5 | 8 | 65 | 6 | |
| 2MBE 040 080 S06 | 2R X 4 | 8 | 70 | 6 | |
| 2MBE 040 080 120 | 2R X 4 | 8 | 120 | 6 | |
| 2MBE 050 120 S06 | 2.5R X 5 | 12 | 75 | 6 | |
| 2MBE 060 120 080 | 3R X 6 | 12 | 80 | 6 | |
| 2MBE 060 120 100 | 3RX 6 | 12 | 100 | 6 | |
| 2MBE 080 140 090 | 4R X 8 | 14 | 90 | 8 | |
| 2MBE 080 140 110 | 4RX 8 | 14 | 110 | 8 | |
| 2MBE 100 180 100 | 5R X 10 | 18 | 100 | 10 | |
| 2MBE 100 180 120 | 5RX 10 | 18 | 120 | 10 | |
| 2MBE 120 220 110 | 6R X 12 | 22 | 110 | 12 | |
| 2MBE 120 220 130 | 6RX 12 | 22 | 130 | 12 | |

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 3MBE

## 3 Flutes Ball End Mills

## 3날 범용 볼 엔드밀




- **일반강, 아크릴, ABS, 목업, 알루미늄 등 비철,비금속 피삭재 가공**
- 균일한 런아웃 공차관리로 떨림을 최소화 하였습니다.
- 날부인선의 조도가 뛰어나 피삭재의 면조도가 우수합니다.
- 미립자 초경합금을 채택하여 내마모성이 좋습니다.

- **Endmills for Mild steels, Acryl, A.B.S, Aluminum, non-ferrous and non-metallic materials**
- Minimize chattering by even run-out and tolerance control.
- Very nice work surface finish.
- Excellent wear resistance by applying fine WC grade.

3 | WC 미립자 | R ± 0.005 0.15R ~ 2R | R ± 0.01 3R | 30° Helix Angle | CUTTING DATA 509P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø0.3 ~ 6 | +0 ~ -0.01mm | ØD = Ød | Ø4 ~ 6 | -0.005 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 3MBE 003 008 S04 | 0.15R X 0.3 | 0.8 | 40 | 4 | |
| 3MBE 003 012 S04 | 0.15R X 0.3 | 1.2 | 40 | 4 | |
| 3MBE 004 010 S04 | 0.2R X 0.4 | 1 | 40 | 4 | |
| 3MBE 004 015 S04 | 0.2R X 0.4 | 1.5 | 40 | 4 | |
| 3MBE 005 013 S04 | 0.25R X 0.5 | 1.3 | 45 | 4 | |
| 3MBE 005 020 S04 | 0.25R X 0.5 | 2 | 45 | 4 | |
| 3MBE 006 015 S04 | 0.3R X 0.6 | 1.5 | 45 | 4 | |
| 3MBE 006 024 S04 | 0.3R X 0.6 | 2.4 | 45 | 4 | |
| 3MBE 007 018 S04 | 0.35R X 0.7 | 1.8 | 45 | 4 | |
| 3MBE 007 028 S04 | 0.35R X 0.7 | 2.8 | 45 | 4 | |
| 3MBE 008 020 S04 | 0.4R X 0.8 | 2 | 45 | 4 | |
| 3MBE 008 032 S04 | 0.4R X 0.8 | 3.2 | 45 | 4 | |
| 3MBE 009 025 S04 | 0.45R X 0.9 | 2.5 | 50 | 4 | |
| 3MBE 009 036 S04 | 0.45R X 0.9 | 3.6 | 50 | 4 | |
| 3MBE 010 025 S04 | 0.5R X 1 | 2.5 | 50 | 4 | |
| 3MBE 010 040 S04 | 0.5R X 1 | 4 | 50 | 4 | |
| 3MBE 010 060 S04 | 0.5R X 1 | 6 | 60 | 4 | |
| 3MBE 012 030 S04 | 0.6R X 1.2 | 3 | 50 | 4 | |
| 3MBE 012 050 S04 | 0.6R X 1.2 | 5 | 50 | 4 | |
| 3MBE 012 070 S04 | 0.6R X 1.2 | 7 | 60 | 4 | |
| 3MBE 015 040 S04 | 0.75R X 1.5 | 4 | 50 | 4 | |
| 3MBE 015 060 S04 | 0.75R X 1.5 | 6 | 50 | 4 | |
| 3MBE 015 090 S04 | 0.75R X 1.5 | 9 | 60 | 4 | |
| 3MBE 020 050 S04 | 1R X 2 | 5 | 50 | 4 | |
| 3MBE 020 080 S04 | 1R X 2 | 8 | 50 | 4 | |
| 3MBE 020 100 S04 | 1R X 2 | 10 | 60 | 4 | |
| 3MBE 025 060 S04 | 1.25R X 2.5 | 6 | 50 | 4 | |
| 3MBE 025 100 S04 | 1.25R X 2.5 | 10 | 60 | 4 | |
| 3MBE 025 150 S04 | 1.25R X 2.5 | 15 | 70 | 4 | |
| 3MBE 030 080 S04 | 1.5R X 3 | 8 | 50 | 4 | |
| 3MBE 030 120 S04 | 1.5R X 3 | 12 | 60 | 4 | |
| 3MBE 030 150 S04 | 1.5R X 3 | 15 | 80 | 4 | |
| 3MBE 040 100 S04 | 2R X 4 | 10 | 60 | 4 | |
| 3MBE 040 150 S04 | 2R X 4 | 15 | 80 | 4 | |
| 3MBE 060 200 S06 | 3R X 6 | 20 | 80 | 6 | |
| 3MBE 060 300 S06 | 3R X 6 | 30 | 110 | 6 | |

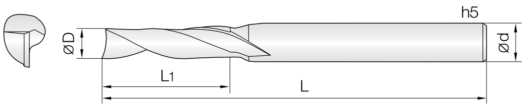
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

FOR A.B.S

# 1MEM

## 1 Flute End Mills

## 1날 엔드밀




- **아크릴, ABS, 목업, 알루미늄 등 비철, 비금속 피삭재 전용 엔드밀**
- 헬릭스 1날 타입으로 칩 배출이 우수하여 비철,비금속 피삭재의 절단 작업 및 측벽 작업에 적합합니다.
- 미립자 초경합금을 채택하여 내마모성이 좋습니다.

- **Endmills for Acryl, A.B.S, Aluminum, non-ferrous and non-metallic materials**
- Excellent chip removing by a helix 1flute design. Optimum for cut-off and wall machining.
- Excellent wear resistance by applying fine WC grade.

1 | WC 미립자 | 30° Helix Angle | Sharp Edge | CUTTING DATA 509P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.2 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 12 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 1MEM 002 004 S04 | 0.2 | 0.4 | 40 | 4 | |
| 1MEM 002 005 S04 | 0.2 | 0.5 | 40 | 4 | |
| 1MEM 003 006 S04 | 0.3 | 0.6 | 40 | 4 | |
| 1MEM 003 009 S04 | 0.3 | 0.9 | 40 | 4 | |
| 1MEM 004 008 S04 | 0.4 | 0.8 | 40 | 4 | |
| 1MEM 004 012 S04 | 0.4 | 1.2 | 40 | 4 | |
| 1MEM 005 010 S04 | 0.5 | 1 | 40 | 4 | |
| 1MEM 005 015 S04 | 0.5 | 1.5 | 40 | 4 | |
| 1MEM 006 012 S04 | 0.6 | 1.2 | 40 | 4 | |
| 1MEM 006 018 S04 | 0.6 | 1.8 | 40 | 4 | |
| 1MEM 007 014 S04 | 0.7 | 1.4 | 40 | 4 | |
| 1MEM 007 021 S04 | 0.7 | 2.1 | 40 | 4 | |
| 1MEM 008 016 S04 | 0.8 | 1.6 | 40 | 4 | |
| 1MEM 008 024 S04 | 0.8 | 2.4 | 40 | 4 | |
| 1MEM 009 018 S04 | 0.9 | 1.8 | 40 | 4 | |
| 1MEM 009 027 S04 | 0.9 | 2.7 | 40 | 4 | |
| 1MEM 010 025 S06 | 1 | 2.5 | 45 | 6 | |
| 1MEM 010 030 S06 | 1 | 3 | 45 | 6 | |
| 1MEM 010 035 S06 | 1 | 3.5 | 45 | 6 | |
| 1MEM 010 045 S06 | 1 | 4.5 | 45 | 6 | |
| 1MEM 010 060 S06 | 1 | 6 | 50 | 6 | |
| 1MEM 010 070 S06 | 1 | 7 | 50 | 6 | |
| 1MEM 012 030 S06 | 1.2 | 3 | 45 | 6 | |
| 1MEM 012 050 S06 | 1.2 | 5 | 45 | 6 | |
| 1MEM 012 060 S06 | 1.2 | 6 | 50 | 6 | |
| 1MEM 015 040 S06 | 1.5 | 4 | 45 | 6 | |
| 1MEM 015 060 S06 | 1.5 | 6 | 50 | 6 | |
| 1MEM 015 080 S06 | 1.5 | 8 | 50 | 6 | |
| 1MEM 015 100 S06 | 1.5 | 10 | 50 | 6 | |
| 1MEM 015 120 S06 | 1.5 | 12 | 50 | 6 | |
| 1MEM 020 060 S06 | 2 | 6 | 50 | 6 | |
| 1MEM 020 080 S06 | 2 | 8 | 50 | 6 | |
| 1MEM 020 100 S06 | 2 | 10 | 50 | 6 | |
| 1MEM 020 120 S06 | 2 | 12 | 50 | 6 | |
| 1MEM 020 140 S06 | 2 | 14 | 55 | 6 | |
| 1MEM 020 160 S06 | 2 | 16 | 60 | 6 | |
| 1MEM 025 080 S06 | 2.5 | 8 | 50 | 6 | |
| 1MEM 025 100 S06 | 2.5 | 10 | 50 | 6 | |
| 1MEM 025 120 S06 | 2.5 | 12 | 50 | 6 | |
| 1MEM 025 160 S06 | 2.5 | 16 | 60 | 6 | |
| 1MEM 030 080 S06 | 3 | 8 | 50 | 6 | |
| 1MEM 030 120 S06 | 3 | 12 | 50 | 6 | |
| 1MEM 030 150 S06 | 3 | 15 | 50 | 6 | |
| 1MEM 030 200 S06 | 3 | 20 | 60 | 6 | |
| 1MEM 030 250 S06 | 3 | 25 | 70 | 6 | |
| 1MEM 040 100 S06 | 4 | 10 | 50 | 6 | |
| 1MEM 040 150 S06 | 4 | 15 | 50 | 6 | |
| 1MEM 040 200 S06 | 4 | 20 | 60 | 6 | |
| 1MEM 040 250 S06 | 4 | 25 | 70 | 6 | |
| 1MEM 040 300 S06 | 4 | 30 | 75 | 6 | |

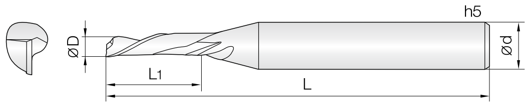
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 1MEM 050 130 S06 | 5 | 13 | 60 | 6 | |
| 1MEM 050 200 S06 | 5 | 20 | 60 | 6 | |
| 1MEM 050 250 S06 | 5 | 25 | 60 | 6 | |
| 1MEM 050 300 S06 | 5 | 30 | 75 | 6 | |
| 1MEM 060 150 S06 | 6 | 15 | 60 | 6 | |
| 1MEM 060 200 S06 | 6 | 20 | 60 | 6 | |
| 1MEM 060 250 S06 | 6 | 25 | 60 | 6 | |
| 1MEM 060 300 S06 | 6 | 30 | 70 | 6 | |
| 1MEM 060 410 S06 | 6 | 41 | 90 | 6 | |
| 1MEM 080 190 S08 | 8 | 19 | 70 | 8 | |
| 1MEM 080 250 S08 | 8 | 25 | 75 | 8 | |
| 1MEM 080 300 S08 | 8 | 30 | 80 | 8 | |
| 1MEM 080 410 S08 | 8 | 41 | 90 | 8 | |
| 1MEM 100 220 S10 | 10 | 22 | 75 | 10 | |
| 1MEM 100 300 S10 | 10 | 30 | 80 | 10 | |
| 1MEM 100 410 S10 | 10 | 41 | 100 | 10 | |
| 1MEM 120 260 S12 | 12 | 26 | 75 | 12 | |
| 1MEM 120 350 S12 | 12 | 35 | 90 | 12 | |
| 1MEM 120 510 S12 | 12 | 51 | 110 | 12 | |

FOR A.B.S

# 1REM

## 1 Flute Reverse Edge End Mills

## 1날 역날 엔드밀




- **아크릴, ABS, 목업, 알루미늄 등 비철, 비금속 피삭재 전용 엔드밀**
- 역 헬릭스 타입으로 칩 배출이 아래 방향으로 배출되어, 작업시 피삭재가 떠오르는 현상이 없습니다.
- 피삭재에 상면 버가 발생하지 않습니다.
- 피삭재의 정착이 불안정한 경우 적합합니다.
- 미립자 초경합금을 채택하여 내마모성이 좋습니다.

- **Endmills for Acryl, A.B.S, Aluminum, non-ferrous and non-metallic materials**
- Downward chip direction by reverse helix design helps chip control.
- No burr in work materials.
- Optimum for unstable work clamping.
- Excellent wear resistance by applying fine WC grade.

1 | WC 미립자 | 30° Helix Angle | Sharp Edge | CUTTING DATA 509P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.5 ~ 6 | +0 ~ -0.01mm |
| | Ø8 ~ 12 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 1REM 005 010 S04 | 0.5 | 1 | 45 | 4 | |
| 1REM 005 015 S04 | 0.5 | 1.5 | 45 | 4 | |
| 1REM 005 020 S04 | 0.5 | 2 | 45 | 4 | |
| 1REM 006 012 S04 | 0.6 | 1.2 | 45 | 4 | |
| 1REM 006 018 S04 | 0.6 | 1.8 | 45 | 4 | |
| 1REM 006 025 S04 | 0.6 | 2.5 | 45 | 4 | |
| 1REM 007 014 S04 | 0.7 | 1.4 | 45 | 4 | |
| 1REM 007 021 S04 | 0.7 | 2.1 | 45 | 4 | |
| 1REM 008 016 S04 | 0.8 | 1.6 | 45 | 4 | |
| 1REM 008 024 S04 | 0.8 | 2.4 | 45 | 4 | |
| 1REM 008 030 S04 | 0.8 | 3 | 45 | 4 | |
| 1REM 009 018 S04 | 0.9 | 1.8 | 45 | 4 | |
| 1REM 010 030 S06 | 1 | 3 | 50 | 6 | |
| 1REM 010 040 S06 | 1 | 4 | 50 | 6 | |
| 1REM 010 050 S06 | 1 | 5 | 50 | 6 | |
| 1REM 010 060 S06 | 1 | 6 | 60 | 6 | |
| 1REM 012 040 S06 | 1.2 | 4 | 50 | 6 | |
| 1REM 012 060 S06 | 1.2 | 6 | 50 | 6 | |
| 1REM 015 040 S06 | 1.5 | 4 | 50 | 6 | |
| 1REM 015 060 S06 | 1.5 | 6 | 50 | 6 | |
| 1REM 015 080 S06 | 1.5 | 8 | 50 | 6 | |
| 1REM 020 060 S06 | 2 | 6 | 60 | 6 | |
| 1REM 020 080 S06 | 2 | 8 | 60 | 6 | |
| 1REM 020 100 S06 | 2 | 10 | 60 | 6 | |
| 1REM 020 120 S06 | 2 | 12 | 60 | 6 | |
| 1REM 025 060 S06 | 2.5 | 6 | 60 | 6 | |
| 1REM 025 080 S06 | 2.5 | 8 | 60 | 6 | |
| 1REM 025 100 S06 | 2.5 | 10 | 60 | 6 | |
| 1REM 030 080 S06 | 3 | 8 | 60 | 6 | |
| 1REM 030 120 S06 | 3 | 12 | 65 | 6 | |
| 1REM 030 160 S06 | 3 | 16 | 70 | 6 | |
| 1REM 040 120 S06 | 4 | 12 | 65 | 6 | |
| 1REM 040 160 S06 | 4 | 16 | 70 | 6 | |
| 1REM 040 200 S06 | 4 | 20 | 70 | 6 | |
| 1REM 050 150 S06 | 5 | 15 | 70 | 6 | |
| 1REM 050 220 S06 | 5 | 22 | 75 | 6 | |
| 1REM 060 270 S06 | 6 | 27 | 75 | 6 | |
| 1REM 080 260 S08 | 8 | 26 | 80 | 8 | |
| 1REM 080 320 S08 | 8 | 32 | 90 | 8 | |
| 1REM 100 300 S10 | 10 | 30 | 90 | 10 | |
| 1REM 120 350 S12 | 12 | 35 | 100 | 12 | |

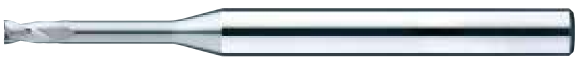
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

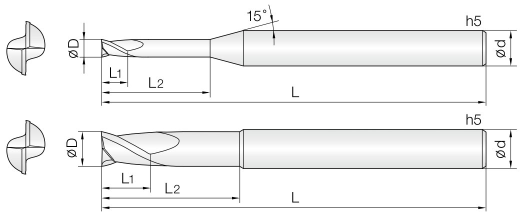
FOR A.B.S

# 2MRE

## 2 Flutes Micro Rib End Mills

## 2날 범용 마이크로 리브 엔드밀






- **아크릴, ABS, 목업, 알루미늄등비철, 비금속 피삭재 가공**
- 짧은 날장 채택으로 떨림을 최소화 하였습니다.
- 고속, 고이송 작업시 짧은 날장을 채택하여 공구의 강성이 우수합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 미립자 초경합금을 채택하여 내마모성이 좋습니다.

- **Endmills for Acryl, A.B.S, Aluminum, non-ferrous and non-metallic materials**
- Minimize chattering by short flute design.
- Excellent tool rigidity by short flute design at high speed, feed machining.
- Reinforced edge design for preventing edge chipping.
- Excellent wear resistance by applying fine WC grade.

2 | WC 미립자 | 30° Helix Angle | Sharp Edge | CUTTING DATA 510P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| øD ≠ ød | ø0.2 ~ 6 | +0 ~ -0.01mm | øD = ød | ø6 | -0.005 ~ -0.015mm |

단위 : mm

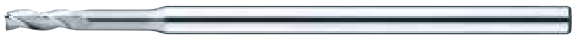
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2MRE 002 005 S04 | 0.2 | 0.3 | 0.5 | 40 | 4 | |
| 2MRE 002 010 S04 | 0.2 | 0.3 | 1 | 40 | 4 | |
| 2MRE 002 015 S04 | 0.2 | 0.3 | 1.5 | 40 | 4 | |
| 2MRE 002 020 S04 | 0.2 | 0.3 | 2 | 40 | 4 | |
| 2MRE 003 010 S04 | 0.3 | 0.45 | 1 | 40 | 4 | |
| 2MRE 003 020 S04 | 0.3 | 0.45 | 2 | 40 | 4 | |
| 2MRE 003 030 S04 | 0.3 | 0.45 | 3 | 40 | 4 | |
| 2MRE 003 050 S04 | 0.3 | 0.45 | 5 | 40 | 4 | |
| 2MRE 004 020 S04 | 0.4 | 0.6 | 2 | 40 | 4 | |
| 2MRE 004 030 S04 | 0.4 | 0.6 | 3 | 40 | 4 | |
| 2MRE 004 040 S04 | 0.4 | 0.6 | 4 | 40 | 4 | |
| 2MRE 004 050 S04 | 0.4 | 0.6 | 5 | 40 | 4 | |
| 2MRE 004 060 S04 | 0.4 | 0.6 | 6 | 40 | 4 | |
| 2MRE 005 020 S04 | 0.5 | 1 | 2 | 45 | 4 | |
| 2MRE 005 040 S04 | 0.5 | 1 | 4 | 45 | 4 | |
| 2MRE 005 060 S04 | 0.5 | 1 | 6 | 45 | 4 | |
| 2MRE 005 080 S04 | 0.5 | 1 | 8 | 45 | 4 | |
| 2MRE 005 100 S04 | 0.5 | 1 | 10 | 45 | 4 | |
| 2MRE 006 020 S04 | 0.6 | 1.2 | 2 | 45 | 4 | |
| 2MRE 006 040 S04 | 0.6 | 1.2 | 4 | 45 | 4 | |
| 2MRE 006 060 S04 | 0.6 | 1.2 | 6 | 45 | 4 | |
| 2MRE 006 080 S04 | 0.6 | 1.2 | 8 | 45 | 4 | |
| 2MRE 006 100 S04 | 0.6 | 1.2 | 10 | 45 | 4 | |
| 2MRE 007 040 S04 | 0.7 | 1.4 | 4 | 45 | 4 | |
| 2MRE 007 060 S04 | 0.7 | 1.4 | 6 | 45 | 4 | |
| 2MRE 007 080 S04 | 0.7 | 1.4 | 8 | 45 | 4 | |
| 2MRE 007 100 S04 | 0.7 | 1.4 | 10 | 45 | 4 | |
| 2MRE 008 040 S04 | 0.8 | 1.6 | 4 | 45 | 4 | |
| 2MRE 008 060 S04 | 0.8 | 1.6 | 6 | 45 | 4 | |
| 2MRE 008 080 S04 | 0.8 | 1.6 | 8 | 45 | 4 | |
| 2MRE 008 100 S04 | 0.8 | 1.6 | 10 | 45 | 4 | |
| 2MRE 008 120 S04 | 0.8 | 1.6 | 12 | 45 | 4 | |
| 2MRE 009 060 S04 | 0.9 | 1.8 | 6 | 45 | 4 | |
| 2MRE 009 100 S04 | 0.9 | 1.8 | 10 | 45 | 4 | |
| 2MRE 009 120 S04 | 0.9 | 1.8 | 12 | 45 | 4 | |
| 2MRE 010 060 S04 | 1 | 2 | 6 | 50 | 4 | |
| 2MRE 010 080 S04 | 1 | 2 | 8 | 50 | 4 | |
| 2MRE 010 100 S04 | 1 | 2 | 10 | 50 | 4 | |
| 2MRE 010 120 S04 | 1 | 2 | 12 | 50 | 4 | |
| 2MRE 010 160 S04 | 1 | 2 | 16 | 50 | 4 | |
| 2MRE 010 200 S04 | 1 | 2 | 20 | 60 | 4 | |
| 2MRE 010 250 S04 | 1 | 2 | 25 | 60 | 4 | |
| 2MRE 012 060 S04 | 1.2 | 2.4 | 6 | 50 | 4 | |
| 2MRE 012 080 S04 | 1.2 | 2.4 | 8 | 50 | 4 | |
| 2MRE 012 100 S04 | 1.2 | 2.4 | 10 | 50 | 4 | |
| 2MRE 012 120 S04 | 1.2 | 2.4 | 12 | 50 | 4 | |
| 2MRE 012 160 S04 | 1.2 | 2.4 | 16 | 50 | 4 | |
| 2MRE 014 060 S04 | 1.4 | 2.8 | 6 | 50 | 4 | |
| 2MRE 014 100 S04 | 1.4 | 2.8 | 10 | 50 | 4 | |
| 2MRE 014 160 S04 | 1.4 | 2.8 | 16 | 50 | 4 | |

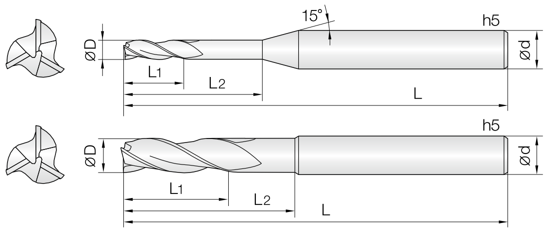
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2MRE 015 060 S04 | 1.5 | 3 | 6 | 50 | 4 | |
| 2MRE 015 100 S04 | 1.5 | 3 | 10 | 50 | 4 | |
| 2MRE 015 140 S04 | 1.5 | 3 | 14 | 50 | 4 | |
| 2MRE 015 160 S04 | 1.5 | 3 | 16 | 50 | 4 | |
| 2MRE 015 200 S04 | 1.5 | 3 | 20 | 60 | 4 | |
| 2MRE 015 250 S04 | 1.5 | 3 | 25 | 60 | 4 | |
| 2MRE 015 300 S04 | 1.5 | 3 | 30 | 70 | 4 | |
| 2MRE 016 060 S04 | 1.6 | 3.2 | 6 | 50 | 4 | |
| 2MRE 020 080 S04 | 2 | 4 | 8 | 50 | 4 | |
| 2MRE 020 100 S04 | 2 | 4 | 10 | 50 | 4 | |
| 2MRE 020 120 S04 | 2 | 4 | 12 | 50 | 4 | |
| 2MRE 020 140 S04 | 2 | 4 | 14 | 50 | 4 | |
| 2MRE 020 160 S04 | 2 | 4 | 16 | 50 | 4 | |
| 2MRE 020 180 S04 | 2 | 4 | 18 | 50 | 4 | |
| 2MRE 020 200 S04 | 2 | 4 | 20 | 60 | 4 | |
| 2MRE 020 250 S04 | 2 | 4 | 25 | 60 | 4 | |
| 2MRE 020 300 S04 | 2 | 4 | 30 | 70 | 4 | |
| 2MRE 020 350 S04 | 2 | 4 | 35 | 80 | 4 | |
| 2MRE 020 400 S04 | 2 | 4 | 40 | 80 | 4 | |
| 2MRE 025 120 S04 | 2.5 | 5 | 12 | 60 | 4 | |
| 2MRE 025 200 S04 | 2.5 | 5 | 20 | 60 | 4 | |
| 2MRE 030 080 S06 | 3 | 6 | 8 | 70 | 6 | |
| 2MRE 030 120 S06 | 3 | 6 | 12 | 70 | 6 | |
| 2MRE 030 160 S06 | 3 | 6 | 16 | 70 | 6 | |
| 2MRE 030 200 S06 | 3 | 6 | 20 | 70 | 6 | |
| 2MRE 030 250 S06 | 3 | 6 | 25 | 70 | 6 | |
| 2MRE 030 300 S06 | 3 | 6 | 30 | 80 | 6 | |
| 2MRE 030 400 S06 | 3 | 6 | 40 | 90 | 6 | |
| 2MRE 030 450 S06 | 3 | 6 | 45 | 90 | 6 | |
| 2MRE 040 120 S06 | 4 | 8 | 12 | 70 | 6 | |
| 2MRE 040 160 S06 | 4 | 8 | 16 | 70 | 6 | |
| 2MRE 040 200 S06 | 4 | 8 | 20 | 70 | 6 | |
| 2MRE 040 250 S06 | 4 | 8 | 25 | 70 | 6 | |
| 2MRE 040 300 S06 | 4 | 8 | 30 | 70 | 6 | |
| 2MRE 040 350 S06 | 4 | 8 | 35 | 80 | 6 | |
| 2MRE 040 400 S06 | 4 | 8 | 40 | 80 | 6 | |
| 2MRE 040 500 S06 | 4 | 8 | 50 | 100 | 6 | |
| 2MRE 050 160 S06 | 5 | 10 | 16 | 80 | 6 | |
| 2MRE 050 250 S06 | 5 | 10 | 25 | 80 | 6 | |
| 2MRE 050 350 S06 | 5 | 10 | 35 | 80 | 6 | |
| 2MRE 060 250 S06 | 6 | 12 | 25 | 80 | 6 | |
| 2MRE 060 350 S06 | 6 | 12 | 35 | 80 | 6 | |
| 2MRE 060 500 S06 | 6 | 12 | 50 | 120 | 6 | |
| 2MRE 060 600 S06 | 6 | 12 | 60 | 120 | 6 | |

# 3MRE

## 3 Flutes Micro Rib End Mills

## 3날 범용 마이크로 리브 엔드밀






- **아크릴, ABS, 목업, 알루미늄 등 비철, 비금속 피삭재 가공**
- 짧은 날장 채택으로 떨림을 최소화 하였습니다
- 고속, 고이송 작업시 짧은 날장을 채택하여 공구의 강성이 우수합니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 미립자 초경합금을 채택하여 내마모성이 좋습니다.

- **Endmills for Acryl, A.B.S, Aluminum, non-ferrous and non-metallic materials**
- Minimize chattering by short flute design.
- Excellent tool rigidity by short flute design at high speed, feed machining.
- Reinforced edge design for preventing edge chipping.
- Excellent wear resistance by applying fine WC grade.

3 | WC 미립자 | 30° Helix Angle | Sharp Edge | CUTTING DATA 511P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø2 ~ 6 | +0 ~ -0.01mm |
| | Ø6.1 ~ 25 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø4 ~ 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | Ø16 | -0.015 ~ -0.03mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 3MRE 010 050 S04 | 1 | 3 | 5 | 70 | 4 | |
| 3MRE 010 100 S04 | 1 | 3 | 10 | 70 | 4 | |
| 3MRE 010 150 S04 | 1 | 3 | 15 | 70 | 4 | |
| 3MRE 010 200 S04 | 1 | 3 | 20 | 70 | 4 | |
| 3MRE 010 250 S04 | 1 | 3 | 25 | 70 | 4 | |
| 3MRE 015 100 S04 | 1.5 | 4.5 | 10 | 70 | 4 | |
| 3MRE 015 150 S04 | 1.5 | 4.5 | 15 | 70 | 4 | |
| 3MRE 015 200 S04 | 1.5 | 4.5 | 20 | 70 | 4 | |
| 3MRE 015 250 S04 | 1.5 | 4.5 | 25 | 70 | 4 | |
| 3MRE 015 300 S04 | 1.5 | 4.5 | 30 | 70 | 4 | |
| 3MRE 020 100 S04 | 2 | 6 | 10 | 70 | 4 | |
| 3MRE 020 150 S04 | 2 | 6 | 15 | 70 | 4 | |
| 3MRE 020 200 S04 | 2 | 6 | 20 | 70 | 4 | |
| 3MRE 020 250 S04 | 2 | 6 | 25 | 70 | 4 | |
| 3MRE 020 300 S04 | 2 | 6 | 30 | 70 | 4 | |
| 3MRE 030 200 080 | 3 | 15 | 20 | 80 | 3 | |
| 3MRE 030 200 S04 | 3 | 9 | 20 | 80 | 4 | |
| 3MRE 030 300 100 | 3 | 15 | 30 | 100 | 3 | |
| 3MRE 030 300 S04 | 3 | 9 | 30 | 80 | 4 | |
| 3MRE 040 200 080 | 4 | 12 | 20 | 80 | 4 | |
| 3MRE 040 300 100 | 4 | 12 | 30 | 100 | 4 | |
| 3MRE 060 300 100 | 6 | 18 | 30 | 100 | 6 | |
| 3MRE 060 400 150 | 6 | 18 | 40 | 150 | 6 | |
| 3MRE 080 400 120 | 8 | 24 | 40 | 120 | 8 | |
| 3MRE 080 500 150 | 8 | 24 | 50 | 150 | 8 | |
| 3MRE 100 500 120 | 10 | 30 | 50 | 120 | 10 | |
| 3MRE 100 600 150 | 10 | 30 | 60 | 150 | 10 | |
| 3MRE 120 600 150 | 12 | 36 | 60 | 150 | 12 | |
| 3MRE 160 700 160 | 16 | 54 | 70 | 160 | 16 | |

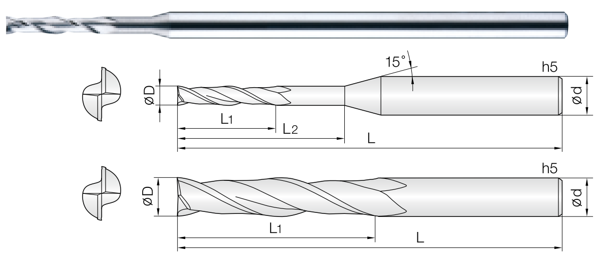
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

FOR A.B.S

# 2MLE

## 2 Flutes Micro Long End Mills

## 2날 ABS수지 가공용 마이크로 롱 엔드밀




- **아크릴, ABS, 목업, 알루미늄 등 비철, 비금속 피삭재 전용 엔드밀**
- 균일한 런아웃 공차관리로 떨림을 최소화 하였습니다.
- 깊은 피삭재 가공시 긴 날장을 채택하여 가공이 용이하며, 칩배출이 좋습니다.
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 미립자 초경합금을 채택하여 내마모성이 좋습니다.

- **Endmills for Acryl, A.B.S, Aluminum, non-ferrous and non-metallic materials**
- Minimize chattering by short flute design.
- Excellent tool rigidity by short flute design at high speed, feed machining.
- Reinforced edge design for preventing edge chipping.
- Excellent wear resistance by applying fine WC grade.

2 | WC 미립자 | 30° Helix Angle | Sharp Edge | CUTTING DATA 508P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø0.2 ~ 6 | +0 ~ -0.01mm | ØD = Ød | Ø3 ~ 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 16 | +0 ~ -0.015mm | | Ø8 ~ 12 | -0.01 ~ -0.025mm |
| | | | | Ø16 | -0.015 ~ -0.03mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2MLE 002 010 S03 | 0.2 | 0.4 | 1 | 40 | 3 | |
| 2MLE 002 015 S03 | 0.2 | 0.4 | 1.5 | 40 | 3 | |
| 2MLE 002 020 S03 | 0.2 | 0.4 | 2 | 40 | 3 | |
| 2MLE 003 010 S03 | 0.3 | 1 | - | 45 | 3 | |
| 2MLE 003 015 S03 | 0.3 | 1 | 1.5 | 45 | 3 | |
| 2MLE 003 018 S03 | 0.3 | 1.8 | - | 45 | 3 | |
| 2MLE 003 020 S03 | 0.3 | 1 | 2 | 45 | 3 | |
| 2MLE 003 025 S03 | 0.3 | 1 | 2.5 | 45 | 3 | |
| 2MLE 003 030 S03 | 0.3 | 1 | 3 | 45 | 3 | |
| 2MLE 003 040 S03 | 0.3 | 1 | 4 | 45 | 3 | |
| 2MLE 004 012 S03 | 0.4 | 1.2 | - | 45 | 3 | |
| 2MLE 004 020 S03 | 0.4 | 2 | - | 45 | 3 | |
| 2MLE 004 030 S03 | 0.4 | 1.2 | 3 | 45 | 3 | |
| 2MLE 004 040 S03 | 0.4 | 1.2 | 4 | 45 | 3 | |
| 2MLE 004 050 S03 | 0.4 | 1.2 | 5 | 45 | 3 | |
| 2MLE 005 015 S03 | 0.5 | 1.5 | - | 50 | 3 | |
| 2MLE 005 020 S03 | 0.5 | 2 | - | 50 | 3 | |
| 2MLE 005 030 S03 | 0.5 | 1.5 | 3 | 50 | 3 | |
| 2MLE 005 040 S03 | 0.5 | 1.5 | 4 | 50 | 3 | |
| 2MLE 005 050 S03 | 0.5 | 1.5 | 5 | 50 | 3 | |
| 2MLE 005 060 S03 | 0.5 | 1.5 | 6 | 50 | 3 | |
| 2MLE 005 080 S03 | 0.5 | 1.5 | 8 | 50 | 3 | |
| 2MLE 005 100 S03 | 0.5 | 1.5 | 10 | 50 | 3 | |
| 2MLE 006 030 S03 | 0.6 | 3 | - | 50 | 3 | |
| 2MLE 006 060 S03 | 0.6 | 3 | 6 | 50 | 3 | |
| 2MLE 006 080 S03 | 0.6 | 3 | 8 | 50 | 3 | |
| 2MLE 006 100 S03 | 0.6 | 3 | 10 | 50 | 3 | |
| 2MLE 007 030 S03 | 0.7 | 3 | - | 50 | 3 | |
| 2MLE 007 070 S03 | 0.7 | 3 | 7 | 50 | 3 | |
| 2MLE 007 100 S03 | 0.7 | 3 | 10 | 50 | 3 | |
| 2MLE 007 120 S03 | 0.7 | 3 | 12 | 50 | 3 | |
| 2MLE 008 040 S03 | 0.8 | 4 | - | 50 | 3 | |
| 2MLE 008 080 S03 | 0.8 | 4 | 8 | 50 | 3 | |
| 2MLE 008 100 S03 | 0.8 | 4 | 10 | 50 | 3 | |
| 2MLE 008 120 S03 | 0.8 | 4 | 12 | 50 | 3 | |
| 2MLE 009 040 S03 | 0.9 | 4 | - | 50 | 3 | |
| 2MLE 009 060 S03 | 0.9 | 4 | 6 | 50 | 3 | |
| 2MLE 009 080 S03 | 0.9 | 4 | 8 | 50 | 3 | |
| 2MLE 009 100 S03 | 0.9 | 4 | 10 | 50 | 3 | |
| 2MLE 010 050 S03 | 1 | 5 | - | 80 | 3 | |
| 2MLE 010 050 S04 | 1 | 5 | - | 80 | 4 | |
| 2MLE 010 100 S03 | 1 | 5 | 10 | 80 | 3 | |
| 2MLE 010 100 S04 | 1 | 5 | 10 | 80 | 4 | |
| 2MLE 010 150 S03 | 1 | 5 | 15 | 80 | 3 | |
| 2MLE 010 150 S04 | 1 | 5 | 15 | 80 | 4 | |
| 2MLE 010 200 S03 | 1 | 5 | 20 | 80 | 3 | |
| 2MLE 010 200 S04 | 1 | 5 | 20 | 80 | 4 | |
| 2MLE 010 250 S03 | 1 | 5 | 25 | 80 | 3 | |
| 2MLE 010 250 S04 | 1 | 5 | 25 | 80 | 4 | |
| 2MLE 010 300 S03 | 1 | 5 | 30 | 80 | 3 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2MLE 010 300 S04 | 1 | 5 | 30 | 80 | 4 | |
| 2MLE 010 350 S04 | 1 | 5 | 35 | 100 | 4 | |
| 2MLE 010 400 S04 | 1 | 5 | 40 | 100 | 4 | |
| 2MLE 015 100 S03 | 1.5 | 10 | - | 80 | 3 | |
| 2MLE 015 100 S04 | 1.5 | 10 | - | 80 | 4 | |
| 2MLE 015 150 S03 | 1.5 | 10 | 15 | 80 | 3 | |
| 2MLE 015 150 S04 | 1.5 | 10 | 15 | 80 | 4 | |
| 2MLE 015 200 S03 | 1.5 | 10 | 20 | 80 | 3 | |
| 2MLE 015 200 S04 | 1.5 | 10 | 20 | 80 | 4 | |
| 2MLE 015 250 S03 | 1.5 | 10 | 25 | 80 | 3 | |
| 2MLE 015 250 S04 | 1.5 | 10 | 25 | 80 | 4 | |
| 2MLE 015 300 S03 | 1.5 | 10 | 30 | 80 | 3 | |
| 2MLE 015 300 S04 | 1.5 | 10 | 30 | 80 | 4 | |
| 2MLE 015 350 S04 | 1.5 | 10 | 35 | 100 | 4 | |
| 2MLE 015 400 S04 | 1.5 | 10 | 40 | 100 | 4 | |
| 2MLE 020 100 S03 | 2 | 10 | - | 80 | 3 | |
| 2MLE 020 100 S04 | 2 | 10 | - | 80 | 4 | |
| 2MLE 020 150 S03 | 2 | 10 | 15 | 80 | 3 | |
| 2MLE 020 150 S04 | 2 | 10 | 15 | 80 | 4 | |
| 2MLE 020 200 S03 | 2 | 10 | 20 | 80 | 3 | |
| 2MLE 020 200 S04 | 2 | 10 | 20 | 80 | 4 | |
| 2MLE 020 250 S03 | 2 | 10 | 25 | 80 | 3 | |
| 2MLE 020 250 S04 | 2 | 10 | 25 | 80 | 4 | |
| 2MLE 020 300 S03 | 2 | 10 | 30 | 80 | 3 | |
| 2MLE 020 300 S04 | 2 | 10 | 30 | 80 | 4 | |
| 2MLE 020 350 S03 | 2 | 10 | 35 | 80 | 3 | |
| 2MLE 020 350 S04 | 2 | 10 | 35 | 100 | 4 | |
| 2MLE 020 400 S03 | 2 | 10 | 40 | 80 | 3 | |
| 2MLE 020 400 S04 | 2 | 10 | 40 | 100 | 4 | |
| 2MLE 025 100 S03 | 2.5 | 10 | - | 80 | 3 | |
| 2MLE 025 150 S03 | 2.5 | 15 | - | 80 | 3 | |
| 2MLE 025 200 S03 | 2.5 | 15 | 20 | 80 | 3 | |
| 2MLE 030 100 060 | 3 | 10 | - | 60 | 3 | |
| 2MLE 030 200 080 | 3 | 20 | - | 80 | 3 | |
| 2MLE 030 200 100 | 3 | 20 | - | 100 | 3 | |
| 2MLE 030 200 120 | 3 | 20 | - | 120 | 3 | |
| 2MLE 030 150 S06 | 3 | 15 | - | 100 | 6 | |
| 2MLE 030 200 S06 | 3 | 15 | 20 | 100 | 6 | |
| 2MLE 030 250 S06 | 3 | 15 | 25 | 100 | 6 | |
| 2MLE 030 300 S06 | 3 | 15 | 30 | 100 | 6 | |
| 2MLE 040 200 080 | 4 | 20 | - | 80 | 4 | |
| 2MLE 040 200 100 | 4 | 20 | - | 100 | 4 | |
| 2MLE 040 200 130 | 4 | 20 | - | 130 | 4 | |
| 2MLE 040 200 S06 | 4 | 20 | - | 100 | 6 | |
| 2MLE 040 250 S06 | 4 | 20 | 25 | 100 | 6 | |
| 2MLE 040 300 S06 | 4 | 20 | 30 | 100 | 6 | |
| 2MLE 040 400 S06 | 4 | 20 | 40 | 120 | 6 | |
| 2MLE 050 200 S06 | 5 | 20 | - | 100 | 6 | |
| 2MLE 050 300 100 | 5 | 30 | - | 100 | 5 | |
| 2MLE 050 300 120 | 5 | 30 | - | 120 | 5 | |

FOR A.B.S

# 2MLE

## 2 Flutes Micro Long End Mills

## 2날 ABS수지 가공용 마이크로 롱 엔드밀

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2MLE 060 250 080 | 6 | 25 | - | 80 | 6 | |
| 2MLE 060 300 080 | 6 | 30 | - | 80 | 6 | |
| 2MLE 060 400 100 | 6 | 40 | - | 100 | 6 | |
| 2MLE 060 400 120 | 6 | 40 | - | 120 | 6 | |
| 2MLE 060 400 150 | 6 | 40 | - | 150 | 6 | |
| 2MLE 080 300 080 | 8 | 30 | - | 80 | 8 | |
| 2MLE 080 350 090 | 8 | 35 | - | 90 | 8 | |
| 2MLE 080 400 100 | 8 | 40 | - | 100 | 8 | |
| 2MLE 080 450 120 | 8 | 45 | - | 120 | 8 | |
| 2MLE 080 450 150 | 8 | 45 | - | 150 | 8 | |
| 2MLE 100 300 080 | 10 | 30 | - | 80 | 10 | |
| 2MLE 100 350 090 | 10 | 35 | - | 90 | 10 | |
| 2MLE 100 400 100 | 10 | 40 | - | 100 | 10 | |
| 2MLE 100 500 120 | 10 | 50 | - | 120 | 10 | |
| 2MLE 100 500 150 | 10 | 50 | - | 150 | 10 | |
| 2MLE 120 300 090 | 12 | 30 | - | 90 | 12 | |
| 2MLE 120 400 100 | 12 | 40 | - | 100 | 12 | |
| 2MLE 120 500 110 | 12 | 50 | - | 110 | 12 | |
| 2MLE 120 550 130 | 12 | 55 | - | 130 | 12 | |
| 2MLE 120 550 150 | 12 | 55 | - | 150 | 12 | |
| 2MLE 160 700 160 | 16 | 70 | - | 160 | 16 | |

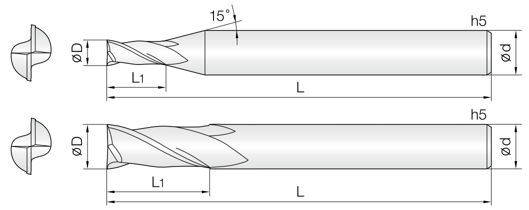
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

FOR A.B.S

# 2MEM

## 2 Flutes End Mills

## 2날 범용 엔드밀




- **일반강, 아크릴, ABS, 목업, 알루미늄 등 비철, 비금속 피삭재 가공**
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 균일한 런아웃 공차관리로 공구의 성능을 향상 시켰습니다.
- 미립자 초경합금을 채택하여 내마모성이 좋습니다.

- **Endmills for Mild steel, Acryl, A.B.S, Aluminum, non-ferrous and non-metallic materials**
- Reinforced edge design for preventing edge chipping.
- Improved tool performance by even run-out and tolerance control.
- Excellent wear resistance by applying fine WC grade.

2 | WC 미립자 | 30° Helix Angle | Sharp Edge | CUTTING DATA 512P

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD ≠ Ød | Ø0.1 ~ 0.15 | +0 ~ -0.005mm |
| | Ø0.2 ~ 6 | +0 ~ -0.01mm |
| | Ø7 ~ 12 | +0 ~ -0.015mm |

| Condition | D Size | D Tolerance |
|---|---|---|
| ØD = Ød | Ø3 ~ 6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | -0.01 ~ -0.025mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2MEM 001 002 S03 | 0.1 | 0.2 | 40 | 3 | |
| 2MEM 0015 003 S03 | 0.15 | 0.3 | 40 | 3 | |
| 2MEM 002 004 S03 | 0.2 | 0.4 | 40 | 3 | |
| 2MEM 003 006 S03 | 0.3 | 0.6 | 40 | 3 | |
| 2MEM 004 008 S03 | 0.4 | 0.8 | 40 | 3 | |
| 2MEM 005 010 S03 | 0.5 | 1 | 40 | 3 | |
| 2MEM 006 012 S03 | 0.6 | 1.2 | 40 | 3 | |
| 2MEM 007 014 S03 | 0.7 | 1.4 | 40 | 3 | |
| 2MEM 008 016 S03 | 0.8 | 1.6 | 40 | 3 | |
| 2MEM 009 018 S03 | 0.9 | 1.8 | 40 | 3 | |
| 2MEM 010 025 S03 | 1 | 2.5 | 40 | 3 | |
| 2MEM 010 025 S06 | 1 | 2.5 | 40 | 6 | |
| 2MEM 011 025 S03 | 1.1 | 2.5 | 40 | 3 | |
| 2MEM 012 035 S03 | 1.2 | 3.5 | 40 | 3 | |
| 2MEM 013 040 S03 | 1.3 | 4 | 40 | 3 | |
| 2MEM 014 040 S03 | 1.4 | 4 | 40 | 3 | |
| 2MEM 015 040 S03 | 1.5 | 4 | 40 | 3 | |
| 2MEM 015 040 S06 | 1.5 | 4 | 40 | 6 | |
| 2MEM 016 040 S03 | 1.6 | 4 | 40 | 3 | |
| 2MEM 017 050 S03 | 1.7 | 5 | 40 | 3 | |
| 2MEM 018 055 S03 | 1.8 | 5.5 | 40 | 3 | |
| 2MEM 019 060 S03 | 1.9 | 6 | 40 | 3 | |
| 2MEM 020 060 S03 | 2 | 6 | 40 | 3 | |
| 2MEM 020 060 S06 | 2 | 6 | 40 | 6 | |
| 2MEM 025 080 S03 | 2.5 | 8 | 40 | 3 | |
| 2MEM 025 080 S06 | 2.5 | 8 | 40 | 6 | |
| 2MEM 030 080 S03 | 3 | 8 | 45 | 3 | |
| 2MEM 030 080 S06 | 3 | 8 | 45 | 6 | |
| 2MEM 035 100 S06 | 3.5 | 10 | 45 | 6 | |
| 2MEM 040 110 S06 | 4 | 11 | 45 | 6 | |
| 2MEM 045 110 S06 | 4.5 | 11 | 45 | 6 | |
| 2MEM 050 130 S06 | 5 | 13 | 50 | 6 | |
| 2MEM 060 130 S06 | 6 | 13 | 50 | 6 | |
| 2MEM 070 160 S08 | 7 | 16 | 60 | 8 | |
| 2MEM 080 190 S08 | 8 | 19 | 60 | 8 | |
| 2MEM 090 190 S10 | 9 | 19 | 70 | 10 | |
| 2MEM 100 220 S10 | 10 | 22 | 70 | 10 | |
| 2MEM 120 260 S12 | 12 | 26 | 75 | 12 | |

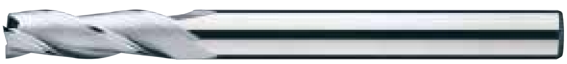
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

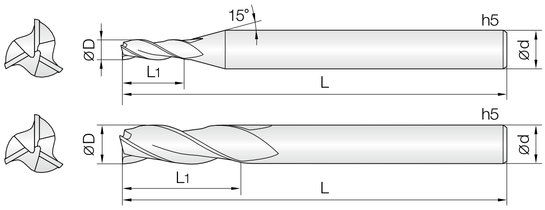
FOR A.B.S

# 3MEM

## 3 Flutes End Mills

## 3날 범용 엔드밀






- **일반강, 아크릴, ABS, 목업, 알루미늄 등 비철, 비금속 피삭재 가공**
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 짧은 날장 채택으로 떨림을 최소화 하였습니다.
- 미립자 초경합금을 채택하여 내마모성이 좋습니다.

- **Endmills for Mild steel, Acryl, A.B.S, Aluminum, non-ferrous and non-metallic materials**
- Reinforced edge design for preventing edge chipping.
- Minimize chattering by short flute design
- Excellent wear resistance by applying fine WC grade.

3 | WC 미립자 | 30° Helix Angle | Sharp Edge | CUTTING DATA 512P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø0.3 ~ 6 | +0 ~ -0.01mm | ØD = Ød | Ø4 ~ 6 | -0.005 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 3MEM 003 008 S04 | 0.3 | 0.8 | 40 | 4 | |
| 3MEM 003 012 S04 | 0.3 | 1.2 | 40 | 4 | |
| 3MEM 004 010 S04 | 0.4 | 1 | 40 | 4 | |
| 3MEM 004 015 S04 | 0.4 | 1.5 | 40 | 4 | |
| 3MEM 005 013 S04 | 0.5 | 1.3 | 40 | 4 | |
| 3MEM 005 020 S04 | 0.5 | 2 | 45 | 4 | |
| 3MEM 006 015 S04 | 0.6 | 1.5 | 40 | 4 | |
| 3MEM 006 024 S04 | 0.6 | 2.4 | 45 | 4 | |
| 3MEM 007 018 S04 | 0.7 | 1.8 | 40 | 4 | |
| 3MEM 007 028 S04 | 0.7 | 2.8 | 45 | 4 | |
| 3MEM 008 020 S04 | 0.8 | 2 | 40 | 4 | |
| 3MEM 008 032 S04 | 0.8 | 3.2 | 45 | 4 | |
| 3MEM 009 025 S04 | 0.9 | 2.5 | 40 | 4 | |
| 3MEM 009 036 S04 | 0.9 | 3.6 | 45 | 4 | |
| 3MEM 010 025 S04 | 1 | 2.5 | 40 | 4 | |
| 3MEM 010 040 S04 | 1 | 4 | 45 | 4 | |
| 3MEM 010 060 S04 | 1 | 6 | 50 | 4 | |
| 3MEM 012 030 S04 | 1.2 | 3 | 40 | 4 | |
| 3MEM 012 050 S04 | 1.2 | 5 | 40 | 4 | |
| 3MEM 012 070 S04 | 1.2 | 7 | 50 | 4 | |
| 3MEM 015 040 S04 | 1.5 | 4 | 40 | 4 | |
| 3MEM 015 060 S04 | 1.5 | 6 | 40 | 4 | |
| 3MEM 015 090 S04 | 1.5 | 9 | 60 | 4 | |
| 3MEM 020 050 S04 | 2 | 5 | 40 | 4 | |
| 3MEM 020 080 S04 | 2 | 8 | 50 | 4 | |
| 3MEM 020 100 S04 | 2 | 10 | 60 | 4 | |
| 3MEM 025 060 S04 | 2.5 | 6 | 45 | 4 | |
| 3MEM 025 100 S04 | 2.5 | 10 | 50 | 4 | |
| 3MEM 025 150 S04 | 2.5 | 15 | 60 | 4 | |
| 3MEM 030 080 S04 | 3 | 8 | 50 | 4 | |
| 3MEM 030 120 S04 | 3 | 12 | 60 | 4 | |
| 3MEM 030 150 S04 | 3 | 15 | 80 | 4 | |
| 3MEM 040 100 S04 | 4 | 10 | 50 | 4 | |
| 3MEM 040 150 S04 | 4 | 15 | 80 | 4 | |
| 3MEM 060 200 S06 | 6 | 20 | 80 | 6 | |
| 3MEM 060 300 S06 | 6 | 30 | 110 | 6 | |

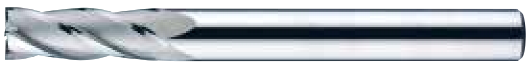
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

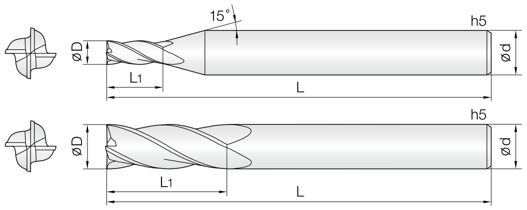
FOR A.B.S

# 4MEM

## 4 Flutes End Mills

## 4날 범용 엔드밀






- **일반강, 아크릴, ABS, 목업, 알루미늄 등 비철, 비금속 피삭재 가공**
- 인선부 강성을 보강하여 날부치핑을 최소화 하였습니다.
- 균일한 런아웃 공차관리로 떨림을 최소화 하였습니다.
- 미립자 초경합금을 채택하여 내마모성이 좋습니다.

- **Endmills for Mild steel, Acryl, A.B.S, Aluminum, non-ferrous and non-metallic materials**
- Reinforced edge design for preventing edge chipping.
- Minimize chattering by even run-out and tolerance control.
- Excellent wear resistance by applying fine WC grade.

4 | WC 미립자 | D +0~0.01 Ø1 ~ 5 | D -0.01~0.025 Ø6 ~ 12 | 30° Helix Angle | Sharp Edge | CUTTING DATA 512P

| Condition | D Size | D Tolerance | Condition | D Size | D Tolerance |
|---|---|---|---|---|---|
| ØD ≠ Ød | Ø1 ~ 6 | +0 ~ -0.01mm | ØD = Ød | Ø6 | -0.005 ~ -0.015mm |
| | Ø8 ~ 12 | +0 ~ -0.015mm | | Ø8 ~ 12 | -0.01 ~ -0.025mm |

단위 : mm

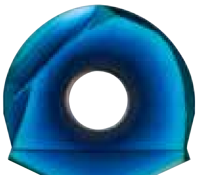
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4MEM 010 025 S04 | 1 | 2.5 | 40 | 4 | |
| 4MEM 010 040 S04 | 1 | 4 | 45 | 4 | |
| 4MEM 015 040 S04 | 1.5 | 4 | 40 | 4 | |
| 4MEM 015 060 S04 | 1.5 | 6 | 45 | 4 | |
| 4MEM 020 050 S04 | 2 | 5 | 40 | 4 | |
| 4MEM 020 080 S04 | 2 | 8 | 45 | 4 | |
| 4MEM 025 080 S04 | 2.5 | 8 | 45 | 4 | |
| 4MEM 025 100 S04 | 2.5 | 10 | 50 | 4 | |
| 4MEM 030 080 S06 | 3 | 8 | 45 | 6 | |
| 4MEM 030 120 S06 | 3 | 12 | 50 | 6 | |
| 4MEM 040 110 S06 | 4 | 11 | 45 | 6 | |
| 4MEM 040 160 S06 | 4 | 16 | 55 | 6 | |
| 4MEM 050 130 S06 | 5 | 13 | 50 | 6 | |
| 4MEM 050 200 S06 | 5 | 20 | 60 | 6 | |
| 4MEM 060 130 S06 | 6 | 13 | 50 | 6 | |
| 4MEM 060 240 S06 | 6 | 24 | 70 | 6 | |
| 4MEM 080 200 S08 | 8 | 20 | 60 | 8 | |
| 4MEM 080 320 S08 | 8 | 32 | 80 | 8 | |
| 4MEM 100 220 S10 | 10 | 22 | 70 | 10 | |
| 4MEM 100 400 S10 | 10 | 40 | 100 | 10 | |
| 4MEM 120 260 S12 | 12 | 26 | 75 | 12 | |
| 4MEM 120 480 S12 | 12 | 48 | 100 | 12 | |

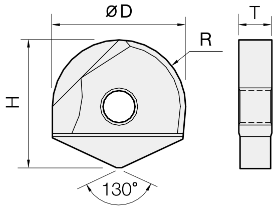
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

# 2HHINB

*2 Flutes HH Carbide Helix Ball Inserts for Hardened Steels*

## 초경2날 고경도 가공용 HH헬릭스 볼 인서트






- **고경도강(HRc62이하), 프리하든강 계열의 고정밀 가공 인서트, 그라파이트**
- TISIN-S 코팅 처리하여 인선부 내마모성이 탁월합니다.
- 헬릭스 형상의 인선부를 설계하여, 절삭력이 향상되었습니다.
- 볼 형상을 날부 치핑이 적도록 설계하였습니다.
- 항절력이 높은 초미립자 초경합금(0.3㎛)을채택, 인서트의 파손을 최소화 하였습니다.

- **Ball Inserts for hardened steels(~HRc62), pre-hardened and graphite materials**
- Optimum for wear resistance by TISIN-S coating.
- Maximize cutting force by applying the new helix edge design.
- Designed for minimizing edge chipping by ball shape.
- Minimize fracturing by ultra fine(0.3㎛) WC grade.

2 | UWC 초미립자 | TISIN-S Coating | R ± 0.01 (5 ~ 6.5R) | R ± 0.015 (8 ~ 15R) | JOIN ± 0.02 (5 ~ 15R) | CUTTING DATA (513P)

| D Size | D Tolerance |
|---|---|
| Ø 10 ~ 13 | +0 ~ -0.01mm |
| Ø 16 ~ 30 | +0 ~ -0.02mm |

단위 : mm

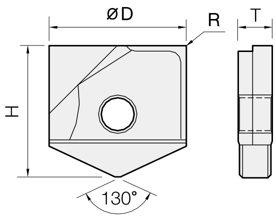
| Order Number | 날경 Diameter R × D | 높이 Height H | 두께 Thickness T |
|---|---|---|---|
| 2HHINB 100 | 5R X 10 | 12.1 | 2.7 |
| 2HHINB 110 | 5.5R X11 | 12.6 | 2.7 |
| 2HHINB 120 | 6R X 12 | 14.6 | 3.2 |
| 2HHINB 130 | 6.5R X 13 | 15.1 | 3.2 |
| 2HHINB 160 | 8R X 16 | 16.5 | 4.2 |
| 2HHINB 170 | 8.5R X 17 | 17 | 4.2 |
| 2HHINB 200 | 10R X 20 | 20.4 | 5.2 |

| Order Number | 날경 Diameter R × D | 높이 Height H | 두께 Thickness T |
|---|---|---|---|
| 2HHINB 210 | 10.5R X 21 | 20.9 | 5.2 |
| 2HHINB 250 | 12.5R X 25 | 24.1 | 6.2 |
| 2HHINB 260 | 13R X 26 | 24.6 | 6.2 |
| 2HHINB 300 | 15R X 30 | 29.1 | 7.2 |
| New 2HHINB 320 | 16R X 32 | 30.4 | 7.2 |
| New 2HHINB 330 | 16.5R X 33 | 30.4 | 7.2 |

# 2HHINC

*2 Flutes HH Carbide Helix Corner Radius Inserts for Hardened Steels*

## 초경 2날 고경도 가공용 헬릭스 코너R 인서트




- **고경도강(HRc62이하), 프리하든강 계열의 고정밀 가공 인서트, 그라파이트**
- TISIN-S 코팅 처리하여 인선부 내마모성이 탁월 합니다.
- 헬릭스 형상의 인선부를 설계하여, 절삭력이 향상 되었습니다.
- 볼 형상을 날부 치핑이 적도록 설계 하였습니다.
- 항절력이 높은 초미립자 초경합금(0.3㎛)을 채택, 인서트의 파손을 최소화 하였습니다.

- **Inserts for Mild steel, Acryl, A.B.S, Aluminum, non-ferrous and non-metallic materials**
- Optimum for wear resistance by TISIN-S coating.
- Maximize cutting force by applying the new helix edge design.
- Designed for minimizing edge chipping by ball shape.
- Minimize fracturing by ultra fine(0.3㎛) WC grade.

2 | UWC 초미립자 | TISIN-S Coating | R ± 0.015 (0.5 ~ 2R) | JOIN ± 0.02 (Ø10 ~30) | CUTTING DATA (513P)

| D Size | D Tolerance |
|---|---|
| Ø 10 ~ 13 | +0 ~ -0.01mm |
| Ø 16 ~ 30 | +0 ~ -0.02mm |

단위 : mm

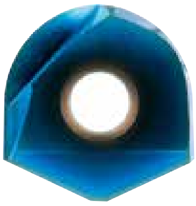
| Order Number | 날경 Diameter D × R | 높이 Height H | 두께 Thickness T |
|---|---|---|---|
| 2HHINC 100 005 | 10 X R0.5 | 12.1 | 2.7 |
| 2HHINC 100 010 | 10 X R1 | 12.1 | 2.7 |
| 2HHINC 110 005 | 11 X R0.5 | 12.6 | 2.7 |
| 2HHINC 110 010 | 11 X R1 | 12.6 | 2.7 |
| 2HHINC 120 005 | 12 X R0.5 | 14.6 | 3.2 |
| 2HHINC 120 010 | 12 X R1 | 14.6 | 3.2 |
| 2HHINC 120 020 | 12 X R2 | 14.6 | 3.2 |
| 2HHINC 130 005 | 13 X R0.5 | 15.1 | 3.2 |
| 2HHINC 130 010 | 13 X R1 | 15.1 | 3.2 |
| 2HHINC 130 020 | 13 X R2 | 15.1 | 3.2 |
| 2HHINC 160 005 | 16 X R0.5 | 16.5 | 4.2 |
| 2HHINC 160 010 | 16 X R1 | 16.5 | 4.2 |
| 2HHINC 160 020 | 16 X R2 | 16.5 | 4.2 |
| 2HHINC 170 005 | 17 X R0.5 | 17 | 4.2 |
| 2HHINC 170 010 | 17 X R1 | 17 | 4.2 |
| 2HHINC 170 020 | 17 X R2 | 17 | 4.2 |
| 2HHINC 200 005 | 20 X R0.5 | 20.4 | 5.2 |
| 2HHINC 200 010 | 20 X R1 | 20.4 | 5.2 |
| 2HHINC 200 020 | 20 X R2 | 20.4 | 5.2 |

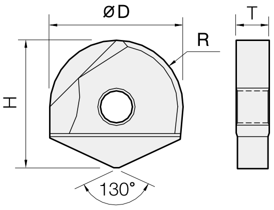
| Order Number | 날경 Diameter D × R | 높이 Height H | 두께 Thickness T |
|---|---|---|---|
| 2HHINC 210 005 | 21 X R0.5 | 20.9 | 5.2 |
| 2HHINC 210 010 | 21 X R1 | 20.9 | 5.2 |
| 2HHINC 210 020 | 21 X R2 | 20.9 | 5.2 |
| 2HHINC 250 005 | 25 X R0.5 | 24.1 | 6.2 |
| 2HHINC 250 010 | 25 X R1 | 24.1 | 6.2 |
| 2HHINC 250 020 | 25 X R2 | 24.1 | 6.2 |
| 2HHINC 260 005 | 26 X R0.5 | 24.6 | 6.2 |
| 2HHINC 260 010 | 26 X R1 | 24.6 | 6.2 |
| 2HHINC 260 020 | 26 X R2 | 24.6 | 6.2 |
| 2HHINC 300 005 | 30 X R0.5 | 29.1 | 7.2 |
| 2HHINC 300 010 | 30 X R1 | 29.1 | 7.2 |
| 2HHINC 300 020 | 30 X R2 | 29.1 | 7.2 |
| New 2HHINC 320 005 | 32 X R0.5 | 30.4 | 7.2 |
| New 2HHINC 320 010 | 32 X R1 | 30.4 | 7.2 |
| New 2HHINC 320 020 | 32 X R2 | 30.4 | 7.2 |
| New 2HHINC 330 005 | 33 X R0.5 | 30.4 | 7.2 |
| New 2HHINC 330 010 | 33 X R1 | 30.4 | 7.2 |
| New 2HHINC 330 020 | 33 X R2 | 30.4 | 7.2 |

# 2JJINB

## 2 Flutes JJ Carbide Ball Inserts for Hardened Steels

## 초경 2날 고경도 가공용 제이제이 볼 인서트






- **고경도강(HRc62이하), 프리하든강 계열의 고정밀 가공 인서트, 그라파이트**
- TISIN-S 코팅 처리하여 인선부 내마모성이 탁월합니다.
- 볼 형상을 날부 치핑이 적도록 설계하였습니다.
- 항절력이 높은 초미립자 초경합금(0.3㎛)을 채택, 인서트의 파손을 최소화 하였습니다.

- **Ball Inserts for hardened steel(~HRc62), pre-hardened and graphite materials**
- Optimum for wear resistance by TISIN-S coating.
- Designed for minimizing edge chipping by ball shape.
- Minimize fracturing by ultra fine(0.3㎛) WC grade.

2 | UWC 초미립자 | TISIN-S Coating | R ±0.01 5 ~ 6.5R | R ±0.015 8 ~ 15R | JOIN ±0.02 5 ~ 15R | CUTTING DATA 513P

| D Size | D Tolerance |
|---|---|
| Ø 10 ~ 13 | +0 ~ -0.01mm |
| Ø 16 ~ 30 | +0 ~ -0.02mm |

단위 : mm

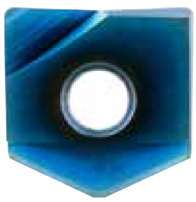
| Order Number | 날경 Diameter R × D | 높이 Height H | 두께 Thickness T |
|---|---|---|---|
| 2JJINB 100 | 5R X 10 | 12.1 | 2.7 |
| 2JJINB 110 | 5.5R X11 | 12.6 | 2.7 |
| 2JJINB 120 | 6R X 12 | 14.6 | 3.2 |
| 2JJINB 130 | 6.5R X 13 | 15.1 | 3.2 |
| 2JJINB 160 | 8R X 16 | 16.5 | 4.2 |
| 2JJINB 170 | 8.5R X 17 | 17 | 4.2 |
| 2JJINB 200 | 10R X 20 | 20.4 | 5.2 |

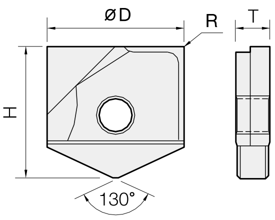
| Order Number | 날경 Diameter R × D | 높이 Height H | 두께 Thickness T |
|---|---|---|---|
| 2JJINB 210 | 10.5R X 21 | 20.9 | 5.2 |
| 2JJINB 250 | 12.5R X 25 | 24.1 | 6.2 |
| 2JJINB 260 | 13R X 26 | 24.6 | 6.2 |
| 2JJINB 300 | 15R X 30 | 29.1 | 7.2 |
| New 2JJINB 320 | 16R X 32 | 30.4 | 7.2 |
| New 2JJINB 330 | 16.5R X 33 | 30.4 | 7.2 |

# 2JJINC

## 2 Flutes JJ CarbideCorner Radius Inserts for Hardened Steels

## 초경 2날 고경도 가공용 제이제이 코너R 인서트






- **고경도강(HRc62이하), 프리하든강 계열의 고정밀 가공인서트, 그라파이트**
- TISIN-S 코팅 처리하여 인선부 내마모성이 탁월합니다.
- 볼 형상을 날부 치핑이 적도록 설계하였습니다.
- 항절력이 높은 초미립자 초경합금(0.3㎛)을 채택, 인서트의 파손을 최소화 하였습니다.

- **Inserts for hardened steel(~HRc62), pre-hardened and graphite materials**
- Optimum for wear resistance by TISIN-S coating.
- Designed for minimizing edge chipping by ball shape.
- Minimize fracturing by ultra fine(0.3㎛) WC grade.

2 | UWC 초미립자 | TISIN-S Coating | R ±0.015 0.5 ~ 2R | JOIN ±0.02 Ø10 ~30 | CUTTING DATA 513P

| D Size | D Tolerance |
|---|---|
| Ø 10 ~ 13 | +0 ~ -0.01mm |
| Ø 16 ~ 30 | +0 ~ -0.02mm |

단위 : mm

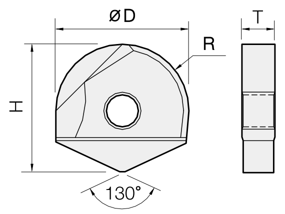
| Order Number | 날경 Diameter D × R | 높이 Height H | 두께 Thickness T |
|---|---|---|---|
| 2JJINC 100 005 | 10 X R0.5 | 12.1 | 2.7 |
| 2JJINC 100 010 | 10 X R1 | 12.1 | 2.7 |
| 2JJINC 110 005 | 11 X R0.5 | 12.6 | 2.7 |
| 2JJINC 110 010 | 11 X R1 | 12.6 | 2.7 |
| 2JJINC 120 005 | 12 X R0.5 | 14.6 | 3.2 |
| 2JJINC 120 010 | 12 X R1 | 14.6 | 3.2 |
| 2JJINC 120 020 | 12 X R2 | 14.6 | 3.2 |
| 2JJINC 130 005 | 13 X R0.5 | 15.1 | 3.2 |
| 2JJINC 130 010 | 13 X R1 | 15.1 | 3.2 |
| 2JJINC 130 020 | 13 X R2 | 15.1 | 3.2 |
| 2JJINC 160 005 | 16 X R0.5 | 16.5 | 4.2 |
| 2JJINC 160 010 | 16 X R1 | 16.5 | 4.2 |
| 2JJINC 160 020 | 16 X R2 | 16.5 | 4.2 |
| 2JJINC 170 005 | 17 X R0.5 | 17 | 4.2 |
| 2JJINC 170 010 | 17 X R1 | 17 | 4.2 |
| 2JJINC 170 020 | 17 X R2 | 17 | 4.2 |
| 2JJINC 200 005 | 20 X R0.5 | 20.4 | 5.2 |
| 2JJINC 200 010 | 20 X R1 | 20.4 | 5.2 |
| 2JJINC 200 020 | 20 X R2 | 20.4 | 5.2 |

| Order Number | 날경 Diameter D × R | 높이 Height H | 두께 Thickness T |
|---|---|---|---|
| 2JJINC 210 005 | 21 X R0.5 | 20.9 | 5.2 |
| 2JJINC 210 010 | 21 X R1 | 20.9 | 5.2 |
| 2JJINC 210 020 | 21 X R2 | 20.9 | 5.2 |
| 2JJINC 250 005 | 25 X R0.5 | 24.1 | 6.2 |
| 2JJINC 250 010 | 25 X R1 | 24.1 | 6.2 |
| 2JJINC 250 020 | 25 X R2 | 24.1 | 6.2 |
| 2JJINC 260 005 | 26 X R0.5 | 24.6 | 6.2 |
| 2JJINC 260 010 | 26 X R1 | 24.6 | 6.2 |
| 2JJINC 260 020 | 26 X R2 | 24.6 | 6.2 |
| 2JJINC 300 005 | 30 X R0.5 | 29.1 | 7.2 |
| 2JJINC 300 010 | 30 X R1 | 29.1 | 7.2 |
| 2JJINC 300 020 | 30 X R2 | 29.1 | 7.2 |
| New 2JJINC 320 005 | 32 X R0.5 | 30.4 | 7.2 |
| New 2JJINC 320 010 | 32 X R1 | 30.4 | 7.2 |
| New 2JJINC 320 020 | 32 X R2 | 30.4 | 7.2 |
| New 2JJINC 330 005 | 33 X R0.5 | 30.4 | 7.2 |
| New 2JJINC 330 010 | 33 X R1 | 30.4 | 7.2 |
| New 2JJINC 330 020 | 33 X R2 | 30.4 | 7.2 |

# 2GINB

## 2 Flutes Carbide Helix Ball Inserts for General Purpose

## 초경 2날 범용 헬릭스 볼 인서트




- **고경도강(HRc52이하), 프리하든강 계열의 고정밀 가공 인서트, 그라파이트**
- TISIN 코팅 처리하여 날부 치핑이 적도록 설계하였습니다.
- 헬릭스 형상의 인선부를 설계하여, 절삭력이 향상되었습니다.
- 항절력이 높은 미립자 초경합금을 채택, 인서트의 파손을 최소화 하였습니다.

- **Ball Inserts for hardened steels (~HRc52), pre-hardened and graphite materials**
- Designed for minimizing edge chipping by TISIN coating.
- Maximize cutting force by applying the new helix edge design.
- Minimize fracturing by high TRS fine WC grade.

2 | WC 미립자 | TISIN Coating | R ± 0.01 (5 ~ 6.5R) | R ± 0.015 (8 ~ 15R) | JOIN ± 0.02 (5 ~ 15R) | CUTTING DATA (514P)

| D Size | D Tolerance |
|---|---|
| Ø 10 ~ 13 | +0 ~ -0.01mm |
| Ø 16 ~ 30 | +0 ~ -0.02mm |

단위 : mm

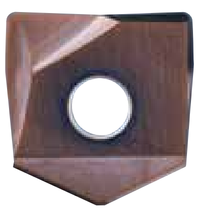
| Order Number | 날경 Diameter R × D | 높이 Height H | 두께 Thickness T |
|---|---|---|---|
| 2GINB 100 | 5R X 10 | 12.1 | 2.7 |
| 2GINB 110 | 5.5R X11 | 12.6 | 2.7 |
| 2GINB 120 | 6R X 12 | 14.6 | 3.2 |
| 2GINB 130 | 6.5R X 13 | 15.1 | 3.2 |
| 2GINB 160 | 8R X 16 | 16.5 | 4.2 |
| 2GINB 170 | 8.5R X 17 | 17 | 4.2 |
| 2GINB 200 | 10R X 20 | 20.4 | 5.2 |

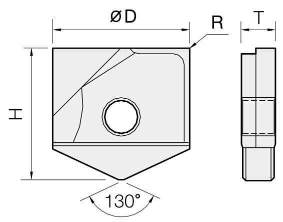
| Order Number | 날경 Diameter R × D | 높이 Height H | 두께 Thickness T |
|---|---|---|---|
| 2GINB 210 | 10.5R X 21 | 20.9 | 5.2 |
| 2GINB 250 | 12.5R X 25 | 24.1 | 6.2 |
| 2GINB 260 | 13R X 26 | 24.6 | 6.2 |
| 2GINB 300 | 15R X 30 | 29.1 | 7.2 |
| New 2GINB 320 | 16R X 32 | 30.4 | 7.2 |
| New 2GINB 330 | 16.5R X 33 | 30.4 | 7.2 |

# 2GINC

## 2 Flutes Carbide Helix Corner Radius Inserts for General Purpose

## 초경 2날 범용 헬릭스 코너R 인서트






- **고경도강(HRc52이하), 프리하든강 계열의 고정밀 가공 인서트, 그라파이트**
- TISIN 코팅 처리하여 날부 치핑이 적도록 설계하였습니다.
- 헬릭스 형상의 인선부를 설계하여, 절삭력이 향상되었습니다.
- 항절력이 높은 미립자 초경합금을 채택, 인서트의 파손을 최소화 하였습니다.

- **Inserts for hardened steels (~HRc52), pre-hardened and graphite materials.**
- Designed for minimizing edge chipping by TISIN coating.
- Maximize cutting force by applying the new helix edge design.
- Minimize fracturing by high TRS fine WC grade.

2 | WC 미립자 | TISIN Coating | R ± 0.015 (0.5 ~ 2R) | JOIN ± 0.02 (Ø10 ~30) | CUTTING DATA (514P)

| D Size | D Tolerance |
|---|---|
| Ø 10 ~ 13 | +0 ~ -0.01mm |
| Ø 16 ~ 30 | +0 ~ -0.02mm |

단위 : mm

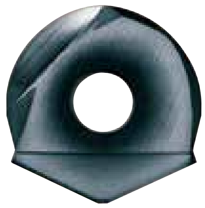
| Order Number | 날경 Diameter D × R | 높이 Height H | 두께 Thickness T |
|---|---|---|---|
| 2GINC 100 005 | 10 X R0.5 | 12.1 | 2.7 |
| 2GINC 100 010 | 10 X R1 | 12.1 | 2.7 |
| 2GINC 110 005 | 11 X R0.5 | 12.6 | 2.7 |
| 2GINC 110 010 | 11 X R1 | 12.6 | 2.7 |
| 2GINC 120 005 | 12 X R0.5 | 14.6 | 3.2 |
| 2GINC 120 010 | 12 X R1 | 14.6 | 3.2 |
| 2GINC 120 020 | 12 X R2 | 14.6 | 3.2 |
| 2GINC 130 005 | 13 X R0.5 | 15.1 | 3.2 |
| 2GINC 130 010 | 13 X R1 | 15.1 | 3.2 |
| 2GINC 130 020 | 13 X R2 | 15.1 | 3.2 |
| 2GINC 160 005 | 16 X R0.5 | 16.5 | 4.2 |
| 2GINC 160 010 | 16 X R1 | 16.5 | 4.2 |
| 2GINC 160 020 | 16 X R2 | 16.5 | 4.2 |
| 2GINC 170 005 | 17 X R0.5 | 17 | 4.2 |
| 2GINC 170 010 | 17 X R1 | 17 | 4.2 |
| 2GINC 170 020 | 17 X R2 | 17 | 4.2 |
| 2GINC 200 005 | 20 X R0.5 | 20.4 | 5.2 |
| 2GINC 200 010 | 20 X R1 | 20.4 | 5.2 |
| 2GINC 200 020 | 20 X R2 | 20.4 | 5.2 |

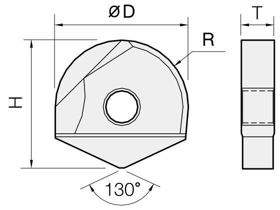
| Order Number | 날경 Diameter D × R | 높이 Height H | 두께 Thickness T |
|---|---|---|---|
| 2GINC 210 005 | 21 X R0.5 | 20.9 | 5.2 |
| 2GINC 210 010 | 21 X R1 | 20.9 | 5.2 |
| 2GINC 210 020 | 21 X R2 | 20.9 | 5.2 |
| 2GINC 250 005 | 25 X R0.5 | 24.1 | 6.2 |
| 2GINC 250 010 | 25 X R1 | 24.1 | 6.2 |
| 2GINC 250 020 | 25 X R2 | 24.1 | 6.2 |
| 2GINC 260 005 | 26 X R0.5 | 24.6 | 6.2 |
| 2GINC 260 010 | 26 X R1 | 24.6 | 6.2 |
| 2GINC 260 020 | 26 X R2 | 24.6 | 6.2 |
| 2GINC 300 005 | 30 X R0.5 | 29.1 | 7.2 |
| 2GINC 300 010 | 30 X R1 | 29.1 | 7.2 |
| 2GINC 300 020 | 30 X R2 | 29.1 | 7.2 |
| New 2GINC 320 005 | 32 X R0.5 | 30.4 | 7.2 |
| New 2GINC 320 010 | 32 X R1 | 30.4 | 7.2 |
| New 2GINC 320 020 | 32 X R2 | 30.4 | 7.2 |
| New 2GINC 330 005 | 33 X R0.5 | 30.4 | 7.2 |
| New 2GINC 330 010 | 33 X R1 | 30.4 | 7.2 |
| New 2GINC 330 020 | 33 X R2 | 30.4 | 7.2 |

# 2DINB

## 2Flutes Diamond Coated Ball Inserts for Graphite

## 초경 2날 흑연 가공용 다이아몬드 코팅 볼 인서트






- **그라파이트(흑연) 가공 전용 인서트**
- CVD 순수 다이아몬드 코팅을 적용하여 내마모성이 우수합니다.
- 헬릭스 형상의 인선부를 설계하여, 절삭력이 향상되었습니다.

- **Inserts for graphite milling**
- Excellent wear resistance by applying qualified CVD diamond coating.
- Maximize cutting force by applying the new helix edge design.

2 | WC 미립자 | DIA. Coating | R ± 0.01 | R ± 0.015 | JOIN ± 0.02 | CUTTING DATA

5 ~ 6.5R | 8 ~ 15R | 5 ~ 15R | 515P

| D Size | D Tolerance |
|---|---|
| Ø 10 ~ 13 | +0 ~ -0.01mm |
| Ø 16 ~ 30 | +0 ~ -0.02mm |

단위 : mm

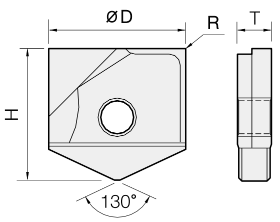
| Order Number | 날경 Diameter R × D | 높이 Height H | 두께 Thickness T |
|---|---|---|---|
| 2DINB 100 | 5R X 10 | 12.1 | 2.7 |
| 2DINB 110 | 5.5R X11 | 12.6 | 2.7 |
| 2DINB 120 | 6R X 12 | 14.6 | 3.2 |
| 2DINB 130 | 6.5R X 13 | 15.1 | 3.2 |
| 2DINB 160 | 8R X 16 | 16.5 | 4.2 |
| 2DINB 170 | 8.5R X 17 | 17 | 4.2 |
| 2DINB 200 | 10R X 20 | 20.4 | 5.2 |

| Order Number | 날경 Diameter R × D | 높이 Height H | 두께 Thickness T |
|---|---|---|---|
| 2DINB 210 | 10.5R X 21 | 20.9 | 5.2 |
| 2DINB 250 | 12.5R X 25 | 24.1 | 6.2 |
| 2DINB 260 | 13R X 26 | 24.6 | 6.2 |
| 2DINB 300 | 15R X 30 | 29.1 | 7.2 |

# 2DINC

## 2Flutes Diamond Coated Corner Radius Inserts for Graphite

## 초경 2날 흑연 가공용 다이아몬드 코팅 코너 R 인서트




- **그라파이트(흑연) 가공 전용 인서트**
- CVD 순수 다이아몬드 코팅을 적용하여 내마모성이 우수합니다.
- 헬릭스 형상의 인선부를 설계하여, 절삭력이 향상되었습니다.

- **Inserts for graphite milling**
- Excellent wear resistance by applying qualified CVD diamond coating.
- Maximize cutting force by applying the new helix edge design.

2 | WC 미립자 | DIA. Coating | R ± 0.015 | JOIN ± 0.02 | CUTTING DATA

0.5 ~ 2R | Ø10 ~30 | 515P

| D Size | D Tolerance |
|---|---|
| Ø 10 ~ 13 | +0 ~ -0.01mm |
| Ø 16 ~ 30 | +0 ~ -0.02mm |

단위 : mm

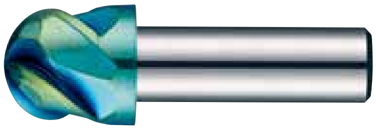
| Order Number | 날경 Diameter D × R | 높이 Height H | 두께 Thickness T |
|---|---|---|---|
| 2DINC 100 005 | 10 X R0.5 | 12.1 | 2.7 |
| 2DINC 100 010 | 10 X R1 | 12.1 | 2.7 |
| 2DINC 110 005 | 11 X R0.5 | 12.6 | 2.7 |
| 2DINC 110 010 | 11 X R1 | 12.6 | 2.7 |
| 2DINC 120 005 | 12 X R0.5 | 14.6 | 3.2 |
| 2DINC 120 010 | 12 X R1 | 14.6 | 3.2 |
| 2DINC 120 020 | 12 X R2 | 14.6 | 3.2 |
| 2DINC 130 005 | 13 X R0.5 | 15.1 | 3.2 |
| 2DINC 130 010 | 13 X R1 | 15.1 | 3.2 |
| 2DINC 130 020 | 13 X R2 | 15.1 | 3.2 |
| 2DINC 160 005 | 16 X R0.5 | 16.5 | 4.2 |
| 2DINC 160 010 | 16 X R1 | 16.5 | 4.2 |
| 2DINC 160 020 | 16 X R2 | 16.5 | 4.2 |
| 2DINC 170 005 | 17 X R0.5 | 17 | 4.2 |
| 2DINC 170 010 | 17 X R1 | 17 | 4.2 |
| 2DINC 170 020 | 17 X R2 | 17 | 4.2 |

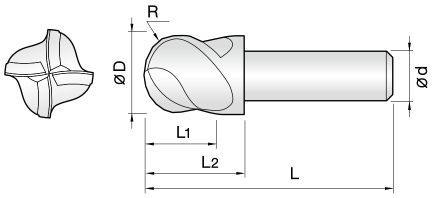
| Order Number | 날경 Diameter D × R | 높이 Height H | 두께 Thickness T |
|---|---|---|---|
| 2DINC 200 005 | 20 X R0.5 | 20.4 | 5.2 |
| 2DINC 200 010 | 20 X R1 | 20.4 | 5.2 |
| 2DINC 200 020 | 20 X R2 | 20.4 | 5.2 |
| 2DINC 210 005 | 21 X R0.5 | 20.9 | 5.2 |
| 2DINC 210 010 | 21 X R1 | 20.9 | 5.2 |
| 2DINC 210 020 | 21 X R2 | 20.9 | 5.2 |
| 2DINC 250 005 | 25 X R0.5 | 24.1 | 6.2 |
| 2DINC 250 010 | 25 X R1 | 24.1 | 6.2 |
| 2DINC 250 020 | 25 X R2 | 24.1 | 6.2 |
| 2DINC 260 005 | 26 X R0.5 | 24.6 | 6.2 |
| 2DINC 260 010 | 26 X R1 | 24.6 | 6.2 |
| 2DINC 260 020 | 26 X R2 | 24.6 | 6.2 |
| 2DINC 300 005 | 30 X R0.5 | 29.1 | 7.2 |
| 2DINC 300 010 | 30 X R1 | 29.1 | 7.2 |
| 2DINC 300 020 | 30 X R2 | 29.1 | 7.2 |

# 4SFJB

## 4Flutes JJ Carbide Helix Ball Shrink-fit Inserts for Hardened steels

## 초경 4날 열박음 고경도 가공용 제이제이 볼 인서트






- 고경도강(HRc52~62), 프리하든강 계열의 고정밀 가공 열박음 인서트
- TISIN-S 코팅 처리하여 인선부 내마모성이 탁월합니다.
- 열박음 홀더 체결시 높은 파지력과 뛰어난 동심도 유지가 가능합니다.
- 3회 이상의 재연마가 가능하여 매우 경제적입니다.
- 항절력이 높은 미립자 초경합금(0.4$\mu$m)을 채택, 인서트의 파손을 최소화 하였습니다.

- Shrink fit inserts for hardened steel (HRc52~62), pre-hardened steels
- Optimum for wear resistance on the edge by TISIN-S coating.
- Excellent holding power and concentricity keeping are available by shrink fitting holder.
- It is very economical because regrinding is available more than three times.
- Minimize fracturing by high TRS fine (0.4㎛) WC grade.

4 | WC 미립자 | TISIN-S Coating | R ± 0.01 (5 ~ 6.5R) | R ± 0.015 (8 ~ 10.5R) | 45° Helix Angle | CUTTING DATA (515P)

| D Size | D Tolerance |
|---|---|
| Ø 10 ~ 12 | -0.005 ~ -0.015mm |
| Ø 13 ~ 21 | -0.01 ~ -0.02mm |

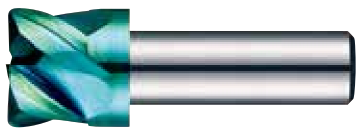
단위 : mm

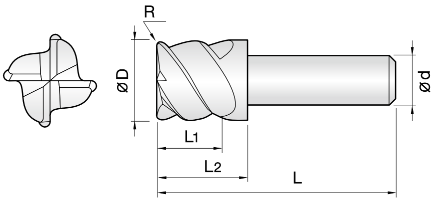
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|
| 4SFJB 100 085 S06 | 5R X 10 | 8.5 | 12 | 37 | 6 |
| 4SFJB 110 085 S06 | 5.5R X 11 | 8.5 | 12 | 37 | 6 |
| 4SFJB 120 090 S06 | 6R X 12 | 9 | 13 | 38 | 6 |
| 4SFJB 130 090 S06 | 6.5R X 13 | 9 | 13 | 38 | 6 |
| 4SFJB 160 120 S10 | 8R X 16 | 12 | 17 | 48 | 10 |
| 4SFJB 170 120 S10 | 8.5R X 17 | 12 | 17 | 48 | 10 |
| 4SFJB 200 150 S12 | 10R X 20 | 15 | 21 | 54 | 12 |
| 4SFJB 210 150 S12 | 10.5R X 21 | 15 | 21 | 54 | 12 |

# 4SFJC

## 4Flutes JJ Carbide Helix Corner Radius Shrink-fit Inserts for Hardened steel

## 초경 4날 열박음 고경도 가공용 제이제이 코너R 인서트






- 고경도강(HRc52~62), 프리하든강 계열의 고정밀 가공 열박음 인서트
- TISIN-S 코팅 처리하여 인선부 내마모성이 탁월합니다.
- 열박음 홀더 체결시 높은 파지력과 뛰어난 동심도 유지가 가능합니다.
- 3회 이상의 재연마가 가능하여 매우 경제적입니다.
- 항절력이 높은 미립자 초경합금(0.4$\mu$m)을 채택, 인서트의 파손을 최소화 하였습니다.

- Shrink fit inserts for hardened steel (HRc52~62), pre-hardened steels.
- Optimum for wear resistance on the edge by TISIN-S coating.
- Excellent holding power and concentricity keeping are available by shrink fitting holder.
- It is very economical because regrinding is available more than three times.
- Minimize fracturing by high TRS fine (0.4㎛) WC grade.

4 | WC 미립자 | TISIN-S Coating | R ± 0.005 (R0.3 ~ 0.5) | R ± 0.01 (R1) | 45° Helix Angle | CUTTING DATA (516P)

| D Size | D Tolerance |
|---|---|
| Ø 10 ~ 12 | -0.005 ~ -0.015mm |
| Ø 13 ~ 21 | -0.01 ~ -0.02mm |

단위 : mm

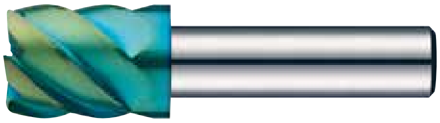
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|
| 4SFJC 100 003 085 | 10 X R0.3 | 8.5 | 12 | 37 | 6 |
| 4SFJC 100 005 085 | 10 X R0.5 | 8.5 | 12 | 37 | 6 |
| 4SFJC 100 010 085 | 10 X R1 | 8.5 | 12 | 37 | 6 |
| 4SFJC 110 003 085 | 11 X R0.3 | 8.5 | 12 | 37 | 6 |
| 4SFJC 110 005 085 | 11 X R0.5 | 8.5 | 12 | 37 | 6 |
| 4SFJC 110 010 085 | 11 X R1 | 8.5 | 12 | 37 | 6 |
| 4SFJC 120 003 090 | 12 X R0.3 | 9 | 13 | 38 | 6 |
| 4SFJC 120 005 090 | 12 X R0.5 | 9 | 13 | 38 | 6 |
| 4SFJC 120 010 090 | 12 X R1 | 9 | 13 | 38 | 6 |
| 4SFJC 130 003 090 | 13 X R0.3 | 9 | 13 | 38 | 6 |
| 4SFJC 130 005 090 | 13 X R0.5 | 9 | 13 | 38 | 6 |

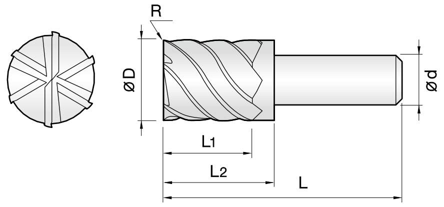
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|
| 4SFJC 130 010 090 | 13 X R1 | 9 | 13 | 38 | 6 |
| 4SFJC 160 005 120 | 16 X R0.5 | 12 | 17 | 48 | 10 |
| 4SFJC 160 010 120 | 16 X R1 | 12 | 17 | 48 | 10 |
| 4SFJC 170 005 120 | 17 X R0.5 | 12 | 17 | 48 | 10 |
| 4SFJC 170 010 120 | 17 X R1 | 12 | 17 | 48 | 10 |
| 4SFJC 200 005 150 | 20 X R0.5 | 15 | 21 | 54 | 12 |
| 4SFJC 200 010 150 | 20 X R1 | 15 | 21 | 54 | 12 |
| 4SFJC 210 005 150 | 21 X R0.5 | 15 | 21 | 54 | 12 |
| 4SFJC 210 010 150 | 21 X R1 | 15 | 21 | 54 | 12 |

# 6~12SFJC

*6~12Flutes JJ Carbide Helix Corner Radius Shrink-fit Inserts for Hardened steels*

## 초경 6~12날 열박음 고경도 가공용 제이제이 코너R 인서트






- **고경도강(HRc52~62), 프리하든강 계열의 고정밀 가공 열박음 인서트**
- TISIN-S 코팅 처리하여 인선부 내마모성이 탁월합니다.
- 6~12날까지 적용하여, 고속 가공을 실현하였습니다.
- 열박음 홀더 체결시 높은 파지력과 뛰어난 동심도 유지가 가능합니다.
- 3회 이상의 재연마가 가능하여 매우 경제적입니다.
- 항절력이 높은 미립자 초경합금(0.4㎛)을 채택, 인서트의 파손을 최소화 하였습니다.

- **Shrink fit inserts for hardened steels (HRc52~62), pre-hardened steels**
- Optimum for wear resistance on the edge by TISIN-S coating.
- High speed milling process is available with multiple 6-12 flutes.
- Excellent holding power and concentricity keeping are available by shrink fitting holder.
- It is very economical because regrinding is available more than three times.
- Minimize fracturing by high TRS fine (0.4㎛) WC grade.


| D Size | D Tolerance |
|---|---|
| ø 10 ~ 12 | -0.005 ~ -0.015mm |
| ø 13 ~ 21 | -0.01 ~ -0.02mm |

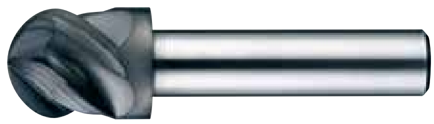
단위 : mm

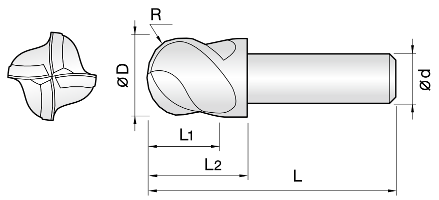
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|
| 6SFJC 100 003 085 | 10 X R0.3 | 8.5 | 12 | 37 | 6 |
| 6SFJC 100 005 085 | 10 X R0.5 | 8.5 | 12 | 37 | 6 |
| 6SFJC 100 010 085 | 10 X R1 | 8.5 | 12 | 37 | 6 |
| 6SFJC 110 003 085 | 11 X R0.3 | 8.5 | 12 | 37 | 6 |
| 6SFJC 110 005 085 | 11 X R0.5 | 8.5 | 12 | 37 | 6 |
| 6SFJC 110 010 085 | 11 X R1 | 8.5 | 12 | 37 | 6 |
| 8SFJC 120 003 090 | 12 X R0.3 | 9 | 13 | 38 | 6 |
| 8SFJC 120 005 090 | 12 X R0.5 | 9 | 13 | 38 | 6 |
| 8SFJC 120 010 090 | 12 X R1 | 9 | 13 | 38 | 6 |
| 8SFJC 130 003 090 | 13 X R0.3 | 9 | 13 | 38 | 6 |
| 8SFJC 130 005 090 | 13 X R0.5 | 9 | 13 | 38 | 6 |
| 8SFJC 130 010 090 | 13 X R1 | 9 | 13 | 38 | 6 |
| 10SFJC 160 005 120 | 16 X R0.5 | 12 | 17 | 48 | 10 |
| 10SFJC 160 010 120 | 16 X R1 | 12 | 17 | 48 | 10 |
| 10SFJC 170 005 120 | 17 X R0.5 | 12 | 17 | 48 | 10 |
| 10SFJC 170 010 120 | 17 X R1 | 12 | 17 | 48 | 10 |
| 12SFJC 200 005 150 | 20 X R0.5 | 15 | 21 | 54 | 12 |
| 12SFJC 200 010 150 | 20 X R1 | 15 | 21 | 54 | 12 |
| 12SFJC 210 005 150 | 21 X R0.5 | 15 | 21 | 54 | 12 |
| 12SFJC 210 010 150 | 21 X R1 | 15 | 21 | 54 | 12 |

# 4SFDB

*4Flutes Diamond Coated Helix Ball Shrink-fit Inserts for Graphites*

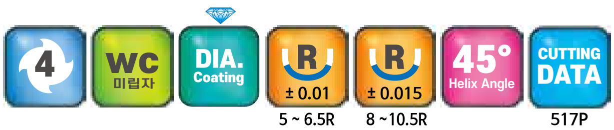
## 초경 4날 열박음 흑연가공용 다이아몬드 코팅 볼 인서트






- **그라파이트(흑연) 가공 전용 인서트**
- CVD 순수 다이아몬드 코팅을 적용하여 내마모성이 우수합니다.
- 헬릭스 형상의 인선부를 설계하여, 절삭력이 향상되었습니다.
- 열박음 홀더 체결시 높은 파지력과 뛰어난 동심도 유지가 가능합니다.

- **Inserts for graphite milling**
- Excellent wear resistance by applying qualified CVD diamond coating.
- Maximize cutting force by applying the new helix edge design.
- Excellent holding power and concentricity keeping are available by shrink fitting holder.




| D Size | D Tolerance |
|---|---|
| ø 10 ~ 12 | +0 ~ -0.02mm |
| ø 13 ~ 21 | +0 ~ -0.025mm |

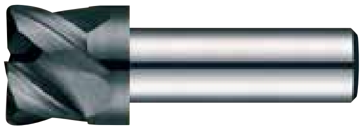
단위 : mm

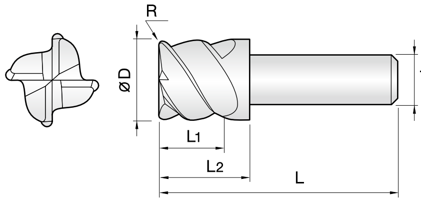
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|
| 4SFDB 100 085 S06 | 5R X 10 | 8.5 | 12 | 37 | 6 |
| 4SFDB 110 085 S06 | 5.5R X 11 | 8.5 | 12 | 37 | 6 |
| 4SFDB 120 090 S06 | 6R X 12 | 9 | 13 | 38 | 6 |
| 4SFDB 130 090 S06 | 6.5R X 13 | 9 | 13 | 38 | 6 |
| 4SFDB 160 120 S10 | 8R X 16 | 12 | 17 | 48 | 10 |
| 4SFDB 170 120 S10 | 8.5R X 17 | 12 | 17 | 48 | 10 |
| 4SFDB 200 150 S12 | 10R X 20 | 15 | 21 | 54 | 12 |
| 4SFDB 210 150 S12 | 10.5R X 21 | 15 | 21 | 54 | 12 |

# 4SFDC

4Flutes Diamond Coated Helix Corner Radius Shrink-fit Inserts for Graphite

## 초경 4날 열박음 흑연가공용 다이아몬드 코팅 코너 R 인서트






- 그라파이트(흑연) 가공 전용 인서트
- CVD 순수 다이아몬드 코팅을 적용하여 내마모성이 우수합니다.
- 헬릭스 형상의 인선부를 설계하여, 절삭력이 향상되었습니다.
- 열박음 홀더 체결시 높은 파지력과 뛰어난 동심도 유지가 가능합니다.

- Inserts for graphite milling
- Excellent wear resistance by applying qualified CVD diamond coating.
- Maximize cutting force by applying the new helix edge design.
- Excellent holding power and concentricity keeping are available by shrink fitting holder.


| D Size | D Tolerance |
|---|---|
| Ø 10 ~ 12 | +0 ~ -0.02mm |
| Ø 13 ~ 21 | +0 ~ -0.025mm |

단위 : mm

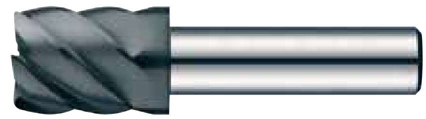
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|
| 4SFDC 100 003 085 | 10 X R0.3 | 8.5 | 12 | 37 | 6 |
| 4SFDC 100 005 085 | 10 X R0.5 | 8.5 | 12 | 37 | 6 |
| 4SFDC 100 010 085 | 10 X R1 | 8.5 | 12 | 37 | 6 |
| 4SFDC 110 003 085 | 11 X R0.3 | 8.5 | 12 | 37 | 6 |
| 4SFDC 110 005 085 | 11 X R0.5 | 8.5 | 12 | 37 | 6 |
| 4SFDC 110 010 085 | 11 X R1 | 8.5 | 12 | 37 | 6 |
| 4SFDC 120 003 090 | 12 X R0.3 | 9 | 13 | 38 | 6 |
| 4SFDC 120 005 090 | 12 X R0.5 | 9 | 13 | 38 | 6 |
| 4SFDC 120 010 090 | 12 X R1 | 9 | 13 | 38 | 6 |
| 4SFDC 130 003 090 | 13 X R0.3 | 9 | 13 | 38 | 6 |
| 4SFDC 130 005 090 | 13 X R0.5 | 9 | 13 | 38 | 6 |

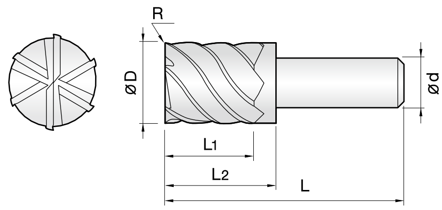
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|
| 4SFDC 130 010 090 | 13 X R1 | 9 | 13 | 38 | 6 |
| 4SFDC 160 005 120 | 16 X R0.5 | 12 | 17 | 48 | 10 |
| 4SFDC 160 010 120 | 16 X R1 | 12 | 17 | 48 | 10 |
| 4SFDC 170 005 120 | 17 X R0.5 | 12 | 17 | 48 | 10 |
| 4SFDC 170 010 120 | 17 X R1 | 12 | 17 | 48 | 10 |
| 4SFDC 200 005 150 | 20 X R0.5 | 15 | 21 | 54 | 12 |
| 4SFDC 200 010 150 | 20 X R1 | 15 | 21 | 54 | 12 |
| 4SFDC 210 005 150 | 21 X R0.5 | 15 | 21 | 54 | 12 |
| 4SFDC 210 010 150 | 21 X R1 | 15 | 21 | 54 | 12 |

# 6~12SFDC

6~12Flutes Diamond Coated Helix Ball Shrink-fit Inserts for Graphite

## 초경 6~12날 열박음 흑연가공용 다이아몬드 코팅 코너R 인서트






- 그라파이트(흑연) 가공 전용 인서트
- CVD 순수 다이아몬드 코팅을 적용하여 내마모성이 우수합니다.
- 6~12날까지 적용하여, 고속 가공을 실현하였습니다.
- 열박음 홀더 체결시 높은 파지력과 뛰어난 동심도 유지가 가능합니다.

- Inserts for graphite milling
- Excellent wear resistance by applying qualified CVD diamond coating.
- High speed milling process is available with multiple 6-12 flutes.
- Excellent holding power and concentricity keeping are available by shrink fitting holder.

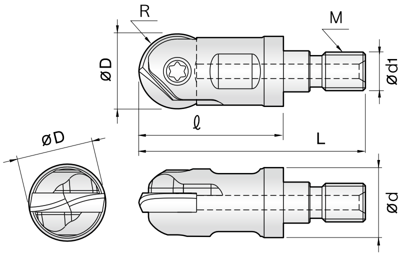

| D Size | D Tolerance |
|---|---|
| Ø 10 ~ 12 | +0 ~ -0.02mm |
| Ø 13 ~ 21 | +0 ~ -0.025mm |

단위 : mm

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|
| 6SFDC 100 003 085 | 10 X R0.3 | 8.5 | 12 | 37 | 6 |
| 6SFDC 100 005 085 | 10 X R0.5 | 8.5 | 12 | 37 | 6 |
| 6SFDC 100 010 085 | 10 X R1 | 8.5 | 12 | 37 | 6 |
| 6SFDC 110 003 085 | 11 X R0.3 | 8.5 | 12 | 37 | 6 |
| 6SFDC 110 005 085 | 11 X R0.5 | 8.5 | 12 | 37 | 6 |
| 6SFDC 110 010 085 | 11 X R1 | 8.5 | 12 | 37 | 6 |
| 8SFDC 120 003 090 | 12 X R0.3 | 9 | 13 | 38 | 6 |
| 8SFDC 120 005 090 | 12 X R0.5 | 9 | 13 | 38 | 6 |
| 8SFDC 120 010 090 | 12 X R1 | 9 | 13 | 38 | 6 |
| 8SFDC 130 003 090 | 13 X R0.3 | 9 | 13 | 38 | 6 |
| 8SFDC 130 005 090 | 13 X R0.5 | 9 | 13 | 38 | 6 |

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|
| 8SFDC 130 010 090 | 13 X R1 | 9 | 13 | 38 | 6 |
| 10SFDC 160 005 120 | 16 X R0.5 | 12 | 17 | 48 | 10 |
| 10SFDC 160 010 120 | 16 X R1 | 12 | 17 | 48 | 10 |
| 10SFDC 170 005 120 | 17 X R0.5 | 12 | 17 | 48 | 10 |
| 10SFDC 170 010 120 | 17 X R1 | 12 | 17 | 48 | 10 |
| 12SFDC 200 005 150 | 20 X R0.5 | 15 | 21 | 54 | 12 |
| 12SFDC 200 010 150 | 20 X R1 | 15 | 21 | 54 | 12 |
| 12SFDC 210 005 150 | 21 X R0.5 | 15 | 21 | 54 | 12 |
| 12SFDC 210 010 150 | 21 X R1 | 15 | 21 | 54 | 12 |

# MHE Modular Head
## 모듈러 헤드



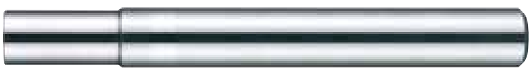

- 볼 인서트 또는 레디우스 인서트 모두 사용 가능합니다.
- 하나의 모듈러 아답터에 다양한 형상의 헤드가 교환 가능하여, 공구비용을 절감할 수 있습니다.
- 아답터가 장비에 장착된 상태에서 헤드만 교환 가능하여. 편의성 및 공구 교체시간이 절감됩니다.

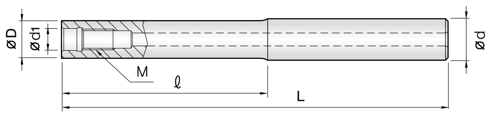
- Can be used for both of ball and corner radius inserts.
- Possible to exchange variety heads for one modular adopter and helps save your purchasing cost.
- Installed modular adopter can change only head without uninstallation, it gives more convenience and it helps save your time.

| Order Number | 규격 Dimensions (mm) | | | | | | 호환인서트 Insert | 부속품 Parts | |
|---|---|---|---|---|---|---|---|---|---|
| | M | D | L | ℓ | d | d1 | | Screw | Wrench |
| MHE 100 250 M06 | M06 | 10 | 40 | 25 | 9.5 | 6.5 | 2JJIN□ 100 / 2JJIN□110 | SC 100 581142 | T10 |
| MHE 120 250 M06 | M06 | 12 | 40 | 25 | 11 | 6.5 | 2JJIN□120 / 2JJIN□130 | SC 120 581143 | T20 |
| MHE 160 290 M08 | M08 | 16 | 45 | 29 | 14.5 | 8.5 | 2JJIN□160 / 2JJIN□170 | SC 160 581144 | T20 |
| MHE 200 330 M10 | M10 | 20 | 55 | 33 | 18 | 10.5 | 2JJIN□200 / 2JJIN□210 | SC 200 581145 | T25 |
| MHE 250 390 M12 | M12 | 25 | 60 | 39 | 22.5 | 12.5 | 2JJIN□250 / 2JJIN□260 | SC 250 581146 | T30 |
| MHE 300 430 M16 | M16 | 30 | 70 | 43 | 28 | 17 | 2JJIN□300 | SC 300 581147 | T30 |

| Bolt Order Number | Screw | Bolt Order Number | Screw |
|---|---|---|---|
| SC 100 581142 | T10 | SC 250 581146 | T30 |
| SC 120 581143 | T20 | SC 300 581147 | T30 |
| SC 160 581144 | T20 | | |
| SC 200 581145 | T25 | | |

# CMA Carbide Modular Adapter
## 초경 모듈러 아답터






- 나사 모듈러 헤드 전용 아답터(MHE 호환)
- 다양한 유효장으로 깊은 형상의 피삭재 가공이 가능합니다.
- 나사 모듈러 헤드 장착시 체결이 편리합니다.

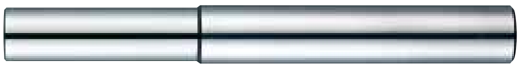
- Adapter for the spiral modular head (Compatible with MHE)
- Deep cavity milling is available with a variety of effective lengths.
- Convenient clamping with the modular head (MHE).

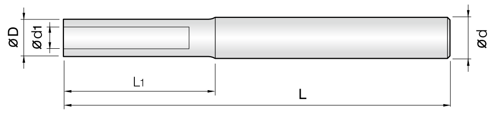
| Order Number | 규격 Dimensions (mm) | | | | | |
|---|---|---|---|---|---|---|
| | M | D | d | d1 | ℓ | L |
| CMA100 240 114 | M06 | 9.7 | 10 | 6.5 | 24 | 114 |
| CMA120 240 129 | M06 | 11 | 12 | 6.5 | 24 | 129 |
| CMA160 300 130 | M08 | 14.5 | 16 | 8.5 | 30 | 130 |
| CMA160 300 160 | M08 | 14.5 | 16 | 8.5 | 30 | 160 |
| CMA160 300 200 | M08 | 14.5 | 16 | 8.5 | 30 | 200 |
| CMA160 300 250 | M08 | 14.5 | 16 | 8.5 | 30 | 250 |
| CMA200 500 170 | M10 | 18.5 | 20 | 10.5 | 50 | 170 |
| CMA200 500 220 | M10 | 18.5 | 20 | 10.5 | 50 | 220 |
| CMA200 500 270 | M10 | 18.5 | 20 | 10.5 | 50 | 270 |
| CMA250 650 265 | M12 | 23 | 25 | 12.5 | 65 | 265 |
| CMA250 650 315 | M12 | 23 | 25 | 12.5 | 65 | 315 |
| CMA300 800 260 | M16 | 28 | 32 | 17 | 80 | 260 |
| CMA300 800 360 | M16 | 28 | 32 | 17 | 80 | 360 |

# SFMA

*Carbide Shrink-fit Insert Modular Adapter for finishing and semi finishing*

## 초경 열박음 아답터 – 정삭 · 중삭 전용






- 일반강, 아크릴, ABS, 목업, 알루미늄 등 비철, 비금속 피삭재 가공
- 다양한 유효장으로 깊은 형상의 피삭재 가공이 가능합니다.
- 열박음 홀더 체결시 높은 파지력과 뛰어난 동심도 유지가 가능합니다.
- 정삭 · 중삭 전용입니다. ※황삭시 파손에 주의하십시오
- 가열된 아답터에 재 히팅 시 수명을 저하시킬수 있으니 완전히 아답터를 냉각후 사용하시길 바랍니다.

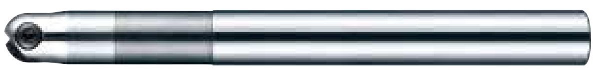
- Adapter for the spiral modular head (MHE)
- Deep cavity milling is available with a variety of effective lengths.
- Excellent holding power and concentricity keeping are available by shrink fitting holder. ※Be careful of breakage when roughing.
- Reheating the adapter may decrease its lifespan, so please use it after allowing the adapter to cool completely.

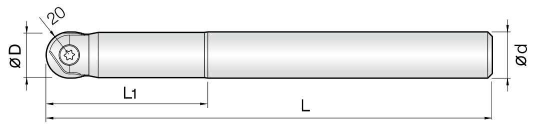
| Order Number | 규격 Dimensions (mm) | | | | | 호환인서트 Insert |
|---|---|---|---|---|---|---|
| | D | d1 | L1 | L | d | |
| SFMA 100 028 108 | 9.8 | 6 | 28 | 108 | 10 | □SF□□ 100 /□SF□□ 110 |
| SFMA 100 028 148 | 9.8 | 6 | 28 | 148 | 10 | □SF□□ 100 /□SF□□ 110 |
| SFMA 100 048 188 | 9.8 | 6 | 48 | 188 | 10 | □SF□□ 100 /□SF□□ 110 |
| SFMA 120 027 117 | 11.8 | 6 | 27 | 117 | 12 | □SF□□ 120 /□SF□□ 130 |
| SFMA 120 027 147 | 11.8 | 6 | 27 | 147 | 12 | □SF□□ 120 /□SF□□ 130 |
| SFMA 120 047 187 | 11.8 | 6 | 47 | 187 | 12 | □SF□□ 120 /□SF□□ 130 |
| SFMA 160 033 143 | 15.8 | 10 | 33 | 143 | 16 | □SF□□ 160 /□SF□□ 170 |
| SFMA 160 053 183 | 15.8 | 10 | 53 | 183 | 16 | □SF□□ 160 /□SF□□ 170 |
| SFMA 200 039 139 | 19.8 | 12 | 39 | 139 | 20 | □SF□□ 200 /□SF□□ 210 |
| SFMA 200 059 179 | 19.8 | 12 | 59 | 179 | 20 | □SF□□ 200 /□SF□□ 210 |
| SFMA 200 079 229 | 19.8 | 12 | 79 | 229 | 20 | □SF□□ 200 /□SF□□ 210 |

# CICF

*Carbide Indexable Cutters for Finishing*

## 초경 인덱서블 커터





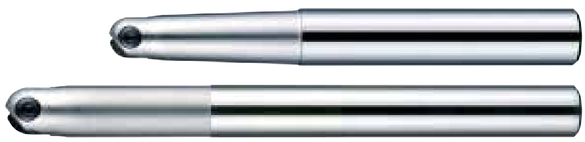

- 볼 인서트 또는 레디우스 인서트 모두 사용 가능합니다.
- Solid 엔드밀과 동일한 강도를 가져 고속, 고정밀 가공에 적합합니다.
- 홀더 파손시 재생이 가능합니다.
- 스틸 홀더와 비교하여 떨림이 최소화되어 안정적인 가공이 가능합니다.

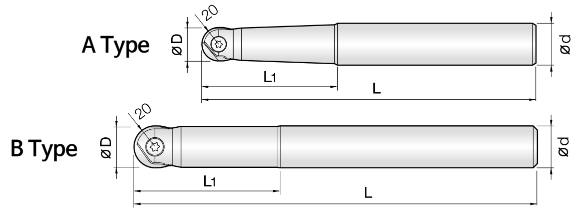
- Can be used for both of ball and corner radius inserts.
- Suitable for high speed cutting and high precise cutting due to same toughness as solid tools.
- Availabe repairing tool holders at JJ TOOLS co., ltd when broken problem.
- Availabe stable machining due to minimized vibration on carbide holders.

| Order Number | 규격 Dimensions (mm) | | | | 호환인서트 Insert | 부속품 Parts | |
|---|---|---|---|---|---|---|---|
| | D | L1 | L | d | | ScrewWrench | |
| CICF100 350 150 | 10 | 35 | 150 | 10 | 2JJIN□ 100 / 2JJIN□110 | SC 100 581142 | T10 |
| CICF120 450 160 | 12 | 45 | 160 | 12 | 2JJIN□120 / 2JJIN□130 | SC 120 581143 | T20 |
| CICF160 600 200 | 16 | 60 | 200 | 16 | 2JJIN□160 / 2JJIN□170 | SC 160 581144 | T20 |
| CICF160 600 230 | 16 | 60 | 230 | 16 | 2JJIN□160 / 2JJIN□170 | SC 160 581144 | T20 |
| CICF200 700 220 | 20 | 70 | 220 | 20 | 2JJIN□200 / 2JJIN□210 | SC 200 581145 | T25 |
| CICF250 800 250 | 25 | 80 | 250 | 25 | 2JJIN□250 / 2JJIN□260 | SC 250 581146 | T30 |
| CICF250 800 300 | 25 | 80 | 300 | 25 | 2JJIN□250 / 2JJIN□260 | SC 250 581146 | T30 |
| CICF300 1000 300 | 30 | 100 | 300 | 30 | 2JJIN□300 | SC 300 581147 | T30 |

INSERT

# ICF Indexable Cutters for Finishing
# 인덱서블 커터

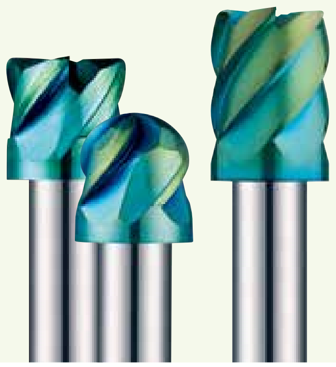





- 볼 인서트 또는 레디우스 인서트 모두 사용 가능합니다.
- 유효장을 테이퍼 형상으로 설계하여 떨림을 최소화 하였습니다(A-Type).
- 다양한 전장 규격을 적용하여, 공구 선택의 폭이 넓습니다.

- Can be used for both of ball and corner radius inserts.
- Effective length design by taper type to minimize vibration (A-Type).
- Wide tool range option is available with a variety of overall lengths.

| Order Number | 규격 Dimensions (mm) | | | | | 호환인서트 Insert | 부속품 Parts | |
|---|---|---|---|---|---|---|---|---|
| | D | L1 | L | d | Type | | Screw | Wrench |
| ICF 100 250 100 S12 | 10 | 25 | 100 | 12 | A | 2JJIN□ 100 / 2JJIN□ 110 | SC 100 581142 | T10 |
| ICF 100 500 150 S16 | 10 | 50 | 150 | 16 | A | 2JJIN□ 100 / 2JJIN□ 110 | SC 100 581142 | T10 |
| ICF 120 300 110 S12 | 12 | 30 | 110 | 12 | B | 2JJIN□ 120 / 2JJIN□ 130 | SC 120 581143 | T20 |
| ICF 120 600 160 S16 | 12 | 60 | 160 | 16 | A | 2JJIN□ 120 / 2JJIN□ 130 | SC 120 581143 | T20 |
| ICF 160 500 130 S20 | 16 | 50 | 130 | 20 | A | 2JJIN□ 160 / 2JJIN□ 170 | SC 160 581144 | T20 |
| ICF 160 600 220 S16 | 16 | 60 | 220 | 16 | B | 2JJIN□ 160 / 2JJIN□ 170 | SC 160 581144 | T20 |
| ICF 160 650 160 S20 | 16 | 65 | 160 | 20 | A | 2JJIN□ 160 / 2JJIN□ 170 | SC 160 581144 | T20 |
| ICF 200 700 220 S20 | 20 | 70 | 220 | 20 | B | 2JJIN□ 200 / 2JJIN□ 210 | SC 200 581145 | T25 |
| ICF 200 700 250 S20 | 20 | 70 | 250 | 20 | B | 2JJIN□ 200 / 2JJIN□ 210 | SC 200 581145 | T25 |
| ICF 200 800 180 S25 | 20 | 80 | 180 | 25 | A | 2JJIN□ 200 / 2JJIN□ 210 | SC 200 581145 | T25 |
| ICF 250 700 220 S25 | 25 | 70 | 220 | 25 | B | 2JJIN□ 250 / 2JJIN□ 260 | SC 250 581146 | T30 |
| ICF 250 800 250 S25 | 25 | 80 | 250 | 25 | B | 2JJIN□ 250 / 2JJIN□ 260 | SC 250 581146 | T30 |
| ICF 250 800 300 S25 | 25 | 80 | 300 | 25 | B | 2JJIN□ 250 / 2JJIN□ 260 | SC 250 581146 | T30 |
| ICF 300 1000 250 S32 | 30 | 100 | 250 | 32 | A | 2JJIN□ 300 | SC 300 581147 | T30 |
| ICF 300 1000 300 S32 | 30 | 100 | 300 | 32 | A | 2JJIN□ 300 | SC 300 581147 | T30 |
| ICF 300 1000 350 S32 | 30 | 100 | 350 | 32 | A | 2JJIN□ 300 | SC 300 581147 | T30 |



## 열박음 인서트 재연마 Regrinding shrink-fit insert

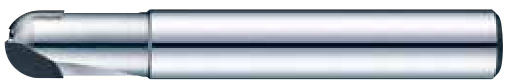
- 2~3회 재연마가 가능하여, 경제적입니다.
- 재연마 시 신품과 동등한 수준의 성능을 발휘합니다.

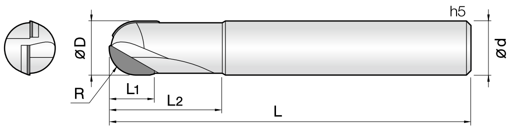
- 2 to 3 times regrinding is available, so it is economical.
- Regrinding performs the same as new product quality.

- 흑연 가공용 DIA 코팅 인서트는재연마가 불가 합니다.
- Regrinding DIA coated insert for graphite material is not available.

*1&2 Flutes PCD Ball Endmills by Laser Processing*

# 1&2날 레이저 가공 PCD 볼엔드밀






- **알루미늄 합금 및 비철 금속전용 PCD 엔드밀**
- LASER 가공으로 날부 인선을 5㎛이하로 구현하여 탁월한 절삭성능과 피삭재의 표면 조도가 뛰어납니다.
- 뛰어난 동심도로 제작되어 정밀가공이 가능합니다.
- 인선부를 폴리싱 처리하여 절삭 칩의 배출이 원활합니다.

- **PCD Endmills for aluminum alloys and non-ferrous metals**
- Laser processing enables the blade to be less than 5㎛, providing excellent cutting performance and surface finish of the workpiece.
- Designed with excellent concentricity for precision machining.
- An additional polishing process on the edge of flutes to facilitates the cutting chip emission.


1.5 ~ 8R

520P

| D Size | D Tolerance |
|---|---|
| ø 3 ~ 6 | +0 ~ −0.012mm |
| ø 8 ~ 12 | +0 ~ −0.015mm |
| ø 12 | +0 ~ −0.018mm |
| ø 16 | +0 ~ −0.022mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 1BPCD 030 080 S06 | 1.5R X 3 | 2.3 | 8 | 50 | 6 | |
| 1BPCD 030 120 S06 | 1.5R X 3 | 2.3 | 12 | 50 | 6 | |
| 1BPCD 030 180 S06 | 1.5R X 3 | 2.3 | 18 | 60 | 6 | |
| 1BPCD 040 100 S06 | 2R X 4 | 3.3 | 10 | 50 | 6 | |
| 1BPCD 040 120 S06 | 2R X 4 | 3.3 | 12 | 50 | 6 | |
| 1BPCD 040 180 S06 | 2R X 4 | 3.3 | 18 | 60 | 6 | |
| 2BPCD 060 120 S06 | 3R X 6 | 5.1 | 12 | 60 | 6 | |
| 2BPCD 060 150 S06 | 3R X 6 | 5.1 | 15 | 65 | 6 | |
| 2BPCD 060 200 S06 | 3R X 6 | 5.1 | 20 | 70 | 6 | |
| 2BPCD 060 250 100 | 3R X 6 | 5.1 | 25 | 100 | 6 | |
| 2BPCD 080 150 S08 | 4R X 8 | 7 | 15 | 60 | 8 | |
| 2BPCD 080 300 110 | 4R X 8 | 7 | 30 | 110 | 8 | |
| 2BPCD 100 200 S10 | 5R X 10 | 8 | 20 | 70 | 10 | |
| 2BPCD 100 300 110 | 5R X 10 | 8 | 30 | 110 | 10 | |
| 2BPCD 100 350 150 | 5R X 10 | 8 | 35 | 150 | 10 | |
| 2BPCD 120 250 S12 | 6R X 12 | 9 | 25 | 80 | 12 | |
| 2BPCD 120 350 110 | 6R X 12 | 9 | 35 | 110 | 12 | |
| 2BPCD 120 400 150 | 6R X 12 | 9 | 40 | 150 | 12 | |
| 2BPCD 160 350 S16 | 8R X 16 | 12 | 35 | 90 | 16 | |
| 2BPCD 160 450 110 | 8R X 16 | 12 | 45 | 110 | 16 | |
| 2BPCD 160 500 150 | 8R X 16 | 12 | 50 | 150 | 16 | |

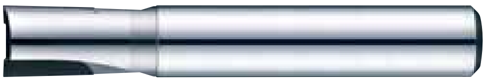
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

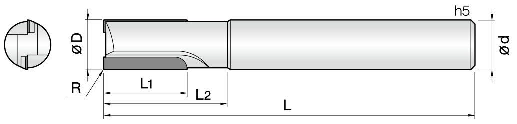
PCD series

# 1~4PCD

*1~4 Flutes PCD Endmills by Laser Processing*

## 1~4날 레이저 가공 PCD 엔드밀






- **알루미늄 합금 및 비철 금속전용 PCD 엔드밀**
- LASER 가공으로 날부 인선을 5㎛이하로 구현하여 탁월한 절삭성능과 피삭재의 표면 조도가 뛰어납니다.
- 뛰어난 동심도로 제작되어 정밀가공이 가능합니다.
- 인선부를 폴리싱 처리하여 절삭 칩의 배출이 원활합니다.

- **PCD Endmills for aluminum alloys and non-ferrous metals**
- Laser processing enables the blade to be less than 5㎛, providing excellent cutting performance and surface finish of the workpiece.
- Designed with excellent concentricity for precision machining.
- An additional polishing process on the edge of flutes to facilitates the cutting chip emission.

1 2 3 4 WC 미립자 PCD R ± 0.005 R0.1 0° Helix Angle CUTTING DATA 518P

| D Size | D Tolerance |
|---|---|
| Ø 3 ~ 6 | +0 ~ -0.012mm |
| Ø 8 ~ 10 | +0 ~ -0.015mm |
| Ø 12 | +0 ~ -0.018mm |
| Ø 16 ~ 20 | +0 ~ -0.022mm |

단위 : mm

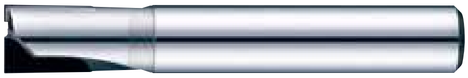
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 1PCD 030 080 S04 | 3 X R0.1 | 4 | 8 | 50 | 4 | |
| 1PCD 040 100 S06 | 4 X R0.1 | 5 | 10 | 50 | 6 | |
| 2PCD 060 200 S06 | 6 X R0.1 | 10 | 20 | 60 | 6 | |
| 2PCD 060 250 S06 | 6 X R0.1 | 15 | 25 | 60 | 6 | |
| 2PCD 060 250 080 | 6 X R0.1 | 15 | 25 | 80 | 6 | |
| 2PCD 080 200 S08 | 8 X R0.1 | 10 | 20 | 60 | 8 | |
| 2PCD 080 250 S08 | 8 X R0.1 | 15 | 25 | 60 | 8 | |
| 2PCD 080 300 S08 | 8 X R0.1 | 20 | 30 | 70 | 8 | |
| 2PCD 080 300 100 | 8 X R0.1 | 20 | 30 | 100 | 8 | |
| 2PCD 100 250 S10 | 10 X R0.1 | 10 | 25 | 70 | 10 | |
| 2PCD 100 300 S10 | 10 X R0.1 | 15 | 30 | 70 | 10 | |
| 2PCD 100 300 080 | 10 X R0.1 | 20 | 30 | 80 | 10 | |
| 2PCD 100 300 110 | 10 X R0.1 | 20 | 30 | 110 | 10 | |
| 2PCD 120 250 S12 | 12 X R0.1 | 10 | 25 | 80 | 12 | |
| 2PCD 120 300 S12 | 12 X R0.1 | 15 | 30 | 80 | 12 | |
| 2PCD 120 300 090 | 12 X R0.1 | 20 | 30 | 90 | 12 | |
| 2PCD 120 300 130 | 12 X R0.1 | 20 | 30 | 130 | 12 | |
| 2PCD 160 250 S16 | 16 X R0.1 | 10 | 25 | 90 | 16 | |
| 2PCD 160 300 S16 | 16 X R0.1 | 15 | 30 | 90 | 16 | |
| 2PCD 160 350 S16 | 16 X R0.1 | 20 | 35 | 100 | 16 | |
| 2PCD 200 250 S20 | 20 X R0.1 | 10 | 25 | 90 | 20 | |
| 2PCD 200 300 S20 | 20 X R0.1 | 15 | 30 | 90 | 20 | |
| 2PCD 200 300 100 | 20 X R0.1 | 20 | 30 | 100 | 20 | |

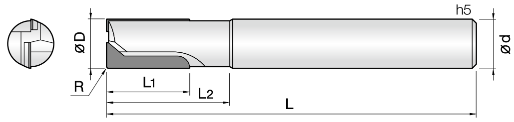
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 3PCD 120 300 090 | 12 X R0.1 | 20 | 30 | 90 | 12 | |
| 3PCD 160 250 S16 | 16 X R0.1 | 15 | 25 | 90 | 16 | |
| 3PCD 160 350 S16 | 16 X R0.1 | 20 | 35 | 130 | 16 | |
| 3PCD 160 400 S16 | 16 X R0.1 | 25 | 40 | 160 | 16 | |
| 3PCD 200 250 S20 | 20 X R0.1 | 15 | 25 | 90 | 20 | |
| 3PCD 200 350 S20 | 20 X R0.1 | 20 | 35 | 130 | 20 | |
| 3PCD 200 400 S20 | 20 X R0.1 | 25 | 40 | 160 | 20 | |
| 4PCD 160 250 S16 | 16 X R0.1 | 15 | 25 | 90 | 16 | |
| 4PCD 160 350 S16 | 16 X R0.1 | 20 | 35 | 130 | 16 | |
| 4PCD 160 400 S16 | 16 X R0.1 | 25 | 40 | 160 | 16 | |
| 4PCD 200 250 S20 | 20 X R0.1 | 15 | 25 | 90 | 20 | |
| 4PCD 200 350 S20 | 20 X R0.1 | 20 | 35 | 130 | 20 | |
| 4PCD 200 400 S20 | 20 X R0.1 | 25 | 40 | 160 | 20 | |

# 2~4CPCD

## 2~4 Flutes PCD Endmills by Laser Processing (Center Over)

## 2~4날 레이저 가공 PCD 엔드밀 (센터 오버 타입)






**• 알루미늄 합금 및 비철 금속전용 PCD 엔드밀**

- LASER 가공으로 날부 인선을 5㎛이하로 구현하여 탁월한 절삭성능과 피삭재의 표면 조도가 뛰어납니다.
- 뛰어난 동심도로 제작되어 정밀가공이 가능합니다.
- 인선부를 폴리싱 처리하여 절삭 칩의 배출이 원활합니다.

**• PCD Endmills for aluminum alloys and non-ferrous metals**

- Laser processing enables the blade to be less than 5㎛, providing excellent cutting performance and surface finish of the workpiece.
- Designed with excellent concentricity for precision machining.
- An additional polishing process on the edge of flutes to facilitates the cutting chip emission.


R0.1 518P

| D Size | D Tolerance |
|---|---|
| Ø 6 | +0 ~ -0.012mm |
| Ø 8 ~ 10 | +0 ~ -0.015mm |
| Ø 12 | +0 ~ -0.018mm |
| Ø 16 ~ 20 | +0 ~ -0.022mm |

단위 : mm

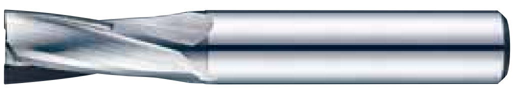
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2CPCD 060 200 S06 | 6 X R0.1 | 10 | 20 | 60 | 6 | |
| 2CPCD 060 250 S06 | 6 X R0.1 | 15 | 25 | 60 | 6 | |
| 2CPCD 080 200 S08 | 8 X R0.1 | 10 | 20 | 60 | 8 | |
| 2CPCD 080 250 S08 | 8 X R0.1 | 15 | 25 | 60 | 8 | |
| 2CPCD 080 250 070 | 8 X R0.1 | 20 | 25 | 70 | 8 | |
| 2CPCD 100 250 S10 | 10 X R0.1 | 10 | 25 | 70 | 10 | |
| 2CPCD 100 300 S10 | 10 X R0.1 | 15 | 30 | 70 | 10 | |
| 2CPCD 100 300 080 | 10 X R0.1 | 20 | 30 | 80 | 10 | |
| 2CPCD 120 250 S12 | 12 X R0.1 | 10 | 25 | 80 | 12 | |
| 2CPCD 120 300 S12 | 12 X R0.1 | 15 | 30 | 80 | 12 | |
| 2CPCD 120 300 090 | 12 X R0.1 | 20 | 30 | 90 | 12 | |
| 2CPCD 160 250 S16 | 16 X R0.1 | 10 | 25 | 90 | 16 | |
| 2CPCD 160 300 S16 | 16 X R0.1 | 15 | 30 | 90 | 16 | |
| 2CPCD 160 300 100 | 16 X R0.1 | 20 | 30 | 100 | 16 | |
| 2CPCD 200 250 S20 | 20 X R0.1 | 10 | 25 | 90 | 20 | |
| 2CPCD 200 300 S20 | 20 X R0.1 | 15 | 30 | 90 | 20 | |
| 2CPCD 200 300 100 | 20 X R0.1 | 20 | 30 | 100 | 20 | |
| 3CPCD 160 250 S16 | 16 X R0.1 | 15 | 25 | 90 | 16 | |
| 3CPCD 160 300 S16 | 16 X R0.1 | 20 | 30 | 100 | 16 | |
| 4CPCD 200 300 S20 | 20 X R0.1 | 15 | 30 | 90 | 20 | |
| 4CPCD 200 350 S20 | 20 X R0.1 | 20 | 35 | 100 | 20 | |

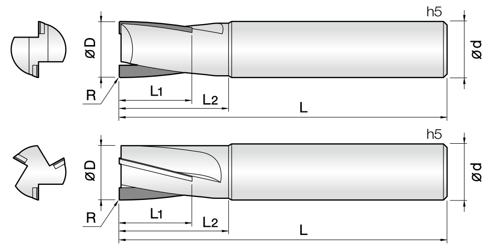
PCD series

# 1~3HPCD

*1~3 Flutes PCD Helix Endmills by Laser Processing*

## 1~3날 레이저 가공 PCD 헬릭스 엔드밀






- **알루미늄 합금 및 비철 금속전용 PCD 엔드밀**
- LASER 가공으로 날부 인선을 5㎛이하로 구현하여 탁월한 절삭성능과 피삭재의 표면 조도가 뛰어납니다.
- 뛰어난 동심도로 제작되어 정밀가공이 가능합니다.
- 옆날 인선부의 헬릭스 설계로 절삭저항이 적으며, 내마모 성능을 향상 시켰습니다.
- 인선부를 폴리싱 처리하여 절삭 칩의 배출이 원활합니다.

- **PCD Endmills for aluminum alloys and non-ferrous metals**
- Laser processing enables the blade to be less than 5㎛, providing excellent cutting performance and surface finish of the workpiece.
- Designed with excellent concentricity for precision machining.
- Helix design on the side of the edge reduces cutting resistance and improves wear resistance.
- An additional polishing process on the edge of flutes to facilitates the cutting chip emission.

| D Size | D Tolerance |
|---|---|
| Ø 4 ~ 6 | +0 ~ -0.012mm |
| Ø 8 ~ 10 | +0 ~ -0.015mm |
| Ø 12 | +0 ~ -0.018mm |
| Ø 16 ~ 20 | +0 ~ -0.022mm |

1 2 3 WC 미립자 PCD 20° Helix Angle 12° Helix Angle CUTTING DATA

A Type B Type 518P

단위 : mm

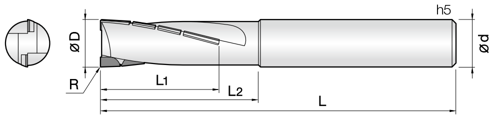
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 타입 Type | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|
| 1HPCD 040 180 S06 | 4 X R0.1 | 10 | 18 | A | 60 | 6 |
| 2HPCD 060 180 S06 | 6 X R0.1 | 10 | 18 | A | 60 | 6 |
| 2HPCD 060 250 S06 | 6 X R0.1 | 15 | 25 | B | 80 | 6 |
| 2HPCD 080 200 S08 | 8 X R0.1 | 10 | 20 | A | 70 | 8 |
| 2HPCD 080 250 S08 | 8 X R0.1 | 20 | 25 | B | 90 | 8 |
| 2HPCD 100 220 S10 | 10 X R0.1 | 12 | 22 | A | 70 | 10 |
| 2HPCD 100 400 S10 | 10 X R0.1 | 25 | 40 | B | 100 | 10 |
| 2HPCD 120 250 S12 | 12 X R0.1 | 15 | 25 | A | 80 | 12 |
| 2HPCD 120 450 S12 | 12 X R0.1 | 30 | 45 | B | 100 | 12 |
| 2HPCD 160 300 S16 | 16 X R0.1 | 20 | 30 | A | 90 | 16 |
| 2HPCD 160 450 S16 | 16 X R0.1 | 30 | 45 | B | 110 | 16 |
| 2HPCD 200 400 S20 | 20 X R0.1 | 25 | 40 | A | 100 | 20 |
| 2HPCD 200 550 S20 | 20 X R0.1 | 40 | 55 | B | 110 | 20 |

| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 타입 Type | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|
| 3HPCD 120 250 S12 | 12 X R0.1 | 15 | 25 | A | 80 | 12 |
| 3HPCD 120 450 S12 | 12 X R0.1 | 30 | 45 | B | 100 | 12 |
| 3HPCD 160 300 S16 | 16 X R0.1 | 20 | 30 | A | 90 | 16 |
| 3HPCD 160 450 S16 | 16 X R0.1 | 30 | 45 | B | 110 | 16 |
| 3HPCD 200 400 S20 | 20 X R0.1 | 25 | 40 | A | 100 | 20 |
| 3HPCD 200 550 S20 | 20 X R0.1 | 40 | 55 | B | 110 | 20 |

# 2&3RPCD

## 2&3 Flutes PCD Roughing Endmills by Laser Processing

## 2&3날 레이저 가공 PCD 라핑 엔드밀

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- 뛰어난 동심도로 제작되어 정밀가공이 가능합니다.
- 옆날 인선부의 헬릭스 설계로 절삭저항이 적으며, 내마모 성능을 향상 시켰습니다.
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- **PCD Endmills for aluminum alloys and non-ferrous metals**
- Laser processing enables the blade to be less than 5㎛, providing excellent cutting performance and surface finish of the workpiece.
- Designed with excellent concentricity for precision machining.
- Helix design on the side of the edge reduces cutting resistance and improves wear resistance.
- An additional polishing process on the edge of flutes to facilitates the cutting chip emission.

2 | 3 | WC 미립자 | PCD | 20° Helix Angle | CUTTING DATA

518P

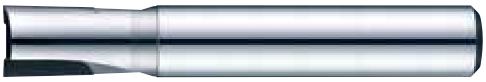
| D Size | D Tolerance |
|---|---|
| Ø 10 | +0 ~ -0.015mm |
| Ø 12 | +0 ~ -0.018mm |
| Ø 16 ~ 20 | +0 ~ -0.022mm |

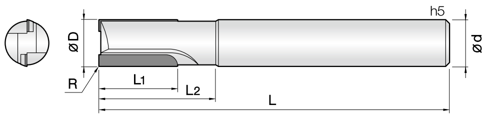
단위 : mm

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|
| 2RPCD 100 300 S10 | 10 X R0.1 | 20 | 30 | 80 | 10 |
| 2RPCD 100 400 S10 | 10 X R0.1 | 30 | 40 | 90 | 10 |
| 2RPCD 120 300 S12 | 12 X R0.1 | 20 | 30 | 80 | 12 |
| 2RPCD 120 400 S12 | 12 X R0.1 | 30 | 40 | 90 | 12 |
| 2RPCD 160 400 S16 | 16 X R0.1 | 30 | 40 | 100 | 16 |
| 2RPCD 160 650 S16 | 16 X R0.1 | 50 | 65 | 130 | 16 |
| 2RPCD 200 400 S20 | 20 X R0.1 | 30 | 40 | 100 | 20 |
| 2RPCD 200 650 S20 | 20 X R0.1 | 50 | 65 | 130 | 20 |

| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|
| 3RPCD 100 300 S10 | 10 X R0.1 | 20 | 30 | 80 | 10 |
| 3RPCD 100 400 S10 | 10 X R0.1 | 30 | 40 | 90 | 10 |
| 3RPCD 120 300 S12 | 12 X R0.1 | 20 | 30 | 80 | 12 |
| 3RPCD 120 400 S12 | 12 X R0.1 | 30 | 40 | 90 | 12 |
| 3RPCD 160 400 S16 | 16 X R0.1 | 30 | 40 | 100 | 16 |
| 3RPCD 160 650 S16 | 16 X R0.1 | 50 | 65 | 130 | 16 |
| 3RPCD 200 400 S20 | 20 X R0.1 | 30 | 40 | 100 | 20 |
| 3RPCD 200 650 S20 | 20 X R0.1 | 50 | 65 | 130 | 20 |

# 1&2날 레이저 가공 PCD 코너 레디우스 엔드밀



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- 뛰어난 동심도로 제작되어 정밀가공이 가능합니다.
- 인선부를 폴리싱 처리하여 절삭 칩의 배출이 원활합니다.

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- Designed with excellent concentricity for precision machining.
- An additional polishing process on the edge of flutes to facilitates the cutting chip emission.


R0.2 ~ 1 518P

| D Size | D Tolerance |
|---|---|
| Ø 4 ~ 6 | +0 ~ -0.012mm |
| Ø 8 ~ 10 | +0 ~ -0.015mm |
| Ø 12 | +0 ~ -0.018mm |

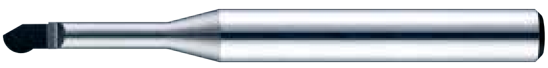
단위 : mm

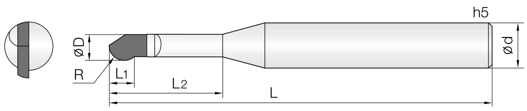
| Order Number | 날경 Diameter D × R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 1PCDC 040 002 100 | 4 X R0.2 | 5 | 10 | 50 | 6 | |
| 1PCDC 040 003 100 | 4 X R0.3 | 5 | 10 | 50 | 6 | |
| 2PCDC 060 003 200 | 6 X R0.3 | 6 | 20 | 60 | 6 | |
| 2PCDC 060 003 250 | 6 X R0.3 | 15 | 25 | 60 | 6 | |
| 2PCDC 060 005 200 | 6 X R0.5 | 6 | 20 | 60 | 6 | |
| 2PCDC 060 005 250 | 6 X R0.5 | 15 | 25 | 60 | 6 | |
| 2PCDC 060 010 200 | 6 X R1 | 6 | 20 | 60 | 6 | |
| 2PCDC 060 010 250 | 6 X R1 | 15 | 25 | 60 | 6 | |
| 2PCDC 080 003 200 | 8 X R0.3 | 8 | 20 | 60 | 8 | |
| 2PCDC 080 003 250 | 8 X R0.3 | 15 | 25 | 60 | 8 | |
| 2PCDC 080 005 200 | 8 X R0.5 | 8 | 20 | 60 | 8 | |
| 2PCDC 080 005 250 | 8 X R0.5 | 15 | 25 | 60 | 8 | |
| 2PCDC 080 010 200 | 8 X R1 | 8 | 20 | 60 | 8 | |
| 2PCDC 080 010 250 | 8 X R1 | 15 | 25 | 60 | 8 | |
| 2PCDC 100 005 250 | 10 X R0.5 | 10 | 25 | 70 | 10 | |
| 2PCDC 100 005 300 | 10 X R0.5 | 15 | 30 | 70 | 10 | |
| 2PCDC 100 010 250 | 10 X R1 | 10 | 25 | 70 | 10 | |
| 2PCDC 100 010 300 | 10 X R1 | 15 | 30 | 70 | 10 | |
| 2PCDC 120 005 250 | 12 X R0.5 | 10 | 25 | 80 | 12 | |
| 2PCDC 120 005 300 | 12 X R0.5 | 15 | 30 | 80 | 12 | |
| 2PCDC 120 010 250 | 12 X R1 | 10 | 25 | 80 | 12 | |
| 2PCDC 120 010 300 | 12 X R1 | 15 | 30 | 80 | 12 | |

# 1&2BPCDW

*1&2 Flutes PCD Ball Endmills by Wire Processing*

## 1&2날 와이어 가공 PCD 볼 엔드밀



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- PCD 날부 인선을 구현하여 그라파이트 가공시 피삭재의 표면 조도가 뛰어나며 내마모성이 탁월합니다.
- 인선부를 폴리싱 처리하여 절삭 칩의 배출이 원활합니다.

- **PCD Endmills for graphite, aluminum alloys and non-ferrous metals**
- The edge of the PCD flute enables excellent surface finish and wear resistance during graphite machining.
- An additional polishing process on the edge of flutes to facilitates the cutting chip emission.

1 | 2 | WC 미립자 | PCD | R ± 0.005 R1.5 ~ 6 | 0° Helix Angle | CUTTING DATA 518P

| D Size | D Tolerance |
|---|---|
| Ø 3 ~ 6 | +0 ~ -0.012mm |
| Ø 8 ~ 10 | +0 ~ -0.015mm |
| Ø 12 | +0 ~ -0.018mm |

단위 : mm

| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 1BPCDW 030 060 S04 | 1.5R X 3 | 2.3 | 6 | 60 | 4 | |
| 1BPCDW 030 100 S04 | 1.5R X 3 | 2.3 | 10 | 80 | 4 | |
| 1BPCDW 030 200 S04 | 1.5R X 3 | 2.3 | 20 | 80 | 4 | |
| 1BPCDW 030 300 S04 | 1.5R X 3 | 2.3 | 30 | 80 | 4 | |
| 1BPCDW 040 060 S06 | 2R X 4 | 3.3 | 6 | 60 | 6 | |
| 1BPCDW 040 100 S06 | 2R X 4 | 3.3 | 10 | 80 | 6 | |
| 1BPCDW 040 200 S06 | 2R X 4 | 3.3 | 20 | 80 | 6 | |
| 1BPCDW 040 300 S06 | 2R X 4 | 3.3 | 30 | 80 | 6 | |
| 2BPCDW 060 051 S06 | 3R X 6 | 5.1 | - | 60 | 6 | |
| 2BPCDW 060 200 S06 | 3R X 6 | 5.1 | 20 | 90 | 6 | |
| 2BPCDW 060 300 S06 | 3R X 6 | 5.1 | 30 | 90 | 6 | |
| 2BPCDW 060 400 S06 | 3R X 6 | 5.1 | 40 | 100 | 6 | |
| 2BPCDW 080 300 S08 | 4R X 8 | 7 | 30 | 80 | 8 | |
| 2BPCDW 080 500 S08 | 4R X 8 | 7 | 50 | 150 | 8 | |
| 2BPCDW 100 300 S10 | 5R X 10 | 8 | 30 | 80 | 10 | |
| 2BPCDW 100 500 S10 | 5R X 10 | 8 | 50 | 150 | 10 | |
| 2BPCDW 120 300 S12 | 6R X 12 | 9 | 30 | 80 | 12 | |
| 2BPCDW 120 500 S12 | 6R X 12 | 9 | 50 | 150 | 12 | |

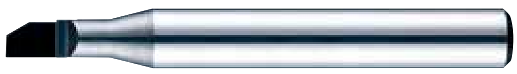
| Order Number | 날경 Diameter R × D | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

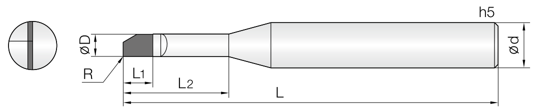
PCD series

# 1&2PCDW

1&2 Flutes PCD Endmills by Wire Processing

## 1&2날 와이어 가공 PCD 엔드밀



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- **PCD Endmills for graphite, aluminum alloys and non-ferrous metals**
- The edge of the PCD flute enables excellent surface finish and wear resistance during graphite machining.
- An additional polishing process on the edge of flutes to facilitates the cutting chip emission.

1 | 2 | WC 미립자 | PCD | R ± 0.005 R0.1 | 0° Helix Angle | CUTTING DATA 518P

| D Size | D Tolerance |
|---|---|
| Ø 3 ~ 6 | +0 ~ -0.012mm |
| Ø 8 ~ 10 | +0 ~ -0.015mm |
| Ø 12 | +0 ~ -0.018mm |

단위 : mm

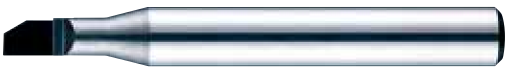
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 1PCDW 030 060 S04 | 3 X R0.1 | 4 | 6 | 60 | 4 | |
| 1PCDW 030 100 S04 | 3 X R0.1 | 4 | 10 | 80 | 4 | |
| 1PCDW 030 200 S04 | 3 X R0.1 | 4 | 20 | 80 | 4 | |
| 1PCDW 030 300 S04 | 3 X R0.1 | 4 | 30 | 80 | 4 | |
| 1PCDW 040 060 S06 | 4 X R0.1 | 5 | 6 | 60 | 6 | |
| 1PCDW 040 100 S06 | 4 X R0.1 | 5 | 10 | 80 | 6 | |
| 1PCDW 040 200 S06 | 4 X R0.1 | 5 | 20 | 80 | 6 | |
| 1PCDW 040 300 S06 | 4 X R0.1 | 5 | 30 | 80 | 6 | |
| 2PCDW 060 100 S06 | 6 X R0.1 | 10 | - | 60 | 6 | |
| 2PCDW 060 200 S06 | 6 X R0.1 | 10 | 20 | 90 | 6 | |
| 2PCDW 060 300 S06 | 6 X R0.1 | 10 | 30 | 90 | 6 | |
| 2PCDW 060 400 S06 | 6 X R0.1 | 10 | 40 | 100 | 6 | |
| 2PCDW 080 300 S08 | 8 X R0.1 | 10 | 30 | 80 | 8 | |
| 2PCDW 080 500 S08 | 8 X R0.1 | 10 | 50 | 150 | 8 | |
| 2PCDW 100 300 S10 | 10 X R0.1 | 12 | 30 | 80 | 10 | |
| 2PCDW 100 500 S10 | 10 X R0.1 | 12 | 50 | 150 | 10 | |
| 2PCDW 120 300 S12 | 12 X R0.1 | 12 | 30 | 80 | 12 | |
| 2PCDW 120 500 S12 | 12 X R0.1 | 12 | 50 | 150 | 12 | |

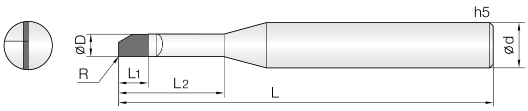
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

# 1&2CPCDW

## 1&2 Flutes PCD Coner Radius Endmills by Wire Processing

## 1&2날 와이어 가공 PCD 코너 레디우스 엔드밀



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- The edge of the PCD flute enables excellent surface finish and wear resistance during graphite machining.
- An additional polishing process on the edge of flutes to facilitates the cutting chip emission.


R0.2 ~ 1 518P

| D Size | D Tolerance |
|---|---|
| Ø 4 ~ 6 | +0 ~ -0.012mm |
| Ø 8 ~ 10 | +0 ~ -0.015mm |
| Ø 12 | +0 ~ -0.018mm |

단위 : mm

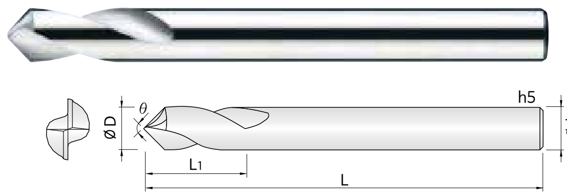
| Order Number | 날경 Diameter D×R | 날장 Length of cut L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 1CPCDW 040 002 100 | 4 X R0.2 | 5 | 10 | 50 | 6 | |
| 1CPCDW 040 003 100 | 4 X R0.3 | 5 | 10 | 50 | 6 | |
| 2CPCDW 060 003 200 | 6 X R0.3 | 6 | 20 | 60 | 6 | |
| 2CPCDW 060 003 250 | 6 X R0.3 | 15 | 25 | 60 | 6 | |
| 2CPCDW 060 005 200 | 6 X R0.5 | 6 | 20 | 60 | 6 | |
| 2CPCDW 060 005 250 | 6 X R0.5 | 15 | 25 | 60 | 6 | |
| 2CPCDW 060 010 200 | 6 X R1 | 6 | 20 | 60 | 6 | |
| 2CPCDW 060 010 250 | 6 X R1 | 15 | 25 | 60 | 6 | |
| 2CPCDW 080 003 200 | 8 X R0.3 | 8 | 20 | 60 | 8 | |
| 2CPCDW 080 003 250 | 8 X R0.3 | 15 | 25 | 60 | 8 | |
| 2CPCDW 080 005 200 | 8 X R0.5 | 8 | 20 | 60 | 8 | |
| 2CPCDW 080 005 250 | 8 X R0.5 | 15 | 25 | 60 | 8 | |
| 2CPCDW 080 010 200 | 8 X R1 | 8 | 20 | 60 | 8 | |
| 2CPCDW 080 010 250 | 8 X R1 | 15 | 25 | 60 | 8 | |
| 2CPCDW 100 005 250 | 10 X R0.5 | 10 | 25 | 70 | 10 | |
| 2CPCDW 100 005 300 | 10 X R0.5 | 15 | 30 | 70 | 10 | |
| 2CPCDW 100 010 250 | 10 X R1 | 10 | 25 | 70 | 10 | |
| 2CPCDW 100 010 300 | 10 X R1 | 15 | 30 | 70 | 10 | |
| 2CPCDW 120 005 250 | 12 X R0.5 | 10 | 25 | 80 | 12 | |
| 2CPCDW 120 005 300 | 12 X R0.5 | 15 | 30 | 80 | 12 | |
| 2CPCDW 120 010 250 | 12 X R1 | 10 | 25 | 80 | 12 | |
| 2CPCDW 120 010 300 | 12 X R1 | 15 | 30 | 80 | 12 | |

PCD series

# 2SPO

Carbide 2 Flutes NC Spotting Drills

## 초경2날 NC 스포팅 드릴




- **HRc50이하 고경도강, 프리하든강, 공구강, 주철 등 피삭재 가공**
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 헬릭스 타입 2날을 적용하여 센터링 작업에 적합합니다.
- 코팅과 비코팅으로 구분하여 수지, 아크릴 등의 가공도 가능합니다.
- 미립자 초경합금을 채택하여 다양한 비철합금 및 목업의 피삭재 영역에 적용 가능합니다.

- **Drills for various work materials, hardened steels(~HRc50), pre-hardened steels, tool steels and cast irons**
- Good wear resistance by Si-based PVD coating.
- Optimum for centering with helix 2flutes.
- Resin, plastic machining applicable witn coated or non coated endmill.
- Applied fine WC grade optimized for various non-ferrous and non-metallic work materials.


518P

| D Size | D Tolerance |
|---|---|
| Ø0.3 ~ 4 | +0 ~ -0.012mm |
| Ø6 ~ 12 | -0.01 ~ -0.025mm |
| Ø16 | -0.015 ~ -0.03mm |

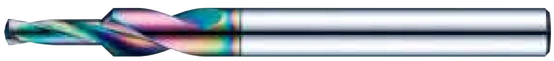
단위 : mm

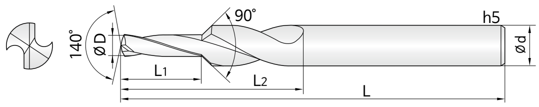
| Order Number 비코팅 Un coated | Order Number 코팅 Coated | 날경 Diameter D | 각도 Angle θ | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 비코팅 Un coated | 비고 코팅 Coated |
|---|---|---|---|---|---|---|---|---|
| 2SPO 003 090 040 | 2SPOC 003 090 040 | 0.3 | 90° | 0.9 | 40 | 3 | | |
| 2SPO 005 090 040 | 2SPOC 005 090 040 | 0.5 | 90° | 1.5 | 40 | 3 | | |
| 2SPO 008 090 040 | 2SPOC 008 090 040 | 0.8 | 90° | 2.4 | 40 | 3 | | |
| 2SPO 010 090 050 | 2SPOC 010 090 050 | 1 | 90° | 3 | 50 | 3 | | |
| | 2SPOC 010 090 080 | 1 | 90° | 3 | 80 | 3 | | |
| 2SPO 010 120 050 | 2SPOC 010 120 050 | 1 | 120° | 3 | 50 | 3 | | |
| 2SPO 015 090 050 | 2SPOC 015 090 050 | 1.5 | 90° | 4.5 | 50 | 3 | | |
| 2SPO 020 090 050 | 2SPOC 020 090 050 | 2 | 90° | 6 | 50 | 3 | | |
| | 2SPOC 020 090 080 | 2 | 90° | 6 | 80 | 3 | | |
| 2SPO 020 120 050 | 2SPOC 020 120 050 | 2 | 120° | 6 | 50 | 3 | | |
| 2SPO 030 090 050 | 2SPOC 030 090 050 | 3 | 90° | 10 | 50 | 3 | | |
| 2SPO 030 120 050 | 2SPOC 030 120 050 | 3 | 120° | 10 | 50 | 3 | | |
| 2SPO 030 090 100 | 2SPOC 030 090 100 | 3 | 90° | 10 | 100 | 3 | | |
| 2SPO 030 120 100 | 2SPOC 030 120 100 | 3 | 120° | 10 | 100 | 3 | | |
| 2SPO 040 090 050 | 2SPOC 040 090 050 | 4 | 90° | 12 | 50 | 4 | | |
| 2SPO 040 120 050 | 2SPOC 040 120 050 | 4 | 120° | 12 | 50 | 4 | | |
| 2SPO 040 090 100 | 2SPOC 040 090 100 | 4 | 90° | 12 | 100 | 4 | | |
| 2SPO 040 120 100 | 2SPOC 040 120 100 | 4 | 120° | 12 | 100 | 4 | | |
| New 2SPO 050 090 060 | 2SPOC 050 090 060 | 5 | 90 | 13 | 60 | 5 | | |
| New 2SPO 050 120 060 | 2SPOC 050 120 060 | 5 | 120 | 13 | 60 | 5 | | |
| New 2SPO 050 090 110 | 2SPOC 050 090 110 | 5 | 90 | 13 | 110 | 5 | | |
| New 2SPO 050 120 110 | 2SPOC 050 120 110 | 5 | 120 | 13 | 110 | 5 | | |
| 2SPO 060 090 070 | 2SPOC 060 090 070 | 6 | 90° | 15 | 70 | 6 | | |
| 2SPO 060 120 070 | 2SPOC 060 120 070 | 6 | 120° | 15 | 70 | 6 | | |
| 2SPO 060 090 110 | 2SPOC 060 090 110 | 6 | 90° | 15 | 110 | 6 | | |
| | 2SPOC 060 090 150 | 6 | 90° | 15 | 150 | 6 | | |
| 2SPO 060 120 110 | 2SPOC 060 120 110 | 6 | 120° | 15 | 110 | 6 | | |
| 2SPO 080 090 080 | 2SPOC 080 090 080 | 8 | 90° | 25 | 80 | 8 | | |
| | 2SPOC 080 090 150 | 8 | 90° | 25 | 150 | 8 | | |
| 2SPO 080 120 080 | 2SPOC 080 120 080 | 8 | 120° | 25 | 80 | 8 | | |
| 2SPO 100 090 090 | 2SPOC 100 090 090 | 10 | 90° | 25 | 90 | 10 | | |
| 2SPO 100 120 090 | 2SPOC 100 120 090 | 10 | 120° | 25 | 90 | 10 | | |
| 2SPO 100 090 150 | 2SPOC 100 090 150 | 10 | 90° | 25 | 150 | 10 | | |
| 2SPO 100 120 150 | 2SPOC 100 120 150 | 10 | 120° | 25 | 150 | 10 | | |
| 2SPO 120 090 090 | 2SPOC 120 090 090 | 12 | 90° | 30 | 90 | 12 | | |
| 2SPO 120 120 090 | 2SPOC 120 120 090 | 12 | 120° | 30 | 90 | 12 | | |
| 2SPO 120 090 150 | 2SPOC 120 090 150 | 12 | 90° | 30 | 150 | 12 | | |
| 2SPO 120 120 150 | 2SPOC 120 120 150 | 12 | 120° | 30 | 150 | 12 | | |
| 2SPO 160 090 110 | 2SPOC 160 090 110 | 16 | 90° | 35 | 110 | 16 | | |
| 2SPO 160 120 110 | 2SPOC 160 120 110 | 16 | 120° | 35 | 110 | 16 | | |

# 2STD

*Carbide 2 Flutes Step Drills*

## 초경 2날 스텝 드릴






- **프리하든강, 일반강, 주물, 비철합금 가공 드릴**
- 드릴링과 면취, 카운터 작업을 동시에 가공할 수 있는 다기능 드릴입니다.
- HR 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며 피삭재의 면조도가 향상됩니다
- 다양한 피삭재 영역에 적용이 가능합니다.

- **Drills for pre-hardened steels, mild steels, cast irons and non-ferrous alloys**
- A multifunctional drill capable of simultaneously processing drilling,
- chamfering, and counter operations.
- HR coating reduces stress on the edge and improves the
- surface of roughness of the workpiece.
  It can be applied to various of workpieces.

2 | WC 미립자 | HR Coating | 18° Helix Angle | 140° | CUTTING DATA 518P

| D Size | D Tolerance |
|---|---|
| Ø 3.4 ~ 5.1 | +0 ~ -0.02mm |
| Ø 6.9 ~ 10.3 | +0 ~ -0.025mm |

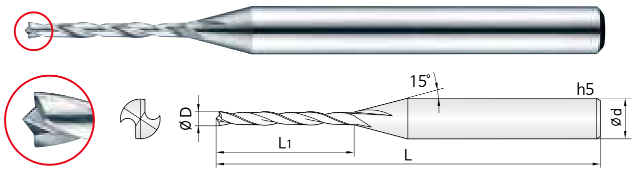
단위 : mm

| Order Number | 날경 Diameter D | 텝 TAP | 날장 Length of cut L1 | 홈길이 Flute Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|---|
| 2STD 034 080 S06 | 3.4 | M4 | 8 | 22 | 75 | 6 | |
| 2STD 034 120 S06 | 3.4 | M4 | 12 | 27 | 75 | 6 | |
| 2STD 043 100 S08 | 4.3 | M5 | 10 | 25 | 80 | 8 | |
| 2STD 043 150 S08 | 4.3 | M5 | 15 | 30 | 80 | 8 | |
| 2STD 051 120 S08 | 5.1 | M6 | 12 | 30 | 90 | 8 | |
| 2STD 051 180 S08 | 5.1 | M6 | 18 | 35 | 90 | 8 | |
| 2STD 069 160 S10 | 6.9 | M8 | 16 | 40 | 90 | 10 | |
| 2STD 069 240 S10 | 6.9 | M8 | 24 | 45 | 100 | 10 | |
| 2STD 086 200 S12 | 8.6 | M10 | 20 | 45 | 110 | 12 | |
| 2STD 086 300 S12 | 8.6 | M10 | 30 | 55 | 120 | 12 | |
| 2STD 103 240 S14 | 10.3 | M12 | 24 | 50 | 110 | 14 | |
| 2STD 103 360 S14 | 10.3 | M12 | 36 | 60 | 120 | 14 | |

# 2DED

## Carbide 2 Flutes Deburring Micro Drills

## 초경 2날 디버링 마이크로 드릴




- **알루미늄, 구리, 비철합금, A.B.S수지, 레진 가공 드릴**
- 버를 최소화하기 위한 스페셜한 드릴 헤드 형상을 설계하였습니다.
- 드릴링 작업시 피삭재 센터의 드릴링 워킹 현상을 방지하여 정확한 드릴링 위치와 홀 크기를 제공합니다.
- 극소형 드릴링에 최적화 된 포인트 설계로 안정적인 드릴링을 구현 합니다.

- **Drills for aluminium, copper, non-ferrous alloys, A.B.S and resin**
- Special drill head geometry designed to minimize burrs.
- The drill location and hole size are provided to prevent drill walking in the center of the workpiece during drilling.
- Implements stable drilling with a point design optimized for ultra-small drilling.


519P

| D Size | D Tolerance |
|---|---|
| Ø 0.15 ~ 0.2 | +0 ~ -0.005mm |
| Ø 0.21 ~ 3 | +0 ~ -0.01mm |
| Ø 3.5 ~ 6 | +0 ~ -0.015mm |

단위 : mm

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DED 0015 009 S03 | 0.15 | 0.9 | 40 | 3 | |
| 2DED 0015 018 S03 | 0.15 | 1.8 | 40 | 3 | |
| 2DED 0016 009 S03 | 0.16 | 0.9 | 40 | 3 | |
| 2DED 0016 018 S03 | 0.16 | 1.8 | 40 | 3 | |
| 2DED 0017 009 S03 | 0.17 | 0.9 | 40 | 3 | |
| 2DED 0017 018 S03 | 0.17 | 1.8 | 40 | 3 | |
| 2DED 0018 0105 S03 | 0.18 | 1.05 | 40 | 3 | |
| 2DED 0018 021 S03 | 0.18 | 2.1 | 40 | 3 | |
| 2DED 0019 0105 S03 | 0.19 | 1.05 | 40 | 3 | |
| 2DED 0019 021 S03 | 0.19 | 2.1 | 40 | 3 | |
| 2DED 002 012 S03 | 0.2 | 1.2 | 40 | 3 | |
| 2DED 002 024 S03 | 0.2 | 2.4 | 40 | 3 | |
| 2DED 0021 012 S03 | 0.21 | 1.2 | 40 | 3 | |
| 2DED 0021 024 S03 | 0.21 | 2.4 | 40 | 3 | |
| 2DED 0022 013 S03 | 0.22 | 1.3 | 40 | 3 | |
| 2DED 0022 026 S03 | 0.22 | 2.6 | 40 | 3 | |
| 2DED 0023 013 S03 | 0.23 | 1.3 | 40 | 3 | |
| 2DED 0023 026 S03 | 0.23 | 2.6 | 40 | 3 | |
| 2DED 0024 013 S03 | 0.24 | 1.3 | 40 | 3 | |
| 2DED 0024 026 S03 | 0.24 | 2.6 | 40 | 3 | |
| 2DED 0025 015 S03 | 0.25 | 1.5 | 40 | 3 | |
| 2DED 0025 030 S03 | 0.25 | 3 | 40 | 3 | |
| 2DED 0026 015 S03 | 0.26 | 1.5 | 40 | 3 | |
| 2DED 0026 030 S03 | 0.26 | 3 | 40 | 3 | |
| 2DED 0027 015 S03 | 0.27 | 1.5 | 40 | 3 | |
| 2DED 0027 030 S03 | 0.27 | 3 | 40 | 3 | |
| 2DED 0028 0165 S03 | 0.28 | 1.65 | 40 | 3 | |
| 2DED 0028 033 S03 | 0.28 | 3.3 | 40 | 3 | |
| 2DED 0029 0165 S03 | 0.29 | 1.65 | 40 | 3 | |
| 2DED 0029 033 S03 | 0.29 | 3.3 | 40 | 3 | |
| 2DED 003 025 S03 | 0.3 | 2.5 | 40 | 3 | |
| 2DED 003 050 S03 | 0.3 | 5 | 40 | 3 | |
| 2DED 0035 025 S03 | 0.35 | 2.5 | 40 | 3 | |
| 2DED 0035 050 S03 | 0.35 | 5 | 40 | 3 | |
| 2DED 004 030 S03 | 0.4 | 3 | 40 | 3 | |
| 2DED 004 060 S03 | 0.4 | 6 | 40 | 3 | |
| 2DED 0045 030 S03 | 0.45 | 3 | 40 | 3 | |
| 2DED 0045 060 S03 | 0.45 | 6 | 40 | 3 | |
| 2DED 005 030 S03 | 0.5 | 3 | 40 | 3 | |
| 2DED 005 060 S03 | 0.5 | 6 | 40 | 3 | |
| 2DED 0055 030 S03 | 0.55 | 3 | 40 | 3 | |
| 2DED 0055 060 S03 | 0.55 | 6 | 40 | 3 | |
| 2DED 006 035 S03 | 0.6 | 3.5 | 40 | 3 | |
| 2DED 006 070 S03 | 0.6 | 7 | 40 | 3 | |
| 2DED 0065 035 S03 | 0.65 | 3.5 | 40 | 3 | |
| 2DED 0065 070 S03 | 0.65 | 7 | 40 | 3 | |
| 2DED 007 040 S03 | 0.7 | 4 | 40 | 3 | |
| 2DED 007 080 S03 | 0.7 | 8 | 40 | 3 | |
| 2DED 0075 040 S03 | 0.75 | 4 | 40 | 3 | |
| 2DED 0075 080 S03 | 0.75 | 8 | 40 | 3 | |

| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DED 008 040 S03 | 0.8 | 4 | 40 | 3 | |
| 2DED 008 080 S03 | 0.8 | 8 | 40 | 3 | |
| 2DED 0085 040 S03 | 0.85 | 4 | 40 | 3 | |
| 2DED 0085 080 S03 | 0.85 | 8 | 40 | 3 | |
| 2DED 009 040 S03 | 0.9 | 4 | 40 | 3 | |
| 2DED 009 080 S03 | 0.9 | 8 | 40 | 3 | |
| 2DED 0095 040 S03 | 0.95 | 4 | 40 | 3 | |
| 2DED 0095 080 S03 | 0.95 | 8 | 40 | 3 | |
| 2DED 010 050 S03 | 1 | 5 | 40 | 3 | |
| 2DED 010 100 S03 | 1 | 10 | 40 | 3 | |
| 2DED 011 050 S03 | 1.1 | 5 | 40 | 3 | |
| 2DED 011 100 S03 | 1.1 | 10 | 40 | 3 | |
| 2DED 012 050 S03 | 1.2 | 5 | 40 | 3 | |
| 2DED 012 100 S03 | 1.2 | 10 | 40 | 3 | |
| 2DED 013 050 S03 | 1.3 | 5 | 40 | 3 | |
| 2DED 013 100 S03 | 1.3 | 10 | 40 | 3 | |
| 2DED 014 050 S03 | 1.4 | 5 | 40 | 3 | |
| 2DED 014 100 S03 | 1.4 | 10 | 40 | 3 | |
| 2DED 015 075 S03 | 1.5 | 7.5 | 45 | 3 | |
| 2DED 015 150 S03 | 1.5 | 15 | 45 | 3 | |
| 2DED 016 075 S03 | 1.6 | 7.5 | 45 | 3 | |
| 2DED 016 150 S03 | 1.6 | 15 | 45 | 3 | |
| 2DED 017 075 S03 | 1.7 | 7.5 | 45 | 3 | |
| 2DED 017 150 S03 | 1.7 | 15 | 45 | 3 | |
| 2DED 018 075 S03 | 1.8 | 7.5 | 45 | 3 | |
| 2DED 018 150 S03 | 1.8 | 15 | 45 | 3 | |
| 2DED 019 075 S03 | 1.9 | 7.5 | 45 | 3 | |
| 2DED 019 150 S03 | 1.9 | 15 | 45 | 3 | |
| 2DED 020 110 S03 | 2 | 11 | 50 | 3 | |
| 2DED 020 220 S03 | 2 | 22 | 50 | 3 | |
| 2DED 021 110 S03 | 2.1 | 11 | 50 | 3 | |
| 2DED 021 220 S03 | 2.1 | 22 | 50 | 3 | |
| 2DED 022 110 S03 | 2.2 | 11 | 50 | 3 | |
| 2DED 022 220 S03 | 2.2 | 22 | 50 | 3 | |
| 2DED 023 110 S03 | 2.3 | 11 | 50 | 3 | |
| 2DED 023 220 S03 | 2.3 | 22 | 50 | 3 | |
| 2DED 024 110 S03 | 2.4 | 11 | 50 | 3 | |
| 2DED 024 220 S03 | 2.4 | 22 | 50 | 3 | |
| 2DED 025 110 S03 | 2.5 | 11 | 50 | 3 | |
| 2DED 025 220 S03 | 2.5 | 22 | 50 | 3 | |
| 2DED 026 110 S03 | 2.6 | 11 | 50 | 3 | |
| 2DED 026 220 S03 | 2.6 | 22 | 50 | 3 | |
| 2DED 027 125 S03 | 2.7 | 12.5 | 50 | 3 | |
| 2DED 027 250 S03 | 2.7 | 25 | 50 | 3 | |
| 2DED 028 125 S03 | 2.8 | 12.5 | 50 | 3 | |
| 2DED 028 250 S03 | 2.8 | 25 | 50 | 3 | |
| 2DED 029 125 S03 | 2.9 | 12.5 | 50 | 3 | |
| 2DED 029 250 S03 | 2.9 | 25 | 50 | 3 | |
| 2DED 030 125 S03 | 3 | 12.5 | 50 | 3 | |
| 2DED 030 250 S03 | 3 | 25 | 50 | 3 | |

단위 : mm

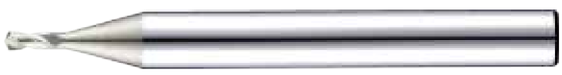
| Order Number | 날경 Diameter D | 날장 Length of cut L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DED 035 175 S04 | 3.5 | 17.5 | 75 | 4 | |
| 2DED 035 350 S04 | 3.5 | 35 | 75 | 4 | |
| 2DED 040 200 S04 | 4 | 20 | 85 | 4 | |
| 2DED 040 400 S04 | 4 | 40 | 85 | 4 | |
| 2DED 045 210 S06 | 4.5 | 21 | 85 | 6 | |
| 2DED 045 420 S06 | 4.5 | 42 | 85 | 6 | |
| 2DED 050 225 S06 | 5 | 22.5 | 90 | 6 | |
| 2DED 050 450 S06 | 5 | 45 | 90 | 6 | |
| 2DED 055 225 S06 | 5.5 | 22.5 | 95 | 6 | |
| 2DED 055 450 S06 | 5.5 | 45 | 95 | 6 | |
| 2DED 060 250 S06 | 6 | 25 | 100 | 6 | |
| 2DED 060 500 S06 | 6 | 50 | 100 | 6 | |

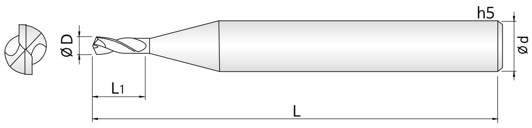
# 2MID

## Carbide 2 Flutes Micro Drills

## 초경 2날 마이크로 드릴

New






- **중저 탄소강, 동합금, 알루미늄용 고정도 드릴**
- 다양한 규격으로 정밀 기계부품, IT부품 분야에 극소경 작업이 가능합니다.
- 특수한 인선처리로 뛰어난 고정도, 고능률 작업이 가능합니다.
- 저마찰과 내소착 및 이형성이 우수한 T-CRO코팅을 적용하여 내마모성이 뛰어납니다.

- **High-precision drills for low to medium carbon steels, non-ferrous alloys, and aluminum**
- Capable of ultra-precision work in the field of precision mechanical components and IT components with various specifications.
- Excellent precision and high-efficiency operations are possible with special edge treatment.
- Outstanding wear resistance with the application of T-CRO coating, which has low friction, superior adhesion resistance, and deformability.


519P

단위 : mm

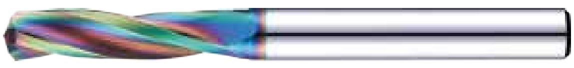
| Order Number | 날경<br>Diameter<br>D | 홈길이<br>Flute Length<br>L1 | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d | 비고 |
|---|---|---|---|---|---|
| 2MID 005 015 S03 | 0.5 | 1.5 | 40 | 3 | |
| 2MID 005 025 S03 | 0.5 | 2.5 | 40 | 3 | |
| 2MID 0055 018 S03 | 0.55 | 1.8 | 40 | 3 | |
| 2MID 0055 030 S03 | 0.55 | 3 | 40 | 3 | |
| 2MID 006 018 S03 | 0.6 | 1.8 | 40 | 3 | |
| 2MID 006 030 S03 | 0.6 | 3 | 40 | 3 | |
| 2MID 0065 021 S03 | 0.65 | 2.1 | 40 | 3 | |
| 2MID 0065 035 S03 | 0.65 | 3.5 | 40 | 3 | |
| 2MID 007 021 S03 | 0.7 | 2.1 | 40 | 3 | |
| 2MID 007 035 S03 | 0.7 | 3.5 | 40 | 3 | |
| 2MID 0075 024 S03 | 0.75 | 2.4 | 40 | 3 | |
| 2MID 0075 040 S03 | 0.75 | 4 | 40 | 3 | |
| 2MID 008 024 S03 | 0.8 | 2.4 | 40 | 3 | |
| 2MID 008 040 S03 | 0.8 | 4 | 40 | 3 | |
| 2MID 0085 027 S03 | 0.85 | 2.7 | 40 | 3 | |
| 2MID 0085 045 S03 | 0.85 | 4.5 | 40 | 3 | |
| 2MID 009 027 S03 | 0.9 | 2.7 | 40 | 3 | |
| 2MID 009 045 S03 | 0.9 | 4.5 | 40 | 3 | |
| 2MID 0095 030 S03 | 0.95 | 3 | 40 | 3 | |
| 2MID 0095 050 S03 | 0.95 | 5 | 40 | 3 | |
| 2MID 010 030 S03 | 1 | 3 | 40 | 3 | |
| 2MID 0105 033 S03 | 1.05 | 3.3 | 40 | 3 | |
| 2MID 011 033 S03 | 1.1 | 3.3 | 40 | 3 | |
| 2MID 0115 036 S03 | 1.15 | 3.6 | 40 | 3 | |
| 2MID 012 036 S03 | 1.2 | 3.6 | 40 | 3 | |
| 2MID 0125 039 S03 | 1.25 | 3.9 | 40 | 3 | |
| 2MID 013 039 S03 | 1.3 | 3.9 | 40 | 3 | |
| 2MID 0135 042 S03 | 1.35 | 4.2 | 40 | 3 | |
| 2MID 014 042 S03 | 1.4 | 4.2 | 40 | 3 | |
| 2MID 0145 045 S03 | 1.45 | 4.5 | 40 | 3 | |
| 2MID 015 045 S03 | 1.5 | 4.5 | 40 | 3 | |
| 2MID 0155 048 S03 | 1.55 | 4.8 | 40 | 3 | |
| 2MID 016 048 S03 | 1.6 | 4.8 | 40 | 3 | |
| 2MID 0165 051 S03 | 1.65 | 5.1 | 40 | 3 | |
| 2MID 017 051 S03 | 1.7 | 5.1 | 40 | 3 | |
| 2MID 0175 054 S03 | 1.75 | 5.4 | 40 | 3 | |
| 2MID 018 054 S03 | 1.8 | 5.4 | 40 | 3 | |
| 2MID 0185 057 S03 | 1.85 | 5.7 | 40 | 3 | |
| 2MID 019 057 S03 | 1.9 | 5.7 | 40 | 3 | |
| 2MID 0195 060 S03 | 1.95 | 6 | 40 | 3 | |
| 2MID 020 060 S03 | 2 | 6 | 40 | 3 | |
| 2MID 0205 063 S03 | 2.05 | 6.3 | 40 | 3 | |
| 2MID 021 063 S03 | 2.1 | 6.3 | 40 | 3 | |
| 2MID 0215 066 S03 | 2.15 | 6.6 | 40 | 3 | |
| 2MID 022 066 S03 | 2.2 | 6.6 | 40 | 3 | |
| 2MID 0225 069 S03 | 2.25 | 6.9 | 40 | 3 | |
| 2MID 023 069 S03 | 2.3 | 6.9 | 40 | 3 | |
| 2MID 0235 072 S03 | 2.35 | 7.2 | 40 | 3 | |
| 2MID 024 072 S03 | 2.4 | 7.2 | 40 | 3 | |
| 2MID 0245 075 S03 | 2.45 | 7.5 | 40 | 3 | |
| 2MID 025 075 S03 | 2.5 | 7.5 | 40 | 3 | |
| 2MID 0255 078 S03 | 2.55 | 7.8 | 40 | 3 | |
| 2MID 026 078 S03 | 2.6 | 7.8 | 40 | 3 | |
| 2MID 0265 081 S03 | 2.65 | 8.1 | 40 | 3 | |
| 2MID 027 081 S03 | 2.7 | 8.1 | 40 | 3 | |
| 2MID 0275 084 S03 | 2.75 | 8.4 | 40 | 3 | |
| 2MID 028 084 S03 | 2.8 | 8.4 | 40 | 3 | |
| 2MID 0285 087 S03 | 2.85 | 8.7 | 40 | 3 | |
| 2MID 029 087 S03 | 2.9 | 8.7 | 40 | 3 | |
| 2MID 0295 090 S03 | 2.95 | 9 | 40 | 3 | |
| 2MID 030 090 S03 | 3 | 9 | 40 | 3 | |

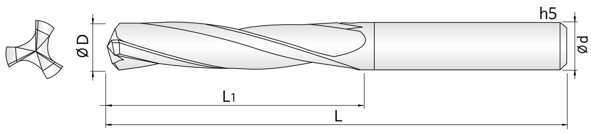
# 3DUBEH

## Carbide 3 Flutes Dube H Drill for hardened Steels

## 초경 3날 두배 H 드릴

New






- **고경도강(HRc52~65), 열처리강 계열의 강력 드릴**
- HR코팅으로 내열성과 내마모성이 우수, 긴 공구수명을 실현 하였습니다.
- 치핑을 최소화 하는 Point thinning을 적용 하였습니다.
- 140도와 90도의 선단각과 최적의 플루트 형상 설계로 공구의 성능을 극대화하였습니다.
- 칩 배출력과 드릴의 강성을 고려한 플루트 홈 설계로 안정적인 드릴링을 구현합니다.

- **Powerful drills for hardened steels(HRc52~65) and heat-treated steels**
- Longer tool life HR coating which provides excellent heat resistance and wear resistance.
- Point thinning was applied to minimize chipping.
- With an optimal flute design and 90 and 140-degree point angle, the tool's performance is maximized.
- Implements stable drilling with a flute groove design considering chip evacuation and drill rigidity.


520P

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 3DUBEH 010 060 S03 | 1 | 6 | 40 | 3 | |
| 3DUBEH 011 060 S03 | 1.1 | 6 | 40 | 3 | |
| 3DUBEH 012 060 S03 | 1.2 | 6 | 40 | 3 | |
| 3DUBEH 013 080 S03 | 1.3 | 8 | 40 | 3 | |
| 3DUBEH 014 080 S03 | 1.4 | 8 | 40 | 3 | |
| 3DUBEH 015 080 S03 | 1.5 | 8 | 40 | 3 | |
| 3DUBEH 016 100 S03 | 1.6 | 10 | 40 | 3 | |
| 3DUBEH 017 100 S03 | 1.7 | 10 | 40 | 3 | |
| 3DUBEH 018 100 S03 | 1.8 | 10 | 40 | 3 | |
| 3DUBEH 019 100 S03 | 1.9 | 10 | 40 | 3 | |
| 3DUBEH 020 120 S03 | 2 | 12 | 45 | 3 | |
| 3DUBEH 021 120 S03 | 2.1 | 12 | 45 | 3 | |
| 3DUBEH 022 120 S03 | 2.2 | 12 | 45 | 3 | |
| 3DUBEH 023 120 S03 | 2.3 | 12 | 45 | 3 | |
| 3DUBEH 024 120 S03 | 2.4 | 12 | 45 | 3 | |
| 3DUBEH 025 130 S03 | 2.5 | 13 | 45 | 3 | |
| 3DUBEH 026 130 S03 | 2.6 | 13 | 45 | 3 | |
| 3DUBEH 027 130 S03 | 2.7 | 13 | 45 | 3 | |
| 3DUBEH 028 130 S03 | 2.8 | 13 | 45 | 3 | |
| 3DUBEH 029 130 S03 | 2.9 | 13 | 45 | 3 | |
| 3DUBEH 030 130 S03 | 3 | 13 | 45 | 3 | |
| 3DUBEH 031 190 S04 | 3.1 | 19 | 55 | 4 | |
| 3DUBEH 032 190 S04 | 3.2 | 19 | 55 | 4 | |
| 3DUBEH 033 190 S04 | 3.3 | 19 | 55 | 4 | |
| 3DUBEH 034 190 S04 | 3.4 | 19 | 55 | 4 | |
| 3DUBEH 035 190 S04 | 3.5 | 19 | 55 | 4 | |
| 3DUBEH 036 210 S04 | 3.6 | 21 | 55 | 4 | |
| 3DUBEH 037 210 S04 | 3.7 | 21 | 55 | 4 | |
| 3DUBEH 038 210 S04 | 3.8 | 21 | 55 | 4 | |
| 3DUBEH 039 210 S04 | 3.9 | 21 | 55 | 4 | |
| 3DUBEH 040 210 S04 | 4 | 21 | 55 | 4 | |
| 3DUBEH 041 230 S06 | 4.1 | 23 | 60 | 6 | |
| 3DUBEH 042 230 S06 | 4.2 | 23 | 60 | 6 | |
| 3DUBEH 043 230 S06 | 4.3 | 23 | 60 | 6 | |
| 3DUBEH 044 230 S06 | 4.4 | 23 | 60 | 6 | |
| 3DUBEH 045 230 S06 | 4.5 | 23 | 60 | 6 | |
| 3DUBEH 046 250 S06 | 4.6 | 25 | 60 | 6 | |
| 3DUBEH 047 250 S06 | 4.7 | 25 | 60 | 6 | |
| 3DUBEH 048 250 S06 | 4.8 | 25 | 60 | 6 | |
| 3DUBEH 049 250 S06 | 4.9 | 25 | 60 | 6 | |
| 3DUBEH 050 250 S06 | 5 | 25 | 60 | 6 | |
| 3DUBEH 051 250 S06 | 5.1 | 25 | 65 | 6 | |
| 3DUBEH 052 250 S06 | 5.2 | 25 | 65 | 6 | |
| 3DUBEH 053 250 S06 | 5.3 | 25 | 65 | 6 | |
| 3DUBEH 054 250 S06 | 5.4 | 25 | 65 | 6 | |
| 3DUBEH 055 250 S06 | 5.5 | 25 | 65 | 6 | |
| 3DUBEH 056 270 S06 | 5.6 | 27 | 65 | 6 | |
| 3DUBEH 057 270 S06 | 5.7 | 27 | 65 | 6 | |
| 3DUBEH 058 270 S06 | 5.8 | 27 | 65 | 6 | |
| 3DUBEH 059 270 S06 | 5.9 | 27 | 65 | 6 | |

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 3DUBEH 060 270 S06 | 6 | 27 | 65 | 6 | |
| 3DUBEH 061 310 S08 | 6.1 | 31 | 75 | 8 | |
| 3DUBEH 062 310 S08 | 6.2 | 31 | 75 | 8 | |
| 3DUBEH 063 310 S08 | 6.3 | 31 | 75 | 8 | |
| 3DUBEH 064 310 S08 | 6.4 | 31 | 75 | 8 | |
| 3DUBEH 065 310 S08 | 6.5 | 31 | 75 | 8 | |
| 3DUBEH 066 330 S08 | 6.6 | 33 | 75 | 8 | |
| 3DUBEH 067 330 S08 | 6.7 | 33 | 75 | 8 | |
| 3DUBEH 068 330 S08 | 6.8 | 33 | 75 | 8 | |
| 3DUBEH 069 330 S08 | 6.9 | 33 | 75 | 8 | |
| 3DUBEH 070 330 S08 | 7 | 33 | 75 | 8 | |
| 3DUBEH 071 330 S08 | 7.1 | 33 | 80 | 8 | |
| 3DUBEH 072 330 S08 | 7.2 | 33 | 80 | 8 | |
| 3DUBEH 073 330 S08 | 7.3 | 33 | 80 | 8 | |
| 3DUBEH 074 330 S08 | 7.4 | 33 | 80 | 8 | |
| 3DUBEH 075 330 S08 | 7.5 | 33 | 80 | 8 | |
| 3DUBEH 076 360 S08 | 7.6 | 36 | 80 | 8 | |
| 3DUBEH 077 360 S08 | 7.7 | 36 | 80 | 8 | |
| 3DUBEH 078 360 S08 | 7.8 | 36 | 80 | 8 | |
| 3DUBEH 079 360 S08 | 7.9 | 36 | 80 | 8 | |
| 3DUBEH 080 360 S08 | 8 | 36 | 80 | 8 | |
| 3DUBEH 081 360 S10 | 8.1 | 36 | 85 | 10 | |
| 3DUBEH 082 360 S10 | 8.2 | 36 | 85 | 10 | |
| 3DUBEH 083 360 S10 | 8.3 | 36 | 85 | 10 | |
| 3DUBEH 084 360 S10 | 8.4 | 36 | 85 | 10 | |
| 3DUBEH 085 360 S10 | 8.5 | 36 | 85 | 10 | |
| 3DUBEH 086 380 S10 | 8.6 | 38 | 85 | 10 | |
| 3DUBEH 087 380 S10 | 8.7 | 38 | 85 | 10 | |
| 3DUBEH 088 380 S10 | 8.8 | 38 | 85 | 10 | |
| 3DUBEH 089 380 S10 | 8.9 | 38 | 85 | 10 | |
| 3DUBEH 090 380 S10 | 9 | 38 | 85 | 10 | |
| 3DUBEH 091 380 S10 | 9.1 | 38 | 90 | 10 | |
| 3DUBEH 092 380 S10 | 9.2 | 38 | 90 | 10 | |
| 3DUBEH 093 380 S10 | 9.3 | 38 | 90 | 10 | |
| 3DUBEH 094 380 S10 | 9.4 | 38 | 90 | 10 | |
| 3DUBEH 095 380 S10 | 9.5 | 38 | 90 | 10 | |
| 3DUBEH 096 410 S10 | 9.6 | 41 | 90 | 10 | |
| 3DUBEH 097 410 S10 | 9.7 | 41 | 90 | 10 | |
| 3DUBEH 098 410 S10 | 9.8 | 41 | 90 | 10 | |
| 3DUBEH 099 410 S10 | 9.9 | 41 | 90 | 10 | |
| 3DUBEH 100 410 S10 | 10 | 41 | 90 | 10 | |
| 3DUBEH 101 410 S12 | 10.1 | 41 | 95 | 12 | |
| 3DUBEH 102 410 S12 | 10.2 | 41 | 95 | 12 | |
| 3DUBEH 103 410 S12 | 10.3 | 41 | 95 | 12 | |
| 3DUBEH 104 410 S12 | 10.4 | 41 | 95 | 12 | |
| 3DUBEH 105 410 S12 | 10.5 | 41 | 95 | 12 | |
| 3DUBEH 106 450 S12 | 10.6 | 45 | 95 | 12 | |
| 3DUBEH 107 450 S12 | 10.7 | 45 | 95 | 12 | |
| 3DUBEH 108 450 S12 | 10.8 | 45 | 95 | 12 | |
| 3DUBEH 109 450 S12 | 10.9 | 45 | 95 | 12 | |

단위 : mm

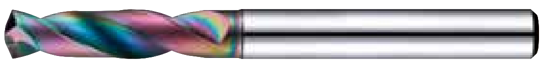
| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 3DUBEH 110 450 S12 | 11 | 45 | 95 | 12 | |
| 3DUBEH 111 450 S12 | 11.1 | 45 | 100 | 12 | |
| 3DUBEH 112 450 S12 | 11.2 | 45 | 100 | 12 | |
| 3DUBEH 113 450 S12 | 11.3 | 45 | 100 | 12 | |
| 3DUBEH 114 450 S12 | 11.4 | 45 | 100 | 12 | |
| 3DUBEH 115 450 S12 | 11.5 | 45 | 100 | 12 | |
| 3DUBEH 116 470 S12 | 11.6 | 47 | 100 | 12 | |
| 3DUBEH 117 470 S12 | 11.7 | 47 | 100 | 12 | |
| 3DUBEH 118 470 S12 | 11.8 | 47 | 100 | 12 | |
| 3DUBEH 119 470 S12 | 11.9 | 47 | 100 | 12 | |
| 3DUBEH 120 470 S12 | 12 | 47 | 100 | 12 | |
| 3DUBEH 130 490 S14 | 13 | 49 | 100 | 14 | |
| 3DUBEH 140 520 S14 | 14 | 52 | 110 | 14 | |
| 3DUBEH 150 530 S16 | 15 | 53 | 110 | 16 | |
| 3DUBEH 160 550 S16 | 16 | 55 | 120 | 16 | |

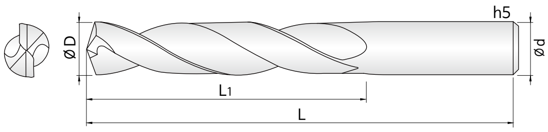
# 2DUBES

## Carbide 2 Flutes Dube S Drills (Strong) - [3XD]

## 초경 2날 두배 S 드릴 [3XD]

New






- **HRc48이하, NAK, SCM, 열처리강용 강력 드릴**
- 우수한 내마모성의 HR코팅을 적용하여 장시간 가공에 적합합니다.
- 절삭 저항을 최소화하는 Point thinning을 채택 하였습니다.
- 열 배출의 최적화 된 형상으로 안정적인 공구의 수명을 유지합니다.
- 칩 배출력과 드릴의 강성을 고려한 플루트 홈 설계를 적용하여 우수한 칩배출을 실현합니다.

- **Powerful drills for materials up to HRc48, NAK, SCM, and heat-treated steels**
- Suitable for long-term machining with excellent wear resistance HR coating.
- Adopted Point thinning to minimize cutting resistance.
- Maintains the stable lifespan of the tool with an optimized shape for heat dissipation.
- Achieves excellent chip evacuation with flute groove design considering chip evacuation and drill rigidity.


521P

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBES 010 080 S03 | 1 | 8 | 40 | 3 | |
| 2DUBES 011 080 S03 | 1.1 | 8 | 40 | 3 | |
| 2DUBES 012 080 S03 | 1.2 | 8 | 40 | 3 | |
| 2DUBES 013 080 S03 | 1.3 | 8 | 40 | 3 | |
| 2DUBES 014 080 S03 | 1.4 | 8 | 40 | 3 | |
| 2DUBES 015 080 S03 | 1.5 | 8 | 50 | 3 | |
| 2DUBES 016 080 S03 | 1.6 | 8 | 50 | 3 | |
| 2DUBES 017 100 S03 | 1.7 | 10 | 50 | 3 | |
| 2DUBES 018 100 S03 | 1.8 | 10 | 50 | 3 | |
| 2DUBES 019 100 S03 | 1.9 | 10 | 50 | 3 | |
| 2DUBES 020 160 S04 | 2 | 16 | 50 | 4 | |
| 2DUBES 021 160 S04 | 2.1 | 16 | 50 | 4 | |
| 2DUBES 022 160 S04 | 2.2 | 16 | 50 | 4 | |
| 2DUBES 023 160 S04 | 2.3 | 16 | 50 | 4 | |
| 2DUBES 024 160 S04 | 2.4 | 16 | 50 | 4 | |
| 2DUBES 025 200 S04 | 2.5 | 20 | 50 | 4 | |
| 2DUBES 026 200 S04 | 2.6 | 20 | 50 | 4 | |
| 2DUBES 027 200 S04 | 2.7 | 20 | 50 | 4 | |
| 2DUBES 028 200 S04 | 2.8 | 20 | 50 | 4 | |
| 2DUBES 029 200 S04 | 2.9 | 20 | 50 | 4 | |
| 2DUBES 030 200 S06 | 3 | 20 | 60 | 6 | |
| 2DUBES 031 200 S06 | 3.1 | 20 | 60 | 6 | |
| 2DUBES 032 200 S06 | 3.2 | 20 | 60 | 6 | |
| 2DUBES 033 200 S06 | 3.3 | 20 | 60 | 6 | |
| 2DUBES 034 200 S06 | 3.4 | 20 | 60 | 6 | |
| 2DUBES 035 200 S06 | 3.5 | 20 | 60 | 6 | |
| 2DUBES 036 200 S06 | 3.6 | 20 | 60 | 6 | |
| 2DUBES 037 200 S06 | 3.7 | 20 | 60 | 6 | |
| 2DUBES 038 240 S06 | 3.8 | 24 | 65 | 6 | |
| 2DUBES 039 240 S06 | 3.9 | 24 | 65 | 6 | |
| 2DUBES 040 240 S06 | 4 | 24 | 65 | 6 | |
| 2DUBES 041 240 S06 | 4.1 | 24 | 65 | 6 | |
| 2DUBES 042 240 S06 | 4.2 | 24 | 65 | 6 | |
| 2DUBES 043 240 S06 | 4.3 | 24 | 65 | 6 | |
| 2DUBES 044 240 S06 | 4.4 | 24 | 65 | 6 | |
| 2DUBES 045 240 S06 | 4.5 | 24 | 65 | 6 | |
| 2DUBES 046 240 S06 | 4.6 | 24 | 65 | 6 | |
| 2DUBES 047 240 S06 | 4.7 | 24 | 65 | 6 | |
| 2DUBES 048 280 S06 | 4.8 | 28 | 65 | 6 | |
| 2DUBES 049 280 S06 | 4.9 | 28 | 65 | 6 | |
| 2DUBES 050 280 S06 | 5 | 28 | 65 | 6 | |
| 2DUBES 051 280 S06 | 5.1 | 28 | 65 | 6 | |
| 2DUBES 052 280 S06 | 5.2 | 28 | 65 | 6 | |
| 2DUBES 053 280 S06 | 5.3 | 28 | 65 | 6 | |
| 2DUBES 054 280 S06 | 5.4 | 28 | 65 | 6 | |
| 2DUBES 055 280 S06 | 5.5 | 28 | 65 | 6 | |
| 2DUBES 056 280 S06 | 5.6 | 28 | 65 | 6 | |
| 2DUBES 057 280 S06 | 5.7 | 28 | 65 | 6 | |
| 2DUBES 058 280 S06 | 5.8 | 28 | 65 | 6 | |
| 2DUBES 059 280 S06 | 5.9 | 28 | 65 | 6 | |

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBES 060 280 S06 | 6 | 28 | 65 | 6 | |
| 2DUBES 061 340 S08 | 6.1 | 34 | 80 | 8 | |
| 2DUBES 062 340 S08 | 6.2 | 34 | 80 | 8 | |
| 2DUBES 063 340 S08 | 6.3 | 34 | 80 | 8 | |
| 2DUBES 064 340 S08 | 6.4 | 34 | 80 | 8 | |
| 2DUBES 065 340 S08 | 6.5 | 34 | 80 | 8 | |
| 2DUBES 066 340 S08 | 6.6 | 34 | 80 | 8 | |
| 2DUBES 067 340 S08 | 6.7 | 34 | 80 | 8 | |
| 2DUBES 068 340 S08 | 6.8 | 34 | 80 | 8 | |
| 2DUBES 069 340 S08 | 6.9 | 34 | 80 | 8 | |
| 2DUBES 070 340 S08 | 7 | 34 | 80 | 8 | |
| 2DUBES 071 410 S08 | 7.1 | 41 | 80 | 8 | |
| 2DUBES 072 410 S08 | 7.2 | 41 | 80 | 8 | |
| 2DUBES 073 410 S08 | 7.3 | 41 | 80 | 8 | |
| 2DUBES 074 410 S08 | 7.4 | 41 | 80 | 8 | |
| 2DUBES 075 410 S08 | 7.5 | 41 | 80 | 8 | |
| 2DUBES 076 410 S08 | 7.6 | 41 | 80 | 8 | |
| 2DUBES 077 410 S08 | 7.7 | 41 | 80 | 8 | |
| 2DUBES 078 410 S08 | 7.8 | 41 | 80 | 8 | |
| 2DUBES 079 410 S08 | 7.9 | 41 | 80 | 8 | |
| 2DUBES 080 410 S08 | 8 | 41 | 80 | 8 | |
| 2DUBES 081 470 S10 | 8.1 | 47 | 90 | 10 | |
| 2DUBES 082 470 S10 | 8.2 | 47 | 90 | 10 | |
| 2DUBES 083 470 S10 | 8.3 | 47 | 90 | 10 | |
| 2DUBES 084 470 S10 | 8.4 | 47 | 90 | 10 | |
| 2DUBES 085 470 S10 | 8.5 | 47 | 90 | 10 | |
| 2DUBES 086 470 S10 | 8.6 | 47 | 90 | 10 | |
| 2DUBES 087 470 S10 | 8.7 | 47 | 90 | 10 | |
| 2DUBES 088 470 S10 | 8.8 | 47 | 90 | 10 | |
| 2DUBES 089 470 S10 | 8.9 | 47 | 90 | 10 | |
| 2DUBES 090 470 S10 | 9 | 47 | 90 | 10 | |
| 2DUBES 091 470 S10 | 9.1 | 47 | 90 | 10 | |
| 2DUBES 092 470 S10 | 9.2 | 47 | 90 | 10 | |
| 2DUBES 093 470 S10 | 9.3 | 47 | 90 | 10 | |
| 2DUBES 094 470 S10 | 9.4 | 47 | 90 | 10 | |
| 2DUBES 095 470 S10 | 9.5 | 47 | 90 | 10 | |
| 2DUBES 096 470 S10 | 9.6 | 47 | 90 | 10 | |
| 2DUBES 097 470 S10 | 9.7 | 47 | 90 | 10 | |
| 2DUBES 098 470 S10 | 9.8 | 47 | 90 | 10 | |
| 2DUBES 099 470 S10 | 9.9 | 47 | 90 | 10 | |
| 2DUBES 100 470 S10 | 10 | 47 | 90 | 10 | |
| 2DUBES 101 550 S12 | 10.1 | 55 | 100 | 12 | |
| 2DUBES 102 550 S12 | 10.2 | 55 | 100 | 12 | |
| 2DUBES 103 550 S12 | 10.3 | 55 | 100 | 12 | |
| 2DUBES 104 550 S12 | 10.4 | 55 | 100 | 12 | |
| 2DUBES 105 550 S12 | 10.5 | 55 | 100 | 12 | |
| 2DUBES 106 550 S12 | 10.6 | 55 | 100 | 12 | |
| 2DUBES 107 550 S12 | 10.7 | 55 | 100 | 12 | |
| 2DUBES 108 550 S12 | 10.8 | 55 | 100 | 12 | |
| 2DUBES 109 550 S12 | 10.9 | 55 | 100 | 12 | |

# Carbide 2 Flutes Dube S Drills (Strong) - [3XD]
## 초경 2날 두배 S 드릴 [3XD]

New

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBES 110 550 S12 | 11 | 55 | 100 | 12 | |
| 2DUBES 111 550 S12 | 11.1 | 55 | 100 | 12 | |
| 2DUBES 112 550 S12 | 11.2 | 55 | 100 | 12 | |
| 2DUBES 113 550 S12 | 11.3 | 55 | 100 | 12 | |
| 2DUBES 114 550 S12 | 11.4 | 55 | 100 | 12 | |
| 2DUBES 115 550 S12 | 11.5 | 55 | 100 | 12 | |
| 2DUBES 116 550 S12 | 11.6 | 55 | 100 | 12 | |
| 2DUBES 117 550 S12 | 11.7 | 55 | 100 | 12 | |
| 2DUBES 118 550 S12 | 11.8 | 55 | 100 | 12 | |
| 2DUBES 119 550 S12 | 11.9 | 55 | 100 | 12 | |
| 2DUBES 120 550 S12 | 12 | 55 | 100 | 12 | |
| 2DUBES 121 600 S14 | 12.1 | 60 | 100 | 14 | |
| 2DUBES 122 600 S14 | 12.2 | 60 | 100 | 14 | |
| 2DUBES 123 600 S14 | 12.3 | 60 | 100 | 14 | |
| 2DUBES 124 600 S14 | 12.4 | 60 | 100 | 14 | |
| 2DUBES 125 600 S14 | 12.5 | 60 | 100 | 14 | |
| 2DUBES 126 600 S14 | 12.6 | 60 | 100 | 14 | |
| 2DUBES 127 600 S14 | 12.7 | 60 | 100 | 14 | |
| 2DUBES 128 600 S14 | 12.8 | 60 | 100 | 14 | |
| 2DUBES 129 600 S14 | 12.9 | 60 | 100 | 14 | |
| 2DUBES 130 600 S14 | 13 | 60 | 100 | 14 | |
| 2DUBES 131 600 S14 | 13.1 | 60 | 100 | 14 | |
| 2DUBES 132 600 S14 | 13.2 | 60 | 105 | 14 | |
| 2DUBES 133 600 S14 | 13.3 | 60 | 105 | 14 | |
| 2DUBES 134 600 S14 | 13.4 | 60 | 105 | 14 | |
| 2DUBES 135 600 S14 | 13.5 | 60 | 105 | 14 | |
| 2DUBES 136 600 S14 | 13.6 | 60 | 105 | 14 | |
| 2DUBES 137 600 S14 | 13.7 | 60 | 105 | 14 | |
| 2DUBES 138 600 S14 | 13.8 | 60 | 105 | 14 | |
| 2DUBES 139 600 S14 | 13.9 | 60 | 105 | 14 | |
| 2DUBES 140 600 S14 | 14 | 60 | 105 | 14 | |
| 2DUBES 141 650 S16 | 14.1 | 65 | 110 | 16 | |
| 2DUBES 142 650 S16 | 14.2 | 65 | 110 | 16 | |
| 2DUBES 143 650 S16 | 14.3 | 65 | 110 | 16 | |
| 2DUBES 144 650 S16 | 14.4 | 65 | 110 | 16 | |
| 2DUBES 145 650 S16 | 14.5 | 65 | 110 | 16 | |
| 2DUBES 146 650 S16 | 14.6 | 65 | 110 | 16 | |
| 2DUBES 147 650 S16 | 14.7 | 65 | 110 | 16 | |
| 2DUBES 148 650 S16 | 14.8 | 65 | 110 | 16 | |
| 2DUBES 149 650 S16 | 14.9 | 65 | 110 | 16 | |
| 2DUBES 150 650 S16 | 15 | 65 | 110 | 16 | |
| 2DUBES 151 650 S16 | 15.1 | 65 | 110 | 16 | |
| 2DUBES 152 650 S16 | 15.2 | 65 | 115 | 16 | |
| 2DUBES 153 650 S16 | 15.3 | 65 | 115 | 16 | |
| 2DUBES 154 650 S16 | 15.4 | 65 | 115 | 16 | |
| 2DUBES 155 650 S16 | 15.5 | 65 | 115 | 16 | |
| 2DUBES 156 650 S16 | 15.6 | 65 | 115 | 16 | |
| 2DUBES 157 650 S16 | 15.7 | 65 | 115 | 16 | |
| 2DUBES 158 650 S16 | 15.8 | 65 | 115 | 16 | |
| 2DUBES 159 650 S16 | 15.9 | 65 | 115 | 16 | |

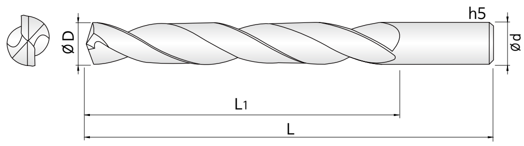
| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBES 160 650 S16 | 16 | 65 | 115 | 16 | |
| 2DUBES 161 730 S18 | 16.1 | 73 | 125 | 18 | |
| 2DUBES 162 730 S18 | 16.2 | 73 | 125 | 18 | |
| 2DUBES 163 730 S18 | 16.3 | 73 | 125 | 18 | |
| 2DUBES 164 730 S18 | 16.4 | 73 | 125 | 18 | |
| 2DUBES 165 730 S18 | 16.5 | 73 | 125 | 18 | |
| 2DUBES 166 730 S18 | 16.6 | 73 | 125 | 18 | |
| 2DUBES 167 730 S18 | 16.7 | 73 | 125 | 18 | |
| 2DUBES 168 730 S18 | 16.8 | 73 | 125 | 18 | |
| 2DUBES 169 730 S18 | 16.9 | 73 | 125 | 18 | |
| 2DUBES 170 730 S18 | 17 | 73 | 125 | 18 | |
| 2DUBES 171 730 S18 | 17.1 | 73 | 125 | 18 | |
| 2DUBES 172 730 S18 | 17.2 | 73 | 125 | 18 | |
| 2DUBES 173 730 S18 | 17.3 | 73 | 125 | 18 | |
| 2DUBES 174 730 S18 | 17.4 | 73 | 125 | 18 | |
| 2DUBES 175 730 S18 | 17.5 | 73 | 125 | 18 | |
| 2DUBES 176 730 S18 | 17.6 | 73 | 125 | 18 | |
| 2DUBES 177 730 S18 | 17.7 | 73 | 125 | 18 | |
| 2DUBES 178 730 S18 | 17.8 | 73 | 125 | 18 | |
| 2DUBES 179 730 S18 | 17.9 | 73 | 125 | 18 | |
| 2DUBES 180 730 S18 | 18 | 73 | 125 | 18 | |
| 2DUBES 181 790 S20 | 18.1 | 79 | 130 | 20 | |
| 2DUBES 182 790 S20 | 18.2 | 79 | 130 | 20 | |
| 2DUBES 183 790 S20 | 18.3 | 79 | 130 | 20 | |
| 2DUBES 184 790 S20 | 18.4 | 79 | 130 | 20 | |
| 2DUBES 185 790 S20 | 18.5 | 79 | 130 | 20 | |
| 2DUBES 186 790 S20 | 18.6 | 79 | 130 | 20 | |
| 2DUBES 187 790 S20 | 18.7 | 79 | 130 | 20 | |
| 2DUBES 188 790 S20 | 18.8 | 79 | 130 | 20 | |
| 2DUBES 189 790 S20 | 18.9 | 79 | 130 | 20 | |
| 2DUBES 190 790 S20 | 19 | 79 | 130 | 20 | |
| 2DUBES 191 790 S20 | 19.1 | 79 | 130 | 20 | |
| 2DUBES 192 790 S20 | 19.2 | 79 | 130 | 20 | |
| 2DUBES 193 790 S20 | 19.3 | 79 | 130 | 20 | |
| 2DUBES 194 790 S20 | 19.4 | 79 | 130 | 20 | |
| 2DUBES 195 790 S20 | 19.5 | 79 | 130 | 20 | |
| 2DUBES 196 790 S20 | 19.6 | 79 | 130 | 20 | |
| 2DUBES 197 790 S20 | 19.7 | 79 | 130 | 20 | |
| 2DUBES 198 790 S20 | 19.8 | 79 | 130 | 20 | |
| 2DUBES 199 790 S20 | 19.9 | 79 | 130 | 20 | |
| 2DUBES 200 790 S20 | 20 | 79 | 130 | 20 | |

# 2DUBES

## Carbide 2 Flutes Dube S Drills (Strong) - [5XD]

## 초경 2날 두배 S 드릴 [5XD]

New




- **HRc48이하, NAK, SCM, 열처리강용 강력 드릴**
- 우수한 내마모성의 HR코팅을 적용하여 장시간 가공에 적합합니다.
- 절삭 저항을 최소화하는 Point thinning을 채택 하였습니다.
- 열 배출의 최적화 된 형상으로 안정적인 공구의 수명을 유지합니다.
- 칩 배출력과 드릴의 강성을 고려한 플루트 홈 설계를 적용하여 우수한 칩배출을 실현합니다.

- **Powerful drills for materials up to HRc48, NAK, SCM, and heat-treated steels**
- Suitable for long-term machining with excellent wear resistance HR coating.
- Adopted Point thinning to minimize cutting resistance.
- Maintains the stable lifespan of the tool with an optimized shape for heat dissipation.
- Achieves excellent chip evacuation with flute groove design considering chip evacuation and drill rigidity.


단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBES 010 100 S03 | 1 | 10 | 55 | 3 | |
| 2DUBES 011 120 S03 | 1.1 | 12 | 55 | 3 | |
| 2DUBES 012 120 S03 | 1.2 | 12 | 55 | 3 | |
| 2DUBES 013 120 S03 | 1.3 | 12 | 55 | 3 | |
| 2DUBES 014 120 S03 | 1.4 | 12 | 55 | 3 | |
| 2DUBES 015 120 S03 | 1.5 | 12 | 55 | 3 | |
| 2DUBES 016 160 S03 | 1.6 | 16 | 55 | 3 | |
| 2DUBES 017 160 S03 | 1.7 | 16 | 55 | 3 | |
| 2DUBES 018 160 S03 | 1.8 | 16 | 55 | 3 | |
| 2DUBES 019 160 S03 | 1.9 | 16 | 55 | 3 | |
| 2DUBES 020 210 S04 | 2 | 21 | 55 | 4 | |
| 2DUBES 021 210 S04 | 2.1 | 21 | 55 | 4 | |
| 2DUBES 022 210 S04 | 2.2 | 21 | 55 | 4 | |
| 2DUBES 023 210 S04 | 2.3 | 21 | 55 | 4 | |
| 2DUBES 024 210 S04 | 2.4 | 21 | 55 | 4 | |
| 2DUBES 025 210 S04 | 2.5 | 21 | 55 | 4 | |
| 2DUBES 026 210 S04 | 2.6 | 21 | 55 | 4 | |
| 2DUBES 027 210 S04 | 2.7 | 21 | 55 | 4 | |
| 2DUBES 028 210 S04 | 2.8 | 21 | 55 | 4 | |
| 2DUBES 029 210 S04 | 2.9 | 21 | 55 | 4 | |
| 2DUBES 030 280 S06 | 3 | 28 | 65 | 6 | |
| 2DUBES 031 280 S06 | 3.1 | 28 | 65 | 6 | |
| 2DUBES 032 280 S06 | 3.2 | 28 | 65 | 6 | |
| 2DUBES 033 280 S06 | 3.3 | 28 | 65 | 6 | |
| 2DUBES 034 280 S06 | 3.4 | 28 | 65 | 6 | |
| 2DUBES 035 280 S06 | 3.5 | 28 | 65 | 6 | |
| 2DUBES 036 280 S06 | 3.6 | 28 | 65 | 6 | |
| 2DUBES 037 280 S06 | 3.7 | 28 | 65 | 6 | |
| 2DUBES 038 360 S06 | 3.8 | 36 | 75 | 6 | |
| 2DUBES 039 360 S06 | 3.9 | 36 | 75 | 6 | |
| 2DUBES 040 360 S06 | 4 | 36 | 75 | 6 | |
| 2DUBES 041 360 S06 | 4.1 | 36 | 75 | 6 | |
| 2DUBES 042 360 S06 | 4.2 | 36 | 75 | 6 | |
| 2DUBES 043 360 S06 | 4.3 | 36 | 75 | 6 | |
| 2DUBES 044 360 S06 | 4.4 | 36 | 75 | 6 | |
| 2DUBES 045 360 S06 | 4.5 | 36 | 75 | 6 | |
| 2DUBES 046 360 S06 | 4.6 | 36 | 75 | 6 | |
| 2DUBES 047 360 S06 | 4.7 | 36 | 75 | 6 | |
| 2DUBES 048 440 S06 | 4.8 | 44 | 80 | 6 | |
| 2DUBES 049 440 S06 | 4.9 | 44 | 80 | 6 | |
| 2DUBES 050 440 S06 | 5 | 44 | 80 | 6 | |
| 2DUBES 051 440 S06 | 5.1 | 44 | 80 | 6 | |
| 2DUBES 052 440 S06 | 5.2 | 44 | 80 | 6 | |
| 2DUBES 053 440 S06 | 5.3 | 44 | 80 | 6 | |
| 2DUBES 054 440 S06 | 5.4 | 44 | 80 | 6 | |
| 2DUBES 055 440 S06 | 5.5 | 44 | 80 | 6 | |
| 2DUBES 056 440 S06 | 5.6 | 44 | 80 | 6 | |
| 2DUBES 057 440 S06 | 5.7 | 44 | 80 | 6 | |
| 2DUBES 058 440 S06 | 5.8 | 44 | 80 | 6 | |
| 2DUBES 059 440 S06 | 5.9 | 44 | 80 | 6 | |

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBES 060 440 S06 | 6 | 44 | 80 | 6 | |
| 2DUBES 061 530 S08 | 6.1 | 53 | 90 | 8 | |
| 2DUBES 062 530 S08 | 6.2 | 53 | 90 | 8 | |
| 2DUBES 063 530 S08 | 6.3 | 53 | 90 | 8 | |
| 2DUBES 064 530 S08 | 6.4 | 53 | 90 | 8 | |
| 2DUBES 065 530 S08 | 6.5 | 53 | 90 | 8 | |
| 2DUBES 066 530 S08 | 6.6 | 53 | 90 | 8 | |
| 2DUBES 067 530 S08 | 6.7 | 53 | 90 | 8 | |
| 2DUBES 068 530 S08 | 6.8 | 53 | 90 | 8 | |
| 2DUBES 069 530 S08 | 6.9 | 53 | 90 | 8 | |
| 2DUBES 070 530 S08 | 7 | 53 | 90 | 8 | |
| 2DUBES 071 530 S08 | 7.1 | 53 | 90 | 8 | |
| 2DUBES 072 530 S08 | 7.2 | 53 | 90 | 8 | |
| 2DUBES 073 530 S08 | 7.3 | 53 | 90 | 8 | |
| 2DUBES 074 530 S08 | 7.4 | 53 | 90 | 8 | |
| 2DUBES 075 530 S08 | 7.5 | 53 | 90 | 8 | |
| 2DUBES 076 530 S08 | 7.6 | 53 | 90 | 8 | |
| 2DUBES 077 530 S08 | 7.7 | 53 | 90 | 8 | |
| 2DUBES 078 530 S08 | 7.8 | 53 | 90 | 8 | |
| 2DUBES 079 530 S08 | 7.9 | 53 | 90 | 8 | |
| 2DUBES 080 530 S08 | 8 | 53 | 90 | 8 | |
| 2DUBES 081 610 S10 | 8.1 | 61 | 105 | 10 | |
| 2DUBES 082 610 S10 | 8.2 | 61 | 105 | 10 | |
| 2DUBES 083 610 S10 | 8.3 | 61 | 105 | 10 | |
| 2DUBES 084 610 S10 | 8.4 | 61 | 105 | 10 | |
| 2DUBES 085 610 S10 | 8.5 | 61 | 105 | 10 | |
| 2DUBES 086 610 S10 | 8.6 | 61 | 105 | 10 | |
| 2DUBES 087 610 S10 | 8.7 | 61 | 105 | 10 | |
| 2DUBES 088 610 S10 | 8.8 | 61 | 105 | 10 | |
| 2DUBES 089 610 S10 | 8.9 | 61 | 105 | 10 | |
| 2DUBES 090 610 S10 | 9 | 61 | 105 | 10 | |
| 2DUBES 091 610 S10 | 9.1 | 61 | 105 | 10 | |
| 2DUBES 092 610 S10 | 9.2 | 61 | 105 | 10 | |
| 2DUBES 093 610 S10 | 9.3 | 61 | 105 | 10 | |
| 2DUBES 094 610 S10 | 9.4 | 61 | 105 | 10 | |
| 2DUBES 095 610 S10 | 9.5 | 61 | 105 | 10 | |
| 2DUBES 096 610 S10 | 9.6 | 61 | 105 | 10 | |
| 2DUBES 097 610 S10 | 9.7 | 61 | 105 | 10 | |
| 2DUBES 098 610 S10 | 9.8 | 61 | 105 | 10 | |
| 2DUBES 099 610 S10 | 9.9 | 61 | 105 | 10 | |
| 2DUBES 100 610 S10 | 10 | 61 | 105 | 10 | |
| 2DUBES 101 710 S12 | 10.1 | 71 | 120 | 12 | |
| 2DUBES 102 710 S12 | 10.2 | 71 | 120 | 12 | |
| 2DUBES 103 710 S12 | 10.3 | 71 | 120 | 12 | |
| 2DUBES 104 710 S12 | 10.4 | 71 | 120 | 12 | |
| 2DUBES 105 710 S12 | 10.5 | 71 | 120 | 12 | |
| 2DUBES 106 710 S12 | 10.6 | 71 | 120 | 12 | |
| 2DUBES 107 710 S12 | 10.7 | 71 | 120 | 12 | |
| 2DUBES 108 710 S12 | 10.8 | 71 | 120 | 12 | |
| 2DUBES 109 710 S12 | 10.9 | 71 | 120 | 12 | |

# 2DUBES

## Carbide 2 Flutes Dube S Drills (Strong) - [5XD]
## 초경 2날 두배 S 드릴 [5XD]

New

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBES 110 710 S12 | 11 | 71 | 120 | 12 | |
| 2DUBES 111 710 S12 | 11.1 | 71 | 120 | 12 | |
| 2DUBES 112 710 S12 | 11.2 | 71 | 120 | 12 | |
| 2DUBES 113 710 S12 | 11.3 | 71 | 120 | 12 | |
| 2DUBES 114 710 S12 | 11.4 | 71 | 120 | 12 | |
| 2DUBES 115 710 S12 | 11.5 | 71 | 120 | 12 | |
| 2DUBES 116 710 S12 | 11.6 | 71 | 120 | 12 | |
| 2DUBES 117 710 S12 | 11.7 | 71 | 120 | 12 | |
| 2DUBES 118 710 S12 | 11.8 | 71 | 120 | 12 | |
| 2DUBES 119 710 S12 | 11.9 | 71 | 120 | 12 | |
| 2DUBES 120 710 S12 | 12 | 71 | 120 | 12 | |
| 2DUBES 121 770 S14 | 12.1 | 77 | 125 | 14 | |
| 2DUBES 122 770 S14 | 12.2 | 77 | 125 | 14 | |
| 2DUBES 123 770 S14 | 12.3 | 77 | 125 | 14 | |
| 2DUBES 124 770 S14 | 12.4 | 77 | 125 | 14 | |
| 2DUBES 125 770 S14 | 12.5 | 77 | 125 | 14 | |
| 2DUBES 126 770 S14 | 12.6 | 77 | 125 | 14 | |
| 2DUBES 127 770 S14 | 12.7 | 77 | 125 | 14 | |
| 2DUBES 128 770 S14 | 12.8 | 77 | 125 | 14 | |
| 2DUBES 129 770 S14 | 12.9 | 77 | 125 | 14 | |
| 2DUBES 130 770 S14 | 13 | 77 | 125 | 14 | |
| 2DUBES 131 770 S14 | 13.1 | 77 | 125 | 14 | |
| 2DUBES 132 770 S14 | 13.2 | 77 | 125 | 14 | |
| 2DUBES 133 770 S14 | 13.3 | 77 | 125 | 14 | |
| 2DUBES 134 770 S14 | 13.4 | 77 | 125 | 14 | |
| 2DUBES 135 770 S14 | 13.5 | 77 | 125 | 14 | |
| 2DUBES 136 770 S14 | 13.6 | 77 | 125 | 14 | |
| 2DUBES 137 770 S14 | 13.7 | 77 | 125 | 14 | |
| 2DUBES 138 770 S14 | 13.8 | 77 | 125 | 14 | |
| 2DUBES 139 770 S14 | 13.9 | 77 | 125 | 14 | |
| 2DUBES 140 770 S14 | 14 | 77 | 125 | 14 | |
| 2DUBES 141 830 S16 | 14.1 | 83 | 135 | 16 | |
| 2DUBES 142 830 S16 | 14.2 | 83 | 135 | 16 | |
| 2DUBES 143 830 S16 | 14.3 | 83 | 135 | 16 | |
| 2DUBES 144 830 S16 | 14.4 | 83 | 135 | 16 | |
| 2DUBES 145 830 S16 | 14.5 | 83 | 135 | 16 | |
| 2DUBES 146 830 S16 | 14.6 | 83 | 135 | 16 | |
| 2DUBES 147 830 S16 | 14.7 | 83 | 135 | 16 | |
| 2DUBES 148 830 S16 | 14.8 | 83 | 135 | 16 | |
| 2DUBES 149 830 S16 | 14.9 | 83 | 135 | 16 | |
| 2DUBES 150 830 S16 | 15 | 83 | 135 | 16 | |
| 2DUBES 151 830 S16 | 15.1 | 83 | 135 | 16 | |
| 2DUBES 152 830 S16 | 15.2 | 83 | 135 | 16 | |
| 2DUBES 153 830 S16 | 15.3 | 83 | 135 | 16 | |
| 2DUBES 154 830 S16 | 15.4 | 83 | 135 | 16 | |
| 2DUBES 155 830 S16 | 15.5 | 83 | 135 | 16 | |
| 2DUBES 156 830 S16 | 15.6 | 83 | 135 | 16 | |
| 2DUBES 157 830 S16 | 15.7 | 83 | 135 | 16 | |
| 2DUBES 158 830 S16 | 15.8 | 83 | 135 | 16 | |
| 2DUBES 159 830 S16 | 15.9 | 83 | 135 | 16 | |

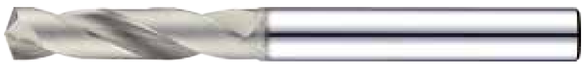
| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBES 160 830 S16 | 16 | 83 | 135 | 16 | |
| 2DUBES 161 930 S18 | 16.1 | 93 | 145 | 18 | |
| 2DUBES 162 930 S18 | 16.2 | 93 | 145 | 18 | |
| 2DUBES 163 930 S18 | 16.3 | 93 | 145 | 18 | |
| 2DUBES 164 930 S18 | 16.4 | 93 | 145 | 18 | |
| 2DUBES 165 930 S18 | 16.5 | 93 | 145 | 18 | |
| 2DUBES 166 930 S18 | 16.6 | 93 | 145 | 18 | |
| 2DUBES 167 930 S18 | 16.7 | 93 | 145 | 18 | |
| 2DUBES 168 930 S18 | 16.8 | 93 | 145 | 18 | |
| 2DUBES 169 930 S18 | 16.9 | 93 | 145 | 18 | |
| 2DUBES 170 930 S18 | 17 | 93 | 145 | 18 | |
| 2DUBES 171 930 S18 | 17.1 | 93 | 145 | 18 | |
| 2DUBES 172 930 S18 | 17.2 | 93 | 145 | 18 | |
| 2DUBES 173 930 S18 | 17.3 | 93 | 145 | 18 | |
| 2DUBES 174 930 S18 | 17.4 | 93 | 145 | 18 | |
| 2DUBES 175 930 S18 | 17.5 | 93 | 145 | 18 | |
| 2DUBES 176 930 S18 | 17.6 | 93 | 145 | 18 | |
| 2DUBES 177 930 S18 | 17.7 | 93 | 145 | 18 | |
| 2DUBES 178 930 S18 | 17.8 | 93 | 145 | 18 | |
| 2DUBES 179 930 S18 | 17.9 | 93 | 145 | 18 | |
| 2DUBES 180 930 S18 | 18 | 93 | 145 | 18 | |
| 2DUBES 181 1010 S20 | 18.1 | 101 | 155 | 20 | |
| 2DUBES 182 1010 S20 | 18.2 | 101 | 155 | 20 | |
| 2DUBES 183 1010 S20 | 18.3 | 101 | 155 | 20 | |
| 2DUBES 184 1010 S20 | 18.4 | 101 | 155 | 20 | |
| 2DUBES 185 1010 S20 | 18.5 | 101 | 155 | 20 | |
| 2DUBES 186 1010 S20 | 18.6 | 101 | 155 | 20 | |
| 2DUBES 187 1010 S20 | 18.7 | 101 | 155 | 20 | |
| 2DUBES 188 1010 S20 | 18.8 | 101 | 155 | 20 | |
| 2DUBES 189 1010 S20 | 18.9 | 101 | 155 | 20 | |
| 2DUBES 190 1010 S20 | 19 | 101 | 155 | 20 | |
| 2DUBES 191 1010 S20 | 19.1 | 101 | 155 | 20 | |
| 2DUBES 192 1010 S20 | 19.2 | 101 | 155 | 20 | |
| 2DUBES 193 1010 S20 | 19.3 | 101 | 155 | 20 | |
| 2DUBES 194 1010 S20 | 19.4 | 101 | 155 | 20 | |
| 2DUBES 195 1010 S20 | 19.5 | 101 | 155 | 20 | |
| 2DUBES 196 1010 S20 | 19.6 | 101 | 155 | 20 | |
| 2DUBES 197 1010 S20 | 19.7 | 101 | 155 | 20 | |
| 2DUBES 198 1010 S20 | 19.8 | 101 | 155 | 20 | |
| 2DUBES 199 1010 S20 | 19.9 | 101 | 155 | 20 | |
| 2DUBES 200 1010 S20 | 20 | 101 | 155 | 20 | |

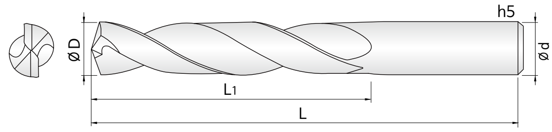
# 2DUBE

Carbide 2 Flutes Dube Drills (Short length)

## 초경 2날 짧은 길이 두배 드릴

New






- **HRc28이하, S45C, SCM, 주강, 주철용 고정밀 드릴**
- T-CRO 코팅을 적용하여 드릴 가공 시 발생하는 융착 현상을 최소화 하였습니다.
- 절삭 저항을 최소화하는 Point thinning을 채택 하였습니다.
- 특수 인선처리와 최적의 형상으로 치핑 및 돌발파손을 방지합니다.
- 우수한 공구의 강성과 칩 배출의 설계를 적용하여 칩 배출성을 향상시켰습니다.

- **High-speed drills for materials up to HRc28, S45C, SCM, cast steels, and cast irons**
- Minimized adhesion during drilling operations by applying T-CRO coating.
- Adopted point thinning to minimize cutting resistance.
- Prevents chipping and unexpected fractures with special edge treatment and optimal shape.
- Enhanced chip evacuation with the application of a design for superior tool rigidity and chip evacuation.


522P

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBE 010 050 S03 | 1 | 5 | 40 | 3 | |
| 2DUBE 0105 050 S03 | 1.05 | 5 | 40 | 3 | |
| 2DUBE 011 060 S03 | 1.1 | 6 | 40 | 3 | |
| 2DUBE 0115 060 S03 | 1.15 | 6 | 40 | 3 | |
| 2DUBE 012 060 S03 | 1.2 | 6 | 40 | 3 | |
| 2DUBE 0125 060 S03 | 1.25 | 6 | 40 | 3 | |
| 2DUBE 013 060 S03 | 1.3 | 6 | 40 | 3 | |
| 2DUBE 0135 070 S03 | 1.35 | 7 | 40 | 3 | |
| 2DUBE 014 070 S03 | 1.4 | 7 | 40 | 3 | |
| 2DUBE 0145 070 S03 | 1.45 | 7 | 40 | 3 | |
| 2DUBE 015 070 S03 | 1.5 | 7 | 40 | 3 | |
| 2DUBE 0155 080 S03 | 1.55 | 8 | 40 | 3 | |
| 2DUBE 016 080 S03 | 1.6 | 8 | 40 | 3 | |
| 2DUBE 0165 080 S03 | 1.65 | 8 | 40 | 3 | |
| 2DUBE 017 080 S03 | 1.7 | 8 | 40 | 3 | |
| 2DUBE 0175 090 S03 | 1.75 | 9 | 40 | 3 | |
| 2DUBE 018 090 S03 | 1.8 | 9 | 40 | 3 | |
| 2DUBE 0185 090 S03 | 1.85 | 9 | 40 | 3 | |
| 2DUBE 019 090 S03 | 1.9 | 9 | 40 | 3 | |
| 2DUBE 0195 100 S03 | 1.95 | 10 | 50 | 3 | |
| 2DUBE 020 100 S03 | 2 | 10 | 50 | 3 | |
| 2DUBE 0205 100 S03 | 2.05 | 10 | 50 | 3 | |
| 2DUBE 021 100 S03 | 2.1 | 10 | 50 | 3 | |
| 2DUBE 0215 110 S03 | 2.15 | 11 | 50 | 3 | |
| 2DUBE 022 110 S03 | 2.2 | 11 | 50 | 3 | |
| 2DUBE 0225 110 S03 | 2.25 | 11 | 50 | 3 | |
| 2DUBE 023 110 S03 | 2.3 | 11 | 50 | 3 | |
| 2DUBE 0235 110 S03 | 2.35 | 11 | 50 | 3 | |
| 2DUBE 024 120 S03 | 2.4 | 12 | 50 | 3 | |
| 2DUBE 0245 120 S03 | 2.45 | 12 | 50 | 3 | |
| 2DUBE 025 120 S03 | 2.5 | 12 | 50 | 3 | |
| 2DUBE 0255 120 S03 | 2.55 | 12 | 50 | 3 | |
| 2DUBE 026 120 S03 | 2.6 | 12 | 50 | 3 | |
| 2DUBE 0265 120 S03 | 2.65 | 12 | 50 | 3 | |
| 2DUBE 027 140 S03 | 2.7 | 14 | 50 | 3 | |
| 2DUBE 0275 140 S03 | 2.75 | 14 | 50 | 3 | |
| 2DUBE 028 140 S03 | 2.8 | 14 | 50 | 3 | |
| 2DUBE 0285 140 S03 | 2.85 | 14 | 50 | 3 | |
| 2DUBE 029 140 S03 | 2.9 | 14 | 50 | 3 | |
| 2DUBE 0295 140 S03 | 2.95 | 14 | 50 | 3 | |
| 2DUBE 030 140 S03 | 3 | 14 | 50 | 3 | |
| 2DUBE 0305 160 S04 | 3.05 | 16 | 55 | 4 | |
| 2DUBE 031 160 S04 | 3.1 | 16 | 55 | 4 | |
| 2DUBE 0315 160 S04 | 3.15 | 16 | 55 | 4 | |
| 2DUBE 032 160 S04 | 3.2 | 16 | 55 | 4 | |
| 2DUBE 0325 160 S04 | 3.25 | 16 | 55 | 4 | |
| 2DUBE 033 160 S04 | 3.3 | 16 | 55 | 4 | |
| 2DUBE 0335 160 S04 | 3.35 | 16 | 55 | 4 | |
| 2DUBE 034 160 S04 | 3.4 | 16 | 55 | 4 | |
| 2DUBE 0345 160 S04 | 3.45 | 16 | 55 | 4 | |

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBE 035 160 S04 | 3.5 | 16 | 55 | 4 | |
| 2DUBE 0355 160 S04 | 3.55 | 16 | 55 | 4 | |
| 2DUBE 036 180 S04 | 3.6 | 18 | 55 | 4 | |
| 2DUBE 0365 180 S04 | 3.65 | 18 | 55 | 4 | |
| 2DUBE 037 180 S04 | 3.7 | 18 | 55 | 4 | |
| 2DUBE 0375 180 S04 | 3.75 | 18 | 55 | 4 | |
| 2DUBE 038 200 S04 | 3.8 | 20 | 55 | 4 | |
| 2DUBE 0385 200 S04 | 3.85 | 20 | 55 | 4 | |
| 2DUBE 039 200 S04 | 3.9 | 20 | 55 | 4 | |
| 2DUBE 0395 200 S04 | 3.95 | 20 | 55 | 4 | |
| 2DUBE 040 200 S04 | 4 | 20 | 55 | 4 | |
| 2DUBE 0405 200 S05 | 4.05 | 20 | 60 | 5 | |
| 2DUBE 041 200 S05 | 4.1 | 20 | 60 | 5 | |
| 2DUBE 0415 200 S05 | 4.15 | 20 | 60 | 5 | |
| 2DUBE 042 200 S05 | 4.2 | 20 | 60 | 5 | |
| 2DUBE 0425 200 S05 | 4.25 | 20 | 60 | 5 | |
| 2DUBE 043 220 S05 | 4.3 | 22 | 60 | 5 | |
| 2DUBE 0435 220 S05 | 4.35 | 22 | 60 | 5 | |
| 2DUBE 044 220 S05 | 4.4 | 22 | 60 | 5 | |
| 2DUBE 0445 220 S05 | 4.45 | 22 | 60 | 5 | |
| 2DUBE 045 220 S05 | 4.5 | 22 | 60 | 5 | |
| 2DUBE 0455 220 S05 | 4.55 | 22 | 60 | 5 | |
| 2DUBE 046 220 S05 | 4.6 | 22 | 60 | 5 | |
| 2DUBE 0465 220 S05 | 4.65 | 22 | 60 | 5 | |
| 2DUBE 047 220 S05 | 4.7 | 22 | 60 | 5 | |
| 2DUBE 0475 220 S05 | 4.75 | 22 | 60 | 5 | |
| 2DUBE 048 240 S05 | 4.8 | 24 | 60 | 5 | |
| 2DUBE 0485 240 S05 | 4.85 | 24 | 60 | 5 | |
| 2DUBE 049 240 S05 | 4.9 | 24 | 60 | 5 | |
| 2DUBE 0495 240 S05 | 4.95 | 24 | 60 | 5 | |
| 2DUBE 050 240 S05 | 5 | 24 | 60 | 5 | |
| 2DUBE 051 240 S06 | 5.1 | 24 | 60 | 6 | |
| 2DUBE 052 240 S06 | 5.2 | 24 | 60 | 6 | |
| 2DUBE 053 240 S06 | 5.3 | 24 | 60 | 6 | |
| 2DUBE 054 240 S06 | 5.4 | 24 | 60 | 6 | |
| 2DUBE 055 280 S06 | 5.5 | 28 | 65 | 6 | |
| 2DUBE 056 280 S06 | 5.6 | 28 | 65 | 6 | |
| 2DUBE 057 280 S06 | 5.7 | 28 | 65 | 6 | |
| 2DUBE 058 280 S06 | 5.8 | 28 | 65 | 6 | |
| 2DUBE 059 280 S06 | 5.9 | 28 | 65 | 6 | |
| 2DUBE 060 280 S06 | 6 | 28 | 65 | 6 | |
| 2DUBE 061 280 S06 | 6.1 | 28 | 65 | 6 | |
| 2DUBE 062 320 S07 | 6.2 | 32 | 65 | 7 | |
| 2DUBE 063 320 S07 | 6.3 | 32 | 65 | 7 | |
| 2DUBE 064 320 S07 | 6.4 | 32 | 65 | 7 | |
| 2DUBE 065 320 S07 | 6.5 | 32 | 65 | 7 | |
| 2DUBE 066 320 S07 | 6.6 | 32 | 65 | 7 | |
| 2DUBE 067 320 S07 | 6.7 | 32 | 65 | 7 | |
| 2DUBE 068 320 S07 | 6.8 | 32 | 65 | 7 | |
| 2DUBE 069 320 S07 | 6.9 | 32 | 65 | 7 | |

# 초경 2날 짧은 길이 두배 드릴

New

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBE 070 320 S07 | 7 | 32 | 65 | 7 | |
| 2DUBE 071 320 S07 | 7.1 | 32 | 65 | 7 | |
| 2DUBE 072 360 S08 | 7.2 | 36 | 70 | 8 | |
| 2DUBE 073 360 S08 | 7.3 | 36 | 70 | 8 | |
| 2DUBE 074 360 S08 | 7.4 | 36 | 70 | 8 | |
| 2DUBE 075 360 S08 | 7.5 | 36 | 70 | 8 | |
| 2DUBE 076 360 S08 | 7.6 | 36 | 70 | 8 | |
| 2DUBE 077 360 S08 | 7.7 | 36 | 70 | 8 | |
| 2DUBE 078 360 S08 | 7.8 | 36 | 70 | 8 | |
| 2DUBE 079 360 S08 | 7.9 | 36 | 70 | 8 | |
| 2DUBE 080 360 S08 | 8 | 36 | 70 | 8 | |
| 2DUBE 081 360 S08 | 8.1 | 36 | 70 | 8 | |
| 2DUBE 082 400 S09 | 8.2 | 40 | 75 | 9 | |
| 2DUBE 083 400 S09 | 8.3 | 40 | 75 | 9 | |
| 2DUBE 084 400 S09 | 8.4 | 40 | 75 | 9 | |
| 2DUBE 085 400 S09 | 8.5 | 40 | 75 | 9 | |
| 2DUBE 086 400 S09 | 8.6 | 40 | 75 | 9 | |
| 2DUBE 087 400 S09 | 8.7 | 40 | 75 | 9 | |
| 2DUBE 088 400 S09 | 8.8 | 40 | 75 | 9 | |
| 2DUBE 089 400 S09 | 8.9 | 40 | 75 | 9 | |
| 2DUBE 090 400 S09 | 9 | 40 | 75 | 9 | |
| 2DUBE 091 400 S09 | 9.1 | 40 | 75 | 9 | |
| 2DUBE 092 430 S10 | 9.2 | 43 | 80 | 10 | |
| 2DUBE 093 430 S10 | 9.3 | 43 | 80 | 10 | |
| 2DUBE 094 430 S10 | 9.4 | 43 | 80 | 10 | |
| 2DUBE 095 430 S10 | 9.5 | 43 | 80 | 10 | |
| 2DUBE 096 430 S10 | 9.6 | 43 | 80 | 10 | |
| 2DUBE 097 430 S10 | 9.7 | 43 | 80 | 10 | |
| 2DUBE 098 430 S10 | 9.8 | 43 | 80 | 10 | |
| 2DUBE 099 430 S10 | 9.9 | 43 | 80 | 10 | |
| 2DUBE 100 430 S10 | 10 | 43 | 80 | 10 | |
| 2DUBE 101 430 S10 | 10.1 | 43 | 80 | 10 | |
| 2DUBE 102 450 S11 | 10.2 | 45 | 85 | 11 | |
| 2DUBE 103 450 S11 | 10.3 | 45 | 85 | 11 | |
| 2DUBE 104 450 S11 | 10.4 | 45 | 85 | 11 | |
| 2DUBE 105 450 S11 | 10.5 | 45 | 85 | 11 | |
| 2DUBE 106 450 S11 | 10.6 | 45 | 85 | 11 | |
| 2DUBE 107 450 S11 | 10.7 | 45 | 85 | 11 | |
| 2DUBE 108 450 S11 | 10.8 | 45 | 85 | 11 | |
| 2DUBE 109 450 S11 | 10.9 | 45 | 85 | 11 | |
| 2DUBE 110 450 S11 | 11 | 45 | 85 | 11 | |
| 2DUBE 111 450 S11 | 11.1 | 45 | 85 | 11 | |
| 2DUBE 112 520 S12 | 11.2 | 52 | 90 | 12 | |
| 2DUBE 113 520 S12 | 11.3 | 52 | 90 | 12 | |
| 2DUBE 114 520 S12 | 11.4 | 52 | 90 | 12 | |
| 2DUBE 115 520 S12 | 11.5 | 52 | 90 | 12 | |
| 2DUBE 116 520 S12 | 11.6 | 52 | 90 | 12 | |
| 2DUBE 117 520 S12 | 11.7 | 52 | 90 | 12 | |
| 2DUBE 118 520 S12 | 11.8 | 52 | 90 | 12 | |
| 2DUBE 119 520 S12 | 11.9 | 52 | 90 | 12 | |
| 2DUBE 120 520 S12 | 12 | 52 | 90 | 12 | |

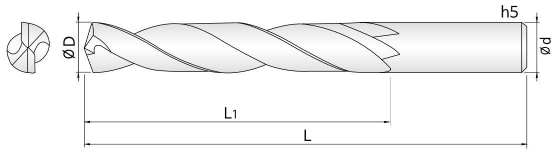
DRILL

# 2DUBE

## Carbide 2 Flutes Dube Drills(Standard length)

## 초경 2날 두배 드릴

New




- **HRc28이하, S45C, SCM, 주강, 주철용 고정밀 드릴**
- T-CRO 코팅을 적용하여 드릴 가공 시 발생하는 융착 현상을 최소화 하였습니다.
- 절삭 저항을 최소화하는 Point thinning을 채택 하였습니다.
- 특수 인선처리와 최적의 형상으로 치핑 및 돌발파손을 방지합니다.
- 우수한 공구의 강성과 칩 배출의 설계를 적용하여 칩 배출성을 향상시켰습니다.

- **High-speed drills for materials up to HRc28, S45C, SCM, cast steels, and cast irons**
- Minimized adhesion during drilling operations by applying T-CRO coating.
- Adopted point thinning to minimize cutting resistance.
- Prevents chipping and unexpected fractures with special edge treatment and optimal shape.
- Enhanced chip evacuation with the application of a design for superior tool rigidity and chip evacuation.


522P

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBE 010 080 S03 | 1 | 8 | 40 | 3 | |
| 2DUBE 011 090 S03 | 1.1 | 9 | 40 | 3 | |
| 2DUBE 012 100 S03 | 1.2 | 10 | 40 | 3 | |
| 2DUBE 013 100 S03 | 1.3 | 10 | 40 | 3 | |
| 2DUBE 014 110 S03 | 1.4 | 11 | 40 | 3 | |
| 2DUBE 015 110 S03 | 1.5 | 11 | 40 | 3 | |
| 2DUBE 016 120 S03 | 1.6 | 12 | 40 | 3 | |
| 2DUBE 017 120 S03 | 1.7 | 12 | 40 | 3 | |
| 2DUBE 018 130 S03 | 1.8 | 13 | 40 | 3 | |
| 2DUBE 019 130 S03 | 1.9 | 13 | 40 | 3 | |
| 2DUBE 020 170 S03 | 2 | 17 | 50 | 3 | |
| 2DUBE 021 170 S03 | 2.1 | 17 | 50 | 3 | |
| 2DUBE 022 170 S03 | 2.2 | 17 | 50 | 3 | |
| 2DUBE 023 170 S03 | 2.3 | 17 | 50 | 3 | |
| 2DUBE 024 170 S03 | 2.4 | 17 | 50 | 3 | |
| 2DUBE 025 170 S03 | 2.5 | 17 | 50 | 3 | |
| 2DUBE 026 170 S03 | 2.6 | 17 | 50 | 3 | |
| 2DUBE 027 170 S03 | 2.7 | 17 | 50 | 3 | |
| 2DUBE 028 170 S03 | 2.8 | 17 | 50 | 3 | |
| 2DUBE 029 170 S03 | 2.9 | 17 | 50 | 3 | |
| 2DUBE 030 200 S04 | 3 | 20 | 55 | 4 | |
| 2DUBE 031 200 S04 | 3.1 | 20 | 55 | 4 | |
| 2DUBE 032 200 S04 | 3.2 | 20 | 55 | 4 | |
| 2DUBE 033 200 S04 | 3.3 | 20 | 55 | 4 | |
| 2DUBE 034 200 S04 | 3.4 | 20 | 55 | 4 | |
| 2DUBE 035 200 S04 | 3.5 | 20 | 55 | 4 | |
| 2DUBE 036 250 S04 | 3.6 | 25 | 55 | 4 | |
| 2DUBE 037 250 S04 | 3.7 | 25 | 55 | 4 | |
| 2DUBE 038 250 S04 | 3.8 | 25 | 55 | 4 | |
| 2DUBE 039 250 S04 | 3.9 | 25 | 55 | 4 | |
| 2DUBE 040 250 S04 | 4 | 25 | 55 | 4 | |
| 2DUBE 041 250 S04 | 4.1 | 25 | 55 | 4 | |
| 2DUBE 042 320 S05 | 4.2 | 32 | 60 | 5 | |
| 2DUBE 043 320 S05 | 4.3 | 32 | 60 | 5 | |
| 2DUBE 044 320 S05 | 4.4 | 32 | 60 | 5 | |
| 2DUBE 045 320 S05 | 4.5 | 32 | 60 | 5 | |
| 2DUBE 046 320 S05 | 4.6 | 32 | 60 | 5 | |
| 2DUBE 047 320 S05 | 4.7 | 32 | 60 | 5 | |
| 2DUBE 048 320 S05 | 4.8 | 32 | 60 | 5 | |
| 2DUBE 049 320 S05 | 4.9 | 32 | 60 | 5 | |
| 2DUBE 050 320 S05 | 5 | 32 | 60 | 5 | |
| 2DUBE 051 320 S05 | 5.1 | 32 | 60 | 5 | |
| 2DUBE 052 360 S06 | 5.2 | 36 | 65 | 6 | |
| 2DUBE 053 360 S06 | 5.3 | 36 | 65 | 6 | |
| 2DUBE 054 360 S06 | 5.4 | 36 | 65 | 6 | |
| 2DUBE 055 360 S06 | 5.5 | 36 | 65 | 6 | |
| 2DUBE 056 360 S06 | 5.6 | 36 | 65 | 6 | |
| 2DUBE 057 360 S06 | 5.7 | 36 | 65 | 6 | |
| 2DUBE 058 360 S06 | 5.8 | 36 | 65 | 6 | |
| 2DUBE 059 360 S06 | 5.9 | 36 | 65 | 6 | |

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBE 060 360 S06 | 6 | 36 | 65 | 6 | |
| 2DUBE 061 360 S06 | 6.1 | 36 | 65 | 6 | |
| 2DUBE 062 420 S07 | 6.2 | 42 | 75 | 7 | |
| 2DUBE 063 420 S07 | 6.3 | 42 | 75 | 7 | |
| 2DUBE 064 420 S07 | 6.4 | 42 | 75 | 7 | |
| 2DUBE 065 420 S07 | 6.5 | 42 | 75 | 7 | |
| 2DUBE 066 420 S07 | 6.6 | 42 | 75 | 7 | |
| 2DUBE 067 420 S07 | 6.7 | 42 | 75 | 7 | |
| 2DUBE 068 420 S07 | 6.8 | 42 | 75 | 7 | |
| 2DUBE 069 420 S07 | 6.9 | 42 | 75 | 7 | |
| 2DUBE 070 420 S07 | 7 | 42 | 75 | 7 | |
| 2DUBE 071 420 S07 | 7.1 | 42 | 75 | 7 | |
| 2DUBE 072 460 S08 | 7.2 | 46 | 80 | 8 | |
| 2DUBE 073 460 S08 | 7.3 | 46 | 80 | 8 | |
| 2DUBE 074 460 S08 | 7.4 | 46 | 80 | 8 | |
| 2DUBE 075 460 S08 | 7.5 | 46 | 80 | 8 | |
| 2DUBE 076 460 S08 | 7.6 | 46 | 80 | 8 | |
| 2DUBE 077 460 S08 | 7.7 | 46 | 80 | 8 | |
| 2DUBE 078 460 S08 | 7.8 | 46 | 80 | 8 | |
| 2DUBE 079 460 S08 | 7.9 | 46 | 80 | 8 | |
| 2DUBE 080 460 S08 | 8 | 46 | 80 | 8 | |
| 2DUBE 081 460 S08 | 8.1 | 46 | 80 | 8 | |
| 2DUBE 082 500 S09 | 8.2 | 50 | 85 | 9 | |
| 2DUBE 083 500 S09 | 8.3 | 50 | 85 | 9 | |
| 2DUBE 084 500 S09 | 8.4 | 50 | 85 | 9 | |
| 2DUBE 085 500 S09 | 8.5 | 50 | 85 | 9 | |
| 2DUBE 086 500 S09 | 8.6 | 50 | 85 | 9 | |
| 2DUBE 087 500 S09 | 8.7 | 50 | 85 | 9 | |
| 2DUBE 088 500 S09 | 8.8 | 50 | 85 | 9 | |
| 2DUBE 089 500 S09 | 8.9 | 50 | 85 | 9 | |
| 2DUBE 090 500 S09 | 9 | 50 | 85 | 9 | |
| 2DUBE 091 500 S09 | 9.1 | 50 | 85 | 9 | |
| 2DUBE 092 530 S10 | 9.2 | 53 | 90 | 10 | |
| 2DUBE 093 530 S10 | 9.3 | 53 | 90 | 10 | |
| 2DUBE 094 530 S10 | 9.4 | 53 | 90 | 10 | |
| 2DUBE 095 530 S10 | 9.5 | 53 | 90 | 10 | |
| 2DUBE 096 530 S10 | 9.6 | 53 | 90 | 10 | |
| 2DUBE 097 530 S10 | 9.7 | 53 | 90 | 10 | |
| 2DUBE 098 530 S10 | 9.8 | 53 | 90 | 10 | |
| 2DUBE 099 530 S10 | 9.9 | 53 | 90 | 10 | |
| 2DUBE 100 530 S10 | 10 | 53 | 90 | 10 | |
| 2DUBE 101 530 S10 | 10.1 | 53 | 90 | 10 | |
| 2DUBE 102 550 S11 | 10.2 | 55 | 95 | 11 | |
| 2DUBE 103 550 S11 | 10.3 | 55 | 95 | 11 | |
| 2DUBE 104 550 S11 | 10.4 | 55 | 95 | 11 | |
| 2DUBE 105 550 S11 | 10.5 | 55 | 95 | 11 | |
| 2DUBE 106 550 S11 | 10.6 | 55 | 95 | 11 | |
| 2DUBE 107 550 S11 | 10.7 | 55 | 95 | 11 | |
| 2DUBE 108 550 S11 | 10.8 | 55 | 95 | 11 | |
| 2DUBE 109 550 S11 | 10.9 | 55 | 95 | 11 | |

# 2DUBE

## Carbide 2 Flutes Dube Drills(Standard length)

## 초경 2날 두배 드릴

New

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBE 110 550 S11 | 11 | 55 | 100 | 11 | |
| 2DUBE 111 550 S11 | 11.1 | 55 | 100 | 11 | |
| 2DUBE 112 620 S12 | 11.2 | 62 | 100 | 12 | |
| 2DUBE 113 620 S12 | 11.3 | 62 | 100 | 12 | |
| 2DUBE 114 620 S12 | 11.4 | 62 | 100 | 12 | |
| 2DUBE 115 620 S12 | 11.5 | 62 | 100 | 12 | |
| 2DUBE 116 620 S12 | 11.6 | 62 | 100 | 12 | |
| 2DUBE 117 620 S12 | 11.7 | 62 | 100 | 12 | |
| 2DUBE 118 620 S12 | 11.8 | 62 | 100 | 12 | |
| 2DUBE 119 620 S12 | 11.9 | 62 | 100 | 12 | |
| 2DUBE 120 620 S12 | 12 | 62 | 100 | 12 | |
| 2DUBE 121 620 S12 | 12.1 | 62 | 100 | 12 | |
| 2DUBE 122 620 S13 | 12.2 | 62 | 100 | 13 | |
| 2DUBE 123 620 S13 | 12.3 | 62 | 100 | 13 | |
| 2DUBE 124 620 S13 | 12.4 | 62 | 100 | 13 | |
| 2DUBE 125 620 S13 | 12.5 | 62 | 100 | 13 | |
| 2DUBE 126 620 S13 | 12.6 | 62 | 100 | 13 | |
| 2DUBE 127 620 S13 | 12.7 | 62 | 100 | 13 | |
| 2DUBE 128 620 S13 | 12.8 | 62 | 100 | 13 | |
| 2DUBE 129 620 S13 | 12.9 | 62 | 100 | 13 | |
| 2DUBE 130 620 S13 | 13 | 62 | 100 | 13 | |
| 2DUBE 131 620 S13 | 13.1 | 62 | 100 | 13 | |
| 2DUBE 132 640 S14 | 13.2 | 64 | 105 | 14 | |
| 2DUBE 133 640 S14 | 13.3 | 64 | 105 | 14 | |
| 2DUBE 134 640 S14 | 13.4 | 64 | 105 | 14 | |
| 2DUBE 135 640 S14 | 13.5 | 64 | 105 | 14 | |
| 2DUBE 136 640 S14 | 13.6 | 64 | 105 | 14 | |
| 2DUBE 137 640 S14 | 13.7 | 64 | 105 | 14 | |
| 2DUBE 138 640 S14 | 13.8 | 64 | 105 | 14 | |
| 2DUBE 139 640 S14 | 13.9 | 64 | 105 | 14 | |
| 2DUBE 140 640 S14 | 14 | 64 | 105 | 14 | |
| 2DUBE 141 640 S14 | 14.1 | 64 | 105 | 14 | |
| 2DUBE 142 670 S15 | 14.2 | 67 | 110 | 15 | |
| 2DUBE 143 670 S15 | 14.3 | 67 | 110 | 15 | |
| 2DUBE 144 670 S15 | 14.4 | 67 | 110 | 15 | |
| 2DUBE 145 670 S15 | 14.5 | 67 | 110 | 15 | |
| 2DUBE 146 670 S15 | 14.6 | 67 | 110 | 15 | |
| 2DUBE 147 670 S15 | 14.7 | 67 | 110 | 15 | |
| 2DUBE 148 670 S15 | 14.8 | 67 | 110 | 15 | |
| 2DUBE 149 670 S15 | 14.9 | 67 | 110 | 15 | |
| 2DUBE 150 670 S15 | 15 | 67 | 110 | 15 | |
| 2DUBE 151 670 S15 | 15.1 | 67 | 110 | 15 | |
| 2DUBE 152 690 S16 | 15.2 | 69 | 115 | 16 | |
| 2DUBE 153 690 S16 | 15.3 | 69 | 115 | 16 | |
| 2DUBE 154 690 S16 | 15.4 | 69 | 115 | 16 | |
| 2DUBE 155 690 S16 | 15.5 | 69 | 115 | 16 | |
| 2DUBE 156 690 S16 | 15.6 | 69 | 115 | 16 | |
| 2DUBE 157 690 S16 | 15.7 | 69 | 115 | 16 | |
| 2DUBE 158 690 S16 | 15.8 | 69 | 115 | 16 | |
| 2DUBE 159 690 S16 | 15.9 | 69 | 115 | 16 | |
| 2DUBE 160 690 S16 | 16 | 69 | 115 | 16 | |
| 2DUBE 161 690 S16 | 16.1 | 69 | 115 | 16 | |
| 2DUBE 162 710 S17 | 16.2 | 71 | 120 | 17 | |
| 2DUBE 163 710 S17 | 16.3 | 71 | 120 | 17 | |
| 2DUBE 164 710 S17 | 16.4 | 71 | 120 | 17 | |
| 2DUBE 165 710 S17 | 16.5 | 71 | 120 | 17 | |
| 2DUBE 166 710 S17 | 16.6 | 71 | 120 | 17 | |
| 2DUBE 167 710 S17 | 16.7 | 71 | 120 | 17 | |
| 2DUBE 168 710 S17 | 16.8 | 71 | 120 | 17 | |
| 2DUBE 169 710 S17 | 16.9 | 71 | 120 | 17 | |
| 2DUBE 170 710 S17 | 17 | 71 | 120 | 17 | |
| 2DUBE 171 710 S17 | 17.1 | 71 | 120 | 17 | |
| 2DUBE 172 740 S18 | 17.2 | 74 | 125 | 18 | |
| 2DUBE 173 740 S18 | 17.3 | 74 | 125 | 18 | |
| 2DUBE 174 740 S18 | 17.4 | 74 | 125 | 18 | |
| 2DUBE 175 740 S18 | 17.5 | 74 | 125 | 18 | |
| 2DUBE 176 740 S18 | 17.6 | 74 | 125 | 18 | |
| 2DUBE 177 740 S18 | 17.7 | 74 | 125 | 18 | |
| 2DUBE 178 740 S18 | 17.8 | 74 | 125 | 18 | |
| 2DUBE 179 740 S18 | 17.9 | 74 | 125 | 18 | |
| 2DUBE 180 740 S18 | 18 | 74 | 125 | 18 | |
| 2DUBE 181 740 S18 | 18.1 | 74 | 125 | 18 | |
| 2DUBE 182 760 S19 | 18.2 | 76 | 130 | 19 | |
| 2DUBE 183 760 S19 | 18.3 | 76 | 130 | 19 | |
| 2DUBE 184 760 S19 | 18.4 | 76 | 130 | 19 | |
| 2DUBE 185 760 S19 | 18.5 | 76 | 130 | 19 | |
| 2DUBE 186 760 S19 | 18.6 | 76 | 130 | 19 | |
| 2DUBE 187 760 S19 | 18.7 | 76 | 130 | 19 | |
| 2DUBE 188 760 S19 | 18.8 | 76 | 130 | 19 | |
| 2DUBE 189 760 S19 | 18.9 | 76 | 130 | 19 | |
| 2DUBE 190 760 S19 | 19 | 76 | 130 | 19 | |
| 2DUBE 191 760 S19 | 19.1 | 76 | 130 | 19 | |
| 2DUBE 192 800 S20 | 19.2 | 80 | 130 | 20 | |
| 2DUBE 193 800 S20 | 19.3 | 80 | 130 | 20 | |
| 2DUBE 194 800 S20 | 19.4 | 80 | 130 | 20 | |
| 2DUBE 195 800 S20 | 19.5 | 80 | 130 | 20 | |
| 2DUBE 196 800 S20 | 19.6 | 80 | 130 | 20 | |
| 2DUBE 197 800 S20 | 19.7 | 80 | 130 | 20 | |
| 2DUBE 198 800 S20 | 19.8 | 80 | 130 | 20 | |
| 2DUBE 199 800 S20 | 19.9 | 80 | 130 | 20 | |
| 2DUBE 200 800 S20 | 20 | 80 | 130 | 20 | |

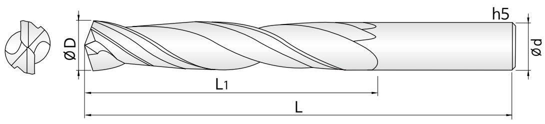
DRILL

# 4DUBE

## Carbide 4 Flutes Dube Drills (Standard length)

## 초경 4날 두배 드릴

New




End point (2F)
Flute (4F)

- **HRc28이하, S45C, SCM, 주강, 주철용 고정밀 드릴**
- T-CRO 코팅을 적용하여 드릴 가공 시 발생하는 융착 현상을 최소화 하였습니다.
- 절삭 저항을 최소화하는 Point thinning을 채택 하였습니다.
- 특수 인선처리와 최적의 형상으로 치핑 및 돌발파손을 방지합니다.
- 우수한 공구의 강성과 칩 배출의 설계를 적용하여 칩 배출성을 향상시켰습니다.

- **High-speed drills for materials up to HRc28, S45C, SCM, cast steels, and cast irons**
- Minimized adhesion during drilling operations by applying T-CRO coating.
- Adopted point thinning to minimize cutting resistance.
- Prevents chipping and unexpected fractures with special edge treatment and optimal shape.
- Enhanced chip evacuation with the application of a design for superior tool rigidity and chip evacuation.


520P

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 4DUBE 060 360 S06 | 6 | 36 | 65 | 6 | |
| 4DUBE 080 460 S08 | 8 | 46 | 80 | 8 | |
| 4DUBE 100 530 S10 | 10 | 53 | 90 | 10 | |
| 4DUBE 120 620 S12 | 12 | 62 | 100 | 12 | |

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|

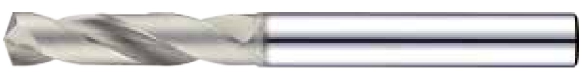
DRILL

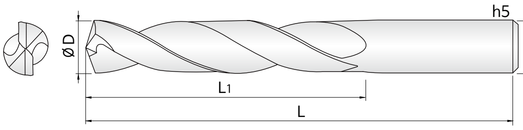
# 2DUBEV

Carbide 2 Flutes Dube V Drills(Various) - [3XD]

초경 2날 두배 V 드릴 [3XD]

New






- **HRc28이하, S45C, SCM, 주강, 주철용 고정밀 드릴**
- T-CRO 코팅을 적용하여 드릴 가공 시 발생하는 융착 현상을 최소화 하였습니다.
- 절삭 저항을 최소화하는 Point thinning을 채택 하였습니다.
- 특수 인선처리와 최적의 형상으로 치핑 및 돌발파손을 방지합니다.
- 우수한 공구의 강성과 칩 배출의 설계를 적용하여 칩 배출성을 향상시켰습니다.

- **High-speed drills for materials up to HRc28, S45C, SCM, cast steels, and cast irons**
- Minimized adhesion during drilling operations by applying T-CRO coating.
- Adopted point thinning to minimize cutting resistance.
- Prevents chipping and unexpected fractures with special edge treatment and optimal shape.
- Enhanced chip evacuation with the application of a design for superior tool rigidity and chip evacuation.


523P

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEV 010 080 S03 | 1 | 8 | 40 | 3 | |
| 2DUBEV 011 080 S03 | 1.1 | 8 | 40 | 3 | |
| 2DUBEV 012 080 S03 | 1.2 | 8 | 40 | 3 | |
| 2DUBEV 013 080 S03 | 1.3 | 8 | 40 | 3 | |
| 2DUBEV 014 080 S03 | 1.4 | 8 | 40 | 3 | |
| 2DUBEV 015 080 S03 | 1.5 | 8 | 50 | 3 | |
| 2DUBEV 016 080 S03 | 1.6 | 8 | 50 | 3 | |
| 2DUBEV 017 100 S03 | 1.7 | 10 | 50 | 3 | |
| 2DUBEV 018 100 S03 | 1.8 | 10 | 50 | 3 | |
| 2DUBEV 019 100 S03 | 1.9 | 10 | 50 | 3 | |
| 2DUBEV 020 160 S04 | 2 | 16 | 50 | 4 | |
| 2DUBEV 021 160 S04 | 2.1 | 16 | 50 | 4 | |
| 2DUBEV 022 160 S04 | 2.2 | 16 | 50 | 4 | |
| 2DUBEV 023 160 S04 | 2.3 | 16 | 50 | 4 | |
| 2DUBEV 024 160 S04 | 2.4 | 16 | 50 | 4 | |
| 2DUBEV 025 200 S04 | 2.5 | 20 | 50 | 4 | |
| 2DUBEV 026 200 S04 | 2.6 | 20 | 50 | 4 | |
| 2DUBEV 027 200 S04 | 2.7 | 20 | 50 | 4 | |
| 2DUBEV 028 200 S04 | 2.8 | 20 | 50 | 4 | |
| 2DUBEV 029 200 S04 | 2.9 | 20 | 50 | 4 | |
| 2DUBEV 030 200 S06 | 3 | 20 | 60 | 6 | |
| 2DUBEV 031 200 S06 | 3.1 | 20 | 60 | 6 | |
| 2DUBEV 032 200 S06 | 3.2 | 20 | 60 | 6 | |
| 2DUBEV 033 200 S06 | 3.3 | 20 | 60 | 6 | |
| 2DUBEV 034 200 S06 | 3.4 | 20 | 60 | 6 | |
| 2DUBEV 035 200 S06 | 3.5 | 20 | 60 | 6 | |
| 2DUBEV 036 200 S06 | 3.6 | 20 | 60 | 6 | |
| 2DUBEV 037 200 S06 | 3.7 | 20 | 60 | 6 | |
| 2DUBEV 038 240 S06 | 3.8 | 24 | 65 | 6 | |
| 2DUBEV 039 240 S06 | 3.9 | 24 | 65 | 6 | |
| 2DUBEV 040 240 S06 | 4 | 24 | 65 | 6 | |
| 2DUBEV 041 240 S06 | 4.1 | 24 | 65 | 6 | |
| 2DUBEV 042 240 S06 | 4.2 | 24 | 65 | 6 | |
| 2DUBEV 043 240 S06 | 4.3 | 24 | 65 | 6 | |
| 2DUBEV 044 240 S06 | 4.4 | 24 | 65 | 6 | |
| 2DUBEV 045 240 S06 | 4.5 | 24 | 65 | 6 | |
| 2DUBEV 046 240 S06 | 4.6 | 24 | 65 | 6 | |
| 2DUBEV 047 240 S06 | 4.7 | 24 | 65 | 6 | |
| 2DUBEV 048 280 S06 | 4.8 | 28 | 65 | 6 | |
| 2DUBEV 049 280 S06 | 4.9 | 28 | 65 | 6 | |
| 2DUBEV 050 280 S06 | 5 | 28 | 65 | 6 | |
| 2DUBEV 051 280 S06 | 5.1 | 28 | 65 | 6 | |
| 2DUBEV 052 280 S06 | 5.2 | 28 | 65 | 6 | |
| 2DUBEV 053 280 S06 | 5.3 | 28 | 65 | 6 | |
| 2DUBEV 054 280 S06 | 5.4 | 28 | 65 | 6 | |
| 2DUBEV 055 280 S06 | 5.5 | 28 | 65 | 6 | |
| 2DUBEV 056 280 S06 | 5.6 | 28 | 65 | 6 | |
| 2DUBEV 057 280 S06 | 5.7 | 28 | 65 | 6 | |
| 2DUBEV 058 280 S06 | 5.8 | 28 | 65 | 6 | |
| 2DUBEV 059 280 S06 | 5.9 | 28 | 65 | 6 | |

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEV 060 280 S06 | 6 | 28 | 65 | 6 | |
| 2DUBEV 061 340 S08 | 6.1 | 34 | 80 | 8 | |
| 2DUBEV 062 340 S08 | 6.2 | 34 | 80 | 8 | |
| 2DUBEV 063 340 S08 | 6.3 | 34 | 80 | 8 | |
| 2DUBEV 064 340 S08 | 6.4 | 34 | 80 | 8 | |
| 2DUBEV 065 340 S08 | 6.5 | 34 | 80 | 8 | |
| 2DUBEV 066 340 S08 | 6.6 | 34 | 80 | 8 | |
| 2DUBEV 067 340 S08 | 6.7 | 34 | 80 | 8 | |
| 2DUBEV 068 340 S08 | 6.8 | 34 | 80 | 8 | |
| 2DUBEV 069 340 S08 | 6.9 | 34 | 80 | 8 | |
| 2DUBEV 070 340 S08 | 7 | 34 | 80 | 8 | |
| 2DUBEV 071 410 S08 | 7.1 | 41 | 80 | 8 | |
| 2DUBEV 072 410 S08 | 7.2 | 41 | 80 | 8 | |
| 2DUBEV 073 410 S08 | 7.3 | 41 | 80 | 8 | |
| 2DUBEV 074 410 S08 | 7.4 | 41 | 80 | 8 | |
| 2DUBEV 075 410 S08 | 7.5 | 41 | 80 | 8 | |
| 2DUBEV 076 410 S08 | 7.6 | 41 | 80 | 8 | |
| 2DUBEV 077 410 S08 | 7.7 | 41 | 80 | 8 | |
| 2DUBEV 078 410 S08 | 7.8 | 41 | 80 | 8 | |
| 2DUBEV 079 410 S08 | 7.9 | 41 | 80 | 8 | |
| 2DUBEV 080 410 S08 | 8 | 41 | 80 | 8 | |
| 2DUBEV 081 470 S10 | 8.1 | 47 | 90 | 10 | |
| 2DUBEV 082 470 S10 | 8.2 | 47 | 90 | 10 | |
| 2DUBEV 083 470 S10 | 8.3 | 47 | 90 | 10 | |
| 2DUBEV 084 470 S10 | 8.4 | 47 | 90 | 10 | |
| 2DUBEV 085 470 S10 | 8.5 | 47 | 90 | 10 | |
| 2DUBEV 086 470 S10 | 8.6 | 47 | 90 | 10 | |
| 2DUBEV 087 470 S10 | 8.7 | 47 | 90 | 10 | |
| 2DUBEV 088 470 S10 | 8.8 | 47 | 90 | 10 | |
| 2DUBEV 089 470 S10 | 8.9 | 47 | 90 | 10 | |
| 2DUBEV 090 470 S10 | 9 | 47 | 90 | 10 | |
| 2DUBEV 091 470 S10 | 9.1 | 47 | 90 | 10 | |
| 2DUBEV 092 470 S10 | 9.2 | 47 | 90 | 10 | |
| 2DUBEV 093 470 S10 | 9.3 | 47 | 90 | 10 | |
| 2DUBEV 094 470 S10 | 9.4 | 47 | 90 | 10 | |
| 2DUBEV 095 470 S10 | 9.5 | 47 | 90 | 10 | |
| 2DUBEV 096 470 S10 | 9.6 | 47 | 90 | 10 | |
| 2DUBEV 097 470 S10 | 9.7 | 47 | 90 | 10 | |
| 2DUBEV 098 470 S10 | 9.8 | 47 | 90 | 10 | |
| 2DUBEV 099 470 S10 | 9.9 | 47 | 90 | 10 | |
| 2DUBEV 100 470 S10 | 10 | 47 | 90 | 10 | |
| 2DUBEV 101 550 S12 | 10.1 | 55 | 100 | 12 | |
| 2DUBEV 102 550 S12 | 10.2 | 55 | 100 | 12 | |
| 2DUBEV 103 550 S12 | 10.3 | 55 | 100 | 12 | |
| 2DUBEV 104 550 S12 | 10.4 | 55 | 100 | 12 | |
| 2DUBEV 105 550 S12 | 10.5 | 55 | 100 | 12 | |
| 2DUBEV 106 550 S12 | 10.6 | 55 | 100 | 12 | |
| 2DUBEV 107 550 S12 | 10.7 | 55 | 100 | 12 | |
| 2DUBEV 108 550 S12 | 10.8 | 55 | 100 | 12 | |
| 2DUBEV 109 550 S12 | 10.9 | 55 | 100 | 12 | |

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEV 110 550 S12 | 11 | 55 | 100 | 12 | |
| 2DUBEV 111 550 S12 | 11.1 | 55 | 100 | 12 | |
| 2DUBEV 112 550 S12 | 11.2 | 55 | 100 | 12 | |
| 2DUBEV 113 550 S12 | 11.3 | 55 | 100 | 12 | |
| 2DUBEV 114 550 S12 | 11.4 | 55 | 100 | 12 | |
| 2DUBEV 115 550 S12 | 11.5 | 55 | 100 | 12 | |
| 2DUBEV 116 550 S12 | 11.6 | 55 | 100 | 12 | |
| 2DUBEV 117 550 S12 | 11.7 | 55 | 100 | 12 | |
| 2DUBEV 118 550 S12 | 11.8 | 55 | 100 | 12 | |
| 2DUBEV 119 550 S12 | 11.9 | 55 | 100 | 12 | |
| 2DUBEV 120 550 S12 | 12 | 55 | 100 | 12 | |
| 2DUBEV 121 600 S14 | 12.1 | 60 | 100 | 14 | |
| 2DUBEV 122 600 S14 | 12.2 | 60 | 100 | 14 | |
| 2DUBEV 123 600 S14 | 12.3 | 60 | 100 | 14 | |
| 2DUBEV 124 600 S14 | 12.4 | 60 | 100 | 14 | |
| 2DUBEV 125 600 S14 | 12.5 | 60 | 100 | 14 | |
| 2DUBEV 126 600 S14 | 12.6 | 60 | 100 | 14 | |
| 2DUBEV 127 600 S14 | 12.7 | 60 | 100 | 14 | |
| 2DUBEV 128 600 S14 | 12.8 | 60 | 100 | 14 | |
| 2DUBEV 129 600 S14 | 12.9 | 60 | 100 | 14 | |
| 2DUBEV 130 600 S14 | 13 | 60 | 100 | 14 | |
| 2DUBEV 131 600 S14 | 13.1 | 60 | 100 | 14 | |
| 2DUBEV 132 600 S14 | 13.2 | 60 | 105 | 14 | |
| 2DUBEV 133 600 S14 | 13.3 | 60 | 105 | 14 | |
| 2DUBEV 134 600 S14 | 13.4 | 60 | 105 | 14 | |
| 2DUBEV 135 600 S14 | 13.5 | 60 | 105 | 14 | |
| 2DUBEV 136 600 S14 | 13.6 | 60 | 105 | 14 | |
| 2DUBEV 137 600 S14 | 13.7 | 60 | 105 | 14 | |
| 2DUBEV 138 600 S14 | 13.8 | 60 | 105 | 14 | |
| 2DUBEV 139 600 S14 | 13.9 | 60 | 105 | 14 | |
| 2DUBEV 140 600 S14 | 14 | 60 | 105 | 14 | |
| 2DUBEV 141 650 S16 | 14.1 | 65 | 110 | 16 | |
| 2DUBEV 142 650 S16 | 14.2 | 65 | 110 | 16 | |
| 2DUBEV 143 650 S16 | 14.3 | 65 | 110 | 16 | |
| 2DUBEV 144 650 S16 | 14.4 | 65 | 110 | 16 | |
| 2DUBEV 145 650 S16 | 14.5 | 65 | 110 | 16 | |
| 2DUBEV 146 650 S16 | 14.6 | 65 | 110 | 16 | |
| 2DUBEV 147 650 S16 | 14.7 | 65 | 110 | 16 | |
| 2DUBEV 148 650 S16 | 14.8 | 65 | 110 | 16 | |
| 2DUBEV 149 650 S16 | 14.9 | 65 | 110 | 16 | |
| 2DUBEV 150 650 S16 | 15 | 65 | 110 | 16 | |
| 2DUBEV 151 650 S16 | 15.1 | 65 | 110 | 16 | |
| 2DUBEV 152 650 S16 | 15.2 | 65 | 115 | 16 | |
| 2DUBEV 153 650 S16 | 15.3 | 65 | 115 | 16 | |
| 2DUBEV 154 650 S16 | 15.4 | 65 | 115 | 16 | |
| 2DUBEV 155 650 S16 | 15.5 | 65 | 115 | 16 | |
| 2DUBEV 156 650 S16 | 15.6 | 65 | 115 | 16 | |
| 2DUBEV 157 650 S16 | 15.7 | 65 | 115 | 16 | |
| 2DUBEV 158 650 S16 | 15.8 | 65 | 115 | 16 | |
| 2DUBEV 159 650 S16 | 15.9 | 65 | 115 | 16 | |

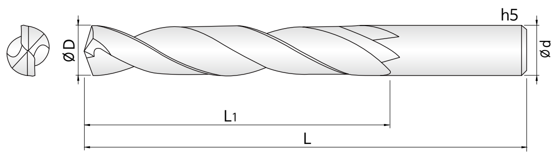
| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 섕크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEV 160 650 S16 | 16 | 65 | 115 | 16 | |
| 2DUBEV 161 730 S18 | 16.1 | 73 | 125 | 18 | |
| 2DUBEV 162 730 S18 | 16.2 | 73 | 125 | 18 | |
| 2DUBEV 163 730 S18 | 16.3 | 73 | 125 | 18 | |
| 2DUBEV 164 730 S18 | 16.4 | 73 | 125 | 18 | |
| 2DUBEV 165 730 S18 | 16.5 | 73 | 125 | 18 | |
| 2DUBEV 166 730 S18 | 16.6 | 73 | 125 | 18 | |
| 2DUBEV 167 730 S18 | 16.7 | 73 | 125 | 18 | |
| 2DUBEV 168 730 S18 | 16.8 | 73 | 125 | 18 | |
| 2DUBEV 169 730 S18 | 16.9 | 73 | 125 | 18 | |
| 2DUBEV 170 730 S18 | 17 | 73 | 125 | 18 | |
| 2DUBEV 171 730 S18 | 17.1 | 73 | 125 | 18 | |
| 2DUBEV 172 730 S18 | 17.2 | 73 | 125 | 18 | |
| 2DUBEV 173 730 S18 | 17.3 | 73 | 125 | 18 | |
| 2DUBEV 174 730 S18 | 17.4 | 73 | 125 | 18 | |
| 2DUBEV 175 730 S18 | 17.5 | 73 | 125 | 18 | |
| 2DUBEV 176 730 S18 | 17.6 | 73 | 125 | 18 | |
| 2DUBEV 177 730 S18 | 17.7 | 73 | 125 | 18 | |
| 2DUBEV 178 730 S18 | 17.8 | 73 | 125 | 18 | |
| 2DUBEV 179 730 S18 | 17.9 | 73 | 125 | 18 | |
| 2DUBEV 180 730 S18 | 18 | 73 | 125 | 18 | |
| 2DUBEV 181 790 S20 | 18.1 | 79 | 130 | 20 | |
| 2DUBEV 182 790 S20 | 18.2 | 79 | 130 | 20 | |
| 2DUBEV 183 790 S20 | 18.3 | 79 | 130 | 20 | |
| 2DUBEV 184 790 S20 | 18.4 | 79 | 130 | 20 | |
| 2DUBEV 185 790 S20 | 18.5 | 79 | 130 | 20 | |
| 2DUBEV 186 790 S20 | 18.6 | 79 | 130 | 20 | |
| 2DUBEV 187 790 S20 | 18.7 | 79 | 130 | 20 | |
| 2DUBEV 188 790 S20 | 18.8 | 79 | 130 | 20 | |
| 2DUBEV 189 790 S20 | 18.9 | 79 | 130 | 20 | |
| 2DUBEV 190 790 S20 | 19 | 79 | 130 | 20 | |
| 2DUBEV 191 790 S20 | 19.1 | 79 | 130 | 20 | |
| 2DUBEV 192 790 S20 | 19.2 | 79 | 130 | 20 | |
| 2DUBEV 193 790 S20 | 19.3 | 79 | 130 | 20 | |
| 2DUBEV 194 790 S20 | 19.4 | 79 | 130 | 20 | |
| 2DUBEV 195 790 S20 | 19.5 | 79 | 130 | 20 | |
| 2DUBEV 196 790 S20 | 19.6 | 79 | 130 | 20 | |
| 2DUBEV 197 790 S20 | 19.7 | 79 | 130 | 20 | |
| 2DUBEV 198 790 S20 | 19.8 | 79 | 130 | 20 | |
| 2DUBEV 199 790 S20 | 19.9 | 79 | 130 | 20 | |
| 2DUBEV 200 790 S20 | 20 | 79 | 130 | 20 | |

# 2DUBEV

## Carbide 2 Flutes Dube V Drills (Various) - [5XD]

## 초경 2날 두배 V 드릴 [5XD]

New

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- 특수 인선처리와 최적의 형상으로 치핑 및 돌발파손을 방지합니다.
- 우수한 공구의 강성과 칩 배출의 설계를 적용하여 칩 배출성을 향상시켰습니다.

- **High-speed drills for materials up to HRc28, S45C, SCM, cast steels, and cast irons**
- Minimized adhesion during drilling operations by applying T-CRO coating.
- Adopted point thinning to minimize cutting resistance.
- Prevents chipping and unexpected fractures with special edge treatment and optimal shape.
- Enhanced chip evacuation with the application of a design for superior tool rigidity and chip evacuation.


523P

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEV 010 100 S03 | 1 | 10 | 55 | 3 | |
| 2DUBEV 011 120 S03 | 1.1 | 12 | 55 | 3 | |
| 2DUBEV 012 120 S03 | 1.2 | 12 | 55 | 3 | |
| 2DUBEV 013 120 S03 | 1.3 | 12 | 55 | 3 | |
| 2DUBEV 014 120 S03 | 1.4 | 12 | 55 | 3 | |
| 2DUBEV 015 120 S03 | 1.5 | 12 | 55 | 3 | |
| 2DUBEV 016 160 S03 | 1.6 | 16 | 55 | 3 | |
| 2DUBEV 017 160 S03 | 1.7 | 16 | 55 | 3 | |
| 2DUBEV 018 160 S03 | 1.8 | 16 | 55 | 3 | |
| 2DUBEV 019 160 S03 | 1.9 | 16 | 55 | 3 | |
| 2DUBEV 020 210 S04 | 2 | 21 | 55 | 4 | |
| 2DUBEV 021 210 S04 | 2.1 | 21 | 55 | 4 | |
| 2DUBEV 022 210 S04 | 2.2 | 21 | 55 | 4 | |
| 2DUBEV 023 210 S04 | 2.3 | 21 | 55 | 4 | |
| 2DUBEV 024 210 S04 | 2.4 | 21 | 55 | 4 | |
| 2DUBEV 025 210 S04 | 2.5 | 21 | 55 | 4 | |
| 2DUBEV 026 210 S04 | 2.6 | 21 | 55 | 4 | |
| 2DUBEV 027 210 S04 | 2.7 | 21 | 55 | 4 | |
| 2DUBEV 028 210 S04 | 2.8 | 21 | 55 | 4 | |
| 2DUBEV 029 210 S04 | 2.9 | 21 | 55 | 4 | |
| 2DUBEV 030 280 S06 | 3 | 28 | 65 | 6 | |
| 2DUBEV 031 280 S06 | 3.1 | 28 | 65 | 6 | |
| 2DUBEV 032 280 S06 | 3.2 | 28 | 65 | 6 | |
| 2DUBEV 033 280 S06 | 3.3 | 28 | 65 | 6 | |
| 2DUBEV 034 280 S06 | 3.4 | 28 | 65 | 6 | |
| 2DUBEV 035 280 S06 | 3.5 | 28 | 65 | 6 | |
| 2DUBEV 036 280 S06 | 3.6 | 28 | 65 | 6 | |
| 2DUBEV 037 280 S06 | 3.7 | 28 | 65 | 6 | |
| 2DUBEV 038 360 S06 | 3.8 | 36 | 75 | 6 | |
| 2DUBEV 039 360 S06 | 3.9 | 36 | 75 | 6 | |
| 2DUBEV 040 360 S06 | 4 | 36 | 75 | 6 | |
| 2DUBEV 041 360 S06 | 4.1 | 36 | 75 | 6 | |
| 2DUBEV 042 360 S06 | 4.2 | 36 | 75 | 6 | |
| 2DUBEV 043 360 S06 | 4.3 | 36 | 75 | 6 | |
| 2DUBEV 044 360 S06 | 4.4 | 36 | 75 | 6 | |
| 2DUBEV 045 360 S06 | 4.5 | 36 | 75 | 6 | |
| 2DUBEV 046 360 S06 | 4.6 | 36 | 75 | 6 | |
| 2DUBEV 047 360 S06 | 4.7 | 36 | 75 | 6 | |
| 2DUBEV 048 440 S06 | 4.8 | 44 | 80 | 6 | |
| 2DUBEV 049 440 S06 | 4.9 | 44 | 80 | 6 | |
| 2DUBEV 050 440 S06 | 5 | 44 | 80 | 6 | |
| 2DUBEV 051 440 S06 | 5.1 | 44 | 80 | 6 | |
| 2DUBEV 052 440 S06 | 5.2 | 44 | 80 | 6 | |
| 2DUBEV 053 440 S06 | 5.3 | 44 | 80 | 6 | |
| 2DUBEV 054 440 S06 | 5.4 | 44 | 80 | 6 | |
| 2DUBEV 055 440 S06 | 5.5 | 44 | 80 | 6 | |
| 2DUBEV 056 440 S06 | 5.6 | 44 | 80 | 6 | |
| 2DUBEV 057 440 S06 | 5.7 | 44 | 80 | 6 | |
| 2DUBEV 058 440 S06 | 5.8 | 44 | 80 | 6 | |
| 2DUBEV 059 440 S06 | 5.9 | 44 | 80 | 6 | |

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEV 060 440 S06 | 6 | 44 | 80 | 6 | |
| 2DUBEV 061 530 S08 | 6.1 | 53 | 90 | 8 | |
| 2DUBEV 062 530 S08 | 6.2 | 53 | 90 | 8 | |
| 2DUBEV 063 530 S08 | 6.3 | 53 | 90 | 8 | |
| 2DUBEV 064 530 S08 | 6.4 | 53 | 90 | 8 | |
| 2DUBEV 065 530 S08 | 6.5 | 53 | 90 | 8 | |
| 2DUBEV 066 530 S08 | 6.6 | 53 | 90 | 8 | |
| 2DUBEV 067 530 S08 | 6.7 | 53 | 90 | 8 | |
| 2DUBEV 068 530 S08 | 6.8 | 53 | 90 | 8 | |
| 2DUBEV 069 530 S08 | 6.9 | 53 | 90 | 8 | |
| 2DUBEV 070 530 S08 | 7 | 53 | 90 | 8 | |
| 2DUBEV 071 530 S08 | 7.1 | 53 | 90 | 8 | |
| 2DUBEV 072 530 S08 | 7.2 | 53 | 90 | 8 | |
| 2DUBEV 073 530 S08 | 7.3 | 53 | 90 | 8 | |
| 2DUBEV 074 530 S08 | 7.4 | 53 | 90 | 8 | |
| 2DUBEV 075 530 S08 | 7.5 | 53 | 90 | 8 | |
| 2DUBEV 076 530 S08 | 7.6 | 53 | 90 | 8 | |
| 2DUBEV 077 530 S08 | 7.7 | 53 | 90 | 8 | |
| 2DUBEV 078 530 S08 | 7.8 | 53 | 90 | 8 | |
| 2DUBEV 079 530 S08 | 7.9 | 53 | 90 | 8 | |
| 2DUBEV 080 530 S08 | 8 | 53 | 90 | 8 | |
| 2DUBEV 081 610 S10 | 8.1 | 61 | 105 | 10 | |
| 2DUBEV 082 610 S10 | 8.2 | 61 | 105 | 10 | |
| 2DUBEV 083 610 S10 | 8.3 | 61 | 105 | 10 | |
| 2DUBEV 084 610 S10 | 8.4 | 61 | 105 | 10 | |
| 2DUBEV 085 610 S10 | 8.5 | 61 | 105 | 10 | |
| 2DUBEV 086 610 S10 | 8.6 | 61 | 105 | 10 | |
| 2DUBEV 087 610 S10 | 8.7 | 61 | 105 | 10 | |
| 2DUBEV 088 610 S10 | 8.8 | 61 | 105 | 10 | |
| 2DUBEV 089 610 S10 | 8.9 | 61 | 105 | 10 | |
| 2DUBEV 090 610 S10 | 9 | 61 | 105 | 10 | |
| 2DUBEV 091 610 S10 | 9.1 | 61 | 105 | 10 | |
| 2DUBEV 092 610 S10 | 9.2 | 61 | 105 | 10 | |
| 2DUBEV 093 610 S10 | 9.3 | 61 | 105 | 10 | |
| 2DUBEV 094 610 S10 | 9.4 | 61 | 105 | 10 | |
| 2DUBEV 095 610 S10 | 9.5 | 61 | 105 | 10 | |
| 2DUBEV 096 610 S10 | 9.6 | 61 | 105 | 10 | |
| 2DUBEV 097 610 S10 | 9.7 | 61 | 105 | 10 | |
| 2DUBEV 098 610 S10 | 9.8 | 61 | 105 | 10 | |
| 2DUBEV 099 610 S10 | 9.9 | 61 | 105 | 10 | |
| 2DUBEV 100 610 S10 | 10 | 61 | 105 | 10 | |
| 2DUBEV 101 710 S12 | 10.1 | 71 | 120 | 12 | |
| 2DUBEV 102 710 S12 | 10.2 | 71 | 120 | 12 | |
| 2DUBEV 103 710 S12 | 10.3 | 71 | 120 | 12 | |
| 2DUBEV 104 710 S12 | 10.4 | 71 | 120 | 12 | |
| 2DUBEV 105 710 S12 | 10.5 | 71 | 120 | 12 | |
| 2DUBEV 106 710 S12 | 10.6 | 71 | 120 | 12 | |
| 2DUBEV 107 710 S12 | 10.7 | 71 | 120 | 12 | |
| 2DUBEV 108 710 S12 | 10.8 | 71 | 120 | 12 | |
| 2DUBEV 109 710 S12 | 10.9 | 71 | 120 | 12 | |

# Carbide 2 Flutes Dube V Drills (Various) - [5XD]

# 초경 2날 두배 V 드릴 [5XD]

New

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEV 110 710 S12 | 11 | 71 | 120 | 12 | |
| 2DUBEV 111 710 S12 | 11.1 | 71 | 120 | 12 | |
| 2DUBEV 112 710 S12 | 11.2 | 71 | 120 | 12 | |
| 2DUBEV 113 710 S12 | 11.3 | 71 | 120 | 12 | |
| 2DUBEV 114 710 S12 | 11.4 | 71 | 120 | 12 | |
| 2DUBEV 115 710 S12 | 11.5 | 71 | 120 | 12 | |
| 2DUBEV 116 710 S12 | 11.6 | 71 | 120 | 12 | |
| 2DUBEV 117 710 S12 | 11.7 | 71 | 120 | 12 | |
| 2DUBEV 118 710 S12 | 11.8 | 71 | 120 | 12 | |
| 2DUBEV 119 710 S12 | 11.9 | 71 | 120 | 12 | |
| 2DUBEV 120 710 S12 | 12 | 71 | 120 | 12 | |
| 2DUBEV 121 770 S14 | 12.1 | 77 | 125 | 14 | |
| 2DUBEV 122 770 S14 | 12.2 | 77 | 125 | 14 | |
| 2DUBEV 123 770 S14 | 12.3 | 77 | 125 | 14 | |
| 2DUBEV 124 770 S14 | 12.4 | 77 | 125 | 14 | |
| 2DUBEV 125 770 S14 | 12.5 | 77 | 125 | 14 | |
| 2DUBEV 126 770 S14 | 12.6 | 77 | 125 | 14 | |
| 2DUBEV 127 770 S14 | 12.7 | 77 | 125 | 14 | |
| 2DUBEV 128 770 S14 | 12.8 | 77 | 125 | 14 | |
| 2DUBEV 129 770 S14 | 12.9 | 77 | 125 | 14 | |
| 2DUBEV 130 770 S14 | 13 | 77 | 125 | 14 | |
| 2DUBEV 131 770 S14 | 13.1 | 77 | 125 | 14 | |
| 2DUBEV 132 770 S14 | 13.2 | 77 | 125 | 14 | |
| 2DUBEV 133 770 S14 | 13.3 | 77 | 125 | 14 | |
| 2DUBEV 134 770 S14 | 13.4 | 77 | 125 | 14 | |
| 2DUBEV 135 770 S14 | 13.5 | 77 | 125 | 14 | |
| 2DUBEV 136 770 S14 | 13.6 | 77 | 125 | 14 | |
| 2DUBEV 137 770 S14 | 13.7 | 77 | 125 | 14 | |
| 2DUBEV 138 770 S14 | 13.8 | 77 | 125 | 14 | |
| 2DUBEV 139 770 S14 | 13.9 | 77 | 125 | 14 | |
| 2DUBEV 140 770 S14 | 14 | 77 | 125 | 14 | |
| 2DUBEV 141 830 S16 | 14.1 | 83 | 135 | 16 | |
| 2DUBEV 142 830 S16 | 14.2 | 83 | 135 | 16 | |
| 2DUBEV 143 830 S16 | 14.3 | 83 | 135 | 16 | |
| 2DUBEV 144 830 S16 | 14.4 | 83 | 135 | 16 | |
| 2DUBEV 145 830 S16 | 14.5 | 83 | 135 | 16 | |
| 2DUBEV 146 830 S16 | 14.6 | 83 | 135 | 16 | |
| 2DUBEV 147 830 S16 | 14.7 | 83 | 135 | 16 | |
| 2DUBEV 148 830 S16 | 14.8 | 83 | 135 | 16 | |
| 2DUBEV 149 830 S16 | 14.9 | 83 | 135 | 16 | |
| 2DUBEV 150 830 S16 | 15 | 83 | 135 | 16 | |
| 2DUBEV 151 830 S16 | 15.1 | 83 | 135 | 16 | |
| 2DUBEV 152 830 S16 | 15.2 | 83 | 135 | 16 | |
| 2DUBEV 153 830 S16 | 15.3 | 83 | 135 | 16 | |
| 2DUBEV 154 830 S16 | 15.4 | 83 | 135 | 16 | |
| 2DUBEV 155 830 S16 | 15.5 | 83 | 135 | 16 | |
| 2DUBEV 156 830 S16 | 15.6 | 83 | 135 | 16 | |
| 2DUBEV 157 830 S16 | 15.7 | 83 | 135 | 16 | |
| 2DUBEV 158 830 S16 | 15.8 | 83 | 135 | 16 | |
| 2DUBEV 159 830 S16 | 15.9 | 83 | 135 | 16 | |

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEV 160 830 S16 | 16 | 83 | 135 | 16 | |
| 2DUBEV 161 930 S18 | 16.1 | 93 | 145 | 18 | |
| 2DUBEV 162 930 S18 | 16.2 | 93 | 145 | 18 | |
| 2DUBEV 163 930 S18 | 16.3 | 93 | 145 | 18 | |
| 2DUBEV 164 930 S18 | 16.4 | 93 | 145 | 18 | |
| 2DUBEV 165 930 S18 | 16.5 | 93 | 145 | 18 | |
| 2DUBEV 166 930 S18 | 16.6 | 93 | 145 | 18 | |
| 2DUBEV 167 930 S18 | 16.7 | 93 | 145 | 18 | |
| 2DUBEV 168 930 S18 | 16.8 | 93 | 145 | 18 | |
| 2DUBEV 169 930 S18 | 16.9 | 93 | 145 | 18 | |
| 2DUBEV 170 930 S18 | 17 | 93 | 145 | 18 | |
| 2DUBEV 171 930 S18 | 17.1 | 93 | 145 | 18 | |
| 2DUBEV 172 930 S18 | 17.2 | 93 | 145 | 18 | |
| 2DUBEV 173 930 S18 | 17.3 | 93 | 145 | 18 | |
| 2DUBEV 174 930 S18 | 17.4 | 93 | 145 | 18 | |
| 2DUBEV 175 930 S18 | 17.5 | 93 | 145 | 18 | |
| 2DUBEV 176 930 S18 | 17.6 | 93 | 145 | 18 | |
| 2DUBEV 177 930 S18 | 17.7 | 93 | 145 | 18 | |
| 2DUBEV 178 930 S18 | 17.8 | 93 | 145 | 18 | |
| 2DUBEV 179 930 S18 | 17.9 | 93 | 145 | 18 | |
| 2DUBEV 180 930 S18 | 18 | 93 | 145 | 18 | |
| 2DUBEV 181 1010 S20 | 18.1 | 101 | 155 | 20 | |
| 2DUBEV 182 1010 S20 | 18.2 | 101 | 155 | 20 | |
| 2DUBEV 183 1010 S20 | 18.3 | 101 | 155 | 20 | |
| 2DUBEV 184 1010 S20 | 18.4 | 101 | 155 | 20 | |
| 2DUBEV 185 1010 S20 | 18.5 | 101 | 155 | 20 | |
| 2DUBEV 186 1010 S20 | 18.6 | 101 | 155 | 20 | |
| 2DUBEV 187 1010 S20 | 18.7 | 101 | 155 | 20 | |
| 2DUBEV 188 1010 S20 | 18.8 | 101 | 155 | 20 | |
| 2DUBEV 189 1010 S20 | 18.9 | 101 | 155 | 20 | |
| 2DUBEV 190 1010 S20 | 19 | 101 | 155 | 20 | |
| 2DUBEV 191 1010 S20 | 19.1 | 101 | 155 | 20 | |
| 2DUBEV 192 1010 S20 | 19.2 | 101 | 155 | 20 | |
| 2DUBEV 193 1010 S20 | 19.3 | 101 | 155 | 20 | |
| 2DUBEV 194 1010 S20 | 19.4 | 101 | 155 | 20 | |
| 2DUBEV 195 1010 S20 | 19.5 | 101 | 155 | 20 | |
| 2DUBEV 196 1010 S20 | 19.6 | 101 | 155 | 20 | |
| 2DUBEV 197 1010 S20 | 19.7 | 101 | 155 | 20 | |
| 2DUBEV 198 1010 S20 | 19.8 | 101 | 155 | 20 | |
| 2DUBEV 199 1010 S20 | 19.9 | 101 | 155 | 20 | |
| 2DUBEV 200 1010 S20 | 20 | 101 | 155 | 20 | |

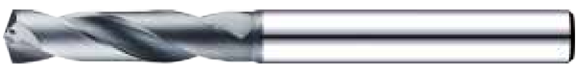
DRILL

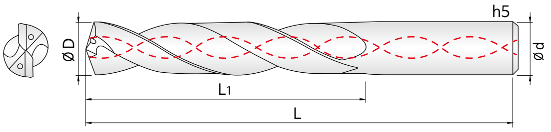
# 2DUBEW

Carbide 2 Flutes Dube W Drills with Coolant hole-[3XD]

초경 2날 두배 W 드릴(내부 쿨런트)-[3XD]

New






- **SUS, Titanium, HRc28이하 SCM등의 합금용 난삭재 가공 드릴**
- Cross cut 코팅을 적용하여 우수한 내열성과 내마모성으로 절삭영역을 확대하였습니다.
- 절삭 저항을 최소화하는 Point thinning을 채택 하였습니다.
- 최적에 플루트 형성 설계와 내부급유 방식을 적용하여 칩배출 성능이 매우 우수합니다.
- 140도 선단각 설계하여 높은 고정밀, 고속 드릴링 작업에 탁월한 성능을 발휘합니다.

- **High-speed drills for SUS, alloy materials up to HRc28, SCM and Titanium**
- Minimized adhesion during drilling operations by applying cross-cut coating.
- Adopted point thinning to minimize cutting resistance.
- Excellent chip evacuation performance achieved by applying an optimal flute design and internal coolant system.
- Design with a 140-degree point angle for outstanding performance in high highprecision, high-speed drilling operations.


524P

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEW 010 080 S03 | 1 | 8 | 40 | 3 | |
| 2DUBEW 011 080 S03 | 1.1 | 8 | 40 | 3 | |
| 2DUBEW 012 080 S03 | 1.2 | 8 | 40 | 3 | |
| 2DUBEW 013 080 S03 | 1.3 | 8 | 40 | 3 | |
| 2DUBEW 014 080 S03 | 1.4 | 8 | 40 | 3 | |
| 2DUBEW 015 080 S03 | 1.5 | 8 | 50 | 3 | |
| 2DUBEW 016 080 S03 | 1.6 | 8 | 50 | 3 | |
| 2DUBEW 017 100 S03 | 1.7 | 10 | 50 | 3 | |
| 2DUBEW 018 100 S03 | 1.8 | 10 | 50 | 3 | |
| 2DUBEW 019 100 S03 | 1.9 | 10 | 50 | 3 | |
| 2DUBEW 020 160 S04 | 2 | 16 | 50 | 4 | |
| 2DUBEW 021 160 S04 | 2.1 | 16 | 50 | 4 | |
| 2DUBEW 022 160 S04 | 2.2 | 16 | 50 | 4 | |
| 2DUBEW 023 160 S04 | 2.3 | 16 | 50 | 4 | |
| 2DUBEW 024 160 S04 | 2.4 | 16 | 50 | 4 | |
| 2DUBEW 025 200 S04 | 2.5 | 20 | 50 | 4 | |
| 2DUBEW 026 200 S04 | 2.6 | 20 | 50 | 4 | |
| 2DUBEW 027 200 S04 | 2.7 | 20 | 50 | 4 | |
| 2DUBEW 028 200 S04 | 2.8 | 20 | 50 | 4 | |
| 2DUBEW 029 200 S04 | 2.9 | 20 | 50 | 4 | |
| 2DUBEW 030 200 S06 | 3 | 20 | 60 | 6 | |
| 2DUBEW 031 200 S06 | 3.1 | 20 | 60 | 6 | |
| 2DUBEW 032 200 S06 | 3.2 | 20 | 60 | 6 | |
| 2DUBEW 033 200 S06 | 3.3 | 20 | 60 | 6 | |
| 2DUBEW 034 200 S06 | 3.4 | 20 | 60 | 6 | |
| 2DUBEW 035 200 S06 | 3.5 | 20 | 60 | 6 | |
| 2DUBEW 036 200 S06 | 3.6 | 20 | 60 | 6 | |
| 2DUBEW 037 200 S06 | 3.7 | 20 | 60 | 6 | |
| 2DUBEW 038 240 S06 | 3.8 | 24 | 65 | 6 | |
| 2DUBEW 039 240 S06 | 3.9 | 24 | 65 | 6 | |
| 2DUBEW 040 240 S06 | 4 | 24 | 65 | 6 | |
| 2DUBEW 041 240 S06 | 4.1 | 24 | 65 | 6 | |
| 2DUBEW 042 240 S06 | 4.2 | 24 | 65 | 6 | |
| 2DUBEW 043 240 S06 | 4.3 | 24 | 65 | 6 | |
| 2DUBEW 044 240 S06 | 4.4 | 24 | 65 | 6 | |
| 2DUBEW 045 240 S06 | 4.5 | 24 | 65 | 6 | |
| 2DUBEW 046 240 S06 | 4.6 | 24 | 65 | 6 | |
| 2DUBEW 047 240 S06 | 4.7 | 24 | 65 | 6 | |
| 2DUBEW 048 280 S06 | 4.8 | 28 | 65 | 6 | |
| 2DUBEW 049 280 S06 | 4.9 | 28 | 65 | 6 | |
| 2DUBEW 050 280 S06 | 5 | 28 | 65 | 6 | |
| 2DUBEW 051 280 S06 | 5.1 | 28 | 65 | 6 | |
| 2DUBEW 052 280 S06 | 5.2 | 28 | 65 | 6 | |
| 2DUBEW 053 280 S06 | 5.3 | 28 | 65 | 6 | |
| 2DUBEW 054 280 S06 | 5.4 | 28 | 65 | 6 | |
| 2DUBEW 055 280 S06 | 5.5 | 28 | 65 | 6 | |
| 2DUBEW 056 280 S06 | 5.6 | 28 | 65 | 6 | |
| 2DUBEW 057 280 S06 | 5.7 | 28 | 65 | 6 | |
| 2DUBEW 058 280 S06 | 5.8 | 28 | 65 | 6 | |
| 2DUBEW 059 280 S06 | 5.9 | 28 | 65 | 6 | |

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEW 060 280 S06 | 6 | 28 | 65 | 6 | |
| 2DUBEW 061 340 S08 | 6.1 | 34 | 80 | 8 | |
| 2DUBEW 062 340 S08 | 6.2 | 34 | 80 | 8 | |
| 2DUBEW 063 340 S08 | 6.3 | 34 | 80 | 8 | |
| 2DUBEW 064 340 S08 | 6.4 | 34 | 80 | 8 | |
| 2DUBEW 065 340 S08 | 6.5 | 34 | 80 | 8 | |
| 2DUBEW 066 340 S08 | 6.6 | 34 | 80 | 8 | |
| 2DUBEW 067 340 S08 | 6.7 | 34 | 80 | 8 | |
| 2DUBEW 068 340 S08 | 6.8 | 34 | 80 | 8 | |
| 2DUBEW 069 340 S08 | 6.9 | 34 | 80 | 8 | |
| 2DUBEW 070 340 S08 | 7 | 34 | 80 | 8 | |
| 2DUBEW 071 410 S08 | 7.1 | 41 | 80 | 8 | |
| 2DUBEW 072 410 S08 | 7.2 | 41 | 80 | 8 | |
| 2DUBEW 073 410 S08 | 7.3 | 41 | 80 | 8 | |
| 2DUBEW 074 410 S08 | 7.4 | 41 | 80 | 8 | |
| 2DUBEW 075 410 S08 | 7.5 | 41 | 80 | 8 | |
| 2DUBEW 076 410 S08 | 7.6 | 41 | 80 | 8 | |
| 2DUBEW 077 410 S08 | 7.7 | 41 | 80 | 8 | |
| 2DUBEW 078 410 S08 | 7.8 | 41 | 80 | 8 | |
| 2DUBEW 079 410 S08 | 7.9 | 41 | 80 | 8 | |
| 2DUBEW 080 410 S08 | 8 | 41 | 80 | 8 | |
| 2DUBEW 081 470 S10 | 8.1 | 47 | 90 | 10 | |
| 2DUBEW 082 470 S10 | 8.2 | 47 | 90 | 10 | |
| 2DUBEW 083 470 S10 | 8.3 | 47 | 90 | 10 | |
| 2DUBEW 084 470 S10 | 8.4 | 47 | 90 | 10 | |
| 2DUBEW 085 470 S10 | 8.5 | 47 | 90 | 10 | |
| 2DUBEW 086 470 S10 | 8.6 | 47 | 90 | 10 | |
| 2DUBEW 087 470 S10 | 8.7 | 47 | 90 | 10 | |
| 2DUBEW 088 470 S10 | 8.8 | 47 | 90 | 10 | |
| 2DUBEW 089 470 S10 | 8.9 | 47 | 90 | 10 | |
| 2DUBEW 090 470 S10 | 9 | 47 | 90 | 10 | |
| 2DUBEW 091 470 S10 | 9.1 | 47 | 90 | 10 | |
| 2DUBEW 092 470 S10 | 9.2 | 47 | 90 | 10 | |
| 2DUBEW 093 470 S10 | 9.3 | 47 | 90 | 10 | |
| 2DUBEW 094 470 S10 | 9.4 | 47 | 90 | 10 | |
| 2DUBEW 095 470 S10 | 9.5 | 47 | 90 | 10 | |
| 2DUBEW 096 470 S10 | 9.6 | 47 | 90 | 10 | |
| 2DUBEW 097 470 S10 | 9.7 | 47 | 90 | 10 | |
| 2DUBEW 098 470 S10 | 9.8 | 47 | 90 | 10 | |
| 2DUBEW 099 470 S10 | 9.9 | 47 | 90 | 10 | |
| 2DUBEW 100 470 S10 | 10 | 47 | 90 | 10 | |
| 2DUBEW 101 550 S12 | 10.1 | 55 | 100 | 12 | |
| 2DUBEW 102 550 S12 | 10.2 | 55 | 100 | 12 | |
| 2DUBEW 103 550 S12 | 10.3 | 55 | 100 | 12 | |
| 2DUBEW 104 550 S12 | 10.4 | 55 | 100 | 12 | |
| 2DUBEW 105 550 S12 | 10.5 | 55 | 100 | 12 | |
| 2DUBEW 106 550 S12 | 10.6 | 55 | 100 | 12 | |
| 2DUBEW 107 550 S12 | 10.7 | 55 | 100 | 12 | |
| 2DUBEW 108 550 S12 | 10.8 | 55 | 100 | 12 | |
| 2DUBEW 109 550 S12 | 10.9 | 55 | 100 | 12 | |

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEW 110 550 S12 | 11 | 55 | 100 | 12 | |
| 2DUBEW 111 550 S12 | 11.1 | 55 | 100 | 12 | |
| 2DUBEW 112 550 S12 | 11.2 | 55 | 100 | 12 | |
| 2DUBEW 113 550 S12 | 11.3 | 55 | 100 | 12 | |
| 2DUBEW 114 550 S12 | 11.4 | 55 | 100 | 12 | |
| 2DUBEW 115 550 S12 | 11.5 | 55 | 100 | 12 | |
| 2DUBEW 116 550 S12 | 11.6 | 55 | 100 | 12 | |
| 2DUBEW 117 550 S12 | 11.7 | 55 | 100 | 12 | |
| 2DUBEW 118 550 S12 | 11.8 | 55 | 100 | 12 | |
| 2DUBEW 119 550 S12 | 11.9 | 55 | 100 | 12 | |
| 2DUBEW 120 550 S12 | 12 | 55 | 100 | 12 | |
| 2DUBEW 121 600 S14 | 12.1 | 60 | 100 | 14 | |
| 2DUBEW 122 600 S14 | 12.2 | 60 | 100 | 14 | |
| 2DUBEW 123 600 S14 | 12.3 | 60 | 100 | 14 | |
| 2DUBEW 124 600 S14 | 12.4 | 60 | 100 | 14 | |
| 2DUBEW 125 600 S14 | 12.5 | 60 | 100 | 14 | |
| 2DUBEW 126 600 S14 | 12.6 | 60 | 100 | 14 | |
| 2DUBEW 127 600 S14 | 12.7 | 60 | 100 | 14 | |
| 2DUBEW 128 600 S14 | 12.8 | 60 | 100 | 14 | |
| 2DUBEW 129 600 S14 | 12.9 | 60 | 100 | 14 | |
| 2DUBEW 130 600 S14 | 13 | 60 | 100 | 14 | |
| 2DUBEW 131 600 S14 | 13.1 | 60 | 100 | 14 | |
| 2DUBEW 132 600 S14 | 13.2 | 60 | 105 | 14 | |
| 2DUBEW 133 600 S14 | 13.3 | 60 | 105 | 14 | |
| 2DUBEW 134 600 S14 | 13.4 | 60 | 105 | 14 | |
| 2DUBEW 135 600 S14 | 13.5 | 60 | 105 | 14 | |
| 2DUBEW 136 600 S14 | 13.6 | 60 | 105 | 14 | |
| 2DUBEW 137 600 S14 | 13.7 | 60 | 105 | 14 | |
| 2DUBEW 138 600 S14 | 13.8 | 60 | 105 | 14 | |
| 2DUBEW 139 600 S14 | 13.9 | 60 | 105 | 14 | |
| 2DUBEW 140 600 S14 | 14 | 60 | 105 | 14 | |
| 2DUBEW 141 650 S16 | 14.1 | 65 | 110 | 16 | |
| 2DUBEW 142 650 S16 | 14.2 | 65 | 110 | 16 | |
| 2DUBEW 143 650 S16 | 14.3 | 65 | 110 | 16 | |
| 2DUBEW 144 650 S16 | 14.4 | 65 | 110 | 16 | |
| 2DUBEW 145 650 S16 | 14.5 | 65 | 110 | 16 | |
| 2DUBEW 146 650 S16 | 14.6 | 65 | 110 | 16 | |
| 2DUBEW 147 650 S16 | 14.7 | 65 | 110 | 16 | |
| 2DUBEW 148 650 S16 | 14.8 | 65 | 110 | 16 | |
| 2DUBEW 149 650 S16 | 14.9 | 65 | 110 | 16 | |
| 2DUBEW 150 650 S16 | 15 | 65 | 110 | 16 | |
| 2DUBEW 151 650 S16 | 15.1 | 65 | 110 | 16 | |
| 2DUBEW 152 650 S16 | 15.2 | 65 | 115 | 16 | |
| 2DUBEW 153 650 S16 | 15.3 | 65 | 115 | 16 | |
| 2DUBEW 154 650 S16 | 15.4 | 65 | 115 | 16 | |
| 2DUBEW 155 650 S16 | 15.5 | 65 | 115 | 16 | |
| 2DUBEW 156 650 S16 | 15.6 | 65 | 115 | 16 | |
| 2DUBEW 157 650 S16 | 15.7 | 65 | 115 | 16 | |
| 2DUBEW 158 650 S16 | 15.8 | 65 | 115 | 16 | |
| 2DUBEW 159 650 S16 | 15.9 | 65 | 115 | 16 | |

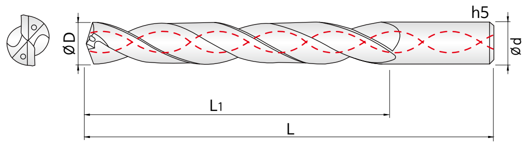
| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEW 160 650 S16 | 16 | 65 | 115 | 16 | |
| 2DUBEW 161 730 S18 | 16.1 | 73 | 125 | 18 | |
| 2DUBEW 162 730 S18 | 16.2 | 73 | 125 | 18 | |
| 2DUBEW 163 730 S18 | 16.3 | 73 | 125 | 18 | |
| 2DUBEW 164 730 S18 | 16.4 | 73 | 125 | 18 | |
| 2DUBEW 165 730 S18 | 16.5 | 73 | 125 | 18 | |
| 2DUBEW 166 730 S18 | 16.6 | 73 | 125 | 18 | |
| 2DUBEW 167 730 S18 | 16.7 | 73 | 125 | 18 | |
| 2DUBEW 168 730 S18 | 16.8 | 73 | 125 | 18 | |
| 2DUBEW 169 730 S18 | 16.9 | 73 | 125 | 18 | |
| 2DUBEW 170 730 S18 | 17 | 73 | 125 | 18 | |
| 2DUBEW 171 730 S18 | 17.1 | 73 | 125 | 18 | |
| 2DUBEW 172 730 S18 | 17.2 | 73 | 125 | 18 | |
| 2DUBEW 173 730 S18 | 17.3 | 73 | 125 | 18 | |
| 2DUBEW 174 730 S18 | 17.4 | 73 | 125 | 18 | |
| 2DUBEW 175 730 S18 | 17.5 | 73 | 125 | 18 | |
| 2DUBEW 176 730 S18 | 17.6 | 73 | 125 | 18 | |
| 2DUBEW 177 730 S18 | 17.7 | 73 | 125 | 18 | |
| 2DUBEW 178 730 S18 | 17.8 | 73 | 125 | 18 | |
| 2DUBEW 179 730 S18 | 17.9 | 73 | 125 | 18 | |
| 2DUBEW 180 730 S18 | 18 | 73 | 125 | 18 | |
| 2DUBEW 181 790 S20 | 18.1 | 79 | 130 | 20 | |
| 2DUBEW 182 790 S20 | 18.2 | 79 | 130 | 20 | |
| 2DUBEW 183 790 S20 | 18.3 | 79 | 130 | 20 | |
| 2DUBEW 184 790 S20 | 18.4 | 79 | 130 | 20 | |
| 2DUBEW 185 790 S20 | 18.5 | 79 | 130 | 20 | |
| 2DUBEW 186 790 S20 | 18.6 | 79 | 130 | 20 | |
| 2DUBEW 187 790 S20 | 18.7 | 79 | 130 | 20 | |
| 2DUBEW 188 790 S20 | 18.8 | 79 | 130 | 20 | |
| 2DUBEW 189 790 S20 | 18.9 | 79 | 130 | 20 | |
| 2DUBEW 190 790 S20 | 19 | 79 | 130 | 20 | |
| 2DUBEW 191 790 S20 | 19.1 | 79 | 130 | 20 | |
| 2DUBEW 192 790 S20 | 19.2 | 79 | 130 | 20 | |
| 2DUBEW 193 790 S20 | 19.3 | 79 | 130 | 20 | |
| 2DUBEW 194 790 S20 | 19.4 | 79 | 130 | 20 | |
| 2DUBEW 195 790 S20 | 19.5 | 79 | 130 | 20 | |
| 2DUBEW 196 790 S20 | 19.6 | 79 | 130 | 20 | |
| 2DUBEW 197 790 S20 | 19.7 | 79 | 130 | 20 | |
| 2DUBEW 198 790 S20 | 19.8 | 79 | 130 | 20 | |
| 2DUBEW 199 790 S20 | 19.9 | 79 | 130 | 20 | |
| 2DUBEW 200 790 S20 | 20 | 79 | 130 | 20 | |

# 2DUBEW

## Carbide 2 Flutes Dube W Drills with Coolant hole-[5XD]

## 초경 2날 두배 W 드릴(내부 쿨런트)-[5XD]

New




- **SUS, Titanium, HRc28이하 SCM등의 합금용 난삭재 가공 드릴**
- Cross cut 코팅을 적용하여 우수한 내열성과 내마모성으로 절삭영역을 확대하였습니다.
- 절삭 저항을 최소화하는 Point thinning을 채택 하였습니다.
- 최적에 플루트 형성 설계와 내부급유 방식을 적용하여 칩배출 성능이 매우 우수합니다.
- 140도 선단각 설계하여 높은 고정밀, 고속 드릴링 작업에 탁월한 성능을 발휘합니다.

- **High-speed drills for SUS, alloy materials up to HRc28, SCM and Titanium**
- Minimized adhesion during drilling operations by applying cross-cut coating.
- Adopted point thinning to minimize cutting resistance.
- Excellent chip evacuation performance achieved by applying an optimal flute design and internal coolant system.
- Design with a 140-degree point angle for outstanding performance in high highprecision, high-speed drilling operations.


524P

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEW 010 100 S03 | 1 | 10 | 55 | 3 | |
| 2DUBEW 011 120 S03 | 1.1 | 12 | 55 | 3 | |
| 2DUBEW 012 120 S03 | 1.2 | 12 | 55 | 3 | |
| 2DUBEW 013 120 S03 | 1.3 | 12 | 55 | 3 | |
| 2DUBEW 014 120 S03 | 1.4 | 12 | 55 | 3 | |
| 2DUBEW 015 120 S03 | 1.5 | 12 | 55 | 3 | |
| 2DUBEW 016 160 S03 | 1.6 | 16 | 55 | 3 | |
| 2DUBEW 017 160 S03 | 1.7 | 16 | 55 | 3 | |
| 2DUBEW 018 160 S03 | 1.8 | 16 | 55 | 3 | |
| 2DUBEW 019 160 S03 | 1.9 | 16 | 55 | 3 | |
| 2DUBEW 020 210 S04 | 2 | 21 | 55 | 4 | |
| 2DUBEW 021 210 S04 | 2.1 | 21 | 55 | 4 | |
| 2DUBEW 022 210 S04 | 2.2 | 21 | 55 | 4 | |
| 2DUBEW 023 210 S04 | 2.3 | 21 | 55 | 4 | |
| 2DUBEW 024 210 S04 | 2.4 | 21 | 55 | 4 | |
| 2DUBEW 025 210 S04 | 2.5 | 21 | 55 | 4 | |
| 2DUBEW 026 210 S04 | 2.6 | 21 | 55 | 4 | |
| 2DUBEW 027 210 S04 | 2.7 | 21 | 55 | 4 | |
| 2DUBEW 028 210 S04 | 2.8 | 21 | 55 | 4 | |
| 2DUBEW 029 210 S04 | 2.9 | 21 | 55 | 4 | |
| 2DUBEW 030 280 S06 | 3 | 28 | 65 | 6 | |
| 2DUBEW 031 280 S06 | 3.1 | 28 | 65 | 6 | |
| 2DUBEW 032 280 S06 | 3.2 | 28 | 65 | 6 | |
| 2DUBEW 033 280 S06 | 3.3 | 28 | 65 | 6 | |
| 2DUBEW 034 280 S06 | 3.4 | 28 | 65 | 6 | |
| 2DUBEW 035 280 S06 | 3.5 | 28 | 65 | 6 | |
| 2DUBEW 036 280 S06 | 3.6 | 28 | 65 | 6 | |
| 2DUBEW 037 280 S06 | 3.7 | 28 | 65 | 6 | |
| 2DUBEW 038 360 S06 | 3.8 | 36 | 75 | 6 | |
| 2DUBEW 039 360 S06 | 3.9 | 36 | 75 | 6 | |
| 2DUBEW 040 360 S06 | 4 | 36 | 75 | 6 | |
| 2DUBEW 041 360 S06 | 4.1 | 36 | 75 | 6 | |
| 2DUBEW 042 360 S06 | 4.2 | 36 | 75 | 6 | |
| 2DUBEW 043 360 S06 | 4.3 | 36 | 75 | 6 | |
| 2DUBEW 044 360 S06 | 4.4 | 36 | 75 | 6 | |
| 2DUBEW 045 360 S06 | 4.5 | 36 | 75 | 6 | |
| 2DUBEW 046 360 S06 | 4.6 | 36 | 75 | 6 | |
| 2DUBEW 047 360 S06 | 4.7 | 36 | 75 | 6 | |
| 2DUBEW 048 440 S06 | 4.8 | 44 | 80 | 6 | |
| 2DUBEW 049 440 S06 | 4.9 | 44 | 80 | 6 | |
| 2DUBEW 050 440 S06 | 5 | 44 | 80 | 6 | |
| 2DUBEW 051 440 S06 | 5.1 | 44 | 80 | 6 | |
| 2DUBEW 052 440 S06 | 5.2 | 44 | 80 | 6 | |
| 2DUBEW 053 440 S06 | 5.3 | 44 | 80 | 6 | |
| 2DUBEW 054 440 S06 | 5.4 | 44 | 80 | 6 | |
| 2DUBEW 055 440 S06 | 5.5 | 44 | 80 | 6 | |
| 2DUBEW 056 440 S06 | 5.6 | 44 | 80 | 6 | |
| 2DUBEW 057 440 S06 | 5.7 | 44 | 80 | 6 | |
| 2DUBEW 058 440 S06 | 5.8 | 44 | 80 | 6 | |
| 2DUBEW 059 440 S06 | 5.9 | 44 | 80 | 6 | |
| 2DUBEW 060 440 S06 | 6 | 44 | 80 | 6 | |
| 2DUBEW 061 530 S08 | 6.1 | 53 | 90 | 8 | |
| 2DUBEW 062 530 S08 | 6.2 | 53 | 90 | 8 | |
| 2DUBEW 063 530 S08 | 6.3 | 53 | 90 | 8 | |
| 2DUBEW 064 530 S08 | 6.4 | 53 | 90 | 8 | |
| 2DUBEW 065 530 S08 | 6.5 | 53 | 90 | 8 | |
| 2DUBEW 066 530 S08 | 6.6 | 53 | 90 | 8 | |
| 2DUBEW 067 530 S08 | 6.7 | 53 | 90 | 8 | |
| 2DUBEW 068 530 S08 | 6.8 | 53 | 90 | 8 | |
| 2DUBEW 069 530 S08 | 6.9 | 53 | 90 | 8 | |
| 2DUBEW 070 530 S08 | 7 | 53 | 90 | 8 | |
| 2DUBEW 071 530 S08 | 7.1 | 53 | 90 | 8 | |
| 2DUBEW 072 530 S08 | 7.2 | 53 | 90 | 8 | |
| 2DUBEW 073 530 S08 | 7.3 | 53 | 90 | 8 | |
| 2DUBEW 074 530 S08 | 7.4 | 53 | 90 | 8 | |
| 2DUBEW 075 530 S08 | 7.5 | 53 | 90 | 8 | |
| 2DUBEW 076 530 S08 | 7.6 | 53 | 90 | 8 | |
| 2DUBEW 077 530 S08 | 7.7 | 53 | 90 | 8 | |
| 2DUBEW 078 530 S08 | 7.8 | 53 | 90 | 8 | |
| 2DUBEW 079 530 S08 | 7.9 | 53 | 90 | 8 | |
| 2DUBEW 080 530 S08 | 8 | 53 | 90 | 8 | |
| 2DUBEW 081 610 S10 | 8.1 | 61 | 105 | 10 | |
| 2DUBEW 082 610 S10 | 8.2 | 61 | 105 | 10 | |
| 2DUBEW 083 610 S10 | 8.3 | 61 | 105 | 10 | |
| 2DUBEW 084 610 S10 | 8.4 | 61 | 105 | 10 | |
| 2DUBEW 085 610 S10 | 8.5 | 61 | 105 | 10 | |
| 2DUBEW 086 610 S10 | 8.6 | 61 | 105 | 10 | |
| 2DUBEW 087 610 S10 | 8.7 | 61 | 105 | 10 | |
| 2DUBEW 088 610 S10 | 8.8 | 61 | 105 | 10 | |
| 2DUBEW 089 610 S10 | 8.9 | 61 | 105 | 10 | |
| 2DUBEW 090 610 S10 | 9 | 61 | 105 | 10 | |
| 2DUBEW 091 610 S10 | 9.1 | 61 | 105 | 10 | |
| 2DUBEW 092 610 S10 | 9.2 | 61 | 105 | 10 | |
| 2DUBEW 093 610 S10 | 9.3 | 61 | 105 | 10 | |
| 2DUBEW 094 610 S10 | 9.4 | 61 | 105 | 10 | |
| 2DUBEW 095 610 S10 | 9.5 | 61 | 105 | 10 | |
| 2DUBEW 096 610 S10 | 9.6 | 61 | 105 | 10 | |
| 2DUBEW 097 610 S10 | 9.7 | 61 | 105 | 10 | |
| 2DUBEW 098 610 S10 | 9.8 | 61 | 105 | 10 | |
| 2DUBEW 099 610 S10 | 9.9 | 61 | 105 | 10 | |
| 2DUBEW 100 610 S10 | 10 | 61 | 105 | 10 | |
| 2DUBEW 101 710 S12 | 10.1 | 71 | 120 | 12 | |
| 2DUBEW 102 710 S12 | 10.2 | 71 | 120 | 12 | |
| 2DUBEW 103 710 S12 | 10.3 | 71 | 120 | 12 | |
| 2DUBEW 104 710 S12 | 10.4 | 71 | 120 | 12 | |
| 2DUBEW 105 710 S12 | 10.5 | 71 | 120 | 12 | |
| 2DUBEW 106 710 S12 | 10.6 | 71 | 120 | 12 | |
| 2DUBEW 107 710 S12 | 10.7 | 71 | 120 | 12 | |
| 2DUBEW 108 710 S12 | 10.8 | 71 | 120 | 12 | |
| 2DUBEW 109 710 S12 | 10.9 | 71 | 120 | 12 | |

# 2DUBEW

## Carbide 2 Flutes Dube W Drills with Coolant hole-[5XD]

## 초경 2날 두배 W 드릴(내부 쿨런트)-[5XD]

New

단위 : mm

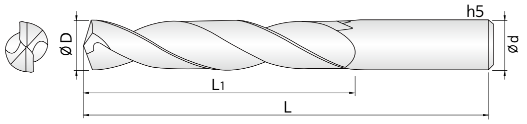
| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEW 110 710 S12 | 11 | 71 | 120 | 12 | |
| 2DUBEW 111 710 S12 | 11.1 | 71 | 120 | 12 | |
| 2DUBEW 112 710 S12 | 11.2 | 71 | 120 | 12 | |
| 2DUBEW 113 710 S12 | 11.3 | 71 | 120 | 12 | |
| 2DUBEW 114 710 S12 | 11.4 | 71 | 120 | 12 | |
| 2DUBEW 115 710 S12 | 11.5 | 71 | 120 | 12 | |
| 2DUBEW 116 710 S12 | 11.6 | 71 | 120 | 12 | |
| 2DUBEW 117 710 S12 | 11.7 | 71 | 120 | 12 | |
| 2DUBEW 118 710 S12 | 11.8 | 71 | 120 | 12 | |
| 2DUBEW 119 710 S12 | 11.9 | 71 | 120 | 12 | |
| 2DUBEW 120 710 S12 | 12 | 71 | 120 | 12 | |
| 2DUBEW 121 770 S14 | 12.1 | 77 | 125 | 14 | |
| 2DUBEW 122 770 S14 | 12.2 | 77 | 125 | 14 | |
| 2DUBEW 123 770 S14 | 12.3 | 77 | 125 | 14 | |
| 2DUBEW 124 770 S14 | 12.4 | 77 | 125 | 14 | |
| 2DUBEW 125 770 S14 | 12.5 | 77 | 125 | 14 | |
| 2DUBEW 126 770 S14 | 12.6 | 77 | 125 | 14 | |
| 2DUBEW 127 770 S14 | 12.7 | 77 | 125 | 14 | |
| 2DUBEW 128 770 S14 | 12.8 | 77 | 125 | 14 | |
| 2DUBEW 129 770 S14 | 12.9 | 77 | 125 | 14 | |
| 2DUBEW 130 770 S14 | 13 | 77 | 125 | 14 | |
| 2DUBEW 131 770 S14 | 13.1 | 77 | 125 | 14 | |
| 2DUBEW 132 770 S14 | 13.2 | 77 | 125 | 14 | |
| 2DUBEW 133 770 S14 | 13.3 | 77 | 125 | 14 | |
| 2DUBEW 134 770 S14 | 13.4 | 77 | 125 | 14 | |
| 2DUBEW 135 770 S14 | 13.5 | 77 | 125 | 14 | |
| 2DUBEW 136 770 S14 | 13.6 | 77 | 125 | 14 | |
| 2DUBEW 137 770 S14 | 13.7 | 77 | 125 | 14 | |
| 2DUBEW 138 770 S14 | 13.8 | 77 | 125 | 14 | |
| 2DUBEW 139 770 S14 | 13.9 | 77 | 125 | 14 | |
| 2DUBEW 140 770 S14 | 14 | 77 | 125 | 14 | |
| 2DUBEW 141 830 S16 | 14.1 | 83 | 135 | 16 | |
| 2DUBEW 142 830 S16 | 14.2 | 83 | 135 | 16 | |
| 2DUBEW 143 830 S16 | 14.3 | 83 | 135 | 16 | |
| 2DUBEW 144 830 S16 | 14.4 | 83 | 135 | 16 | |
| 2DUBEW 145 830 S16 | 14.5 | 83 | 135 | 16 | |
| 2DUBEW 146 830 S16 | 14.6 | 83 | 135 | 16 | |
| 2DUBEW 147 830 S16 | 14.7 | 83 | 135 | 16 | |
| 2DUBEW 148 830 S16 | 14.8 | 83 | 135 | 16 | |
| 2DUBEW 149 830 S16 | 14.9 | 83 | 135 | 16 | |
| 2DUBEW 150 830 S16 | 15 | 83 | 135 | 16 | |
| 2DUBEW 151 830 S16 | 15.1 | 83 | 135 | 16 | |
| 2DUBEW 152 830 S16 | 15.2 | 83 | 135 | 16 | |
| 2DUBEW 153 830 S16 | 15.3 | 83 | 135 | 16 | |
| 2DUBEW 154 830 S16 | 15.4 | 83 | 135 | 16 | |
| 2DUBEW 155 830 S16 | 15.5 | 83 | 135 | 16 | |
| 2DUBEW 156 830 S16 | 15.6 | 83 | 135 | 16 | |
| 2DUBEW 157 830 S16 | 15.7 | 83 | 135 | 16 | |
| 2DUBEW 158 830 S16 | 15.8 | 83 | 135 | 16 | |
| 2DUBEW 159 830 S16 | 15.9 | 83 | 135 | 16 | |
| 2DUBEW 160 830 S16 | 16 | 83 | 135 | 16 | |
| 2DUBEW 161 930 S18 | 16.1 | 93 | 145 | 18 | |
| 2DUBEW 162 930 S18 | 16.2 | 93 | 145 | 18 | |
| 2DUBEW 163 930 S18 | 16.3 | 93 | 145 | 18 | |
| 2DUBEW 164 930 S18 | 16.4 | 93 | 145 | 18 | |
| 2DUBEW 165 930 S18 | 16.5 | 93 | 145 | 18 | |
| 2DUBEW 166 930 S18 | 16.6 | 93 | 145 | 18 | |
| 2DUBEW 167 930 S18 | 16.7 | 93 | 145 | 18 | |
| 2DUBEW 168 930 S18 | 16.8 | 93 | 145 | 18 | |
| 2DUBEW 169 930 S18 | 16.9 | 93 | 145 | 18 | |
| 2DUBEW 170 930 S18 | 17 | 93 | 145 | 18 | |
| 2DUBEW 171 930 S18 | 17.1 | 93 | 145 | 18 | |
| 2DUBEW 172 930 S18 | 17.2 | 93 | 145 | 18 | |
| 2DUBEW 173 930 S18 | 17.3 | 93 | 145 | 18 | |
| 2DUBEW 174 930 S18 | 17.4 | 93 | 145 | 18 | |
| 2DUBEW 175 930 S18 | 17.5 | 93 | 145 | 18 | |
| 2DUBEW 176 930 S18 | 17.6 | 93 | 145 | 18 | |
| 2DUBEW 177 930 S18 | 17.7 | 93 | 145 | 18 | |
| 2DUBEW 178 930 S18 | 17.8 | 93 | 145 | 18 | |
| 2DUBEW 179 930 S18 | 17.9 | 93 | 145 | 18 | |
| 2DUBEW 180 930 S18 | 18 | 93 | 145 | 18 | |
| 2DUBEW 181 1010 S20 | 18.1 | 101 | 155 | 20 | |
| 2DUBEW 182 1010 S20 | 18.2 | 101 | 155 | 20 | |
| 2DUBEW 183 1010 S20 | 18.3 | 101 | 155 | 20 | |
| 2DUBEW 184 1010 S20 | 18.4 | 101 | 155 | 20 | |
| 2DUBEW 185 1010 S20 | 18.5 | 101 | 155 | 20 | |
| 2DUBEW 186 1010 S20 | 18.6 | 101 | 155 | 20 | |
| 2DUBEW 187 1010 S20 | 18.7 | 101 | 155 | 20 | |
| 2DUBEW 188 1010 S20 | 18.8 | 101 | 155 | 20 | |
| 2DUBEW 189 1010 S20 | 18.9 | 101 | 155 | 20 | |
| 2DUBEW 190 1010 S20 | 19 | 101 | 155 | 20 | |
| 2DUBEW 191 1010 S20 | 19.1 | 101 | 155 | 20 | |
| 2DUBEW 192 1010 S20 | 19.2 | 101 | 155 | 20 | |
| 2DUBEW 193 1010 S20 | 19.3 | 101 | 155 | 20 | |
| 2DUBEW 194 1010 S20 | 19.4 | 101 | 155 | 20 | |
| 2DUBEW 195 1010 S20 | 19.5 | 101 | 155 | 20 | |
| 2DUBEW 196 1010 S20 | 19.6 | 101 | 155 | 20 | |
| 2DUBEW 197 1010 S20 | 19.7 | 101 | 155 | 20 | |
| 2DUBEW 198 1010 S20 | 19.8 | 101 | 155 | 20 | |
| 2DUBEW 199 1010 S20 | 19.9 | 101 | 155 | 20 | |
| 2DUBEW 200 1010 S20 | 20 | 101 | 155 | 20 | |

# 2DUBEN

## Carbide 2 Flutes Dube N Drills for Non-ferrous [3XD]

## 초경 2날 두배 N 드릴 [3XD]

New




- **알루미늄 주물, 알루미늄 다이캐스팅, 비철금속, 플라스틱 등 비철 비금속 계열 전용 드릴**
- 비철금속 드릴링의 최적화 된 설계로 칩 융착을 최소화 하였습니다.
- 최적의 플루트 형상을 적용하여 안정적인 칩 배출과 절삭성이 우수합니다.
- 폭넓은 비철금속 피삭재에 적용 가능합니다.
- 우수한 제품의 강성과 칩 배출을 고려한 플루트 홈 설계를 적용하였습니다.

- **Drills for aluminum casting, aluminum die casting, non-ferrous metal, plastic and etc.**
- Chip fusion is minimized with an optimized design for non-ferrous metal drilling.
- Provides stable chip evacuation and excellent cutting performance by optimized flute design.
- Applicable for various kinds of non-ferrous metals.
- Applied flute groove design considering the excellent rigidity of the product and chip evacuation.


525P

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEN 010 060 S03 | 1 | 6 | 40 | 3 | |
| 2DUBEN 011 070 S03 | 1.1 | 7 | 40 | 3 | |
| 2DUBEN 012 080 S03 | 1.2 | 8 | 40 | 3 | |
| 2DUBEN 013 080 S03 | 1.3 | 8 | 40 | 3 | |
| 2DUBEN 014 090 S03 | 1.4 | 9 | 40 | 3 | |
| 2DUBEN 015 090 S03 | 1.5 | 9 | 40 | 3 | |
| 2DUBEN 016 100 S03 | 1.6 | 10 | 40 | 3 | |
| 2DUBEN 017 100 S03 | 1.7 | 10 | 40 | 3 | |
| 2DUBEN 018 110 S03 | 1.8 | 11 | 45 | 3 | |
| 2DUBEN 019 110 S03 | 1.9 | 11 | 45 | 3 | |
| 2DUBEN 020 120 S03 | 2 | 12 | 45 | 3 | |
| 2DUBEN 021 120 S03 | 2.1 | 12 | 45 | 3 | |
| 2DUBEN 022 130 S03 | 2.2 | 13 | 45 | 3 | |
| 2DUBEN 023 130 S03 | 2.3 | 13 | 45 | 3 | |
| 2DUBEN 024 140 S03 | 2.4 | 14 | 45 | 3 | |
| 2DUBEN 025 140 S03 | 2.5 | 14 | 45 | 3 | |
| 2DUBEN 026 140 S03 | 2.6 | 14 | 45 | 3 | |
| 2DUBEN 027 160 S03 | 2.7 | 16 | 45 | 3 | |
| 2DUBEN 028 160 S03 | 2.8 | 16 | 45 | 3 | |
| 2DUBEN 029 160 S03 | 2.9 | 16 | 45 | 3 | |
| 2DUBEN 030 160 S03 | 3 | 16 | 45 | 3 | |
| 2DUBEN 031 180 S04 | 3.1 | 18 | 50 | 4 | |
| 2DUBEN 032 180 S04 | 3.2 | 18 | 50 | 4 | |
| 2DUBEN 033 180 S04 | 3.3 | 18 | 50 | 4 | |
| 2DUBEN 034 200 S04 | 3.4 | 20 | 55 | 4 | |
| 2DUBEN 035 200 S04 | 3.5 | 20 | 55 | 4 | |
| 2DUBEN 036 200 S04 | 3.6 | 20 | 55 | 4 | |
| 2DUBEN 037 200 S04 | 3.7 | 20 | 55 | 4 | |
| 2DUBEN 038 220 S04 | 3.8 | 22 | 55 | 4 | |
| 2DUBEN 039 220 S04 | 3.9 | 22 | 55 | 4 | |
| 2DUBEN 040 220 S04 | 4 | 22 | 55 | 4 | |
| 2DUBEN 041 220 S05 | 4.1 | 22 | 55 | 5 | |
| 2DUBEN 042 220 S05 | 4.2 | 22 | 55 | 5 | |
| 2DUBEN 043 240 S05 | 4.3 | 24 | 60 | 5 | |
| 2DUBEN 044 240 S05 | 4.4 | 24 | 60 | 5 | |
| 2DUBEN 045 240 S05 | 4.5 | 24 | 60 | 5 | |
| 2DUBEN 046 240 S05 | 4.6 | 24 | 60 | 5 | |
| 2DUBEN 047 240 S05 | 4.7 | 24 | 60 | 5 | |
| 2DUBEN 048 260 S05 | 4.8 | 26 | 65 | 5 | |
| 2DUBEN 049 260 S05 | 4.9 | 26 | 65 | 5 | |
| 2DUBEN 050 260 S05 | 5 | 26 | 65 | 5 | |
| 2DUBEN 051 260 S06 | 5.1 | 26 | 65 | 6 | |
| 2DUBEN 052 260 S06 | 5.2 | 26 | 65 | 6 | |
| 2DUBEN 053 260 S06 | 5.3 | 26 | 65 | 6 | |
| 2DUBEN 054 280 S06 | 5.4 | 28 | 65 | 6 | |
| 2DUBEN 055 280 S06 | 5.5 | 28 | 65 | 6 | |
| 2DUBEN 056 280 S06 | 5.6 | 28 | 65 | 6 | |
| 2DUBEN 057 280 S06 | 5.7 | 28 | 65 | 6 | |
| 2DUBEN 058 280 S06 | 5.8 | 28 | 65 | 6 | |
| 2DUBEN 059 280 S06 | 5.9 | 28 | 65 | 6 | |

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEN 060 280 S06 | 6 | 28 | 65 | 6 | |
| 2DUBEN 061 310 S07 | 6.1 | 31 | 70 | 7 | |
| 2DUBEN 062 310 S07 | 6.2 | 31 | 70 | 7 | |
| 2DUBEN 063 310 S07 | 6.3 | 31 | 70 | 7 | |
| 2DUBEN 064 310 S07 | 6.4 | 31 | 70 | 7 | |
| 2DUBEN 065 310 S07 | 6.5 | 31 | 70 | 7 | |
| 2DUBEN 066 310 S07 | 6.6 | 31 | 70 | 7 | |
| 2DUBEN 067 310 S07 | 6.7 | 31 | 70 | 7 | |
| 2DUBEN 068 340 S07 | 6.8 | 34 | 75 | 7 | |
| 2DUBEN 069 340 S07 | 6.9 | 34 | 75 | 7 | |
| 2DUBEN 070 340 S07 | 7 | 34 | 75 | 7 | |
| 2DUBEN 071 340 S08 | 7.1 | 34 | 75 | 8 | |
| 2DUBEN 072 340 S08 | 7.2 | 34 | 75 | 8 | |
| 2DUBEN 073 340 S08 | 7.3 | 34 | 75 | 8 | |
| 2DUBEN 074 340 S08 | 7.4 | 34 | 75 | 8 | |
| 2DUBEN 075 340 S08 | 7.5 | 34 | 75 | 8 | |
| 2DUBEN 076 370 S08 | 7.6 | 37 | 80 | 8 | |
| 2DUBEN 077 370 S08 | 7.7 | 37 | 80 | 8 | |
| 2DUBEN 078 370 S08 | 7.8 | 37 | 80 | 8 | |
| 2DUBEN 079 370 S08 | 7.9 | 37 | 80 | 8 | |
| 2DUBEN 080 370 S08 | 8 | 37 | 80 | 8 | |
| 2DUBEN 081 370 S09 | 8.1 | 37 | 80 | 9 | |
| 2DUBEN 082 370 S09 | 8.2 | 37 | 80 | 9 | |
| 2DUBEN 083 370 S09 | 8.3 | 37 | 80 | 9 | |
| 2DUBEN 084 370 S09 | 8.4 | 37 | 80 | 9 | |
| 2DUBEN 085 370 S09 | 8.5 | 37 | 80 | 9 | |
| 2DUBEN 086 400 S09 | 8.6 | 40 | 85 | 9 | |
| 2DUBEN 087 400 S09 | 8.7 | 40 | 85 | 9 | |
| 2DUBEN 088 400 S09 | 8.8 | 40 | 85 | 9 | |
| 2DUBEN 089 400 S09 | 8.9 | 40 | 85 | 9 | |
| 2DUBEN 090 400 S09 | 9 | 40 | 85 | 9 | |
| 2DUBEN 091 400 S10 | 9.1 | 40 | 85 | 10 | |
| 2DUBEN 092 400 S10 | 9.2 | 40 | 85 | 10 | |
| 2DUBEN 093 400 S10 | 9.3 | 40 | 85 | 10 | |
| 2DUBEN 094 400 S10 | 9.4 | 40 | 85 | 10 | |
| 2DUBEN 095 400 S10 | 9.5 | 40 | 85 | 10 | |
| 2DUBEN 096 400 S10 | 9.6 | 40 | 90 | 10 | |
| 2DUBEN 097 430 S10 | 9.7 | 43 | 90 | 10 | |
| 2DUBEN 098 430 S10 | 9.8 | 43 | 90 | 10 | |
| 2DUBEN 099 430 S10 | 9.9 | 43 | 90 | 10 | |
| 2DUBEN 100 430 S10 | 10 | 43 | 90 | 10 | |
| 2DUBEN 101 430 S11 | 10.1 | 43 | 90 | 11 | |
| 2DUBEN 102 430 S11 | 10.2 | 43 | 90 | 11 | |
| 2DUBEN 103 430 S11 | 10.3 | 43 | 90 | 11 | |
| 2DUBEN 104 430 S11 | 10.4 | 43 | 90 | 11 | |
| 2DUBEN 105 430 S11 | 10.5 | 43 | 90 | 11 | |
| 2DUBEN 106 430 S11 | 10.6 | 43 | 90 | 11 | |
| 2DUBEN 107 470 S11 | 10.7 | 47 | 95 | 11 | |
| 2DUBEN 108 470 S11 | 10.8 | 47 | 95 | 11 | |
| 2DUBEN 109 470 S11 | 10.9 | 47 | 95 | 11 | |

단위 : mm

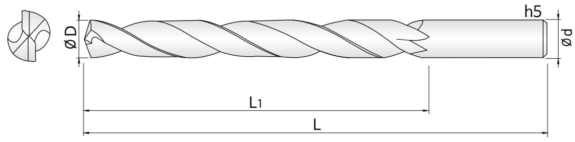
| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEN 110 470 S11 | 11 | 47 | 95 | 11 | |
| 2DUBEN 111 470 S12 | 11.1 | 47 | 95 | 12 | |
| 2DUBEN 112 470 S12 | 11.2 | 47 | 95 | 12 | |
| 2DUBEN 113 470 S12 | 11.3 | 47 | 95 | 12 | |
| 2DUBEN 114 470 S12 | 11.4 | 47 | 95 | 12 | |
| 2DUBEN 115 470 S12 | 11.5 | 47 | 95 | 12 | |
| 2DUBEN 116 470 S12 | 11.6 | 47 | 95 | 12 | |
| 2DUBEN 117 470 S12 | 11.7 | 47 | 95 | 12 | |
| 2DUBEN 118 470 S12 | 11.8 | 47 | 95 | 12 | |
| 2DUBEN 119 510 S12 | 11.9 | 51 | 100 | 12 | |
| 2DUBEN 120 510 S12 | 12 | 51 | 100 | 12 | |
| 2DUBEN 121 510 S13 | 12.1 | 51 | 100 | 13 | |
| 2DUBEN 122 510 S13 | 12.2 | 51 | 100 | 13 | |
| 2DUBEN 123 510 S13 | 12.3 | 51 | 100 | 13 | |
| 2DUBEN 124 510 S13 | 12.4 | 51 | 100 | 13 | |
| 2DUBEN 125 510 S13 | 12.5 | 51 | 100 | 13 | |
| 2DUBEN 126 510 S13 | 12.6 | 51 | 100 | 13 | |
| 2DUBEN 127 510 S13 | 12.7 | 51 | 100 | 13 | |
| 2DUBEN 128 510 S13 | 12.8 | 51 | 100 | 13 | |
| 2DUBEN 129 510 S13 | 12.9 | 51 | 100 | 13 | |
| 2DUBEN 130 510 S13 | 13 | 51 | 100 | 13 | |

# 2DUBEN

## Carbide 2 Flutes Dube N Drills for Non-ferrous [5XD]

## 초경 2날 두배 N 드릴 [5XD]

New




- **알루미늄 주물, 알루미늄 다이캐스팅, 비철금속, 플라스틱 등 비철 비금속 계열 전용 드릴**
- 비철금속 드릴링의 최적화 된 설계로 칩 융착을 최소화 하였습니다.
- 최적의 플루트 형상을 적용하여 안정적인 칩 배출과 절삭성이 우수합니다.
- 폭넓은 비철금속 피삭재에 적용 가능합니다.
- 우수한 제품의 강성과 칩 배출을 고려한 플루트 홈 설계를 적용하였습니다.

- **Drills for aluminum casting, aluminum die casting, non-ferrous metal, plastics and etc.**
- Chip fusion is minimized with an optimized design for non-ferrous metal drilling.
- Provides stable chip evacuation and excellent cutting performance by optimized flute design.
- Applicable for various kinds of non-ferrous metals.
- Applied flute groove design considering the excellent rigidity of the product and chip evacuation.


525P

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEN 010 120 S03 | 1 | 12 | 45 | 3 | |
| 2DUBEN 011 140 S03 | 1.1 | 14 | 45 | 3 | |
| 2DUBEN 012 160 S03 | 1.2 | 16 | 45 | 3 | |
| 2DUBEN 013 160 S03 | 1.3 | 16 | 45 | 3 | |
| 2DUBEN 014 180 S03 | 1.4 | 18 | 50 | 3 | |
| 2DUBEN 015 180 S03 | 1.5 | 18 | 50 | 3 | |
| 2DUBEN 016 200 S03 | 1.6 | 20 | 50 | 3 | |
| 2DUBEN 017 200 S03 | 1.7 | 20 | 50 | 3 | |
| 2DUBEN 018 220 S03 | 1.8 | 22 | 55 | 3 | |
| 2DUBEN 019 220 S03 | 1.9 | 22 | 55 | 3 | |
| 2DUBEN 020 240 S03 | 2 | 24 | 55 | 3 | |
| 2DUBEN 021 240 S03 | 2.1 | 24 | 55 | 3 | |
| 2DUBEN 022 270 S03 | 2.2 | 27 | 60 | 3 | |
| 2DUBEN 023 270 S03 | 2.3 | 27 | 60 | 3 | |
| 2DUBEN 024 300 S03 | 2.4 | 30 | 60 | 3 | |
| 2DUBEN 025 300 S03 | 2.5 | 30 | 60 | 3 | |
| 2DUBEN 026 300 S03 | 2.6 | 30 | 60 | 3 | |
| 2DUBEN 027 330 S03 | 2.7 | 33 | 65 | 3 | |
| 2DUBEN 028 330 S03 | 2.8 | 33 | 65 | 3 | |
| 2DUBEN 029 330 S03 | 2.9 | 33 | 65 | 3 | |
| 2DUBEN 030 330 S03 | 3 | 33 | 65 | 3 | |
| 2DUBEN 031 360 S04 | 3.1 | 36 | 65 | 4 | |
| 2DUBEN 032 360 S04 | 3.2 | 36 | 65 | 4 | |
| 2DUBEN 033 360 S04 | 3.3 | 36 | 65 | 4 | |
| 2DUBEN 034 390 S04 | 3.4 | 39 | 70 | 4 | |
| 2DUBEN 035 390 S04 | 3.5 | 39 | 70 | 4 | |
| 2DUBEN 036 390 S04 | 3.6 | 39 | 70 | 4 | |
| 2DUBEN 037 390 S04 | 3.7 | 39 | 70 | 4 | |
| 2DUBEN 038 390 S04 | 3.8 | 39 | 70 | 4 | |
| 2DUBEN 039 430 S04 | 3.9 | 43 | 75 | 4 | |
| 2DUBEN 040 430 S04 | 4 | 43 | 75 | 4 | |
| 2DUBEN 041 430 S05 | 4.1 | 43 | 75 | 5 | |
| 2DUBEN 042 430 S05 | 4.2 | 43 | 75 | 5 | |
| 2DUBEN 043 470 S05 | 4.3 | 47 | 80 | 5 | |
| 2DUBEN 044 470 S05 | 4.4 | 47 | 80 | 5 | |
| 2DUBEN 045 470 S05 | 4.5 | 47 | 80 | 5 | |
| 2DUBEN 046 470 S05 | 4.6 | 47 | 80 | 5 | |
| 2DUBEN 047 470 S05 | 4.7 | 47 | 80 | 5 | |
| 2DUBEN 048 520 S05 | 4.8 | 52 | 85 | 5 | |
| 2DUBEN 049 520 S05 | 4.9 | 52 | 85 | 5 | |
| 2DUBEN 050 520 S05 | 5 | 52 | 85 | 5 | |
| 2DUBEN 051 520 S06 | 5.1 | 52 | 85 | 6 | |
| 2DUBEN 052 520 S06 | 5.2 | 52 | 85 | 6 | |
| 2DUBEN 053 520 S06 | 5.3 | 52 | 85 | 6 | |
| 2DUBEN 054 570 S06 | 5.4 | 57 | 95 | 6 | |
| 2DUBEN 055 570 S06 | 5.5 | 57 | 95 | 6 | |
| 2DUBEN 056 570 S06 | 5.6 | 57 | 95 | 6 | |
| 2DUBEN 057 570 S06 | 5.7 | 57 | 95 | 6 | |
| 2DUBEN 058 570 S06 | 5.8 | 57 | 95 | 6 | |
| 2DUBEN 059 570 S06 | 5.9 | 57 | 95 | 6 | |

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEN 060 570 S06 | 6 | 57 | 95 | 6 | |
| 2DUBEN 061 630 S07 | 6.1 | 63 | 100 | 7 | |
| 2DUBEN 062 630 S07 | 6.2 | 63 | 100 | 7 | |
| 2DUBEN 063 630 S07 | 6.3 | 63 | 100 | 7 | |
| 2DUBEN 064 630 S07 | 6.4 | 63 | 100 | 7 | |
| 2DUBEN 065 630 S07 | 6.5 | 63 | 100 | 7 | |
| 2DUBEN 066 630 S07 | 6.6 | 63 | 100 | 7 | |
| 2DUBEN 067 630 S07 | 6.7 | 63 | 100 | 7 | |
| 2DUBEN 068 690 S07 | 6.8 | 69 | 110 | 7 | |
| 2DUBEN 069 690 S07 | 6.9 | 69 | 110 | 7 | |
| 2DUBEN 070 690 S07 | 7 | 69 | 110 | 7 | |
| 2DUBEN 071 690 S08 | 7.1 | 69 | 110 | 8 | |
| 2DUBEN 072 690 S08 | 7.2 | 69 | 110 | 8 | |
| 2DUBEN 073 690 S08 | 7.3 | 69 | 110 | 8 | |
| 2DUBEN 074 690 S08 | 7.4 | 69 | 110 | 8 | |
| 2DUBEN 075 690 S08 | 7.5 | 69 | 110 | 8 | |
| 2DUBEN 076 750 S08 | 7.6 | 75 | 120 | 8 | |
| 2DUBEN 077 750 S08 | 7.7 | 75 | 120 | 8 | |
| 2DUBEN 078 750 S08 | 7.8 | 75 | 120 | 8 | |
| 2DUBEN 079 750 S08 | 7.9 | 75 | 120 | 8 | |
| 2DUBEN 080 750 S08 | 8 | 75 | 120 | 8 | |
| 2DUBEN 081 750 S09 | 8.1 | 75 | 120 | 9 | |
| 2DUBEN 082 750 S09 | 8.2 | 75 | 120 | 9 | |
| 2DUBEN 083 750 S09 | 8.3 | 75 | 120 | 9 | |
| 2DUBEN 084 750 S09 | 8.4 | 75 | 120 | 9 | |
| 2DUBEN 085 750 S09 | 8.5 | 75 | 120 | 9 | |
| 2DUBEN 086 810 S09 | 8.6 | 81 | 125 | 9 | |
| 2DUBEN 087 810 S09 | 8.7 | 81 | 125 | 9 | |
| 2DUBEN 088 810 S09 | 8.8 | 81 | 125 | 9 | |
| 2DUBEN 089 810 S09 | 8.9 | 81 | 125 | 9 | |
| 2DUBEN 090 810 S09 | 9 | 81 | 125 | 9 | |
| 2DUBEN 091 810 S10 | 9.1 | 81 | 125 | 10 | |
| 2DUBEN 092 810 S10 | 9.2 | 81 | 125 | 10 | |
| 2DUBEN 093 810 S10 | 9.3 | 81 | 125 | 10 | |
| 2DUBEN 094 810 S10 | 9.4 | 81 | 125 | 10 | |
| 2DUBEN 095 810 S10 | 9.5 | 81 | 125 | 10 | |
| 2DUBEN 096 870 S10 | 9.6 | 87 | 135 | 10 | |
| 2DUBEN 097 870 S10 | 9.7 | 87 | 135 | 10 | |
| 2DUBEN 098 870 S10 | 9.8 | 87 | 135 | 10 | |
| 2DUBEN 099 870 S10 | 9.9 | 87 | 135 | 10 | |
| 2DUBEN 100 870 S10 | 10 | 87 | 135 | 10 | |
| 2DUBEN 101 870 S11 | 10.1 | 87 | 135 | 11 | |
| 2DUBEN 102 870 S11 | 10.2 | 87 | 135 | 11 | |
| 2DUBEN 103 870 S11 | 10.3 | 87 | 135 | 11 | |
| 2DUBEN 104 870 S11 | 10.4 | 87 | 135 | 11 | |
| 2DUBEN 105 870 S11 | 10.5 | 87 | 135 | 11 | |
| 2DUBEN 106 870 S11 | 10.6 | 87 | 135 | 11 | |
| 2DUBEN 107 940 S11 | 10.7 | 94 | 145 | 11 | |
| 2DUBEN 108 940 S11 | 10.8 | 94 | 145 | 11 | |
| 2DUBEN 109 940 S11 | 10.9 | 94 | 145 | 11 | |

New

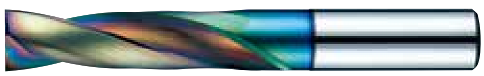
단위 : mm

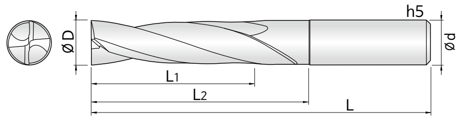
| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|
| 2DUBEN 110 940 S11 | 11 | 94 | 145 | 11 | |
| 2DUBEN 111 940 S12 | 11.1 | 94 | 145 | 12 | |
| 2DUBEN 112 940 S12 | 11.2 | 94 | 145 | 12 | |
| 2DUBEN 113 940 S12 | 11.3 | 94 | 145 | 12 | |
| 2DUBEN 114 940 S12 | 11.4 | 94 | 145 | 12 | |
| 2DUBEN 115 940 S12 | 11.5 | 94 | 145 | 12 | |
| 2DUBEN 116 940 S12 | 11.6 | 94 | 145 | 12 | |
| 2DUBEN 117 940 S12 | 11.7 | 94 | 145 | 12 | |
| 2DUBEN 118 940 S12 | 11.8 | 94 | 145 | 12 | |
| 2DUBEN 119 1010 S12 | 11.9 | 101 | 150 | 12 | |
| 2DUBEN 120 1010 S12 | 12 | 101 | 150 | 12 | |
| 2DUBEN 121 1010 S13 | 12.1 | 101 | 150 | 13 | |
| 2DUBEN 122 1010 S13 | 12.2 | 101 | 150 | 13 | |
| 2DUBEN 123 1010 S13 | 12.3 | 101 | 150 | 13 | |
| 2DUBEN 124 1010 S13 | 12.4 | 101 | 150 | 13 | |
| 2DUBEN 125 1010 S13 | 12.5 | 101 | 150 | 13 | |
| 2DUBEN 126 1010 S13 | 12.6 | 101 | 150 | 13 | |
| 2DUBEN 127 1010 S13 | 12.7 | 101 | 150 | 13 | |
| 2DUBEN 128 1010 S13 | 12.8 | 101 | 150 | 13 | |
| 2DUBEN 129 1010 S13 | 12.9 | 101 | 150 | 13 | |
| 2DUBEN 130 1010 S13 | 13 | 101 | 150 | 13 | |

# 2FDR

## Carbide 2 Flutes, Multi-Processing Flat Drills

## 초경 2날/ 다기능 플랫 드릴






- **HRc50이하, 프리하든강, 합금강, 주철 가공용 플랫 드릴**
- 밑날 플랫타입으로 다양한 경사면과 곡면 드릴가공에 탁월한 성능을 발휘합니다.
- 20도 헬릭스를 채택하여 칩배출 성능이 매우 우수합니다.
- 관통 드릴 작업시 버 발생을 최소화 합니다.
- HR 코팅으로 내열성과 내마모성이 우수, 긴 공구수명을 실현 하였습니다.

- **Flat drills for materials up to HRc50, pre-hardened steels, alloy steels, cast irons**
- With flat type of end face, excellent performance drilling is available to a variety of inclined and curved surfaces.
- Chip emission is great and stable drilling is available with 20 degree helix design.
- Minimize burrs during penetration drilling.
- Increased tool life by applying HR coating with great heat and wear resistance.

2 | WC 미립자 | HR Coating | h7 Diameter Tolerence | 20° Helix Angle | CUTTING DATA 526P

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2FDR 002 009 S03 | 0.2 | 0.8 | 0.9 | 50 | 3 | |
| 2FDR 0025 011 S03 | 0.25 | 1 | 1.1 | 50 | 3 | |
| 2FDR 003 013 S03 | 0.3 | 1.2 | 1.3 | 50 | 3 | |
| 2FDR 0035 015 S03 | 0.35 | 1.4 | 1.5 | 50 | 3 | |
| 2FDR 004 017 S03 | 0.4 | 1.6 | 1.7 | 50 | 3 | |
| 2FDR 0045 019 S03 | 0.45 | 1.8 | 1.9 | 50 | 3 | |
| 2FDR 005 022 S03 | 0.5 | 2 | 2.2 | 50 | 3 | |
| 2FDR 0055 024 S03 | 0.55 | 2.2 | 2.4 | 50 | 3 | |
| 2FDR 006 026 S03 | 0.6 | 2.4 | 2.6 | 50 | 3 | |
| 2FDR 0065 028 S03 | 0.65 | 2.6 | 2.8 | 50 | 3 | |
| 2FDR 007 030 S03 | 0.7 | 2.8 | 3 | 50 | 3 | |
| 2FDR 0075 032 S03 | 0.75 | 3 | 3.2 | 50 | 3 | |
| 2FDR 008 034 S03 | 0.8 | 3.2 | 3.4 | 50 | 3 | |
| 2FDR 0085 037 S03 | 0.85 | 3.4 | 3.7 | 50 | 3 | |
| 2FDR 009 039 S03 | 0.9 | 3.6 | 3.9 | 50 | 3 | |
| 2FDR 0095 041 S03 | 0.95 | 3.8 | 4.1 | 50 | 3 | |
| 2FDR 010 043 S03 | 1 | 4 | 4.3 | 50 | 3 | |
| 2FDR 011 047 S03 | 1.1 | 4.4 | 4.7 | 50 | 3 | |
| 2FDR 012 052 S03 | 1.2 | 4.8 | 5.2 | 50 | 3 | |
| 2FDR 013 056 S03 | 1.3 | 5.2 | 5.6 | 50 | 3 | |
| 2FDR 014 060 S03 | 1.4 | 5.6 | 6 | 50 | 3 | |
| 2FDR 015 065 S03 | 1.5 | 6 | 6.5 | 50 | 3 | |
| 2FDR 016 069 S03 | 1.6 | 6.4 | 6.9 | 50 | 3 | |
| 2FDR 017 073 S03 | 1.7 | 6.8 | 7.3 | 50 | 3 | |
| 2FDR 018 077 S03 | 1.8 | 7.2 | 7.7 | 50 | 3 | |
| 2FDR 019 082 S03 | 1.9 | 7.6 | 8.2 | 50 | 3 | |
| 2FDR 020 086 S04 | 2 | 8 | 8.6 | 50 | 4 | |
| 2FDR 021 090 S04 | 2.1 | 8.4 | 9 | 50 | 4 | |
| 2FDR 022 095 S04 | 2.2 | 8.8 | 9.5 | 50 | 4 | |
| 2FDR 023 099 S04 | 2.3 | 9.2 | 9.9 | 50 | 4 | |
| 2FDR 024 103 S04 | 2.4 | 9.6 | 10.3 | 50 | 4 | |
| 2FDR 025 108 S04 | 2.5 | 10 | 10.8 | 50 | 4 | |
| 2FDR 026 112 S04 | 2.6 | 10.4 | 11.2 | 50 | 4 | |
| 2FDR 027 116 S04 | 2.7 | 10.8 | 11.6 | 50 | 4 | |
| 2FDR 028 120 S04 | 2.8 | 11.2 | 12 | 50 | 4 | |
| 2FDR 029 125 S04 | 2.9 | 11.6 | 12.5 | 50 | 4 | |
| 2FDR 030 129 S06 | 3 | 12 | 12.9 | 50 | 6 | |
| 2FDR 031 133 S06 | 3.1 | 12.4 | 13.3 | 50 | 6 | |
| 2FDR 032 138 S06 | 3.2 | 12.8 | 13.8 | 50 | 6 | |
| 2FDR 033 142 S06 | 3.3 | 13.2 | 14.2 | 50 | 6 | |
| 2FDR 034 146 S06 | 3.4 | 13.6 | 14.6 | 50 | 6 | |
| 2FDR 035 151 S06 | 3.5 | 14 | 15.1 | 50 | 6 | |
| 2FDR 036 155 S06 | 3.6 | 14.4 | 15.5 | 50 | 6 | |
| 2FDR 037 159 S06 | 3.7 | 14.8 | 15.9 | 50 | 6 | |
| 2FDR 038 163 S06 | 3.8 | 15.2 | 16.3 | 50 | 6 | |
| 2FDR 039 168 S06 | 3.9 | 15.6 | 16.8 | 50 | 6 | |
| 2FDR 040 172 S06 | 4 | 16 | 17.2 | 50 | 6 | |
| 2FDR 041 176 S06 | 4.1 | 16.4 | 17.6 | 60 | 6 | |
| 2FDR 042 181 S06 | 4.2 | 16.8 | 18.1 | 60 | 6 | |
| 2FDR 043 185 S06 | 4.3 | 17.2 | 18.5 | 60 | 6 | |

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2FDR 044 189 S06 | 4.4 | 17.6 | 18.9 | 60 | 6 | |
| 2FDR 045 194 S06 | 4.5 | 18 | 19.4 | 60 | 6 | |
| 2FDR 046 198 S06 | 4.6 | 18.4 | 19.8 | 60 | 6 | |
| 2FDR 047 202 S06 | 4.7 | 18.8 | 20.2 | 60 | 6 | |
| 2FDR 048 206 S06 | 4.8 | 19.2 | 20.6 | 60 | 6 | |
| 2FDR 049 211 S06 | 4.9 | 19.6 | 21.1 | 60 | 6 | |
| 2FDR 050 215 S06 | 5 | 20 | 21.5 | 60 | 6 | |
| 2FDR 051 219 S06 | 5.1 | 20.4 | 21.9 | 60 | 6 | |
| 2FDR 052 224 S06 | 5.2 | 20.8 | 22.4 | 60 | 6 | |
| 2FDR 053 228 S06 | 5.3 | 21.2 | 22.8 | 60 | 6 | |
| 2FDR 054 232 S06 | 5.4 | 21.6 | 23.2 | 60 | 6 | |
| 2FDR 055 237 S06 | 5.5 | 22 | 23.7 | 60 | 6 | |
| 2FDR 056 241 S06 | 5.6 | 22.4 | 24.1 | 60 | 6 | |
| 2FDR 057 245 S06 | 5.7 | 22.8 | 24.5 | 60 | 6 | |
| 2FDR 058 249 S06 | 5.8 | 23.2 | 24.9 | 60 | 6 | |
| 2FDR 059 254 S06 | 5.9 | 23.6 | 25.4 | 60 | 6 | |
| 2FDR 060 258 S06 | 6 | 24 | 25.8 | 60 | 6 | |
| 2FDR 061 262 S08 | 6.1 | 24.4 | 26.2 | 70 | 8 | |
| 2FDR 062 267 S08 | 6.2 | 24.8 | 26.7 | 70 | 8 | |
| 2FDR 063 271 S08 | 6.3 | 25.2 | 27.1 | 70 | 8 | |
| 2FDR 064 275 S08 | 6.4 | 25.6 | 27.5 | 70 | 8 | |
| 2FDR 065 280 S08 | 6.5 | 26 | 28 | 70 | 8 | |
| 2FDR 066 284 S08 | 6.6 | 26.4 | 28.4 | 70 | 8 | |
| 2FDR 067 288 S08 | 6.7 | 26.8 | 28.8 | 70 | 8 | |
| 2FDR 068 292 S08 | 6.8 | 27.2 | 29.2 | 70 | 8 | |
| 2FDR 069 297 S08 | 6.9 | 27.6 | 29.7 | 70 | 8 | |
| 2FDR 070 301 S08 | 7 | 28 | 30.1 | 70 | 8 | |
| 2FDR 071 305 S08 | 7.1 | 28.4 | 30.5 | 70 | 8 | |
| 2FDR 072 310 S08 | 7.2 | 28.8 | 31 | 70 | 8 | |
| 2FDR 073 314 S08 | 7.3 | 29.2 | 31.4 | 70 | 8 | |
| 2FDR 074 318 S08 | 7.4 | 29.6 | 31.8 | 70 | 8 | |
| 2FDR 075 323 S08 | 7.5 | 30 | 32.3 | 70 | 8 | |
| 2FDR 076 327 S08 | 7.6 | 30.4 | 32.7 | 70 | 8 | |
| 2FDR 077 331 S08 | 7.7 | 30.8 | 33.1 | 70 | 8 | |
| 2FDR 078 335 S08 | 7.8 | 31.2 | 33.5 | 70 | 8 | |
| 2FDR 079 340 S08 | 7.9 | 31.6 | 34 | 70 | 8 | |
| 2FDR 080 344 S08 | 8 | 32 | 34.4 | 70 | 8 | |
| 2FDR 081 348 S10 | 8.1 | 32.4 | 34.8 | 80 | 10 | |
| 2FDR 082 353 S10 | 8.2 | 32.8 | 35.3 | 80 | 10 | |
| 2FDR 083 357 S10 | 8.3 | 33.2 | 35.7 | 80 | 10 | |
| 2FDR 084 361 S10 | 8.4 | 33.6 | 36.1 | 80 | 10 | |
| 2FDR 085 366 S10 | 8.5 | 34 | 36.6 | 80 | 10 | |
| 2FDR 086 370 S10 | 8.6 | 34.4 | 37 | 80 | 10 | |
| 2FDR 087 374 S10 | 8.7 | 34.8 | 37.4 | 80 | 10 | |
| 2FDR 088 378 S10 | 8.8 | 35.2 | 37.8 | 80 | 10 | |
| 2FDR 089 383 S10 | 8.9 | 35.6 | 38.3 | 80 | 10 | |
| 2FDR 090 387 S10 | 9 | 36 | 38.7 | 80 | 10 | |
| 2FDR 091 391 S10 | 9.1 | 36.4 | 39.1 | 80 | 10 | |
| 2FDR 092 396 S10 | 9.2 | 36.8 | 39.6 | 80 | 10 | |
| 2FDR 093 400 S10 | 9.3 | 37.2 | 40 | 80 | 10 | |

# 2FDR

## Carbide 2 Flutes, Multi-Processing Flat Drills

## 초경 2날/ 다기능 플랫 드릴

단위 : mm

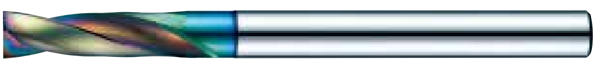
| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2FDR 094 404 S10 | 9.4 | 37.6 | 40.4 | 80 | 10 | |
| 2FDR 095 409 S10 | 9.5 | 38 | 40.9 | 80 | 10 | |
| 2FDR 096 413 S10 | 9.6 | 38.4 | 41.3 | 80 | 10 | |
| 2FDR 097 417 S10 | 9.7 | 38.8 | 41.7 | 80 | 10 | |
| 2FDR 098 421 S10 | 9.8 | 39.2 | 42.1 | 80 | 10 | |
| 2FDR 099 426 S10 | 9.9 | 39.6 | 42.6 | 80 | 10 | |
| 2FDR 100 430 S10 | 10 | 40 | 43 | 80 | 10 | |
| 2FDR 101 434 S12 | 10.1 | 40.4 | 43.4 | 90 | 12 | |
| 2FDR 102 439 S12 | 10.2 | 40.8 | 43.9 | 90 | 12 | |
| 2FDR 103 443 S12 | 10.3 | 41.2 | 44.3 | 90 | 12 | |
| 2FDR 104 447 S12 | 10.4 | 41.6 | 44.7 | 90 | 12 | |
| 2FDR 105 452 S12 | 10.5 | 42 | 45.2 | 90 | 12 | |
| 2FDR 106 456 S12 | 10.6 | 42.4 | 45.6 | 90 | 12 | |
| 2FDR 107 460 S12 | 10.7 | 42.8 | 46 | 90 | 12 | |
| 2FDR 108 464 S12 | 10.8 | 43.2 | 46.4 | 90 | 12 | |
| 2FDR 109 469 S12 | 10.9 | 43.6 | 46.9 | 90 | 12 | |
| 2FDR 110 473 S12 | 11 | 44 | 47.3 | 90 | 12 | |
| 2FDR 111 477 S12 | 11.1 | 44.4 | 47.7 | 90 | 12 | |
| 2FDR 112 482 S12 | 11.2 | 44.8 | 48.2 | 90 | 12 | |
| 2FDR 113 486 S12 | 11.3 | 45.2 | 48.6 | 90 | 12 | |
| 2FDR 114 490 S12 | 11.4 | 45.6 | 49 | 90 | 12 | |
| 2FDR 115 495 S12 | 11.5 | 46 | 49.5 | 90 | 12 | |
| 2FDR 116 499 S12 | 11.6 | 46.4 | 49.9 | 90 | 12 | |
| 2FDR 117 503 S12 | 11.7 | 46.8 | 50.3 | 90 | 12 | |
| 2FDR 118 507 S12 | 11.8 | 47.2 | 50.7 | 90 | 12 | |
| 2FDR 119 512 S12 | 11.9 | 47.6 | 51.2 | 90 | 12 | |
| 2FDR 120 516 S12 | 12 | 48 | 51.6 | 90 | 12 | |
| 2FDR 121 520 S14 | 12.1 | 48.4 | 52 | 100 | 14 | |
| 2FDR 122 525 S14 | 12.2 | 48.8 | 52.5 | 100 | 14 | |
| 2FDR 123 529 S14 | 12.3 | 49.2 | 52.9 | 100 | 14 | |
| 2FDR 124 533 S14 | 12.4 | 49.6 | 53.3 | 100 | 14 | |
| 2FDR 125 538 S14 | 12.5 | 50 | 53.8 | 100 | 14 | |
| 2FDR 126 542 S14 | 12.6 | 50.4 | 54.2 | 100 | 14 | |
| 2FDR 127 546 S14 | 12.7 | 50.8 | 54.6 | 100 | 14 | |
| 2FDR 128 550 S14 | 12.8 | 51.2 | 55 | 100 | 14 | |
| 2FDR 129 555 S14 | 12.9 | 51.6 | 55.5 | 100 | 14 | |
| 2FDR 130 559 S14 | 13 | 52 | 55.9 | 100 | 14 | |
| 2FDR 131 563 S14 | 13.1 | 52.4 | 56.3 | 100 | 14 | |
| 2FDR 132 568 S14 | 13.2 | 52.8 | 56.8 | 100 | 14 | |
| 2FDR 133 572 S14 | 13.3 | 53.2 | 57.2 | 100 | 14 | |
| 2FDR 134 576 S14 | 13.4 | 53.6 | 57.6 | 100 | 14 | |
| 2FDR 135 581 S14 | 13.5 | 54 | 58.1 | 100 | 14 | |
| 2FDR 136 585 S14 | 13.6 | 54.4 | 58.5 | 100 | 14 | |
| 2FDR 137 589 S14 | 13.7 | 54.8 | 58.9 | 100 | 14 | |
| 2FDR 138 593 S14 | 13.8 | 55.2 | 59.3 | 100 | 14 | |
| 2FDR 139 598 S14 | 13.9 | 55.6 | 59.8 | 100 | 14 | |
| 2FDR 140 602 S14 | 14 | 56 | 60.2 | 100 | 14 | |
| 2FDR 141 606 S16 | 14.1 | 56.4 | 60.6 | 105 | 16 | |
| 2FDR 142 611 S16 | 14.2 | 56.8 | 61.1 | 105 | 16 | |
| 2FDR 143 615 S16 | 14.3 | 57.2 | 61.5 | 105 | 16 | |
| 2FDR 144 619 S16 | 14.4 | 57.6 | 61.9 | 105 | 16 | |
| 2FDR 145 624 S16 | 14.5 | 58 | 62.4 | 105 | 16 | |
| 2FDR 146 628 S16 | 14.6 | 58.4 | 62.8 | 105 | 16 | |
| 2FDR 147 632 S16 | 14.7 | 58.8 | 63.2 | 105 | 16 | |
| 2FDR 148 636 S16 | 14.8 | 59.2 | 63.6 | 105 | 16 | |
| 2FDR 149 641 S16 | 14.9 | 59.6 | 64.1 | 105 | 16 | |
| 2FDR 150 645 S16 | 15 | 60 | 64.5 | 105 | 16 | |
| 2FDR 151 649 S16 | 15.1 | 60.4 | 64.9 | 115 | 16 | |
| 2FDR 152 654 S16 | 15.2 | 60.8 | 65.4 | 115 | 16 | |
| 2FDR 153 658 S16 | 15.3 | 61.2 | 65.8 | 115 | 16 | |
| 2FDR 154 662 S16 | 15.4 | 61.6 | 66.2 | 115 | 16 | |
| 2FDR 155 667 S16 | 15.5 | 62 | 66.7 | 115 | 16 | |
| 2FDR 156 671 S16 | 15.6 | 62.4 | 67.1 | 115 | 16 | |
| 2FDR 157 675 S16 | 15.7 | 62.8 | 67.5 | 115 | 16 | |
| 2FDR 158 679 S16 | 15.8 | 63.2 | 67.9 | 115 | 16 | |
| 2FDR 159 684 S16 | 15.9 | 63.6 | 68.4 | 115 | 16 | |
| 2FDR 160 688 S16 | 16 | 64 | 68.8 | 115 | 16 | |
| 2FDR 165 710 S18 | 16.5 | 66 | 71 | 125 | 18 | |
| 2FDR 170 731 S18 | 17 | 68 | 73.1 | 125 | 18 | |
| 2FDR 175 753 S18 | 17.5 | 70 | 75.3 | 125 | 18 | |
| 2FDR 180 774 S18 | 18 | 72 | 77.4 | 125 | 18 | |
| 2FDR 185 796 S20 | 18.5 | 74 | 79.6 | 135 | 20 | |
| 2FDR 190 817 S20 | 19 | 76 | 81.7 | 135 | 20 | |
| 2FDR 195 839 S20 | 19.5 | 78 | 83.9 | 145 | 20 | |
| 2FDR 200 860 S20 | 20 | 80 | 86 | 145 | 20 | |

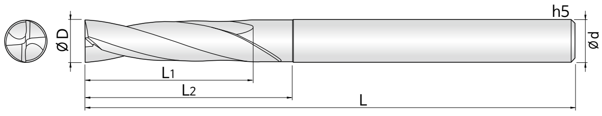
DRILL

# 2FDRL

## Carbide 2 Flutes, Multi-Processing Flat Drills with Long Shank

## 초경 2날/롱생크 다기능 플랫 드릴







- **HRc50이하, 프리하든강, 합금강, 주철 가공용 플랫 드릴**
- 밑날 플랫타입으로 다양한 경사면과 곡면 드릴가공에 탁월한 성능을 발휘합니다.
- 20도 헬릭스를 채택하여 칩배출 성능이 매우 우수합니다.
- 관통 드릴 작업시 버 발생을 최소화 합니다.
- HR 코팅으로 내열성과 내마모성이 우수, 긴 공구수명을 실현 하였습니다.

- **Flat drills for materials up to HRc50, pre-hardened steels, alloy steels, cast irons**
- With flat type of end face, excellent performance drilling is available to a variety of inclined and curved surfaces.
- Chip emission is great and stable drilling is available with 20 degree helix design.
- Minimize burrs during penetration drilling.
- Increased tool life by applying HR coating with great heat and wear resistance.

단위 : mm

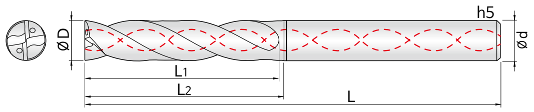
| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2FDRL 030 300 S06 | 3 | 12 | 30 | 100 | 6 | |
| 2FDRL 031 310 S06 | 3.1 | 12.4 | 31 | 100 | 6 | |
| 2FDRL 032 320 S06 | 3.2 | 12.8 | 32 | 100 | 6 | |
| 2FDRL 033 330 S06 | 3.3 | 13.2 | 33 | 100 | 6 | |
| 2FDRL 034 340 S06 | 3.4 | 13.6 | 34 | 100 | 6 | |
| 2FDRL 035 350 S06 | 3.5 | 14 | 35 | 100 | 6 | |
| 2FDRL 036 360 S06 | 3.6 | 14.4 | 36 | 100 | 6 | |
| 2FDRL 037 370 S06 | 3.7 | 14.8 | 37 | 100 | 6 | |
| 2FDRL 038 380 S06 | 3.8 | 15.2 | 38 | 100 | 6 | |
| 2FDRL 039 390 S06 | 3.9 | 15.6 | 39 | 100 | 6 | |
| 2FDRL 040 400 S06 | 4 | 16 | 40 | 100 | 6 | |
| 2FDRL 041 410 S06 | 4.1 | 16.4 | 41 | 100 | 6 | |
| 2FDRL 042 420 S06 | 4.2 | 16.8 | 42 | 100 | 6 | |
| 2FDRL 043 430 S06 | 4.3 | 17.2 | 43 | 100 | 6 | |
| 2FDRL 044 440 S06 | 4.4 | 17.6 | 44 | 100 | 6 | |
| 2FDRL 045 450 S06 | 4.5 | 18 | 45 | 100 | 6 | |
| 2FDRL 046 460 S06 | 4.6 | 18.4 | 46 | 100 | 6 | |
| 2FDRL 047 470 S06 | 4.7 | 18.8 | 47 | 100 | 6 | |
| 2FDRL 048 480 S06 | 4.8 | 19.2 | 48 | 100 | 6 | |
| 2FDRL 049 490 S06 | 4.9 | 19.6 | 49 | 100 | 6 | |
| 2FDRL 050 500 S06 | 5 | 20 | 50 | 100 | 6 | |
| 2FDRL 051 510 S06 | 5.1 | 20.4 | 51 | 110 | 6 | |
| 2FDRL 052 520 S06 | 5.2 | 20.8 | 52 | 110 | 6 | |
| 2FDRL 053 530 S06 | 5.3 | 21.2 | 53 | 110 | 6 | |
| 2FDRL 054 540 S06 | 5.4 | 21.6 | 54 | 110 | 6 | |
| 2FDRL 055 550 S06 | 5.5 | 22 | 55 | 110 | 6 | |
| 2FDRL 056 560 S06 | 5.6 | 22.4 | 56 | 110 | 6 | |
| 2FDRL 057 570 S06 | 5.7 | 22.8 | 57 | 110 | 6 | |
| 2FDRL 058 580 S06 | 5.8 | 23.2 | 58 | 110 | 6 | |
| 2FDRL 059 590 S06 | 5.9 | 23.6 | 59 | 110 | 6 | |
| 2FDRL 060 480 S06 | 6 | 24 | 48 | 110 | 6 | |
| 2FDRL 061 488 S08 | 6.1 | 24.4 | 48.8 | 120 | 8 | |
| 2FDRL 062 496 S08 | 6.2 | 24.8 | 49.6 | 120 | 8 | |
| 2FDRL 063 504 S08 | 6.3 | 25.2 | 50.4 | 120 | 8 | |
| 2FDRL 064 512 S08 | 6.4 | 25.6 | 51.2 | 120 | 8 | |
| 2FDRL 065 520 S08 | 6.5 | 26 | 52 | 120 | 8 | |
| 2FDRL 066 528 S08 | 6.6 | 26.4 | 52.8 | 120 | 8 | |
| 2FDRL 067 536 S08 | 6.7 | 26.8 | 53.6 | 120 | 8 | |
| 2FDRL 068 544 S08 | 6.8 | 27.2 | 54.4 | 120 | 8 | |
| 2FDRL 069 552 S08 | 6.9 | 27.6 | 55.2 | 120 | 8 | |
| 2FDRL 070 560 S08 | 7 | 28 | 56 | 120 | 8 | |
| 2FDRL 071 568 S08 | 7.1 | 28.4 | 56.8 | 120 | 8 | |
| 2FDRL 072 576 S08 | 7.2 | 28.8 | 57.6 | 120 | 8 | |
| 2FDRL 073 584 S08 | 7.3 | 29.2 | 58.4 | 120 | 8 | |
| 2FDRL 074 592 S08 | 7.4 | 29.6 | 59.2 | 120 | 8 | |
| 2FDRL 075 600 S08 | 7.5 | 30 | 60 | 120 | 8 | |
| 2FDRL 076 608 S08 | 7.6 | 30.4 | 60.8 | 120 | 8 | |
| 2FDRL 077 616 S08 | 7.7 | 30.8 | 61.6 | 120 | 8 | |
| 2FDRL 078 624 S08 | 7.8 | 31.2 | 62.4 | 120 | 8 | |
| 2FDRL 079 632 S08 | 7.9 | 31.6 | 63.2 | 120 | 8 | |
| 2FDRL 080 640 S08 | 8 | 32 | 64 | 120 | 8 | |
| 2FDRL 081 648 S10 | 8.1 | 32.4 | 64.8 | 130 | 10 | |
| 2FDRL 082 656 S10 | 8.2 | 32.8 | 65.6 | 130 | 10 | |
| 2FDRL 083 664 S10 | 8.3 | 33.2 | 66.4 | 130 | 10 | |

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2FDRL 084 672 S10 | 8.4 | 33.6 | 67.2 | 130 | 10 | |
| 2FDRL 085 680 S10 | 8.5 | 34 | 68 | 130 | 10 | |
| 2FDRL 086 688 S10 | 8.6 | 34.4 | 68.8 | 130 | 10 | |
| 2FDRL 087 696 S10 | 8.7 | 34.8 | 69.6 | 130 | 10 | |
| 2FDRL 088 704 S10 | 8.8 | 35.2 | 70.4 | 130 | 10 | |
| 2FDRL 089 712 S10 | 8.9 | 35.6 | 71.2 | 130 | 10 | |
| 2FDRL 090 720 S10 | 9 | 36 | 72 | 130 | 10 | |
| 2FDRL 091 728 S10 | 9.1 | 36.4 | 72.8 | 130 | 10 | |
| 2FDRL 092 736 S10 | 9.2 | 36.8 | 73.6 | 130 | 10 | |
| 2FDRL 093 744 S10 | 9.3 | 37.2 | 74.4 | 130 | 10 | |
| 2FDRL 094 752 S10 | 9.4 | 37.6 | 75.2 | 130 | 10 | |
| 2FDRL 095 760 S10 | 9.5 | 38 | 76 | 130 | 10 | |
| 2FDRL 096 768 S10 | 9.6 | 38.4 | 76.8 | 130 | 10 | |
| 2FDRL 097 776 S10 | 9.7 | 38.8 | 77.6 | 130 | 10 | |
| 2FDRL 098 784 S10 | 9.8 | 39.2 | 78.4 | 130 | 10 | |
| 2FDRL 099 792 S10 | 9.9 | 39.6 | 79.2 | 130 | 10 | |
| 2FDRL 100 800 S10 | 10 | 40 | 80 | 130 | 10 | |
| 2FDRL 101 808 S12 | 10.1 | 40.4 | 80.8 | 150 | 12 | |
| 2FDRL 102 816 S12 | 10.2 | 40.8 | 81.6 | 150 | 12 | |
| 2FDRL 103 824 S12 | 10.3 | 41.2 | 82.4 | 150 | 12 | |
| 2FDRL 104 832 S12 | 10.4 | 41.6 | 83.2 | 150 | 12 | |
| 2FDRL 105 840 S12 | 10.5 | 42 | 84 | 150 | 12 | |
| 2FDRL 106 848 S12 | 10.6 | 42.4 | 84.8 | 150 | 12 | |
| 2FDRL 107 856 S12 | 10.7 | 42.8 | 85.6 | 150 | 12 | |
| 2FDRL 108 864 S12 | 10.8 | 43.2 | 86.4 | 150 | 12 | |
| 2FDRL 109 872 S12 | 10.9 | 43.6 | 87.2 | 150 | 12 | |
| 2FDRL 110 880 S12 | 11 | 44 | 88 | 150 | 12 | |
| 2FDRL 111 888 S12 | 11.1 | 44.4 | 88.8 | 150 | 12 | |
| 2FDRL 112 896 S12 | 11.2 | 44.8 | 89.6 | 150 | 12 | |
| 2FDRL 113 904 S12 | 11.3 | 45.2 | 90.4 | 150 | 12 | |
| 2FDRL 114 912 S12 | 11.4 | 45.6 | 91.2 | 150 | 12 | |
| 2FDRL 115 920 S12 | 11.5 | 46 | 92 | 150 | 12 | |
| 2FDRL 116 928 S12 | 11.6 | 46.4 | 92.8 | 150 | 12 | |
| 2FDRL 117 936 S12 | 11.7 | 46.8 | 93.6 | 150 | 12 | |
| 2FDRL 118 944 S12 | 11.8 | 47.2 | 94.4 | 150 | 12 | |
| 2FDRL 119 952 S12 | 11.9 | 47.6 | 95.2 | 150 | 12 | |
| 2FDRL 120 960 S12 | 12 | 48 | 96 | 150 | 12 | |
| 2FDRL 125 1000 S14 | 12.5 | 50 | 100 | 180 | 14 | |
| 2FDRL 130 1040 S14 | 13 | 52 | 104 | 180 | 14 | |
| 2FDRL 135 1080 S14 | 13.5 | 54 | 108 | 180 | 14 | |
| 2FDRL 140 1120 S14 | 14 | 56 | 112 | 180 | 14 | |
| 2FDRL 145 1160 S16 | 14.5 | 58 | 116 | 200 | 16 | |
| 2FDRL 150 1200 S16 | 15 | 60 | 120 | 200 | 16 | |
| 2FDRL 155 1240 S16 | 15.5 | 62 | 124 | 200 | 16 | |
| 2FDRL 160 1280 S16 | 16 | 64 | 128 | 200 | 16 | |
| 2FDRL 165 1320 S18 | 16.5 | 66 | 132 | 220 | 18 | |
| 2FDRL 170 1360 S18 | 17 | 68 | 136 | 220 | 18 | |
| 2FDRL 175 1400 S18 | 17.5 | 70 | 140 | 220 | 18 | |
| 2FDRL 180 1440 S18 | 18 | 72 | 144 | 220 | 18 | |
| 2FDRL 185 1480 S20 | 18.5 | 74 | 148 | 250 | 20 | |
| 2FDRL 190 1520 S20 | 19 | 76 | 152 | 250 | 20 | |
| 2FDRL 195 1560 S20 | 19.5 | 78 | 156 | 250 | 20 | |
| 2FDRL 200 1600 S20 | 20 | 80 | 160 | 250 | 20 | |

# 2FDRW

## 2 Flutes, Multi-Processing Flat Drills with Coolant hole

## 초경 2날/ 다기능 플랫 드릴 (내부 쿨런트)




- **HRc50이하, 프리하든강, 합금강, 주철 가공용 플랫 드릴**
- 더블 마진 옆날과 절삭유 홀을 적용하여, 다양한 경사면과 곡면 드릴가공에 빠른 가공 속도를 실현합니다.
- 24~30도 헬릭스를 채택하여 칩배출 성능이 매우 우수합니다.
- 관통 드릴 작업시 버 발생을 최소화 합니다.
- HR 코팅으로 내열성과 내마모성이 우수, 긴 공구수명을 실현 하였습니다.

- **Flat drills for materials up to HRc50, pre-hardened steels, alloy steels, cast irons**
- With double margin of side flute and coolant hole, high speed drilling is available to a variety of inclined and curved surfaces.
- Chip emission is great and stable drilling is available with between 24 to 30 degree helix design.
- Minimize burrs during penetration drilling.
- Increased tool life by applying HR coating with great heat and wear resistance.


527P

단위 : mm

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| New 2FDRW 010 060 S03 | 1 | 4.5 | 6 | 40 | 3 | |
| New 2FDRW 011 061 S03 | 1.1 | 5 | 6.1 | 40 | 3 | |
| New 2FDRW 012 066 S03 | 1.2 | 5.4 | 6.6 | 40 | 3 | |
| New 2FDRW 013 072 S03 | 1.3 | 5.9 | 7.2 | 40 | 3 | |
| New 2FDRW 014 077 S03 | 1.4 | 6.3 | 7.7 | 40 | 3 | |
| New 2FDRW 015 081 S03 | 1.5 | 6.8 | 8.1 | 50 | 3 | |
| New 2FDRW 016 087 S03 | 1.6 | 7.2 | 8.7 | 50 | 3 | |
| New 2FDRW 017 092 S03 | 1.7 | 7.7 | 9.2 | 50 | 3 | |
| New 2FDRW 018 098 S03 | 1.8 | 8.1 | 9.8 | 50 | 3 | |
| New 2FDRW 019 103 S03 | 1.9 | 8.6 | 10.3 | 50 | 3 | |
| New 2FDRW 020 106 S04 | 2 | 9 | 10.6 | 50 | 4 | |
| New 2FDRW 021 112 S04 | 2.1 | 9.5 | 11.2 | 50 | 4 | |
| New 2FDRW 022 117 S04 | 2.2 | 10 | 11.7 | 50 | 4 | |
| New 2FDRW 023 122 S04 | 2.3 | 10.4 | 12.2 | 50 | 4 | |
| New 2FDRW 024 128 S04 | 2.4 | 10.8 | 12.8 | 50 | 4 | |
| New 2FDRW 025 130 S04 | 2.5 | 11.3 | 13 | 50 | 4 | |
| New 2FDRW 026 136 S04 | 2.6 | 11.7 | 13.6 | 50 | 4 | |
| New 2FDRW 027 141 S04 | 2.7 | 12.2 | 14.1 | 50 | 4 | |
| New 2FDRW 028 146 S04 | 2.8 | 12.6 | 14.6 | 50 | 4 | |
| New 2FDRW 029 151 S04 | 2.9 | 13.1 | 15.1 | 50 | 4 | |
| 2FDRW 030 165 S04 | 3 | 13.5 | 16.5 | 60 | 4 | |
| 2FDRW 031 170 S04 | 3.1 | 14 | 17 | 60 | 4 | |
| 2FDRW 032 174 S04 | 3.2 | 14.4 | 17.4 | 60 | 4 | |
| 2FDRW 033 179 S04 | 3.3 | 14.9 | 17.9 | 60 | 4 | |
| 2FDRW 034 183 S04 | 3.4 | 15.3 | 18.3 | 60 | 4 | |
| 2FDRW 035 188 S04 | 3.5 | 15.8 | 18.8 | 60 | 4 | |
| 2FDRW 036 192 S04 | 3.6 | 16.2 | 19.2 | 60 | 4 | |
| 2FDRW 037 197 S04 | 3.7 | 16.7 | 19.7 | 60 | 4 | |
| 2FDRW 038 201 S04 | 3.8 | 17.1 | 20.1 | 60 | 4 | |
| 2FDRW 039 206 S04 | 3.9 | 17.6 | 20.6 | 60 | 4 | |
| 2FDRW 040 210 S06 | 4 | 18 | 21 | 60 | 6 | |
| 2FDRW 041 215 S06 | 4.1 | 18.5 | 21.5 | 70 | 6 | |
| 2FDRW 042 219 S06 | 4.2 | 18.9 | 21.9 | 70 | 6 | |
| 2FDRW 043 224 S06 | 4.3 | 19.4 | 22.4 | 70 | 6 | |
| 2FDRW 044 228 S06 | 4.4 | 19.8 | 22.8 | 70 | 6 | |
| 2FDRW 045 233 S06 | 4.5 | 20.3 | 22.3 | 70 | 6 | |
| 2FDRW 046 237 S06 | 4.6 | 20.7 | 23.7 | 70 | 6 | |
| 2FDRW 047 242 S06 | 4.7 | 21.2 | 24.2 | 70 | 6 | |
| 2FDRW 048 246 S06 | 4.8 | 21.6 | 24.6 | 70 | 6 | |
| 2FDRW 049 251 S06 | 4.9 | 22.1 | 25.1 | 70 | 6 | |
| 2FDRW 050 255 S06 | 5 | 22.5 | 25.5 | 70 | 6 | |
| 2FDRW 051 260 S06 | 5.1 | 23 | 26 | 70 | 6 | |
| 2FDRW 052 264 S06 | 5.2 | 23.4 | 26.4 | 70 | 6 | |
| 2FDRW 053 269 S06 | 5.3 | 23.9 | 26.9 | 70 | 6 | |
| 2FDRW 054 273 S06 | 5.4 | 24.3 | 27.3 | 70 | 6 | |
| 2FDRW 055 278 S06 | 5.5 | 24.8 | 27.8 | 70 | 6 | |
| 2FDRW 056 282 S06 | 5.6 | 25.2 | 28.2 | 70 | 6 | |
| 2FDRW 057 287 S06 | 5.7 | 25.7 | 28.7 | 70 | 6 | |
| 2FDRW 058 291 S06 | 5.8 | 26.1 | 29.1 | 70 | 6 | |
| 2FDRW 059 296 S06 | 5.9 | 26.6 | 29.6 | 70 | 6 | |
| 2FDRW 060 300 S06 | 6 | 27 | 30 | 70 | 6 | |
| 2FDRW 061 305 S08 | 6.1 | 27.5 | 30.5 | 80 | 8 | |
| 2FDRW 062 309 S08 | 6.2 | 27.9 | 30.9 | 80 | 8 | |
| 2FDRW 063 314 S08 | 6.3 | 28.4 | 31.4 | 80 | 8 | |
| 2FDRW 064 318 S08 | 6.4 | 28.8 | 31.8 | 80 | 8 | |
| 2FDRW 065 323 S08 | 6.5 | 29.3 | 32.3 | 80 | 8 | |
| 2FDRW 066 327 S08 | 6.6 | 29.7 | 32.7 | 80 | 8 | |
| 2FDRW 067 332 S08 | 6.7 | 30.2 | 33.2 | 80 | 8 | |
| 2FDRW 068 336 S08 | 6.8 | 30.6 | 33.6 | 80 | 8 | |
| 2FDRW 069 341 S08 | 6.9 | 31.1 | 34.1 | 80 | 8 | |
| 2FDRW 070 345 S08 | 7 | 31.5 | 34.5 | 80 | 8 | |
| 2FDRW 071 350 S08 | 7.1 | 32 | 35 | 80 | 8 | |
| 2FDRW 072 354 S08 | 7.2 | 32.4 | 35.4 | 80 | 8 | |
| 2FDRW 073 359 S08 | 7.3 | 32.9 | 35.9 | 80 | 8 | |
| 2FDRW 074 363 S08 | 7.4 | 33.3 | 36.3 | 80 | 8 | |
| 2FDRW 075 368 S08 | 7.5 | 33.8 | 36.8 | 80 | 8 | |
| 2FDRW 076 372 S08 | 7.6 | 34.2 | 37.2 | 80 | 8 | |
| 2FDRW 077 377 S08 | 7.7 | 34.7 | 37.7 | 80 | 8 | |
| 2FDRW 078 381 S08 | 7.8 | 35.1 | 38.1 | 80 | 8 | |
| 2FDRW 079 386 S08 | 7.9 | 35.6 | 38.6 | 80 | 8 | |
| 2FDRW 080 390 S08 | 8 | 36 | 39 | 80 | 8 | |
| 2FDRW 081 395 S10 | 8.1 | 36.5 | 39.5 | 90 | 10 | |
| 2FDRW 082 399 S10 | 8.2 | 36.9 | 39.9 | 90 | 10 | |
| 2FDRW 083 404 S10 | 8.3 | 37.4 | 40.4 | 90 | 10 | |
| 2FDRW 084 408 S10 | 8.4 | 37.8 | 40.8 | 90 | 10 | |
| 2FDRW 085 413 S10 | 8.5 | 38.3 | 41.3 | 90 | 10 | |
| 2FDRW 086 417 S10 | 8.6 | 38.7 | 41.7 | 90 | 10 | |
| 2FDRW 087 422 S10 | 8.7 | 39.2 | 42.2 | 90 | 10 | |
| 2FDRW 088 426 S10 | 8.8 | 39.6 | 42.6 | 90 | 10 | |
| 2FDRW 089 431 S10 | 8.9 | 40.1 | 43.1 | 90 | 10 | |
| 2FDRW 090 435 S10 | 9 | 40.5 | 43.5 | 90 | 10 | |
| 2FDRW 091 440 S10 | 9.1 | 41 | 44 | 90 | 10 | |
| 2FDRW 092 444 S10 | 9.2 | 41.4 | 44.4 | 90 | 10 | |
| 2FDRW 093 449 S10 | 9.3 | 41.9 | 44.9 | 90 | 10 | |
| 2FDRW 094 453 S10 | 9.4 | 42.3 | 45.3 | 90 | 10 | |
| 2FDRW 095 458 S10 | 9.5 | 42.8 | 45.8 | 90 | 10 | |
| 2FDRW 096 462 S10 | 9.6 | 43.2 | 46.2 | 90 | 10 | |
| 2FDRW 097 467 S10 | 9.7 | 43.7 | 46.7 | 90 | 10 | |
| 2FDRW 098 471 S10 | 9.8 | 44.1 | 47.1 | 90 | 10 | |
| 2FDRW 099 476 S10 | 9.9 | 44.6 | 47.6 | 90 | 10 | |
| 2FDRW 100 480 S10 | 10 | 45 | 48 | 90 | 10 | |
| 2FDRW 101 485 S12 | 10.1 | 45.5 | 48.5 | 100 | 12 | |
| 2FDRW 102 489 S12 | 10.2 | 45.9 | 48.9 | 100 | 12 | |
| 2FDRW 103 494 S12 | 10.3 | 46.4 | 49.4 | 100 | 12 | |
| 2FDRW 104 498 S12 | 10.4 | 46.8 | 49.8 | 100 | 12 | |
| 2FDRW 105 503 S12 | 10.5 | 47.3 | 50.3 | 100 | 12 | |
| 2FDRW 106 507 S12 | 10.6 | 47.7 | 50.7 | 100 | 12 | |
| 2FDRW 107 512 S12 | 10.7 | 48.2 | 51.2 | 100 | 12 | |
| 2FDRW 108 516 S12 | 10.8 | 48.6 | 51.6 | 100 | 12 | |
| 2FDRW 109 521 S12 | 10.9 | 49.1 | 52.1 | 100 | 12 | |

단위 : mm

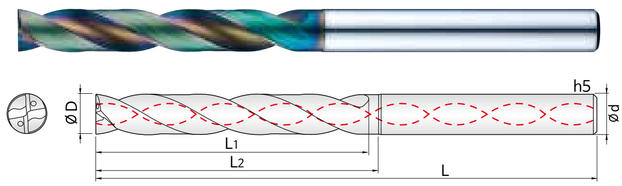
| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2FDRW 110 525 S12 | 11 | 49.5 | 52.5 | 100 | 12 | |
| 2FDRW 111 530 S12 | 11.1 | 50 | 53 | 110 | 12 | |
| 2FDRW 112 534 S12 | 11.2 | 50.4 | 53.4 | 110 | 12 | |
| 2FDRW 113 539 S12 | 11.3 | 50.9 | 53.9 | 110 | 12 | |
| 2FDRW 114 543 S12 | 11.4 | 51.3 | 54.3 | 110 | 12 | |
| 2FDRW 115 548 S12 | 11.5 | 51.8 | 54.8 | 110 | 12 | |
| 2FDRW 116 552 S12 | 11.6 | 52.2 | 55.2 | 110 | 12 | |
| 2FDRW 117 557 S12 | 11.7 | 52.7 | 55.7 | 110 | 12 | |
| 2FDRW 118 561 S12 | 11.8 | 53.1 | 56.1 | 110 | 12 | |
| 2FDRW 119 566 S12 | 11.9 | 53.6 | 56.6 | 110 | 12 | |
| 2FDRW 120 570 S12 | 12 | 54 | 57 | 110 | 12 | |
| 2FDRW 125 593 S14 | 12.5 | 56.3 | 59.3 | 120 | 14 | |
| 2FDRW 130 615 S14 | 13 | 58.5 | 61.5 | 120 | 14 | |
| 2FDRW 135 638 S14 | 13.5 | 60.8 | 63.8 | 120 | 14 | |
| 2FDRW 140 660 S14 | 14 | 63 | 66 | 120 | 14 | |
| 2FDRW 145 683 S16 | 14.5 | 65.3 | 68.3 | 130 | 16 | |
| 2FDRW 150 705 S16 | 15 | 67.5 | 70.5 | 130 | 16 | |
| 2FDRW 155 728 S16 | 15.5 | 69.8 | 72.8 | 130 | 16 | |
| 2FDRW 160 750 S16 | 16 | 72 | 75 | 130 | 16 | |

| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|

# 2FDRLW

## 2 Flutes, Long Length Multi-Processing Flat Drills with Coolant hole

## 초경 2날/긴 길이 다기능 플랫 드릴 (내부 쿨런트)




- **HRc50이하, 프리하든강, 합금강, 주철 가공용 플랫 드릴**
  - 더블 마진 옆날과 절삭유 홀을 적용하여, 다양한 경사면과 곡면 드릴가공에 빠른 가공 속도를 실현합니다.
  - 24~30도 헬릭스를 채택하여 칩배출 성능이 매우 우수합니다.
  - 관통 드릴 작업시 버 발생을 최소화 합니다.
  - HR 코팅으로 내열성과 내마모성이 우수, 긴 공구수명을 실현 하였습니다.

- **Flat drills for materials up to HRc50, pre-hardened steels, alloy steels, cast irons**
  - With double margin of side flute and coolant hole, high speed drilling is available to a variety of inclined and curved surfaces.
  - Chip emission is great and stable drilling is available with between 24 to 30 degree helix design.
  - Minimize burrs during penetration drilling.
  - Increased tool life by applying HR coating with great heat and wear resistance.

2 | WC 미립자 | HR Coating | h7 Diameter Tolerence | 24°~30° Helix Angle | CUTTING DATA 527P

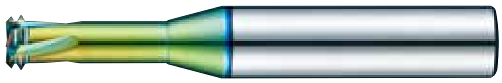
단위 : mm

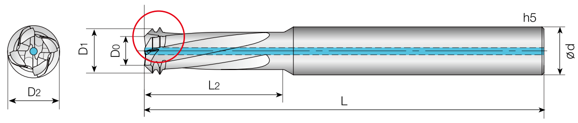
| Order Number | 날경 Diameter D | 홈길이 Flute Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d | 비고 |
|---|---|---|---|---|---|---|
| 2FDRLW 030 231 S04 | 3 | 20.1 | 23.1 | 70 | 4 | |
| 2FDRLW 031 238 S04 | 3.1 | 20.8 | 23.8 | 70 | 4 | |
| 2FDRLW 032 244 S04 | 3.2 | 21.4 | 24.4 | 70 | 4 | |
| 2FDRLW 033 251 S04 | 3.3 | 22.1 | 25.1 | 70 | 4 | |
| 2FDRLW 034 258 S04 | 3.4 | 22.8 | 25.8 | 70 | 4 | |
| 2FDRLW 035 265 S04 | 3.5 | 23.5 | 26.5 | 70 | 4 | |
| 2FDRLW 036 271 S04 | 3.6 | 24.1 | 27.1 | 70 | 4 | |
| 2FDRLW 037 278 S04 | 3.7 | 24.8 | 27.8 | 70 | 4 | |
| 2FDRLW 038 285 S04 | 3.8 | 25.5 | 28.5 | 70 | 4 | |
| 2FDRLW 039 291 S04 | 3.9 | 26.1 | 29.1 | 70 | 4 | |
| 2FDRLW 040 298 S06 | 4 | 26.8 | 29.8 | 70 | 6 | |
| 2FDRLW 041 305 S06 | 4.1 | 27.5 | 30.5 | 85 | 6 | |
| 2FDRLW 042 311 S06 | 4.2 | 28.1 | 31.1 | 85 | 6 | |
| 2FDRLW 043 318 S06 | 4.3 | 28.8 | 31.8 | 85 | 6 | |
| 2FDRLW 044 325 S06 | 4.4 | 29.5 | 32.5 | 85 | 6 | |
| 2FDRLW 045 332 S06 | 4.5 | 30.2 | 33.2 | 85 | 6 | |
| 2FDRLW 046 338 S06 | 4.6 | 30.8 | 33.8 | 85 | 6 | |
| 2FDRLW 047 345 S06 | 4.7 | 31.5 | 34.5 | 85 | 6 | |
| 2FDRLW 048 352 S06 | 4.8 | 32.2 | 35.2 | 85 | 6 | |
| 2FDRLW 049 358 S06 | 4.9 | 32.8 | 35.8 | 85 | 6 | |
| 2FDRLW 050 365 S06 | 5 | 33.5 | 36.5 | 85 | 6 | |
| 2FDRLW 051 372 S06 | 5.1 | 34.2 | 37.2 | 85 | 6 | |
| 2FDRLW 052 378 S06 | 5.2 | 34.8 | 37.8 | 85 | 6 | |
| 2FDRLW 053 385 S06 | 5.3 | 35.5 | 38.5 | 85 | 6 | |
| 2FDRLW 054 392 S06 | 5.4 | 36.2 | 39.2 | 85 | 6 | |
| 2FDRLW 055 399 S06 | 5.5 | 36.9 | 39.9 | 85 | 6 | |
| 2FDRLW 056 405 S06 | 5.6 | 37.5 | 40.5 | 85 | 6 | |
| 2FDRLW 057 412 S06 | 5.7 | 38.2 | 41.2 | 85 | 6 | |
| 2FDRLW 058 419 S06 | 5.8 | 38.9 | 41.9 | 85 | 6 | |
| 2FDRLW 059 425 S06 | 5.9 | 39.5 | 42.5 | 85 | 6 | |
| 2FDRLW 060 432 S06 | 6 | 40.2 | 43.2 | 85 | 6 | |
| 2FDRLW 061 439 S08 | 6.1 | 40.9 | 43.9 | 100 | 8 | |
| 2FDRLW 062 445 S08 | 6.2 | 41.5 | 44.5 | 100 | 8 | |
| 2FDRLW 063 452 S08 | 6.3 | 42.2 | 45.2 | 100 | 8 | |
| 2FDRLW 064 459 S08 | 6.4 | 42.9 | 45.9 | 100 | 8 | |
| 2FDRLW 065 466 S08 | 6.5 | 43.6 | 46.6 | 100 | 8 | |
| 2FDRLW 066 472 S08 | 6.6 | 44.2 | 47.2 | 100 | 8 | |
| 2FDRLW 067 479 S08 | 6.7 | 44.9 | 47.9 | 100 | 8 | |
| 2FDRLW 068 486 S08 | 6.8 | 45.6 | 48.6 | 100 | 8 | |
| 2FDRLW 069 492 S08 | 6.9 | 46.2 | 49.2 | 100 | 8 | |
| 2FDRLW 070 499 S08 | 7 | 46.9 | 49.9 | 100 | 8 | |
| 2FDRLW 071 506 S08 | 7.1 | 47.6 | 50.6 | 100 | 8 | |
| 2FDRLW 072 512 S08 | 7.2 | 48.2 | 51.2 | 100 | 8 | |
| 2FDRLW 073 519 S08 | 7.3 | 48.9 | 51.9 | 100 | 8 | |
| 2FDRLW 074 526 S08 | 7.4 | 49.6 | 52.6 | 100 | 8 | |
| 2FDRLW 075 533 S08 | 7.5 | 50.3 | 53.3 | 100 | 8 | |
| 2FDRLW 076 539 S08 | 7.6 | 50.9 | 53.9 | 100 | 8 | |
| 2FDRLW 077 546 S08 | 7.7 | 51.6 | 54.6 | 100 | 8 | |
| 2FDRLW 078 553 S08 | 7.8 | 52.3 | 55.3 | 100 | 8 | |
| 2FDRLW 079 559 S08 | 7.9 | 52.9 | 55.9 | 100 | 8 | |
| 2FDRLW 080 566 S08 | 8 | 53.6 | 56.6 | 100 | 8 | |
| 2FDRLW 081 573 S10 | 8.1 | 54.3 | 57.3 | 110 | 10 | |
| 2FDRLW 082 579 S10 | 8.2 | 54.9 | 57.9 | 110 | 10 | |
| 2FDRLW 083 586 S10 | 8.3 | 55.6 | 58.6 | 110 | 10 | |
| 2FDRLW 084 593 S10 | 8.4 | 56.3 | 59.3 | 110 | 10 | |
| 2FDRLW 085 600 S10 | 8.5 | 57 | 60 | 110 | 10 | |
| 2FDRLW 086 606 S10 | 8.6 | 57.6 | 60.6 | 110 | 10 | |
| 2FDRLW 087 613 S10 | 8.7 | 58.3 | 61.3 | 110 | 10 | |
| 2FDRLW 088 620 S10 | 8.8 | 59 | 62 | 110 | 10 | |
| 2FDRLW 089 626 S10 | 8.9 | 59.6 | 62.6 | 110 | 10 | |
| 2FDRLW 090 633 S10 | 9 | 60.3 | 63.3 | 110 | 10 | |
| 2FDRLW 091 640 S10 | 9.1 | 61 | 64 | 110 | 10 | |
| 2FDRLW 092 646 S10 | 9.2 | 61.6 | 64.6 | 110 | 10 | |
| 2FDRLW 093 653 S10 | 9.3 | 62.3 | 65.3 | 110 | 10 | |
| 2FDRLW 094 660 S10 | 9.4 | 63 | 66 | 110 | 10 | |
| 2FDRLW 095 667 S10 | 9.5 | 63.7 | 66.7 | 110 | 10 | |
| 2FDRLW 096 673 S10 | 9.6 | 64.3 | 67.3 | 110 | 10 | |
| 2FDRLW 097 680 S10 | 9.7 | 65 | 68 | 110 | 10 | |
| 2FDRLW 098 687 S10 | 9.8 | 65.7 | 68.7 | 110 | 10 | |
| 2FDRLW 099 693 S10 | 9.9 | 66.3 | 69.3 | 110 | 10 | |
| 2FDRLW 100 700 S10 | 10 | 67 | 70 | 110 | 10 | |
| 2FDRLW 101 707 S12 | 10.1 | 67.7 | 70.7 | 125 | 12 | |
| 2FDRLW 102 713 S12 | 10.2 | 68.3 | 71.3 | 125 | 12 | |
| 2FDRLW 103 720 S12 | 10.3 | 69 | 72 | 125 | 12 | |
| 2FDRLW 104 727 S12 | 10.4 | 69.7 | 72.7 | 125 | 12 | |
| 2FDRLW 105 734 S12 | 10.5 | 70.4 | 73.4 | 125 | 12 | |
| 2FDRLW 106 740 S12 | 10.6 | 71 | 74 | 125 | 12 | |
| 2FDRLW 107 747 S12 | 10.7 | 71.7 | 74.7 | 125 | 12 | |
| 2FDRLW 108 754 S12 | 10.8 | 72.4 | 75.4 | 125 | 12 | |
| 2FDRLW 109 760 S12 | 10.9 | 73 | 76 | 125 | 12 | |
| 2FDRLW 110 767 S12 | 11 | 73.7 | 76.7 | 125 | 12 | |
| 2FDRLW 111 774 S12 | 11.1 | 74.4 | 77.4 | 135 | 12 | |
| 2FDRLW 112 780 S12 | 11.2 | 75 | 78 | 135 | 12 | |
| 2FDRLW 113 787 S12 | 11.3 | 75.7 | 78.7 | 135 | 12 | |
| 2FDRLW 114 794 S12 | 11.4 | 76.4 | 79.4 | 135 | 12 | |
| 2FDRLW 115 801 S12 | 11.5 | 77.1 | 80.1 | 135 | 12 | |
| 2FDRLW 116 807 S12 | 11.6 | 77.7 | 80.7 | 135 | 12 | |
| 2FDRLW 117 814 S12 | 11.7 | 78.4 | 81.4 | 135 | 12 | |
| 2FDRLW 118 821 S12 | 11.8 | 79.1 | 82.1 | 135 | 12 | |
| 2FDRLW 119 827 S12 | 11.9 | 79.7 | 82.7 | 135 | 12 | |
| 2FDRLW 120 834 S12 | 12 | 80.4 | 83.4 | 135 | 12 | |
| 2FDRLW 125 868 S14 | 12.5 | 83.8 | 86.8 | 140 | 14 | |
| 2FDRLW 130 901 S14 | 13 | 87.1 | 90.1 | 140 | 14 | |
| 2FDRLW 135 935 S14 | 13.5 | 90.5 | 93.5 | 140 | 14 | |
| 2FDRLW 140 968 S14 | 14 | 93.8 | 96.8 | 140 | 14 | |
| 2FDRLW 145 1002 S16 | 14.5 | 97.2 | 100.2 | 160 | 16 | |
| 2FDRLW 150 1035 S16 | 15 | 100.5 | 103.5 | 160 | 16 | |
| 2FDRLW 155 1069 S16 | 15.5 | 103.9 | 106.9 | 160 | 16 | |
| 2FDRLW 160 1102 S16 | 16 | 107.2 | 110.2 | 160 | 16 | |

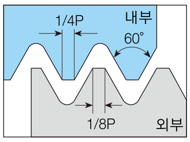
# 4ETM

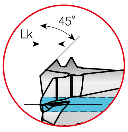
*4 Flutes Multi-functional Thread Mills for Multi Purpose (L Rotation)*

# 4날 범용 다기능 쓰레드밀(역회전)






- **HRc 40이하의 고경도강, 프리하든강, 합금강, 탄소강, 주철가공**
- 4ETM 공구는 하나의 공구로 드릴, 나사 및 챔퍼 작업을 모두 수행합니다.
- 탭 가공을 위한 기초 홀 작업은 더 이상 필요하지 않습니다.
- 다기능 공구로 막힌구멍, 관통구멍, 경사진 곡면에서도 사용이 가능합니다.
- 원활한 칩 배출을 위해 2D이상의 기초홀이 없는경우 내부 급유형을 추천 합니다.
- 헬리코일 나사 가공이 가능합니다.
- 공구의 주축회전은 역 방향(M4)이고, 진행방향은 정 방향으로 진행 됩니다.

- **Thread mills for Hardened steels (up to HRc 40), pre-hardened steels, alloy steels, carbon steels, cast irons**
- With one 4ETM tool, it's available for drilling, threading and chamfering all together.
- Pre-drilling for tapping is no longer needed.
- It can also be used on blocked holes, penetrating holes, and sloping curved surfaces as multi-function tool.
- If the diameter of hole is longer than 2D without pre-drilled hole, use the tool with coolant for the better chip emission.
- It can be used for heli coil threading.
- The main direction of tool rotation is left-handed (M4) and the direction of threading is right-handed.


528P

## ISO 측정항목

단위 Unit: mm

| Order Number | 나사 가능 규격 Thread | 피치규격 Pitch | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D0 | D1 | D2 | 유효장 Effective Length L2 | 길이 Lk | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **외부급유형 (Without coolant)** | | | | | | | | | | | |
| 4ETM 024 070 S06 M3 | M3 | 0.5 | 4 | 2 | 1.37 | 2.17 | 2.4 | 7 | 0.4 | 60 | 6 |
| 4ETM 024 085 S06 M3 | M3 | 0.5 | 4 | 2 | 1.37 | 2.17 | 2.4 | 8.5 | 0.4 | 60 | 6 |
| 4ETM 032 092 S06 M4 | M4 | 0.7 | 4 | 2 | 1.74 | 2.88 | 3.2 | 9.2 | 0.57 | 60 | 6 |
| 4ETM 032 112 S06 M4 | M4 | 0.7 | 4 | 2 | 1.74 | 2.88 | 3.2 | 11.2 | 0.57 | 60 | 6 |
| 4ETM 039 115 S06 M5 | M5 | 0.8 | 4 | 2 | 2.21 | 3.61 | 3.9 | 11.5 | 0.7 | 60 | 6 |
| 4ETM 039 144 S06 M5 | M5 | 0.8 | 4 | 2 | 2.21 | 3.61 | 3.9 | 14.4 | 0.7 | 60 | 6 |
| 4ETM 047 140 S06 M6 | M6 ~ M9 | 1 | 4 | 2 | 2.82 | 4.4 | 4.7 | 14 | 0.79 | 60 | 6 |
| 4ETM 047 170 S06 M6 | M6 ~ M9 | 1 | 4 | 2 | 2.82 | 4.4 | 4.7 | 17 | 0.79 | 60 | 6 |
| 4ETM 061 180 S08 M8 | M8 ~ M12 | 1.25 | 4 | 2 | 4 | 5.8 | 6.1 | 18 | 0.9 | 65 | 8 |
| 4ETM 061 220 S08 M8 | M8 ~ M12 | 1.25 | 4 | 2 | 4 | 5.8 | 6.1 | 22 | 0.9 | 65 | 8 |
| 4ETM 078 230 S08 M10 | M10 ~ M15 | 1.5 | 4 | 2 | 5.16 | 7.4 | 7.8 | 23 | 1.12 | 65 | 8 |
| 4ETM 078 280 S08 M10 | M10 ~ M15 | 1.5 | 4 | 2 | 5.16 | 7.4 | 7.8 | 28 | 1.12 | 65 | 8 |
| 4ETM 090 260 S10 M12 | M12 | 1.75 | 4 | 2 | 6.2 | 8.6 | 9 | 26 | 1.2 | 80 | 10 |
| 4ETM 090 330 S10 M12 | M12 | 1.75 | 4 | 2 | 6.2 | 8.6 | 9 | 33 | 1.2 | 80 | 10 |
| 4ETM 118 350 S12 M16 | M16 ~ M23 | 2 | 4 | 2 | 7.4 | 11.4 | 11.8 | 35 | 2 | 100 | 12 |
| 4ETM 118 430 S12 M16 | M16 ~ M23 | 2 | 4 | 2 | 7.4 | 11.4 | 11.8 | 43 | 2 | 100 | 12 |
| **내부급유형 (With coolant)** | | | | | | | | | | | |
| 4ETM 047 140 S06 M6C | M6 ~ M9 | 1 | 4 | 2 | 2.82 | 4.4 | 4.7 | 14 | 0.79 | 60 | 6 |
| 4ETM 047 170 S06 M6C | M6 ~ M9 | 1 | 4 | 2 | 2.82 | 4.4 | 4.7 | 17 | 0.79 | 60 | 6 |
| 4ETM 061 180 S08 M8C | M8 ~ M12 | 1.25 | 4 | 2 | 4 | 5.8 | 6.1 | 18 | 0.9 | 65 | 8 |
| 4ETM 061 220 S08 M8C | M8 ~ M12 | 1.25 | 4 | 2 | 4 | 5.8 | 6.1 | 22 | 0.9 | 65 | 8 |
| 4ETM 078 230 S08 M10C | M10 ~ M15 | 1.5 | 4 | 2 | 5.16 | 7.4 | 7.8 | 23 | 1.12 | 65 | 8 |
| 4ETM 078 280 S08 M10C | M10 ~ M15 | 1.5 | 4 | 2 | 5.16 | 7.4 | 7.8 | 28 | 1.12 | 65 | 8 |
| 4ETM 090 260 S10 M12C | M12 | 1.75 | 4 | 2 | 6.2 | 8.6 | 9 | 26 | 1.2 | 80 | 10 |
| 4ETM 090 330 S10 M12C | M12 | 1.75 | 4 | 2 | 6.2 | 8.6 | 9 | 33 | 1.2 | 80 | 10 |
| 4ETM 118 350 S12 M16C | M16 ~ M23 | 2 | 4 | 2 | 7.4 | 11.4 | 11.8 | 35 | 2 | 100 | 12 |
| 4ETM 118 430 S12 M16C | M16 ~ M23 | 2 | 4 | 2 | 7.4 | 11.4 | 11.8 | 43 | 2 | 100 | 12 |

## American UN

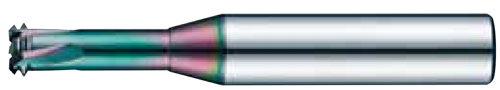
단위 Unit: mm

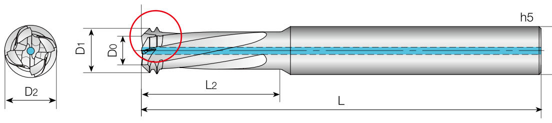
| Order Number | 나사 가능 규격 Thread UNC | UNF | 피치규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D0 | D1 | D2 | 유효장 Effective Length L2 | 길이 Lk | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **외부급유형 (Without coolant)** | | | | | | | | | | | | |
| **4ETM 021 072 S06** | No.4, No.5 | | 40 | 4 | 2 | 1 | 1.76 | 2.1 | 7.2 | 0.38 | 60 | 6 |
| **4ETM 021 088 S06** | No.4, No.5 | | 40 | 4 | 2 | 1 | 1.76 | 2.1 | 8.8 | 0.38 | 60 | 6 |
| **4ETM 026 086 S06** | No.6, No.8 | | 32 | 4 | 2 | 1.32 | 2.21 | 2.6 | 8.6 | 0.45 | 60 | 6 |
| **4ETM 026 105 S06** | No.6, No.8 | | 32 | 4 | 2 | 1.32 | 2.21 | 2.6 | 10.5 | 0.45 | 60 | 6 |
| **4ETM 030 100 S06** | No.8 | No.10 | 32 | 4 | 2 | 1.42 | 2.62 | 3 | 10 | 0.6 | 60 | 6 |
| **4ETM 030 122 S06** | No.8 | No.10 | 32 | 4 | 2 | 1.42 | 2.62 | 3 | 12.2 | 0.6 | 60 | 6 |
| **4ETM 035 114 S06** | No.10, No.12 | | 24 | 4 | 2 | 1.58 | 3.18 | 3.5 | 11.4 | 0.8 | 60 | 6 |
| **4ETM 048 145 S06** | 1/4″ | | 20 | 4 | 2 | 2.69 | 4.29 | 4.8 | 14.5 | 0.8 | 60 | 6 |
| **4ETM 048 180 S06** | 1/4″ | | 20 | 4 | 2 | 2.69 | 4.29 | 4.8 | 18 | 0.8 | 60 | 6 |
| **4ETM 050 144 S06** | | 1/4″ | 28 | 4 | 2 | 3.2 | 4.58 | 5 | 14.4 | 0.69 | 60 | 6 |
| **4ETM 050 178 S06** | | 1/4″ | 28 | 4 | 2 | 3.2 | 4.58 | 5 | 17.8 | 0.69 | 60 | 6 |
| **내부급유형 (With coolant)** | | | | | | | | | | | | |
| **4ETM 048 145 S08C** | 1/4″ | | 20 | 4 | 2 | 2.69 | 4.29 | 4.8 | 14.5 | 0.8 | 65 | 6 |
| **4ETM 048 180 S08C** | 1/4″ | | 20 | 4 | 2 | 2.69 | 4.29 | 4.8 | 18 | 0.8 | 65 | 6 |
| **4ETM 050 144 S08C** | | 1/4″ | 28 | 4 | 2 | 3.2 | 4.58 | 5 | 14.4 | 0.69 | 65 | 8 |
| **4ETM 050 178 S08C** | | 1/4″ | 28 | 4 | 2 | 3.2 | 4.58 | 5 | 17.8 | 0.69 | 65 | 8 |
| **4ETM 065 176 S08C** | | 5/16″, 3/8″ | 24 | 4 | 2 | 4.34 | 6.02 | 6.5 | 17.6 | 0.85 | 65 | 8 |
| **4ETM 065 218 S08C** | | 5/16″, 3/8″ | 24 | 4 | 2 | 4.34 | 6.02 | 6.5 | 21.8 | 0.85 | 65 | 8 |
| **4ETM 067 260 S08C** | 3/8″ | | 16 | 4 | 2 | 3.98 | 6.18 | 6.7 | 26 | 1.1 | 65 | 8 |

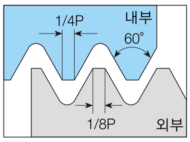
# 4ETMA

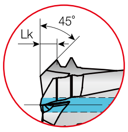
4 Flutes Multi-functional Thread Mills for Aluminum (L Rotation)

## 4날 알루미늄 전용 다기능 쓰레드밀 (역회전)






- **알루미늄, 알루미늄 합금 등 비철 비금속 가공**
- 4ETMA 공구는 하나의 공구로 드릴, 나사 및 챔퍼 작업을 모두 수행합니다.
- 탭 가공을 위한 기초 홀 작업은 더 이상 필요하지 않습니다.
- 다기능 공구로 막힌구멍, 관통구멍, 경사진 곡면에서도 사용이 가능합니다.
- 원활한 칩 배출을 위해 2D이상의 기초홀이 없는경우 내부 급유형을 추천 합니다.
- 헬리코일 나사 가공이 가능합니다.
- 공구의 주축회전은 역 방향(M4)이고, 진행방향은 정 방향으로 진행 됩니다.

- **Thread Mills for Aluminum, Aluminum alloys, non-ferrous and non-metalic materials**
- With one 4ETM tool, it's available for drilling, threading and chamfering all together.
- Pre-drilling for tapping is no longer needed.
- It can also be used on blocked holes, penetrating holes, and sloping curved surfaces as multi-function tool.
- If the diameter of hole is longer than 2D without pre-drilled hole, use the tool with coolant for the better chip emission.
- It can be used for heli coil threading.
- The main direction of tool rotation is left-handed (M4) and the direction of threading is right-handed.


528P

### ISO 측정항목

단위 Unit: mm

| Order Number | 나사 가능 규격 Thread | 피치규격 Pitch | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D0 | D1 | D2 | 유효장 Effective Length L2 | 길이 Lk | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | | | | |
| 4ETMA 0105 033 S04 M014 | M1.4 | 0.3 | 4 | 2 | 0.61 | 0.95 | 1.05 | 3.3 | 0.17 | 45 | 4 |
| 4ETMA 0105 040 S04 M014 | M1.4 | 0.3 | 4 | 2 | 0.61 | 0.95 | 1.05 | 4 | 0.17 | 45 | 4 |
| 4ETMA 012 037 S04 M016 | M1.6~M1.8 | 0.35 | 4 | 2 | 0.65 | 1.04 | 1.2 | 3.7 | 0.195 | 45 | 4 |
| 4ETMA 012 045 S04 M016 | M1.6~M1.8 | 0.35 | 4 | 2 | 0.65 | 1.04 | 1.2 | 4.5 | 0.195 | 45 | 4 |
| 4ETMA 0155 045 S04 M2 | M2 | 0.4 | 4 | 2 | 0.94 | 1.4 | 1.55 | 4.5 | 0.23 | 45 | 4 |
| 4ETMA 0155 055 S04 M2 | M2 | 0.4 | 4 | 2 | 0.94 | 1.4 | 1.55 | 5.5 | 0.23 | 45 | 4 |
| 4ETMA 020 055 S04 M025 | M2.5~M2.6 | 0.45 | 4 | 2 | 1.16 | 1.85 | 2 | 5.5 | 0.345 | 45 | 4 |
| 4ETMA 020 0675 S04 M025 | M2.5~M2.6 | 0.45 | 4 | 2 | 1.16 | 1.85 | 2 | 6.75 | 0.345 | 45 | 4 |
| 4ETMA 024 070 S06 M3 | M3 | 0.5 | 4 | 2 | 1.37 | 2.17 | 2.4 | 7 | 0.4 | 60 | 6 |
| 4ETMA 024 085 S06 M3 | M3 | 0.5 | 4 | 2 | 1.37 | 2.17 | 2.4 | 8.5 | 0.4 | 60 | 6 |
| 4ETMA 032 092 S06 M4 | M4 | 0.7 | 4 | 2 | 1.74 | 2.88 | 3.2 | 9.2 | 0.57 | 60 | 6 |
| 4ETMA 032 112 S06 M4 | M4 | 0.7 | 4 | 2 | 1.74 | 2.88 | 3.2 | 11.2 | 0.57 | 60 | 6 |
| 4ETMA 039 115 S06 M5 | M5 | 0.8 | 4 | 2 | 2.21 | 3.61 | 3.9 | 11.5 | 0.7 | 60 | 6 |
| 4ETMA 039 144 S06 M5 | M5 | 0.8 | 4 | 2 | 2.21 | 3.61 | 3.9 | 14.4 | 0.7 | 60 | 6 |
| 4ETMA 047 140 S06 M6 | M6~M9 | 1 | 4 | 2 | 2.82 | 4.4 | 4.7 | 14 | 0.79 | 60 | 6 |
| 4ETMA 047 170 S06 M6 | M6~M9 | 1 | 4 | 2 | 2.82 | 4.4 | 4.7 | 17 | 0.79 | 60 | 6 |
| 4ETMA 061 180 S08 M8 | M8~M12 | 1.25 | 4 | 2 | 4 | 5.8 | 6.1 | 18 | 0.9 | 65 | 8 |
| 4ETMA 061 220 S08 M8 | M8~M12 | 1.25 | 4 | 2 | 4 | 5.8 | 6.1 | 22 | 0.9 | 65 | 8 |
| 4ETMA 078 230 S08 M10 | M10~M15 | 1.5 | 4 | 2 | 5.16 | 7.4 | 7.8 | 23 | 1.12 | 65 | 8 |
| 4ETMA 078 280 S08 M10 | M10~M15 | 1.5 | 4 | 2 | 5.16 | 7.4 | 7.8 | 28 | 1.12 | 65 | 8 |
| 4ETMA 090 260 S10 M12 | M12 | 1.75 | 4 | 2 | 6.2 | 8.6 | 9 | 26 | 1.2 | 80 | 10 |
| 4ETMA 090 330 S10 M12 | M12 | 1.75 | 4 | 2 | 6.2 | 8.6 | 9 | 33 | 1.2 | 80 | 10 |
| 4ETMA 118 350 S12 M16 | M16~M23 | 2 | 4 | 2 | 7.4 | 11.4 | 11.8 | 35 | 2 | 100 | 12 |
| 4ETMA 118 430 S12 M16 | M16~M23 | 2 | 4 | 2 | 7.4 | 11.4 | 11.8 | 43 | 2 | 100 | 12 |
| **내부 급유형 (With coolant)** | | | | | | | | | | | |
| 4ETMA 047 140 S06 M6C | M6~M9 | 1 | 4 | 2 | 2.82 | 4.4 | 4.7 | 14 | 0.79 | 60 | 6 |
| 4ETMA 047 170 S06 M6C | M6~M9 | 1 | 4 | 2 | 2.82 | 4.4 | 4.7 | 17 | 0.79 | 60 | 6 |
| 4ETMA 061 180 S08 M8C | M8~M12 | 1.25 | 4 | 2 | 4 | 5.8 | 6.1 | 18 | 0.9 | 65 | 8 |
| 4ETMA 061 220 S08 M8C | M8~M12 | 1.25 | 4 | 2 | 4 | 5.8 | 6.1 | 22 | 0.9 | 65 | 8 |
| 4ETMA 078 230 S08 M10C | M10~M15 | 1.5 | 4 | 2 | 5.16 | 7.4 | 7.8 | 23 | 1.12 | 65 | 8 |
| 4ETMA 078 280 S08 M10C | M10~M15 | 1.5 | 4 | 2 | 5.16 | 7.4 | 7.8 | 28 | 1.12 | 65 | 8 |
| 4ETMA 090 260 S10 M12C | M12 | 1.75 | 4 | 2 | 6.2 | 8.6 | 9 | 26 | 1.2 | 80 | 10 |
| 4ETMA 090 330 S10 M12C | M12 | 1.75 | 4 | 2 | 6.2 | 8.6 | 9 | 33 | 1.2 | 80 | 10 |
| 4ETMA 118 350 S12 M16C | M16~M23 | 2 | 4 | 2 | 7.4 | 11.4 | 11.8 | 35 | 2 | 100 | 12 |
| 4ETMA 118 430 S12 M16C | M16~M23 | 2 | 4 | 2 | 7.4 | 11.4 | 11.8 | 43 | 2 | 100 | 12 |

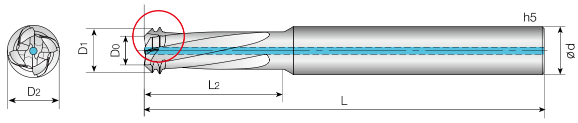
## American UN

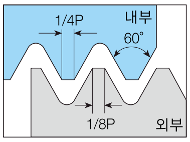
단위 Unit: mm

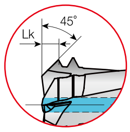
| Order Number | 나사 가능 규격 Thread UNC | UNF | 피치규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D0 | D1 | D2 | 유효장 Effective Length L2 | 길이 Lk | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **외부급유형 (Without coolant)** | | | | | | | | | | | | |
| **4ETMA 021 072 S06** | No.4, No.5 | | 40 | 4 | 2 | 1 | 1.76 | 2.1 | 7.2 | 0.38 | 60 | 6 |
| **4ETMA 021 088 S06** | No.4, No.5 | | 40 | 4 | 2 | 1 | 1.76 | 2.1 | 8.8 | 0.38 | 60 | 6 |
| **4ETMA 026 086 S06** | No.6, No.8 | | 32 | 4 | 2 | 1.32 | 2.21 | 2.6 | 8.6 | 0.45 | 60 | 6 |
| **4ETMA 026 105 S06** | No.6, No.8 | | 32 | 4 | 2 | 1.32 | 2.21 | 2.6 | 10.5 | 0.45 | 60 | 6 |
| **4ETMA 030 100 S06** | No.8 | No.10 | 32 | 4 | 2 | 1.42 | 2.62 | 3 | 10 | 0.6 | 60 | 6 |
| **4ETMA 030 122 S06** | No.8 | No.10 | 32 | 4 | 2 | 1.42 | 2.62 | 3 | 12.2 | 0.6 | 60 | 6 |
| **4ETMA 035 114 S06** | No.10, No.12 | | 24 | 4 | 2 | 1.58 | 3.18 | 3.5 | 11.4 | 0.8 | 60 | 6 |
| **4ETMA 048 145 S06** | 1/4" | | 20 | 4 | 2 | 2.69 | 4.29 | 4.8 | 14.5 | 0.8 | 60 | 6 |
| **4ETMA 048 180 S06** | 1/4" | | 20 | 4 | 2 | 2.69 | 4.29 | 4.8 | 18 | 0.8 | 60 | 6 |
| **4ETMA 050 144 S06** | | 1/4" | 28 | 4 | 2 | 3.2 | 4.58 | 5 | 14.4 | 0.69 | 60 | 6 |
| **4ETMA 050 178 S06** | | 1/4" | 28 | 4 | 2 | 3.2 | 4.58 | 5 | 17.8 | 0.69 | 60 | 6 |
| **내부급유형 (With coolant)** | | | | | | | | | | | | |
| **4ETMA 048 145 S08C** | 1/4″ | | 20 | 4 | 2 | 2.69 | 4.29 | 4.8 | 14.5 | 0.8 | 65 | 6 |
| **4ETMA 048 180 S08C** | 1/4″ | | 20 | 4 | 2 | 2.69 | 4.29 | 4.8 | 18 | 0.8 | 65 | 6 |
| **4ETMA 050 144 S08C** | | 1/4″ | 28 | 4 | 2 | 3.2 | 4.58 | 5 | 14.4 | 0.69 | 65 | 8 |
| **4ETMA 050 178 S08C** | | 1/4″ | 28 | 4 | 2 | 3.2 | 4.58 | 5 | 17.8 | 0.69 | 65 | 8 |
| **4ETMA 065 176 S08C** | | 5/16″, 3/8″ | 24 | 4 | 2 | 4.34 | 6.02 | 6.5 | 17.6 | 0.85 | 65 | 8 |
| **4ETMA 065 218 S08C** | | 5/16″, 3/8″ | 24 | 4 | 2 | 4.34 | 6.02 | 6.5 | 21.8 | 0.85 | 65 | 8 |
| **4ETMA 067 260 S08C** | 3/8″ | | 16 | 4 | 2 | 3.98 | 6.18 | 6.7 | 26 | 1.1 | 65 | 8 |

# 4 Flutes Multi-functional Thread Mills for Stainless Steels (L Rotation)

# 4날 SUS 가공용 다기능 쓰레드밀(역회전)




## SUS, 티타늄 합금 가공

- 4ETMS 공구는 하나의 공구로 드릴, 나사 및 챔퍼 작업을 모두 수행합니다.
- 탭 가공을 위한 기초 홀 작업은 더 이상 필요하지 않습니다.
- 다기능 공구로 막힌구멍, 관통구멍, 경사진 곡면에서도 사용이 가능합니다.
- 원활한 칩 배출을 위해 2D이상의 기초홀이 없는경우 내부 급유형을 추천 합니다.
- 헬리코일 나사 가공이 가능합니다.
- 공구의 주축회전은 역 방향(M4)이고, 진행방향은 정 방향으로 진행 됩니다.

## Thread Mills for Stainless and Titanium alloys

- With one 4ETM tool, it's available for drilling, threading and chamfering all together.
- Pre-drilling for tapping is no longer needed.
- It can also be used on blocked holes, penetrating holes, and sloping curved surfaces as multi-function tool.
- If the diameter of hole is longer than 2D without pre-drilled hole, use the tool with coolant for the better chip emission.
- It can be used for heli coil threading.
- The main direction of tool rotation is left-handed (M4) and the direction of threading is right-handed.


528P

## ISO 측정항목

단위 Unit: mm

외부 급유형 (Without coolant)

| Order Number | 나사 가능 규격<br>Thread | 피치규격<br>Pitch | 날수<br>Flutes<br>Z | 산수<br>Teeth<br>Zt | 날경<br>Diameter<br>D0 | D1 | D2 | 유효장<br>Effective Length<br>L2 | 길이<br>Lk | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4ETMS 024 070 S06 M3 | M3 | 0.5 | 4 | 2 | 1.37 | 2.17 | 2.4 | 7 | 0.4 | 60 | 6 |
| 4ETMS 024 085 S06 M3 | M3 | 0.5 | 4 | 2 | 1.37 | 2.17 | 2.4 | 8.5 | 0.4 | 60 | 6 |
| 4ETMS 032 092 S06 M4 | M4 | 0.7 | 4 | 2 | 1.74 | 2.88 | 3.2 | 9.2 | 0.57 | 60 | 6 |
| 4ETMS 032 112 S06 M4 | M4 | 0.7 | 4 | 2 | 1.74 | 2.88 | 3.2 | 11.2 | 0.57 | 60 | 6 |
| 4ETMS 039 115 S06 M5 | M5 | 0.8 | 4 | 2 | 2.21 | 3.61 | 3.9 | 11.5 | 0.7 | 60 | 6 |
| 4ETMS 039 144 S06 M5 | M5 | 0.8 | 4 | 2 | 2.21 | 3.61 | 3.9 | 14.4 | 0.7 | 60 | 6 |
| 4ETMS 047 140 S06 M6 | M6 ~ M9 | 1 | 4 | 2 | 2.82 | 4.4 | 4.7 | 14 | 0.79 | 60 | 6 |
| 4ETMS 047 170 S06 M6 | M6 ~ M9 | 1 | 4 | 2 | 2.82 | 4.4 | 4.7 | 17 | 0.79 | 60 | 6 |
| 4ETMS 061 180 S08 M8 | M8 ~ M12 | 1.25 | 4 | 2 | 4 | 5.8 | 6.1 | 18 | 0.9 | 65 | 8 |
| 4ETMS 061 220 S08 M8 | M8 ~ M12 | 1.25 | 4 | 2 | 4 | 5.8 | 6.1 | 22 | 0.9 | 65 | 8 |
| 4ETMS 078 230 S08 M10 | M10 ~ M15 | 1.5 | 4 | 2 | 5.16 | 7.4 | 7.8 | 23 | 1.12 | 65 | 8 |
| 4ETMS 078 280 S08 M10 | M10 ~ M15 | 1.5 | 4 | 2 | 5.16 | 7.4 | 7.8 | 28 | 1.12 | 65 | 8 |
| 4ETMS 090 260 S10 M12 | M12 | 1.75 | 4 | 2 | 6.2 | 8.6 | 9 | 26 | 1.2 | 80 | 10 |
| 4ETMS 090 330 S10 M12 | M12 | 1.75 | 4 | 2 | 6.2 | 8.6 | 9 | 33 | 1.2 | 80 | 10 |
| 4ETMS 118 350 S12 M16 | M16 ~ M23 | 2 | 4 | 2 | 7.4 | 11.4 | 11.8 | 35 | 2 | 100 | 12 |
| 4ETMS 118 430 S12 M16 | M16 ~ M23 | 2 | 4 | 2 | 7.4 | 11.4 | 11.8 | 43 | 2 | 100 | 12 |

내부 급유형 (With coolant)

| Order Number | Thread | Pitch | Z | Zt | D0 | D1 | D2 | L2 | Lk | L | d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4ETMS 047 140 S06 M6C | M6~M9 | 1 | 4 | 2 | 2.82 | 4.4 | 4.7 | 14 | 0.79 | 60 | 6 |
| 4ETMS 047 170 S06 M6C | M6~M9 | 1 | 4 | 2 | 2.82 | 4.4 | 4.7 | 17 | 0.79 | 60 | 6 |
| 4ETMS 061 180 S08 M8C | M8~M12 | 1.25 | 4 | 2 | 4 | 5.8 | 6.1 | 18 | 0.9 | 65 | 8 |
| 4ETMS 061 220 S08 M8C | M8~M12 | 1.25 | 4 | 2 | 4 | 5.8 | 6.1 | 22 | 0.9 | 65 | 8 |
| 4ETMS 078 230 S08 M10C | M10~M15 | 1.5 | 4 | 2 | 5.16 | 7.4 | 7.8 | 23 | 1.12 | 65 | 8 |
| 4ETMS 078 280 S08 M10C | M10~M15 | 1.5 | 4 | 2 | 5.16 | 7.4 | 7.8 | 28 | 1.12 | 65 | 8 |
| 4ETMS 090 260 S10 M12C | M12 | 1.75 | 4 | 2 | 6.2 | 8.6 | 9 | 26 | 1.2 | 80 | 10 |
| 4ETMS 090 330 S10 M12C | M12 | 1.75 | 4 | 2 | 6.2 | 8.6 | 9 | 33 | 1.2 | 80 | 10 |
| 4ETMS 118 350 S12 M16C | M16~M23 | 2 | 4 | 2 | 7.4 | 11.4 | 11.8 | 35 | 2 | 100 | 12 |
| 4ETMS 118 430 S12 M16C | M16~M23 | 2 | 4 | 2 | 7.4 | 11.4 | 11.8 | 43 | 2 | 100 | 12 |

## American UN

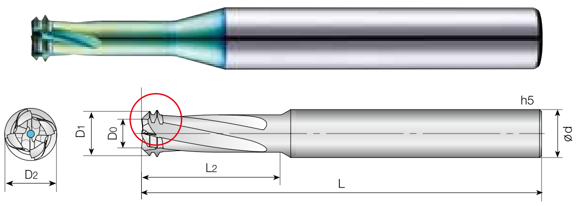
단위 Unit: mm

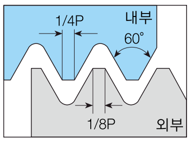
| Order Number | 나사 가능 규격 Thread | | 피치규격 Pitch (TPI) | 날수 Flutes | 산수 Teeth | 날경 Diameter | | | 유효장 Effective Length | 길이 | 전장 Overall Length | 섕크 Shank Dia |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | UNC | UNF | | Z | Zt | D0 | D1 | D2 | L2 | Lk | L | d |
| **외부급유형 (Without coolant)** | | | | | | | | | | | | |
| **4ETMS 021 072 S06** | No.4, No.5 | | 40 | 4 | 2 | 1 | 1.76 | 2.1 | 7.2 | 0.38 | 60 | 6 |
| **4ETMS 021 088 S06** | No.4, No.5 | | 40 | 4 | 2 | 1 | 1.76 | 2.1 | 8.8 | 0.38 | 60 | 6 |
| **4ETMS 026 086 S06** | No.6, No.8 | | 32 | 4 | 2 | 1.32 | 2.21 | 2.6 | 8.6 | 0.45 | 60 | 6 |
| **4ETMS 026 105 S06** | No.6, No.8 | | 32 | 4 | 2 | 1.32 | 2.21 | 2.6 | 10.5 | 0.45 | 60 | 6 |
| **4ETMS 030 100 S06** | No.8 | No.10 | 32 | 4 | 2 | 1.42 | 2.62 | 3 | 10 | 0.6 | 60 | 6 |
| **4ETMS 030 122 S06** | No.8 | No.10 | 32 | 4 | 2 | 1.42 | 2.62 | 3 | 12.2 | 0.6 | 60 | 6 |
| **4ETMS 035 114 S06** | No.10, No.12 | | 24 | 4 | 2 | 1.58 | 3.18 | 3.5 | 11.4 | 0.8 | 60 | 6 |
| **4ETMS 048 145 S06** | 1/4″ | | 20 | 4 | 2 | 2.69 | 4.29 | 4.8 | 14.5 | 0.8 | 60 | 6 |
| **4ETMS 048 180 S06** | 1/4″ | | 20 | 4 | 2 | 2.69 | 4.29 | 4.8 | 18 | 0.8 | 60 | 6 |
| **4ETMS 050 144 S06** | | 1/4″ | 28 | 4 | 2 | 3.2 | 4.58 | 5 | 14.4 | 0.69 | 60 | 6 |
| **4ETMS 050 178 S06** | | 1/4″ | 28 | 4 | 2 | 3.2 | 4.58 | 5 | 17.8 | 0.69 | 60 | 6 |
| **내부급유형 (With coolant)** | | | | | | | | | | | | |
| **4ETMS 048 145 S08C** | 1/4″ | | 20 | 4 | 2 | 2.69 | 4.29 | 4.8 | 14.5 | 0.8 | 65 | 6 |
| **4ETMS 048 180 S08C** | 1/4″ | | 20 | 4 | 2 | 2.69 | 4.29 | 4.8 | 18 | 0.8 | 65 | 6 |
| **4ETMS 050 144 S08C** | | 1/4″ | 28 | 4 | 2 | 3.2 | 4.58 | 5 | 14.4 | 0.69 | 65 | 8 |
| **4ETMS 050 178 S08C** | | 1/4″ | 28 | 4 | 2 | 3.2 | 4.58 | 5 | 17.8 | 0.69 | 65 | 8 |
| **4ETMS 065 176 S08C** | | 5/16″, 3/8″ | 24 | 4 | 2 | 4.34 | 6.02 | 6.5 | 17.6 | 0.85 | 65 | 8 |
| **4ETMS 065 218 S08C** | | 5/16″, 3/8″ | 24 | 4 | 2 | 4.34 | 6.02 | 6.5 | 21.8 | 0.85 | 65 | 8 |
| **4ETMS 067 260 S08C** | 3/8″ | | 16 | 4 | 2 | 3.98 | 6.18 | 6.7 | 26 | 1.1 | 65 | 8 |

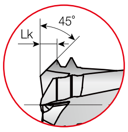
# 4ETMR

## Multi-functional Engraving Thread Mills for Multi Purpose (R Rotation)

## 범용 다기능 조각기용 쓰레드밀 (정회전)




- **HRc 40이하의 고경도강, 프리하든강, 합금강, 탄소강, 주철가공**
- 4ETMR 공구는 하나의 공구로 드릴,나사 및 챔퍼 작업 모두 수행합니다.
- 조각기용으로 공구의 주축회전과 진행방향 모두 정 방향(M3)으로 진행 됩니다.
- 탭 가공을 위한 기초 홀 작업은 더 이상 필요하지 않습니다.
- 다기능 공구로 막힌구멍, 관통구멍, 경사진 곡면에서도 사용이 가능합니다.
- 헬리코일 나사 가공이 가능합니다.

- **Thread mills for Hardened steels(up to HRc 40), pre-hardened steels, alloy steels, carbon steels, cast irons**
- With one 4ETMR tool, it's available for drilling, threading, and chamfering all together.
- For engraving purpose, the main direction of tool rotation and the direction of threading are right-handed (M3).
- Pre-drilling for tapping is no longer needed.
- It can also be used on blocked holes, penetrating holes, and sloping curved surfaces as multi-function tool.
- It can be used for heli coil threading.

4 | UWC 초미립자 | TISIN-S Coating | 15° Helix Angle | R Rotation | CUTTING DATA 528P

### ISO 측정항목

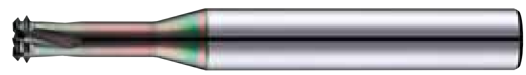
단위 Unit: mm

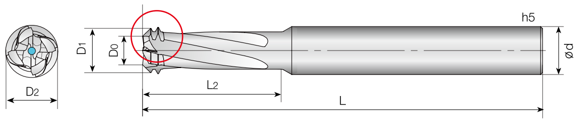
| Order Number | 나사 가능 규격 Thread | 피치규격 Pitch | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D0 | D1 | D2 | 유효장 Effective Length L2 | 길이 Lk | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 외부 급유형 (Without coolant) | | | | | | | | | | | |
| 4ETMR 024 070 S06 M3 | M3 | 0.5 | 4 | 2 | 1.37 | 2.17 | 2.4 | 7 | 0.4 | 60 | 6 |
| 4ETMR 032 092 S06 M4 | M4 | 0.7 | 4 | 2 | 1.74 | 2.88 | 3.2 | 9.2 | 0.57 | 60 | 6 |
| 4ETMR 039 115 S06 M5 | M5 | 0.8 | 4 | 2 | 2.21 | 3.61 | 3.9 | 11.5 | 0.7 | 60 | 6 |
| 4ETMR 047 140 S06 M6 | M6 ~ M9 | 1 | 4 | 2 | 2.82 | 4.4 | 4.7 | 14 | 0.79 | 60 | 6 |
| 4ETMR 061 180 S08 M8 | M8 ~ M12 | 1.25 | 4 | 2 | 4 | 5.8 | 6.1 | 18 | 0.9 | 65 | 8 |
| 4ETMR 078 230 S08 M10 | M10 ~ M15 | 1.5 | 4 | 2 | 5.16 | 7.4 | 7.8 | 23 | 1.12 | 65 | 8 |
| 4ETMR 090 260 S10 M12 | M12 | 1.75 | 4 | 2 | 6.2 | 8.6 | 9 | 26 | 1.2 | 80 | 10 |
| 4ETMR 118 350 S12 M16 | M16 ~ M23 | 2 | 4 | 2 | 7.4 | 11.4 | 11.8 | 35 | 2 | 100 | 12 |

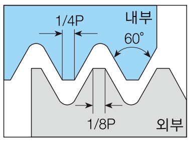
# 4ETMRA

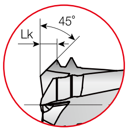
## Multi-functional Engraving Thread Mills for Aluminum (R Rotation)

## 알루미늄 전용 다기능 조각기용 쓰레드밀 (정회전)






- **알루미늄, 알루미늄 합금 등 비철 비금속 가공**
- 4ETMRA 공구는 하나의 공구로 드릴,나사 및 챔퍼 작업 모두 수행합니다.
- 조각기용으로 공구의 주축회전과 진행방향 모두 정 방향(M3)으로 진행 됩니다.
- 탭 가공을 위한 기초 홀 작업은 더 이상 필요하지 않습니다.
- 다기능 공구로 막힌구멍, 관통구멍, 경사진 곡면에서도 사용이 가능합니다.
- 헬리코일 나사 가공이 가능합니다.

- **Thread mills for Aluminum, Aluminum alloys, non-ferrous, and non-metallic materials**
- With one 4ETMRA tool, it's available for drilling, threading, and chamfering all together.
- For engraving purpose, the main direction of tool rotation and the direction of threading are right-handed (M3).
- Pre-drilling for tapping is no longer needed.
- It can also be used on blocked holes, penetrating holes, and sloping curved surfaces as multi-function tool.
- It can be used for heli coil threading.


528P

ISO 측정항목

단위 Unit : mm

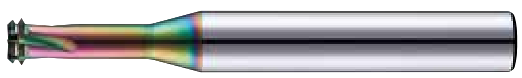
| Order Number | 나사 가능 규격 Thread | 피치규격 Pitch | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D0 | D1 | D2 | 유효장 Effective Length L2 | 길이 Lk | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 외부 급유형 (Without coolant) | | | | | | | | | | | |
| 4ETMRA 0105 033 S04 M014 | M1.4 | 0.3 | 4 | 2 | 0.61 | 0.95 | 1.05 | 3.3 | 0.17 | 45 | 4 |
| 4ETMRA 012 037 S04 M016 | M1.6~M1.8 | 0.35 | 4 | 2 | 0.65 | 1.04 | 1.2 | 3.7 | 0.195 | 45 | 4 |
| 4ETMRA 0155 045 S04 M2 | M2 | 0.4 | 4 | 2 | 0.94 | 1.4 | 1.55 | 4.5 | 0.23 | 45 | 4 |
| 4ETMRA 020 055 S04 M025 | M2.5~M2.6 | 0.45 | 4 | 2 | 1.16 | 1.85 | 2 | 5.5 | 0.345 | 45 | 4 |
| 4ETMRA 024 070 S06 M3 | M3 | 0.5 | 4 | 2 | 1.37 | 2.17 | 2.4 | 7 | 0.4 | 60 | 6 |
| 4ETMRA 032 092 S06 M4 | M4 | 0.7 | 4 | 2 | 1.74 | 2.88 | 3.2 | 9.2 | 0.57 | 60 | 6 |
| 4ETMRA 039 115 S06 M5 | M5 | 0.8 | 4 | 2 | 2.21 | 3.61 | 3.9 | 11.5 | 0.7 | 60 | 6 |
| 4ETMRA 047 140 S06 M6 | M6 ~ M9 | 1 | 4 | 2 | 2.82 | 4.4 | 4.7 | 14 | 0.79 | 60 | 6 |
| 4ETMRA 061 180 S08 M8 | M8 ~ M12 | 1.25 | 4 | 2 | 4 | 5.8 | 6.1 | 18 | 0.9 | 65 | 8 |
| 4ETMRA 078 230 S08 M10 | M10 ~ M15 | 1.5 | 4 | 2 | 5.16 | 7.4 | 7.8 | 23 | 1.12 | 65 | 8 |
| 4ETMRA 090 260 S10 M12 | M12 | 1.75 | 4 | 2 | 6.2 | 8.6 | 9 | 26 | 1.2 | 80 | 10 |
| 4ETMRA 118 350 S12 M16 | M16 ~ M23 | 2 | 4 | 2 | 7.4 | 11.4 | 11.8 | 35 | 2 | 100 | 12 |

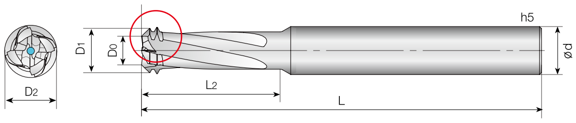
THREAD MILL

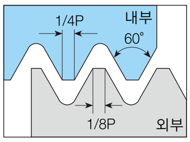
# 4ETMRS

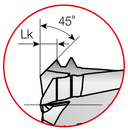
*Multi-functional Engraving/Router Thread Mills for SUS (R Rotation)*

## SUS용 다기능 조각기용 쓰레드밀 (정회전)






- **SUS, 티타늄합금 가공**
- 4ETMRS 공구는 하나의 공구로 드릴,나사 및 챔퍼 작업 모두 수행합니다.
- 조각기용으로 공구의 주축회전과 진행방향 모두 정 방향(M3)으로 진행 됩니다.
- 탭 가공을 위한 기초 홀 작업은 더 이상 필요하지 않습니다.
- 다기능 공구로 막힌구멍, 관통구멍, 경사진 곡면에서도 사용이 가능합니다.
- 헬리코일 나사 가공이 가능합니다.

- **Thread Mills for Stainless and Titanium alloys**
- With one 4ETMRS tool, it's available for drilling, threading, and chamfering all together.
- For engraving purpose, the main direction of tool rotation and the direction of threading are right-handed (M3).
- Pre-drilling for tapping is no longer needed.
- It can also be used on blocked holes, penetrating holes, and sloping curved surfaces as multi-function tool.
- It can be used for heli coil threading.


528P

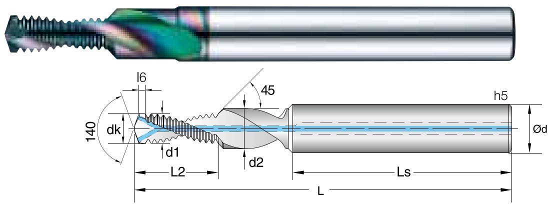
ISO 측정항목

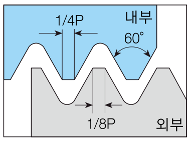
단위 Unit: mm

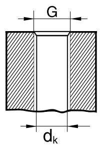
외부 급유형 (Without coolant)

| Order Number | 나사 가능 규격 Thread | 피치규격 Pitch | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D0 | D1 | D2 | 유효장 Effective Length L2 | 길이 Lk | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4ETMRS 024 070 S06 M3 | M3 | 0.5 | 4 | 2 | 1.37 | 2.17 | 2.4 | 7 | 0.4 | 60 | 6 |
| 4ETMRS 032 092 S06 M4 | M4 | 0.7 | 4 | 2 | 1.74 | 2.88 | 3.2 | 9.2 | 0.57 | 60 | 6 |
| 4ETMRS 039 115 S06 M5 | M5 | 0.8 | 4 | 2 | 2.21 | 3.61 | 3.9 | 11.5 | 0.7 | 60 | 6 |
| 4ETMRS 047 140 S06 M6 | M6 ~ M9 | 1 | 4 | 2 | 2.82 | 4.4 | 4.7 | 14 | 0.79 | 60 | 6 |
| 4ETMRS 061 180 S08 M8 | M8 ~ M12 | 1.25 | 4 | 2 | 4 | 5.8 | 6.1 | 18 | 0.9 | 65 | 8 |
| 4ETMRS 078 230 S08 M10 | M10 ~ M15 | 1.5 | 4 | 2 | 5.16 | 7.4 | 7.8 | 23 | 1.12 | 65 | 8 |
| 4ETMRS 090 260 S10 M12 | M12 | 1.75 | 4 | 2 | 6.2 | 8.6 | 9 | 26 | 1.2 | 80 | 10 |
| 4ETMRS 118 350 S12 M16 | M16 ~ M23 | 2 | 4 | 2 | 7.4 | 11.4 | 11.8 | 35 | 2 | 100 | 12 |

# 2날 비철금속 전용 다기능 쓰레드밀




- **알루미늄, 알루미늄 합금 등 비철 비금속 가공**
- 2DTM 공구는 하나의 공구로 드릴가공과 나사가공,챔퍼가공까지 모두 가능합니다.
- 툴 교체 없이 하나의 공구로 진행되어 가공시간을 단축 시킵니다.
- 나사부 이후로 챔퍼가공이 가능하게 구성되어, 유효장 이상 만큼의 깊이 가공 시 챔퍼량이 정해집니다.

- **Thread Mills for Aluminum, Aluminum alloys, non-ferrous and non-metalic materials**
- With one 2DTM tool, it's available for drilling, threading and chamfering all together.
- One tool operation method without changing tool, it enables to save machining time.
- Chamfering is possible after effective length, Chamfering size is set once machining longer than effective length.

528P

## ISO 측정항목

단위 Unit : mm

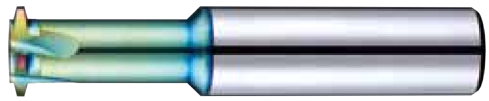
| Order Number 비코팅 Un coated | Order Number 코팅 Coated | 나사규격 Thread | 피치규격 Pitch | 드릴직경 Drill Dia dk | 외경 Cutter Dia d1 | 목부직경 Max. C'sink d2 | 유효장 Effective Length L2 | 생크길이 Shank Length Ls | 드릴길이 Drill Length l6 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | | | | |
| 2DTM 011 0276 M014 | 2DTMC 011 0276 M014 | M1.4 | 0.3 | 1.1 | 1.05 | 1.55 | 2.76 | 33 | 0.2 | 45 | 4 |
| 2DTM 011 0367 M014 | 2DTMC 011 0367 M014 | M1.4 | 0.3 | 1.1 | 1.05 | 1.55 | 3.67 | 33 | 0.2 | 45 | 4 |
| 2DTM 0125 032 M016 | 2DTMC 0125 032 M016 | M1.6 | 0.35 | 1.25 | 1.2 | 1.75 | 3.2 | 33 | 0.25 | 45 | 4 |
| 2DTM 0125 0425 M016 | 2DTMC 0125 0425 M016 | M1.6 | 0.35 | 1.25 | 1.2 | 1.75 | 4.25 | 33 | 0.25 | 45 | 4 |
| 2DTM 0145 0358 M018 | 2DTMC 0145 0358 M018 | M1.8 | 0.35 | 1.45 | 1.4 | 2 | 3.58 | 33 | 0.25 | 45 | 4 |
| 2DTM 0145 0463 M018 | 2DTMC 0145 0463 M018 | M1.8 | 0.35 | 1.45 | 1.4 | 2 | 4.63 | 33 | 0.25 | 45 | 4 |
| 2DTM 016 0448 M2 | 2DTMC 016 0448 M2 | M2 | 0.4 | 1.6 | 1.55 | 2.25 | 4.48 | 32 | 0.3 | 45 | 4 |
| 2DTM 016 0568 M2 | 2DTMC 016 0568 M2 | M2 | 0.4 | 1.6 | 1.55 | 2.25 | 5.68 | 32 | 0.3 | 45 | 4 |
| 2DTM 0205 0554 M025 | 2DTMC 0205 0554 M025 | M2.5 | 0.45 | 2.05 | 2 | 2.85 | 5.54 | 30.5 | 0.35 | 45 | 4 |
| 2DTM 0205 0689 M025 | 2DTMC 0205 0689 M025 | M2.5 | 0.45 | 2.05 | 2 | 2.85 | 6.89 | 30.5 | 0.35 | 45 | 4 |
| 2DTM 0215 0554 M026 | 2DTMC 0215 0554 M026 | M2.6 | 0.45 | 2.15 | 2.1 | 2.95 | 5.54 | 30.5 | 0.35 | 45 | 4 |
| 2DTM 0215 0691 M026 | 2DTMC 0215 0691 M026 | M2.6 | 0.45 | 2.15 | 2.1 | 2.95 | 6.91 | 30.5 | 0.35 | 45 | 4 |
| 2DTM 025 067 S06 M3 | 2DTMC 025 067 S06 M3 | M3 | 0.5 | 2.5 | 2.45 | 3.4 | 6.7 | 36 | 0.4 | 50 | 6 |
| 2DTM 025 082 S06 M3 | 2DTMC 025 082 S06 M3 | M3 | 0.5 | 2.5 | 2.45 | 3.4 | 8.2 | 36 | 0.4 | 50 | 6 |
| 2DTM 033 087 S06 M4 | 2DTMC 033 087 S06 M4 | M4 | 0.7 | 3.3 | 3.25 | 4.5 | 8.7 | 36 | 0.6 | 50 | 6 |
| 2DTM 033 108 S06 M4 | 2DTMC 033 108 S06 M4 | M4 | 0.7 | 3.3 | 3.25 | 4.5 | 10.8 | 36 | 0.6 | 50 | 6 |
| 2DTM 042 109 S06 M5 | 2DTMC 042 109 S06 M5 | M5 | 0.8 | 4.2 | 4 | 5.5 | 10.9 | 36 | 0.7 | 55 | 6 |
| 2DTM 042 133 S06 M5 | 2DTMC 042 133 S06 M5 | M5 | 0.8 | 4.2 | 4 | 5.5 | 13.3 | 36 | 0.7 | 55 | 6 |
| 2DTM 050 137 S08 M6 | 2DTMC 050 137 S08 M6 | M6 | 1 | 5 | 4.75 | 6.6 | 13.7 | 36 | 1 | 60 | 8 |
| 2DTM 050 167 S08 M6 | 2DTMC 050 167 S08 M6 | M6 | 1 | 5 | 4.75 | 6.6 | 16.7 | 36 | 1 | 60 | 8 |
| 2DTM 068 184 S10 M8 | 2DTMC 068 184 S10 M8 | M8 | 1.25 | 6.8 | 6.35 | 9 | 18.4 | 40 | 1.2 | 75 | 10 |
| 2DTM 068 221 S10 M8 | 2DTMC 068 221 S10 M8 | M8 | 1.25 | 6.8 | 6.35 | 9 | 22.1 | 40 | 1.2 | 75 | 10 |
| 2DTM 085 222 S12 M10 | 2DTMC 085 222 S12 M10 | M10 | 1.5 | 8.5 | 7.95 | 11 | 22.2 | 45 | 1.5 | 80 | 12 |
| 2DTM 085 267 S12 M10 | 2DTMC 085 267 S12 M10 | M10 | 1.5 | 8.5 | 7.95 | 11 | 26.7 | 45 | 1.5 | 80 | 12 |
| 2DTM 102 255 S14 M12 | 2DTMC 102 255 S14 M12 | M12 | 1.75 | 10.2 | 9.95 | 13.5 | 25.5 | 45 | 1.5 | 90 | 14 |
| 2DTM 102 308 S14 M12 | 2DTMC 102 308 S14 M12 | M12 | 1.75 | 10.2 | 9.95 | 13.5 | 30.8 | 45 | 1.5 | 90 | 14 |
| 2DTM 120 312 S16 M14 | 2DTMC 120 312 S16 M14 | M14 | 2 | 12 | 11.2 | 15.5 | 31.2 | 48 | 1.5 | 100 | 16 |
| 2DTM 120 392 S16 M14 | 2DTMC 120 392 S16 M14 | M14 | 2 | 12 | 11.2 | 15.5 | 39.2 | 48 | 1.5 | 100 | 16 |
| 2DTM 140 355 S18 M16 | 2DTMC 140 355 S18 M16 | M16 | 2 | 14 | 13.2 | 17.5 | 35.5 | 48 | 1.5 | 100 | 18 |
| 2DTM 140 435 S18 M16 | 2DTMC 140 435 S18 M16 | M16 | 2 | 14 | 13.2 | 17.5 | 43.5 | 55.7 | 1.5 | 115 | 18 |
| **내부 급유형 (With coolant)** | | | | | | | | | | | |
| 2DTM 042 109 S06 M5C | 2DTMC 042 109 S06 M5C | M5 | 0.8 | 4.2 | 4 | 5.5 | 10.9 | 36 | 0.7 | 55 | 6 |
| 2DTM 042 133 S06 M5C | 2DTMC 042 133 S06 M5C | M5 | 0.8 | 4.2 | 4 | 5.5 | 13.3 | 36 | 0.7 | 55 | 6 |
| 2DTM 050 137 S08 M6C | 2DTMC 050 137 S08 M6C | M6 | 1 | 5 | 4.75 | 6.6 | 13.7 | 36 | 1 | 60 | 8 |
| 2DTM 050 167 S08 M6C | 2DTMC 050 167 S08 M6C | M6 | 1 | 5 | 4.75 | 6.6 | 16.7 | 36 | 1 | 60 | 8 |
| 2DTM 068 184 S10 M8C | 2DTMC 068 184 S10 M8C | M8 | 1.25 | 6.8 | 6.35 | 9 | 18.4 | 40 | 1.2 | 75 | 10 |
| 2DTM 068 221 S10 M8C | 2DTMC 068 221 S10 M8C | M8 | 1.25 | 6.8 | 6.35 | 9 | 22.1 | 40 | 1.2 | 75 | 10 |
| 2DTM 085 222 S12 M10C | 2DTMC 085 222 S12 M10C | M10 | 1.5 | 8.5 | 7.95 | 11 | 22.2 | 45 | 1.5 | 80 | 12 |
| 2DTM 085 267 S12 M10C | 2DTMC 085 267 S12 M10C | M10 | 1.5 | 8.5 | 7.95 | 11 | 26.7 | 45 | 1.5 | 80 | 12 |
| 2DTM 102 255 S14 M12C | 2DTMC 102 255 S14 M12C | M12 | 1.75 | 10.2 | 9.95 | 13.5 | 25.5 | 45 | 1.5 | 90 | 14 |
| 2DTM 102 308 S14 M12C | 2DTMC 102 308 S14 M12C | M12 | 1.75 | 10.2 | 9.95 | 13.5 | 30.8 | 45 | 1.5 | 90 | 14 |
| 2DTM 120 312 S16 M14C | 2DTMC 120 312 S16 M14C | M14 | 2 | 12 | 11.2 | 15.5 | 31.2 | 48 | 1.5 | 100 | 16 |
| 2DTM 120 392 S16 M14C | 2DTMC 120 392 S16 M14C | M14 | 2 | 12 | 11.2 | 15.5 | 39.2 | 48 | 1.5 | 100 | 16 |
| 2DTM 140 355 S18 M16C | 2DTMC 140 355 S18 M16C | M16 | 2 | 14 | 13.2 | 17.5 | 35.5 | 48 | 1.5 | 100 | 18 |
| 2DTM 140 435 S18 M16C | 2DTMC 140 435 S18 M16C | M16 | 2 | 14 | 13.2 | 17.5 | 43.5 | 55.7 | 1.5 | 115 | 18 |

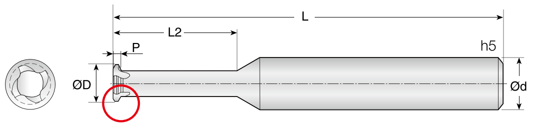
# 4TRTM

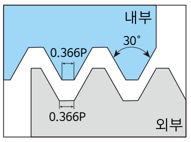
*4 Flutes TR Thread Mills*

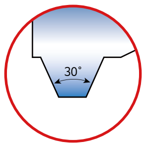
## 4날 TR나사 쓰레드밀

**New**





나사산 확대

- **HRc 42이하의 열처리강, 프리하든강, 합금강, 탄소강, 주철가공**
- 동력 전달용 미터계 30˚ 사다리꼴 나사 가공 전용
- 소구경 크기의 깊은홀의 나사가공에 사용할 수 있습니다.
- 프로파일에 따라 나사산 깊이는 최대가 될 수 있습니다.
- 하나의 나사산으로 구성되어 다양한 PITCH의 나사 가공이 가능합니다.
- 다양한 피삭재의 하나의 나사산으로 여러번의 절삭이 가능하여 안정적입니다.

- **Thread mills for Hardened steels (up to HRc 42), pre-hardened steels, alloy steels, carbon steels, cast irons**
- For power transmission meter 30˚ trapezoidal thread milling.
- It can be used for threading deep holes the size of a small diameter.
- Depending on the profile, thread depth can be maximum
- Composed of a single thread, it performs various pitch thread milling.
- Available for multiple milling of various materials with one thread ensuring stability

4 · UWC 초미립자 · TISIN-S Coating · 15° Helix Angle · R Rotation · CUTTING DATA 528P

### ISO 측정항목

단위 Unit: mm

| Order Number | 나사가능규격<br>Thread | 피치규격<br>Pitch | 날수<br>Flutes<br>Z | 산수<br>Teeth<br>Zt | 날경<br>Diameter<br>D1 | 유효장<br>Effective Length<br>L2 | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | **외부급유형 (Without coolant)** |
| **4TRTM 055 135 S06** | Tr8, Tr9 | 1.5 | 4 | 1 | 5.5 | 13.5 | 60 | 6 |
| **4TRTM 066 210 S08** | Tr10, Tr11 | 2 | 4 | 1 | 6.6 | 21 | 65 | 8 |
| **4TRTM 070 250 S08** | Tr12 | 3 | 4 | 1 | 7 | 25 | 65 | 8 |
| **4TRTM 086 250 S10** | Tr12, Tr14 | 2 | 4 | 1 | 8.6 | 25 | 75 | 10 |
| **4TRTM 089 290 S10** | Tr14, Tr22 | 3 | 4 | 1 | 8.9 | 29 | 75 | 10 |
| **4TRTM 092 330 S10** | Tr16, Tr18, Tr20 | 4 | 4 | 1 | 9.2 | 33 | 75 | 10 |
| **4TRTM 135 450 S14** | Tr22, Tr24, Tr26 | 5 | 4 | 1 | 13.5 | 45 | 105 | 14 |

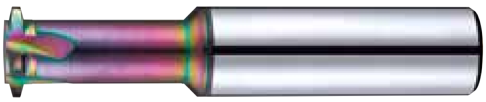
THREAD MILL

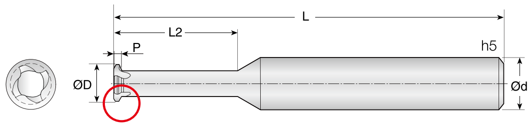
# 4TRTMS

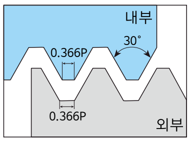
*4 Flutes TR Thread Mills for SUS*

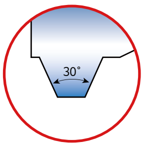
## 4날 SUS용 TR나사 쓰레드밀

New






나사산 확대

- **SUS, 티타늄합금 가공**
- 동력 전달용 미터계 30˚ 사다리꼴 나사 가공 전용
- 소구경 크기의 깊은홀의 나사가공에 사용할 수 있습니다.
- 프로파일에 따라 나사산 깊이는 최대가 될 수 있습니다.
- 하나의 나사산으로 구성되어 다양한 PITCH의 나사 가공이 가능합니다.
- 다양한 피삭재의 하나의 나사산으로 여러번의 절삭이 가능하여 안정적입니다.

- **Thread mills for SUS and Titanium alloys**
- For power transmission meter 30˚ trapezoidal thread milling.
- It can be used for threading deep holes the size of a small diameter.
- Depending on the profile, thread depth can be maximum
- Composed of a single thread, it performs various pitch thread milling.
- Available for multiple milling of various materials with one thread ensuring stability


528P

ISO 측정항목

단위 Unit : mm

외부급유형 (Without coolant)

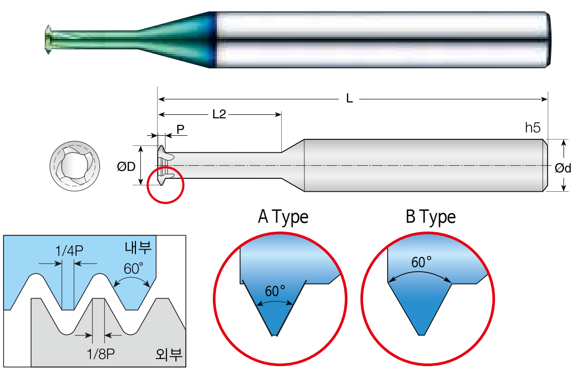
| Order Number | 나사가능규격 Thread | 피치규격 Pitch | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| 4TRTMS 055 135 S06 | Tr8, Tr9 | 1.5 | 4 | 1 | 5.5 | 13.5 | 60 | 6 |
| 4TRTMS 066 210 S08 | Tr10, Tr11 | 2 | 4 | 1 | 6.6 | 21 | 65 | 8 |
| 4TRTMS 070 250 S08 | Tr12 | 3 | 4 | 1 | 7 | 25 | 65 | 8 |
| 4TRTMS 086 250 S10 | Tr12, Tr14 | 2 | 4 | 1 | 8.6 | 25 | 75 | 10 |
| 4TRTMS 089 290 S10 | Tr14, Tr22 | 3 | 4 | 1 | 8.9 | 29 | 75 | 10 |
| 4TRTMS 092 330 S10 | Tr16, Tr18, Tr20 | 4 | 4 | 1 | 9.2 | 33 | 75 | 10 |
| 4TRTMS 135 450 S14 | Tr22, Tr24, Tr26 | 5 | 4 | 1 | 13.5 | 45 | 105 | 14 |

THREAD MILL

# 4MTM

*4 Flutes Multi-functional Thread Mills with One Thread*

## 4날 범용 다기능 쓰레드밀(1나사산)



나사산 확대

- **HRC58이하의 열처리강, 프리하든강, 합금강, 탄소강, 주철 가공**
- 60° 미터나사 / 관용나사 / 유니파이 나사가공 전용
- 소구경 크기의 깊은홀의 나사가공에 사용할 수 있습니다.
- 프로파일에 따라 나사산 깊이는 최대가 될 수 있습니다.
- 하나의 나사산으로 구성되어 다양한 PITCH와 테이퍼 나사 가공이 가능합니다.
- 오른나사와 왼나사 작업이 모두 가능합니다.
- 헬리코일 나사 가공이 가능합니다.

- **Machining of heat-treated steels pre-hardened steels, alloy steels, carbon steels, and cast irons with HRc58 or below**
- Specifically designed for 60° metric threads, NPT threads, and UN threads.
- Suitable for threading deep holes with small diameters.
- Maximum thread depth can be achieved based on the profile.
- Configured with a single tap, allowing for various PITCH and taper threading operations.
- Suitable for both right-hand and left-hand threading.
- It can be used for heli coil threading.

4 | UWC 초미립자 | TISIN-S Coating | 15° Helix Angle | R Rotation | CUTTING DATA

529P

### ISO 측정항목 / American UN

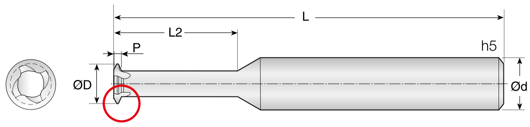
단위 Unit: mm

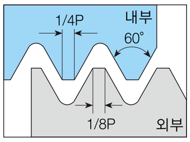
| Order Number | 미터나사 (Metric screw) 일반 나사 M Coarse | 가는 나사 M Fine | 유니파이나사 Unified screw UNC | UNF | UNS | 날수 Flutes Z | 타입 Type | 날경 Diameter D | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 외부 급유형 (Without coolant) | | | | | | | | | | | |
| 4MTM 0072 036 S03 | M1 x 0.25 | | | | | 4 | A | 0.72 | 3.6 | 45 | 3 |
| 4MTM 009 043 S03 | M1.2 x 0.25 | M1.4 x 0.25<br>M1.6 x 0.25 | | | | 4 | A | 0.9 | 4.3 | 45 | 3 |
| 4MTM 0105 050 S03 | M1.4 x 0.3 | | | | | 4 | A | 1.05 | 5 | 45 | 3 |
| 4MTM 0115 031 S03 | M1.6 x 0.35 | M1.6 x 0.25<br>M1.8 x 0.25<br>M2 x 0.25 | | 0-80 | | 4 | B | 1.15 | 3.1 | 45 | 3 |
| 4MTM 012 057 S03 | M1.6 x 0.35 | M2 x 0.35<br>M2.2 x 0.35 | | | | 4 | A | 1.2 | 5.7 | 45 | 3 |
| 4MTM 014 037 S03 | M2 x 0.4<br>M2.2 x 0.45 | M2 x 0.35<br>M2.2 x 0.35 | 1-64<br>2-56 | 1-72<br>2-64 | | 4 | B | 1.4 | 3.7 | 45 | 3 |
| 4MTM 0155 071 S03 | M2 x 0.4 | | | | | 4 | A | 1.55 | 7.1 | 45 | 3 |
| 4MTM 019 052 S03 | M2.5 x 0.45 | M2.5 x 0.35<br>M3 x 0.35 | 3-48<br>4-40 | 3-56<br>4-48 | | 4 | B | 1.9 | 5.2 | 45 | 3 |
| 4MTM 020 090 S03 | M2.5 x 0.45 | M2.6 x 0.45 | | | | 4 | A | 2 | 9 | 45 | 3 |
| 4MTM 0237 0106 S03 | M3 x 0.5 | M3.5 x 0.5<br>M4 x 0.5 | | | | 4 | A | 2.37 | 10.6 | 45 | 3 |
| 4MTM 0245 070 S03 | M3 x 0.5<br>M3.5 x 0.6 | M3.5 x 0.5 | 5-40<br>6-32 | 5-44<br>6-40 | | 4 | B | 2.45 | 7 | 45 | 3 |
| 4MTM 032 095 S06 | M4 x 0.7<br>M4.5 x 0.75 | M4 x 0.5 | 8-32<br>10-24 | 8-36<br>10-32 | 10-28 | 4 | B | 3.2 | 9.5 | 60 | 6 |
| 4MTM 040 125 S06 | M5 x 0.8<br>M6 x 1 | M5 x 0.5<br>M5.5 x 0.5<br>M5 x 0.75 | 12-24 | 12-28 | 10-36<br>10-40<br>10-48 | 4 | B | 4 | 12.5 | 60 | 6 |
| 4MTM 065 166 S08 | M8 x 1.25 | M10 x 1.25<br>M12 x 1.25<br>M14 x 1.25 | | | | 4 | B | 6.5 | 16.6 | 60 | 8 |
| 4MTM 082 208 S10 | M10 x 1.5 | M12 x 1.5<br>M14 x 1.5<br>M16 x 1.5 | | | | 4 | B | 8.2 | 20.8 | 70 | 10 |
| 4MTM 099 250 S10 | M12 x 1.75 | M14 x 1.75<br>M16 x 1.75<br>M18 x 1.75 | | | | 4 | B | 9.9 | 25 | 70 | 10 |

# 4MTMA

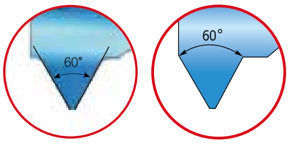
*4 Flutes Multi-functional Thread Mills with One Thread for Aluminum*

## 4날 알루미늄 전용 다기능 쓰레드밀(1나사산)




A Type B Type




나사산 확대

- **알루미늄, 알루미늄 합금 등 비철 비금속 가공**
- 60˚ 미터나사 / 관용나사 / 유니파이 나사가공 전용
- 소구경 크기의 깊은홀의 나사가공에 사용할 수 있습니다.
- 프로파일에 따라 나사산 깊이는 최대가 될 수 있습니다.
- 하나의 나사산으로 구성되어 다양한 PITCH와 테이퍼 나사 가공이 가능합니다.
- 오른나사와 왼나사 작업이 모두 가능합니다.
- 헬리코일 나사 가공이 가능합니다.

- **Thread mills for aluminum, aluminum alloys, non-ferrous and non-metalic materials.**
- Specifically designed for 60˚ metric threads, NPT threads, and UN threads.
- Suitable for threading deep holes with small diameters.
- Maximum thread depth can be achieved based on the profile.
- Configured with a single tap, allowing for various PITCH and taper threading operations.
- Suitable for both right-hand and left-hand threading.
- It can be used for heli coil threading.

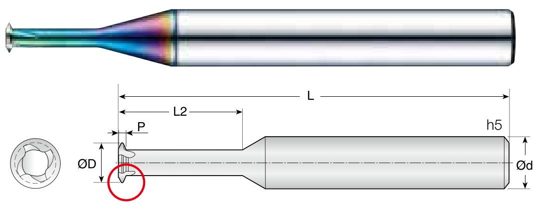

529P

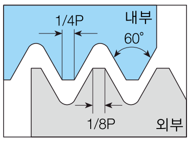
### ISO 측정항목 / American UN

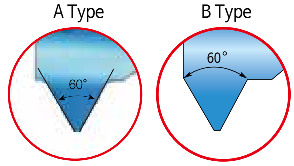
단위 Unit: mm

| Order Number | 미터나사 (Metric screw) 일반 나사 M Coarse | 가는 나사 M Fine | 유니파이나사 Unified screw UNC | UNF | UNS | 날수 Flutes Z | 타입 Type | 날경 Diameter D | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | | | | |
| 4MTMA 0072 036 S03 | M1 x 0.25 | | | | | 4 | A | 0.72 | 3.6 | 45 | 3 |
| 4MTMA 009 043 S03 | M1.2 x 0.25 | M1.4 x 0.25<br>M1.6 x 0.25 | | | | 4 | A | 0.9 | 4.3 | 45 | 3 |
| 4MTMA 0105 050 S03 | M1.4 x 0.3 | | | | | 4 | A | 1.05 | 5 | 45 | 3 |
| 4MTMA 0115 031 S03 | M1.6 x 0.35 | M1.6 x 0.25<br>M1.8 x 0.25<br>M2 x 0.25 | | 0-80 | | 4 | B | 1.15 | 3.1 | 45 | 3 |
| 4MTMA 012 057 S03 | M1.6 x 0.35 | M2 x 0.35<br>M2.2 x 0.35 | | | | 4 | A | 1.2 | 5.7 | 45 | 3 |
| 4MTMA 014 037 S03 | M2 x 0.4<br>M2.2 x 0.45 | M2 x 0.35<br>M2.2 x 0.35 | 1-64<br>2-56 | 1-72<br>2-64 | | 4 | B | 1.4 | 3.7 | 45 | 3 |
| 4MTMA 0155 071 S03 | M2 x 0.4 | | | | | 4 | A | 1.55 | 7.1 | 45 | 3 |
| 4MTMA 019 052 S03 | M2.5 x 0.45 | M2.5 x 0.35<br>M3 x 0.35 | 3-48<br>4-40 | 3-56<br>4-48 | | 4 | B | 1.9 | 5.2 | 45 | 3 |
| 4MTMA 020 090 S03 | M2.5 x 0.45 | M2.6 x 0.45 | | | | 4 | A | 2 | 9 | 45 | 3 |
| 4MTMA 0237 0106 S03 | M3 x 0.5 | M3.5 x 0.5<br>M4 x 0.5 | | | | 4 | A | 2.37 | 10.6 | 45 | 3 |
| 4MTMA 0245 070 S03 | M3 x 0.5<br>M3.5 x 0.6 | M3.5 x 0.5 | 5-40<br>6-32 | 5-44<br>6-40 | | 4 | B | 2.45 | 7 | 45 | 3 |
| 4MTMA 032 095 S06 | M4 x 0.7<br>M4.5 x 0.75 | M4 x 0.5 | 8-32<br>10-24 | 8-36<br>10-32 | 10-28 | 4 | B | 3.2 | 9.5 | 60 | 6 |
| 4MTMA 040 125 S06 | M5 x 0.8<br>M6 x 1 | M5 x 0.5<br>M5.5 x 0.5<br>M5 x 0.75 | 12-24 | 12-28 | 10-36<br>10-40<br>10-48 | 4 | B | 4 | 12.5 | 60 | 6 |
| 4MTMA 065 166 S08 | M8 x 1.25 | M10 x 1.25<br>M12 x 1.25<br>M14 x 1.25 | | | | 4 | B | 6.5 | 16.6 | 60 | 8 |
| 4MTMA 082 208 S10 | M10 x 1.5 | M12 x 1.5<br>M14 x 1.5<br>M16 x 1.5 | | | | 4 | B | 8.2 | 20.8 | 70 | 10 |
| 4MTMA 099 250 S10 | M12 x 1.75 | M14 x 1.75<br>M16 x 1.75<br>M18 x 1.75 | | | | 4 | B | 9.9 | 25 | 70 | 10 |

# 4날 SUS 가공용 다기능 쓰레드밀(1나사산)




나사산 확대

- **SUS, 티타늄합금 가공**
- 60° 미터나사 / 관용나사 / 유니파이 나사가공 전용
- 소구경 크기의 깊은홀의 나사가공에 사용할 수 있습니다.
- 프로파일에 따라 나사산 깊이는 최대가 될 수 있습니다.
- 하나의 나사산으로 구성되어 다양한 PITCH와 테이퍼 나사 가공이 가능합니다.
- 오른나사와 왼나사 작업이 모두 가능합니다.
- 헬리코일 나사 가공이 가능합니다.

- **Thread Mills for SUS, Titanium alloy**
- Specifically designed for 60° metric threads, NPT threads, and UN threads.
- Suitable for threading deep holes with small diameters.
- Maximum thread depth can be achieved based on the profile.
- Configured with a single tap, allowing for various PITCH and taper threading operations.
- Suitable for both right-hand and left-hand threading.
- It can be used for heli coil threading.

4 | UWC 초미립자 | HR Coating | 15° Helix Angle | R Rotation | CUTTING DATA 529P

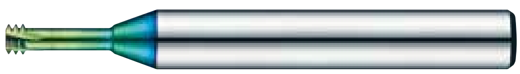
## ISO 측정항목 / American UN

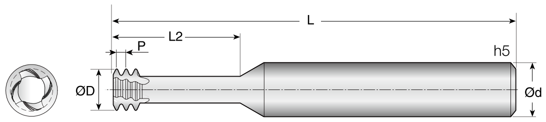
단위 Unit: mm

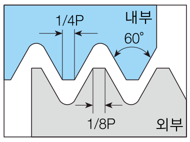
| Order Number | 미터나사 (Metric screw) 일반 나사 M Coarse | 가는 나사 M Fine | 유니파이나사 Unified screw UNC | UNF | UNS | 날수 Flutes Z | 타입 Type | 날경 Diameter D | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | | | | |
| 4MTMS 0072 036 S03 | M1 x 0.25 | | | | | 4 | A | 0.72 | 3.6 | 45 | 3 |
| 4MTMS 009 043 S03 | M1.2 x 0.25 | M1.4 x 0.25<br>M1.6 x 0.25 | | | | 4 | A | 0.9 | 4.3 | 45 | 3 |
| 4MTMS 0105 050 S03 | M1.4 x 0.3 | | | | | 4 | A | 1.05 | 5 | 45 | 3 |
| 4MTMS 0115 031 S03 | M1.6 x 0.35 | M1.6 x 0.25<br>M1.8 x 0.25<br>M2 x 0.25 | | 0-80 | | 4 | B | 1.15 | 3.1 | 45 | 3 |
| 4MTMS 012 057 S03 | M1.6 x 0.35 | M2 x 0.35<br>M2.2 x 0.35 | | | | 4 | A | 1.2 | 5.7 | 45 | 3 |
| 4MTMS 014 037 S03 | M2 x 0.4<br>M2.2 x 0.45 | M2 x 0.35<br>M2.2 x 0.35 | 1-64<br>2-56 | 1-72<br>2-64 | | 4 | B | 1.4 | 3.7 | 45 | 3 |
| 4MTMS 0155 071 S03 | M2 x 0.4 | | | | | 4 | A | 1.55 | 7.1 | 45 | 3 |
| 4MTMS 019 052 S03 | M2.5 x 0.45 | M2.5 x 0.35<br>M3 x 0.35 | 3-48<br>4-40 | 3-56<br>4-48 | | 4 | B | 1.9 | 5.2 | 45 | 3 |
| 4MTMS 020 090 S03 | M2.5 x 0.45 | M2.6 x 0.45 | | | | 4 | A | 2 | 9 | 45 | 3 |
| 4MTMS 0237 0106 S03 | M3 x 0.5 | M3.5 x 0.5<br>M4 x 0.5 | | | | 4 | A | 2.37 | 10.6 | 45 | 3 |
| 4MTMS 0245 070 S03 | M3 x 0.5<br>M3.5 x 0.6 | M3.5 x 0.5 | 5-40<br>6-32 | 5-44<br>6-40 | | 4 | B | 2.45 | 7 | 45 | 3 |
| 4MTMS 032 095 S06 | M4 x 0.7<br>M4.5 x 0.75 | M4 x 0.5 | 8-32<br>10-24 | 8-36<br>10-32 | 10-28 | 4 | B | 3.2 | 9.5 | 60 | 6 |
| 4MTMS 040 125 S06 | M5 x 0.8<br>M6 x 1 | M5 x 0.5<br>M5.5 x 0.5<br>M5 x 0.75 | 12-24 | 12-28 | 10-36<br>10-40<br>10-48 | 4 | B | 4 | 12.5 | 60 | 6 |
| 4MTMS 065 166 S08 | M8 x 1.25 | M10 x 1.25<br>M12 x 1.25<br>M14 x 1.25 | | | | 4 | B | 6.5 | 16.6 | 60 | 8 |
| 4MTMS 082 208 S10 | M10 x 1.5 | M12 x 1.5<br>M14 x 1.5<br>M16 x 1.5 | | | | 4 | B | 8.2 | 20.8 | 70 | 10 |
| 4MTMS 099 250 S10 | M12 x 1.75 | M14 x 1.75<br>M16 x 1.75<br>M18 x 1.75 | | | | 4 | B | 9.9 | 25 | 70 | 10 |

# 4STM

## 4 Flutes Short Flute Thread Mills for Multi Purpose
## 4날 범용 짧은 날 쓰레드밀






- **HRc 58이하의 열처리강, 프리하든강, 합금강, 탄소강, 주철 가공**
- 경화강 내 나사 가공을 위한 견고하고 강력한 날 디자인.
- 향상된 절삭 및 칩제거를 통해 공구 성능을 향상 시킵니다.
- 팁 형상은 절삭 저항을 줄이고 공구 구부림을 억제합니다.
- 헬리코일 나사 가공이 가능합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for Hardened steels (up to HRc 58), pre-hardened steels, alloy steels, carbon steels, cast irons**
- Powerful flute design applied for hardened steel.
- Improved cutting and chip removal reduce the risk of tool breaking in holes.
- The tip shape reduces cutting resistance and tool bend.
- It can be used for heli coil threading.
- It can be used for both right and left-handed threading.


530P

### ISO 측정항목

단위 Unit : mm

| Order Number | 나사 가능 규격 Thread | 피치규격 Pitch | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| **외부급유형 (Without coolant)** | | | | | | | | |
| 4STM 0072 020 S04 M1 | M1 | 0.25 | 4 | 3 | 0.72 | 2 | 45 | 4 |
| 4STM 0072 025 S04 M1 | M1 | 0.25 | 4 | 3 | 0.72 | 2.5 | 45 | 4 |
| 4STM 009 024 S04 M012 | M1.2 | 0.25 | 4 | 3 | 0.9 | 2.4 | 45 | 4 |
| 4STM 009 030 S04 M012 | M1.2 | 0.25 | 4 | 3 | 0.9 | 3 | 45 | 4 |
| 4STM 0095 028 S06 M014 | M1.4 | 0.3 | 4 | 3 | 0.95 | 2.8 | 50 | 6 |
| 4STM 0095 035 S06 M014 | M1.4 | 0.3 | 4 | 3 | 0.95 | 3.5 | 50 | 6 |
| 4STM 011 032 S06 M016 | M1.6 ~ 1.8 | 0.35 | 4 | 3 | 1.1 | 3.2 | 50 | 6 |
| 4STM 011 040 S06 M016 | M1.6 ~ 1.8 | 0.35 | 4 | 3 | 1.1 | 4 | 50 | 6 |
| 4STM 012 050 S03 M016 | M1.6 ~ 1.8 | 0.35 | 4 | 3 | 1.2 | 5 | 40 | 3 |
| 4STM 014 040 S06 M2 | M2 | 0.4 | 4 | 3 | 1.4 | 4 | 50 | 6 |
| 4STM 014 050 S06 M2 | M2 | 0.4 | 4 | 3 | 1.4 | 5 | 50 | 6 |
| 4STM 0155 062 S03 M2 | M2 | 0.4 | 4 | 3 | 1.55 | 6.2 | 40 | 3 |
| 4STM 0155 062 S06 M2 | M2 | 0.4 | 4 | 3 | 1.55 | 6.2 | 60 | 6 |
| 4STM 016 044 S06 M022 | M2.2 | 0.45 | 4 | 3 | 1.6 | 4.4 | 50 | 6 |
| 4STM 016 055 S06 M022 | M2.2 | 0.45 | 4 | 3 | 1.6 | 5.5 | 50 | 6 |
| 4STM 018 050 S06 M025 | M2.5 | 0.45 | 4 | 3 | 1.8 | 5 | 50 | 6 |
| 4STM 018 0625 S06 M025 | M2.5 | 0.45 | 4 | 3 | 1.8 | 6.25 | 50 | 6 |
| 4STM 0195 077 S03 M025 | M2.5 | 0.45 | 4 | 3 | 1.95 | 7.7 | 40 | 3 |
| 4STM 0195 077 S06 M025 | M2.5 | 0.45 | 4 | 3 | 1.95 | 7.7 | 60 | 6 |
| 4STM 024 060 S06 M3 | M3 | 0.5 | 4 | 3 | 2.4 | 6 | 50 | 6 |
| 4STM 024 075 S06 M3 | M3 | 0.5 | 4 | 3 | 2.4 | 7.5 | 50 | 6 |
| 4STM 024 092 S03 M3 | M3 | 0.5 | 4 | 3 | 2.4 | 9.2 | 40 | 3 |
| 4STM 024 092 S06 M3 | M3 | 0.5 | 4 | 3 | 2.4 | 9.2 | 60 | 6 |
| 4STM 0275 108 S06 M035 | M3.5 | 0.6 | 4 | 3 | 2.75 | 10.8 | 60 | 6 |
| 4STM 031 080 S06 M4 | M4 | 0.7 | 4 | 3 | 3.1 | 8 | 50 | 6 |
| 4STM 031 100 S06 M4 | M4 | 0.7 | 4 | 3 | 3.1 | 10 | 50 | 6 |
| 4STM 0315 123 S06 M4 | M4 | 0.7 | 4 | 3 | 3.15 | 12.3 | 60 | 6 |
| 4STM 038 100 S06 M5 | M5 | 0.8 | 4 | 3 | 3.8 | 10 | 50 | 6 |
| 4STM 038 125 S06 M5 | M5 | 0.8 | 4 | 3 | 3.8 | 12.5 | 50 | 6 |
| 4STM 0405 154 S06 M5 | M5 | 0.8 | 4 | 3 | 4.05 | 15.4 | 60 | 6 |
| 4STM 046 120 S06 M6 | M6 | 1 | 4 | 3 | 4.6 | 12 | 50 | 6 |
| 4STM 046 150 S06 M6 | M6 | 1 | 4 | 3 | 4.6 | 15 | 50 | 6 |
| 4STM 048 185 S06 M6 | M6 | 1 | 4 | 3 | 4.8 | 18.5 | 60 | 6 |
| 4STM 062 160 S10 M8 | M8 | 1.25 | 4 | 3 | 6.2 | 16 | 70 | 10 |
| 4STM 062 200 S10 M8 | M8 | 1.25 | 4 | 3 | 6.2 | 20 | 70 | 10 |
| 4STM 065 246 S08 M8 | M8 | 1.25 | 4 | 3 | 6.5 | 24.6 | 65 | 8 |
| 4STM 075 200 S10 M10 | M10 | 1.5 | 4 | 3 | 7.5 | 20 | 70 | 10 |
| 4STM 075 250 S10 M10 | M10 | 1.5 | 4 | 3 | 7.5 | 25 | 70 | 10 |
| 4STM 082 308 S10 M10 | M10 | 1.5 | 4 | 3 | 8.2 | 30.8 | 80 | 10 |
| 4STM 090 240 S10 M12 | M12 | 1.75 | 4 | 3 | 9 | 24 | 80 | 10 |
| 4STM 090 300 S10 M12 | M12 | 1.75 | 4 | 3 | 9 | 30 | 80 | 10 |
| 4STM 099 370 S10 M12 | M12 | 1.75 | 4 | 3 | 9.9 | 37 | 85 | 10 |
| 4STM 115 320 S12 M16 | M16 | 2 | 4 | 3 | 11.5 | 32 | 100 | 12 |
| 4STM 115 400 S12 M16 | M16 | 2 | 4 | 3 | 11.5 | 40 | 100 | 12 |
| 4STM 119 490 S12 M16 | M16 | 2 | 4 | 3 | 11.9 | 49 | 95 | 12 |

ISO 측정항목

단위 Unit: mm

| Order Number | 나사 가능 규격 Thread | 피치규격 Pitch | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | |
| 4STM 140 360 S16 M18 | M18 | 2.5 | 4 | 3 | 14 | 36 | 135 | 16 |
| 4STM 140 450 S16 M18 | M18 | 2.5 | 4 | 3 | 14 | 45 | 135 | 16 |
| 4STM 150 400 S16 M20 | M20 | 2.5 | 4 | 3 | 15 | 40 | 135 | 16 |
| 4STM 150 500 S16 M20 | M20 | 2.5 | 4 | 3 | 15 | 50 | 135 | 16 |
| 4STM 159 613 S16 M20 | M20 | 2.5 | 4 | 3 | 15.9 | 61.3 | 115 | 16 |
| **내부 급유형 (With coolant)** | | | | | | | | |
| 4STM 031 080 S06 M4C | M4 | 0.7 | 4 | 3 | 3.1 | 8 | 50 | 6 |
| 4STM 031 100 S06 M4C | M4 | 0.7 | 4 | 3 | 3.1 | 10 | 50 | 6 |
| 4STM 038 100 S06 M5C | M5 | 0.8 | 4 | 3 | 3.8 | 10 | 50 | 6 |
| 4STM 038 125 S06 M5C | M5 | 0.8 | 4 | 3 | 3.8 | 12.5 | 50 | 6 |
| 4STM 046 120 S06 M6C | M6 | 1 | 4 | 3 | 4.6 | 12 | 50 | 6 |
| 4STM 046 150 S06 M6C | M6 | 1 | 4 | 3 | 4.6 | 15 | 50 | 6 |
| 4STM 048 185 S06 M6C | M6 | 1 | 4 | 3 | 4.8 | 18.5 | 60 | 6 |
| 4STM 062 160 S10 M8C | M8 | 1.25 | 4 | 3 | 6.2 | 16 | 70 | 10 |
| 4STM 062 200 S10 M8C | M8 | 1.25 | 4 | 3 | 6.2 | 20 | 70 | 10 |
| 4STM 065 246 S08 M8C | M8 | 1.25 | 4 | 3 | 6.5 | 24.6 | 65 | 8 |
| 4STM 075 200 S10 M10C | M10 | 1.5 | 4 | 3 | 7.5 | 20 | 70 | 10 |
| 4STM 075 250 S10 M10C | M10 | 1.5 | 4 | 3 | 7.5 | 25 | 70 | 10 |
| 4STM 082 308 S10 M10C | M10 | 1.5 | 4 | 3 | 8.2 | 30.8 | 80 | 10 |
| 4STM 090 240 S10 M12C | M12 | 1.75 | 4 | 3 | 9 | 24 | 80 | 10 |
| 4STM 090 300 S10 M12C | M12 | 1.75 | 4 | 3 | 9 | 30 | 80 | 10 |
| 4STM 099 370 S10 M12C | M12 | 1.75 | 4 | 3 | 9.9 | 37 | 85 | 10 |
| 4STM 115 320 S12 M16C | M16 | 2 | 4 | 3 | 11.5 | 32 | 100 | 12 |
| 4STM 115 400 S12 M16C | M16 | 2 | 4 | 3 | 11.5 | 40 | 100 | 12 |
| 4STM 119 490 S12 M16C | M16 | 2 | 4 | 3 | 11.9 | 49 | 95 | 12 |
| 4STM 140 360 S16 M18C | M18 | 2.5 | 4 | 3 | 14 | 36 | 135 | 16 |
| 4STM 140 450 S16 M18C | M18 | 2.5 | 4 | 3 | 14 | 45 | 135 | 16 |
| 4STM 150 400 S16 M20C | M20 | 2.5 | 4 | 3 | 15 | 40 | 135 | 16 |
| 4STM 150 500 S16 M20C | M20 | 2.5 | 4 | 3 | 15 | 50 | 135 | 16 |
| 4STM 159 613 S16 M20C | M20 | 2.5 | 4 | 3 | 15.9 | 61.3 | 115 | 16 |

## American UN

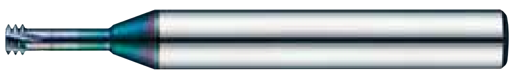
단위 Unit : mm

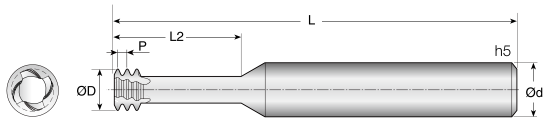
| Order Number | 나사 가능 규격 Thread UNC | UNF | 피치규격 Pitch | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|
| 외부급유형(Without coolant) | | | | | | | | | |
| 4STM 014 037 S06 | No.1-64 | | 64 | 4 | 3 | 1.4 | 3.7 | 50 | 6 |
| 4STM 014 046 S06 | No.1-64 | | 64 | 4 | 3 | 1.4 | 4.6 | 50 | 6 |
| 4STM 0165 044 S06 | No.2-56 | | 56 | 4 | 3 | 1.65 | 4.4 | 50 | 6 |
| 4STM 0165 055 S06 | No.2-56 | | 56 | 4 | 3 | 1.65 | 5.5 | 50 | 6 |
| 4STM 019 050 S06 | No. 3-48 | | 48 | 4 | 3 | 1.9 | 5 | 50 | 6 |
| 4STM 019 063 S06 | No. 3-48 | | 48 | 4 | 3 | 1.9 | 6.3 | 50 | 6 |
| 4STM 021 057 S06 | No. 4-40 | | 40 | 4 | 3 | 2.1 | 5.7 | 50 | 6 |
| 4STM 021 071 S06 | No. 4-40 | | 40 | 4 | 3 | 2.1 | 7.1 | 50 | 6 |
| 4STM 0255 070 S06 | No. 6-32 | | 32 | 4 | 3 | 2.55 | 7 | 50 | 6 |
| 4STM 0255 088 S06 | No. 6-32 | | 32 | 4 | 3 | 2.55 | 8.8 | 50 | 6 |
| 4STM 033 083 S06 | | No. 8-36 | 36 | 4 | 3 | 3.3 | 8.3 | 50 | 6 |
| 4STM 033 104 S06 | | No. 8-36 | 36 | 4 | 3 | 3.3 | 10.4 | 50 | 6 |
| 4STM 035 097 S06 | No. 10-24 | | 24 | 4 | 3 | 3.5 | 9.7 | 65 | 6 |
| 4STM 035 121 S06 | No. 10-24 | | 24 | 4 | 3 | 3.5 | 12.1 | 65 | 6 |
| 4STM 0475 127 S06 | 1/4″ x 20 | | 20 | 4 | 3 | 4.75 | 12.7 | 65 | 6 |
| 4STM 0475 159 S06 | 1/4″ x 20 | | 20 | 4 | 3 | 4.75 | 15.9 | 65 | 6 |
| 4STM 050 127 S06 | | 1/4″ x 28 | 28 | 4 | 3 | 5 | 12.7 | 65 | 6 |
| 4STM 050 159 S06 | | 1/4″ x 28 | 28 | 4 | 3 | 5 | 15.9 | 65 | 6 |
| 4STM 060 159 S10 | 5/16″ x 18 | | 18 | 4 | 3 | 6 | 15.9 | 80 | 10 |
| 4STM 060 198 S10 | 5/16″ x 18 | | 18 | 4 | 3 | 6 | 19.8 | 80 | 10 |
| 4STM 067 191 S10 | 3/8″ x 16 | | 16 | 4 | 3 | 6.7 | 19.1 | 80 | 10 |
| 4STM 067 238 S10 | 3/8″ x 16 | | 16 | 4 | 3 | 6.7 | 23.8 | 80 | 10 |
| 4STM 077 222 S10 | 7/16″ x 14 | | 14 | 4 | 3 | 7.7 | 22.2 | 80 | 10 |
| 4STM 077 278 S10 | 7/16″ x 14 | | 14 | 4 | 3 | 7.7 | 27.8 | 80 | 10 |
| 4STM 092 254 S10 | 1/2″ x 13 | | 13 | 4 | 3 | 9.2 | 25.4 | 80 | 10 |
| 4STM 092 318 S10 | 1/2″ x 13 | | 13 | 4 | 3 | 9.2 | 31.8 | 80 | 10 |
| 4STM 105 286 S12 | 9/16″ x 12 | | 12 | 4 | 3 | 10.5 | 28.6 | 100 | 12 |
| 4STM 105 357 S12 | 9/16″ x 12 | | 12 | 4 | 3 | 10.5 | 35.7 | 100 | 12 |
| 4STM 114 318 S12 | 5/8″ x 11 | | 11 | 4 | 3 | 11.4 | 31.8 | 100 | 12 |
| 4STM 114 397 S12 | 5/8″ x 11 | | 11 | 4 | 3 | 11.4 | 39.7 | 100 | 12 |
| 내부급유형(With coolant) | | | | | | | | | |
| 4STM 033 083 S06C | | No. 8-36 | 36 | 4 | 3 | 3.3 | 8.3 | 50 | 6 |
| 4STM 033 104 S06C | | No. 8-36 | 36 | 4 | 3 | 3.3 | 10.4 | 50 | 6 |
| 4STM 035 097 S06C | No. 10-24 | | 24 | 4 | 3 | 3.5 | 9.7 | 65 | 6 |
| 4STM 035 121 S06C | No. 10-24 | | 24 | 4 | 3 | 3.5 | 12.1 | 65 | 6 |
| 4STM 0475 127 S06C | 1/4″ x 20 | | 20 | 4 | 3 | 4.75 | 12.7 | 65 | 6 |
| 4STM 0475 159 S06C | 1/4″ x 20 | | 20 | 4 | 3 | 4.75 | 15.9 | 65 | 6 |
| 4STM 050 127 S06C | | 1/4″ x 28 | 28 | 4 | 3 | 5 | 12.7 | 65 | 6 |
| 4STM 050 159 S06C | | 1/4″ x 28 | 28 | 4 | 3 | 5 | 15.9 | 65 | 6 |
| 4STM 060 159 S10C | 5/16″ x 18 | | 18 | 4 | 3 | 6 | 15.9 | 80 | 10 |
| 4STM 060 198 S10C | 5/16″ x 18 | | 18 | 4 | 3 | 6 | 19.8 | 80 | 10 |
| 4STM 067 191 S10C | 3/8″ x 16 | | 16 | 4 | 3 | 6.7 | 19.1 | 80 | 10 |
| 4STM 067 238 S10C | 3/8″ x 16 | | 16 | 4 | 3 | 6.7 | 23.8 | 80 | 10 |
| 4STM 077 222 S10C | 7/16″ x 14 | | 14 | 4 | 3 | 7.7 | 22.2 | 80 | 10 |
| 4STM 077 278 S10C | 7/16″ x 14 | | 14 | 4 | 3 | 7.7 | 27.8 | 80 | 10 |
| 4STM 092 254 S10C | 1/2″ x 13 | | 13 | 4 | 3 | 9.2 | 25.4 | 80 | 10 |
| 4STM 092 318 S10C | 1/2″ x 13 | | 13 | 4 | 3 | 9.2 | 31.8 | 80 | 10 |
| 4STM 105 286 S12C | 9/16″ x 12 | | 12 | 4 | 3 | 10.5 | 28.6 | 100 | 12 |
| 4STM 105 357 S12C | 9/16″ x 12 | | 12 | 4 | 3 | 10.5 | 35.7 | 100 | 12 |
| 4STM 114 318 S12C | 5/8″ x 11 | | 11 | 4 | 3 | 11.4 | 31.8 | 100 | 12 |
| 4STM 114 397 S12C | 5/8″ x 11 | | 11 | 4 | 3 | 11.4 | 39.7 | 100 | 12 |

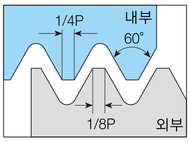
# 4STMA

## 4 Flutes Short Flute Thread Mills for Aluminum

## 4날 알루미늄 전용 짧은 날 쓰레드밀






- **알루미늄, 알루미늄 합금 등 비철 비금속 가공**
- 경화강 내 나사 가공을 위한 견고하고 강력한 날 디자인.
- 향상된 절삭 및 칩제거를 통해 공구 성능을 향상 시킵니다.
- 팁 형상은 절삭 저항을 줄이고 공구 구부림을 억제합니다.
- 헬리코일 나사 가공이 가능합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread Mills for Aluminum, Aluminum alloys, non-ferrous and non-metalic materials**
- Powerful flute design applied for hardened steel.
- Improved cutting and chip removal reduce the risk of tool breaking in holes.
- The tip shape reduces cutting resistance and tool bend.
- It can be used for heli coil threading.
- It can be used for both right and left-handed threading.


### ISO 측정항목

단위 Unit: mm

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| **외부 급유형(Without coolant)** | | | | | | | | |
| 4STMA 0072 020 S04 M1 | M1 | 0.25 | 4 | 3 | 0.72 | 2 | 45 | 4 |
| 4STMA 0072 025 S04 M1 | M1 | 0.25 | 4 | 3 | 0.72 | 2.5 | 45 | 4 |
| 4STMA 009 024 S04 M012 | M1.2 | 0.25 | 4 | 3 | 0.9 | 2.4 | 45 | 4 |
| 4STMA 009 030 S04 M012 | M1.2 | 0.25 | 4 | 3 | 0.9 | 3 | 45 | 4 |
| 4STMA 0095 028 S06 M014 | M1.4 | 0.3 | 4 | 3 | 0.95 | 2.8 | 50 | 6 |
| 4STMA 0095 035 S06 M014 | M1.4 | 0.3 | 4 | 3 | 0.95 | 3.5 | 50 | 6 |
| 4STMA 011 032 S06 M016 | M1.6 ~ 1.8 | 0.35 | 4 | 3 | 1.1 | 3.2 | 50 | 6 |
| 4STMA 011 040 S06 M016 | M1.6 ~ 1.8 | 0.35 | 4 | 3 | 1.1 | 4 | 50 | 6 |
| 4STMA 012 050 S03 M016 | M1.6 ~ 1.8 | 0.35 | 4 | 3 | 1.2 | 5 | 40 | 3 |
| 4STMA 014 040 S06 M2 | M2 | 0.4 | 4 | 3 | 1.4 | 4 | 50 | 6 |
| 4STMA 014 050 S06 M2 | M2 | 0.4 | 4 | 3 | 1.4 | 5 | 50 | 6 |
| 4STMA 0155 062 S03 M2 | M2 | 0.4 | 4 | 3 | 1.55 | 6.2 | 40 | 3 |
| 4STMA 0155 062 S06 M2 | M2 | 0.4 | 4 | 3 | 1.55 | 6.2 | 60 | 6 |
| 4STMA 016 044 S06 M022 | M2.2 | 0.45 | 4 | 3 | 1.6 | 4.4 | 50 | 6 |
| 4STMA 016 055 S06 M022 | M2.2 | 0.45 | 4 | 3 | 1.6 | 5.5 | 50 | 6 |
| 4STMA 018 050 S06 M025 | M2.5 | 0.45 | 4 | 3 | 1.8 | 5 | 50 | 6 |
| 4STMA 018 0625 S06 M025 | M2.5 | 0.45 | 4 | 3 | 1.8 | 6.25 | 50 | 6 |
| 4STMA 0195 077 S03 M025 | M2.5 | 0.45 | 4 | 3 | 1.95 | 7.7 | 40 | 3 |
| 4STMA 0195 077 S06 M025 | M2.5 | 0.45 | 4 | 3 | 1.95 | 7.7 | 60 | 6 |
| 4STMA 024 060 S06 M3 | M3 | 0.5 | 4 | 3 | 2.4 | 6 | 50 | 6 |
| 4STMA 024 075 S06 M3 | M3 | 0.5 | 4 | 3 | 2.4 | 7.5 | 50 | 6 |
| 4STMA 024 092 S03 M3 | M3 | 0.5 | 4 | 3 | 2.4 | 9.2 | 40 | 3 |
| 4STMA 024 092 S06 M3 | M3 | 0.5 | 4 | 3 | 2.4 | 9.2 | 60 | 6 |
| 4STMA 0275 108 S06 M035 | M3.5 | 0.6 | 4 | 3 | 2.75 | 10.8 | 60 | 6 |
| 4STMA 031 080 S06 M4 | M4 | 0.7 | 4 | 3 | 3.1 | 8 | 50 | 6 |
| 4STMA 031 100 S06 M4 | M4 | 0.7 | 4 | 3 | 3.1 | 10 | 50 | 6 |
| 4STMA 0315 123 S06 M4 | M4 | 0.7 | 4 | 3 | 3.15 | 12.3 | 60 | 6 |
| 4STMA 038 100 S06 M5 | M5 | 0.8 | 4 | 3 | 3.8 | 10 | 50 | 6 |
| 4STMA 038 125 S06 M5 | M5 | 0.8 | 4 | 3 | 3.8 | 12.5 | 50 | 6 |
| 4STMA 0405 154 S06 M5 | M5 | 0.8 | 4 | 3 | 4.05 | 15.4 | 60 | 6 |
| 4STMA 046 120 S06 M6 | M6 | 1 | 4 | 3 | 4.6 | 12 | 50 | 6 |
| 4STMA 046 150 S06 M6 | M6 | 1 | 4 | 3 | 4.6 | 15 | 50 | 6 |
| 4STMA 048 185 S06 M6 | M6 | 1 | 4 | 3 | 4.8 | 18.5 | 60 | 6 |
| 4STMA 062 160 S10 M8 | M8 | 1.25 | 4 | 3 | 6.2 | 16 | 70 | 10 |
| 4STMA 062 200 S10 M8 | M8 | 1.25 | 4 | 3 | 6.2 | 20 | 70 | 10 |
| 4STMA 065 246 S08 M8 | M8 | 1.25 | 4 | 3 | 6.5 | 24.6 | 65 | 8 |
| 4STMA 075 200 S10 M10 | M10 | 1.5 | 4 | 3 | 7.5 | 20 | 70 | 10 |
| 4STMA 075 250 S10 M10 | M10 | 1.5 | 4 | 3 | 7.5 | 25 | 70 | 10 |
| 4STMA 082 308 S10 M10 | M10 | 1.5 | 4 | 3 | 8.2 | 30.8 | 80 | 10 |
| 4STMA 090 240 S10 M12 | M12 | 1.75 | 4 | 3 | 9 | 24 | 80 | 10 |
| 4STMA 090 300 S10 M12 | M12 | 1.75 | 4 | 3 | 9 | 30 | 80 | 10 |
| 4STMA 099 370 S10 M12 | M12 | 1.75 | 4 | 3 | 9.9 | 37 | 85 | 10 |
| 4STMA 115 320 S12 M16 | M16 | 2 | 4 | 3 | 11.5 | 32 | 100 | 12 |
| 4STMA 115 400 S12 M16 | M16 | 2 | 4 | 3 | 11.5 | 40 | 100 | 12 |
| 4STMA 119 490 S12 M16 | M16 | 2 | 4 | 3 | 11.9 | 49 | 95 | 12 |

## ISO 측정항목

단위 Unit: mm

### 외부 급유형 (Without coolant)

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| 4STMA 140 360 S16 M18 | M18 | 2.5 | 4 | 3 | 14 | 36 | 135 | 16 |
| 4STMA 140 450 S16 M18 | M18 | 2.5 | 4 | 3 | 14 | 45 | 135 | 16 |
| 4STMA 150 400 S16 M20 | M20 | 2.5 | 4 | 3 | 15 | 40 | 135 | 16 |
| 4STMA 150 500 S16 M20 | M20 | 2.5 | 4 | 3 | 15 | 50 | 135 | 16 |
| 4STMA 159 613 S16 M20 | M20 | 2.5 | 4 | 3 | 15.9 | 61.3 | 115 | 16 |

### 내부 급유형 (With coolant)

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| 4STMA 031 080 S06 M4C | M4 | 0.7 | 4 | 3 | 3.1 | 8 | 50 | 6 |
| 4STMA 031 100 S06 M4C | M4 | 0.7 | 4 | 3 | 3.1 | 10 | 50 | 6 |
| 4STMA 038 100 S06 M5C | M5 | 0.8 | 4 | 3 | 3.8 | 10 | 50 | 6 |
| 4STMA 038 125 S06 M5C | M5 | 0.8 | 4 | 3 | 3.8 | 12.5 | 50 | 6 |
| 4STMA 046 120 S06 M6C | M6 | 1 | 4 | 3 | 4.6 | 12 | 50 | 6 |
| 4STMA 046 150 S06 M6C | M6 | 1 | 4 | 3 | 4.6 | 15 | 50 | 6 |
| 4STMA 048 185 S06 M6C | M6 | 1 | 4 | 3 | 4.8 | 18.5 | 60 | 6 |
| 4STMA 062 160 S10 M8C | M8 | 1.25 | 4 | 3 | 6.2 | 16 | 70 | 10 |
| 4STMA 062 200 S10 M8C | M8 | 1.25 | 4 | 3 | 6.2 | 20 | 70 | 10 |
| 4STMA 065 246 S08 M8C | M8 | 1.25 | 4 | 3 | 6.5 | 24.6 | 65 | 8 |
| 4STMA 075 200 S10 M10C | M10 | 1.5 | 4 | 3 | 7.5 | 20 | 70 | 10 |
| 4STMA 075 250 S10 M10C | M10 | 1.5 | 4 | 3 | 7.5 | 25 | 70 | 10 |
| 4STMA 082 308 S10 M10C | M10 | 1.5 | 4 | 3 | 8.2 | 30.8 | 80 | 10 |
| 4STMA 090 240 S10 M12C | M12 | 1.75 | 4 | 3 | 9 | 24 | 80 | 10 |
| 4STMA 090 300 S10 M12C | M12 | 1.75 | 4 | 3 | 9 | 30 | 80 | 10 |
| 4STMA 099 370 S10 M12C | M12 | 1.75 | 4 | 3 | 9.9 | 37 | 85 | 10 |
| 4STMA 115 320 S12 M16C | M16 | 2 | 4 | 3 | 11.5 | 32 | 100 | 12 |
| 4STMA 115 400 S12 M16C | M16 | 2 | 4 | 3 | 11.5 | 40 | 100 | 12 |
| 4STMA 119 490 S12 M16C | M16 | 2 | 4 | 3 | 11.9 | 49 | 95 | 12 |
| 4STMA 140 360 S16 M18C | M18 | 2.5 | 4 | 3 | 14 | 36 | 135 | 16 |
| 4STMA 140 450 S16 M18C | M18 | 2.5 | 4 | 3 | 14 | 45 | 135 | 16 |
| 4STMA 150 400 S16 M20C | M20 | 2.5 | 4 | 3 | 15 | 40 | 135 | 16 |
| 4STMA 150 500 S16 M20C | M20 | 2.5 | 4 | 3 | 15 | 50 | 135 | 16 |
| 4STMA 159 613 S16 M20C | M20 | 2.5 | 4 | 3 | 15.9 | 61.3 | 115 | 16 |

## American UN

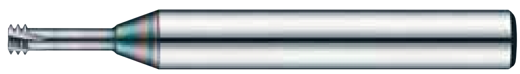
단위 Unit: mm

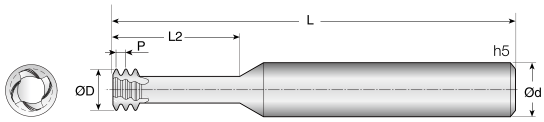
| Order Number | 나사 가능 규격 Thread UNC | UNF | 피치규격 Pitch | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|
| 외부급유형 (Without coolant) | | | | | | | | | |
| 4STMA 014 037 S06 | No.1-64 | | 64 | 4 | 3 | 1.4 | 3.7 | 50 | 6 |
| 4STMA 014 046 S06 | No.1-64 | | 64 | 4 | 3 | 1.4 | 4.6 | 50 | 6 |
| 4STMA 0165 044 S06 | No.2-56 | | 56 | 4 | 3 | 1.65 | 4.4 | 50 | 6 |
| 4STMA 0165 055 S06 | No.2-56 | | 56 | 4 | 3 | 1.65 | 5.5 | 50 | 6 |
| 4STMA 019 050 S06 | No. 3-48 | | 48 | 4 | 3 | 1.9 | 5 | 50 | 6 |
| 4STMA 019 063 S06 | No. 3-48 | | 48 | 4 | 3 | 1.9 | 6.3 | 50 | 6 |
| 4STMA 021 057 S06 | No. 4-40 | | 40 | 4 | 3 | 2.1 | 5.7 | 50 | 6 |
| 4STMA 021 071 S06 | No. 4-40 | | 40 | 4 | 3 | 2.1 | 7.1 | 50 | 6 |
| 4STMA 0255 070 S06 | No. 6-32 | | 32 | 4 | 3 | 2.55 | 7 | 50 | 6 |
| 4STMA 0255 088 S06 | No. 6-32 | | 32 | 4 | 3 | 2.55 | 8.8 | 50 | 6 |
| 4STMA 033 083 S06 | | No. 8-36 | 36 | 4 | 3 | 3.3 | 8.3 | 50 | 6 |
| 4STMA 033 104 S06 | | No. 8-36 | 36 | 4 | 3 | 3.3 | 10.4 | 50 | 6 |
| 4STMA 035 097 S06 | No. 10-24 | | 24 | 4 | 3 | 3.5 | 9.7 | 65 | 6 |
| 4STMA 035 121 S06 | No. 10-24 | | 24 | 4 | 3 | 3.5 | 12.1 | 65 | 6 |
| 4STMA 0475 127 S06 | 1/4″ x 20 | | 20 | 4 | 3 | 4.75 | 12.7 | 65 | 6 |
| 4STMA 0475 159 S06 | 1/4″ x 20 | | 20 | 4 | 3 | 4.75 | 15.9 | 65 | 6 |
| 4STMA 050 127 S06 | | 1/4″ x 28 | 28 | 4 | 3 | 5 | 12.7 | 65 | 6 |
| 4STMA 050 159 S06 | | 1/4″ x 28 | 28 | 4 | 3 | 5 | 15.9 | 65 | 6 |
| 4STMA 060 159 S10 | 5/16″ x 18 | | 18 | 4 | 3 | 6 | 15.9 | 80 | 10 |
| 4STMA 060 198 S10 | 5/16″ x 18 | | 18 | 4 | 3 | 6 | 19.8 | 80 | 10 |
| 4STMA 067 191 S10 | 3/8″ x 16 | | 16 | 4 | 3 | 6.7 | 19.1 | 80 | 10 |
| 4STMA 067 238 S10 | 3/8″ x 16 | | 16 | 4 | 3 | 6.7 | 23.8 | 80 | 10 |
| 4STMA 077 222 S10 | 7/16″ x 14 | | 14 | 4 | 3 | 7.7 | 22.2 | 80 | 10 |
| 4STMA 077 278 S10 | 7/16″ x 14 | | 14 | 4 | 3 | 7.7 | 27.8 | 80 | 10 |
| 4STMA 092 254 S10 | 1/2″ x 13 | | 13 | 4 | 3 | 9.2 | 25.4 | 80 | 10 |
| 4STMA 092 318 S10 | 1/2″ x 13 | | 13 | 4 | 3 | 9.2 | 31.8 | 80 | 10 |
| 4STMA 105 286 S12 | 9/16″ x 12 | | 12 | 4 | 3 | 10.5 | 28.6 | 100 | 12 |
| 4STMA 105 357 S12 | 9/16″ x 12 | | 12 | 4 | 3 | 10.5 | 35.7 | 100 | 12 |
| 4STMA 114 318 S12 | 5/8″ x 11 | | 11 | 4 | 3 | 11.4 | 31.8 | 100 | 12 |
| 4STMA 114 397 S12 | 5/8″ x 11 | | 11 | 4 | 3 | 11.4 | 39.7 | 100 | 12 |
| 내부급유형 (With coolant) | | | | | | | | | |
| 4STMA 033 083 S06C | | No. 8-36 | 36 | 4 | 3 | 3.3 | 8.3 | 50 | 6 |
| 4STMA 033 104 S06C | | No. 8-36 | 36 | 4 | 3 | 3.3 | 10.4 | 50 | 6 |
| 4STMA 035 097 S06C | No. 10-24 | | 24 | 4 | 3 | 3.5 | 9.7 | 65 | 6 |
| 4STMA 035 121 S06C | No. 10-24 | | 24 | 4 | 3 | 3.5 | 12.1 | 65 | 6 |
| 4STMA 0475 127 S06C | 1/4″ x 20 | | 20 | 4 | 3 | 4.75 | 12.7 | 65 | 6 |
| 4STMA 0475 159 S06C | 1/4″ x 20 | | 20 | 4 | 3 | 4.75 | 15.9 | 65 | 6 |
| 4STMA 050 127 S06C | | 1/4″ x 28 | 28 | 4 | 3 | 5 | 12.7 | 65 | 6 |
| 4STMA 050 159 S06C | | 1/4″ x 28 | 28 | 4 | 3 | 5 | 15.9 | 65 | 6 |
| 4STMA 060 159 S10C | 5/16″ x 18 | | 18 | 4 | 3 | 6 | 15.9 | 80 | 10 |
| 4STMA 060 198 S10C | 5/16″ x 18 | | 18 | 4 | 3 | 6 | 19.8 | 80 | 10 |
| 4STMA 067 191 S10C | 3/8″ x 16 | | 16 | 4 | 3 | 6.7 | 19.1 | 80 | 10 |
| 4STMA 067 238 S10C | 3/8″ x 16 | | 16 | 4 | 3 | 6.7 | 23.8 | 80 | 10 |
| 4STMA 077 222 S10C | 7/16″ x 14 | | 14 | 4 | 3 | 7.7 | 22.2 | 80 | 10 |
| 4STMA 077 278 S10C | 7/16″ x 14 | | 14 | 4 | 3 | 7.7 | 27.8 | 80 | 10 |
| 4STMA 092 254 S10C | 1/2″ x 13 | | 13 | 4 | 3 | 9.2 | 25.4 | 80 | 10 |
| 4STMA 092 318 S10C | 1/2″ x 13 | | 13 | 4 | 3 | 9.2 | 31.8 | 80 | 10 |
| 4STMA 105 286 S12C | 9/16″ x 12 | | 12 | 4 | 3 | 10.5 | 28.6 | 100 | 12 |
| 4STMA 105 357 S12C | 9/16″ x 12 | | 12 | 4 | 3 | 10.5 | 35.7 | 100 | 12 |
| 4STMA 114 318 S12C | 5/8″ x 11 | | 11 | 4 | 3 | 11.4 | 31.8 | 100 | 12 |
| 4STMA 114 397 S12C | 5/8″ x 11 | | 11 | 4 | 3 | 11.4 | 39.7 | 100 | 12 |

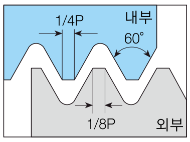
# 4STMS

4 Flutes Short Flute Thread Mills for Stainless Steel

## 4날 SUS 가공용 짧은 날 쓰레드밀






- SUS, 티타늄 합금 가공
- 경화강 내 나사 가공을 위한 견고하고 강력한 날 디자인.
- 향상된 절삭 및 칩제거를 통해 공구가 구멍안에서 끊어지는 위험을 줄입니다.
- 팁 형상은 절삭 저항을 줄이고 공구 구부림을 억제합니다.
- 헬리코일 나사로 사용이 가능합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- Thread Mills for SUS, Titanium alloys
- Powerful flute design applied for hardened steel.
- Improved cutting and chip removal reduce the risk of tool breaking in holes.
- The tip shape reduces cutting resistance and tool bend.
- It can be used for heli coil threading.
- It can be used for both right and left-handed threading.


530P

### ISO 측정항목

단위 Unit : mm

| Order Number | 피치 규격 Thread | Pitch | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 외부 급유형 (Without coolant) | |
| 4STMS 0072 020 S04 M1 | M1 | 0.25 | 4 | 3 | 0.72 | 2 | 45 | 4 |
| 4STMS 0072 025 S04 M1 | M1 | 0.25 | 4 | 3 | 0.72 | 2.5 | 45 | 4 |
| 4STMS 009 024 S04 M012 | M1.2 | 0.25 | 4 | 3 | 0.9 | 2.4 | 45 | 4 |
| 4STMS 009 030 S04 M012 | M1.2 | 0.25 | 4 | 3 | 0.9 | 3 | 45 | 4 |
| 4STMS 0095 028 S06 M014 | M1.4 | 0.3 | 4 | 3 | 0.95 | 2.8 | 50 | 6 |
| 4STMS 0095 035 S06 M014 | M1.4 | 0.3 | 4 | 3 | 0.95 | 3.5 | 50 | 6 |
| 4STMS 011 032 S06 M016 | M1.6 ~ 1.8 | 0.35 | 4 | 3 | 1.1 | 3.2 | 50 | 6 |
| 4STMS 011 040 S06 M016 | M1.6 ~ 1.8 | 0.35 | 4 | 3 | 1.1 | 4 | 50 | 6 |
| 4STMS 012 050 S03 M016 | M1.6 ~ 1.8 | 0.35 | 4 | 3 | 1.2 | 5 | 40 | 3 |
| 4STMS 014 040 S06 M2 | M2 | 0.4 | 4 | 3 | 1.4 | 4 | 50 | 6 |
| 4STMS 014 050 S06 M2 | M2 | 0.4 | 4 | 3 | 1.4 | 5 | 50 | 6 |
| 4STMS 0155 062 S03 M2 | M2 | 0.4 | 4 | 3 | 1.55 | 6.2 | 40 | 3 |
| 4STMS 0155 062 S06 M2 | M2 | 0.4 | 4 | 3 | 1.55 | 6.2 | 60 | 6 |
| 4STMS 016 044 S06 M022 | M2.2 | 0.45 | 4 | 3 | 1.6 | 4.4 | 50 | 6 |
| 4STMS 016 055 S06 M022 | M2.2 | 0.45 | 4 | 3 | 1.6 | 5.5 | 50 | 6 |
| 4STMS 018 050 S06 M025 | M2.5 | 0.45 | 4 | 3 | 1.8 | 5 | 50 | 6 |
| 4STMS 018 0625 S06 M025 | M2.5 | 0.45 | 4 | 3 | 1.8 | 6.25 | 50 | 6 |
| 4STMS 0195 077 S03 M025 | M2.5 | 0.45 | 4 | 3 | 1.95 | 7.7 | 40 | 3 |
| 4STMS 0195 077 S06 M025 | M2.5 | 0.45 | 4 | 3 | 1.95 | 7.7 | 60 | 6 |
| 4STMS 024 060 S06 M3 | M3 | 0.5 | 4 | 3 | 2.4 | 6 | 50 | 6 |
| 4STMS 024 075 S06 M3 | M3 | 0.5 | 4 | 3 | 2.4 | 7.5 | 50 | 6 |
| 4STMS 024 092 S03 M3 | M3 | 0.5 | 4 | 3 | 2.4 | 9.2 | 40 | 3 |
| 4STMS 024 092 S06 M3 | M3 | 0.5 | 4 | 3 | 2.4 | 9.2 | 60 | 6 |
| 4STMS 0275 108 S06 M3.5 | M3.5 | 0.6 | 4 | 3 | 2.75 | 10.8 | 60 | 6 |
| 4STMS 031 080 S06 M4 | M4 | 0.7 | 4 | 3 | 3.1 | 8 | 50 | 6 |
| 4STMS 031 100 S06 M4 | M4 | 0.7 | 4 | 3 | 3.1 | 10 | 50 | 6 |
| 4STMS 0315 123 S06 M4 | M4 | 0.7 | 4 | 3 | 3.15 | 12.3 | 60 | 6 |
| 4STMS 038 100 S06 M5 | M5 | 0.8 | 4 | 3 | 3.8 | 10 | 50 | 6 |
| 4STMS 038 125 S06 M5 | M5 | 0.8 | 4 | 3 | 3.8 | 12.5 | 50 | 6 |
| 4STMS 0405 154 S06 M5 | M5 | 0.8 | 4 | 3 | 4.05 | 15.4 | 60 | 6 |
| 4STMS 046 120 S06 M6 | M6 | 1 | 4 | 3 | 4.6 | 12 | 50 | 6 |
| 4STMS 046 150 S06 M6 | M6 | 1 | 4 | 3 | 4.6 | 15 | 50 | 6 |
| 4STMS 048 185 S06 M6 | M6 | 1 | 4 | 3 | 4.8 | 18.5 | 60 | 6 |
| 4STMS 062 160 S10 M8 | M8 | 1.25 | 4 | 3 | 6.2 | 16 | 70 | 10 |
| 4STMS 062 200 S10 M8 | M8 | 1.25 | 4 | 3 | 6.2 | 20 | 70 | 10 |
| 4STMS 065 246 S08 M8 | M8 | 1.25 | 4 | 3 | 6.5 | 24.6 | 65 | 8 |
| 4STMS 075 200 S10 M10 | M10 | 1.5 | 4 | 3 | 7.5 | 20 | 70 | 10 |
| 4STMS 075 250 S10 M10 | M10 | 1.5 | 4 | 3 | 7.5 | 25 | 70 | 10 |
| 4STMS 082 308 S10 M10 | M10 | 1.5 | 4 | 3 | 8.2 | 30.8 | 80 | 10 |
| 4STMS 090 240 S10 M12 | M12 | 1.75 | 4 | 3 | 9 | 24 | 80 | 10 |
| 4STMS 090 300 S10 M12 | M12 | 1.75 | 4 | 3 | 9 | 30 | 80 | 10 |
| 4STMS 099 370 S10 M12 | M12 | 1.75 | 4 | 3 | 9.9 | 37 | 85 | 10 |
| 4STMS 115 320 S12 M16 | M16 | 2 | 4 | 3 | 11.5 | 32 | 100 | 12 |
| 4STMS 115 400 S12 M16 | M16 | 2 | 4 | 3 | 11.5 | 40 | 100 | 12 |
| 4STMS 119 490 S12 M16 | M16 | 2 | 4 | 3 | 11.9 | 49 | 95 | 12 |

## ISO 측정항목

단위 Unit : mm

| Order Number | 나사 가능 규격<br>Thread | 피치 규격<br>Pitch | 날수<br>Flutes<br>Z | 산수<br>Teeth<br>Zt | 날경<br>Diameter<br>D | 유효장<br>Effective Length<br>L2 | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d |
|---|---|---|---|---|---|---|---|---|
| 외부 급유형 (Without coolant) | | | | | | | | |
| 4STMS 140 360 S16 M18 | M18 | 2.5 | 4 | 3 | 14 | 36 | 135 | 16 |
| 4STMS 140 450 S16 M18 | M18 | 2.5 | 4 | 3 | 14 | 45 | 135 | 16 |
| 4STMS 150 400 S16 M20 | M20 | 2.5 | 4 | 3 | 15 | 40 | 135 | 16 |
| 4STMS 150 500 S16 M20 | M20 | 2.5 | 4 | 3 | 15 | 50 | 135 | 16 |
| 4STMS 159 613 S16 M20 | M20 | 2.5 | 4 | 3 | 15.9 | 61.3 | 115 | 16 |
| 내부 급유형 (With coolant) | | | | | | | | |
| 4STMS 031 080 S06 M4C | M4 | 0.7 | 4 | 3 | 3.1 | 8 | 50 | 6 |
| 4STMS 031 100 S06 M4C | M4 | 0.7 | 4 | 3 | 3.1 | 10 | 50 | 6 |
| 4STMS 038 100 S06 M5C | M5 | 0.8 | 4 | 3 | 3.8 | 10 | 50 | 6 |
| 4STMS 038 125 S06 M5C | M5 | 0.8 | 4 | 3 | 3.8 | 12.5 | 50 | 6 |
| 4STMS 046 120 S06 M6C | M6 | 1 | 4 | 3 | 4.6 | 12 | 50 | 6 |
| 4STMS 046 150 S06 M6C | M6 | 1 | 4 | 3 | 4.6 | 15 | 50 | 6 |
| 4STMS 048 185 S06 M6C | M6 | 1 | 4 | 3 | 4.8 | 18.5 | 60 | 6 |
| 4STMS 062 160 S10 M8C | M8 | 1.25 | 4 | 3 | 6.2 | 16 | 70 | 10 |
| 4STMS 062 200 S10 M8C | M8 | 1.25 | 4 | 3 | 6.2 | 20 | 70 | 10 |
| 4STMS 065 246 S08 M8C | M8 | 1.25 | 4 | 3 | 6.5 | 24.6 | 65 | 8 |
| 4STMS 075 200 S10 M10C | M10 | 1.5 | 4 | 3 | 7.5 | 20 | 70 | 10 |
| 4STMS 075 250 S10 M10C | M10 | 1.5 | 4 | 3 | 7.5 | 25 | 70 | 10 |
| 4STMS 082 308 S10 M10C | M10 | 1.5 | 4 | 3 | 8.2 | 30.8 | 80 | 10 |
| 4STMS 090 240 S10 M12C | M12 | 1.75 | 4 | 3 | 9 | 24 | 80 | 10 |
| 4STMS 090 300 S10 M12C | M12 | 1.75 | 4 | 3 | 9 | 30 | 80 | 10 |
| 4STMS 099 370 S10 M12C | M12 | 1.75 | 4 | 3 | 9.9 | 37 | 85 | 10 |
| 4STMS 115 320 S12 M16C | M16 | 2 | 4 | 3 | 11.5 | 32 | 100 | 12 |
| 4STMS 115 400 S12 M16C | M16 | 2 | 4 | 3 | 11.5 | 40 | 100 | 12 |
| 4STMS 119 490 S12 M16C | M16 | 2 | 4 | 3 | 11.9 | 49 | 95 | 12 |
| 4STMS 140 360 S16 M18C | M18 | 2.5 | 4 | 3 | 14 | 36 | 135 | 16 |
| 4STMS 140 450 S16 M18C | M18 | 2.5 | 4 | 3 | 14 | 45 | 135 | 16 |
| 4STMS 150 400 S16 M20C | M20 | 2.5 | 4 | 3 | 15 | 40 | 135 | 16 |
| 4STMS 150 500 S16 M20C | M20 | 2.5 | 4 | 3 | 15 | 50 | 135 | 16 |
| 4STMS 159 613 S16 M20C | M20 | 2.5 | 4 | 3 | 15.9 | 61.3 | 115 | 16 |

# 4STMS

4 Flutes Short Flute Thread Mills for Stainless Steel

## 4날 SUS 가공용 짧은 날 쓰레드밀

### American UN

단위 Unit : mm

외부급유형(Without coolant)

| Order Number | 나사 가능 규격 Thread UNC | UNF | 피치규격 Pitch | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|
| 4STMS 014 037 S06 | No.1-64 | | 64 | 4 | 3 | 1.4 | 3.7 | 50 | 6 |
| 4STMS 014 046 S06 | No.1-64 | | 64 | 4 | 3 | 1.4 | 4.6 | 50 | 6 |
| 4STMS 0165 044 S06 | No.2-56 | | 56 | 4 | 3 | 1.65 | 4.4 | 50 | 6 |
| 4STMS 0165 055 S06 | No.2-56 | | 56 | 4 | 3 | 1.65 | 5.5 | 50 | 6 |
| 4STMS 019 050 S06 | No. 3-48 | | 48 | 4 | 3 | 1.9 | 5 | 50 | 6 |
| 4STMS 019 063 S06 | No. 3-48 | | 48 | 4 | 3 | 1.9 | 6.3 | 50 | 6 |
| 4STMS 021 057 S06 | No. 4-40 | | 40 | 4 | 3 | 2.1 | 5.7 | 50 | 6 |
| 4STMS 021 071 S06 | No. 4-40 | | 40 | 4 | 3 | 2.1 | 7.1 | 50 | 6 |
| 4STMS 0255 070 S06 | No. 6-32 | | 32 | 4 | 3 | 2.55 | 7 | 50 | 6 |
| 4STMS 0255 088 S06 | No. 6-32 | | 32 | 4 | 3 | 2.55 | 8.8 | 50 | 6 |
| 4STMS 033 083 S06 | | No. 8-36 | 36 | 4 | 3 | 3.3 | 8.3 | 50 | 6 |
| 4STMS 033 104 S06 | | No. 8-36 | 36 | 4 | 3 | 3.3 | 10.4 | 50 | 6 |
| 4STMS 035 097 S06 | No. 10-24 | | 24 | 4 | 3 | 3.5 | 9.7 | 65 | 6 |
| 4STMS 035 121 S06 | No. 10-24 | | 24 | 4 | 3 | 3.5 | 12.1 | 65 | 6 |
| 4STMS 0475 127 S06 | 1/4″ x 20 | | 20 | 4 | 3 | 4.75 | 12.7 | 65 | 6 |
| 4STMS 0475 159 S06 | 1/4″ x 20 | | 20 | 4 | 3 | 4.75 | 15.9 | 65 | 6 |
| 4STMS 050 127 S06 | | 1/4″ x 28 | 28 | 4 | 3 | 5 | 12.7 | 65 | 6 |
| 4STMS 050 159 S06 | | 1/4″ x 28 | 28 | 4 | 3 | 5 | 15.9 | 65 | 6 |
| 4STMS 060 159 S10 | 5/16″ x 18 | | 18 | 4 | 3 | 6 | 15.9 | 80 | 10 |
| 4STMS 060 198 S10 | 5/16″ x 18 | | 18 | 4 | 3 | 6 | 19.8 | 80 | 10 |
| 4STMS 067 191 S10 | 3/8″ x 16 | | 16 | 4 | 3 | 6.7 | 19.1 | 80 | 10 |
| 4STMS 067 238 S10 | 3/8″ x 16 | | 16 | 4 | 3 | 6.7 | 23.8 | 80 | 10 |
| 4STMS 077 222 S10 | 7/16″ x 14 | | 14 | 4 | 3 | 7.7 | 22.2 | 80 | 10 |
| 4STMS 077 278 S10 | 7/16″ x 14 | | 14 | 4 | 3 | 7.7 | 27.8 | 80 | 10 |
| 4STMS 092 254 S10 | 1/2″ x 13 | | 13 | 4 | 3 | 9.2 | 25.4 | 80 | 10 |
| 4STMS 092 318 S10 | 1/2″ x 13 | | 13 | 4 | 3 | 9.2 | 31.8 | 80 | 10 |
| 4STMS 105 286 S12 | 9/16″ x 12 | | 12 | 4 | 3 | 10.5 | 28.6 | 100 | 12 |
| 4STMS 105 357 S12 | 9/16″ x 12 | | 12 | 4 | 3 | 10.5 | 35.7 | 100 | 12 |
| 4STMS 114 318 S12 | 5/8″ x 11 | | 11 | 4 | 3 | 11.4 | 31.8 | 100 | 12 |
| 4STMS 14 397 S12 | 5/8″ x 11 | | 11 | 4 | 3 | 11.4 | 39.7 | 100 | 12 |

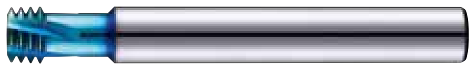
내부급유형(With coolant)

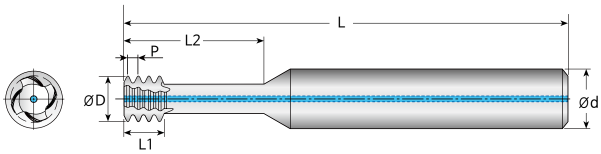
| Order Number | UNC | UNF | Pitch | Z | Zt | D | L2 | L | d |
|---|---|---|---|---|---|---|---|---|---|
| 4STMS 033 083 S06C | | No. 8-36 | 36 | 4 | 3 | 3.3 | 8.3 | 50 | 6 |
| 4STMS 033 104 S06C | | No. 8-36 | 36 | 4 | 3 | 3.3 | 10.4 | 50 | 6 |
| 4STMS 035 097 S06C | No. 10-24 | | 24 | 4 | 3 | 3.5 | 9.7 | 65 | 6 |
| 4STMS 035 121 S06C | No. 10-24 | | 24 | 4 | 3 | 3.5 | 12.1 | 65 | 6 |
| 4STMS 0475 127 S06C | 1/4″ x 20 | | 20 | 4 | 3 | 4.75 | 12.7 | 65 | 6 |
| 4STMS 0475 159 S06C | 1/4″ x 20 | | 20 | 4 | 3 | 4.75 | 15.9 | 65 | 6 |
| 4STMS 050 127 S06C | | 1/4″ x 28 | 28 | 4 | 3 | 5 | 12.7 | 65 | 6 |
| 4STMS 050 159 S06C | | 1/4″ x 28 | 28 | 4 | 3 | 5 | 15.9 | 65 | 6 |
| 4STMS 060 159 S10C | 5/16″ x 18 | | 18 | 4 | 3 | 6 | 15.9 | 80 | 10 |
| 4STMS 060 198 S10C | 5/16″ x 18 | | 18 | 4 | 3 | 6 | 19.8 | 80 | 10 |
| 4STMS 067 191 S10C | 3/8″ x 16 | | 16 | 4 | 3 | 6.7 | 19.1 | 80 | 10 |
| 4STMS 067 238 S10C | 3/8″ x 16 | | 16 | 4 | 3 | 6.7 | 23.8 | 80 | 10 |
| 4STMS 077 222 S10C | 7/16″ x 14 | | 14 | 4 | 3 | 7.7 | 22.2 | 80 | 10 |
| 4STMS 077 278 S10C | 7/16″ x 14 | | 14 | 4 | 3 | 7.7 | 27.8 | 80 | 10 |
| 4STMS 092 254 S10C | 1/2″ x 13 | | 13 | 4 | 3 | 9.2 | 25.4 | 80 | 10 |
| 4STMS 092 318 S10C | 1/2″ x 13 | | 13 | 4 | 3 | 9.2 | 31.8 | 80 | 10 |
| 4STMS 105 286 S12C | 9/16″ x 12 | | 12 | 4 | 3 | 10.5 | 28.6 | 100 | 12 |
| 4STMS 105 357 S12C | 9/16″ x 12 | | 12 | 4 | 3 | 10.5 | 35.7 | 100 | 12 |
| 4STMS 114 318 S12C | 5/8″ x 11 | | 11 | 4 | 3 | 11.4 | 31.8 | 100 | 12 |
| 4STMS 114 397 S12C | 5/8″ x 11 | | 11 | 4 | 3 | 11.4 | 39.7 | 100 | 12 |

# 4BSP

## 4 Flutes Pipe Short Parallel Thread Mills for Multi Purpose

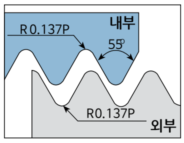
## 4날 범용 관용 평행 나사 가공 짧은 날 쓰레드밀






- **HRc 58이하의 고경도강, 프리하든강, 합금강, 탄소강, 주철 가공**
- 경화강 내 나사 가공을 위한 견고하고 강력한 날 디자인.
- 향상된 절삭 및 칩 제거를 통해 공구 성능을 향상 시킵니다.
- 팁 형상은 절삭 저항을 줄이고 공구 구부림을 억제합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for Hardened steels(up to HRc 58), pre-hardened steels, alloy steels, carbon steels, cast irons**
- Rigid and powerful flutes design for inside hardening steel.
- Enhanced threading enables chip removal smoothly to reduce possible brekage of tool inside hole.
- The shape of tip reduces fraction and prevent tool bending.
- Both right and left threading are available.




- 규격 정의 : B.S.2779:1956
- 공차 등급 : Medium class


529P

### American UN

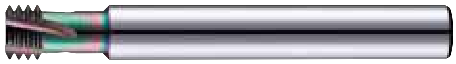
단위 Unit: mm

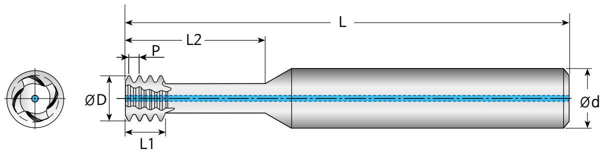
| Order Number | 나사 가능 규격<br>Thread | 피치 규격<br>Pitch (TPI) | 날수<br>Flutes<br>Z | 산수<br>Teeth<br>Zt | 날경<br>Diameter<br>D | 나사부 길이<br>Thread Length<br>L1 | 유효장<br>Effective Length<br>L2 | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | **외부 급유형 (Without coolant)** |
| **4BSP 060 095 S06** | 1/16″, 1/8″ | 28 | 4 | 4 | 6 | 3.66 | 9.5 | 60 | 6 |
| **4BSP 060 158 S06** | 1/16″, 1/8″ | 28 | 4 | 4 | 6 | 3.66 | 15.8 | 60 | 6 |
| **4BSP 080 140 S08** | 1/4″, 3/8″ | 19 | 4 | 4 | 8 | 5.38 | 14 | 65 | 8 |
| **4BSP 100 206 S10** | 1/4″, 3/8″ | 19 | 4 | 4 | 10 | 5.38 | 20.6 | 75 | 10 |
| **4BSP 120 265 S12** | 1/2″, 5/8″, 3/4″ | 14 | 4 | 4 | 12 | 7.29 | 26.5 | 80 | 12 |
| **4BSP 140 260 S14** | 3/8″ | 19 | 4 | 4 | 14 | 5.38 | 26 | 85 | 14 |
| **4BSP 140 334 S16** | 1/2″, 5/8″, 3/4″, 7/8″ | 14 | 4 | 4 | 16 | 7.29 | 33.4 | 95 | 16 |
| **4BSP 160 380 S16** | 1″, 1 1/4″, 1 1/2″, 2″ | 11 | 4 | 4 | 16 | 9.27 | 38 | 105 | 16 |
| **4BSP 160 517 S16** | 1″, 1 1/4″, 1 1/2″, 2″, 2 1/2″ | 11 | 4 | 4 | 16 | 9.27 | 51.7 | 120 | 16 |
| | | | | | | | | | **내부 급유형 (With coolant)** |
| **4BSP 060 095 S06C** | 1/16″, 1/8″ | 28 | 4 | 4 | 6 | 3.66 | 9.5 | 60 | 6 |
| **4BSP 060 158 S06C** | 1/16″, 1/8″ | 28 | 4 | 4 | 6 | 3.66 | 15.8 | 60 | 6 |
| **4BSP 080 140 S08C** | 1/4″, 3/8″ | 19 | 4 | 4 | 8 | 5.38 | 14 | 65 | 8 |
| **4BSP 100 206 S10C** | 1/4″, 3/8″ | 19 | 4 | 4 | 10 | 5.38 | 20.6 | 75 | 10 |
| **4BSP 120 265 S12C** | 1/2″, 5/8″, 3/4″ | 14 | 4 | 4 | 12 | 7.29 | 26.5 | 80 | 12 |
| **4BSP 140 260 S14C** | 3/8″ | 19 | 4 | 4 | 14 | 5.38 | 26 | 85 | 14 |
| **4BSP 140 334 S16C** | 1/2″, 5/8″, 3/4″, 7/8″ | 14 | 4 | 4 | 16 | 7.29 | 33.4 | 95 | 16 |
| **4BSP 160 380 S16C** | 1″, 1 1/4″, 1 1/2″, 2″ | 11 | 4 | 4 | 16 | 9.27 | 38 | 105 | 16 |
| **4BSP 160 517 S16C** | 1″, 1 1/4″, 1 1/2″, 2″, 2 1/2″ | 11 | 4 | 4 | 16 | 9.27 | 51.7 | 120 | 16 |

# 4BSPA

*4 Flutes Pipe Short Parallel Thread Mills for Aluminum*

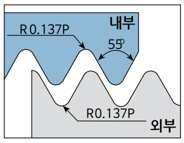
## 4날 알루미늄 관용 평행 나사 가공 짧은 날 쓰레드밀






- **알루미늄, 알루미늄 합금 등 비철 비금속 가공**
- 경화강 내 나사 가공을 위한 견고하고 강력한 날 디자인.
- 향상된 절삭 및 칩제거를 통해 공구 성능을 향상 시킵니다.
- 팁 형상은 절삭 저항을 줄이고 공구 구부림을 억제합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for Aluminum, Aluminum alloys, non-ferrous, and non-metallic materials**
- Rigid and powerful flutes design for inside hardening steel.
- Enhanced threading enables chip removal smoothly to reduce possible brekage of tool inside hole.
- The shape of tip reduces fraction and prevent tool bending.
- Both right and left threading are available.




- 규격 정의 : B.S.2779:1956
- 공차 등급 : Medium class


### American UN

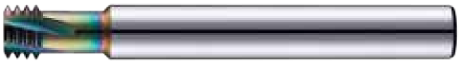
단위 Unit : mm

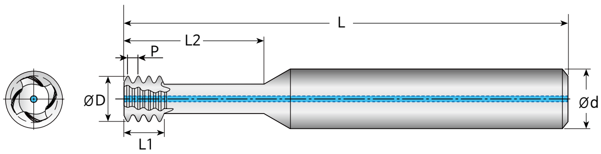
| Order Number | 나사 가능 규격<br>Thread | 피치 규격<br>Pitch (TPI) | 날수<br>Flutes<br>Z | 산수<br>Teeth<br>Zt | 날경<br>Diameter<br>D | 나사부 길이<br>Thread Length<br>L1 | 유효장<br>Effective Length<br>L2 | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d |
|---|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | | |
| 4BSPA 060 095 S06 | 1/16″, 1/8″ | 28 | 4 | 4 | 6 | 3.66 | 9.5 | 60 | 6 |
| 4BSPA 060 158 S06 | 1/16″, 1/8″ | 28 | 4 | 4 | 6 | 3.66 | 15.8 | 60 | 6 |
| 4BSPA 080 140 S08 | 1/4″, 3/8″ | 19 | 4 | 4 | 8 | 5.38 | 14 | 65 | 8 |
| 4BSPA 100 206 S10 | 1/4″, 3/8″ | 19 | 4 | 4 | 10 | 5.38 | 20.6 | 75 | 10 |
| 4BSPA 120 265 S12 | 1/2″, 5/8″, 3/4″ | 14 | 4 | 4 | 12 | 7.29 | 26.5 | 80 | 12 |
| 4BSPA 140 260 S14 | 3/8″ | 19 | 4 | 4 | 14 | 5.38 | 26 | 85 | 14 |
| 4BSPA 140 334 S16 | 1/2″, 5/8″, 3/4″, 7/8″ | 14 | 4 | 4 | 16 | 7.29 | 33.4 | 95 | 16 |
| 4BSPA 160 380 S16 | 1″, 1 1/4″, 1 1/2″, 2″ | 11 | 4 | 4 | 16 | 9.27 | 38 | 105 | 16 |
| 4BSPA 160 517 S16 | 1″, 1 1/4″, 1 1/2″, 2″, 2 1/2″ | 11 | 4 | 4 | 16 | 9.27 | 51.7 | 120 | 16 |
| **내부 급유형 (With coolant)** | | | | | | | | | |
| 4BSPA 060 095 S06C | 1/16", 1/8" | 28 | 4 | 4 | 6 | 3.66 | 9.5 | 60 | 6 |
| 4BSPA 060 158 S06C | 1/16", 1/8" | 28 | 4 | 4 | 6 | 3.66 | 15.8 | 60 | 6 |
| 4BSPA 080 140 S08C | 1/4", 3/8" | 19 | 4 | 4 | 8 | 5.38 | 14 | 65 | 8 |
| 4BSPA 100 206 S10C | 1/4", 3/8" | 19 | 4 | 4 | 10 | 5.38 | 20.6 | 75 | 10 |
| 4BSPA 120 265 S12C | 1/2", 5/8", 3/4" | 14 | 4 | 4 | 12 | 7.29 | 26.5 | 80 | 12 |
| 4BSPA 140 260 S14C | 3/8" | 19 | 4 | 4 | 14 | 5.38 | 26 | 85 | 14 |
| 4BSPA 140 334 S16C | 1/2", 5/8", 3/4", 7/8" | 14 | 4 | 4 | 16 | 7.29 | 33.4 | 95 | 16 |
| 4BSPA 160 380 S16C | 1", 1 1/4", 1 1/2", 2" | 11 | 4 | 4 | 16 | 9.27 | 38 | 105 | 16 |
| 4BSPA 160 517 S16C | 1", 1 1/4", 1 1/2", 2", 2 1/2" | 11 | 4 | 4 | 16 | 9.27 | 51.7 | 120 | 16 |

# 4BSPS

*4 Flutes Pipe Short Parallel Thread Mills for Stainless Steel*

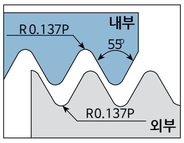
## 4날 SUS 관용 평행 나사 가공 짧은 날 쓰레드밀






- **SUS, 티타늄 합금 가공**
- 경화강 내 나사 가공을 위한 견고하고 강력한 날 디자인.
- 향상된 절삭 및 칩 제거를 통해 공구 성능을 향상 시킵니다.
- 팁 형상은 절삭 저항을 줄이고 공구 구부림을 억제합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for SUS and Titanium alloys**
- Rigid and powerful flutes design for inside hardening steel.
- Enhanced threading enables chip removal smoothly to reduce possible brekage of tool inside hole.
- The shape of tip reduces fraction and prevent tool bending.
- Both right and left threading are available.




- 규격 정의 : B.S.2779:1956
- 공차 등급 : Medium class


529P

### American UN

단위 Unit: mm

**외부 급유형 (Without coolant)**

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|
| 4BSPS 060 095 S06 | 1/16″, 1/8″ | 28 | 4 | 4 | 6 | 3.66 | 9.5 | 60 | 6 |
| 4BSPS 060 158 S06 | 1/16″, 1/8″ | 28 | 4 | 4 | 6 | 3.66 | 15.8 | 60 | 6 |
| 4BSPS 080 140 S08 | 1/4″, 3/8″ | 19 | 4 | 4 | 8 | 5.38 | 14 | 65 | 8 |
| 4BSPS 100 206 S10 | 1/4″, 3/8″ | 19 | 4 | 4 | 10 | 5.38 | 20.6 | 75 | 10 |
| 4BSPS 120 265 S12 | 1/2″, 5/8″, 3/4″ | 14 | 4 | 4 | 12 | 7.29 | 26.5 | 80 | 12 |
| 4BSPS 140 260 S14 | 3/8″ | 19 | 4 | 4 | 14 | 5.38 | 26 | 85 | 14 |
| 4BSPS 140 334 S16 | 1/2″, 5/8″, 3/4″, 7/8″ | 14 | 4 | 4 | 16 | 7.29 | 33.4 | 95 | 16 |
| 4BSPS 160 380 S16 | 1″, 1 1/4″, 1 1/2″, 2″ | 11 | 4 | 4 | 16 | 9.27 | 38 | 105 | 16 |
| 4BSPS 160 517 S16 | 1″, 1 1/4″, 1 1/2″, 2″, 2 1/2″ | 11 | 4 | 4 | 16 | 9.27 | 51.7 | 120 | 16 |

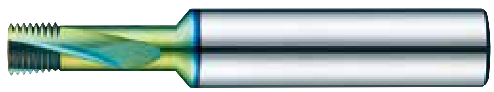
**내부 급유형 (With coolant)**

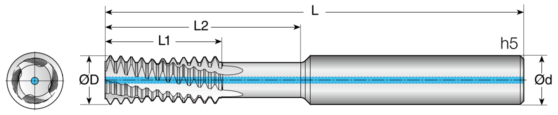
| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|
| 4BSPS 060 095 S06C | 1/16", 1/8" | 28 | 4 | 4 | 6 | 3.66 | 9.5 | 60 | 6 |
| 4BSPS 060 158 S06C | 1/16", 1/8" | 28 | 4 | 4 | 6 | 3.66 | 15.8 | 60 | 6 |
| 4BSPS 080 140 S08C | 1/4", 3/8" | 19 | 4 | 4 | 8 | 5.38 | 14 | 65 | 8 |
| 4BSPS 100 206 S10C | 1/4", 3/8" | 19 | 4 | 4 | 10 | 5.38 | 20.6 | 75 | 10 |
| 4BSPS 120 265 S12C | 1/2", 5/8", 3/4" | 14 | 4 | 4 | 12 | 7.29 | 26.5 | 80 | 12 |
| 4BSPS 140 260 S14C | 3/8" | 19 | 4 | 4 | 14 | 5.38 | 26 | 85 | 14 |
| 4BSPS 140 334 S16C | 1/2", 5/8", 3/4", 7/8" | 14 | 4 | 4 | 16 | 7.29 | 33.4 | 95 | 16 |
| 4BSPS 160 380 S16C | 1", 1 1/4", 1 1/2", 2" | 11 | 4 | 4 | 16 | 9.27 | 38 | 105 | 16 |
| 4BSPS 160 517 S16C | 1", 1 1/4", 1 1/2", 2", 2 1/2" | 11 | 4 | 4 | 16 | 9.27 | 51.7 | 120 | 16 |

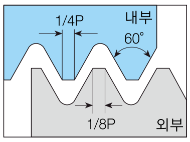
# 4HTM

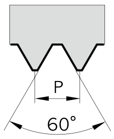
*4 Flutes Helix Thread Mills for Multi Purpose*

## 4날 범용 헬릭스 쓰레드밀






- **HRc 48이하의 고경도강, 프리하든강, 합금강, 탄소강, 주철 가공**
- 깊은 나사 가공을 위한 쿨런트 타입 헬리컬 날
- 다중 날 로 구성되어 한번에 여러 나사산 생성으로 시간단축이 가능합니다.
- 최대 나사 가공깊이 : 3xD2 (나사가공 직경)
- 헬리코일 나사 가공이 가능합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for Hardened steel (up to HRc 48), pre-hardened steels, alloy steels, carbon steels, cast irons**
- Coolant type of helix flutes for deep threading.
- With multiple flutes composition, it shortens threading time.
- Maximum drilling depth: 3*D2 (Threading diameter)
- It can be used for heli coil threading.
- Both right and left threading are available.


530P

### ISO 측정항목

단위 Unit : mm

| Order Number | 나사 가능 규격<br>Thread | 피치 규격<br>Pitch | 기초홀 직경<br>Guide Hole<br>mm | 날경<br>Diameter<br>D | 나사부 길이<br>Thread Length<br>L1 | 유효장<br>Effective Length<br>L2 | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d |
|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | |
| **4HTM 0315 120 S04 M4** | M4 | 0.7 | 3.3 | 3.15 | 6.6 | 12 | 45 | 4 |
| **4HTM 039 150 S04 M5** | M5 | 0.8 | 4.2 | 3.9 | 7.6 | 15 | 50 | 4 |
| **4HTM 048 180 S06 M6** | M6 | 1 | 5 | 4.8 | 9.5 | 18 | 60 | 6 |
| **4HTM 065 240 S08 M8** | M8 | 1.25 | 6.8 | 6.5 | 13.1 | 24 | 65 | 8 |
| **4HTM 082 300 S10 M10** | M10 | 1.5 | 8.5 | 8.2 | 15.7 | 30 | 75 | 10 |
| **4HTM 099 360 S10 M12** | M12 | 1.75 | 10.2 | 9.9 | 18.4 | 36 | 85 | 10 |
| **4HTM 116 420 S12 M14** | M14 | 2 | 12 | 11.6 | 21 | 42 | 90 | 12 |
| **4HTM 136 480 S14 M16** | M16 | 2 | 14 | 13.6 | 25 | 48 | 100 | 14 |
| **내부 급유형 (With coolant)** | | | | | | | | |
| **4HTM 0315 120 S04 M4C** | M4 | 0.7 | 3.3 | 3.15 | 6.6 | 12 | 45 | 4 |
| **4HTM 039 150 S04 M5C** | M5 | 0.8 | 4.2 | 3.9 | 7.6 | 15 | 50 | 4 |
| **4HTM 048 180 S06 M6C** | M6 | 1 | 5 | 4.8 | 9.5 | 18 | 60 | 6 |
| **4HTM 065 240 S08 M8C** | M8 | 1.25 | 6.8 | 6.5 | 13.1 | 24 | 65 | 8 |
| **4HTM 082 300 S10 M10C** | M10 | 1.5 | 8.5 | 8.2 | 15.7 | 30 | 75 | 10 |
| **4HTM 099 360 S10 M12C** | M12 | 1.75 | 10.2 | 9.9 | 18.4 | 36 | 85 | 10 |
| **4HTM 116 420 S12 M14C** | M14 | 2 | 12 | 11.6 | 21 | 42 | 90 | 12 |
| **4HTM 136 480 S14 M16C** | M16 | 2 | 14 | 13.6 | 25 | 48 | 100 | 14 |

## American UN

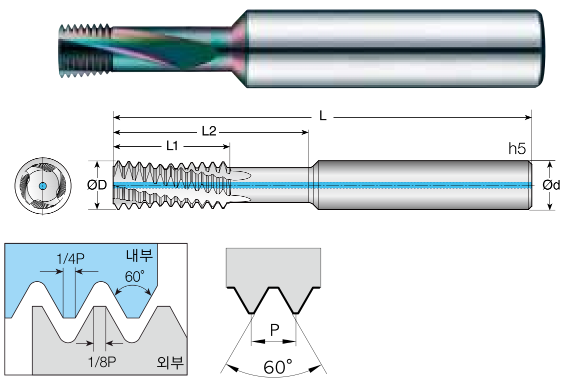
단위 Unit : mm

| Order Number | 나사 가능 규격 Thread UNC | UNF | 피치 규격 Pitch | 날경 Diameter D | 나사부 길이 Thread Length L1 | 나사 산수 Number of threads | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | | |
| **4HTM 0358 1585 S04** | No.10-24 | | 24 | 3.58 | 8.46 | 8 | 15.85 | 45 | 4 |
| **4HTM 0414 1798 S06** | No.12-24 | | 24 | 4.14 | 9.6 | 9 | 17.98 | 65 | 6 |
| **4HTM 0488 1905 S06** | 1/4″ x 20 | | 20 | 4.88 | 10.21 | 8 | 19.05 | 65 | 6 |
| **4HTM 0516 1905 S06** | | 1/4″ x 28 | 28 | 5.16 | 10.01 | 11 | 19.05 | 65 | 6 |
| **4HTM 0615 2398 S08** | 5/16″ x 18 | | 18 | 6.15 | 12.7 | 9 | 23.98 | 65 | 8 |
| **4HTM 0765 3018 S08** | 3/8″ x 16 | | 16 | 7.65 | 15.9 | 10 | 30.18 | 65 | 8 |
| **4HTM 0899 3444 S10** | 7/16 x 14 | | 14 | 8.99 | 18.16 | 10 | 34.44 | 75 | 10 |
| **4HTM 1034 4105 S12** | 1/2″ x 13 | | 13 | 10.34 | 19.58 | 10 | 41.05 | 80 | 12 |
| **4HTM 1181 4445 S12** | 9/16″ x 12 | | 12 | 11.81 | 23.29 | 11 | 44.45 | 80 | 12 |
| **내부 급유형 (With coolant)** | | | | | | | | | |
| **4HTM 0358 1585 S04C** | No.10-24 | | 24 | 3.58 | 8.46 | 8 | 15.85 | 45 | 4 |
| **4HTM 0414 1798 S06C** | No.12-24 | | 24 | 4.14 | 9.6 | 9 | 17.98 | 65 | 6 |
| **4HTM 0488 1905 S06C** | 1/4″ x 20 | | 20 | 4.88 | 10.21 | 8 | 19.05 | 65 | 6 |
| **4HTM 0516 1905 S06C** | | 1/4″ x 28 | 28 | 5.16 | 10.01 | 11 | 19.05 | 65 | 6 |
| **4HTM 0615 2398 S08C** | 5/16″ x 18 | | 18 | 6.15 | 12.7 | 9 | 23.98 | 65 | 8 |
| **4HTM 0765 3018 S08C** | 3/8″ x 16 | | 16 | 7.65 | 15.9 | 10 | 30.18 | 65 | 8 |
| **4HTM 0899 3444 S10C** | 7/16 x 14 | | 14 | 8.99 | 18.16 | 10 | 34.44 | 75 | 10 |
| **4HTM 1034 4105 S12C** | 1/2″ x 13 | | 13 | 10.34 | 19.58 | 10 | 41.05 | 80 | 12 |
| **4HTM 1181 4445 S12C** | 9/16″ x 12 | | 12 | 11.81 | 23.29 | 11 | 44.45 | 80 | 12 |

# 4HTMA

4 Flutes Helix Thread Mills for Aluminum

## 4날 알루미늄 전용 헬릭스 쓰레드밀




- 알루미늄, 알루미늄 합금 등 비철 비금속 가공
- 깊은 나사 가공을 위한 쿨런트 타입 헬리컬 날
- 다중 날 로 구성되어 한번에 여러 나사산 생성으로 시간단축이 가능합니다.
- 최대 나사 가공깊이 : 3xD2 (나사가공 직경)
- 헬리코일 나사 가공이 가능합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- Thread Mills for Aluminum, Aluminum alloys, non-ferrous and non-metalic materials
- Coolant type of helix flutes for deep threading.
- With multiple flutes composition, it shortens threading time.
- Maximum drilling depth: 3*D2 (Threading diameter)
- It can be used for heli coil threading.
- Both right and left threading are available.


530P

ISO 측정항목

단위 Unit: mm

외부 급유형 (Without coolant)

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch | 기초홀 직경 Guide Hole mm | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| 4HTMA 0315 120 S04 M4 | M4 | 0.7 | 3.3 | 3.15 | 6.6 | 12 | 45 | 4 |
| 4HTMA 039 150 S04 M5 | M5 | 0.8 | 4.2 | 3.9 | 7.6 | 15 | 50 | 4 |
| 4HTMA 048 180 S06 M6 | M6 | 1 | 5 | 4.8 | 9.5 | 18 | 60 | 6 |
| 4HTMA 065 240 S08 M8 | M8 | 1.25 | 6.8 | 6.5 | 13.1 | 24 | 65 | 8 |
| 4HTMA 082 300 S10 M10 | M10 | 1.5 | 8.5 | 8.2 | 15.7 | 30 | 75 | 10 |
| 4HTMA 099 360 S10 M12 | M12 | 1.75 | 10.2 | 9.9 | 18.4 | 36 | 85 | 10 |
| 4HTMA 116 420 S12 M14 | M14 | 2 | 12 | 11.6 | 21 | 42 | 90 | 12 |
| 4HTMA 136 480 S14 M16 | M16 | 2 | 14 | 13.6 | 25 | 48 | 100 | 14 |

내부 급유형 (With coolant)

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch | 기초홀 직경 Guide Hole mm | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| 4HTMA 0315 120 S04 M4C | M4 | 0.7 | 3.3 | 3.15 | 6.6 | 12 | 45 | 4 |
| 4HTMA 039 150 S04 M5C | M5 | 0.8 | 4.2 | 3.9 | 7.6 | 15 | 50 | 4 |
| 4HTMA 048 180 S06 M6C | M6 | 1 | 5 | 4.8 | 9.5 | 18 | 60 | 6 |
| 4HTMA 065 240 S08 M8C | M8 | 1.25 | 6.8 | 6.5 | 13.1 | 24 | 65 | 8 |
| 4HTMA 082 300 S10 M10C | M10 | 1.5 | 8.5 | 8.2 | 15.7 | 30 | 75 | 10 |
| 4HTMA 099 360 S10 M12C | M12 | 1.75 | 10.2 | 9.9 | 18.4 | 36 | 85 | 10 |
| 4HTMA 116 420 S12 M14C | M14 | 2 | 12 | 11.6 | 21 | 42 | 90 | 12 |
| 4HTMA 136 480 S14 M16C | M16 | 2 | 14 | 13.6 | 25 | 48 | 100 | 14 |

## American UN

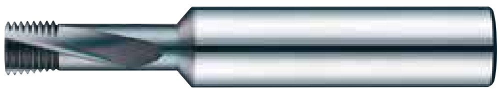
단위 Unit : mm

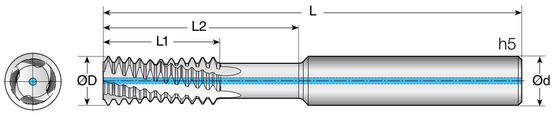
| Order Number | 나사 가능 규격 Thread UNC | UNF | 피치 규격 Pitch | 날경 Diameter D | 나사부 길이 Thread Length L1 | 나사 산수 Number of threads | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | | |
| **4HTMA 0358 1585 S04** | No.10-24 | | 24 | 3.58 | 8.46 | 8 | 15.85 | 45 | 4 |
| **4HTMA 0414 1798 S06** | No.12-24 | | 24 | 4.14 | 9.6 | 9 | 17.98 | 65 | 6 |
| **4HTMA 0488 1905 S06** | 1/4″ x 20 | | 20 | 4.88 | 10.21 | 8 | 19.05 | 65 | 6 |
| **4HTMA 0516 1905 S06** | | 1/4″ x 28 | 28 | 5.16 | 10.01 | 11 | 19.05 | 65 | 6 |
| **4HTMA 0615 2398 S08** | 5/16″ x 18 | | 18 | 6.15 | 12.7 | 9 | 23.98 | 65 | 8 |
| **4HTMA 0765 3018 S08** | 3/8″ x 16 | | 16 | 7.65 | 15.9 | 10 | 30.18 | 65 | 8 |
| **4HTMA 0899 3444 S10** | 7/16 x 14 | | 14 | 8.99 | 18.16 | 10 | 34.44 | 75 | 10 |
| **4HTMA 1034 4105 S12** | 1/2″ x 13 | | 13 | 10.34 | 19.58 | 10 | 41.05 | 80 | 12 |
| **4HTMA 1181 4445 S12** | 9/16″ x 12 | | 12 | 11.81 | 23.29 | 11 | 44.45 | 80 | 12 |
| **내부 급유형 (With coolant)** | | | | | | | | | |
| **4HTMA 0358 1585 S04C** | No.10-24 | | 24 | 3.58 | 8.46 | 8 | 15.85 | 45 | 4 |
| **4HTMA 0414 1798 S06C** | No.12-24 | | 24 | 4.14 | 9.6 | 9 | 17.98 | 65 | 6 |
| **4HTMA 0488 1905 S06C** | 1/4″ x 20 | | 20 | 4.88 | 10.21 | 8 | 19.05 | 65 | 6 |
| **4HTMA 0516 1905 S06C** | | 1/4″ x 28 | 28 | 5.16 | 10.01 | 11 | 19.05 | 65 | 6 |
| **4HTMA 0615 2398 S08C** | 5/16″ x 18 | | 18 | 6.15 | 12.7 | 9 | 23.98 | 65 | 8 |
| **4HTMA 0765 3018 S08C** | 3/8″ x 16 | | 16 | 7.65 | 15.9 | 10 | 30.18 | 65 | 8 |
| **4HTMA 0899 3444 S10C** | 7/16 x 14 | | 14 | 8.99 | 18.16 | 10 | 34.44 | 75 | 10 |
| **4HTMA 1034 4105 S12C** | 1/2″ x 13 | | 13 | 10.34 | 19.58 | 10 | 41.05 | 80 | 12 |
| **4HTMA 1181 4445 S12C** | 9/16″ x 12 | | 12 | 11.81 | 23.29 | 11 | 44.45 | 80 | 12 |

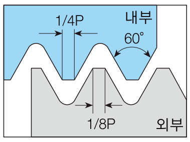
# 4HTMS

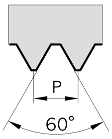
*4 Flutes Helix Thread Mills for Stainless Steels*

## 4날 SUS 가공용 헬릭스 쓰레드밀






- **SUS, 티타늄 합금 가공**
  - 깊은 나사 가공을 위한 쿨런트 타입 헬리컬 날
  - 다중 날 로 구성되어 한번에 여러 나사산 생성으로 시간단축이 가능합니다.
  - 최대 나사 가공깊이 : 3xD2 (나사가공 직경)
  - 헬리코일 나사 가공이 가능합니다.
  - 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread Mills for SUS, Titanium alloys**
  - Coolant type of helix flutes for deep threading.
  - With multiple flutes composition, it shortens threading time.
  - Maximum drilling depth: 3*D2 (Threading diameter)
  - It can be used for heli coil threading.
  - Both right and left threading are available.


530P

ISO 측정항목

단위 Unit : mm

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch | 기초홀 직경 Guide Hole mm | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | |
| **4HTMS 0315 120 S04 M4** | M4 | 0.7 | 3.3 | 3.15 | 6.6 | 12 | 45 | 4 |
| **4HTMS 039 150 S04 M5** | M5 | 0.8 | 4.2 | 3.9 | 7.6 | 15 | 50 | 4 |
| **4HTMS 048 180 S06 M6** | M6 | 1 | 5 | 4.8 | 9.5 | 18 | 60 | 6 |
| **4HTMS 065 240 S08 M8** | M8 | 1.25 | 6.8 | 6.5 | 13.1 | 24 | 65 | 8 |
| **4HTMS 082 300 S10 M10** | M10 | 1.5 | 8.5 | 8.2 | 15.7 | 30 | 75 | 10 |
| **4HTMS 099 360 S10 M12** | M12 | 1.75 | 10.2 | 9.9 | 18.4 | 36 | 85 | 10 |
| **4HTMS 116 420 S12 M14** | M14 | 2 | 12 | 11.6 | 21 | 42 | 90 | 12 |
| **4HTMS 136 480 S14 M16** | M16 | 2 | 14 | 13.6 | 25 | 48 | 100 | 14 |
| **내부 급유형 (With coolant)** | | | | | | | | |
| **4HTMS 0315 120 S04 M4C** | M4 | 0.7 | 3.3 | 3.15 | 6.6 | 12 | 45 | 4 |
| **4HTMS 039 150 S04 M5C** | M5 | 0.8 | 4.2 | 3.9 | 7.6 | 15 | 50 | 4 |
| **4HTMS 048 180 S06 M6C** | M6 | 1 | 5 | 4.8 | 9.5 | 18 | 60 | 6 |
| **4HTMS 065 240 S08 M8C** | M8 | 1.25 | 6.8 | 6.5 | 13.1 | 24 | 65 | 8 |
| **4HTMS 082 300 S10 M10C** | M10 | 1.5 | 8.5 | 8.2 | 15.7 | 30 | 75 | 10 |
| **4HTMS 099 360 S10 M12C** | M12 | 1.75 | 10.2 | 9.9 | 18.4 | 36 | 85 | 10 |
| **4HTMS 116 420 S12 M14C** | M14 | 2 | 12 | 11.6 | 21 | 42 | 90 | 12 |
| **4HTMS 136 480 S14 M16C** | M16 | 2 | 14 | 13.6 | 25 | 48 | 100 | 14 |

## American UN

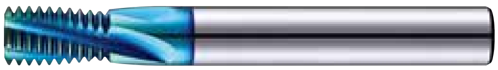
단위 Unit : mm

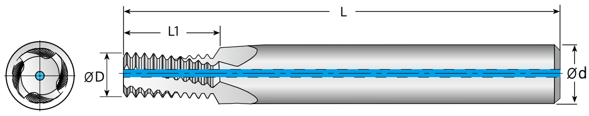
| Order Number | 나사 가능 규격 Thread UNC | UNF | 피치 규격 Pitch | 날경 Diameter D | 나사부 길이 Thread Length L1 | 나사 산수 Number of threads | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 외부 급유형 (Without coolant) |
| **4HTMS 0358 1585 S04** | No.10-24 | | 24 | 3.58 | 8.46 | 8 | 15.85 | 45 | 4 |
| **4HTMS 0414 1798 S06** | No.12-24 | | 24 | 4.14 | 9.6 | 9 | 17.98 | 65 | 6 |
| **4HTMS 0488 1905 S06** | 1/4″ x 20 | | 20 | 4.88 | 10.21 | 8 | 19.05 | 65 | 6 |
| **4HTMS 0516 1905 S06** | | 1/4″ x 28 | 28 | 5.16 | 10.01 | 11 | 19.05 | 65 | 6 |
| **4HTMS 0615 2398 S08** | 5/16″ x 18 | | 18 | 6.15 | 12.7 | 9 | 23.98 | 65 | 8 |
| **4HTMS 0765 3018 S08** | 3/8″ x 16 | | 16 | 7.65 | 15.9 | 10 | 30.18 | 65 | 8 |
| **4HTMS 0899 3444 S10** | 7/16 x 14 | | 14 | 8.99 | 18.16 | 10 | 34.44 | 75 | 10 |
| **4HTMS 1034 4105 S12** | 1/2″ x 13 | | 13 | 10.34 | 19.58 | 10 | 41.05 | 80 | 12 |
| **4HTMS 1181 4445 S12** | 9/16″ x 12 | | 12 | 11.81 | 23.29 | 11 | 44.45 | 80 | 12 |
| | | | | | | | | | 내부 급유형 (With coolant) |
| **4HTMS 0358 1585 S04C** | No.10-24 | | 24 | 3.58 | 8.46 | 8 | 15.85 | 45 | 4 |
| **4HTMS 0414 1798 S06C** | No.12-24 | | 24 | 4.14 | 9.6 | 9 | 17.98 | 65 | 6 |
| **4HTMS 0488 1905 S06C** | 1/4″ x 20 | | 20 | 4.88 | 10.21 | 8 | 19.05 | 65 | 6 |
| **4HTMS 0516 1905 S06C** | | 1/4″ x 28 | 28 | 5.16 | 10.01 | 11 | 19.05 | 65 | 6 |
| **4HTMS 0615 2398 S08C** | 5/16″ x 18 | | 18 | 6.15 | 12.7 | 9 | 23.98 | 65 | 8 |
| **4HTMS 0765 3018 S08C** | 3/8″ x 16 | | 16 | 7.65 | 15.9 | 10 | 30.18 | 65 | 8 |
| **4HTMS 0899 3444 S10C** | 7/16 x 14 | | 14 | 8.99 | 18.16 | 10 | 34.44 | 75 | 10 |
| **4HTMS 1034 4105 S12C** | 1/2″ x 13 | | 13 | 10.34 | 19.58 | 10 | 41.05 | 80 | 12 |
| **4HTMS 1181 4445 S12C** | 9/16″ x 12 | | 12 | 11.81 | 23.29 | 11 | 44.45 | 80 | 12 |

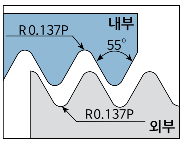
# 4HBSP

## 4 Flutes Pipe Parallel Thread Mills for Multi Purpose

## 4날 범용 관용 평행 나사 가공 쓰레드밀






- 규격 정의 : B.S.2779:1956
- 공차 등급 : Medium class

4 | UWC 초미립자 | TISIN-S Coating | 15° Helix Angle | R Rotation | CUTTING DATA

529P

- **HRc 48이하의 프리하든강, 합금강, 탄소강, 주철 가공**
- 경화강 내 나사 가공을 위한 견고하고 강력한 날 디자인.
- 향상된 절삭 및 칩 제거를 통해 공구 성능을 향상 시킵니다.
- 팁 형상은 절삭 저항을 줄이고 공구 구부림을 억제합니다.
- 1.5D 이상 사용 시 내부 급유형을 추천합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for Hardened steels(up to HRc 48), pre-hardened steels, alloy steels, carbon steels, cast irons**
- Rigid and powerful flutes design for inside hardening steel.
- Enhanced threading enables chip removal smoothly to reduce possible brekage of tool inside hole.
- The shape of tip reduces fraction and prevent tool bending.
- Inner coollant type if recommended for threading over 1.5 Diameter.
- Both right and left threading are available.

### American UN

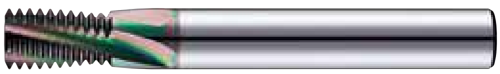
단위 Unit : mm

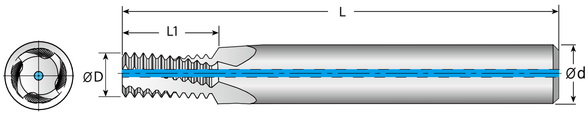
| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | |
| 4HBSP 060 0942 S06 | 1/16″, 1/8″ | 28 | 4 | 10 | 6 | 9.42 | 60 | 6 |
| New 4HBSP 060 1577 S06 | 1/16″, 1/8″ | 28 | 4 | 17 | 6 | 15.77 | 60 | 6 |
| 4HBSP 080 1387 S08 | 1/4″, 3/8″ | 19 | 4 | 10 | 8 | 13.87 | 65 | 8 |
| New 4HBSP 100 2055 S10 | 1/4″, 3/8″ | 19 | 4 | 15 | 10 | 20.55 | 75 | 10 |
| 4HBSP 120 1882 S12 | 1/2″, 5/8″, 3/4″ | 14 | 4 | 10 | 12 | 18.82 | 80 | 12 |
| New 4HBSP 140 259 S14 | 3/8″ | 19 | 4 | 19 | 14 | 25.9 | 85 | 14 |
| 4HBSP 160 378 S16 | 1″, 1 1/4″, 1 1/2″, 2″ | 11 | 4 | 16 | 16 | 37.8 | 105 | 16 |
| New 4HBSP 160 3333 S16 | 1/2″, 5/8″, 3/4″, 7/8″ | 14 | 4 | 18 | 16 | 33.33 | 95 | 16 |
| New 4HBSP 160 5165 S16 | 1″, 1 1/4″, 1 1/2″, 2″, 2 1/2″ | 11 | 4 | 22 | 16 | 51.65 | 120 | 16 |
| **내부 급유형 (With coolant)** | | | | | | | | |
| 4HBSP 060 0942 S06C | 1/16″, 1/8″ | 28 | 4 | 10 | 6 | 9.42 | 60 | 6 |
| New 4HBSP 060 1577 S06C | 1/16″, 1/8″ | 28 | 4 | 17 | 6 | 15.77 | 60 | 6 |
| 4HBSP 080 1387 S08C | 1/4″, 3/8″ | 19 | 4 | 10 | 8 | 13.87 | 65 | 8 |
| New 4HBSP 100 2055 S10C | 1/4″, 3/8″ | 19 | 4 | 15 | 10 | 20.55 | 75 | 10 |
| 4HBSP 120 1882 S12C | 1/2″, 5/8″, 3/4″ | 14 | 4 | 10 | 12 | 18.82 | 80 | 12 |
| New 4HBSP 140 259 S14C | 3/8″ | 19 | 4 | 19 | 14 | 25.9 | 85 | 14 |
| 4HBSP 160 378 S16C | 1″, 1 1/4″, 1 1/2″, 2″ | 11 | 4 | 16 | 16 | 37.8 | 105 | 16 |
| New 4HBSP 160 3333 S16C | 1/2″, 5/8″, 3/4″, 7/8″ | 14 | 4 | 18 | 16 | 33.33 | 95 | 16 |
| New 4HBSP 160 5165 S16C | 1″, 1 1/4″, 1 1/2″, 2″, 2 1/2″ | 11 | 4 | 22 | 16 | 51.65 | 120 | 16 |

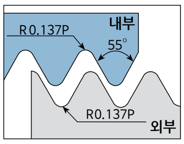
# 4HBSPA

4 Flutes Pipe Parallel Thread Mills for Aluminum

## 4날 알루미늄 관용 평행 나사 가공 쓰레드밀






- 규격 정의 : B.S.2779:1956
- 공차 등급 : Medium class


529P

- **알루미늄, 알루미늄 합금 등 비철 비금속 가공**
- 경화강 내 나사 가공을 위한 견고하고 강력한 날 디자인.
- 향상된 절삭 및 칩 제거를 통해 공구 성능을 향상 시킵니다.
- 팁 형상은 절삭 저항을 줄이고 공구 구부림을 억제합니다.
- 1.5D 이상 사용 시 내부 급유형을 추천합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for Aluminum, Aluminum alloys, non-ferrous, and non-metallic materials**
- Rigid and powerful flutes design for inside hardening steel.
- Enhanced threading enables chip removal smoothly to reduce possible brekage of tool inside hole.
- The shape of tip reduces fraction and prevent tool bending.
- Inner collant type if recommended for threading over 1.5 Diameter.
- Both right and left threading are available.

## American UN

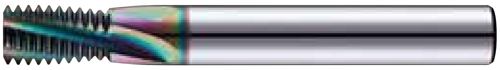
단위 Unit: mm

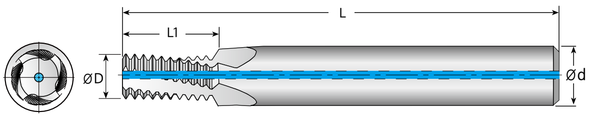
| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | |
| 4HBSPA 060 0942 S06 | 1/16″, 1/8″ | 28 | 4 | 10 | 6 | 9.42 | 60 | 6 |
| New 4HBSPA 060 1577 S06 | 1/16″, 1/8″ | 28 | 4 | 17 | 6 | 15.77 | 60 | 6 |
| 4HBSPA 080 1387 S08 | 1/4″, 3/8″ | 19 | 4 | 10 | 8 | 13.87 | 65 | 8 |
| New 4HBSPA 100 2055 S10 | 1/4″, 3/8″ | 19 | 4 | 15 | 10 | 20.55 | 75 | 10 |
| 4HBSPA 120 1882 S12 | 1/2″, 5/8″, 3/4″ | 14 | 4 | 10 | 12 | 18.82 | 80 | 12 |
| New 4HBSPA 140 259 S14 | 3/8″ | 19 | 4 | 19 | 14 | 25.9 | 85 | 14 |
| 4HBSPA 160 378 S16 | 1″, 1 1/4″, 1 1/2″, 2″ | 11 | 4 | 16 | 16 | 37.8 | 105 | 16 |
| New 4HBSPA 160 3333 S16 | 1/2″, 5/8″, 3/4″, 7/8″ | 14 | 4 | 18 | 16 | 33.33 | 95 | 16 |
| New 4HBSPA 160 5165 S16 | 1″, 1 1/4″, 1 1/2″, 2″, 2 1/2″ | 11 | 4 | 22 | 16 | 51.65 | 120 | 16 |
| **내부 급유형 (With coolant)** | | | | | | | | |
| 4HBSPA 060 0942 S06C | 1/16″, 1/8″ | 28 | 4 | 10 | 6 | 9.42 | 60 | 6 |
| New 4HBSPA 060 1577 S06C | 1/16″, 1/8″ | 28 | 4 | 17 | 6 | 15.77 | 60 | 6 |
| 4HBSPA 080 1387 S08C | 1/4″, 3/8″ | 19 | 4 | 10 | 8 | 13.87 | 65 | 8 |
| New 4HBSPA 100 2055 S10C | 1/4″, 3/8″ | 19 | 4 | 15 | 10 | 20.55 | 75 | 10 |
| 4HBSPA 120 1882 S12C | 1/2″, 5/8″, 3/4″ | 14 | 4 | 10 | 12 | 18.82 | 80 | 12 |
| New 4HBSPA 140 259 S14C | 3/8″ | 19 | 4 | 19 | 14 | 25.9 | 85 | 14 |
| 4HBSPA 160 378 S16C | 1″, 1 1/4″, 1 1/2″, 2″ | 11 | 4 | 16 | 16 | 37.8 | 105 | 16 |
| New 4HBSPA 160 3333 S16C | 1/2″, 5/8″, 3/4″, 7/8″ | 14 | 4 | 18 | 16 | 33.33 | 95 | 16 |
| New 4HBSPA 160 5165 S16C | 1″, 1 1/4″, 1 1/2″, 2″, 2 1/2″ | 11 | 4 | 22 | 16 | 51.65 | 120 | 16 |

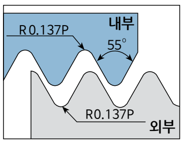
# 4HBSPS

*4 Flutes Pipe Parallel Thread Mills for Stainless Steels*

## 4날 SUS 관용 평행 나사 가공 쓰레드밀






- 규격 정의 : B.S.2779:1956
- 공차 등급 : Medium class


529P

- **SUS, 티타늄 합금 가공**
- 경화강 내 나사 가공을 위한 견고하고 강력한 날 디자인.
- 향상된 절삭 및 칩 제거를 통해 공구 성능을 향상 시킵니다.
- 팁 형상은 절삭 저항을 줄이고 공구 구부림을 억제합니다.
- 1.5D 이상 사용 시 내부 급유형을 추천합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for SUS and Titanium alloys**
- Rigid and powerful flutes design for inside hardening steel.
- Enhanced threading enables chip removal smoothly to reduce possible brekage of tool inside hole.
- The shape of tip reduces fraction and prevent tool bending.
- Inner collant type if recommended for threading over 1.5 Diameter.
- Both right and left threading are available.

### American UN

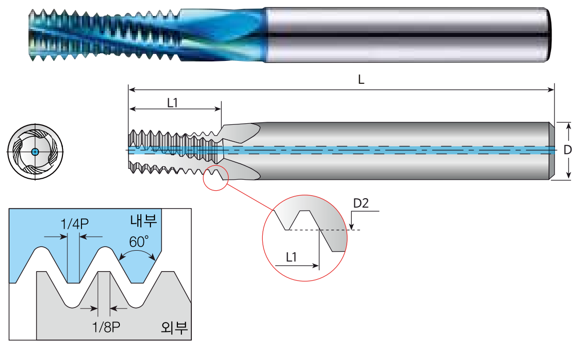
단위 Unit : mm

| | Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|
| | **외부 급유형 (Without coolant)** | | | | | | | | |
| | 4HBSPS 060 0942 S06 | 1/16″, 1/8″ | 28 | 4 | 10 | 6 | 9.42 | 60 | 6 |
| New | 4HBSPS 060 1577 S06 | 1/16″, 1/8″ | 28 | 4 | 17 | 6 | 15.77 | 60 | 6 |
| | 4HBSPS 080 1387 S08 | 1/4″, 3/8″ | 19 | 4 | 10 | 8 | 13.87 | 65 | 8 |
| New | 4HBSPS 100 2055 S10 | 1/4″, 3/8″ | 19 | 4 | 15 | 10 | 20.55 | 75 | 10 |
| | 4HBSPS 120 1882 S12 | 1/2″, 5/8″, 3/4″ | 14 | 4 | 10 | 12 | 18.82 | 80 | 12 |
| New | 4HBSPS 140 259 S14 | 3/8″ | 19 | 4 | 19 | 14 | 25.9 | 85 | 14 |
| | 4HBSPS 160 378 S16 | 1″, 1 1/4″, 1 1/2″, 2″ | 11 | 4 | 16 | 16 | 37.8 | 105 | 16 |
| New | 4HBSPS 160 3333 S16 | 1/2″, 5/8″, 3/4″, 7/8″ | 14 | 4 | 18 | 16 | 33.33 | 95 | 16 |
| New | 4HBSPS 160 5165 S16 | 1″, 1 1/4″, 1 1/2″, 2″, 2 1/2″ | 11 | 4 | 22 | 16 | 51.65 | 120 | 16 |
| | **내부 급유형 (With coolant)** | | | | | | | | |
| | 4HBSPS 060 0942 S06C | 1/16″, 1/8″ | 28 | 4 | 10 | 6 | 9.42 | 60 | 6 |
| New | 4HBSPS 060 1577 S06C | 1/16″, 1/8″ | 28 | 4 | 17 | 6 | 15.77 | 60 | 6 |
| | 4HBSPS 080 1387 S08C | 1/4″, 3/8″ | 19 | 4 | 10 | 8 | 13.87 | 65 | 8 |
| New | 4HBSPS 100 2055 S10C | 1/4″, 3/8″ | 19 | 4 | 15 | 10 | 20.55 | 75 | 10 |
| | 4HBSPS 120 1882 S12C | 1/2″, 5/8″, 3/4″ | 14 | 4 | 10 | 12 | 18.82 | 80 | 12 |
| New | 4HBSPS 140 259 S14C | 3/8″ | 19 | 4 | 19 | 14 | 25.9 | 85 | 14 |
| | 4HBSPS 160 378 S16C | 1″, 1 1/4″, 1 1/2″, 2″ | 11 | 4 | 16 | 16 | 37.8 | 105 | 16 |
| New | 4HBSPS 160 3333 S16C | 1/2″, 5/8″, 3/4″, 7/8″ | 14 | 4 | 18 | 16 | 33.33 | 95 | 16 |
| New | 4HBSPS 160 5165 S16C | 1″, 1 1/4″, 1 1/2″, 2″, 2 1/2″ | 11 | 4 | 22 | 16 | 51.65 | 120 | 16 |

# 4LTM

*4 Flutes Helix Long Thread Mills For Multi Purpose*

## 4날 범용 헬릭스 긴 길이 쓰레드밀




- 규격 정의 : R262 (DN 13)
- 공차 등급 : 6H

- **HRc48 이하의 고경도강, 프리하든강, 합금강, 탄소강, 주철 가공**
- 최적화된 형상으로 소프트 절삭을 실현합니다.
- 최적화된 플루트 배출부로 매우 안정적 입니다.
- 높은 절삭 속도와 긴 공구의 수명이 가능합니다.
- 헬리코일 나사 가공이 가능합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for Hardened steels (up to HRc 48), pre-hardened steels, alloy steels, carbon steels, cast irons**
- Optimized tool design enables soft threading.
- Optimized flute design enables stable threading.
- High spindle speed is available with long tool life.
- It can be used for heli coil threading.
- Both right and left threading are available.

4 | UWC 초미립자 | TISIN-S Coating | 15° Helix Angle | R Rotation | CUTTING DATA

530P

ISO 측정항목

단위 Unit : mm

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch | 날수 Flutes Z | 날경 Diameter D | 나사부 길이 Thread Length L1 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|
| | | | | | | 외부 급유형 (Without coolant) | |
| **4LTM 022 060 S06 M3** | M3 | 0.5 | 4 | 2.2 | 6 | 60 | 6 |
| **4LTM 022 075 S06 M3** | M3 | 0.5 | 4 | 2.2 | 7.5 | 60 | 6 |
| **4LTM 029 084 S06 M4** | M4 | 0.7 | 4 | 2.9 | 8.4 | 60 | 6 |
| **4LTM 029 105 S06 M4** | M4 | 0.7 | 4 | 2.9 | 10.5 | 60 | 6 |
| **4LTM 038 104 S06 M5** | M5 | 0.8 | 4 | 3.8 | 10.4 | 60 | 6 |
| **4LTM 038 128 S06 M5** | M5 | 0.8 | 4 | 3.8 | 12.8 | 60 | 6 |
| **4LTM 045 120 S06 M6** | M6 | 1 | 4 | 4.5 | 12 | 60 | 6 |
| **4LTM 045 150 S06 M6** | M6 | 1 | 4 | 4.5 | 15 | 60 | 6 |
| **4LTM 060 1625 S06 M8** | M8 | 1.25 | 4 | 6 | 16.25 | 65 | 6 |
| **4LTM 060 200 S06 M8** | M8 | 1.25 | 4 | 6 | 20 | 65 | 6 |
| **4LTM 075 210 S08 M10** | M10 | 1.5 | 4 | 7.5 | 21 | 75 | 8 |
| **4LTM 075 255 S08 M10** | M10 | 1.5 | 4 | 7.5 | 25.5 | 80 | 8 |
| **4LTM 095 245 S10 M12** | M12 | 1.75 | 4 | 9.5 | 24.5 | 85 | 10 |
| **4LTM 095 315 S10 M12** | M12 | 1.75 | 4 | 9.5 | 31.5 | 85 | 10 |
| **4LTM 100 280 S10 M14** | M14 | 2 | 4 | 10 | 28 | 90 | 10 |
| **4LTM 100 360 S10 M14** | M14 | 2 | 4 | 10 | 36 | 95 | 10 |
| **4LTM 120 320 S12 M16** | M16 | 2 | 4 | 12 | 32 | 100 | 12 |
| **4LTM 120 400 S12 M16** | M16 | 2 | 4 | 12 | 40 | 105 | 12 |
| **4LTM 140 375 S14 M18** | M18 | 2.5 | 4 | 14 | 37.5 | 100 | 14 |
| **4LTM 140 450 S14 M18** | M18 | 2.5 | 4 | 14 | 45 | 110 | 14 |
| **4LTM 160 400 S16 M20** | M20 | 2.5 | 4 | 16 | 40 | 110 | 16 |
| **4LTM 160 500 S16 M20** | M20 | 2.5 | 4 | 16 | 50 | 120 | 16 |
| | | | | | | 내부 급유형 (With coolant) | |
| **4LTM 045 120 S06 M6C** | M6 | 1 | 4 | 4.5 | 12 | 60 | 6 |
| **4LTM 045 150 S06 M6C** | M6 | 1 | 4 | 4.5 | 15 | 60 | 6 |
| **4LTM 060 1625 S06 M8C** | M8 | 1.25 | 4 | 6 | 16.25 | 65 | 6 |
| **4LTM 060 200 S06 M8C** | M8 | 1.25 | 4 | 6 | 20 | 65 | 6 |
| **4LTM 075 210 S08 M10C** | M10 | 1.5 | 4 | 7.5 | 21 | 75 | 8 |
| **4LTM 075 255 S08 M10C** | M10 | 1.5 | 4 | 7.5 | 25.5 | 80 | 8 |
| **4LTM 095 245 S10 M12C** | M12 | 1.75 | 4 | 9.5 | 24.5 | 85 | 10 |
| **4LTM 095 315 S10 M12C** | M12 | 1.75 | 4 | 9.5 | 31.5 | 85 | 10 |
| **4LTM 100 280 S10 M14C** | M14 | 2 | 4 | 10 | 28 | 90 | 10 |
| **4LTM 100 360 S10 M14C** | M14 | 2 | 4 | 10 | 36 | 95 | 10 |
| **4LTM 120 320 S12 M16C** | M16 | 2 | 4 | 12 | 32 | 100 | 12 |
| **4LTM 120 400 S12 M16C** | M16 | 2 | 4 | 12 | 40 | 105 | 12 |
| **4LTM 140 375 S14 M18C** | M18 | 2.5 | 4 | 14 | 37.5 | 100 | 14 |
| **4LTM 140 450 S14 M18C** | M18 | 2.5 | 4 | 14 | 45 | 110 | 14 |
| **4LTM 160 400 S16 M20C** | M20 | 2.5 | 4 | 16 | 40 | 110 | 16 |
| **4LTM 160 500 S16 M20C** | M20 | 2.5 | 4 | 16 | 50 | 120 | 16 |

## American UN

단위 Unit: mm

| Order Number | 나가 사능 규격 Thread UNC | UNF | UNEF | 피치규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|
| 외부급유형(Without coolant) | | | | | | | | | | |
| New 4LTM 0165 045 S04 | No.2 | No.3 | | 56 | 4 | 10 | 1.65 | 4.5 | 45 | 4 |
| New 4LTM 0165 054 S04 | No.2 | No.3 | | 56 | 4 | 12 | 1.65 | 5.4 | 45 | 4 |
| New 4LTM 019 053 S04 | No.3 | No.4 | | 48 | 4 | 10 | 1.9 | 5.3 | 45 | 4 |
| New 4LTM 019 063 S04 | No.3 | No.4 | | 48 | 4 | 12 | 1.9 | 6.3 | 45 | 4 |
| 4LTM 021 060 S04 | No.4, No.5 | No.6 | | 40 | 4 | 9 | 2.1 | 6 | 45 | 4 |
| 4LTM 021 079 S04 | No.4, No.5 | No.6 | | 40 | 4 | 12 | 2.1 | 7.9 | 45 | 4 |
| 4LTM 0255 075 S04 | No.6, No.8 | No.10 | No.12 | 32 | 4 | 9 | 2.55 | 7.5 | 45 | 4 |
| 4LTM 0255 099 S04 | No.6, No.8 | No.10 | No.12 | 32 | 4 | 12 | 2.55 | 9.9 | 45 | 4 |
| 4LTM 033 088 S04 | | No.8 | | 36 | 4 | 12 | 3.3 | 8.8 | 45 | 4 |
| 4LTM 033 109 S04 | | No.8 | | 36 | 4 | 15 | 3.3 | 10.9 | 45 | 4 |
| 4LTM 0358 099 S04 | No.10, No.12 | 5/16″ | | 24 | 4 | 9 | 3.58 | 9.9 | 45 | 4 |
| 4LTM 0358 131 S04 | No.10, No.12 | 5/16″ | | 24 | 4 | 12 | 3.58 | 13.1 | 45 | 4 |
| 4LTM 038 099 S04 | | No.10 | No.12, 5/16″ | 32 | 4 | 12 | 3.8 | 9.9 | 45 | 4 |
| 4LTM 038 130 S04 | | No.10 | No.12, 5/16″ | 32 | 4 | 16 | 3.8 | 13 | 50 | 4 |
| 4LTM 0415 110 S06 | No.12 | 5/16″, 3/8″ | | 24 | 4 | 10 | 4.15 | 11 | 60 | 6 |
| 4LTM 0415 152 S06 | No.12 | 5/16″, 3/8″ | | 24 | 4 | 14 | 4.15 | 15.2 | 60 | 6 |
| 4LTM 043 112 S06 | | No.12, 1/4″ | 7/16″ | 28 | 4 | 12 | 4.3 | 11.2 | 60 | 6 |
| 4LTM 043 149 S06 | | No.12, 1/4″ | 7/16″ | 28 | 4 | 16 | 4.3 | 14.9 | 60 | 6 |
| 4LTM 044 114 S06 | | | No.12, 1/4″, 5/16″ | 32 | 4 | 14 | 4.4 | 11.4 | 60 | 6 |
| 4LTM 044 154 S06 | | | No.12, 1/4″, 5/16″ | 32 | 4 | 19 | 4.4 | 15.4 | 60 | 6 |
| 4LTM 0488 132 S06 | 1/4″ | 7/16″, 1/2″ | | 20 | 4 | 10 | 4.88 | 13.2 | 60 | 6 |
| 4LTM 0488 170 S06 | 1/4″ | 7/16″, 1/2″ | | 20 | 4 | 13 | 4.88 | 17 | 60 | 6 |
| 4LTM 0515 131 S06 | | 1/4″ | 7/16″, 1/2″ | 28 | 4 | 14 | 5.15 | 13.1 | 60 | 6 |
| 4LTM 0515 167 S06 | | 1/4″ | 7/16″, 1/2″ | 28 | 4 | 18 | 5.15 | 16.7 | 60 | 6 |
| 4LTM 0615 160 S08 | 5/16″ | 9/16″, 5/8″ | | 18 | 4 | 11 | 6.15 | 16 | 65 | 8 |
| 4LTM 0615 217 S08 | 5/16″ | 9/16″, 5/8″ | | 18 | 4 | 15 | 6.15 | 21.7 | 75 | 8 |
| 4LTM 0668 163 S08 | | 5/16″, 3/8″ | 9/16″ | 24 | 4 | 15 | 6.68 | 16.3 | 65 | 8 |
| 4LTM 0668 205 S08 | | 5/16″, 3/8″ | 9/16″ | 24 | 4 | 19 | 6.68 | 20.5 | 75 | 8 |
| 4LTM 0765 196 S08 | 3/8″ | 3/4″ | | 16 | 4 | 12 | 7.65 | 19.6 | 65 | 8 |
| 4LTM 0765 244 S08 | 3/8″ | 3/4″ | | 16 | 4 | 15 | 7.65 | 24.4 | 75 | 8 |
| 4LTM 082 195 S10 | | 3/8″ | 9/16″, 5/8″ | 24 | 4 | 18 | 8.2 | 19.5 | 80 | 10 |
| 4LTM 082 247 S10 | | 3/8″ | 9/16″, 5/8″ | 24 | 4 | 23 | 8.2 | 24.7 | 80 | 10 |
| 4LTM 090 224 S10 | 7/16″ | 7/8″ | | 14 | 4 | 12 | 9 | 22.4 | 75 | 10 |
| 4LTM 090 297 S10 | 7/16″ | 7/8″ | | 14 | 4 | 16 | 9 | 29.7 | 80 | 10 |
| 4LTM 096 221 S10 | | 7/16″, 1/2″ | 3/4″ | 20 | 4 | 17 | 9.6 | 22.1 | 75 | 10 |
| 4LTM 096 284 S10 | | 7/16″, 1/2″ | 3/4″ | 20 | 4 | 22 | 9.6 | 28.4 | 80 | 10 |
| 4LTM 099 221 S10 | | | 7/16″, 1/2″ | 28 | 4 | 24 | 9.9 | 22.1 | 75 | 10 |
| 4LTM 099 285 S10 | | | 7/16″, 1/2″ | 28 | 4 | 31 | 9.9 | 28.5 | 80 | 10 |
| 4LTM 1035 261 S12 | 1/2″ | | | 13 | 4 | 13 | 10.35 | 26.1 | 80 | 12 |
| 4LTM 1035 339 S12 | 1/2″ | | | 13 | 4 | 17 | 10.35 | 33.9 | 90 | 12 |
| 4LTM 111 259 S12 | | 1/2″ | 3/4″, 13/16″ | 20 | 4 | 20 | 11.1 | 25.9 | 80 | 12 |
| 4LTM 111 322 S12 | | 1/2″ | 3/4″, 13/16″ | 20 | 4 | 25 | 11.1 | 32.2 | 90 | 12 |
| 4LTM 118 283 S12 | 9/16″ | 1″, 1-1/8″ | | 12 | 4 | 13 | 11.8 | 28.3 | 80 | 12 |
| 4LTM 118 367 S12 | 9/16″ | 1″, 1-1/8″ | | 12 | 4 | 17 | 11.8 | 36.7 | 90 | 12 |
| 4LTM 125 287 S14 | | 9/16″, 5/8″ | 11/16″ | 18 | 4 | 20 | 12.5 | 28.7 | 95 | 14 |
| 4LTM 125 372 S14 | | 9/16″, 5/8″ | 11/16″ | 18 | 4 | 26 | 12.5 | 37.2 | 100 | 14 |
| 4LTM 129 290 S14 | | | 9/16″, 5/8″, 11/16″ | 24 | 4 | 27 | 12.9 | 29 | 95 | 14 |
| 4LTM 129 364 S14 | | | 9/16″, 5/8″, 11/16″ | 24 | 4 | 34 | 12.9 | 36.4 | 100 | 14 |
| 4LTM 131 331 S14 | 5/8″ | | | 11 | 4 | 14 | 13.1 | 33.1 | 95 | 14 |
| 4LTM 131 424 S14 | 5/8″ | | | 11 | 4 | 18 | 13.1 | 42.4 | 105 | 14 |
| 4LTM 141 316 S16 | | 5/8″ | 11/16″, 1-1/8″ | 18 | 4 | 22 | 14.1 | 31.6 | 95 | 16 |
| 4LTM 141 414 S16 | | 5/8″ | 11/16″, 1-1/8″ | 18 | 4 | 29 | 14.1 | 41.4 | 105 | 16 |
| 4LTM 159 390 S16 | 3/4″ | | | 10 | 4 | 15 | 15.9 | 39 | 100 | 16 |
| 4LTM 159 491 S16 | 3/4″ | | | 10 | 4 | 19 | 15.9 | 49.1 | 110 | 16 |
| 4LTM 160 387 S16 | | 3/4″ | | 16 | 4 | 24 | 16 | 38.7 | 105 | 16 |
| 4LTM 160 482 S16 | | 3/4″ | | 16 | 4 | 30 | 16 | 48.2 | 115 | 16 |
| 4LTM 160 386 S16 | | | 3/4″, 13/16″, 7/8″ | 20 | 4 | 30 | 16 | 38.6 | 105 | 16 |
| 4LTM 160 487 S16 | | | 3/4″, 13/16″, 7/8″ | 20 | 4 | 38 | 16 | 48.7 | 115 | 16 |
| 4LTM 160 461 S16 | 7/8″ | | | 9 | 4 | 16 | 16 | 46.1 | 110 | 16 |
| 4LTM 160 442 S16 | | 7/8″ | | 14 | 4 | 24 | 16 | 44.2 | 110 | 16 |
| 4LTM 160 519 S16 | 1″ | | | 8 | 4 | 16 | 16 | 51.9 | 120 | 16 |
| 4LTM 160 515 S16 | | 1″, 1-1/8″, 1-1/2″ | | 12 | 4 | 24 | 16 | 51.5 | 120 | 16 |

# 4LTM



## 4날 범용 헬릭스 긴 길이 쓰레드밀

### American UN

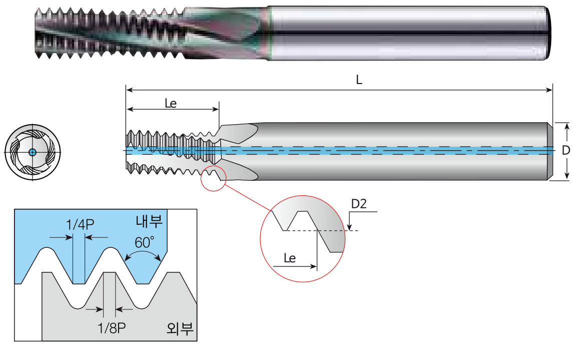
단위 Unit: mm

| Order Number | 나가 사능 규격 Thread UNC | UNF | UNEF | 피치규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|
| **내부 급유형 (With coolant)** | | | | | | | | | | |
| 4LTM 0358 099 S04C | No.10, No.12 | 5/16″ | | 24 | 4 | 9 | 3.58 | 9.9 | 45 | 4 |
| 4LTM 0358 131 S04C | No.10, No.12 | 5/16″ | | 24 | 4 | 12 | 3.58 | 13.1 | 45 | 4 |
| 4LTM 038 099 S04C | | No.10 | No.12, 5/16″ | 32 | 4 | 12 | 3.8 | 9.9 | 45 | 4 |
| 4LTM 038 130 S04C | | No.10 | No.12, 5/16″ | 32 | 4 | 16 | 3.8 | 13 | 50 | 4 |
| 4LTM 0415 110 S06C | No.12 | 5/16″, 3/8″ | | 24 | 4 | 10 | 4.15 | 11 | 60 | 6 |
| 4LTM 0415 152 S06C | No.12 | 5/16″, 3/8″ | | 24 | 4 | 14 | 4.15 | 15.2 | 60 | 6 |
| 4LTM 043 112 S06C | | No.12, 1/4″ | 7/16″ | 28 | 4 | 12 | 4.3 | 11.2 | 60 | 6 |
| 4LTM 043 149 S06C | | No.12, 1/4″ | 7/16″ | 28 | 4 | 16 | 4.3 | 14.9 | 60 | 6 |
| 4LTM 044 114 S06C | | | No.12, 1/4″, 5/16″ | 32 | 4 | 14 | 4.4 | 11.4 | 60 | 6 |
| 4LTM 044 154 S06C | | | No.12, 1/4″, 5/16″ | 32 | 4 | 19 | 4.4 | 15.4 | 60 | 6 |
| 4LTM 0488 132 S06C | 1/4″ | 7/16″, 1/2″ | | 20 | 4 | 10 | 4.88 | 13.2 | 60 | 6 |
| 4LTM 0488 170 S06C | 1/4″ | 7/16″, 1/2″ | | 20 | 4 | 13 | 4.88 | 17 | 60 | 6 |
| 4LTM 0515 131 S06C | | 1/4″ | 7/16″, 1/2″ | 28 | 4 | 14 | 5.15 | 13.1 | 60 | 6 |
| 4LTM 0515 167 S06C | | 1/4″ | 7/16″, 1/2″ | 28 | 4 | 18 | 5.15 | 16.7 | 60 | 6 |
| 4LTM 0615 160 S08C | 5/16″ | 9/16″, 5/8″ | | 18 | 4 | 11 | 6.15 | 16 | 65 | 8 |
| 4LTM 0615 217 S08C | 5/16″ | 9/16″, 5/8″ | | 18 | 4 | 15 | 6.15 | 21.7 | 75 | 8 |
| 4LTM 0668 163 S08C | | 5/16″, 3/8″ | 9/16″ | 24 | 4 | 15 | 6.68 | 16.3 | 65 | 8 |
| 4LTM 0668 205 S08C | | 5/16″, 3/8″ | 9/16″ | 24 | 4 | 19 | 6.68 | 20.5 | 75 | 8 |
| 4LTM 0765 196 S08C | 3/8″ | 3/4″ | | 16 | 4 | 12 | 7.65 | 19.6 | 65 | 8 |
| 4LTM 0765 244 S08C | 3/8″ | 3/4″ | | 16 | 4 | 15 | 7.65 | 24.4 | 75 | 8 |
| 4LTM 082 195 S10C | | 3/8″ | 9/16″, 5/8″ | 24 | 4 | 18 | 8.2 | 19.5 | 80 | 10 |
| 4LTM 082 247 S10C | | 3/8″ | 9/16″, 5/8″ | 24 | 4 | 23 | 8.2 | 24.7 | 80 | 10 |
| 4LTM 090 224 S10C | 7/16″ | 7/8″ | | 14 | 4 | 12 | 9 | 22.4 | 75 | 10 |
| 4LTM 090 297 S10C | 7/16″ | 7/8″ | | 14 | 4 | 16 | 9 | 29.7 | 80 | 10 |
| 4LTM 096 221 S10C | | 7/16″, 1/2″ | 3/4″ | 20 | 4 | 17 | 9.6 | 22.1 | 75 | 10 |
| 4LTM 096 284 S10C | | 7/16″, 1/2″ | 3/4″ | 20 | 4 | 22 | 9.6 | 28.4 | 80 | 10 |
| 4LTM 099 221 S10C | | | 7/16″, 1/2″ | 28 | 4 | 24 | 9.9 | 22.1 | 75 | 10 |
| 4LTM 099 285 S10C | | | 7/16″, 1/2″ | 28 | 4 | 31 | 9.9 | 28.5 | 80 | 10 |
| 4LTM 1035 261 S12C | 1/2″ | | | 13 | 4 | 13 | 10.35 | 26.1 | 80 | 12 |
| 4LTM 1035 339 S12C | 1/2″ | | | 13 | 4 | 17 | 10.35 | 33.9 | 90 | 12 |
| 4LTM 111 259 S12C | | 1/2″ | 3/4″, 13/16″ | 20 | 4 | 20 | 11.1 | 25.9 | 80 | 12 |
| 4LTM 111 322 S12C | | 1/2″ | 3/4″, 13/16″ | 20 | 4 | 25 | 11.1 | 32.2 | 90 | 12 |
| 4LTM 118 283 S12C | 9/16″ | 1″, 1-1/8″ | | 12 | 4 | 13 | 11.8 | 28.3 | 80 | 12 |
| 4LTM 118 367 S12C | 9/16″ | 1″, 1-1/8″ | | 12 | 4 | 17 | 11.8 | 36.7 | 90 | 12 |
| 4LTM 125 287 S14C | | 9/16″, 5/8″ | 11/16″ | 18 | 4 | 20 | 12.5 | 28.7 | 95 | 14 |
| 4LTM 125 372 S14C | | 9/16″, 5/8″ | 11/16″ | 18 | 4 | 26 | 12.5 | 37.2 | 100 | 14 |
| 4LTM 129 290 S14C | | | 9/16″, 5/8″, 11/16″ | 24 | 4 | 27 | 12.9 | 29 | 95 | 14 |
| 4LTM 129 364 S14C | | | 9/16″, 5/8″, 11/16″ | 24 | 4 | 34 | 12.9 | 36.4 | 100 | 14 |
| 4LTM 131 331 S14C | 5/8″ | | | 11 | 4 | 14 | 13.1 | 33.1 | 95 | 14 |
| 4LTM 131 424 S14C | 5/8″ | | | 11 | 4 | 18 | 13.1 | 42.4 | 105 | 14 |
| 4LTM 141 316 S16C | | 5/8″ | 11/16″, 1-1/8″ | 18 | 4 | 22 | 14.1 | 31.6 | 95 | 16 |
| 4LTM 141 414 S16C | | 5/8″ | 11/16″, 1-1/8″ | 18 | 4 | 29 | 14.1 | 41.4 | 105 | 16 |
| 4LTM 159 390 S16C | 3/4″ | | | 10 | 4 | 15 | 15.9 | 39 | 100 | 16 |
| 4LTM 159 491 S16C | 3/4″ | | | 10 | 4 | 19 | 15.9 | 49.1 | 110 | 16 |
| 4LTM 160 387 S16C | | 3/4″ | | 16 | 4 | 24 | 16 | 38.7 | 105 | 16 |
| 4LTM 160 482 S16C | | 3/4″ | | 16 | 4 | 30 | 16 | 48.2 | 115 | 16 |
| 4LTM 160 386 S16C | | | 3/4″, 13/16″, 7/8″ | 20 | 4 | 30 | 16 | 38.6 | 105 | 16 |
| 4LTM 160 487 S16C | | | 3/4″, 13/16″, 7/8″ | 20 | 4 | 38 | 16 | 48.7 | 115 | 16 |
| 4LTM 160 461 S16C | 7/8″ | | | 9 | 4 | 16 | 16 | 46.1 | 110 | 16 |
| 4LTM 160 442 S16C | | 7/8″ | | 14 | 4 | 24 | 16 | 44.2 | 110 | 16 |
| 4LTM 160 519 S16C | 1″ | | | 8 | 4 | 16 | 16 | 51.9 | 120 | 16 |
| 4LTM 160 515 S16C | | 1″, 1-1/8″, 1-1/2″ | | 12 | 4 | 24 | 16 | 51.5 | 120 | 16 |

# 4LTMA

*4 Flutes Helix Long Thread Mills For Aluminum*

## 4날 알루미늄용 헬릭스 긴 길이 쓰레드밀




- 규격 정의 : R262 (DN 13)
- 공차 등급 : 6H

- **알루미늄, 알루미늄 합금 등 비철 비금속 가공**
- 최적화된 형상으로 소프트 절삭을 실현합니다.
- 최적화된 플루트 배출부로 매우 안정적 입니다.
- 높은 절삭 속도와 긴 공구의 수명이 가능합니다.
- 헬리코일 나사 가공이 가능합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for Aluminum, Aluminum alloys, non-ferrous, and non-metallic materials**
- Optimized tool design enables soft threading.
- Optimized flute design enables stable threading.
- High spindle speed is available with long tool life.
- It can be used for heli coil threading.
- Both right and left threading are available.


530P

ISO 측정항목

단위 Unit : mm

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch | 날수 Flutes Z | 날경 Diameter D | 나사부 길이 Thread Length L1 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|
| 외부 급유형 (Without coolant) | | | | | | | |
| 4LTMA 022 060 S06 M3 | M3 | 0.5 | 4 | 2.2 | 6 | 60 | 6 |
| 4LTMA 022 075 S06 M3 | M3 | 0.5 | 4 | 2.2 | 7.5 | 60 | 6 |
| 4LTMA 029 084 S06 M4 | M4 | 0.7 | 4 | 2.9 | 8.4 | 60 | 6 |
| 4LTMA 029 105 S06 M4 | M4 | 0.7 | 4 | 2.9 | 10.5 | 60 | 6 |
| 4LTMA 038 104 S06 M5 | M5 | 0.8 | 4 | 3.8 | 10.4 | 60 | 6 |
| 4LTMA 038 128 S06 M5 | M5 | 0.8 | 4 | 3.8 | 12.8 | 60 | 6 |
| 4LTMA 045 120 S06 M6 | M6 | 1 | 4 | 4.5 | 12 | 60 | 6 |
| 4LTMA 045 150 S06 M6 | M6 | 1 | 4 | 4.5 | 15 | 60 | 6 |
| 4LTMA 060 1625 S06 M8 | M8 | 1.25 | 4 | 6 | 16.25 | 65 | 6 |
| 4LTMA 060 200 S06 M8 | M8 | 1.25 | 4 | 6 | 20 | 65 | 6 |
| 4LTMA 075 210 S08 M10 | M10 | 1.5 | 4 | 7.5 | 21 | 75 | 8 |
| 4LTMA 075 255 S08 M10 | M10 | 1.5 | 4 | 7.5 | 25.5 | 80 | 8 |
| 4LTMA 095 245 S10 M12 | M12 | 1.75 | 4 | 9.5 | 24.5 | 85 | 10 |
| 4LTMA 095 315 S10 M12 | M12 | 1.75 | 4 | 9.5 | 31.5 | 85 | 10 |
| 4LTMA 100 280 S10 M14 | M14 | 2 | 4 | 10 | 28 | 90 | 10 |
| 4LTMA 100 360 S10 M14 | M14 | 2 | 4 | 10 | 36 | 95 | 10 |
| 4LTMA 120 320 S12 M16 | M16 | 2 | 4 | 12 | 32 | 100 | 12 |
| 4LTMA 120 400 S12 M16 | M16 | 2 | 4 | 12 | 40 | 105 | 12 |
| 4LTMA 140 375 S14 M18 | M18 | 2.5 | 4 | 14 | 37.5 | 100 | 14 |
| 4LTMA 140 450 S14 M18 | M18 | 2.5 | 4 | 14 | 45 | 110 | 14 |
| 4LTMA 160 400 S16 M20 | M20 | 2.5 | 4 | 16 | 40 | 110 | 16 |
| 4LTMA 160 500 S16 M20 | M20 | 2.5 | 4 | 16 | 50 | 120 | 16 |
| 내부 급유형 (With coolant) | | | | | | | |
| 4LTMA 045 120 S06 M6C | M6 | 1 | 4 | 4.5 | 12 | 60 | 6 |
| 4LTMA 045 150 S06 M6C | M6 | 1 | 4 | 4.5 | 15 | 60 | 6 |
| 4LTMA 060 1625 S06 M8C | M8 | 1.25 | 4 | 6 | 16.25 | 65 | 6 |
| 4LTMA 060 200 S06 M8C | M8 | 1.25 | 4 | 6 | 20 | 65 | 6 |
| 4LTMA 075 210 S08 M10C | M10 | 1.5 | 4 | 7.5 | 21 | 75 | 8 |
| 4LTMA 075 255 S08 M10C | M10 | 1.5 | 4 | 7.5 | 25.5 | 80 | 8 |
| 4LTMA 095 245 S10 M12C | M12 | 1.75 | 4 | 9.5 | 24.5 | 85 | 10 |
| 4LTMA 095 315 S10 M12C | M12 | 1.75 | 4 | 9.5 | 31.5 | 85 | 10 |
| 4LTMA 100 280 S10 M14C | M14 | 2 | 4 | 10 | 28 | 90 | 10 |
| 4LTMA 100 360 S10 M14C | M14 | 2 | 4 | 10 | 36 | 95 | 10 |
| 4LTMA 120 320 S12 M16C | M16 | 2 | 4 | 12 | 32 | 100 | 12 |
| 4LTMA 120 400 S12 M16C | M16 | 2 | 4 | 12 | 40 | 105 | 12 |
| 4LTMA 140 375 S14 M18C | M18 | 2.5 | 4 | 14 | 37.5 | 100 | 14 |
| 4LTMA 140 450 S14 M18C | M18 | 2.5 | 4 | 14 | 45 | 110 | 14 |
| 4LTMA 160 400 S16 M20C | M20 | 2.5 | 4 | 16 | 40 | 110 | 16 |
| 4LTMA 160 500 S16 M20C | M20 | 2.5 | 4 | 16 | 50 | 120 | 16 |

## American UN

단위 Unit : mm

외부 급유형(Without coolant)

| Order Number | 나사 가능 규격 Thread | | | 피치규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|
| | UNC | UNF | UNEF | | | | | | | |
| New 4LTMA 0165 045 S04 | No.2 | No.2 | | 56 | 4 | 10 | 1.65 | 4.5 | 45 | 4 |
| New 4LTMA 0165 054 S04 | No.2 | No.2 | | 56 | 4 | 12 | 1.65 | 5.4 | 45 | 4 |
| New 4LTMA 019 053 S04 | No.3 | No.3 | | 48 | 4 | 10 | 1.9 | 5.3 | 45 | 4 |
| New 4LTMA 019 063 S04 | No.3 | No.3 | | 48 | 4 | 12 | 1.9 | 6.3 | 45 | 4 |
| 4LTMA 021 060 S04 | No.4, No.5 | No.6 | | 40 | 4 | 9 | 2.1 | 6 | 45 | 4 |
| 4LTMA 021 079 S04 | No.4, No.5 | No.6 | | 40 | 4 | 12 | 2.1 | 7.9 | 45 | 4 |
| 4LTMA 0255 075 S04 | No.6, No.8 | No.10 | No.12 | 32 | 4 | 9 | 2.55 | 7.5 | 45 | 4 |
| 4LTMA 0255 099 S04 | No.6, No.8 | No.10 | No.12 | 32 | 4 | 12 | 2.55 | 9.9 | 45 | 4 |
| 4LTMA 033 088 S04 | | No.8 | | 36 | 4 | 12 | 3.3 | 8.8 | 45 | 4 |
| 4LTMA 033 109 S04 | | No.8 | | 36 | 4 | 15 | 3.3 | 10.9 | 45 | 4 |
| 4LTMA 0358 099 S04 | No.10, No.12 | 5/16″ | | 24 | 4 | 9 | 3.58 | 9.9 | 45 | 4 |
| 4LTMA 0358 131 S04 | No.10, No.12 | 5/16″ | | 24 | 4 | 12 | 3.58 | 13.1 | 45 | 4 |
| 4LTMA 038 099 S04 | | No.10 | No.12, 5/16″ | 32 | 4 | 12 | 3.8 | 9.9 | 45 | 4 |
| 4LTMA 038 130 S04 | | No.10 | No.12, 5/16″ | 32 | 4 | 16 | 3.8 | 13 | 50 | 4 |
| 4LTMA 0415 110 S06 | No.12 | 5/16″, 3/8″ | | 24 | 4 | 10 | 4.15 | 11 | 60 | 6 |
| 4LTMA 0415 152 S06 | No.12 | 5/16″, 3/8″ | | 24 | 4 | 14 | 4.15 | 15.2 | 60 | 6 |
| 4LTMA 043 112 S06 | | No.12, 1/4″ | 7/16″ | 28 | 4 | 12 | 4.3 | 11.2 | 60 | 6 |
| 4LTMA 043 149 S06 | | No.12, 1/4″ | 7/16″ | 28 | 4 | 16 | 4.3 | 14.9 | 60 | 6 |
| 4LTMA 044 114 S06 | | | No.12, 1/4″, 5/16″ | 32 | 4 | 14 | 4.4 | 11.4 | 60 | 6 |
| 4LTMA 044 154 S06 | | | No.12, 1/4″, 5/16″ | 32 | 4 | 19 | 4.4 | 15.4 | 60 | 6 |
| 4LTMA 0488 132 S06 | 1/4″ | 7/16″, 1/2″ | | 20 | 4 | 10 | 4.88 | 13.2 | 60 | 6 |
| 4LTMA 0488 170 S06 | 1/4″ | 7/16″, 1/2″ | | 20 | 4 | 13 | 4.88 | 17 | 60 | 6 |
| 4LTMA 0515 131 S06 | | 1/4″ | 7/16″, 1/2″ | 28 | 4 | 14 | 5.15 | 13.1 | 60 | 6 |
| 4LTMA 0515 167 S06 | | 1/4″ | 7/16″, 1/2″ | 28 | 4 | 18 | 5.15 | 16.7 | 60 | 6 |
| 4LTMA 0615 160 S08 | 5/16″ | 9/16″, 5/8″ | | 18 | 4 | 11 | 6.15 | 16 | 65 | 8 |
| 4LTMA 0615 217 S08 | 5/16″ | 9/16″, 5/8″ | | 18 | 4 | 15 | 6.15 | 21.7 | 75 | 8 |
| 4LTMA 0668 163 S08 | | 5/16″, 3/8″ | 9/16″ | 24 | 4 | 15 | 6.68 | 16.3 | 65 | 8 |
| 4LTMA 0668 205 S08 | | 5/16″, 3/8″ | 9/16″ | 24 | 4 | 19 | 6.68 | 20.5 | 75 | 8 |
| 4LTMA 0765 196 S08 | 3/8″ | 3/4″ | | 16 | 4 | 12 | 7.65 | 19.6 | 65 | 8 |
| 4LTMA 0765 244 S08 | 3/8″ | 3/4″ | | 16 | 4 | 15 | 7.65 | 24.4 | 75 | 8 |
| 4LTMA 082 195 S10 | | 3/8″ | 9/16″, 5/8″ | 24 | 4 | 18 | 8.2 | 19.5 | 80 | 10 |
| 4LTMA 082 247 S10 | | 3/8″ | 9/16″, 5/8″ | 24 | 4 | 23 | 8.2 | 24.7 | 80 | 10 |
| 4LTMA 090 224 S10 | 7/16″ | 7/8″ | | 14 | 4 | 12 | 9 | 22.4 | 75 | 10 |
| 4LTMA 090 297 S10 | 7/16″ | 7/8″ | | 14 | 4 | 16 | 9 | 29.7 | 80 | 10 |
| 4LTMA 096 221 S10 | | 7/16″, 1/2″ | 3/4″ | 20 | 4 | 17 | 9.6 | 22.1 | 75 | 10 |
| 4LTMA 096 284 S10 | | 7/16″, 1/2″ | 3/4″ | 20 | 4 | 22 | 9.6 | 28.4 | 80 | 10 |
| 4LTMA 099 221 S10 | | | 7/16″, 1/2″ | 28 | 4 | 24 | 9.9 | 22.1 | 75 | 10 |
| 4LTMA 099 285 S10 | | | 7/16″, 1/2″ | 28 | 4 | 31 | 9.9 | 28.5 | 80 | 10 |
| 4LTMA 1035 261 S12 | 1/2″ | | | 13 | 4 | 13 | 10.35 | 26.1 | 80 | 12 |
| 4LTMA 1035 339 S12 | 1/2″ | | | 13 | 4 | 17 | 10.35 | 33.9 | 90 | 12 |
| 4LTMA 111 259 S12 | | 1/2″ | 3/4″, 13/16″ | 20 | 4 | 20 | 11.1 | 25.9 | 80 | 12 |
| 4LTMA 111 322 S12 | | 1/2″ | 3/4″, 13/16″ | 20 | 4 | 25 | 11.1 | 32.2 | 90 | 12 |
| 4LTMA 118 283 S12 | 9/16″ | 1″, 1-1/8″ | | 12 | 4 | 13 | 11.8 | 28.3 | 80 | 12 |
| 4LTMA 118 367 S12 | 9/16″ | 1″, 1-1/8″ | | 12 | 4 | 17 | 11.8 | 36.7 | 90 | 12 |
| 4LTMA 125 287 S14 | | 9/16″, 5/8″ | 11/16″ | 18 | 4 | 20 | 12.5 | 28.7 | 95 | 14 |
| 4LTMA 125 372 S14 | | 9/16″, 5/8″ | 11/16″ | 18 | 4 | 26 | 12.5 | 37.2 | 100 | 14 |
| 4LTMA 129 290 S14 | | | 9/16″, 5/8″, 11/16″ | 24 | 4 | 27 | 12.9 | 29 | 95 | 14 |
| 4LTMA 129 364 S14 | | | 9/16″, 5/8″, 11/16″ | 24 | 4 | 34 | 12.9 | 36.4 | 100 | 14 |
| 4LTMA 131 331 S14 | 5/8″ | | | 11 | 4 | 14 | 13.1 | 33.1 | 95 | 14 |
| 4LTMA 131 424 S14 | 5/8″ | | | 11 | 4 | 18 | 13.1 | 42.4 | 105 | 14 |
| 4LTMA 141 316 S16 | | 5/8″ | 11/16″, 1-1/8″ | 18 | 4 | 22 | 14.1 | 31.6 | 95 | 16 |
| 4LTMA 141 414 S16 | | 5/8″ | 11/16″, 1-1/8″ | 18 | 4 | 29 | 14.1 | 41.4 | 105 | 16 |
| 4LTMA 159 390 S16 | 3/4″ | | | 10 | 4 | 15 | 15.9 | 39 | 100 | 16 |
| 4LTMA 159 491 S16 | 3/4″ | | | 10 | 4 | 19 | 15.9 | 49.1 | 110 | 16 |
| 4LTMA 160 387 S16 | | 3/4″ | | 16 | 4 | 24 | 16 | 38.7 | 105 | 16 |
| 4LTMA 160 482 S16 | | 3/4″ | | 16 | 4 | 30 | 16 | 48.2 | 115 | 16 |
| 4LTMA 160 386 S16 | | | 3/4″, 13/16″, 7/8″ | 20 | 4 | 30 | 16 | 38.6 | 105 | 16 |
| 4LTMA 160 487 S16 | | | 3/4″, 13/16″, 7/8″ | 20 | 4 | 38 | 16 | 48.7 | 115 | 16 |
| 4LTMA 160 461 S16 | 7/8″ | | | 9 | 4 | 16 | 16 | 46.1 | 110 | 16 |
| 4LTMA 160 442 S16 | | 7/8″ | | 14 | 4 | 24 | 16 | 44.2 | 110 | 16 |
| 4LTMA 160 519 S16 | 1″ | | | 8 | 4 | 16 | 16 | 51.9 | 120 | 16 |
| 4LTMA 160 515 S16 | | 1″, 1-1/8″, 1-1/2″ | | 12 | 4 | 24 | 16 | 51.5 | 120 | 16 |

# 4날 알루미늄용 헬릭스 긴 길이 쓰레드밀

## American UN

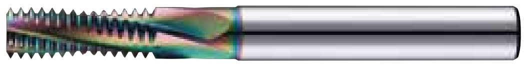
단위 Unit: mm

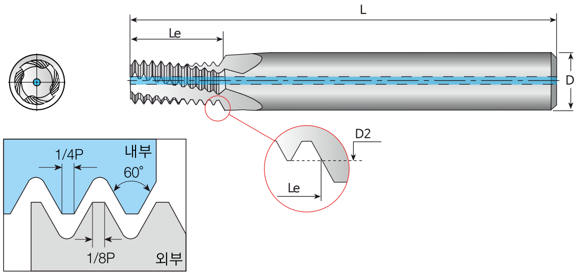
| Order Number | 나사 가능 규격 Thread UNC | UNF | UNEF | 피치규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|
| **내부 급유형(With coolant)** | | | | | | | | | | |
| 4LTMA 0358 099 S04C | No.10, No.12 | 5/16″ | | 24 | 4 | 9 | 3.58 | 9.9 | 45 | 4 |
| 4LTMA 0358 131 S04C | No.10, No.12 | 5/16″ | | 24 | 4 | 12 | 3.58 | 13.1 | 45 | 4 |
| 4LTMA 038 099 S04C | | No.10 | No.12, 5/16″ | 32 | 4 | 12 | 3.8 | 9.9 | 45 | 4 |
| 4LTMA 038 130 S04C | | No.10 | No.12, 5/16″ | 32 | 4 | 16 | 3.8 | 13 | 50 | 4 |
| 4LTMA 0415 110 S06C | No.12 | 5/16″, 3/8″ | | 24 | 4 | 10 | 4.15 | 11 | 60 | 6 |
| 4LTMA 0415 152 S06C | No.12 | 5/16″, 3/8″ | | 24 | 4 | 14 | 4.15 | 15.2 | 60 | 6 |
| 4LTMA 043 112 S06C | | No.12, 1/4″ | 7/16″ | 28 | 4 | 12 | 4.3 | 11.2 | 60 | 6 |
| 4LTMA 043 149 S06C | | No.12, 1/4″ | 7/16″ | 28 | 4 | 16 | 4.3 | 14.9 | 60 | 6 |
| 4LTMA 044 114 S06C | | | No.12, 1/4″, 5/16″ | 32 | 4 | 14 | 4.4 | 11.4 | 60 | 6 |
| 4LTMA 044 154 S06C | | | No.12, 1/4″, 5/16″ | 32 | 4 | 19 | 4.4 | 15.4 | 60 | 6 |
| 4LTMA 0488 132 S06C | 1/4″ | 7/16″, 1/2″ | | 20 | 4 | 10 | 4.88 | 13.2 | 60 | 6 |
| 4LTMA 0488 170 S06C | 1/4″ | 7/16″, 1/2″ | | 20 | 4 | 13 | 4.88 | 17 | 60 | 6 |
| 4LTMA 0515 131 S06C | | 1/4″ | 7/16″, 1/2″ | 28 | 4 | 14 | 5.15 | 13.1 | 60 | 6 |
| 4LTMA 0515 167 S06C | | 1/4″ | 7/16″, 1/2″ | 28 | 4 | 18 | 5.15 | 16.7 | 60 | 6 |
| 4LTMA 0615 160 S08C | 5/16″ | 9/16″, 5/8″ | | 18 | 4 | 11 | 6.15 | 16 | 65 | 8 |
| 4LTMA 0615 217 S08C | 5/16″ | 9/16″, 5/8″ | | 18 | 4 | 15 | 6.15 | 21.7 | 75 | 8 |
| 4LTMA 0668 163 S08C | | 5/16″, 3/8″ | 9/16″ | 24 | 4 | 15 | 6.68 | 16.3 | 65 | 8 |
| 4LTMA 0668 205 S08C | | 5/16″, 3/8″ | 9/16″ | 24 | 4 | 19 | 6.68 | 20.5 | 75 | 8 |
| 4LTMA 0765 196 S08C | 3/8″ | 3/4″ | | 16 | 4 | 12 | 7.65 | 19.6 | 65 | 8 |
| 4LTMA 0765 244 S08C | 3/8″ | 3/4″ | | 16 | 4 | 15 | 7.65 | 24.4 | 75 | 8 |
| 4LTMA 082 195 S10C | | 3/8″ | 9/16″, 5/8″ | 24 | 4 | 18 | 8.2 | 19.5 | 80 | 10 |
| 4LTMA 082 247 S10C | | 3/8″ | 9/16″, 5/8″ | 24 | 4 | 23 | 8.2 | 24.7 | 80 | 10 |
| 4LTMA 090 224 S10C | 7/16″ | 7/8″ | | 14 | 4 | 12 | 9 | 22.4 | 75 | 10 |
| 4LTMA 090 297 S10C | 7/16″ | 7/8″ | | 14 | 4 | 16 | 9 | 29.7 | 80 | 10 |
| 4LTMA 096 221 S10C | | 7/16″, 1/2″ | 3/4″ | 20 | 4 | 17 | 9.6 | 22.1 | 75 | 10 |
| 4LTMA 096 284 S10C | | 7/16″, 1/2″ | 3/4″ | 20 | 4 | 22 | 9.6 | 28.4 | 80 | 10 |
| 4LTMA 099 221 S10C | | | 7/16″, 1/2″ | 28 | 4 | 24 | 9.9 | 22.1 | 75 | 10 |
| 4LTMA 099 285 S10C | | | 7/16″, 1/2″ | 28 | 4 | 31 | 9.9 | 28.5 | 80 | 10 |
| 4LTMA 1035 261 S12C | 1/2″ | | | 13 | 4 | 13 | 10.35 | 26.1 | 80 | 12 |
| 4LTMA 1035 339 S12C | 1/2″ | | | 13 | 4 | 17 | 10.35 | 33.9 | 90 | 12 |
| 4LTMA 111 259 S12C | | 1/2″ | 3/4″, 13/16″ | 20 | 4 | 20 | 11.1 | 25.9 | 80 | 12 |
| 4LTMA 111 322 S12C | | 1/2″ | 3/4″, 13/16″ | 20 | 4 | 25 | 11.1 | 32.2 | 90 | 12 |
| 4LTMA 118 283 S12C | 9/16″ | 1″, 1-1/8″ | | 12 | 4 | 13 | 11.8 | 28.3 | 80 | 12 |
| 4LTMA 118 367 S12C | 9/16″ | 1″, 1-1/8″ | | 12 | 4 | 17 | 11.8 | 36.7 | 90 | 12 |
| 4LTMA 125 287 S14C | | 9/16″, 5/8″ | 11/16″ | 18 | 4 | 20 | 12.5 | 28.7 | 95 | 14 |
| 4LTMA 125 372 S14C | | 9/16″, 5/8″ | 11/16″ | 18 | 4 | 26 | 12.5 | 37.2 | 100 | 14 |
| 4LTMA 129 290 S14C | | | 9/16″, 5/8″, 11/16″ | 24 | 4 | 27 | 12.9 | 29 | 95 | 14 |
| 4LTMA 129 364 S14C | | | 9/16″, 5/8″, 11/16″ | 24 | 4 | 34 | 12.9 | 36.4 | 100 | 14 |
| 4LTMA 131 331 S14C | 5/8″ | | | 11 | 4 | 14 | 13.1 | 33.1 | 95 | 14 |
| 4LTMA 131 424 S14C | 5/8″ | | | 11 | 4 | 18 | 13.1 | 42.4 | 105 | 14 |
| 4LTMA 141 316 S16C | | 5/8″ | 11/16″, 1-1/8″ | 18 | 4 | 22 | 14.1 | 31.6 | 95 | 16 |
| 4LTMA 141 414 S16C | | 5/8″ | 11/16″, 1-1/8″ | 18 | 4 | 29 | 14.1 | 41.4 | 105 | 16 |
| 4LTMA 159 390 S16C | 3/4″ | | | 10 | 4 | 15 | 15.9 | 39 | 100 | 16 |
| 4LTMA 159 491 S16C | 3/4″ | | | 10 | 4 | 19 | 15.9 | 49.1 | 110 | 16 |
| 4LTMA 160 387 S16C | | 3/4″ | | 16 | 4 | 24 | 16 | 38.7 | 105 | 16 |
| 4LTMA 160 482 S16C | | 3/4″ | | 16 | 4 | 30 | 16 | 48.2 | 115 | 16 |
| 4LTMA 160 386 S16C | | | 3/4″, 13/16″, 7/8″ | 20 | 4 | 30 | 16 | 38.6 | 105 | 16 |
| 4LTMA 160 487 S16C | | | 3/4″, 13/16″, 7/8″ | 20 | 4 | 38 | 16 | 48.7 | 115 | 16 |
| 4LTMA 160 461 S16C | 7/8″ | | | 9 | 4 | 16 | 16 | 46.1 | 110 | 16 |
| 4LTMA 160 442 S16C | | 7/8″ | | 14 | 4 | 24 | 16 | 44.2 | 110 | 16 |
| 4LTMA 160 519 S16C | 1″ | | | 8 | 4 | 16 | 16 | 51.9 | 120 | 16 |
| 4LTMA 160 515 S16C | | 1″, 1-1/8″, 1-1/2″ | | 12 | 4 | 24 | 16 | 51.5 | 120 | 16 |

# 4LTMS

*4 Flutes Helix Long Thread Mills For Stainless Steels*

## 4날 SUS 가공용 헬릭스 긴 길이 쓰레드밀






- 규격 정의 : R262 (DN 13)
- 공차 등급 : 6H

4 | UWC 초미립자 | HR Coating | 15° Helix Angle | R Rotation | CUTTING DATA 530P

- **SUS, 티타늄 합금 가공**
- 최적화된 형상으로 소프트 절삭을 실현합니다.
- 최적화된 플루트 배출부로 매우 안정적 입니다.
- 높은 절삭 속도와 긴 공구의 수명이 가능합니다.
- 헬리코일 나사 가공이 가능합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for SUS and Titanium alloys**
- Optimized tool design enables soft threading.
- Optimized flute design enables stable threading.
- High spindle speed is available with long tool life.
- It can be used for heli coil threading.
- Both right and left threading are available.

ISO 측정항목

단위 Unit : mm

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch | 날수 Flutes Z | 날경 Diameter D | 나사부 길이 Thread Length L1 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|
| | | | | | | | 외부 급유형 (Without coolant) |
| 4LTMS 022 060 S06 M3 | M3 | 0.5 | 4 | 2.2 | 6 | 60 | 6 |
| 4LTMS 022 075 S06 M3 | M3 | 0.5 | 4 | 2.2 | 7.5 | 60 | 6 |
| 4LTMS 029 084 S06 M4 | M4 | 0.7 | 4 | 2.9 | 8.4 | 60 | 6 |
| 4LTMS 029 105 S06 M4 | M4 | 0.7 | 4 | 2.9 | 10.5 | 60 | 6 |
| 4LTMS 038 104 S06 M5 | M5 | 0.8 | 4 | 3.8 | 10.4 | 60 | 6 |
| 4LTMS 038 128 S06 M5 | M5 | 0.8 | 4 | 3.8 | 12.8 | 60 | 6 |
| 4LTMS 045 120 S06 M6 | M6 | 1 | 4 | 4.5 | 12 | 60 | 6 |
| 4LTMS 045 150 S06 M6 | M6 | 1 | 4 | 4.5 | 15 | 60 | 6 |
| 4LTMS 060 1625 S06 M8 | M8 | 1.25 | 4 | 6 | 16.25 | 65 | 6 |
| 4LTMS 060 200 S06 M8 | M8 | 1.25 | 4 | 6 | 20 | 65 | 6 |
| 4LTMS 075 210 S08 M10 | M10 | 1.5 | 4 | 7.5 | 21 | 75 | 8 |
| 4LTMS 075 255 S08 M10 | M10 | 1.5 | 4 | 7.5 | 25.5 | 80 | 8 |
| 4LTMS 095 245 S10 M12 | M12 | 1.75 | 4 | 9.5 | 24.5 | 85 | 10 |
| 4LTMS 095 315 S10 M12 | M12 | 1.75 | 4 | 9.5 | 31.5 | 85 | 10 |
| 4LTMS 100 280 S10 M14 | M14 | 2 | 4 | 10 | 28 | 90 | 10 |
| 4LTMS 100 360 S10 M14 | M14 | 2 | 4 | 10 | 36 | 95 | 10 |
| 4LTMS 120 320 S12 M16 | M16 | 2 | 4 | 12 | 32 | 100 | 12 |
| 4LTMS 120 400 S12 M16 | M16 | 2 | 4 | 12 | 40 | 105 | 12 |
| 4LTMS 140 375 S14 M18 | M18 | 2.5 | 4 | 14 | 37.5 | 100 | 14 |
| 4LTMS 140 450 S14 M18 | M18 | 2.5 | 4 | 14 | 45 | 110 | 14 |
| 4LTMS 160 400 S16 M20 | M20 | 2.5 | 4 | 16 | 40 | 110 | 16 |
| 4LTMS 160 500 S16 M20 | M20 | 2.5 | 4 | 16 | 50 | 120 | 16 |
| | | | | | | | 내부 급유형 (With coolant) |
| 4LTMS 045 120 S06 M6C | M6 | 1 | 4 | 4.5 | 12 | 60 | 6 |
| 4LTMS 045 150 S06 M6C | M6 | 1 | 4 | 4.5 | 15 | 60 | 6 |
| 4LTMS 060 1625 S06 M8C | M8 | 1.25 | 4 | 6 | 16.25 | 65 | 6 |
| 4LTMS 060 200 S06 M8C | M8 | 1.25 | 4 | 6 | 20 | 65 | 6 |
| 4LTMS 075 210 S08 M10C | M10 | 1.5 | 4 | 7.5 | 21 | 75 | 8 |
| 4LTMS 075 255 S08 M10C | M10 | 1.5 | 4 | 7.5 | 25.5 | 80 | 8 |
| 4LTMS 095 245 S10 M12C | M12 | 1.75 | 4 | 9.5 | 24.5 | 85 | 10 |
| 4LTMS 095 315 S10 M12C | M12 | 1.75 | 4 | 9.5 | 31.5 | 85 | 10 |
| 4LTMS 100 280 S10 M14C | M14 | 2 | 4 | 10 | 28 | 90 | 10 |
| 4LTMS 100 360 S10 M14C | M14 | 2 | 4 | 10 | 36 | 95 | 10 |
| 4LTMS 120 320 S12 M16C | M16 | 2 | 4 | 12 | 32 | 100 | 12 |
| 4LTMS 120 400 S12 M16C | M16 | 2 | 4 | 12 | 40 | 105 | 12 |
| 4LTMS 140 375 S14 M18C | M18 | 2.5 | 4 | 14 | 37.5 | 100 | 14 |
| 4LTMS 140 450 S14 M18C | M18 | 2.5 | 4 | 14 | 45 | 110 | 14 |
| 4LTMS 160 400 S16 M20C | M20 | 2.5 | 4 | 16 | 40 | 110 | 16 |
| 4LTMS 160 500 S16 M20C | M20 | 2.5 | 4 | 16 | 50 | 120 | 16 |

## American UN

단위 Unit: mm

| Order Number | 나사 가능 규격 Thread UNC | UNF | UNEF | 피치규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 외부 급유형(Without coolant) |
| New 4LTMS 0165 045 S04 | No.2 | No.3 | | 56 | 4 | 10 | 1.65 | 4.5 | 45 | 4 |
| New 4LTMS 0165 054 S04 | No.2 | No.3 | | 56 | 4 | 12 | 1.65 | 5.4 | 45 | 4 |
| New 4LTMS 019 053 S04 | No.3 | No.4 | | 48 | 4 | 10 | 1.9 | 5.3 | 45 | 4 |
| New 4LTMS 019 063 S04 | No.3 | No.4 | | 48 | 4 | 12 | 1.9 | 6.3 | 45 | 4 |
| 4LTMS 021 060 S04 | No.4, No.5 | No.6 | | 40 | 4 | 9 | 2.1 | 6 | 45 | 4 |
| 4LTMS 021 079 S04 | No.4, No.5 | No.6 | | 40 | 4 | 12 | 2.1 | 7.9 | 45 | 4 |
| 4LTMS 0255 075 S04 | No.6, No.8 | No.10 | No.12 | 32 | 4 | 9 | 2.55 | 7.5 | 45 | 4 |
| 4LTMS 0255 099 S04 | No.6, No.8 | No.10 | No.12 | 32 | 4 | 12 | 2.55 | 9.9 | 45 | 4 |
| 4LTMS 033 088 S04 | | No.8 | | 36 | 4 | 12 | 3.3 | 8.8 | 45 | 4 |
| 4LTMS 033 109 S04 | | No.8 | | 36 | 4 | 15 | 3.3 | 10.9 | 45 | 4 |
| 4LTMS 0358 099 S04 | No.10, No.12 | 5/16″ | | 24 | 4 | 9 | 3.58 | 9.9 | 45 | 4 |
| 4LTMS 0358 131 S04 | No.10, No.12 | 5/16″ | | 24 | 4 | 12 | 3.58 | 13.1 | 45 | 4 |
| 4LTMS 038 099 S04 | | No.10 | No.12, 5/16″ | 32 | 4 | 12 | 3.8 | 9.9 | 45 | 4 |
| 4LTMS 038 130 S04 | | No.10 | No.12, 5/16″ | 32 | 4 | 16 | 3.8 | 13 | 50 | 4 |
| 4LTMS 0415 110 S06 | No.12 | 5/16″, 3/8″ | | 24 | 4 | 10 | 4.15 | 11 | 60 | 6 |
| 4LTMS 0415 152 S06 | No.12 | 5/16″, 3/8″ | | 24 | 4 | 14 | 4.15 | 15.2 | 60 | 6 |
| 4LTMS 043 112 S06 | | No.12, 1/4″ | 7/16″ | 28 | 4 | 12 | 4.3 | 11.2 | 60 | 6 |
| 4LTMS 043 149 S06 | | No.12, 1/4″ | 7/16″ | 28 | 4 | 16 | 4.3 | 14.9 | 60 | 6 |
| 4LTMS 044 114 S06 | | | No.12, 1/4″, 5/16″ | 32 | 4 | 14 | 4.4 | 11.4 | 60 | 6 |
| 4LTMS 044 154 S06 | | | No.12, 1/4″, 5/16″ | 32 | 4 | 19 | 4.4 | 15.4 | 60 | 6 |
| 4LTMS 0488 132 S06 | 1/4″ | 7/16″, 1/2″ | | 20 | 4 | 10 | 4.88 | 13.2 | 60 | 6 |
| 4LTMS 0488 170 S06 | 1/4″ | 7/16″, 1/2″ | | 20 | 4 | 13 | 4.88 | 17 | 60 | 6 |
| 4LTMS 0515 131 S06 | | 1/4″ | 7/16″, 1/2″ | 28 | 4 | 14 | 5.15 | 13.1 | 60 | 6 |
| 4LTMS 0515 167 S06 | | 1/4″ | 7/16″, 1/2″ | 28 | 4 | 18 | 5.15 | 16.7 | 60 | 6 |
| 4LTMS 0615 160 S08 | 5/16″ | 9/16″, 5/8″ | | 18 | 4 | 11 | 6.15 | 16 | 65 | 8 |
| 4LTMS 0615 217 S08 | 5/16″ | 9/16″, 5/8″ | | 18 | 4 | 15 | 6.15 | 21.7 | 75 | 8 |
| 4LTMS 0668 163 S08 | | 5/16″, 3/8″ | 9/16″ | 24 | 4 | 15 | 6.68 | 16.3 | 65 | 8 |
| 4LTMS 0668 205 S08 | | 5/16″, 3/8″ | 9/16″ | 24 | 4 | 19 | 6.68 | 20.5 | 75 | 8 |
| 4LTMS 0765 196 S08 | 3/8″ | 3/4″ | | 16 | 4 | 12 | 7.65 | 19.6 | 65 | 8 |
| 4LTMS 0765 244 S08 | 3/8″ | 3/4″ | | 16 | 4 | 15 | 7.65 | 24.4 | 75 | 8 |
| 4LTMS 082 195 S10 | | 3/8″ | 9/16″, 5/8″ | 24 | 4 | 18 | 8.2 | 19.5 | 80 | 10 |
| 4LTMS 082 247 S10 | | 3/8″ | 9/16″, 5/8″ | 24 | 4 | 23 | 8.2 | 24.7 | 80 | 10 |
| 4LTMS 090 224 S10 | 7/16″ | 7/8″ | | 14 | 4 | 12 | 9 | 22.4 | 75 | 10 |
| 4LTMS 090 297 S10 | 7/16″ | 7/8″ | | 14 | 4 | 16 | 9 | 29.7 | 80 | 10 |
| 4LTMS 096 221 S10 | | 7/16″, 1/2″ | 3/4″ | 20 | 4 | 17 | 9.6 | 22.1 | 75 | 10 |
| 4LTMS 096 284 S10 | | 7/16″, 1/2″ | 3/4″ | 20 | 4 | 22 | 9.6 | 28.4 | 80 | 10 |
| 4LTMS 099 221 S10 | | | 7/16″, 1/2″ | 28 | 4 | 24 | 9.9 | 22.1 | 75 | 10 |
| 4LTMS 099 285 S10 | | | 7/16″, 1/2″ | 28 | 4 | 31 | 9.9 | 28.5 | 80 | 10 |
| 4LTMS 1035 261 S12 | 1/2″ | | | 13 | 4 | 13 | 10.35 | 26.1 | 80 | 12 |
| 4LTMS 1035 339 S12 | 1/2″ | | | 13 | 4 | 17 | 10.35 | 33.9 | 90 | 12 |
| 4LTMS 111 259 S12 | | 1/2″ | 3/4″, 13/16″ | 20 | 4 | 20 | 11.1 | 25.9 | 80 | 12 |
| 4LTMS 111 322 S12 | | 1/2″ | 3/4″, 13/16″ | 20 | 4 | 25 | 11.1 | 32.2 | 90 | 12 |
| 4LTMS 118 283 S12 | 9/16″ | 1″, 1-1/8″ | | 12 | 4 | 13 | 11.8 | 28.3 | 80 | 12 |
| 4LTMS 118 367 S12 | 9/16″ | 1″, 1-1/8″ | | 12 | 4 | 17 | 11.8 | 36.7 | 90 | 12 |
| 4LTMS 125 287 S14 | | 9/16″, 5/8″ | 11/16″ | 18 | 4 | 20 | 12.5 | 28.7 | 95 | 14 |
| 4LTMS 125 372 S14 | | 9/16″, 5/8″ | 11/16″ | 18 | 4 | 26 | 12.5 | 37.2 | 100 | 14 |
| 4LTMS 129 290 S14 | | | 9/16″, 5/8″, 11/16″ | 24 | 4 | 27 | 12.9 | 29 | 95 | 14 |
| 4LTMS 129 364 S14 | | | 9/16″, 5/8″, 11/16″ | 24 | 4 | 34 | 12.9 | 36.4 | 100 | 14 |
| 4LTMS 131 331 S14 | 5/8″ | | | 11 | 4 | 14 | 13.1 | 33.1 | 95 | 14 |
| 4LTMS 131 424 S14 | 5/8″ | | | 11 | 4 | 18 | 13.1 | 42.4 | 105 | 14 |
| 4LTMS 141 316 S16 | | 5/8″ | 11/16″, 1-1/8″ | 18 | 4 | 22 | 14.1 | 31.6 | 95 | 16 |
| 4LTMS 141 414 S16 | | 5/8″ | 11/16″, 1-1/8″ | 18 | 4 | 29 | 14.1 | 41.4 | 105 | 16 |
| 4LTMS 159 390 S16 | 3/4″ | | | 10 | 4 | 15 | 15.9 | 39 | 100 | 16 |
| 4LTMS 159 491 S16 | 3/4″ | | | 10 | 4 | 19 | 15.9 | 49.1 | 110 | 16 |
| 4LTMS 160 387 S16 | | 3/4″ | | 16 | 4 | 24 | 16 | 38.7 | 105 | 16 |
| 4LTMS 160 482 S16 | | 3/4″ | | 16 | 4 | 30 | 16 | 48.2 | 115 | 16 |
| 4LTMS 160 386 S16 | | | 3/4″, 13/16″, 7/8″ | 20 | 4 | 30 | 16 | 38.6 | 105 | 16 |
| 4LTMS 160 487 S16 | | | 3/4″, 13/16″, 7/8″ | 20 | 4 | 38 | 16 | 48.7 | 115 | 16 |
| 4LTMS 160 461 S16 | 7/8″ | | | 9 | 4 | 16 | 16 | 46.1 | 110 | 16 |
| 4LTMS 160 442 S16 | | 7/8″ | | 14 | 4 | 24 | 16 | 44.2 | 110 | 16 |
| 4LTMS 160 519 S16 | 1″ | | | 8 | 4 | 16 | 16 | 51.9 | 120 | 16 |
| 4LTMS 160 515 S16 | | 1″, 1-1/8″, 1-1/2″ | | 12 | 4 | 24 | 16 | 51.5 | 120 | 16 |

# 4LTMS

*4 Flutes Helix Long Thread Mills For Stainless Steels*

## *4날 SUS 가공용 헬릭스 긴 길이 쓰레드밀*

### American UN

단위 Unit: mm

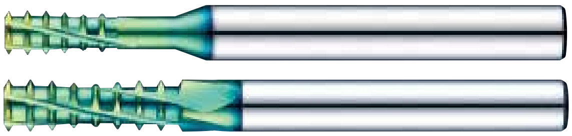
내부 급유형 (With coolant)

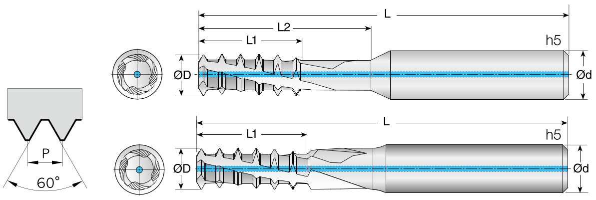
| Order Number | 나사 가능 규격 Thread UNC | UNF | UNEF | 피치규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 전장 Overall Length L | 섕크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|
| 4LTMS 0358 099 S04C | No.10, No.12 | 5/16″ | | 24 | 4 | 9 | 3.58 | 9.9 | 45 | 4 |
| 4LTMS 0358 131 S04C | No.10, No.12 | 5/16″ | | 24 | 4 | 12 | 3.58 | 13.1 | 45 | 4 |
| 4LTMS 038 099 S04C | | No.10 | No.12, 5/16″ | 32 | 4 | 12 | 3.8 | 9.9 | 45 | 4 |
| 4LTMS 038 130 S04C | | No.10 | No.12, 5/16″ | 32 | 4 | 16 | 3.8 | 13 | 50 | 4 |
| 4LTMS 0415 110 S06C | No.12 | 5/16″, 3/8″ | | 24 | 4 | 10 | 4.15 | 11 | 60 | 6 |
| 4LTMS 0415 152 S06C | No.12 | 5/16″, 3/8″ | | 24 | 4 | 14 | 4.15 | 15.2 | 60 | 6 |
| 4LTMS 043 112 S06C | | No.12, 1/4″ | 7/16″ | 28 | 4 | 12 | 4.3 | 11.2 | 60 | 6 |
| 4LTMS 043 149 S06C | | No.12, 1/4″ | 7/16″ | 28 | 4 | 16 | 4.3 | 14.9 | 60 | 6 |
| 4LTMS 044 114 S06C | | | No.12, 1/4″, 5/16″ | 32 | 4 | 14 | 4.4 | 11.4 | 60 | 6 |
| 4LTMS 044 154 S06C | | | No.12, 1/4″, 5/16″ | 32 | 4 | 19 | 4.4 | 15.4 | 60 | 6 |
| 4LTMS 0488 132 S06C | 1/4″ | 7/16″, 1/2″ | | 20 | 4 | 10 | 4.88 | 13.2 | 60 | 6 |
| 4LTMS 0488 170 S06C | 1/4″ | 7/16″, 1/2″ | | 20 | 4 | 13 | 4.88 | 17 | 60 | 6 |
| 4LTMS 0515 131 S06C | | 1/4″ | 7/16″, 1/2″ | 28 | 4 | 14 | 5.15 | 13.1 | 60 | 6 |
| 4LTMS 0515 167 S06C | | 1/4″ | 7/16″, 1/2″ | 28 | 4 | 18 | 5.15 | 16.7 | 60 | 6 |
| 4LTMS 0615 160 S08C | 5/16″ | 9/16″, 5/8″ | | 18 | 4 | 11 | 6.15 | 16 | 65 | 8 |
| 4LTMS 0615 217 S08C | 5/16″ | 9/16″, 5/8″ | | 18 | 4 | 15 | 6.15 | 21.7 | 75 | 8 |
| 4LTMS 0668 163 S08C | | 5/16″, 3/8″ | 9/16″ | 24 | 4 | 15 | 6.68 | 16.3 | 65 | 8 |
| 4LTMS 0668 205 S08C | | 5/16″, 3/8″ | 9/16″ | 24 | 4 | 19 | 6.68 | 20.5 | 75 | 8 |
| 4LTMS 0765 196 S08C | 3/8″ | 3/4″ | | 16 | 4 | 12 | 7.65 | 19.6 | 65 | 8 |
| 4LTMS 0765 244 S08C | 3/8″ | 3/4″ | | 16 | 4 | 15 | 7.65 | 24.4 | 75 | 8 |
| 4LTMS 082 195 S10C | | 3/8″ | 9/16″, 5/8″ | 24 | 4 | 18 | 8.2 | 19.5 | 80 | 10 |
| 4LTMS 082 247 S10C | | 3/8″ | 9/16″, 5/8″ | 24 | 4 | 23 | 8.2 | 24.7 | 80 | 10 |
| 4LTMS 090 224 S10C | 7/16″ | 7/8″ | | 14 | 4 | 12 | 9 | 22.4 | 75 | 10 |
| 4LTMS 090 297 S10C | 7/16″ | 7/8″ | | 14 | 4 | 16 | 9 | 29.7 | 80 | 10 |
| 4LTMS 096 221 S10C | | 7/16″, 1/2″ | 3/4″ | 20 | 4 | 17 | 9.6 | 22.1 | 75 | 10 |
| 4LTMS 096 284 S10C | | 7/16″, 1/2″ | 3/4″ | 20 | 4 | 22 | 9.6 | 28.4 | 80 | 10 |
| 4LTMS 099 221 S10C | | | 7/16″, 1/2″ | 28 | 4 | 24 | 9.9 | 22.1 | 75 | 10 |
| 4LTMS 099 285 S10C | | | 7/16″, 1/2″ | 28 | 4 | 31 | 9.9 | 28.5 | 80 | 10 |
| 4LTMS 1035 261 S12C | 1/2″ | | | 13 | 4 | 13 | 10.35 | 26.1 | 80 | 12 |
| 4LTMS 1035 339 S12C | 1/2″ | | | 13 | 4 | 17 | 10.35 | 33.9 | 90 | 12 |
| 4LTMS 111 259 S12C | | 1/2″ | 3/4″, 13/16″ | 20 | 4 | 20 | 11.1 | 25.9 | 80 | 12 |
| 4LTMS 111 322 S12C | | 1/2″ | 3/4″, 13/16″ | 20 | 4 | 25 | 11.1 | 32.2 | 90 | 12 |
| 4LTMS 118 283 S12C | 9/16″ | 1″, 1-1/8″ | | 12 | 4 | 13 | 11.8 | 28.3 | 80 | 12 |
| 4LTMS 118 367 S12C | 9/16″ | 1″, 1-1/8″ | | 12 | 4 | 17 | 11.8 | 36.7 | 90 | 12 |
| 4LTMS 125 287 S14C | | 9/16″, 5/8″ | 11/16″ | 18 | 4 | 20 | 12.5 | 28.7 | 95 | 14 |
| 4LTMS 125 372 S14C | | 9/16″, 5/8″ | 11/16″ | 18 | 4 | 26 | 12.5 | 37.2 | 100 | 14 |
| 4LTMS 129 290 S14C | | | 9/16″, 5/8″, 11/16″ | 24 | 4 | 27 | 12.9 | 29 | 95 | 14 |
| 4LTMS 129 364 S14C | | | 9/16″, 5/8″, 11/16″ | 24 | 4 | 34 | 12.9 | 36.4 | 100 | 14 |
| 4LTMS 131 331 S14C | 5/8″ | | | 11 | 4 | 14 | 13.1 | 33.1 | 95 | 14 |
| 4LTMS 131 424 S14C | 5/8″ | | | 11 | 4 | 18 | 13.1 | 42.4 | 105 | 14 |
| 4LTMS 141 316 S16C | | 5/8″ | 11/16″, 1-1/8″ | 18 | 4 | 22 | 14.1 | 31.6 | 95 | 16 |
| 4LTMS 141 414 S16C | | 5/8″ | 11/16″, 1-1/8″ | 18 | 4 | 29 | 14.1 | 41.4 | 105 | 16 |
| 4LTMS 159 390 S16C | 3/4″ | | | 10 | 4 | 15 | 15.9 | 39 | 100 | 16 |
| 4LTMS 159 491 S16C | 3/4″ | | | 10 | 4 | 19 | 15.9 | 49.1 | 110 | 16 |
| 4LTMS 160 387 S16C | | 3/4″ | | 16 | 4 | 24 | 16 | 38.7 | 105 | 16 |
| 4LTMS 160 482 S16C | | 3/4″ | | 16 | 4 | 30 | 16 | 48.2 | 115 | 16 |
| 4LTMS 160 386 S16C | | | 3/4″, 13/16″, 7/8″ | 20 | 4 | 30 | 16 | 38.6 | 105 | 16 |
| 4LTMS 160 487 S16C | | | 3/4″, 13/16″, 7/8″ | 20 | 4 | 38 | 16 | 48.7 | 115 | 16 |
| 4LTMS 160 461 S16C | 7/8″ | | | 9 | 4 | 16 | 16 | 46.1 | 110 | 16 |
| 4LTMS 160 442 S16C | | 7/8″ | | 14 | 4 | 24 | 16 | 44.2 | 110 | 16 |
| 4LTMS 160 519 S16C | 1″ | | | 8 | 4 | 16 | 16 | 51.9 | 120 | 16 |
| 4LTMS 160 515 S16C | | 1″, 1-1/8″, 1-1/2″ | | 12 | 4 | 24 | 16 | 51.5 | 120 | 16 |

# 4NKTM

*4 Flutes Helix Nick Type Thread Mills for Multi Purpose*

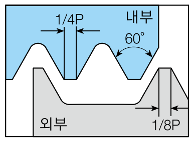
## 4날 범용 헬릭스 니크 타입 쓰레드밀






- HRc 62이하의 열처리강, 프리하든강, 합금강, 탄소강, 주철 가공
- 높은 절삭 속도와 날 당 높은 이송이 가능합니다.
- 최대 나사가공 깊이 : 2xD, 2.5xD, 3xD(나사가공 직경)
- 더 깊은 나사가공을 위한 헬리컬 리브 타입을 채용하였습니다.
- 헬리코일 나사 가공이 가능합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- Thread mills for Hardened steels(up to HRc 62), pre-hardened steels, alloy steels, carbon steels, cast irons
- High spindle speed and feed per tooth are available.
- Maximum drilling depth : 2xD, 2.5xD, 3xD(threading diameter)
- Rib type helical design is applied for deep threading.
- It can be used for heli coil threading.
- Both right and left threading are available.





530P

### ISO 측정항목

단위 Unit : mm

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch | 날수 Flutes Z | 날경 Diameter D | 나사부길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| 외부 급유형 (Without coolant) | | | | | | | | |
| 4NKTM 022 060 S06 M3 | M3 | 0.5 | 4 | 2.2 | 6 | - | 60 | 6 |
| 4NKTM 022 080 S06 M3 | M3 | 0.5 | 4 | 2.2 | 8 | - | 60 | 6 |
| 4NKTM 024 090 S04 M3 | M3 | 0.5 | 4 | 2.4 | 5.47 | 9 | 45 | 4 |
| 4NKTM 029 084 S06 M4 | M4 | 0.7 | 4 | 2.9 | 8.4 | - | 60 | 6 |
| 4NKTM 029 112 S06 M4 | M4 | 0.7 | 4 | 2.9 | 11.2 | - | 60 | 6 |
| 4NKTM 0315 120 S04 M4 | M4 | 0.7 | 4 | 3.15 | 7.64 | 12 | 45 | 4 |
| 4NKTM 038 112 S06 M5 | M5 | 0.8 | 4 | 3.8 | 11.2 | - | 60 | 6 |
| 4NKTM 038 128 S06 M5 | M5 | 0.8 | 4 | 3.8 | 12.8 | - | 60 | 6 |
| 4NKTM 039 150 S04 M5 | M5 | 0.8 | 4 | 3.9 | 8.73 | 15 | 50 | 4 |
| 4NKTM 045 120 S06 M6 | M6 | 1 | 4 | 4.5 | 12 | - | 60 | 6 |
| 4NKTM 045 160 S06 M6 | M6 | 1 | 4 | 4.5 | 16 | - | 60 | 6 |
| 4NKTM 048 180 S06 M6 | M6 | 1 | 4 | 4.8 | 10.9 | 18 | 60 | 6 |
| 4NKTM 060 175 S06 M8 | M8 | 1.25 | 4 | 6 | 17.5 | - | 65 | 6 |
| 4NKTM 060 200 S06 M8 | M8 | 1.25 | 4 | 6 | 20 | - | 65 | 6 |
| 4NKTM 065 240 S08 M8 | M8 | 1.25 | 4 | 6.5 | 13.62 | 24 | 65 | 8 |
| 4NKTM 075 210 S08 M10 | M10 | 1.5 | 4 | 7.5 | 21 | - | 75 | 8 |
| 4NKTM 075 270 S08 M10 | M10 | 1.5 | 4 | 7.5 | 27 | - | 75 | 8 |
| 4NKTM 082 300 S10 M10 | M10 | 1.5 | 4 | 8.2 | 16.34 | 30 | 75 | 10 |
| 4NKTM 095 245 S10 M12 | M12 | 1.75 | 4 | 9.5 | 24.5 | - | 80 | 10 |
| 4NKTM 095 315 S10 M12 | M12 | 1.75 | 4 | 9.5 | 31.5 | - | 80 | 10 |
| 4NKTM 099 360 S10 M12 | M12 | 1.75 | 4 | 9.9 | 19.06 | 36 | 85 | 10 |
| 4NKTM 100 280 S10 M14 | M14 | 2 | 4 | 10 | 28 | - | 85 | 10 |
| 4NKTM 100 360 S10 M14 | M14 | 2 | 4 | 10 | 36 | - | 90 | 10 |
| 4NKTM 116 420 S12 M14 | M14 | 2 | 4 | 11.6 | 21.75 | 42 | 90 | 12 |
| 4NKTM 120 320 S12 M16 | M16 | 2 | 4 | 12 | 32 | - | 95 | 12 |
| 4NKTM 120 400 S12 M16 | M16 | 2 | 4 | 12 | 40 | - | 100 | 12 |
| 4NKTM 136 480 S14 M16 | M16 | 2 | 4 | 13.6 | 25.75 | 48 | 100 | 14 |
| 4NKTM 140 400 S14 M18 | M18 | 2.5 | 4 | 14 | 40 | - | 95 | 14 |
| 4NKTM 140 450 S14 M18 | M18 | 2.5 | 4 | 14 | 45 | - | 105 | 14 |
| 4NKTM 160 400 S16 M20 | M20 | 2.5 | 4 | 16 | 40 | - | 105 | 16 |
| 4NKTM 160 500 S16 M20 | M20 | 2.5 | 4 | 16 | 50 | - | 115 | 16 |

## ISO 측정항목

단위 Unit: mm

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch | 날수 Flutes Z | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| 내부 급유형 (With coolant) | | | | | | | | |
| 4NKTM 045 120 S06 M6C | M6 | 1 | 4 | 4.5 | 12 | - | 60 | 6 |
| 4NKTM 045 160 S06 M6C | M6 | 1 | 4 | 4.5 | 16 | - | 60 | 6 |
| 4NKTM 048 180 S06 M6C | M6 | 1 | 4 | 4.8 | 10.9 | 18 | 60 | 6 |
| 4NKTM 060 175 S06 M8C | M8 | 1.25 | 4 | 6 | 17.5 | - | 65 | 6 |
| 4NKTM 060 200 S06 M8C | M8 | 1.25 | 4 | 6 | 20 | - | 65 | 6 |
| 4NKTM 065 240 S08 M8C | M8 | 1.25 | 4 | 6.5 | 13.62 | 24 | 65 | 8 |
| 4NKTM 075 210 S08 M10C | M10 | 1.5 | 4 | 7.5 | 21 | - | 75 | 8 |
| 4NKTM 075 270 S08 M10C | M10 | 1.5 | 4 | 7.5 | 27 | - | 75 | 8 |
| 4NKTM 082 300 S10 M10C | M10 | 1.5 | 4 | 8.2 | 16.34 | 30 | 75 | 10 |
| 4NKTM 095 245 S10 M12C | M12 | 1.75 | 4 | 9.5 | 24.5 | - | 80 | 10 |
| 4NKTM 095 315 S10 M12C | M12 | 1.75 | 4 | 9.5 | 31.5 | - | 80 | 10 |
| 4NKTM 099 360 S10 M12C | M12 | 1.75 | 4 | 9.9 | 19.06 | 36 | 85 | 10 |
| 4NKTM 100 280 S10 M14C | M14 | 2 | 4 | 10 | 28 | - | 85 | 10 |
| 4NKTM 100 360 S10 M14C | M14 | 2 | 4 | 10 | 36 | - | 90 | 10 |
| 4NKTM 116 420 S12 M14C | M14 | 2 | 4 | 11.6 | 21.75 | 42 | 90 | 12 |
| 4NKTM 120 320 S12 M16C | M16 | 2 | 4 | 12 | 32 | - | 95 | 12 |
| 4NKTM 120 400 S12 M16C | M16 | 2 | 4 | 12 | 40 | - | 100 | 12 |
| 4NKTM 136 480 S14 M16C | M16 | 2 | 4 | 13.6 | 25.75 | 48 | 100 | 14 |
| 4NKTM 140 400 S14 M18C | M18 | 2.5 | 4 | 14 | 40 | - | 95 | 14 |
| 4NKTM 140 450 S14 M18C | M18 | 2.5 | 4 | 14 | 45 | - | 105 | 14 |
| 4NKTM 160 400 S16 M20C | M20 | 2.5 | 4 | 16 | 40 | - | 105 | 16 |
| 4NKTM 160 500 S16 M20C | M20 | 2.5 | 4 | 16 | 50 | - | 115 | 16 |

## American UN

단위 Unit : mm

외부 급유형(Without coolant)

| Order Number | 나사 가능 규격 Thread UNC | UNF | UNEF | 피치규격 Pitch (TPI) | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|
| NEW 4NKTM 0165 045 S06 | No.2 | No.3 | | 56 | 5 | 1.65 | 4.5 | - | 50 | 6 |
| NEW 4NKTM 0165 054 S06 | No.2 | No.3 | | 56 | 6 | 1.65 | 5.4 | - | 50 | 6 |
| NEW 4NKTM 0165 066 S06 | No.2 | No.3 | | 56 | 4 | 1.65 | 3.2 | 6.6 | 50 | 6 |
| NEW 4NKTM 019 053 S06 | No.3 | No.4 | | 48 | 5 | 1.9 | 5.3 | - | 50 | 6 |
| NEW 4NKTM 019 063 S06 | No.3 | No.4 | | 48 | 6 | 1.9 | 6.3 | - | 50 | 6 |
| NEW 4NKTM 019 075 S06 | No.3 | No.4 | | 48 | 4 | 1.9 | 3.7 | 7.5 | 50 | 6 |
| NEW 4NKTM 021 063 S06 | No.4, No.5 | No.6 | | 40 | 5 | 2.1 | 6.3 | - | 50 | 6 |
| NEW 4NKTM 021 076 S06 | No.4, No.5 | No.6 | | 40 | 6 | 2.1 | 7.6 | - | 50 | 6 |
| NEW 4NKTM 021 085 S06 | No.4, No.5 | No.6 | | 40 | 4 | 2.1 | 4.4 | 8.5 | 50 | 6 |
| NEW 4NKTM 0244 063 S06 | No.5 | No.6 | | 40 | 5 | 2.44 | 6.3 | - | 50 | 6 |
| NEW 4NKTM 0244 076 S06 | No.5 | No.6 | | 40 | 6 | 2.44 | 7.6 | - | 50 | 6 |
| NEW 4NKTM 0244 095 S06 | No.5 | No.6 | | 40 | 4 | 2.44 | 4.4 | 9.5 | 50 | 6 |
| NEW 4NKTM 0255 079 S06 | No.6, No.8 | No.10 | No.12 | 32 | 5 | 2.55 | 7.9 | - | 50 | 6 |
| NEW 4NKTM 0255 095 S06 | No.6, No.8 | No.10 | No.12 | 32 | 6 | 2.55 | 9.5 | - | 50 | 6 |
| NEW 4NKTM 0255 105 S06 | No.6, No.8 | No.10 | No.12 | 32 | 4 | 2.55 | 5.6 | 10.5 | 50 | 6 |
| NEW 4NKTM 0321 095 S06 | No.8 | No.10 | No.12, 1/4″ | 32 | 6 | 3.21 | 9.5 | - | 50 | 6 |
| NEW 4NKTM 0321 111 S06 | No.8 | No.10 | No.12, 1/4″ | 32 | 7 | 3.21 | 11.1 | - | 50 | 6 |
| NEW 4NKTM 0321 125 S06 | No.8 | No.10 | No.12, 1/4″ | 32 | 4 | 3.21 | 5.6 | 12.5 | 50 | 6 |
| NEW 4NKTM 033 084 S06 | | No.8 | | 36 | 6 | 3.3 | 8.4 | - | 50 | 6 |
| NEW 4NKTM 033 113 S06 | | No.8 | | 36 | 8 | 3.3 | 11.3 | - | 50 | 6 |
| NEW 4NKTM 033 125 S06 | | No.8 | | 36 | 5 | 3.3 | 6.3 | 12.5 | 50 | 6 |
| NEW 4NKTM 0359 106 S06 | No.10, No.12 | 5/16″ | | 24 | 5 | 3.59 | 10.6 | - | 50 | 6 |
| NEW 4NKTM 0359 127 S06 | No.10, No.12 | 5/16″ | | 24 | 6 | 3.59 | 12.7 | - | 50 | 6 |
| NEW 4NKTM 0359 145 S06 | No.10, No.12 | 5/16″ | | 24 | 4 | 3.59 | 7.4 | 14.5 | 50 | 6 |
| NEW 4NKTM 038 095 S06 | | No.10 | No.12, 1/4″, 5/16″ | 32 | 6 | 3.8 | 9.5 | - | 50 | 6 |
| NEW 4NKTM 038 127 S06 | | No.10 | No.12, 1/4″, 5/16″ | 32 | 8 | 3.8 | 12.7 | - | 50 | 6 |
| NEW 4NKTM 038 145 S06 | | No.10 | No.12, 1/4″, 5/16″ | 32 | 5 | 3.8 | 7 | 14.5 | 50 | 6 |
| NEW 4NKTM 0425 106 S06 | No.12 | 5/16″, 3/8″ | | 24 | 5 | 4.25 | 10.6 | - | 60 | 6 |
| NEW 4NKTM 0425 148 S06 | No.12 | 5/16″, 3/8″ | | 24 | 7 | 4.25 | 14.8 | - | 60 | 6 |
| NEW 4NKTM 0425 165 S06 | No.12 | 5/16″, 3/8″ | | 24 | 4 | 4.25 | 7.4 | 16.5 | 60 | 6 |
| NEW 4NKTM 048 127 S06 | 1/4″ | 7/16″, 1/2″ | | 20 | 5 | 4.8 | 12.7 | - | 65 | 6 |
| NEW 4NKTM 048 178 S06 | 1/4″ | 7/16″, 1/2″ | | 20 | 7 | 4.8 | 17.8 | - | 65 | 6 |
| NEW 4NKTM 048 190 S06 | 1/4″ | 7/16″, 1/2″ | | 20 | 4 | 4.8 | 8.9 | 19 | 65 | 6 |
| NEW 4NKTM 052 127 S06 | | 1/4″ | 7/16″, 1/2″ | 28 | 7 | 5.2 | 12.7 | - | 65 | 6 |
| NEW 4NKTM 052 163 S06 | | 1/4″ | 7/16″, 1/2″ | 28 | 9 | 5.2 | 16.3 | - | 65 | 6 |
| NEW 4NKTM 052 190 S06 | | 1/4″ | 7/16″, 1/2″ | 28 | 6 | 5.2 | 9.8 | 19 | 65 | 6 |
| NEW 4NKTM 062 169 S08 | 5/16″ | 9/16″, 5/8″ | | 18 | 6 | 6.2 | 16.9 | - | 80 | 8 |
| NEW 4NKTM 062 226 S08 | 5/16″ | 9/16″, 5/8″ | | 18 | 8 | 6.2 | 22.6 | - | 80 | 8 |
| NEW 4NKTM 062 240 S08 | 5/16″ | 9/16″, 5/8″ | | 18 | 5 | 6.2 | 12.7 | 24 | 80 | 8 |
| NEW 4NKTM 066 169 S08 | | 5/16″, 3/8″ | 9/16″, 5/8″ | 24 | 8 | 6.6 | 16.9 | - | 80 | 8 |
| NEW 4NKTM 066 211 S08 | | 5/16″, 3/8″ | 9/16″, 5/8″ | 24 | 10 | 6.6 | 21.1 | - | 80 | 8 |
| NEW 4NKTM 066 240 S08 | | 5/16″, 3/8″ | 9/16″, 5/8″ | 24 | 6 | 6.6 | 11.5 | 24 | 80 | 8 |
| NEW 4NKTM 069 190 S08 | 3/8″ | 3/4″ | | 16 | 6 | 6.9 | 19 | - | 80 | 8 |
| NEW 4NKTM 069 254 S08 | 3/8″ | 3/4″ | | 16 | 8 | 6.9 | 25.4 | - | 80 | 8 |
| NEW 4NKTM 069 286 S08 | 3/8″ | 3/4″ | | 16 | 5 | 6.9 | 14 | 28.6 | 80 | 8 |
| NEW 4NKTM 085 218 S10 | 7/16″ | 7/8″ | | 14 | 6 | 8.5 | 21.8 | - | 85 | 10 |
| NEW 4NKTM 085 290 S10 | 7/16″ | 7/8″ | | 14 | 8 | 8.5 | 29 | - | 85 | 10 |
| NEW 4NKTM 085 334 S10 | 7/16″ | 7/8″ | | 14 | 5 | 8.5 | 16.3 | 33.4 | 85 | 10 |
| NEW 4NKTM 092 273 S12 | 1/2″ | | | 13 | 7 | 9.2 | 27.3 | - | 100 | 12 |
| NEW 4NKTM 092 380 S12 | 1/2″ | | | 13 | 6 | 9.2 | 21.5 | 38 | 100 | 12 |
| NEW 4NKTM 108 296 S12 | 9/16″ | 1″, 1-1/8″ | | 12 | 7 | 10.8 | 29.6 | - | 100 | 12 |
| NEW 4NKTM 108 427 S12 | 9/16″ | 1″, 1-1/8″ | | 12 | 6 | 10.8 | 22.9 | 42.7 | 100 | 12 |
| NEW 4NKTM 114 323 S12 | 5/8″ | | | 11 | 7 | 11.4 | 32.3 | - | 100 | 12 |
| NEW 4NKTM 114 476 S12 | 5/8″ | | | 11 | 6 | 11.4 | 25.4 | 47.6 | 100 | 12 |

# 4NKTM

*4 Flutes Helix Nick Type Thread Mills for Multi Purpose*

## 4날 범용 헬릭스 니크 타입 쓰레드밀

### American UN

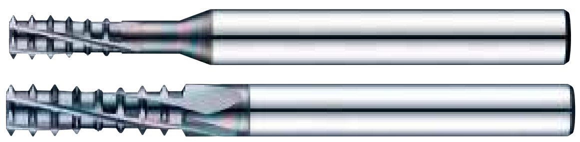
단위 Unit: mm

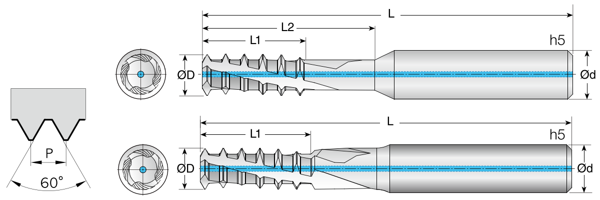
| Order Number | 나사 가능 규격 Thread UNC | UNF | UNEF | 피치규격 Pitch (TPI) | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|
| **내부 급유형(With coolant)** | | | | | | | | | | |
| NEW **4NKTM 0359 106 S06C** | No.10, No.12 | 5/16″ | | 24 | 5 | 3.59 | 10.6 | - | 50 | 6 |
| NEW **4NKTM 0359 127 S06C** | No.10, No.12 | 5/16″ | | 24 | 6 | 3.59 | 12.7 | - | 50 | 6 |
| NEW **4NKTM 0359 145 S06C** | No.10, No.12 | 5/16″ | | 24 | 4 | 3.59 | 7.4 | 14.5 | 50 | 6 |
| NEW **4NKTM 038 095 S06C** | | No.10 | No.12, 1/4″, 5/16″ | 32 | 6 | 3.8 | 9.5 | - | 50 | 6 |
| NEW **4NKTM 038 127 S06C** | | No.10 | No.12, 1/4″, 5/16″ | 32 | 8 | 3.8 | 12.7 | - | 50 | 6 |
| NEW **4NKTM 038 145 S06C** | | No.10 | No.12, 1/4″, 5/16″ | 32 | 5 | 3.8 | 7 | 14.5 | 50 | 6 |
| NEW **4NKTM 0425 106 S06C** | No.12 | 5/16″, 3/8″ | | 24 | 5 | 4.25 | 10.6 | - | 60 | 6 |
| NEW **4NKTM 0425 148 S06C** | No.12 | 5/16″, 3/8″ | | 24 | 7 | 4.25 | 14.8 | - | 60 | 6 |
| NEW **4NKTM 0425 165 S06C** | No.12 | 5/16″, 3/8″ | | 24 | 4 | 4.25 | 7.4 | 16.5 | 60 | 6 |
| NEW **4NKTM 048 127 S06C** | 1/4″ | 7/16″, 1/2″ | | 20 | 5 | 4.8 | 12.7 | - | 65 | 6 |
| NEW **4NKTM 048 178 S06C** | 1/4″ | 7/16″, 1/2″ | | 20 | 7 | 4.8 | 17.8 | - | 65 | 6 |
| NEW **4NKTM 048 190 S06C** | 1/4″ | 7/16″, 1/2″ | | 20 | 4 | 4.8 | 8.9 | 19 | 65 | 6 |
| NEW **4NKTM 052 127 S06C** | | 1/4″ | 7/16″, 1/2″ | 28 | 7 | 5.2 | 12.7 | - | 65 | 6 |
| NEW **4NKTM 052 163 S06C** | | 1/4″ | 7/16″, 1/2″ | 28 | 9 | 5.2 | 16.3 | - | 65 | 6 |
| NEW **4NKTM 052 190 S06C** | | 1/4″ | 7/16″, 1/2″ | 28 | 6 | 5.2 | 9.8 | 19 | 65 | 6 |
| NEW **4NKTM 062 169 S08C** | 5/16″ | 9/16″, 5/8″ | | 18 | 6 | 6.2 | 16.9 | - | 80 | 8 |
| NEW **4NKTM 062 226 S08C** | 5/16″ | 9/16″, 5/8″ | | 18 | 8 | 6.2 | 22.6 | - | 80 | 8 |
| NEW **4NKTM 062 240 S08C** | 5/16″ | 9/16″, 5/8″ | | 18 | 5 | 6.2 | 12.7 | 24 | 80 | 8 |
| NEW **4NKTM 066 169 S08C** | | 5/16″, 3/8″ | 9/16″, 5/8″ | 24 | 8 | 6.6 | 16.9 | - | 80 | 8 |
| NEW **4NKTM 066 211 S08C** | | 5/16″, 3/8″ | 9/16″, 5/8″ | 24 | 10 | 6.6 | 21.1 | - | 80 | 8 |
| NEW **4NKTM 066 240 S08C** | | 5/16″, 3/8″ | 9/16″, 5/8″ | 24 | 6 | 6.6 | 11.5 | 24 | 80 | 8 |
| NEW **4NKTM 069 190 S08C** | 3/8″ | 3/4″ | | 16 | 6 | 6.9 | 19 | - | 80 | 8 |
| NEW **4NKTM 069 254 S08C** | 3/8″ | 3/4″ | | 16 | 8 | 6.9 | 25.4 | - | 80 | 8 |
| NEW **4NKTM 069 286 S08C** | 3/8″ | 3/4″ | | 16 | 5 | 6.9 | 14 | 28.6 | 80 | 8 |
| NEW **4NKTM 085 218 S10C** | 7/16″ | 7/8″ | | 14 | 6 | 8.5 | 21.8 | - | 85 | 10 |
| NEW **4NKTM 085 290 S10C** | 7/16″ | 7/8″ | | 14 | 8 | 8.5 | 29 | - | 85 | 10 |
| NEW **4NKTM 085 334 S10C** | 7/16″ | 7/8″ | | 14 | 5 | 8.5 | 16.3 | 33.4 | 85 | 10 |
| NEW **4NKTM 092 273 S12C** | 1/2″ | | | 13 | 7 | 9.2 | 27.3 | - | 100 | 12 |
| NEW **4NKTM 092 380 S12C** | 1/2″ | | | 13 | 6 | 9.2 | 21.5 | 38 | 100 | 12 |
| NEW **4NKTM 108 296 S12C** | 9/16″ | 1″, 1-1/8″ | | 12 | 7 | 10.8 | 29.6 | - | 100 | 12 |
| NEW **4NKTM 108 427 S12C** | 9/16″ | 1″, 1-1/8″ | | 12 | 6 | 10.8 | 22.9 | 42.7 | 100 | 12 |
| NEW **4NKTM 114 323 S12C** | 5/8″ | | | 11 | 7 | 11.4 | 32.3 | - | 100 | 12 |
| NEW **4NKTM 114 476 S12C** | 5/8″ | | | 11 | 6 | 11.4 | 25.4 | 47.6 | 100 | 12 |

# 4NKTMA

*4 Flutes Helix Nick Type Thread Mills for Aluminum*

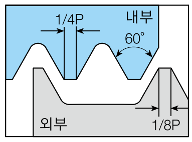
## 4날 알루미늄 전용 헬릭스 니크 타입 쓰레드밀






- **알루미늄, 알루미늄 합금 등 비철 비금속 가공**
- 높은 절삭 속도와 날 당 높은 이송이 가능합니다.
- 최대 나사가공 깊이 : 2xD, 2.5xD, 3xD(나사가공 직경)
- 더 깊은 나사가공을 위한 헬리컬 리브 타입을 채용하였습니다.
- 헬리코일 나사 가공이 가능합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for Aluminum, Aluminum alloys, non-ferrous, and non-metallic materials**
- High spindle speed and feed per tooth are available.
- Maximum drilling depth : 2xD, 2.5xD, 3xD(threading diameter)
- Rib type helical design is applied for deep threading.
- It can be used for heli coil threading.
- Both right and left threading are available.





530P

ISO 측정항목

단위 Unit : mm

| Order Number | 나사 가능 규격<br>Thread | 피치 규격<br>Pitch | 날수<br>Flutes<br>Z | 날경<br>Diameter<br>D | 나사부길이<br>Thread Length<br>L1 | 유효장<br>Effective Length<br>L2 | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | **외부 급유형 (Without coolant)** |
| 4NKTMA 022 060 S06 M3 | M3 | 0.5 | 4 | 2.2 | 6 | - | 60 | 6 |
| 4NKTMA 022 080 S06 M3 | M3 | 0.5 | 4 | 2.2 | 8 | - | 60 | 6 |
| 4NKTMA 024 090 S04 M3 | M3 | 0.5 | 4 | 2.4 | 5.47 | 9 | 45 | 4 |
| 4NKTMA 029 084 S06 M4 | M4 | 0.7 | 4 | 2.9 | 8.4 | - | 60 | 6 |
| 4NKTMA 029 112 S06 M4 | M4 | 0.7 | 4 | 2.9 | 11.2 | - | 60 | 6 |
| 4NKTMA 0315 120 S04 M4 | M4 | 0.7 | 4 | 3.15 | 7.64 | 12 | 45 | 4 |
| 4NKTMA 038 112 S06 M5 | M5 | 0.8 | 4 | 3.8 | 11.2 | - | 60 | 6 |
| 4NKTMA 038 128 S06 M5 | M5 | 0.8 | 4 | 3.8 | 12.8 | - | 60 | 6 |
| 4NKTMA 039 150 S04 M5 | M5 | 0.8 | 4 | 3.9 | 8.73 | 15 | 50 | 4 |
| 4NKTMA 045 120 S06 M6 | M6 | 1 | 4 | 4.5 | 12 | - | 60 | 6 |
| 4NKTMA 045 160 S06 M6 | M6 | 1 | 4 | 4.5 | 16 | - | 60 | 6 |
| 4NKTMA 048 180 S06 M6 | M6 | 1 | 4 | 4.8 | 10.9 | 18 | 60 | 6 |
| 4NKTMA 060 175 S06 M8 | M8 | 1.25 | 4 | 6 | 17.5 | - | 65 | 6 |
| 4NKTMA 060 200 S06 M8 | M8 | 1.25 | 4 | 6 | 20 | - | 65 | 6 |
| 4NKTMA 065 240 S08 M8 | M8 | 1.25 | 4 | 6.5 | 13.62 | 24 | 65 | 8 |
| 4NKTMA 075 210 S08 M10 | M10 | 1.5 | 4 | 7.5 | 21 | - | 75 | 8 |
| 4NKTMA 075 270 S08 M10 | M10 | 1.5 | 4 | 7.5 | 27 | - | 75 | 8 |
| 4NKTMA 082 300 S10 M10 | M10 | 1.5 | 4 | 8.2 | 16.34 | 30 | 75 | 10 |
| 4NKTMA 095 245 S10 M12 | M12 | 1.75 | 4 | 9.5 | 24.5 | - | 80 | 10 |
| 4NKTMA 095 315 S10 M12 | M12 | 1.75 | 4 | 9.5 | 31.5 | - | 80 | 10 |
| 4NKTMA 099 360 S10 M12 | M12 | 1.75 | 4 | 9.9 | 19.06 | 36 | 85 | 10 |
| 4NKTMA 100 280 S10 M14 | M14 | 2 | 4 | 10 | 28 | - | 85 | 10 |
| 4NKTMA 100 360 S10 M14 | M14 | 2 | 4 | 10 | 36 | - | 90 | 10 |
| 4NKTMA 116 420 S12 M14 | M14 | 2 | 4 | 11.6 | 21.75 | 42 | 90 | 12 |
| 4NKTMA 120 320 S12 M16 | M16 | 2 | 4 | 12 | 32 | - | 95 | 12 |
| 4NKTMA 120 400 S12 M16 | M16 | 2 | 4 | 12 | 40 | - | 100 | 12 |
| 4NKTMA 136 480 S14 M16 | M16 | 2 | 4 | 13.6 | 25.75 | 48 | 100 | 14 |
| 4NKTMA 140 400 S14 M18 | M18 | 2.5 | 4 | 14 | 40 | - | 95 | 14 |
| 4NKTMA 140 450 S14 M18 | M18 | 2.5 | 4 | 14 | 45 | - | 105 | 14 |
| 4NKTMA 160 400 S16 M20 | M20 | 2.5 | 4 | 16 | 40 | - | 105 | 16 |
| 4NKTMA 160 500 S16 M20 | M20 | 2.5 | 4 | 16 | 50 | - | 115 | 16 |

## ISO 측정항목

단위 Unit : mm

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch | 날수 Flutes Z | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| **내부 급유형 (With coolant)** | | | | | | | | |
| 4NKTMA 045 120 S06 M6C | M6 | 1 | 4 | 4.5 | 12 | - | 60 | 6 |
| 4NKTMA 045 160 S06 M6C | M6 | 1 | 4 | 4.5 | 16 | - | 60 | 6 |
| 4NKTMA 048 180 S06 M6C | M6 | 1 | 4 | 4.8 | 10.9 | 18 | 60 | 6 |
| 4NKTMA 060 175 S06 M8C | M8 | 1.25 | 4 | 6 | 17.5 | - | 65 | 6 |
| 4NKTMA 060 200 S06 M8C | M8 | 1.25 | 4 | 6 | 20 | - | 65 | 6 |
| 4NKTMA 065 240 S08 M8C | M8 | 1.25 | 4 | 6.5 | 13.62 | 24 | 65 | 8 |
| 4NKTMA 075 210 S08 M10C | M10 | 1.5 | 4 | 7.5 | 21 | - | 75 | 8 |
| 4NKTMA 075 270 S08 M10C | M10 | 1.5 | 4 | 7.5 | 27 | - | 75 | 8 |
| 4NKTMA 082 300 S10 M10C | M10 | 1.5 | 4 | 8.2 | 16.34 | 30 | 75 | 10 |
| 4NKTMA 095 245 S10 M12C | M12 | 1.75 | 4 | 9.5 | 24.5 | - | 80 | 10 |
| 4NKTMA 095 315 S10 M12C | M12 | 1.75 | 4 | 9.5 | 31.5 | - | 80 | 10 |
| 4NKTMA 099 360 S10 M12C | M12 | 1.75 | 4 | 9.9 | 19.06 | 36 | 85 | 10 |
| 4NKTMA 100 280 S10 M14C | M14 | 2 | 4 | 10 | 28 | - | 85 | 10 |
| 4NKTMA 100 360 S10 M14C | M14 | 2 | 4 | 10 | 36 | - | 90 | 10 |
| 4NKTMA 116 420 S12 M14C | M14 | 2 | 4 | 11.6 | 21.75 | 42 | 90 | 12 |
| 4NKTMA 120 320 S12 M16C | M16 | 2 | 4 | 12 | 32 | - | 95 | 12 |
| 4NKTMA 120 400 S12 M16C | M16 | 2 | 4 | 12 | 40 | - | 100 | 12 |
| 4NKTMA 136 480 S14 M16C | M16 | 2 | 4 | 13.6 | 25.75 | 48 | 100 | 14 |
| 4NKTMA 140 400 S14 M18C | M18 | 2.5 | 4 | 14 | 40 | - | 95 | 14 |
| 4NKTMA 140 450 S14 M18C | M18 | 2.5 | 4 | 14 | 45 | - | 105 | 14 |
| 4NKTMA 160 400 S16 M20C | M20 | 2.5 | 4 | 16 | 40 | - | 105 | 16 |
| 4NKTMA 160 500 S16 M20C | M20 | 2.5 | 4 | 16 | 50 | - | 115 | 16 |

# 4NKTMA

4 Flutes Helix Nick Type Thread Mills for Aluminum

4날 알루미늄 전용 헬릭스 니크 타입 쓰레드밀

## American UN

단위 Unit : mm

외부 급유형(Without coolant)

| Order Number | 나사 가능 규격 Thread UNC | UNF | UNEF | 피치규격 Pitch (TPI) | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|
| NEW 4NKTMA 0165 045 S06 | No.2 | No.3 | | 56 | 5 | 1.65 | 4.5 | - | 50 | 6 |
| NEW 4NKTMA 0165 054 S06 | No.2 | No.3 | | 56 | 6 | 1.65 | 5.4 | - | 50 | 6 |
| NEW 4NKTMA 0165 066 S06 | No.2 | No.3 | | 56 | 4 | 1.65 | 3.2 | 6.6 | 50 | 6 |
| NEW 4NKTMA 019 053 S06 | No.3 | No.4 | | 48 | 5 | 1.9 | 5.3 | - | 50 | 6 |
| NEW 4NKTMA 019 063 S06 | No.3 | No.4 | | 48 | 6 | 1.9 | 6.3 | - | 50 | 6 |
| NEW 4NKTMA 019 075 S06 | No.3 | No.4 | | 48 | 4 | 1.9 | 3.7 | 7.5 | 50 | 6 |
| NEW 4NKTMA 021 063 S06 | No.4, No.5 | No.6 | | 40 | 5 | 2.1 | 6.3 | - | 50 | 6 |
| NEW 4NKTMA 021 076 S06 | No.4, No.5 | No.6 | | 40 | 6 | 2.1 | 7.6 | - | 50 | 6 |
| NEW 4NKTMA 021 085 S06 | No.4, No.5 | No.6 | | 40 | 4 | 2.1 | 4.4 | 8.5 | 50 | 6 |
| NEW 4NKTMA 0244 063 S06 | No.5 | No.6 | | 40 | 5 | 2.44 | 6.3 | - | 50 | 6 |
| NEW 4NKTMA 0244 076 S06 | No.5 | No.6 | | 40 | 6 | 2.44 | 7.6 | - | 50 | 6 |
| NEW 4NKTMA 0244 095 S06 | No.5 | No.6 | | 40 | 4 | 2.44 | 4.4 | 9.5 | 50 | 6 |
| NEW 4NKTMA 0255 079 S06 | No.6, No.8 | No.10 | No.12 | 32 | 5 | 2.55 | 7.9 | - | 50 | 6 |
| NEW 4NKTMA 0255 095 S06 | No.6, No.8 | No.10 | No.12 | 32 | 6 | 2.55 | 9.5 | - | 50 | 6 |
| NEW 4NKTMA 0255 105 S06 | No.6, No.8 | No.10 | No.12 | 32 | 4 | 2.55 | 5.6 | 10.5 | 50 | 6 |
| NEW 4NKTMA 0321 095 S06 | No.8 | No.10 | No.12, 1/4″ | 32 | 6 | 3.21 | 9.5 | - | 50 | 6 |
| NEW 4NKTMA 0321 111 S06 | No.8 | No.10 | No.12, 1/4″ | 32 | 7 | 3.21 | 11.1 | - | 50 | 6 |
| NEW 4NKTMA 0321 125 S06 | No.8 | No.10 | No.12, 1/4″ | 32 | 4 | 3.21 | 5.6 | 12.5 | 50 | 6 |
| NEW 4NKTMA 033 084 S06 | | No.8 | | 36 | 6 | 3.3 | 8.4 | - | 50 | 6 |
| NEW 4NKTMA 033 113 S06 | | No.8 | | 36 | 8 | 3.3 | 11.3 | - | 50 | 6 |
| NEW 4NKTMA 033 125 S06 | | No.8 | | 36 | 5 | 3.3 | 6.3 | 12.5 | 50 | 6 |
| NEW 4NKTMA 0359 106 S06 | No.10, No.12 | 5/16″ | | 24 | 5 | 3.59 | 10.6 | - | 50 | 6 |
| NEW 4NKTMA 0359 127 S06 | No.10, No.12 | 5/16″ | | 24 | 6 | 3.59 | 12.7 | - | 50 | 6 |
| NEW 4NKTMA 0359 145 S06 | No.10, No.12 | 5/16″ | | 24 | 4 | 3.59 | 7.4 | 14.5 | 50 | 6 |
| NEW 4NKTMA 038 095 S06 | | No.10 | No.12, 1/4″, 5/16″ | 32 | 6 | 3.8 | 9.5 | - | 50 | 6 |
| NEW 4NKTMA 038 127 S06 | | No.10 | No.12, 1/4″, 5/16″ | 32 | 8 | 3.8 | 12.7 | - | 50 | 6 |
| NEW 4NKTMA 038 145 S06 | | No.10 | No.12, 1/4″, 5/16″ | 32 | 5 | 3.8 | 7 | 14.5 | 50 | 6 |
| NEW 4NKTMA 0425 106 S06 | No.12 | 5/16″, 3/8″ | | 24 | 5 | 4.25 | 10.6 | - | 60 | 6 |
| NEW 4NKTMA 0425 148 S06 | No.12 | 5/16″, 3/8″ | | 24 | 7 | 4.25 | 14.8 | - | 60 | 6 |
| NEW 4NKTMA 0425 165 S06 | No.12 | 5/16″, 3/8″ | | 24 | 4 | 4.25 | 7.4 | 16.5 | 60 | 6 |
| NEW 4NKTMA 048 127 S06 | 1/4″ | 7/16″, 1/2″ | | 20 | 5 | 4.8 | 12.7 | - | 65 | 6 |
| NEW 4NKTMA 048 178 S06 | 1/4″ | 7/16″, 1/2″ | | 20 | 7 | 4.8 | 17.8 | - | 65 | 6 |
| NEW 4NKTMA 048 190 S06 | 1/4″ | 7/16″, 1/2″ | | 20 | 4 | 4.8 | 8.9 | 19 | 65 | 6 |
| NEW 4NKTMA 052 127 S06 | | 1/4″ | 7/16″, 1/2″ | 28 | 7 | 5.2 | 12.7 | - | 65 | 6 |
| NEW 4NKTMA 052 163 S06 | | 1/4″ | 7/16″, 1/2″ | 28 | 9 | 5.2 | 16.3 | - | 65 | 6 |
| NEW 4NKTMA 052 190 S06 | | 1/4″ | 7/16″, 1/2″ | 28 | 6 | 5.2 | 9.8 | 19 | 65 | 6 |
| NEW 4NKTMA 062 169 S08 | 5/16″ | 9/16″, 5/8″ | | 18 | 6 | 6.2 | 16.9 | - | 80 | 8 |
| NEW 4NKTMA 062 226 S08 | 5/16″ | 9/16″, 5/8″ | | 18 | 8 | 6.2 | 22.6 | - | 80 | 8 |
| NEW 4NKTMA 062 240 S08 | 5/16″ | 9/16″, 5/8″ | | 18 | 5 | 6.2 | 12.7 | 24 | 80 | 8 |
| NEW 4NKTMA 066 169 S08 | | 5/16″, 3/8″ | 9/16″, 5/8″ | 24 | 8 | 6.6 | 16.9 | - | 80 | 8 |
| NEW 4NKTMA 066 211 S08 | | 5/16″, 3/8″ | 9/16″, 5/8″ | 24 | 10 | 6.6 | 21.1 | - | 80 | 8 |
| NEW 4NKTMA 066 240 S08 | | 5/16″, 3/8″ | 9/16″, 5/8″ | 24 | 6 | 6.6 | 11.5 | 24 | 80 | 8 |
| NEW 4NKTMA 069 190 S08 | 3/8″ | 3/4″ | | 16 | 6 | 6.9 | 19 | - | 80 | 8 |
| NEW 4NKTMA 069 254 S08 | 3/8″ | 3/4″ | | 16 | 8 | 6.9 | 25.4 | - | 80 | 8 |
| NEW 4NKTMA 069 286 S08 | 3/8″ | 3/4″ | | 16 | 5 | 6.9 | 14 | 28.6 | 80 | 8 |
| NEW 4NKTMA 085 218 S10 | 7/16″ | 7/8″ | | 14 | 6 | 8.5 | 21.8 | - | 85 | 10 |
| NEW 4NKTMA 085 290 S10 | 7/16″ | 7/8″ | | 14 | 8 | 8.5 | 29 | - | 85 | 10 |
| NEW 4NKTMA 085 334 S10 | 7/16″ | 7/8″ | | 14 | 5 | 8.5 | 16.3 | 33.4 | 85 | 10 |
| NEW 4NKTMA 092 273 S12 | 1/2″ | | | 13 | 7 | 9.2 | 27.3 | - | 100 | 12 |
| NEW 4NKTMA 092 380 S12 | 1/2″ | | | 13 | 6 | 9.2 | 21.5 | 38 | 100 | 12 |
| NEW 4NKTMA 108 296 S12 | 9/16″ | 1″, 1-1/8″ | | 12 | 7 | 10.8 | 29.6 | - | 100 | 12 |
| NEW 4NKTMA 108 427 S12 | 9/16″ | 1″, 1-1/8″ | | 12 | 6 | 10.8 | 22.9 | 42.7 | 100 | 12 |
| NEW 4NKTMA 114 323 S12 | 5/8″ | | | 11 | 7 | 11.4 | 32.3 | - | 100 | 12 |
| NEW 4NKTMA 114 476 S12 | 5/8″ | | | 11 | 6 | 11.4 | 25.4 | 47.6 | 100 | 12 |

THREAD MILL

# 4NKTMA

## 4 Flutes Helix Nick Type Thread Mills for Aluminum

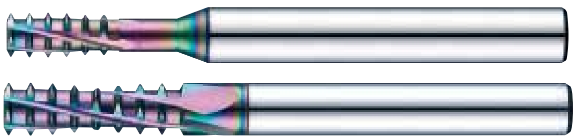
## 4날 알루미늄 전용 헬릭스 니크 타입 쓰레드밀

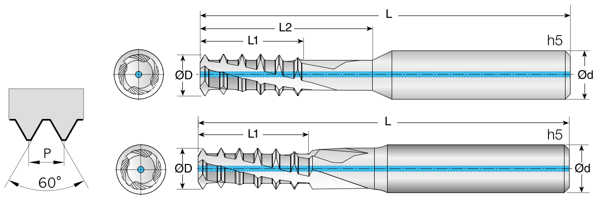
### American UN

단위 Unit: mm

| Order Number | 피치규격 Thread UNC | UNF | UNEF | 피치규격 Pitch (TPI) | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|
| **내부 급유형(With coolant)** | | | | | | | | | | |
| NEW 4NKTMA 0359 106 S06C | No.10, No.12 | 5/16″ | | 24 | 5 | 3.59 | 10.6 | - | 50 | 6 |
| NEW 4NKTMA 0359 127 S06C | No.10, No.12 | 5/16″ | | 24 | 6 | 3.59 | 12.7 | - | 50 | 6 |
| NEW 4NKTMA 0359 145 S06C | No.10, No.12 | 5/16″ | | 24 | 4 | 3.59 | 7.4 | 14.5 | 50 | 6 |
| NEW 4NKTMA 038 095 S06C | | No.10 | No.12, 1/4″, 5/16″ | 32 | 6 | 3.8 | 9.5 | - | 50 | 6 |
| NEW 4NKTMA 038 127 S06C | | No.10 | No.12, 1/4″, 5/16″ | 32 | 8 | 3.8 | 12.7 | - | 50 | 6 |
| NEW 4NKTMA 038 145 S06C | | No.10 | No.12, 1/4″, 5/16″ | 32 | 5 | 3.8 | 7 | 14.5 | 50 | 6 |
| NEW 4NKTMA 0425 106 S06C | No.12 | 5/16″, 3/8″ | | 24 | 5 | 4.25 | 10.6 | - | 60 | 6 |
| NEW 4NKTMA 0425 148 S06C | No.12 | 5/16″, 3/8″ | | 24 | 7 | 4.25 | 14.8 | - | 60 | 6 |
| NEW 4NKTMA 0425 165 S06C | No.12 | 5/16″, 3/8″ | | 24 | 4 | 4.25 | 7.4 | 16.5 | 60 | 6 |
| NEW 4NKTMA 048 127 S06C | 1/4″ | 7/16″, 1/2″ | | 20 | 5 | 4.8 | 12.7 | - | 65 | 6 |
| NEW 4NKTMA 048 178 S06C | 1/4″ | 7/16″, 1/2″ | | 20 | 7 | 4.8 | 17.8 | - | 65 | 6 |
| NEW 4NKTMA 048 190 S06C | 1/4″ | 7/16″, 1/2″ | | 20 | 4 | 4.8 | 8.9 | 19 | 65 | 6 |
| NEW 4NKTMA 052 127 S06C | | 1/4″ | 7/16″, 1/2″ | 28 | 7 | 5.2 | 12.7 | - | 65 | 6 |
| NEW 4NKTMA 052 163 S06C | | 1/4″ | 7/16″, 1/2″ | 28 | 9 | 5.2 | 16.3 | - | 65 | 6 |
| NEW 4NKTMA 052 190 S06C | | 1/4″ | 7/16″, 1/2″ | 28 | 6 | 5.2 | 9.8 | 19 | 65 | 6 |
| NEW 4NKTMA 062 169 S08C | 5/16″ | 9/16″, 5/8″ | | 18 | 6 | 6.2 | 16.9 | - | 80 | 8 |
| NEW 4NKTMA 062 226 S08C | 5/16″ | 9/16″, 5/8″ | | 18 | 8 | 6.2 | 22.6 | - | 80 | 8 |
| NEW 4NKTMA 062 240 S08C | 5/16″ | 9/16″, 5/8″ | | 18 | 5 | 6.2 | 12.7 | 24 | 80 | 8 |
| NEW 4NKTMA 066 169 S08C | | 5/16″, 3/8″ | 9/16″, 5/8″ | 24 | 8 | 6.6 | 16.9 | - | 80 | 8 |
| NEW 4NKTMA 066 211 S08C | | 5/16″, 3/8″ | 9/16″, 5/8″ | 24 | 10 | 6.6 | 21.1 | - | 80 | 8 |
| NEW 4NKTMA 066 240 S08C | | 5/16″, 3/8″ | 9/16″, 5/8″ | 24 | 6 | 6.6 | 11.5 | 24 | 80 | 8 |
| NEW 4NKTMA 069 190 S08C | 3/8″ | 3/4″ | | 16 | 6 | 6.9 | 19 | - | 80 | 8 |
| NEW 4NKTMA 069 254 S08C | 3/8″ | 3/4″ | | 16 | 8 | 6.9 | 25.4 | - | 80 | 8 |
| NEW 4NKTMA 069 286 S08C | 3/8″ | 3/4″ | | 16 | 5 | 6.9 | 14 | 28.6 | 80 | 8 |
| NEW 4NKTMA 085 218 S10C | 7/16″ | 7/8″ | | 14 | 6 | 8.5 | 21.8 | - | 85 | 10 |
| NEW 4NKTMA 085 290 S10C | 7/16″ | 7/8″ | | 14 | 8 | 8.5 | 29 | - | 85 | 10 |
| NEW 4NKTMA 085 334 S10C | 7/16″ | 7/8″ | | 14 | 5 | 8.5 | 16.3 | 33.4 | 85 | 10 |
| NEW 4NKTMA 092 273 S12C | 1/2″ | | | 13 | 7 | 9.2 | 27.3 | - | 100 | 12 |
| NEW 4NKTMA 092 380 S12C | 1/2″ | | | 13 | 6 | 9.2 | 21.5 | 38 | 100 | 12 |
| NEW 4NKTMA 108 296 S12C | 9/16″ | 1″, 1-1/8″ | | 12 | 7 | 10.8 | 29.6 | - | 100 | 12 |
| NEW 4NKTMA 108 427 S12C | 9/16″ | 1″, 1-1/8″ | | 12 | 6 | 10.8 | 22.9 | 42.7 | 100 | 12 |
| NEW 4NKTMA 114 323 S12C | 5/8″ | | | 11 | 7 | 11.4 | 32.3 | - | 100 | 12 |
| NEW 4NKTMA 114 476 S12C | 5/8″ | | | 11 | 6 | 11.4 | 25.4 | 47.6 | 100 | 12 |

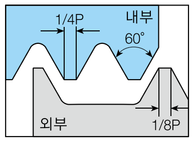
# 4날 SUS 가공용 헬릭스 니크 타입 쓰레드밀






- **SUS, 티타늄 합금 가공**
- 높은 절삭 속도와 날 당 높은 이송이 가능합니다.
- 최대 나사가공 깊이 : 2xD, 2.5xD, 3xD(나사가공 직경)
- 더 깊은 나사가공을 위한 헬리컬 리브 타입을 채용하였습니다.
- 헬리코일 나사 가공이 가능합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread Mills for SUS, Titanium alloys**
- High spindle speed and feed per tooth are available.
- Maximum drilling depth : 2xD, 2.5xD, 3xD(threading diameter)
- Rib type helical design is applied for deep threading.
- It can be used for heli coil threading.
- Both right and left threading are available.





530P

## ISO 측정항목

단위 Unit : mm

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch | 날수 Flutes Z | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | |
| 4NKTMS 022 060 S06 M3 | M3 | 0.5 | 4 | 2.2 | 6 | - | 60 | 6 |
| 4NKTMS 022 080 S06 M3 | M3 | 0.5 | 4 | 2.2 | 8 | - | 60 | 6 |
| 4NKTMS 024 090 S04 M3 | M3 | 0.5 | 4 | 2.4 | 5.47 | 9 | 45 | 4 |
| 4NKTMS 029 084 S06 M4 | M4 | 0.7 | 4 | 2.9 | 8.4 | - | 60 | 6 |
| 4NKTMS 029 112 S06 M4 | M4 | 0.7 | 4 | 2.9 | 11.2 | - | 60 | 6 |
| 4NKTMS 0315 120 S04 M4 | M4 | 0.7 | 4 | 3.15 | 7.64 | 12 | 45 | 4 |
| 4NKTMS 038 112 S06 M5 | M5 | 0.8 | 4 | 3.8 | 11.2 | - | 60 | 6 |
| 4NKTMS 038 128 S06 M5 | M5 | 0.8 | 4 | 3.8 | 12.8 | - | 60 | 6 |
| 4NKTMS 039 150 S04 M5 | M5 | 0.8 | 4 | 3.9 | 8.73 | 15 | 50 | 4 |
| 4NKTMS 045 120 S06 M6 | M6 | 1 | 4 | 4.5 | 12 | - | 60 | 6 |
| 4NKTMS 045 160 S06 M6 | M6 | 1 | 4 | 4.5 | 16 | - | 60 | 6 |
| 4NKTMS 048 180 S06 M6 | M6 | 1 | 4 | 4.8 | 10.9 | 18 | 60 | 6 |
| 4NKTMS 060 175 S06 M8 | M8 | 1.25 | 4 | 6 | 17.5 | - | 65 | 6 |
| 4NKTMS 060 200 S06 M8 | M8 | 1.25 | 4 | 6 | 20 | - | 65 | 6 |
| 4NKTMS 065 240 S08 M8 | M8 | 1.25 | 4 | 6.5 | 13.62 | 24 | 65 | 8 |
| 4NKTMS 075 210 S08 M10 | M10 | 1.5 | 4 | 7.5 | 21 | - | 75 | 8 |
| 4NKTMS 075 270 S08 M10 | M10 | 1.5 | 4 | 7.5 | 27 | - | 75 | 8 |
| 4NKTMS 082 300 S10 M10 | M10 | 1.5 | 4 | 8.2 | 16.34 | 30 | 75 | 10 |
| 4NKTMS 095 245 S10 M12 | M12 | 1.75 | 4 | 9.5 | 24.5 | - | 80 | 10 |
| 4NKTMS 095 315 S10 M12 | M12 | 1.75 | 4 | 9.5 | 31.5 | - | 80 | 10 |
| 4NKTMS 099 360 S10 M12 | M12 | 1.75 | 4 | 9.9 | 19.06 | 36 | 85 | 10 |
| 4NKTMS 100 280 S10 M14 | M14 | 2 | 4 | 10 | 28 | - | 85 | 10 |
| 4NKTMS 100 360 S10 M14 | M14 | 2 | 4 | 10 | 36 | - | 90 | 10 |
| 4NKTMS 116 420 S12 M14 | M14 | 2 | 4 | 11.6 | 21.75 | 42 | 90 | 12 |
| 4NKTMS 120 320 S12 M16 | M16 | 2 | 4 | 12 | 32 | - | 95 | 12 |
| 4NKTMS 120 400 S12 M16 | M16 | 2 | 4 | 12 | 40 | - | 100 | 12 |
| 4NKTMS 136 480 S14 M16 | M16 | 2 | 4 | 13.6 | 25.75 | 48 | 100 | 14 |
| 4NKTMS 140 400 S14 M18 | M18 | 2.5 | 4 | 14 | 40 | - | 95 | 14 |
| 4NKTMS 140 450 S14 M18 | M18 | 2.5 | 4 | 14 | 45 | - | 105 | 14 |
| 4NKTMS 160 400 S16 M20 | M20 | 2.5 | 4 | 16 | 40 | - | 105 | 16 |
| 4NKTMS 160 500 S16 M20 | M20 | 2.5 | 4 | 16 | 50 | - | 115 | 16 |

## ISO 측정항목

단위 Unit: mm

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch | 날수 Flutes Z | 날경 Diameter D | 나사부길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| 내부 급유형 (With coolant) | | | | | | | | |
| **4NKTMS 045 120 S06 M6C** | M6 | 1 | 4 | 4.5 | 12 | - | 60 | 6 |
| **4NKTMS 045 160 S06 M6C** | M6 | 1 | 4 | 4.5 | 16 | - | 60 | 6 |
| **4NKTMS 048 180 S06 M6C** | M6 | 1 | 4 | 4.8 | 10.9 | 18 | 60 | 6 |
| **4NKTMS 060 175 S06 M8C** | M8 | 1.25 | 4 | 6 | 17.5 | - | 65 | 6 |
| **4NKTMS 060 200 S06 M8C** | M8 | 1.25 | 4 | 6 | 20 | - | 65 | 6 |
| **4NKTMS 065 240 S08 M8C** | M8 | 1.25 | 4 | 6.5 | 13.62 | 24 | 65 | 8 |
| **4NKTMS 075 210 S08 M10C** | M10 | 1.5 | 4 | 7.5 | 21 | - | 75 | 8 |
| **4NKTMS 075 270 S08 M10C** | M10 | 1.5 | 4 | 7.5 | 27 | - | 75 | 8 |
| **4NKTMS 082 300 S10 M10C** | M10 | 1.5 | 4 | 8.2 | 16.34 | 30 | 75 | 10 |
| **4NKTMS 095 245 S10 M12C** | M12 | 1.75 | 4 | 9.5 | 24.5 | - | 80 | 10 |
| **4NKTMS 095 315 S10 M12C** | M12 | 1.75 | 4 | 9.5 | 31.5 | - | 80 | 10 |
| **4NKTMS 099 360 S10 M12C** | M12 | 1.75 | 4 | 9.9 | 19.06 | 36 | 85 | 10 |
| **4NKTMS 100 280 S10 M14C** | M14 | 2 | 4 | 10 | 28 | - | 85 | 10 |
| **4NKTMS 100 360 S10 M14C** | M14 | 2 | 4 | 10 | 36 | - | 90 | 10 |
| **4NKTMS 116 420 S12 M14C** | M14 | 2 | 4 | 11.6 | 21.75 | 42 | 90 | 12 |
| **4NKTMS 120 320 S12 M16C** | M16 | 2 | 4 | 12 | 32 | - | 95 | 12 |
| **4NKTMS 120 400 S12 M16C** | M16 | 2 | 4 | 12 | 40 | - | 100 | 12 |
| **4NKTMS 136 480 S14 M16C** | M16 | 2 | 4 | 13.6 | 25.75 | 48 | 100 | 14 |
| **4NKTMS 140 400 S14 M18C** | M18 | 2.5 | 4 | 14 | 40 | - | 95 | 14 |
| **4NKTMS 140 450 S14 M18C** | M18 | 2.5 | 4 | 14 | 45 | - | 105 | 14 |
| **4NKTMS 160 400 S16 M20C** | M20 | 2.5 | 4 | 16 | 40 | - | 105 | 16 |
| **4NKTMS 160 500 S16 M20C** | M20 | 2.5 | 4 | 16 | 50 | - | 115 | 16 |

# 4NKTMS

*4 Flutes Helix Nick Type Thread Mills for Stainless Steels*

## 4날 SUS 가공용 헬릭스 니크 타입 쓰레드밀

### American UN

단위 Unit : mm

외부 급유형(Without coolant)

| Order Number | 피치규격 Thread UNC | UNF | UNEF | 피치규격 Pitch (TPI) | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|
| NEW 4NKTMS 0165 045 S06 | No.2 | No.3 | | 56 | 5 | 1.65 | 4.5 | - | 50 | 6 |
| NEW 4NKTMS 0165 054 S06 | No.2 | No.3 | | 56 | 6 | 1.65 | 5.4 | - | 50 | 6 |
| NEW 4NKTMS 0165 066 S06 | No.2 | No.3 | | 56 | 4 | 1.65 | 3.2 | 6.6 | 50 | 6 |
| NEW 4NKTMS 019 053 S06 | No.3 | No.4 | | 48 | 5 | 1.9 | 5.3 | - | 50 | 6 |
| NEW 4NKTMS 019 063 S06 | No.3 | No.4 | | 48 | 6 | 1.9 | 6.3 | - | 50 | 6 |
| NEW 4NKTMS 019 075 S06 | No.3 | No.4 | | 48 | 4 | 1.9 | 3.7 | 7.5 | 50 | 6 |
| NEW 4NKTMS 021 063 S06 | No.4, No.5 | No.6 | | 40 | 5 | 2.1 | 6.3 | - | 50 | 6 |
| NEW 4NKTMS 021 076 S06 | No.4, No.5 | No.6 | | 40 | 6 | 2.1 | 7.6 | - | 50 | 6 |
| NEW 4NKTMS 021 085 S06 | No.4, No.5 | No.6 | | 40 | 4 | 2.1 | 4.4 | 8.5 | 50 | 6 |
| NEW 4NKTMS 0244 063 S06 | No.5 | No.6 | | 40 | 5 | 2.44 | 6.3 | - | 50 | 6 |
| NEW 4NKTMS 0244 076 S06 | No.5 | No.6 | | 40 | 6 | 2.44 | 7.6 | - | 50 | 6 |
| NEW 4NKTMS 0244 095 S06 | No.5 | No.6 | | 40 | 4 | 2.44 | 4.4 | 9.5 | 50 | 6 |
| NEW 4NKTMS 0255 079 S06 | No.6, No.8 | No.10 | No.12 | 32 | 5 | 2.55 | 7.9 | - | 50 | 6 |
| NEW 4NKTMS 0255 095 S06 | No.6, No.8 | No.10 | No.12 | 32 | 6 | 2.55 | 9.5 | - | 50 | 6 |
| NEW 4NKTMS 0255 105 S06 | No.6, No.8 | No.10 | No.12 | 32 | 4 | 2.55 | 5.6 | 10.5 | 50 | 6 |
| NEW 4NKTMS 0321 095 S06 | No.8 | No.10 | No.12, 1/4" | 32 | 6 | 3.21 | 9.5 | - | 50 | 6 |
| NEW 4NKTMS 0321 111 S06 | No.8 | No.10 | No.12, 1/4" | 32 | 7 | 3.21 | 11.1 | - | 50 | 6 |
| NEW 4NKTMS 0321 125 S06 | No.8 | No.10 | No.12, 1/4" | 32 | 4 | 3.21 | 5.6 | 12.5 | 50 | 6 |
| NEW 4NKTMS 033 084 S06 | | No.8 | | 36 | 6 | 3.3 | 8.4 | - | 50 | 6 |
| NEW 4NKTMS 033 113 S06 | | No.8 | | 36 | 8 | 3.3 | 11.3 | - | 50 | 6 |
| NEW 4NKTMS 033 125 S06 | | No.8 | | 36 | 5 | 3.3 | 6.3 | 12.5 | 50 | 6 |
| NEW 4NKTMS 0359 106 S06 | No.10, No.12 | 5/16" | | 24 | 5 | 3.59 | 10.6 | - | 50 | 6 |
| NEW 4NKTMS 0359 127 S06 | No.10, No.12 | 5/16" | | 24 | 6 | 3.59 | 12.7 | - | 50 | 6 |
| NEW 4NKTMS 0359 145 S06 | No.10, No.12 | 5/16" | | 24 | 4 | 3.59 | 7.4 | 14.5 | 50 | 6 |
| NEW 4NKTMS 038 095 S06 | | No.10 | No.12, 1/4", 5/16" | 32 | 6 | 3.8 | 9.5 | - | 50 | 6 |
| NEW 4NKTMS 038 127 S06 | | No.10 | No.12, 1/4", 5/16" | 32 | 8 | 3.8 | 12.7 | - | 50 | 6 |
| NEW 4NKTMS 038 145 S06 | | No.10 | No.12, 1/4", 5/16" | 32 | 5 | 3.8 | 7 | 14.5 | 50 | 6 |
| NEW 4NKTMS 0425 106 S06 | No.12 | 5/16", 3/8" | | 24 | 5 | 4.25 | 10.6 | - | 60 | 6 |
| NEW 4NKTMS 0425 148 S06 | No.12 | 5/16", 3/8" | | 24 | 7 | 4.25 | 14.8 | - | 60 | 6 |
| NEW 4NKTMS 0425 165 S06 | No.12 | 5/16", 3/8" | | 24 | 4 | 4.25 | 7.4 | 16.5 | 60 | 6 |
| NEW 4NKTMS 048 127 S06 | 1/4" | 7/16", 1/2" | | 20 | 5 | 4.8 | 12.7 | - | 65 | 6 |
| NEW 4NKTMS 048 178 S06 | 1/4" | 7/16", 1/2" | | 20 | 7 | 4.8 | 17.8 | - | 65 | 6 |
| NEW 4NKTMS 048 190 S06 | 1/4" | 7/16", 1/2" | | 20 | 4 | 4.8 | 8.9 | 19 | 65 | 6 |
| NEW 4NKTMS 052 127 S06 | | 1/4" | 7/16", 1/2" | 28 | 7 | 5.2 | 12.7 | - | 65 | 6 |
| NEW 4NKTMS 052 163 S06 | | 1/4" | 7/16", 1/2" | 28 | 9 | 5.2 | 16.3 | - | 65 | 6 |
| NEW 4NKTMS 052 190 S06 | | 1/4" | 7/16", 1/2" | 28 | 6 | 5.2 | 9.8 | 19 | 65 | 6 |
| NEW 4NKTMS 062 169 S08 | 5/16" | 9/16", 5/8" | | 18 | 6 | 6.2 | 16.9 | - | 80 | 8 |
| NEW 4NKTMS 062 226 S08 | 5/16" | 9/16", 5/8" | | 18 | 8 | 6.2 | 22.6 | - | 80 | 8 |
| NEW 4NKTMS 062 240 S08 | 5/16" | 9/16", 5/8" | | 18 | 5 | 6.2 | 12.7 | 24 | 80 | 8 |
| NEW 4NKTMS 066 169 S08 | | 5/16", 3/8" | 9/16", 5/8" | 24 | 8 | 6.6 | 16.9 | - | 80 | 8 |
| NEW 4NKTMS 066 211 S08 | | 5/16", 3/8" | 9/16", 5/8" | 24 | 10 | 6.6 | 21.1 | - | 80 | 8 |
| NEW 4NKTMS 066 240 S08 | | 5/16", 3/8" | 9/16", 5/8" | 24 | 6 | 6.6 | 11.5 | 24 | 80 | 8 |
| NEW 4NKTMS 069 190 S08 | 3/8" | 3/4" | | 16 | 6 | 6.9 | 19 | - | 80 | 8 |
| NEW 4NKTMS 069 254 S08 | 3/8" | 3/4" | | 16 | 8 | 6.9 | 25.4 | - | 80 | 8 |
| NEW 4NKTMS 069 286 S08 | 3/8" | 3/4" | | 16 | 5 | 6.9 | 14 | 28.6 | 80 | 8 |
| NEW 4NKTMS 085 218 S10 | 7/16" | 7/8" | | 14 | 6 | 8.5 | 21.8 | - | 85 | 10 |
| NEW 4NKTMS 085 290 S10 | 7/16" | 7/8" | | 14 | 8 | 8.5 | 29 | - | 85 | 10 |
| NEW 4NKTMS 085 334 S10 | 7/16" | 7/8" | | 14 | 5 | 8.5 | 16.3 | 33.4 | 85 | 10 |
| NEW 4NKTMS 092 273 S12 | 1/2" | | | 13 | 7 | 9.2 | 27.3 | - | 100 | 12 |
| NEW 4NKTMS 092 380 S12 | 1/2" | | | 13 | 6 | 9.2 | 21.5 | 38 | 100 | 12 |
| NEW 4NKTMS 108 296 S12 | 9/16" | 1", 1-1/8" | | 12 | 7 | 10.8 | 29.6 | - | 100 | 12 |
| NEW 4NKTMS 108 427 S12 | 9/16" | 1", 1-1/8" | | 12 | 6 | 10.8 | 22.9 | 42.7 | 100 | 12 |
| NEW 4NKTMS 114 323 S12 | 5/8" | | | 11 | 7 | 11.4 | 32.3 | - | 100 | 12 |
| NEW 4NKTMS 114 476 S12 | 5/8" | | | 11 | 6 | 11.4 | 25.4 | 47.6 | 100 | 12 |

## American UN

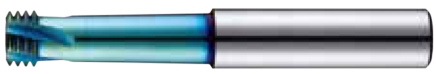
단위 Unit : mm

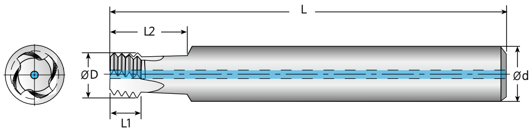
| Order Number | 피치규격 Thread UNC | UNF | UNEF | 피치규격 Pitch (TPI) | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 내부 급유형(With coolant) |
| NEW 4NKTMS 0359 106 S06C | No.10, No.12 | 5/16″ | | 24 | 5 | 3.59 | 10.6 | – | 50 | 6 |
| NEW 4NKTMS 0359 127 S06C | No.10, No.12 | 5/16″ | | 24 | 6 | 3.59 | 12.7 | – | 50 | 6 |
| NEW 4NKTMS 0359 145 S06C | No.10, No.12 | 5/16″ | | 24 | 4 | 3.59 | 7.4 | 14.5 | 50 | 6 |
| NEW 4NKTMS 038 095 S06C | | No.10 | No.12, 1/4″, 5/16″ | 32 | 6 | 3.8 | 9.5 | – | 50 | 6 |
| NEW 4NKTMS 038 127 S06C | | No.10 | No.12, 1/4″, 5/16″ | 32 | 8 | 3.8 | 12.7 | – | 50 | 6 |
| NEW 4NKTMS 038 145 S06C | | No.10 | No.12, 1/4″, 5/16″ | 32 | 5 | 3.8 | 7 | 14.5 | 50 | 6 |
| NEW 4NKTMS 0425 106 S06C | No.12 | 5/16″, 3/8″ | | 24 | 5 | 4.25 | 10.6 | – | 60 | 6 |
| NEW 4NKTMS 0425 148 S06C | No.12 | 5/16″, 3/8″ | | 24 | 7 | 4.25 | 14.8 | – | 60 | 6 |
| NEW 4NKTMS 0425 165 S06C | No.12 | 5/16″, 3/8″ | | 24 | 4 | 4.25 | 7.4 | 16.5 | 60 | 6 |
| NEW 4NKTMS 048 127 S06C | 1/4″ | 7/16″, 1/2″ | | 20 | 5 | 4.8 | 12.7 | – | 65 | 6 |
| NEW 4NKTMS 048 178 S06C | 1/4″ | 7/16″, 1/2″ | | 20 | 7 | 4.8 | 17.8 | – | 65 | 6 |
| NEW 4NKTMS 048 190 S06C | 1/4″ | 7/16″, 1/2″ | | 20 | 4 | 4.8 | 8.9 | 19 | 65 | 6 |
| NEW 4NKTMS 052 127 S06C | | 1/4″ | 7/16″, 1/2″ | 28 | 7 | 5.2 | 12.7 | – | 65 | 6 |
| NEW 4NKTMS 052 163 S06C | | 1/4″ | 7/16″, 1/2″ | 28 | 9 | 5.2 | 16.3 | – | 65 | 6 |
| NEW 4NKTMS 052 190 S06C | | 1/4″ | 7/16″, 1/2″ | 28 | 6 | 5.2 | 9.8 | 19 | 65 | 6 |
| NEW 4NKTMS 062 169 S08C | 5/16″ | 9/16″, 5/8″ | | 18 | 6 | 6.2 | 16.9 | – | 80 | 8 |
| NEW 4NKTMS 062 226 S08C | 5/16″ | 9/16″, 5/8″ | | 18 | 8 | 6.2 | 22.6 | – | 80 | 8 |
| NEW 4NKTMS 062 240 S08C | 5/16″ | 9/16″, 5/8″ | | 18 | 5 | 6.2 | 12.7 | 24 | 80 | 8 |
| NEW 4NKTMS 066 169 S08C | | 5/16″, 3/8″ | 9/16″, 5/8″ | 24 | 8 | 6.6 | 16.9 | – | 80 | 8 |
| NEW 4NKTMS 066 211 S08C | | 5/16″, 3/8″ | 9/16″, 5/8″ | 24 | 10 | 6.6 | 21.1 | – | 80 | 8 |
| NEW 4NKTMS 066 240 S08C | | 5/16″, 3/8″ | 9/16″, 5/8″ | 24 | 6 | 6.6 | 11.5 | 24 | 80 | 8 |
| NEW 4NKTMS 069 190 S08C | 3/8″ | 3/4″ | | 16 | 6 | 6.9 | 19 | – | 80 | 8 |
| NEW 4NKTMS 069 254 S08C | 3/8″ | 3/4″ | | 16 | 8 | 6.9 | 25.4 | – | 80 | 8 |
| NEW 4NKTMS 069 286 S08C | 3/8″ | 3/4″ | | 16 | 5 | 6.9 | 14 | 28.6 | 80 | 8 |
| NEW 4NKTMS 085 218 S10C | 7/16″ | 7/8″ | | 14 | 6 | 8.5 | 21.8 | – | 85 | 10 |
| NEW 4NKTMS 085 290 S10C | 7/16″ | 7/8″ | | 14 | 8 | 8.5 | 29 | – | 85 | 10 |
| NEW 4NKTMS 085 334 S10C | 7/16″ | 7/8″ | | 14 | 5 | 8.5 | 16.3 | 33.4 | 85 | 10 |
| NEW 4NKTMS 092 273 S12C | 1/2″ | | | 13 | 7 | 9.2 | 27.3 | – | 100 | 12 |
| NEW 4NKTMS 092 380 S12C | 1/2″ | | | 13 | 6 | 9.2 | 21.5 | 38 | 100 | 12 |
| NEW 4NKTMS 108 296 S12C | 9/16″ | 1″, 1-1/8″ | | 12 | 7 | 10.8 | 29.6 | – | 100 | 12 |
| NEW 4NKTMS 108 427 S12C | 9/16″ | 1″, 1-1/8″ | | 12 | 6 | 10.8 | 22.9 | 42.7 | 100 | 12 |
| NEW 4NKTMS 114 323 S12C | 5/8″ | | | 11 | 7 | 11.4 | 32.3 | – | 100 | 12 |
| NEW 4NKTMS 114 476 S12C | 5/8″ | | | 11 | 6 | 11.4 | 25.4 | 47.6 | 100 | 12 |

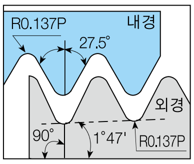
# 4BSPT

## 4 Flutes Pipe Taper Short Thread Mills for Multi Purpose

## 4날 범용 관용 테이퍼 나사 가공 짧은 날 쓰레드밀






규격 정의 : B.S.21:1985
공차 등급 : 표준 BSPT(PT)

- **HRc 58 이하의 고경도강, 프리하든강, 합금강, 탄소강, 주철 가공**
- 내부 홀 을 통한 효과적인 냉각수 공급이 가능합니다.
- 절삭 영역으로 직접 절삭유를 공급합니다.
- 외부 냉각을 사용할 수 없거나 효과가 없을 때 탁월 합니다.
- 낮은 절삭부하를 위해 테이퍼 엔드밀 사용을 권장 합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for Hardened steels (up to HRc 58), pre-hardened steels, alloy steels, carbon steels, cast irons**
- Effective cooling water supply is possible with coolant.
- Direct oil supplying is possible to cutting area.
- More effective when you cannot use outer coolant.
- Recommend to us Taper Endmill for low machining load.
- Both right and left threading are available.

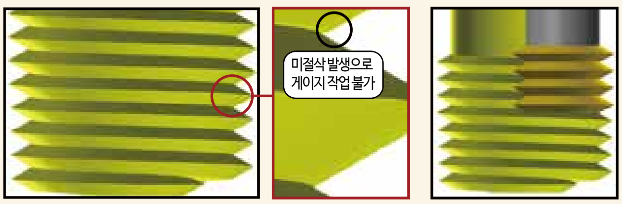
529P

### American UN

단위 Unit : mm

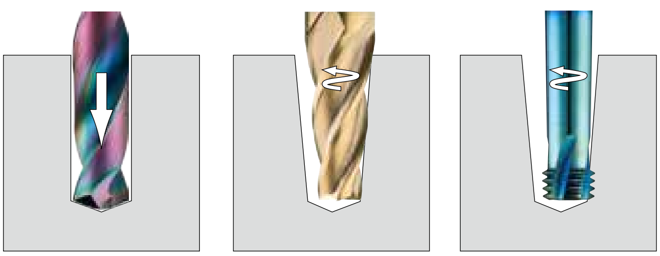
| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | | |
| 4BSPT 055 200 S06 | 1/16″, 1/8″ | 28 | 4 | 4 | 5.5 | 3.6 | 20 | 60 | 6 |
| 4BSPT 0931 335 S10 | 1/4″, 3/8″ | 19 | 4 | 4 | 9.31 | 5.2 | 33.5 | 70 | 10 |
| 4BSPT 1334 440 S16 | 1/2″, 3/4″ | 14 | 4 | 4 | 13.34 | 7.1 | 44 | 90 | 16 |
| 4BSPT 1484 420 S16 | 1″, 1 1/4″, 1 1/2″, 2″ | 11 | 4 | 4 | 14.84 | 9.1 | 42 | 105 | 16 |
| **내부 급유형 (With coolant)** | | | | | | | | | |
| 4BSPT 055 200 S06C | 1/16″, 1/8″ | 28 | 4 | 4 | 5.5 | 3.6 | 20 | 60 | 6 |
| 4BSPT 0931 335 S10C | 1/4″, 3/8″ | 19 | 4 | 4 | 9.31 | 5.2 | 33.5 | 70 | 10 |
| 4BSPT 1334 440 S16C | 1/2″, 3/4″ | 14 | 4 | 4 | 13.34 | 7.1 | 44 | 90 | 16 |
| 4BSPT 1484 420 S16C | 1″, 1 1/4″, 1 1/2″, 2″ | 11 | 4 | 4 | 14.84 | 9.1 | 42 | 105 | 16 |

| | | | |
|---|---|---|---|
| 나사공구이의수 | 4 | 나사공구이의수 | 3 |
| 경사각도 | 1.78991 | 경사각도 | 1.78991 |




- 나사산 가공시에 4산 기준으로 프로그램 설정하면 게이지 측정이 불가 하므로, 3산으로 설정하여 사용 하십시오.
- When threading, it is not possible to measure the gauge when setting the program based on 4 threads, so set it to 3 threads and use it.

### ■ 테이퍼 나사가공 순서



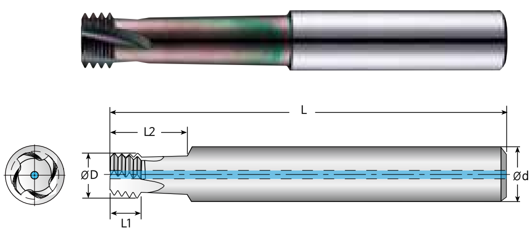
드릴링(2DUBES) 테이퍼 엔드밀 (4CTE) 나사가공

- 1. 드릴링으로 구멍을 뚫어준다.
  2. 테이퍼 엔드밀로 1˚47′를 절삭한다.
  3. 쓰레드밀로 나사가공을 진행한다.
- 1. Drill holes using drilling.
  2. Cut with a taper end mill at 1˚47′.
  3. Thread milling for threading operations.

# 4BSPTA

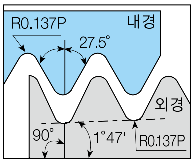
## 4 Flutes Pipe Taper Short Thread Mills for Aluminum

## 4날 알루미늄 관용 테이퍼 나사 가공 짧은 날 쓰레드밀




- **알루미늄, 알루미늄 합금 등 비철 비금속 가공**
- 내부 홀 을 통한 효과적인 냉각수 공급이 가능합니다.
- 절삭 영역으로 직접 절삭유를 공급합니다.
- 외부 냉각을 사용할 수 없거나 효과가 없을 때 탁월 합니다.
- 낮은 절삭부하를 위해 테이퍼 엔드밀 사용을 권장 합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for Aluminum, Aluminum alloys, non-ferrous, and non-metallic materials**
- Effective cooling water supply is possible with coolant.
- Direct oil supplying is possible to cutting area.
- More effective when you cannot use outer coolant.
- Recommend to us Taper Endmill for low machining load.
- Both right and left threading are available.




규격 정의 : B.S.21:1985
공차 등급 : 표준 BSPT(PT)

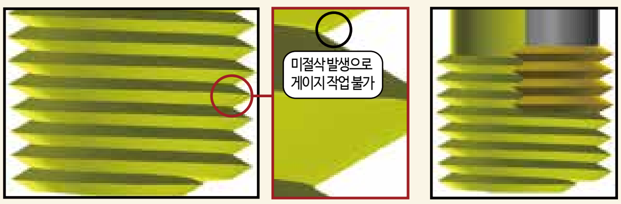

529P

### American UN

단위 Unit: mm

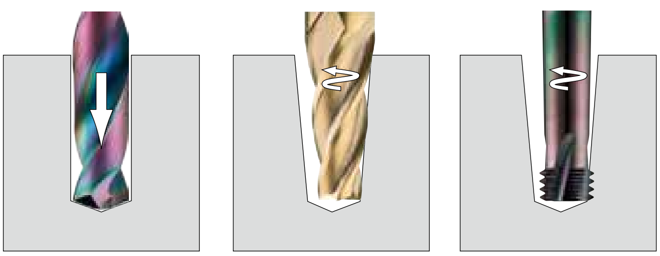
| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | | |
| 4BSPTA 055 200 S06 | 1/16″, 1/8″ | 28 | 4 | 4 | 5.5 | 3.6 | 20 | 60 | 6 |
| 4BSPTA 0931 335 S10 | 1/4″, 3/8″ | 19 | 4 | 4 | 9.31 | 5.2 | 33.5 | 70 | 10 |
| 4BSPTA 1334 440 S16 | 1/2″, 3/4″ | 14 | 4 | 4 | 13.34 | 7.1 | 44 | 90 | 16 |
| 4BSPTA 1484 420 S16 | 1″, 1 1/4″, 1 1/2″, 2″ | 11 | 4 | 4 | 14.84 | 9.1 | 42 | 105 | 16 |
| **내부 급유형 (With coolant)** | | | | | | | | | |
| 4BSPTA 055 200 S06C | 1/16″, 1/8″ | 28 | 4 | 4 | 5.5 | 3.6 | 20 | 60 | 6 |
| 4BSPTA 0931 335 S10C | 1/4″, 3/8″ | 19 | 4 | 4 | 9.31 | 5.2 | 33.5 | 70 | 10 |
| 4BSPTA 1334 440 S16C | 1/2″, 3/4″ | 14 | 4 | 4 | 13.34 | 7.1 | 44 | 90 | 16 |
| 4BSPTA 1484 420 S16C | 1″, 1 1/4″, 1 1/2″, 2″ | 11 | 4 | 4 | 14.84 | 9.1 | 42 | 105 | 16 |

| | | → | | |
|---|---|---|---|---|
| 나사공구이의수 | 4 | → | 나사공구이의수 | 3 |
| 경사각도 | 1.78991 | | 경사각도 | 1.78991 |




- 나사산 가공시에 4산 기준으로 프로그램 설정하면 게이지 측정이 불가 하므로, 3산으로 설정하여 사용 하십시오.
- When threading, it is not possible to measure the gauge when setting the program based on 4 threads, so set it to 3 threads and use it.

### ■ 테이퍼 나사가공 순서



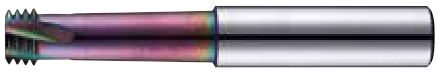
드릴링 (2DUBES) 테이퍼 엔드밀 (4CTE) 나사가공

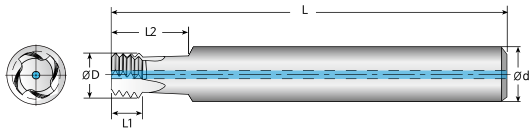
- 1. 드릴링으로 구멍을 뚫어준다.
  2. 테이퍼 엔드밀로 1˚47′를 절삭한다.
  3. 쓰레드밀로 나사가공을 진행한다.
- 1. Drill holes using drilling.
  2. Cut with a taper end mill at 1˚47′.
  3. Thread milling for threading operations.

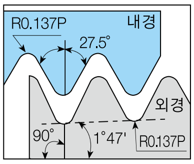
# 4BSPTS

## 4 Flutes Pipe Taper Short Thread Mills for Stainless Steel

## 4날 SUS 관용 테이퍼 나사 가공 짧은 날 쓰레드밀






규격 정의 B.S.21:1985
공차 등급 : 표준 BSPT(PT)

- SUS, 티타늄 합금 가공
- 내부 홀 을 통한 효과적인 냉각수 공급이 가능합니다.
- 절삭 영역으로 직접 절삭유를 공급합니다.
- 외부 냉각을 사용할 수 없거나 효과가 없을 때 탁월 합니다.
- 낮은 절삭부하를 위해 테이퍼 엔드밀 사용을 권장 합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- Thread mills for SUS and Titanium alloys
- Effective cooling water supply is possible with coolant.
- Direct oil supplying is possible to cutting area.
- More effective when you cannot use outer coolant.
- Recommend to us Taper Endmill for low machining load.
- Both right and left threading are available.


529P

### American UN

단위 Unit: mm

**외부 급유형 (Without coolant)**

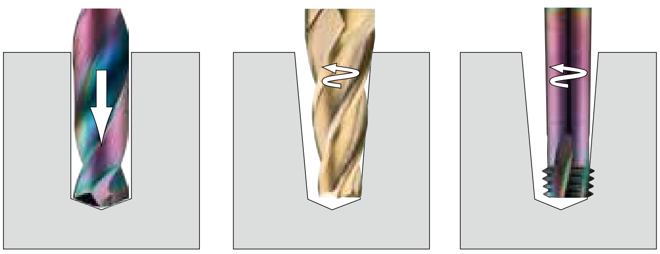
| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|
| 4BSPTS 055 200 S06 | 1/16″, 1/8″ | 28 | 4 | 4 | 5.5 | 3.6 | 20 | 60 | 6 |
| 4BSPTS 0931 335 S10 | 1/4″, 3/8″ | 19 | 4 | 4 | 9.31 | 5.2 | 33.5 | 70 | 10 |
| 4BSPTS 1334 440 S16 | 1/2″, 3/4″ | 14 | 4 | 4 | 13.34 | 7.1 | 44 | 90 | 16 |
| 4BSPTS 1484 420 S16 | 1″, 1 1/4″, 1 1/2″, 2″ | 11 | 4 | 4 | 14.84 | 9.1 | 42 | 105 | 16 |

**내부 급유형 (With coolant)**

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|
| 4BSPTS 055 200 S06C | 1/16″, 1/8″ | 28 | 4 | 4 | 5.5 | 3.6 | 20 | 60 | 6 |
| 4BSPTS 0931 335 S10C | 1/4″, 3/8″ | 19 | 4 | 4 | 9.31 | 5.2 | 33.5 | 70 | 10 |
| 4BSPTS 1334 440 S16C | 1/2″, 3/4″ | 14 | 4 | 4 | 13.34 | 7.1 | 44 | 90 | 16 |
| 4BSPTS 1484 420 S16C | 1″, 1 1/4″, 1 1/2″, 2″ | 11 | 4 | 4 | 14.84 | 9.1 | 42 | 105 | 16 |


- 나사산 가공시에 4산 기준으로 프로그램 설정하면 게이지 측정이 불가 하므로, 3산으로 설정하여 사용 하십시오.
- When threading, it is not possible to measure the gauge when setting the program based on 4 threads, so set it to 3 threads and use it.

## ■ 테이퍼 나사가공 순서



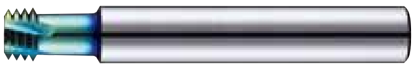
드릴링(2DUBES) 테이퍼 엔드밀 (4CTE) 나사가공

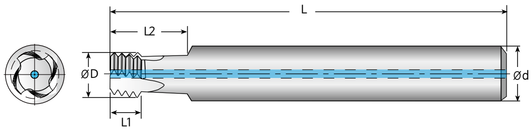
- 1. 드릴링으로 구멍을 뚫어준다.
  2. 테이퍼 엔드밀로 1˚47´를 절삭한다.
  3. 쓰레드밀로 나사가공을 진행한다.
- 1. Drill holes using drilling.
  2. Cut with a taper end mill at 1˚47´.
  3. Thread milling for threading operations.

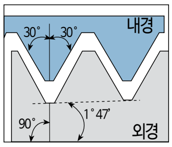
# 4NPTS

## 4 Flutes Pipe Taper Short Thread Mills for Multi Purpose

## 4날 범용 관용 테이퍼 나사 가공 짧은 날 쓰레드밀



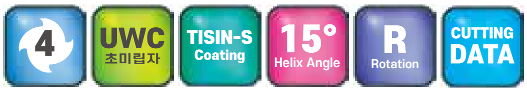



- 규격 정의 : B.S.2779:1956
- 공차 등급 : Medium class

- **HRc 58이하의 프리하든강, 합금강, 탄소강, 주철 가공**
- 내부 홀 을 통한 효과적인 냉각수 공급이 가능합니다.
- 절삭 영역으로 직접 절삭유를 공급합니다.
- 외부 냉각을 사용할 수 없거나 효과가 없을 때 탁월 합니다.
- 낮은 절삭부하를 위해 테이퍼 엔드밀 사용을 권장 합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for Hardened steels (up to HRc 58), pre-hardened steels, alloy steels, carbon steels, cast irons**
- Effective cooling water supply is possible with coolant.
- Water directly supplies to threading face.
- It's more useful for the situation, which cannot be used cooling outside.
- Recommend to us Taper Endmill for low machining load.
- Both right and left threading are available.



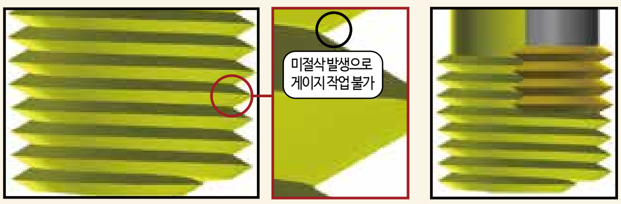

531P

### American UN

단위 Unit : mm

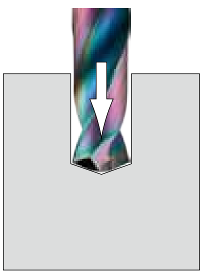
| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | | |
| 4NPTS 0555 105 S06 | 1/16″, 1/8″ | 27 | 4 | 4 | 5.55 | 3.8 | 10.5 | 60 | 6 |
| 4NPTS 0937 155 S10 | 1/4″, 3/8″ | 18 | 4 | 4 | 9.37 | 5.6 | 15.5 | 70 | 10 |
| 4NPTS 1357 260 S16 | 1/2″, 5/8″, 3/4″ | 14 | 4 | 4 | 13.57 | 7.3 | 26 | 90 | 16 |
| 4NPTS 1489 335 S16 | 1″, 1 1/4″, 1 1/2″, 2″ | 11.5 | 4 | 4 | 14.89 | 8.9 | 33.5 | 105 | 16 |
| **내부 급유형 (With coolant)** | | | | | | | | | |
| 4NPTS 0555 105 S06C | 1/16″, 1/8″ | 27 | 4 | 4 | 5.55 | 3.8 | 10.5 | 60 | 6 |
| 4NPTS 0937 155 S10C | 1/4″, 3/8″ | 18 | 4 | 4 | 9.37 | 5.6 | 15.5 | 70 | 10 |
| 4NPTS 1357 260 S16C | 1/2″, 5/8″, 3/4″, 7/8″ | 14 | 4 | 4 | 13.57 | 7.3 | 26 | 90 | 16 |
| 4NPTS 1489 335 S16C | 1″, 1 1/4″, 1 1/2″, 2″ | 11.5 | 4 | 4 | 14.89 | 8.9 | 33.5 | 105 | 16 |

| | | | | |
|---|---|---|---|---|
| 나사공구이의수 | 4 | → | 나사공구이의수 | 3 |
| 경사각도 | 1.78991 | | 경사각도 | 1.78991 |

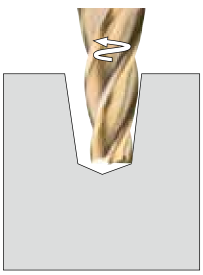



- 나사산 가공시에 4산 기준으로 프로그램 설정하면 게이지 측정이 불가 하므로, 3산으로 설정하여 사용하십시오.
- When threading, it is not possible to measure the gauge when setting the program based on 4 threads, so set it to 3 threads and use it.

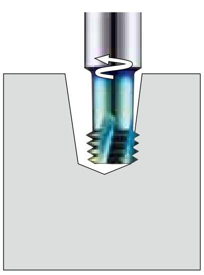
### ■ 테이퍼 나사가공 순서



드릴링 (2DUBES)



테이퍼 엔드밀 (4CTE)



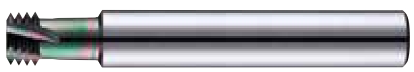
나사가공

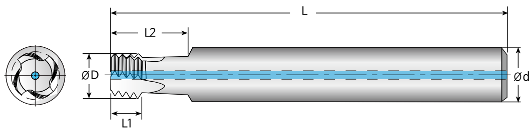
- 1. 드릴링으로 구멍을 뚫어준다.
  2. 테이퍼 엔드밀로 1°47′를 절삭한다.
  3. 쓰레드밀로 나사가공을 진행한다.
- 1. Drill holes using drilling.
  2. Cut with a taper end mill at 1°47′.
  3. Thread milling for threading operations.

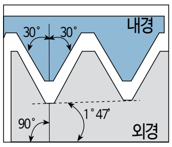
# 4NPTSA

## 4 Flutes Pipe Taper Short Thread Mills for Aluminum

## 4날 알루미늄 관용 테이퍼 나사 가공 짧은 날 쓰레드밀






- 규격 정의 : B.S.2779:1956
- 공차 등급 : Medium class

- **알루미늄, 알루미늄 합금 등 비철 비금속 가공**
- 내부 홀 을 통한 효과적인 냉각수 공급이 가능합니다.
- 절삭 영역으로 직접 절삭유를 공급합니다.
- 외부 냉각을 사용할 수 없거나 효과가 없을 때 탁월 합니다.
- 낮은 절삭부하를 위해 테이퍼 엔드밀 사용을 권장 합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for Aluminum, Aluminum alloys, non-ferrous, and non-metallic materials**
- Effective cooling water supply is possible with coolant.
- Water directly supplies to threading face.
- It's more useful for the situation, which cannot be used cooling outside.
- Recommend to us Taper Endmill for low machining load.
- Both right and left threading are available.


531P

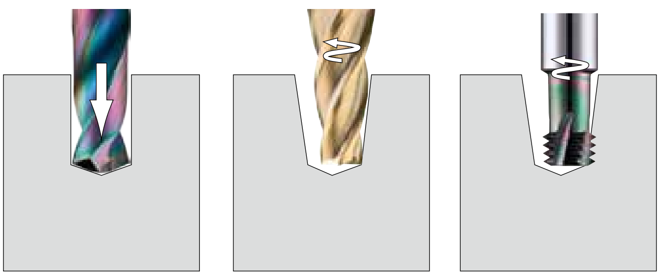
### American UN

단위 Unit : mm

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 섕크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | | |
| 4NPTSA 0555 105 S06 | 1/16″, 1/8″ | 27 | 4 | 4 | 5.55 | 3.8 | 10.5 | 60 | 6 |
| 4NPTSA 0937 155 S10 | 1/4″, 3/8″ | 18 | 4 | 4 | 9.37 | 5.6 | 15.5 | 70 | 10 |
| 4NPTSA 1357 260 S16 | 1/2″, 5/8″, 3/4″ | 14 | 4 | 4 | 13.57 | 7.3 | 26 | 90 | 16 |
| 4NPTSA 1489 335 S16 | 1″, 1 1/4″, 1 1/2″, 2″ | 11.5 | 4 | 4 | 14.89 | 8.9 | 33.5 | 105 | 16 |
| **내부 급유형 (With coolant)** | | | | | | | | | |
| 4NPTSA 0555 105 S06C | 1/16″, 1/8″ | 27 | 4 | 4 | 5.55 | 3.8 | 10.5 | 60 | 6 |
| 4NPTSA 0937 155 S10C | 1/4″, 3/8″ | 18 | 4 | 4 | 9.37 | 5.6 | 15.5 | 70 | 10 |
| 4NPTSA 1357 260 S16C | 1/2″, 5/8″, 3/4″, 7/8″ | 14 | 4 | 4 | 13.57 | 7.3 | 26 | 90 | 16 |
| 4NPTSA 1489 335 S16C | 1″, 1 1/4″, 1 1/2″, 2″ | 11.5 | 4 | 4 | 14.89 | 8.9 | 33.5 | 105 | 16 |


- 나사산 가공시에 4산 기준으로 프로그램 설정하면 게이지 측정이 불가 하므로, 3산으로 설정하여 사용하십시오.
- When threading, it is not possible to measure the gauge when setting the program based on 4 threads, so set it to 3 threads and use it.

### ■ 테이퍼 나사가공 순서



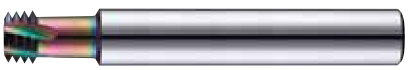
드릴링(2DUBES) 테이퍼 엔드밀 (4CTE) 나사가공

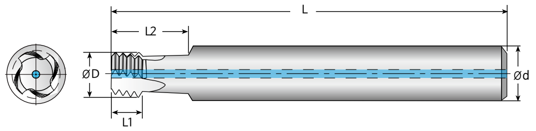
- 1. 드릴링으로 구멍을 뚫어준다.
  2. 테이퍼 엔드밀로 1°47′를 절삭한다.
  3. 쓰레드밀로 나사가공을 진행한다.
- 1. Drill holes using drilling.
  2. Cut with a taper end mill at 1°47′.
  3. Thread milling for threading operations.

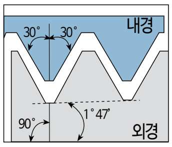
# 4NPTSS

4 Flutes Pipe Taper Short Thread Mills for Stainless Steels

## 4날 SUS 관용 테이퍼 나사 가공 짧은 날 쓰레드밀






- 규격 정의 : B.S.2779:1956
- 공차 등급 : Medium class

**• SUS, 티타늄 합금 가공**
- 내부 홀 을 통한 효과적인 냉각수 공급이 가능합니다.
- 절삭 영역으로 직접 절삭유를 공급합니다.
- 외부 냉각을 사용할 수 없거나 효과가 없을 때 탁월 합니다.
- 낮은 절삭부하를 위해 테이퍼 엔드밀 사용을 권장 합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

**• Thread Mills for SUS, Titanium alloys**
- Effective cooling water supply is possible with coolant.
- Water directly supplies to threading face.
- It's more useful for the situation, which cannot be used cooling outside.
- Recommend to us Taper Endmill for low machining load.
- Both right and left threading are available.


531P

### American UN

단위 Unit: mm

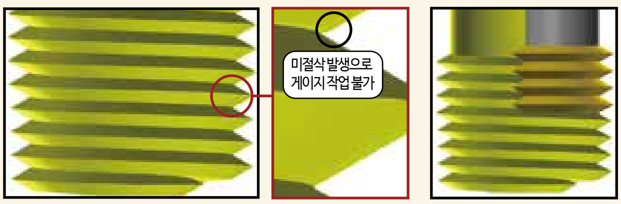
**외부 급유형 (Without coolant)**

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|
| 4NPTSS 0555 105 S06 | 1/16″, 1/8″ | 27 | 4 | 4 | 5.55 | 3.8 | 10.5 | 60 | 6 |
| 4NPTSS 0937 155 S10 | 1/4″, 3/8″ | 18 | 4 | 4 | 9.37 | 5.6 | 15.5 | 70 | 10 |
| 4NPTSS 1357 260 S16 | 1/2″, 5/8″, 3/4″ | 14 | 4 | 4 | 13.57 | 7.3 | 26 | 90 | 16 |
| 4NPTSS 1489 335 S16 | 1″, 1 1/4″, 1 1/2″, 2″ | 11.5 | 4 | 4 | 14.89 | 8.9 | 33.5 | 105 | 16 |

**내부 급유형 (With coolant)**

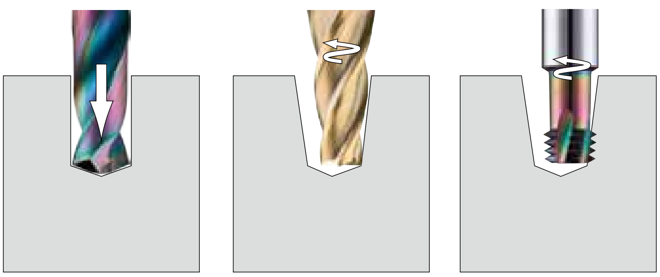
| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|
| 4NPTSS 0555 105 S06C | 1/16″, 1/8″ | 27 | 4 | 4 | 5.55 | 3.8 | 10.5 | 60 | 6 |
| 4NPTSS 0937 155 S10C | 1/4″, 3/8″ | 18 | 4 | 4 | 9.37 | 5.6 | 15.5 | 70 | 10 |
| 4NPTSS 1357 260 S16C | 1/2″, 5/8″, 3/4″, 7/8″ | 14 | 4 | 4 | 13.57 | 7.3 | 26 | 90 | 16 |
| 4NPTSS 1489 335 S16C | 1″, 1 1/4″, 1 1/2″, 2″ | 11.5 | 4 | 4 | 14.89 | 8.9 | 33.5 | 105 | 16 |

| | | | |
|---|---|---|---|
| 나사공구이의수 | 4 | 나사공구이의수 | 3 |
| 경사각도 | 1.78991 | 경사각도 | 1.78991 |




- 나사산 가공시에 4산 기준으로 프로그램 설정하면 게이지 측정이 불가 하므로, 3산으로 설정하여 사용 하십시오.
- When threading, it is not possible to measure the gauge when setting the program based on 4 threads, so set it to 3 threads and use it.

### ■ 테이퍼 나사가공 순서

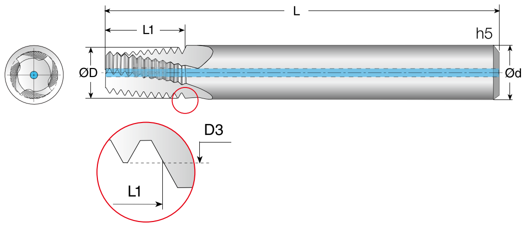


드릴링 (2DUBES)　　테이퍼 엔드밀 (4CTE)　　나사가공

- 1. 드릴링으로 구멍을 뚫어준다.
  2. 테이퍼 엔드밀로 1°47′를 절삭한다.
  3. 쓰레드밀로 나사가공을 진행한다.
- 1. Drill holes using drilling.
  2. Cut with a taper end mill at 1°47′.
  3. Thread milling for threading operations.

# 4BSTM

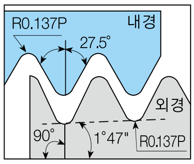
## 4 Flutes Pipe Taper Thread Mills for Multi Purpose
## 4날 범용 관용 테이퍼 나사 가공 쓰레드밀




- HRc 48 이하의 고경도강, 프리하든강, 합금강, 탄소강, 주철 가공
- 내부 홀 을 통한 효과적인 냉각수 공급이 가능합니다.
- 절삭 영역으로 직접 절삭유를 공급하여 칩의 융착 현상을 제거합니다.
- 낮은 절삭부하를 위해 테이퍼 엔드밀 사용을 권장 합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- Thread mills for Hardened steels (up to HRc 48), pre-hardened steels, alloy steels, carbon steels, cast irons
- Effective cooling water supply is possible with coolant.
- With coolant, it removes chip sticking.
- Using taper endmill is recommended to reduce cutting wear.
- Both right and left threading are available.


531P



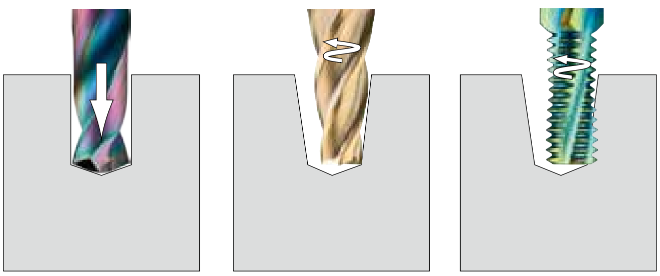

규격 정의 : B.S.21:1985
공차 등급 : 표준 BSPT

### American UN

단위 Unit: mm

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 외부 급유형 (Without coolant) |
| 4BSTM 059 103 S06 | 1/16″, 1/8″ | 28 | 4 | 11 | 5.9 | 10.3 | 60 | 6 |
| 4BSTM 0765 103 S08 | 1/8″ | 28 | 4 | 11 | 7.65 | 10.3 | 60 | 8 |
| 4BSTM 099 152 S10 | 1/4″, 3/8″ | 19 | 4 | 11 | 9.9 | 15.2 | 70 | 10 |
| 4BSTM 1115 152 S12 | 3/8″ | 19 | 4 | 11 | 11.15 | 15.2 | 70 | 12 |
| 4BSTM 1425 224 S16 | 1/2″, 3/4″ | 14 | 4 | 12 | 14.25 | 22.4 | 90 | 16 |
| 4BSTM 160 285 S16 | 1″, 1 1/4″, 1 1/2″, 2″ | 11 | 4 | 12 | 16 | 28.5 | 105 | 16 |
| | | | | | | | | 내부 급유형 (With coolant) |
| 4BSTM 059 103 S06C | 1/16″, 1/8″ | 28 | 4 | 11 | 5.9 | 10.3 | 60 | 6 |
| 4BSTM 0765 103 S08C | 1/8″ | 28 | 4 | 11 | 7.65 | 10.3 | 60 | 8 |
| 4BSTM 099 152 S10C | 1/4″, 3/8″ | 19 | 4 | 11 | 9.9 | 15.2 | 70 | 10 |
| 4BSTM 1115 152 S12C | 3/8″ | 19 | 4 | 11 | 11.15 | 15.2 | 70 | 12 |
| 4BSTM 1425 224 S16C | 1/2″, 3/4″ | 14 | 4 | 12 | 14.25 | 22.4 | 90 | 16 |
| 4BSTM 160 285 S16C | 1″, 1 1/4″, 1 1/2″, 2″ | 11 | 4 | 12 | 16 | 28.5 | 105 | 16 |

### ■ 테이퍼 나사가공 순서



드릴링(2DUBES)　　테이퍼 엔드밀 (4CTE)　　나사가공

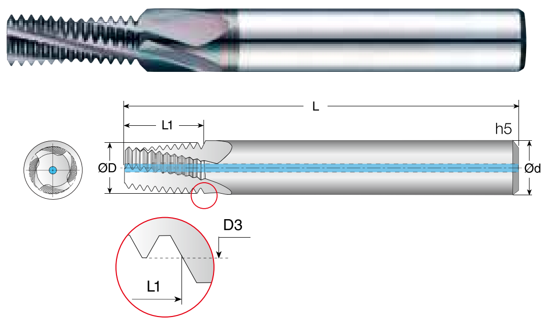
- 1. 드릴링으로 구멍을 뚫어준다.
  2. 테이퍼 엔드밀로 1°47′를 절삭한다.
  3. 쓰레드밀로 나사가공을 진행한다.

- 1. Drill holes using drilling.
  2. Cut with a taper end mill at 1°47′.
  3. Thread milling for threading operations.

# 4BSTMA

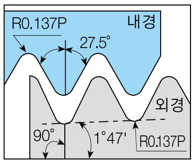
*4 Flutes Pipe Taper Thread Mills for Aluminum*

## 4날 알루미늄 관용 테이퍼 나사 가공 쓰레드밀




- **알루미늄, 알루미늄 합금 등 비철 비금속 가공**
- 내부 홀 을 통한 효과적인 냉각수 공급이 가능합니다.
- 절삭 영역으로 직접 절삭유를 공급하여 칩의 융착 현상을 제거합니다.
- 낮은 절삭부하를 위해 테이퍼 엔드밀 사용을 권장 합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for Aluminum, Aluminum alloys, non-ferrous, and non-metallic materials.**
- Effective cooling water supply is possible with coolant.
- With coolant, it removes chip sticking.
- Using taper endmill is recommended to reduce cutting wear.
- Both right and left threading are available.




규격 정의 : B.S.21:1985
공차 등급 : 표준 BSPT

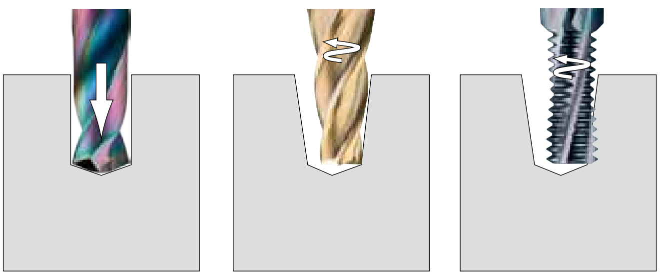

531P

### American UN

단위 Unit: mm

| Order Number | 나사 가능 규격<br>Thread | 피치 규격<br>Pitch (TPI) | 날수<br>Flutes<br>Z | 산수<br>Teeth<br>Zt | 날경<br>Diameter<br>D | 나사부 길이<br>Thread Length<br>L1 | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d |
|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | |
| 4BSTMA 059 103 S06 | 1/16˝ , 1/8˝ | 28 | 4 | 11 | 5.9 | 10.3 | 60 | 6 |
| 4BSTMA 0765 103 S08 | 1/8˝ | 28 | 4 | 11 | 7.65 | 10.3 | 60 | 8 |
| 4BSTMA 099 152 S10 | 1/4˝ , 3/8˝ | 19 | 4 | 11 | 9.9 | 15.2 | 70 | 10 |
| 4BSTMA 1115 152 S12 | 3/8˝ | 19 | 4 | 11 | 11.15 | 15.2 | 70 | 12 |
| 4BSTMA 1425 224 S16 | 1/2˝ , 3/4˝ | 14 | 4 | 12 | 14.25 | 22.4 | 90 | 16 |
| 4BSTMA 160 285 S16 | 1", 1 1/4", 1 1/2", 2" | 11 | 4 | 12 | 16 | 28.5 | 105 | 16 |
| **내부 급유형 (With coolant)** | | | | | | | | |
| 4BSTMA 059 103 S06C | 1/16˝ , 1/8˝ | 28 | 4 | 11 | 5.9 | 10.3 | 60 | 6 |
| 4BSTMA 0765 103 S08C | 1/8˝ | 28 | 4 | 11 | 7.65 | 10.3 | 60 | 8 |
| 4BSTMA 099 152 S10C | 1/4˝ , 3/8˝ | 19 | 4 | 11 | 9.9 | 15.2 | 70 | 10 |
| 4BSTMA 1115 152 S12C | 3/8˝ | 19 | 4 | 11 | 11.15 | 15.2 | 70 | 12 |
| 4BSTMA 1425 224 S16C | 1/2˝ , 3/4˝ | 14 | 4 | 12 | 14.25 | 22.4 | 90 | 16 |
| 4BSTMA 160 285 S16C | 1", 1 1/4", 1 1/2", 2" | 11 | 4 | 12 | 16 | 28.5 | 105 | 16 |

### ■ 테이퍼 나사가공 순서



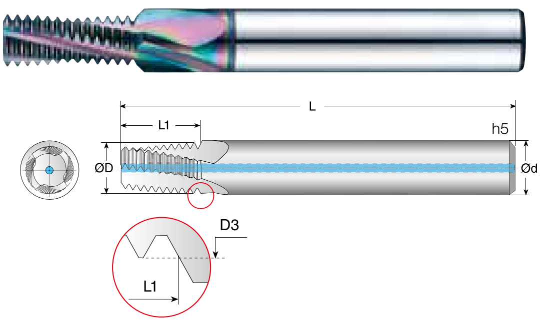
드릴링(2DUBES) 테이퍼 엔드밀 (4CTE) 나사가공

- 1. 드릴링으로 구멍을 뚫어준다.
  2. 테이퍼 엔드밀로 1˚47′를 절삭한다.
  3. 쓰레드밀로 나사가공을 진행한다.
- 1. Drill holes using drilling.
  2. Cut with a taper end mill at 1˚47′.
  3. Thread milling for threading operations.

# 4BSTMS

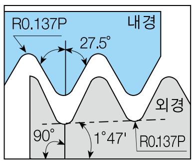
## 4 Flutes Pipe Taper Thread Mills for Stainless Steel

## 4날 SUS 관용 테이퍼 나사 가공 쓰레드밀




- **SUS, 티타늄 합금 가공**
- 내부 홀 을 통한 효과적인 냉각수 공급이 가능합니다.
- 절삭 영역으로 직접 절삭유를 공급하여 칩의 융착 현상을 제거합니다.
- 낮은 절삭부하를 위해 테이퍼 엔드밀 사용을 권장 합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread Mills for SUS, Titanium alloys**
- Effective cooling water supply is possible with coolant.
- With coolant, it removes chip sticking.
- Using taper endmill is recommended to reduce cutting wear.
- Both right and left threading are available.




규격 정의 : B.S.21:1985
공차 등급 : 표준 BSPT


### American UN

단위 Unit: mm

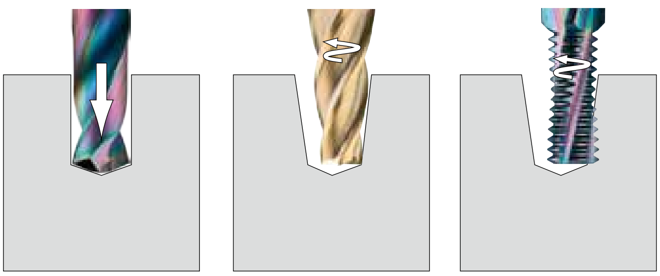
**외부 급유형 (Without coolant)**

| Order Number | 나사 가능 규격<br>Thread | 피치 규격<br>Pitch (TPI) | 날수<br>Flutes<br>Z | 산수<br>Teeth<br>Zt | 날경<br>Diameter<br>D | 나사부 길이<br>Thread Length<br>L1 | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d |
|---|---|---|---|---|---|---|---|---|
| 4BSTMS 059 103 S06 | 1/16˝, 1/8˝ | 28 | 4 | 11 | 5.9 | 10.3 | 60 | 6 |
| 4BSTMS 0765 103 S08 | 1/8˝ | 28 | 4 | 11 | 7.65 | 10.3 | 60 | 8 |
| 4BSTMS 099 152 S10 | 1/4˝, 3/8˝ | 19 | 4 | 11 | 9.9 | 15.2 | 70 | 10 |
| 4BSTMS 1115 152 S12 | 3/8˝ | 19 | 4 | 11 | 11.15 | 15.2 | 70 | 12 |
| 4BSTMS 1425 224 S16 | 1/2˝, 3/4˝ | 14 | 4 | 12 | 14.25 | 22.4 | 90 | 16 |
| 4BSTMS 160 285 S16 | 1", 1 1/4", 1 1/2", 2" | 11 | 4 | 12 | 16 | 28.5 | 105 | 16 |

**내부 급유형 (With coolant)**

| Order Number | 나사 가능 규격<br>Thread | 피치 규격<br>Pitch (TPI) | 날수<br>Flutes<br>Z | 산수<br>Teeth<br>Zt | 날경<br>Diameter<br>D | 나사부 길이<br>Thread Length<br>L1 | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d |
|---|---|---|---|---|---|---|---|---|
| 4BSTMS 059 103 S06C | 1/16˝, 1/8˝ | 28 | 4 | 11 | 5.9 | 10.3 | 60 | 6 |
| 4BSTMS 0765 103 S08C | 1/8˝ | 28 | 4 | 11 | 7.65 | 10.3 | 60 | 8 |
| 4BSTMS 099 152 S10C | 1/4˝, 3/8˝ | 19 | 4 | 11 | 9.9 | 15.2 | 70 | 10 |
| 4BSTMS 1115 152 S12C | 3/8˝ | 19 | 4 | 11 | 11.15 | 15.2 | 70 | 12 |
| 4BSTMS 1425 224 S16C | 1/2˝, 3/4˝ | 14 | 4 | 12 | 14.25 | 22.4 | 90 | 16 |
| 4BSTMS 160 285 S16C | 1", 1 1/4", 1 1/2", 2" | 11 | 4 | 12 | 16 | 28.5 | 105 | 16 |

### ■ 테이퍼 나사가공 순서



드릴링(2DUBES)    테이퍼 엔드밀 (4CTE)    나사가공

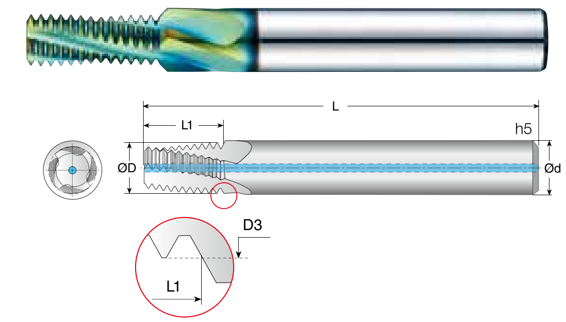
- 1. 드릴링으로 구멍을 뚫어준다.
  2. 테이퍼 엔드밀로 1°47′를 절삭한다.
  3. 쓰레드밀로 나사가공을 진행한다.

- 1. Drill holes using drilling.
  2. Cut with a taper end mill at 1°47′.
  3. Thread milling for threading operations.

# 4NPTM

*4 Flutes Pipe Taper Thread Mills for Multi Purpose*

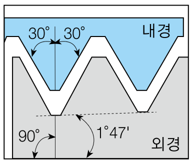
## 4날 범용 관용 테이퍼 나사 가공 쓰레드밀




- **HRc 48 이하의 고경도강, 프리하든강, 합금강, 탄소강, 주철 가공**
- 내부 홀 을 통한 효과적인 냉각수 공급이 가능합니다.
- 절삭 영역으로 직접 절삭유를 공급하여 칩의 융착 현상을 제거합니다.
- 낮은 절삭부하를 위해 테이퍼 엔드밀 사용을 권장 합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for Hardened steels (up to HRc 48), pre-hardened steels, alloy steels, carbon steels, cast irons**
- Effective cooling water supply is possible with coolant.
- With coolant, it removes chip sticking.
- Using taper endmill is recommended to reduce cutting wear.
- Both right and left threading are available.


531P




규격 정의 : USAS B2.1:1968
공차 등급 : 표준 NPT

### American UN

단위 Unit: mm

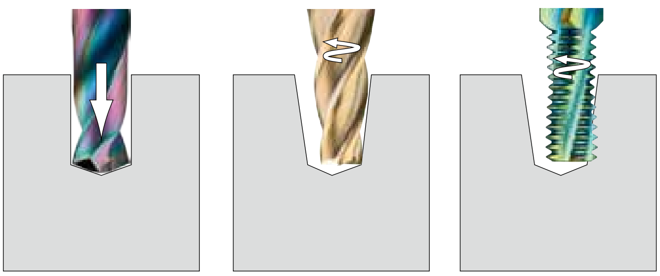
**외부 급유형 (Without coolant)**

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| 4NPTM 059 098 S06 | 1/16˝ , 1/8˝ | 27 | 4 | 10 | 5.9 | 9.8 | 60 | 6 |
| 4NPTM 0765 098 S08 | 1/8˝ | 27 | 4 | 10 | 7.65 | 9.8 | 60 | 8 |
| 4NPTM 099 147 S10 | 1/4˝ , 3/8˝ | 18 | 4 | 10 | 9.9 | 14.7 | 70 | 10 |
| 4NPTM 1115 147 S12 | 3/8˝ | 18 | 4 | 10 | 11.15 | 14.7 | 70 | 12 |
| 4NPTM 1425 189 S16 | 1/2˝ , 3/4˝ | 14 | 4 | 10 | 14.25 | 18.9 | 90 | 16 |
| 4NPTM 160 275 S16 | 1", 1 1/4", 1 1/2", 2" | 11.5 | 4 | 12 | 16 | 27.5 | 105 | 16 |

**내부 급유형 (With coolant)**

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch (TPI) | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 나사부 길이 Thread Length L1 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| 4NPTM 059 098 S06C | 1/16˝ , 1/8˝ | 27 | 4 | 10 | 5.9 | 9.8 | 60 | 6 |
| 4NPTM 0765 098 S08C | 1/8˝ | 27 | 4 | 10 | 7.65 | 9.8 | 60 | 8 |
| 4NPTM 099 147 S10C | 1/4˝ , 3/8˝ | 18 | 4 | 10 | 9.9 | 14.7 | 70 | 10 |
| 4NPTM 1115 147 S12C | 3/8˝ | 18 | 4 | 10 | 11.15 | 14.7 | 70 | 12 |
| 4NPTM 1425 189 S16C | 1/2˝ , 3/4˝ | 14 | 4 | 10 | 14.25 | 18.9 | 90 | 16 |
| 4NPTM 160 275 S16C | 1", 1 1/4", 1 1/2", 2" | 11.5 | 4 | 12 | 16 | 27.5 | 105 | 16 |

### ■ 테이퍼 나사가공 순서



드릴링(2DUBES) 테이퍼 엔드밀 (4CTE) 나사가공

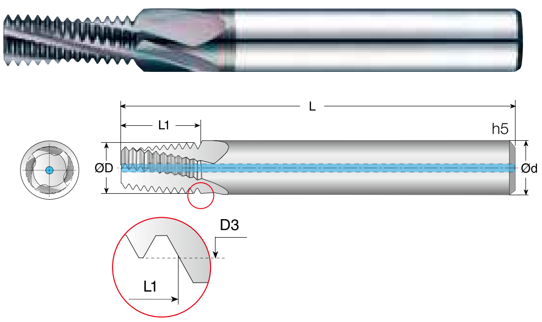
- 1. 드릴링으로 구멍을 뚫어준다.
  2. 테이퍼 엔드밀로 1˚47′를 절삭한다.
  3. 쓰레드밀로 나사가공을 진행한다.

- 1. Drill holes using drilling.
  2. Cut with a taper end mill at 1˚47′.
  3. Thread milling for threading operations.

# 4NPTMA

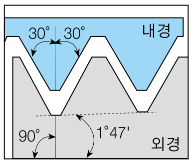
*4 Flutes Pipe Taper Thread Mills for Aluminum*

## 4날 알루미늄 관용 테이퍼 나사 가공 쓰레드밀




- **알루미늄, 알루미늄 합금 등 비철 비금속 가공**
- 내부 홀 을 통한 효과적인 냉각수 공급이 가능합니다.
- 절삭 영역으로 직접 절삭유를 공급하여 칩의 융착 현상을 제거합니다.
- 낮은 절삭부하를 위해 테이퍼 엔드밀 사용을 권장 합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- **Thread mills for Aluminum, Aluminum alloys, non-ferrous, and non-metallic materials**
- Effective cooling water supply is possible with coolant.
- With coolant, it removes chip sticking.
- Using taper endmill is recommended to reduce cutting wear.
- Both right and left threading are available.




규격 정의 : USAS B2.1:1968
공차 등급 : 표준 NPT


531P

### American UN

단위 Unit : mm

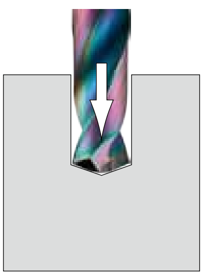
#### 외부 급유형 (Without coolant)

| Order Number | 나사 가능 규격<br>Thread | 피치 규격<br>Pitch (TPI) | 날수<br>Flutes<br>Z | 산수<br>Teeth<br>Zt | 날경<br>Diameter<br>D | 나사부 길이<br>Thread Length<br>L1 | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d |
|---|---|---|---|---|---|---|---|---|
| 4NPTMA 059 098 S06 | 1/16˝ , 1/8˝ | 27 | 4 | 10 | 5.9 | 9.8 | 60 | 6 |
| 4NPTMA 0765 098 S08 | 1/8˝ | 27 | 4 | 10 | 7.65 | 9.8 | 60 | 8 |
| 4NPTMA 099 147 S10 | 1/4˝ , 3/8˝ | 18 | 4 | 10 | 9.9 | 14.7 | 70 | 10 |
| 4NPTMA 1115 147 S12 | 3/8˝ | 18 | 4 | 10 | 11.15 | 14.7 | 70 | 12 |
| 4NPTMA 1425 189 S16 | 1/2˝ , 3/4˝ | 14 | 4 | 10 | 14.25 | 18.9 | 90 | 16 |
| 4NPTMA 160 275 S16 | 1", 1 1/4", 1 1/2", 2" | 11.5 | 4 | 12 | 16 | 27.5 | 105 | 16 |

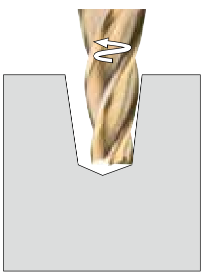
#### 내부 급유형 (With coolant)

| Order Number | 나사 가능 규격<br>Thread | 피치 규격<br>Pitch (TPI) | 날수<br>Flutes<br>Z | 산수<br>Teeth<br>Zt | 날경<br>Diameter<br>D | 나사부 길이<br>Thread Length<br>L1 | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d |
|---|---|---|---|---|---|---|---|---|
| 4NPTMA 059 098 S06C | 1/16˝ , 1/8˝ | 27 | 4 | 10 | 5.9 | 9.8 | 60 | 6 |
| 4NPTMA 0765 098 S08C | 1/8˝ | 27 | 4 | 10 | 7.65 | 9.8 | 60 | 8 |
| 4NPTMA 099 147 S10C | 1/4˝ , 3/8˝ | 18 | 4 | 10 | 9.9 | 14.7 | 70 | 10 |
| 4NPTMA 1115 147 S12C | 3/8˝ | 18 | 4 | 10 | 11.15 | 14.7 | 70 | 12 |
| 4NPTMA 1425 189 S16C | 1/2˝ , 3/4˝ | 14 | 4 | 10 | 14.25 | 18.9 | 90 | 16 |
| 4NPTMA 160 275 S16C | 1", 1 1/4", 1 1/2", 2" | 11.5 | 4 | 12 | 16 | 27.5 | 105 | 16 |

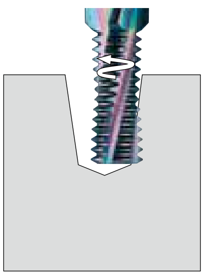
### ■ 테이퍼 나사가공 순서



드릴링(2DUBES)



테이퍼 엔드밀 (4CTE)



나사가공

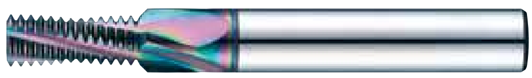
- 1. 드릴링으로 구멍을 뚫어준다.
  2. 테이퍼 엔드밀로 1˚47´를 절삭한다.
  3. 쓰레드밀로 나사가공을 진행한다.

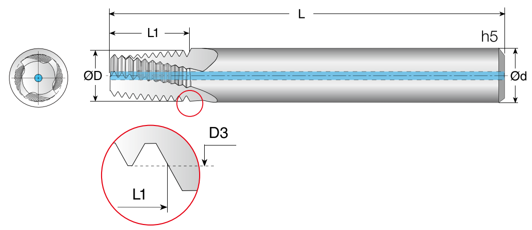
- 1. Drill holes using drilling.
  2. Cut with a taper end mill at 1˚47´.
  3. Thread milling for threading operations.

# 4NPTMS

*4 Flutes Pipe Taper Thread Mills for Stainless Steels*

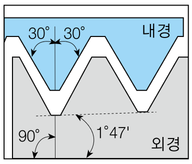
## 4날 SUS 관용 테이퍼 나사 가공 쓰레드밀






- SUS, 티타늄 합금 가공
- 내부 홀 을 통한 효과적인 냉각수 공급이 가능합니다.
- 절삭 영역으로 직접 절삭유를 공급하여 칩의 융착 현상을 제거합니다.
- 낮은 절삭부하를 위해 테이퍼 엔드밀 사용을 권장 합니다.
- 오른나사 및 왼나사 작업이 모두 가능합니다.

- Thread Mills for SUS, Titanium alloys
- Effective cooling water supply is possible with coolant.
- With coolant, it removes chip sticking.
- Using taper endmill is recommended to reduce cutting wear.
- Both right and left threading are available.




규격 정의 : USAS B2.1:1968
공차 등급 : 표준 NPT

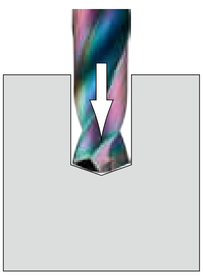

531P

### American UN

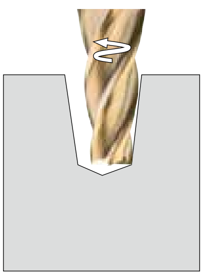
단위 Unit: mm

| Order Number | 나사 가능 규격<br>Thread | 피치 규격<br>Pitch (TPI) | 날수<br>Flutes<br>Z | 산수<br>Teeth<br>Zt | 날경<br>Diameter<br>D | 나사부 길이<br>Thread Length<br>L1 | 전장<br>Overall Length<br>L | 생크<br>Shank Dia<br>d |
|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | |
| 4NPTMS 059 098 S06 | 1/16″, 1/8″ | 27 | 4 | 10 | 5.9 | 9.8 | 60 | 6 |
| 4NPTMS 0765 098 S08 | 1/8″ | 27 | 4 | 10 | 7.65 | 9.8 | 60 | 8 |
| 4NPTMS 099 147 S10 | 1/4″, 3/8″ | 18 | 4 | 10 | 9.9 | 14.7 | 70 | 10 |
| 4NPTMS 1115 147 S12 | 3/8″ | 18 | 4 | 10 | 11.15 | 14.7 | 70 | 12 |
| 4NPTMS 1425 189 S16 | 1/2″, 3/4″ | 14 | 4 | 10 | 14.25 | 18.9 | 90 | 16 |
| 4NPTMS 160 275 S16 | 1″, 1 1/4″, 1 1/2″, 2″ | 11.5 | 4 | 12 | 16 | 27.5 | 105 | 16 |
| **내부 급유형 (With coolant)** | | | | | | | | |
| 4NPTMS 059 098 S06C | 1/16″, 1/8″ | 27 | 4 | 10 | 5.9 | 9.8 | 60 | 6 |
| 4NPTMS 0765 098 S08C | 1/8″ | 27 | 4 | 10 | 7.65 | 9.8 | 60 | 8 |
| 4NPTMS 099 147 S10C | 1/4″, 3/8″ | 18 | 4 | 10 | 9.9 | 14.7 | 70 | 10 |
| 4NPTMS 1115 147 S12C | 3/8″ | 18 | 4 | 10 | 11.15 | 14.7 | 70 | 12 |
| 4NPTMS 1425 189 S16C | 1/2″, 3/4″ | 14 | 4 | 10 | 14.25 | 18.9 | 90 | 16 |
| 4NPTMS 160 275 S16C | 1″, 1 1/4″, 1 1/2″, 2″ | 11.5 | 4 | 12 | 16 | 27.5 | 105 | 16 |

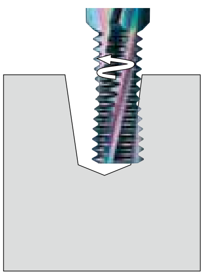
### ■ 테이퍼 나사가공 순서



드릴링(2DUBES)



테이퍼 엔드밀 (4CTE)



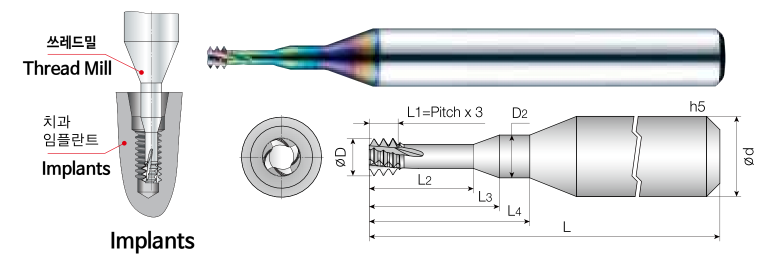
나사가공

- 1. 드릴링으로 구멍을 뚫어준다.
  2. 테이퍼 엔드밀로 1˚47′를 절삭한다.
  3. 쓰레드밀로 나사가공을 진행한다.
- 1. Drill holes using drilling.
  2. Cut with a taper end mill at 1˚47′.
  3. Thread milling for threading operations.

# 4IMTM

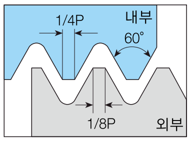
## 4 Flutes Thread Mills for Dental Implants (Three Thread)

## 4날 치과 임플란트 가공 쓰레드밀 (3 나사산)




- **티타늄, 티타늄 합금 가공**
- 경화강 내 나사 가공을 위한 견고하고 강력한 날 디자인.
- 향상된 절삭 및 칩 제거를 통해 공구가 구멍 안에서 끊어지는 위험을 줄입니다.
- 팁 형상은 절삭 저항을 줄이고 공구 구부림을 억제합니다.

- **Thread Mills for Titanium, Titanium alloys**
- Rigid and powerful flutes design for inside hardening steel.
- Enhanced threading enables chip removal smoothly to reduce possible brokage of tool inside hole.
- The shape of tip reduces fraction and prevent tool bending.





ISO 측정항목

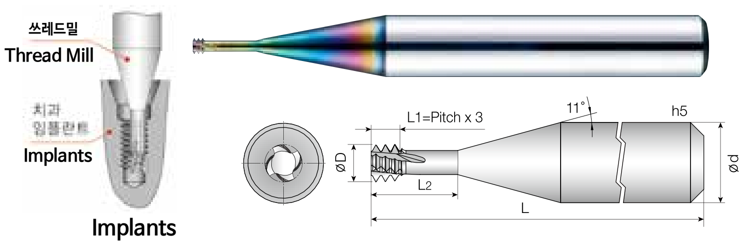
단위 Unit: mm

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 목부경 Neck Diameter D2 | 유효장 Effective Length L2 | L3 | L4 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | | | | |
| 4IMTM 009 025 S03 M012 | M1.2 | 0.25 | 4 | 3 | 0.9 | 0.95 | 2.5 | 3.3 | 4.3 | 40 | 3 |
| 4IMTM 0105 028 S03 M014 | M1.4 | 0.3 | 4 | 3 | 1.05 | 1.1 | 2.8 | 3.5 | 5 | 40 | 3 |
| 4IMTM 012 033 S03 M016 | M1.6 | 0.35 | 4 | 3 | 1.2 | 1.25 | 3.3 | 4.2 | 5.9 | 40 | 3 |
| 4IMTM 014 038 S03 M018 | M1.8 | 0.35 | 4 | 3 | 1.4 | 1.45 | 3.8 | 4.7 | 6.6 | 40 | 3 |
| 4IMTM 0154 039 S03 M2 | M2 | 0.4 | 4 | 3 | 1.54 | 1.7 | 3.9 | 4.9 | 6.7 | 40 | 3 |
| 4IMTM 0196 048 S03 M025 | M2.5 | 0.45 | 4 | 3 | 1.96 | 2 | 4.8 | 5.8 | 8.2 | 40 | 3 |

# 4IMTM

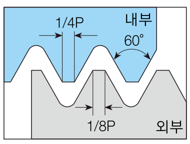
## 4 Flutes Thread Mills for Dental Implants (Three Thread)

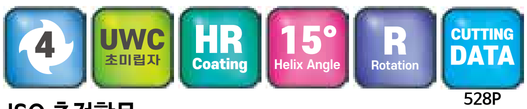
## 4날 치과 임플란트 가공 쓰레드밀 (3 나사산)




- **티타늄, 티타늄 합금 가공**
- 경화강 내 나사 가공을 위한 견고하고 강력한 날 디자인.
- 향상된 절삭 및 칩 제거를 통해 공구가 구멍 안에서 끊어지는 위험을 줄입니다.
- 팁 형상은 절삭 저항을 줄이고 공구 구부림을 억제합니다.

- **Thread Mills for Titanium, Titanium alloys**
- Rigid and powerful flutes design for inside hardening steel.
- Enhanced threading enables chip removal smoothly to reduce possible brokage of tool inside hole.
- The shape of tip reduces fraction and prevent tool bending.




ISO 측정항목

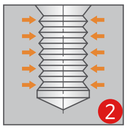
단위 Unit: mm

| Order Number | 나사 가능 규격 Thread | 피치 규격 Pitch | 날수 Flutes Z | 산수 Teeth Zt | 날경 Diameter D | 유효장 Effective Length L2 | 전장 Overall Length L | 생크 Shank Dia d |
|---|---|---|---|---|---|---|---|---|
| **외부 급유형 (Without coolant)** | | | | | | | | |
| 4IMTM 0057 023 S06 M008 | M0.8 | 0.2 | 4 | 3 | 0.57 | 2.3 | 50 | 6 |
| 4IMTM 0064 026 S06 M009 | M0.9 | 0.225 | 4 | 3 | 0.64 | 2.6 | 50 | 6 |
| 4IMTM 0071 029 S06 M1 | M1 | 0.25 | 4 | 3 | 0.71 | 2.9 | 50 | 6 |
| 4IMTM 0091 034 S06 M012 | M1.2 | 0.25 | 4 | 3 | 0.91 | 3.4 | 50 | 6 |
| 4IMTM 0105 039 S06 M014 | M1.4 | 0.3 | 4 | 3 | 1.05 | 3.9 | 50 | 6 |
| 4IMTM 012 045 S06 M016 | M1.6 | 0.35 | 4 | 3 | 1.2 | 4.5 | 50 | 6 |
| 4IMTM 014 050 S06 M018 | M1.8 | 0.35 | 4 | 3 | 1.4 | 5 | 50 | 6 |
| 4IMTM 0154 056 S06 M2 | M2 | 0.4 | 4 | 3 | 1.54 | 5.6 | 50 | 6 |
| 4IMTM 0184 063 S06 M023 | M2.3 | 0.4 | 4 | 3 | 1.84 | 6.3 | 50 | 6 |
| 4IMTM 0198 069 S06 M025 | M2.5 | 0.45 | 4 | 3 | 1.98 | 6.9 | 50 | 6 |
| 4IMTM 0208 071 S06 M026 | M2.6 | 0.45 | 4 | 3 | 2.08 | 7.1 | 50 | 6 |

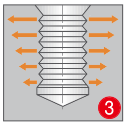
# 2DM 2DTMS 스레드밀 - 가능한 원인들

스레드 프로파일에 채워지거나 접착 된 칩 (Chips packed or glued at the thread profile)
- 열악한 냉각수 (Poor coolant)

→ 냉각제 개선 (즉, 플러드 냉각제, 관통 구멍 용 측면 플루트 냉각제 공급 장치 추가)
Improve Coolant (i.e add flood coolant, lateral flute coolant supply for throuht holes)
→ 냉각수 플루트를 생크에 추가하십시오.
Add coolant flutes flutes on shank.



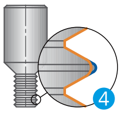

쓰레드 게이지는 피팅되지 않습니다. (Thread go-gage dosen't fit)
- 쓰레드가 너무 작음 (thread too small) → 옵셋 레지스터에서 공구 반경 감소 (Reduce tool radius in offset register)
- 쓰레드에 칩이 있음(Chip in thread) → 냉각제 개선 (Improve coolant)




쓰레드가 점점 가늘어지고 있습니다. (Thread is getting tapered)
- 열악한 공구 클램핑 (Poor tool clamping)

→ 공구 홀딩 (즉, 수축 끼워 맞춤 홀더) 개선 Improve tool holding (i.e shrink fit holders)
- 나사산 밀링 피드가 너무 높음 (thread milling feed too high) → 나사산 밀링 피드 감소 (reduce thread milling feed)

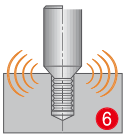
→ 쓰레드 가공 횟수를 황삭, 정삭으로 나눠서 가공
(Machining by dividing the number of thread machining into roughing and finishing)




불규칙한 공구 마모 (Erratic tool wear)
- 공구가 너무 많이 소모 됨 → 공구 홀더 (예 : 단축 장팍 홀더)를 사용하십시오.
- 쓰레드에 칩이 있음(Chip in thread) → 냉각제 개선 (Improve coolant)

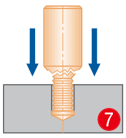

카운터 보어 칩이 공구 주변에 감겨 있습니다.
(Counterbore chips are winding around the tool)
- 모따기 피드가 너무 낮음 (Chamfer feed too low)

→ 모따기 피드가 증가합니다. (Increase chamfer feed)




시끄러운 드릴링 노이즈 (특히 최종 드릴링 깊이 방향)
Loud drilling noise (especially towards the final drilling depth)
- 칩 문제 (Chip problem)

→ 드릴 이송 속도 감소 (reduce drill feed rate)
→ 절삭유가 들어간 공구를 사용하십시오. (Use tool with coolant through)
→ 펙주기 추가 (Add peck cycle)

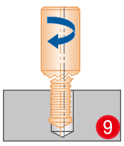



드릴링 중 공구 파손 (특히 긴 칩핑 소재에서)
Tool breakage while drilling (especially in long chipping material)
- 칩 문제 (Chip problem)

→ 드릴 이송 속도 감소 (reduce drill feed rate)
→ 절삭유가 들어간 공구를 사용하십시오. (Use tool with coolant through)
→ 펙주기 추가 (Add peck cycle)


틈새에 붙어있는 칩 (Chips glued up in the flutes)
- 열악한 냉각수 (Poor coolant)

→ 냉각제 상황 개선 (Improve coolant situation)
→ 절삭유가 들어간 공구를 사용하십시오. (Use tool with coolant through)
→ 코팅 공구 사용 (Use coated tool)




쓰레드 밀링 중 공구 파손, 공구 파손 (Chippage, tool breakage while thread milling)
- 이송 속도 나사 밀링이 너무 높음 (feed rate thread milling too high)

→ 보링 작업 후 칩 그루브에 칩이 없음을 확인하십시오
Check that the chip grooves are free of chips after the boring operation)
- 진동(Vibrations)

→ 이송 속도 감소 (NC피드가 중심점 또는 외부 트랙과 관련되는지 확인)
Reduce feed rate (Check whether Nc feeds relate to centre point or external track)

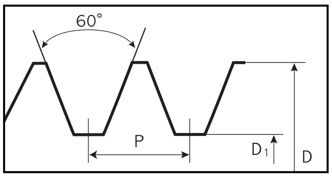

나사 표면이 좋지 않음 (고조파) Poor thread surface (harmonics)
- 진동 (Vibrations)

→ 공구 홀더 확인 (모듈러 시스템을 사용하지 마십시오!)
(Check tool holder (do not use modular systems!))
→ 공작물 클램핑 및 픽스처 확인. 클램핑 셋업이 불안정한 곳에서는 절삭력의 분포가 도입됩니다.
(Check workpiece clamping and fixture. Where the clamping set-up is unstable introduce a distribution of the cutting force.)
→ 절단 속도 감소 (reduce cutting speed)
→ 치아 이송 속도 증가 (Increase tooth feed rate)
→ 절삭력의 분포를 소개 (Introduce distribution of cutting force)

# 나사산 예비 가공 홀 직경 -탭가공 / 스레드 밀링

### 나사의 종류 및 기호

| 나사의 종류 | | 기호 | 나사산 각도 | 규격 | |
|---|---|---|---|---|---|
| 미터 나사 | 보통 나사 | M | 60˚ | JIS B 0205 | |
| | 가는 나사 | | | JIS B 0207 | |
| 항공 우주용 미터 나사 | 보통 나사 | MJ | 60˚ | ISO 5855 | JIS B 0206 |
| 유니파이 나사 | 보통 나사 | UNC | 60˚ | ANSI B1.1 | JIS B 0208 |
| | 가는 나사 | UNF | | | |
| | 아주 가는 나사 | UNEF | | | |
| | 특수 나사 | UNS | | | |
| 항공 우주용 인치 나사 | 보통 나사 | UNJC | 60˚ | MIL-S-8879 | |
| | 가는 나사 | UNJF | | | |
| | 아주 가는 나사 | UNJEF | | | |
| | 특수 나사 | UNJ | | | |
| 관용 테이퍼 나사 | 미국식 관용 테이퍼 나사 | NPT | 60˚ | ANSI/ASEM B1.20.1 | |
| | 미국식 드라이씰 관용 테이퍼 나사 | NPTF | | ANSI B1.20.3 | |
| | 영국식 관용 테이퍼 나사 | PT(Rc) | 55˚ | JIS B 0203 | |
| 관용 평행 나사 | 기계 결합용 관용 평행 나사 | PF(G) | 55˚ | JIS B 0202 | |
| | 내밀 용 관용 평행 나사 | PS(Rp) | | JIS B 0203 | |
| 영국 위트워스 나사 | 보통나사 | BSW | 55˚ | BS 84 | |




## M, UNC, UNF, UNEF 도면

**M** 미터법 ISO 미세 나사산
DIN 13 및 DIN ISO 965-1

| D | | $D_1$ | | |
|---|---|---|---|---|
| 직 경 Diameter | 피 치 Pitch | min (mm) | max (mm) | 드릴 직경 Drill Dia.(mm) |
| 1 | 0.25 | 0.729 | 0.785 | 0.75 |
| 1.1 | 0.25 | 0.829 | 0.885 | 0.85 |
| 1.2 | 0.25 | 0.929 | 0.985 | 0.95 |
| 1.4 | 0.3 | 1.075 | 1.142 | 1.1 |
| 1.6 | 0.35 | 1.221 | 1.321 | 1.25 |
| 1.7 | 0.35 | 1.321 | 1.421 | 1.35 |
| 1.8 | 0.35 | 1.421 | 1.521 | 1.45 |
| 2 | 0.25 | 1.729 | 1.785 | 1.75 |
| 2 | 0.4 | 1.567 | 1.679 | 1.6 |
| 2.2 | 0.25 | 1.929 | 1.985 | 1.95 |
| 2.2 | 0.45 | 1.713 | 1.838 | 1.75 |
| 2.3 | 0.25 | 2.029 | 2.085 | 2.05 |
| 2.3 | 0.4 | 1.813 | 1.938 | 1.85 |
| 2.5 | 0.35 | 2.121 | 2.221 | 2.15 |
| 2.5 | 0.45 | 2.013 | 2.138 | 2.05 |
| 2.6 | 0.45 | 2.113 | 2.238 | 2.15 |
| 3 | 0.25 | 2.729 | 2.785 | 2.75 |
| 3 | 0.35 | 2.621 | 2.721 | 2.65 |
| 3 | 0.5 | 2.459 | 2.599 | 2.5 |
| 3.5 | 0.35 | 3.121 | 3.221 | 3.15 |
| 3.5 | 0.6 | 2.85 | 3.01 | 2.9 |
| 4 | 0.35 | 3.621 | 3.721 | 3.65 |
| 4 | 0.5 | 3.459 | 3.599 | 3.5 |
| 4 | 0.7 | 3.242 | 3.422 | 3.3 |
| 4.5 | 0.5 | 3.959 | 4.099 | 4 |
| 4.5 | 0.75 | 3.688 | 3.878 | 3.7 |
| 5 | 0.35 | 4.621 | 4.721 | 4.65 |
| 5 | 0.5 | 4.459 | 4.599 | 4.5 |
| 5 | 0.75 | 4.188 | 4.378 | 4.2 |
| 5 | 0.8 | 4.134 | 4.334 | 4.2 |

| D | | $D_1$ | | |
|---|---|---|---|---|
| 직 경 Diameter | 피 치 Pitch | min (mm) | max (mm) | 드릴 직경 Drill Dia.(mm) |
| 6 | 0.5 | 5.459 | 5.599 | 5.5 |
| 6 | 0.75 | 5.188 | 5.378 | 5.25 |
| 6 | 1 | 4.917 | 5.153 | 5 |
| 7 | 0.5 | 6.459 | 6.599 | 6.5 |
| 7 | 0.75 | 6.188 | 6.378 | 6.25 |
| 7 | 1 | 5.917 | 6.153 | 6 |
| 8 | 0.5 | 7.459 | 7.599 | 7.5 |
| 8 | 0.75 | 7.188 | 7.378 | 7.25 |
| 8 | 1 | 6.917 | 7.153 | 7 |
| 8 | 1.25 | 6.647 | 6.912 | 6.8 |
| 9 | 0.75 | 8.188 | 8.378 | 8.25 |
| 9 | 1 | 7.917 | 8.153 | 8 |
| 9 | 1.25 | 7.647 | 7.912 | 7.8 |
| 10 | 0.5 | 9.459 | 9.599 | 9.5 |
| 10 | 0.75 | 9.188 | 9.378 | 9.25 |
| 10 | 1 | 8.917 | 9.153 | 9 |
| 10 | 1.25 | 8.647 | 8.912 | 8.75 |
| 10 | 1.5 | 8.376 | 8.676 | 8.5 |
| 11 | 1 | 9.917 | 10.153 | 10 |
| 11 | 1.5 | 9.376 | 9.676 | 9.5 |
| 12 | 0.5 | 11.459 | 11.599 | 11.5 |
| 12 | 1 | 10.917 | 11.153 | 11 |
| 12 | 1.25 | 10.647 | 10.912 | 10.75 |
| 12 | 1.5 | 10.376 | 10.676 | 10.5 |
| 12 | 1.75 | 10.106 | 10.441 | 10.2 |
| 13 | 1 | 11.917 | 12.153 | 12 |
| 14 | 0.75 | 13.188 | 13.378 | 13.2 |
| 14 | 1 | 12.917 | 13.153 | 13 |
| 14 | 1.25 | 12.647 | 12.912 | 12.75 |
| 14 | 1.5 | 12.376 | 12.676 | 12.5 |

# 나사산 예비 가공 홀 직경 -탭가공 / 스레드 밀링

## M

미터법 ISO 미세 나사산
DIN 13 및 DIN ISO 965-1

| D | | $D_1$ | | |
|---|---|---|---|---|
| 직경 Diameter | 피치 Pitch | min (mm) | max (mm) | 드릴 직경 Drill Dia. (mm) |
| 14 | 2 | 11.835 | 12.21 | 12 |
| 15 | 1 | 13.917 | 14.153 | 14 |
| 15 | 1.5 | 13.376 | 13.676 | 13.5 |
| 16 | 0.75 | 15.188 | 15.378 | 15.2 |
| 16 | 1 | 14.917 | 15.153 | 15 |
| 16 | 1.25 | 14.647 | 14.912 | 14.8 |
| 16 | 1.5 | 14.376 | 14.676 | 14.5 |
| 16 | 2 | 13.835 | 14.21 | 14 |
| 17 | 1 | 15.917 | 16.153 | 16 |
| 18 | 1 | 16.917 | 17.153 | 17 |
| 18 | 1.5 | 16.376 | 16.676 | 16.5 |
| 18 | 2 | 15.835 | 16.21 | 16 |
| 18 | 2.5 | 15.294 | 15.744 | 15.5 |
| 20 | 1 | 18.917 | 19.153 | 19 |
| 20 | 1.5 | 18.376 | 18.676 | 18.5 |
| 20 | 2 | 17.835 | 18.21 | 18 |
| 20 | 2.5 | 17.294 | 17.744 | 17.5 |
| 22 | 1 | 20.917 | 21.153 | 21 |
| 22 | 1.5 | 20.376 | 20.676 | 20.5 |
| 22 | 2 | 19.835 | 20.21 | 20 |
| 22 | 2.5 | 19.294 | 19.744 | 19.5 |
| 24 | 1.5 | 22.376 | 22.676 | 22.5 |
| 24 | 2 | 21.835 | 22.21 | 22 |
| 24 | 3 | 20.752 | 21.252 | 21 |
| 25 | 1 | 22.917 | 23.153 | 23 |
| 25 | 1.5 | 23.376 | 23.676 | 23.5 |
| 26 | 1.5 | 24.376 | 24.676 | 24.5 |
| 27 | 1 | 25.917 | 26.153 | 26 |
| 27 | 1.5 | 25.376 | 25.676 | 25.5 |
| 27 | 2 | 24.835 | 25.21 | 25 |
| 27 | 3 | 23.752 | 24.252 | 24 |
| 28 | 1.5 | 26.376 | 26.676 | 26.5 |
| 28 | 2 | 25.835 | 26.21 | 26 |
| 30 | 1 | 28.917 | 29.153 | 29 |
| 30 | 1.5 | 28.376 | 28.676 | 28.5 |
| 30 | 2 | 27.835 | 28.21 | 28 |
| 30 | 3.5 | 26.211 | 26.771 | 26.5 |
| 32 | 1.5 | 30.376 | 30.676 | 30.5 |
| 32 | 2 | 29.835 | 30.21 | 30 |
| 33 | 1.5 | 31.376 | 31.676 | 31.5 |
| 33 | 2 | 30.835 | 31.21 | 31 |
| 33 | 3.5 | 29.211 | 29.771 | 29.5 |
| 34 | 1.5 | 32.376 | 32.676 | 32.5 |
| 35 | 1.5 | 33.376 | 33.676 | 33.5 |
| 36 | 1.5 | 34.376 | 34.676 | 34.5 |
| 36 | 2 | 33.835 | 34.21 | 34 |
| 36 | 3 | 32.752 | 33.252 | 33 |
| 36 | 4 | 31.67 | 32.27 | 32 |
| 38 | 1.5 | 36.376 | 36.676 | 36.5 |
| 39 | 1.5 | 37.376 | 37.676 | 37.5 |
| 39 | 2 | 36.835 | 37.21 | 37 |
| 39 | 3 | 35.752 | 36.252 | 36 |
| 39 | 4 | 34.67 | 35.27 | 35 |
| 40 | 1.5 | 38.376 | 38.676 | 38.5 |
| 40 | 2 | 37.835 | 38.21 | 38 |
| 40 | 3 | 36.752 | 37.252 | 37 |
| 42 | 1.5 | 40.376 | 40.676 | 40.5 |
| 42 | 2 | 39.835 | 40.21 | 40 |
| 42 | 3 | 38.752 | 37.252 | 39 |
| 42 | 4.5 | 37.129 | 37.799 | 37.5 |
| 45 | 1.5 | 43.376 | 40.676 | 43.5 |
| 45 | 2 | 42.835 | 40.21 | 43 |
| 45 | 3 | 41.752 | 42.252 | 42 |
| 45 | 4.5 | 40.129 | 40.799 | 40.5 |
| 48 | 1.5 | 46.376 | 46.676 | 46.5 |
| 48 | 2 | 45.835 | 46.21 | 46 |
| 48 | 3 | 44.752 | 45.252 | 45 |
| 48 | 5 | 42.587 | 43.297 | 43 |
| 50 | 1.5 | 48.376 | 48.676 | 48.5 |
| 50 | 2 | 47.835 | 48.21 | 48 |
| 50 | 3 | 46.752 | 47.252 | 47 |
| 52 | 1.5 | 50.376 | 50.676 | 50.5 |
| 52 | 2 | 49.835 | 50.21 | 50 |
| 52 | 3 | 46.587 | 47.087 | 49 |
| 52 | 5 | 46.587 | 47.297 | 47 |
| 56 | 1.5 | 54.376 | 54.676 | 54.5 |
| 56 | 2 | 53.835 | 54.21 | 54 |
| 56 | 3 | 52.752 | 53.252 | 53 |
| 56 | 5.5 | 50.046 | 50.796 | 50.5 |
| 58 | 1.5 | 56.376 | 56.676 | 56.5 |
| 60 | 1.5 | 58.376 | 58.676 | 58.5 |
| 60 | 2 | 57.835 | 58.21 | 58 |
| 60 | 3 | 56.752 | 57.252 | 57 |
| 60 | 5.5 | 54.046 | 54.796 | 54.5 |
| 64 | 6 | 57.505 | 58.305 | 58 |
| 68 | 6 | 62.505 | 62.305 | 62 |

## UNC

ASME B1.1에 따른
보통 나사산

| D | $D_1$ | | |
|---|---|---|---|
| 직경 Diameter | min (mm) | max (mm) | 드릴 직경 Drill Dia. (mm) |
| 1-64 UNC | 1.425 | 1.582 | 1.55 |
| 2-56 UNC | 1.694 | 1.872 | 1.85 |
| 3-48 UNC | 1.941 | 2.146 | 2.10 |
| 4-40 UNC | 2.156 | 2.385 | 2.35 |
| 5-40 UNC | 2.487 | 2.697 | 2.65 |
| 6-32 UNC | 2.642 | 2.896 | 2.85 |
| 8-32 UNC | 3.302 | 3.531 | 3.50 |
| 10-24 UNC | 3.683 | 3.962 | 3.90 |
| 12-24 UNC | 4.343 | 4.597 | 4.50 |
| 1/4-20 UNC | 4.976 | 5.268 | 5.10 |
| 5/16-18 UNC | 6.411 | 6.734 | 6.60 |
| 3/8-16 UNC | 7.805 | 8.164 | 8.00 |
| 7/16-14 UNC | 9.149 | 9.550 | 9.40 |
| 1/2-13 UNC | 10.584 | 11.013 | 10.80 |
| 9/16-12 UNC | 11.996 | 12.456 | 12.20 |
| 5/8-11 UNC | 13.376 | 13.868 | 13.50 |
| 3/4-10 UNC | 16.299 | 16.833 | 16.50 |
| 7/8-9 UNC | 19.169 | 19.748 | 19.50 |
| 1-8 UNC | 21.963 | 22.598 | 22.25 |
| 1 1/8-7 UNC | 24.648 | 25.348 | 25.00 |
| 1 1/4-7 UNC | 27.823 | 28.524 | 28.00 |
| 1 1/2-6 UNC | 33.518 | 34.295 | 34.00 |
| 1 3/4-5 UNC | 38.951 | 39.814 | 39.50 |
| 2-4,5 UNC | 44.689 | 45.598 | 45.00 |

# 나사산 예비 가공 홀 직경 - 탭가공 / 스레드 밀링

## UNF
ASME B1.1에 따른
미세 나사산

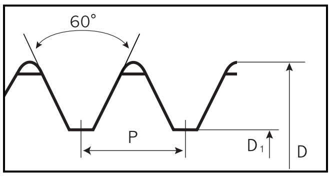
| D | $D_1$ | | |
|---|---|---|---|
| 직경 Diameter | min (mm) | max (mm) | 드릴 직경 Drill Dia. (mm) |
| 0-80 UNF | 1.181 | 1.306 | 1.25 |
| 1-72 UNF | 1.473 | 1.613 | 1.55 |
| 2-64 UNF | 1.755 | 1.913 | 1.85 |
| 3-56 UNF | 2.024 | 2.197 | 2.15 |
| 4-48 UNF | 2.271 | 2.459 | 2.40 |
| 5-44 UNF | 2.550 | 2.741 | 2.70 |
| 6-40 UNF | 2.819 | 3.023 | 2.95 |
| 8-36 UNF | 3.404 | 3.607 | 3.50 |
| 10-32 UNF | 3.962 | 4.166 | 4.10 |
| 12-28 UNF | 4.496 | 4.724 | 4.60 |
| 1/4-28 UNF | 5.367 | 5.580 | 5.50 |
| 5/16-24 UNF | 6.792 | 7.038 | 6.90 |
| 3/8-24 UNF | 8.379 | 8.626 | 8.50 |
| 7/16-20 UNF | 9.738 | 10.030 | 9.90 |
| 1/2-20 UNF | 11.326 | 11.618 | 11.50 |
| 9/16-18 UNF | 12.761 | 13.084 | 12.90 |
| 5/8-18 UNF | 14.348 | 14.671 | 14.50 |
| 3/4-16 UNF | 17.330 | 17.689 | 17.50 |
| 7/8-14 UNF | 20.262 | 20.663 | 20.40 |
| 1-12 UNF | 23.109 | 23.569 | 23.25 |
| 1 1/8-12 UNF | 26.284 | 26.744 | 26.50 |
| 1 1/4-12 UNF | 29.459 | 29.919 | 29.50 |
| 1 3/8-12 UNF | 32.634 | 33.094 | 33.00 |
| 1 1/2-12 UNF | 35.809 | 36.269 | 36.10 |

## UNEF

| D | $D_1$ | | |
|---|---|---|---|
| 직경 Diameter | min (mm) | max (mm) | 드릴 직경 Drill Dia. (mm) |
| No.12-32 UNEF | 4.826 | 4.623 | 4.70 |
| 1/4-32 UNEF | 5.689 | 5.487 | 5.60 |
| 5/16-32 | 7.264 | 7.087 | 7.10 |
| 3/8-32 | 8.864 | 8.662 | 8.70 |
| 7/16-28 | 10.337 | 10.135 | 10.20 |
| 1/2-28 | 11.938 | 11.710 | 11.80 |
| 9/16-24 | 13.385 | 13.132 | 13.20 |
| 5/8-24 | 14.986 | 14.732 | 14.80 |
| 3/4-20 | 17.957 | 17.679 | 17.80 |
| 7/8-20 | 21.132 | 20.854 | 21.00 |
| 1-20 | 24.307 | 24.029 | 24.10 |
| 1 1/8-18 | 27.381 | 27.051 | 27.20 |
| 1 1/4-18 | 30.556 | 30.226 | 30.30 |
| 1 3/8-18 | 33.731 | 33.401 | 33.50 |
| 1 1/2-18 | 36.906 | 36.576 | 36.70 |
| 1 5/8-18 | 40.081 | 39.751 | 39.80 |

## MJ
DIN ISO 5855에 따른
표준 나사산

| D | | $D_1$ | | |
|---|---|---|---|---|
| 직경 Diameter | 피치 Pitch | min (mm) | max (mm) | 드릴 직경 Drill Dia. (mm) |
| MJ3 | 0.5 | 2.513 | 2.653 | 2.6 |
| MJ4 | 0.7 | 3.318 | 3.498 | 3.4 |
| MJ5 | 0.8 | 4.221 | 4.421 | 4.3 |
| MJ6 | 1 | 5.026 | 5.215 | 5.1 |
| MJ8 | 1.25 | 6.782 | 6.994 | 6.9 |
| MJ10 | 1.5 | 8.539 | 8.779 | 8.7 |
| MJ12 | 1.75 | 10.295 | 10.563 | 10.5 |
| MJ16 | 2 | 14.051 | 14.351 | 14.3 |



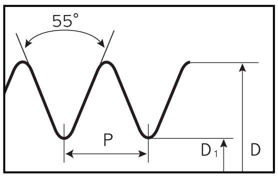

**MJ, UNJC, UNJF 도면**

## UNJC
ASME B1.15 및 ISO 3161에 따른
보통 나사산

| D | $D_1$ | | |
|---|---|---|---|
| 직경 Diameter | min (mm) | max (mm) | 드릴 직경 Drill Dia. (mm) |
| 1-64 UNJC | 1.467 | 1.570 | 1.50 |
| 2-56 UNJC | 1.742 | 1.860 | 1.80 |
| 3-48 UNJC | 1.999 | 2.137 | 2.05 |
| 4-40 UNJC | 2.226 | 2.391 | 2.30 |
| 5-40 UNJC | 2.556 | 2.721 | 2.65 |
| 6-32 UNJC | 2.732 | 2.938 | 2.80 |
| 8-32 UNJC | 3.393 | 3.599 | 3.50 |
| 10-24 UNJC | 3.795 | 4.064 | 3.90 |
| 12-24 UNJC | 4.455 | 4.704 | 4.60 |
| 1/4-20 UNJC | 5.113 | 5.387 | 5.20 |
| 5/16-18 UNJC | 6.563 | 6.833 | 6.70 |
| 3/8-16 UNJC | 7.978 | 8.255 | 8.10 |
| 7/16-14 UNJC | 9.344 | 9.637 | 9.50 |
| 1/2-13 UNJC | 10.796 | 11.093 | 10.90 |
| 9/16-12 UNJC | 12.226 | 12.480 | 12.30 |
| 5/8-11 UNJC | 13.625 | 13.902 | 13.70 |
| 3/4-10 UNJC | 16.575 | 16.880 | 16.75 |

## UNJF
ASME B1.15 및 ISO 3161에 따른
미세 나사산

| D | $D_1$ | | |
|---|---|---|---|
| 직경 Diameter | min (mm) | max (mm) | 드릴 직경 Drill Dia. (mm) |
| 0-80 UNJF | 1.215 | 1.297 | 1.25 |
| 1-72 UNJF | 1.510 | 1.602 | 1.55 |
| 2-64 UNJF | 1.797 | 1.900 | 1.85 |
| 3-56 UNJF | 2.073 | 2.191 | 2.10 |
| 4-48 UNJF | 2.329 | 2.467 | 2.40 |
| 5-44 UNJF | 2.613 | 2.763 | 2.70 |
| 6-40 UNJF | 2.886 | 3.051 | 2.95 |
| 8-36 UNJF | 3.479 | 3.662 | 3.60 |
| 10-32 UNJF | 4.053 | 4.253 | 4.15 |
| 12-28 UNJF | 4.602 | 4.815 | 4.70 |
| 1/4-28 UNJF | 5.466 | 5.662 | 5.60 |
| 5/16-24 UNJF | 6.907 | 7.110 | 7.00 |
| 3/8-24 UNJF | 8.494 | 8.680 | 8.60 |
| 7/16-20 UNJF | 9.875 | 10.083 | 10.00 |
| 1/2-20 UNJF | 11.463 | 11.660 | 11.50 |
| 9/16-18 UNJF | 12.913 | 13.123 | 13.00 |
| 5/8-18 UNJF | 14.500 | 14.702 | 14.50 |




## PF(G), PS(Rp), BSW

## PF(G)

DIN EN ISO 228에 따른 관용 나사산

| D | $D_1$ | | |
|---|---|---|---|
| 직 경 Diameter | min (mm) | max (mm) | 드릴 직경 Drill Dia. (mm) |
| PF(G) 1/16-28 | 6.561 | 6.843 | 6.80 |
| PF(G) 1/8-28 | 8.566 | 8.848 | 8.80 |
| PF(G) 1/4-19 | 11.445 | 11.890 | 11.80 |
| PF(G) 3/8-19 | 14.950 | 15.395 | 15.25 |
| PF(G) 1/2-14 | 18.632 | 19.173 | 19.00 |
| PF(G) 5/8-14 | 20.588 | 21.129 | 21.00 |
| PF(G) 3/4-14 | 24.118 | 24.659 | 24.50 |
| PF(G) 7/8-14 | 27.878 | 28.419 | 28.25 |
| PF(G) 1-11 | 30.292 | 30.932 | 30.75 |
| PF(G) 1 1/8-11 | 34.940 | 35.580 | 35.50 |
| PF(G) 1 1/4-11 | 38.953 | 39.593 | 39.50 |
| PF(G) 1 3/8-11 | 41.366 | 42.006 | 41.90 |
| PF(G) 1 1/2-11 | 44.846 | 45.486 | 45.25 |
| PF(G) 1 3/4-11 | 50.789 | 51.429 | 51.00 |
| PF(G) 2-11 | 56.657 | 57.297 | 57.00 |
| PF(G) 2 1/4-11 | 62.753 | 63.393 | 63.00 |
| PF(G) 2 1/2-11 | 72.227 | 72.867 | 72.60 |
| PF(G) 3-11 | 84.927 | 85.567 | 85.00 |

## BSW

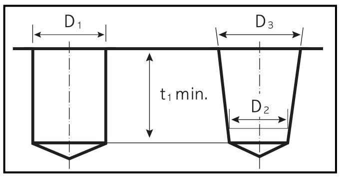
BS 84에 따른 Whitworth 나사산

| D | $D_1$ | | |
|---|---|---|---|
| 직 경 Diameter | min (mm) | max (mm) | 드릴 직경 Drill Dia. (mm) |
| 1/16-60 | 1.045 | 1.231 | 1.2 |
| 3/32-48 | 1.703 | 1.911 | 1.9 |
| 1/8-40 | 2.362 | 2.59 | 2.5 |
| 5/32-32 | 2.952 | 3.213 | 3.1 |
| 3/16-24 | 3.407 | 3.745 | 3.6 |
| 7/32-24 | 4.201 | 4.539 | 4.5 |
| 1/4-20 | 4.724 | 5.155 | 5 |
| 5/16-18 | 6.131 | 6.591 | 6.5 |
| 3/8-16 | 7.493 | 7.988 | 7.9 |
| 7/16-14 | 8.79 | 9.33 | 9.2 |
| 1/2-12 | 9.989 | 10.59 | 10.5 |
| 9/16-12 | 11.577 | 12.178 | 12 |
| 5/8-11 | 12.919 | 13.558 | 13.4 |
| 3/4-10 | 15.798 | 16.484 | 16.4 |
| 7/8-9 | 18.612 | 19.354 | 19.25 |
| 1-8 | 21.335 | 22.148 | 22 |
| 1 1/8-7 | 23.929 | 24.833 | 24.75 |
| 1 1/4-7 | 27.104 | 28.008 | 27.5 |
| 1 3/8-6 | 29.505 | 30.529 | 30 |
| 1 1/2-6 | 32.68 | 33.704 | 33.5 |
| 1 5/8-5 | 34.771 | 35.965 | 35.5 |
| 1 3/4-5 | 37.946 | 39.14 | 39 |
| 1 7/8-4.5 | 40.398 | 41.705 | 41.5 |
| 2-4 1/2 | 43.573 | 44.88 | 44.5 |
| 2 1/4-4 | 49.02 | 50.468 | 50 |
| 2 1/2-4 | 55.37 | 56.818 | 56 |

## PS(Rp)

DIN EN10226-1에 따른 Whitworth 관용 나사산

| D | $D_1$ | | |
|---|---|---|---|
| 직 경 Diameter | min (mm) | max (mm) | 드릴 직경 Drill Dia. (mm) |
| PS(Rp) 1/16-28 | 6.490 | 6.632 | 6.55 |
| PS(Rp) 1/8-28 | 8.495 | 8.637 | 8.60 |
| PS(Rp) 1/4-19 | 11.341 | 11.549 | 11.50 |
| PS(Rp) 3/8-19 | 14.846 | 15.054 | 15.00 |
| PS(Rp) 1/2-14 | 18.490 | 18.774 | 18.50 |
| PS(Rp) 5/8-14 | 20.446 | 20.73 | 20.50 |
| PS(Rp) 3/4-14 | 23.976 | 24.26 | 24.00 |
| PS(Rp) 1-11 | 30.112 | 30.472 | 30.25 |
| PS(Rp) 1 1/4-11 | 38.773 | 39.133 | 39.00 |
| PS(Rp) 1 1/2-11 | 44.629 | 45.063 | 45.00 |
| PS(Rp) 2-11 | 56.440 | 56.874 | 56.50 |
| PS(Rp) 2 1/2-11 | 72.010 | 72.444 | 72.20 |
| PS(Rp) 3-11 | 84.710 | 85.144 | 85.00 |




## NPT, NPTF 도면

## NPT

ASME B1.20.1에 따른 관용 표준 나사산, 테이퍼 1:16

| D | | | | |
|---|---|---|---|---|
| 직 경 Diameter | $D_1$ | $D_2$ | $D_3$ | $T_1$ |
| 1/16-27 NPT | 6.150 | 5.950 | 6.39 | 10.7 |
| 1/8-27 NPT | 8.400 | 8.310 | 8.74 | 10.8 |
| 1/4-18 NPT | 11.100 | 10.730 | 11.36 | 15.6 |
| 3/8-18 NPT | 14.300 | 14.150 | 14.80 | 16.0 |
| 1/2-14 NPT | 17.900 | 17.470 | 18.32 | 20.8 |
| 3/4-14 NPT | 23.300 | 22.790 | 23.67 | 21.3 |
| 1-11 ½ NPT | 29.000 | 28.640 | 29.69 | 25.6 |
| 1 1/4-11 ½ NPT | 37.700 | 3.370 | 38.45 | 26.1 |
| 1 1/2-11 ½ NPT | 43.700 | 43.440 | 44.52 | 26.1 |
| 2-11 ½ NPT | 55.600 | 55.450 | 56.56 | 26.5 |
| 2 1/2-8 NPT | 66.300 | 66.140 | 67.62 | 36.3 |
| 3-8 NPT | 82.300 | 81.900 | 83.52 | 38.5 |

## NPTF

ASME B1.20.3에 따른 미국 관용 표준 나사산, 테이퍼 1:16

| D | | | | |
|---|---|---|---|---|
| 직 경 Diameter | $D_1$ | $D_2$ | $D_3$ | $T_1$ |
| 1/16-27 NPTF | 6.1 | 5.97 | 6.41 | 10.3 |
| 1/8-27 NPTF | 8.4 | 8.33 | 8.77 | 10.3 |
| 1/4-18 NPTF | 11.0 | 10.77 | 11.40 | 15.0 |
| 3/8-18 NPTF | 14.5 | 14.19 | 14.84 | 15.3 |
| 1/2-14 NPTF | 17.5 | 17.48 | 18.33 | 19.9 |
| 3/4-14 NPTF | 23.0 | 22.84 | 23.72 | 20.4 |
| 1-11 1/2 NPTF | 29.0 | 28.62 | 29.76 | 24.5 |
| 1 1/4-11 ½ NPTF | 37.5 | 37.44 | 38.52 | 25.0 |
| 1 1/2-11 ½ NPTF | 43.5 | 43.50 | 44.59 | 25.0 |
| 2-11 ½ NPTF | 56.0 | 55.51 | 56.62 | 25.4 |
| 2 1/2-8 NPTF | 66.0 | 66.03 | 67.71 | 38.0 |
| 3-8 NPTF | 82.0 | 81.80 | 83.62 | 40.0 |

# 나사직경 규격안내

헬리코일 타입 사용을 위한 나사의 직경 Thread diameter to use heli coil type.

## 유니파이 계열 나사직경(와이어 프레임)_UNC

| SIZE | T.P.I | B inch MAJ DIA | mm 환산시 |
|---|---|---|---|
| NO. 2 | 56 | 0.1092 | 2.7737 |
| NO. 3 | 48 | 0.1261 | 3.2029 |
| NO. 4 | 40 | 0.1445 | 3.6703 |
| NO. 5 | 40 | 0.1575 | 4.0005 |
| NO. 6 | 32 | 0.1786 | 4.5364 |
| NO. 8 | 32 | 0.2046 | 5.1968 |
| NO. 10 | 24 | 0.2441 | 6.2001 |
| NO. 12 | 24 | 0.2701 | 6.8605 |
| 1/4 | 20 | 0.315 | 8.001 |
| 5/16 | 18 | 0.3847 | 9.7714 |
| 3/8 | 16 | 0.4562 | 11.5875 |
| 7/16 | 14 | 0.5303 | 13.4696 |
| 1/2 | 13 | 0.5999 | 15.2375 |
| 9/16 | 12 | 0.6708 | 17.0383 |
| 5/8 | 11 | 0.7431 | 18.8747 |
| 3/4 | 10 | 0.8799 | 22.3495 |
| 7/8 | 9 | 1.0193 | 25.8902 |
| 1 | 8 | 1.1624 | 29.525 |
| 11/8 | 7 | 1.3106 | 33.2892 |
| 11/4 | 7 | 1.4356 | 36.4642 |
| 13/8 | 6 | 1.5914 | 40.4216 |
| 11/2 | 6 | 1.7164 | 43.5966 |

## 유니파이 계열 나사직경(와이어 프레임)_UNF

| SIZE | T.P.I | B inch MAJ DIA | mm 환산시 |
|---|---|---|---|
| NO. 3 | 56 | 0.1092 | 2.7737 |
| NO. 4 | 48 | 0.1261 | 3.2029 |
| NO. 5 | 44 | 0.1445 | 3.6703 |
| NO. 6 | 40 | 0.1575 | 4.0005 |
| NO. 8 | 36 | 0.1786 | 4.5364 |
| NO.10 | 32 | 0.2046 | 5.1968 |
| 1/4 | 28 | 0.2441 | 6.2001 |
| 5/16 | 24 | 0.2701 | 6.8605 |
| 3/8 | 24 | 0.315 | 8.001 |
| 7/16 | 20 | 0.3847 | 9.7714 |
| 1/2 | 20 | 0.4562 | 11.5875 |
| 9/16 | 18 | 0.5303 | 13.4696 |
| 5/8 | 18 | 0.5999 | 15.2375 |
| 3/4 | 16 | 0.6708 | 17.0383 |
| 7/8 | 14 | 0.7431 | 18.8747 |
| 1 | 12 | 0.8799 | 22.3495 |
| 1 ⅛ | 12 | 1.0193 | 25.8902 |
| 1 ¼ | 12 | 1.1624 | 29.525 |
| 1 ⅜ | 12 | 1.3106 | 33.2892 |
| 1 ½ | 12 | 1.4356 | 36.4642 |
| | | | |
| | | | |

## 밀리미터(mm) 계열 나사직경(와이어 프레임)

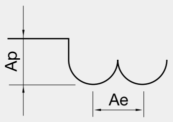
| SIZE | C MM |
|---|---|
| M2 x 0.4 | 2.520 |
| M2.2 x 0.45 | 2.785 |
| M2.5 x 0.45 | 3.085 |
| M3 x 0.5 | 3.650 |
| M3.5 x 0.6 | 4.279 |
| M4 x 0.7 | 4.909 |
| M5 x 0.8 | 6.039 |
| M6 x 1.0 | 7.299 |
| M7 x 1.0 | 8.299 |
| M8 x 1.0 | 9.299 |
| M8 x 1.25 | 9.624 |
| M9 x 1.25 | 10.624 |
| M10 x 1.25 | 11.624 |
| M10 x 1.5 | 11.949 |
| M11 x 1.5 | 12.949 |
| M12 x 1.25 | 13.624 |
| M12 x 1.5 | 14.131 |
| M12 x 1.75 | 14.273 |
| M14 x 1.5 | 15.949 |
| M14 x 2.0 | 16.598 |
| M16 x 1.5 | 17.949 |
| M16 x 2.0 | 18.598 |
| M18 x 1.5 | 19.949 |
| M18 x 2.0 | 20.598 |
| M18 x 2.5 | 21.248 |
| M20 x 1.5 | 21.949 |
| M20 x 2.0 | 22.598 |
| M20 x 2.5 | 23.248 |
| M22 x 1.5 | 23.949 |
| M22 x 2.0 | 24.598 |
| M22 x 2.5 | 25.248 |
| M24 x 2.0 | 26.598 |
| M24 x 3.0 | 27.897 |
| M27 x 3.0 | 30.897 |
| M30 x 3.5 | 34.547 |
| M33 x 3.5 | 37.547 |
| M36 x 4.0 | 41.196 |

# 2BCBN/2SBCBN Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | |
| 반경 Radius | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 0.1 | 0.2 | 50,000 | 326 | 0.005 | 0.005 | 50,000 | 216 | 0.004 | 0.004 | 50,000 | 120 | 0.003 | 0.003 |
| 〃 | 0.5 | 50,000 | 308 | 0.004 | 0.004 | 50,000 | 198 | 0.003 | 0.003 | 50,000 | 110 | 0.002 | 0.003 |
| R 0.15 | 0.3 | 50,000 | 800 | 0.006 | 0.010 | 50,000 | 520 | 0.004 | 0.005 | 50,000 | 410 | 0.003 | 0.005 |
| 〃 | 0.5 | 50,000 | 720 | 0.006 | 0.010 | 50,000 | 450 | 0.003 | 0.005 | 50,000 | 390 | 0.003 | 0.005 |
| 〃 | 1 | 50,000 | 650 | 0.006 | 0.010 | 50,000 | 410 | 0.003 | 0.005 | 50,000 | 350 | 0.003 | 0.004 |
| R 0.2 | 0.3 | 50,000 | 1,120 | 0.010 | 0.010 | 50,000 | 750 | 0.005 | 0.006 | 50,000 | 650 | 0.005 | 0.005 |
| 〃 | 1 | 50,000 | 1,050 | 0.010 | 0.010 | 50,000 | 710 | 0.005 | 0.005 | 50,000 | 600 | 0.005 | 0.005 |
| 〃 | 3 | 50,000 | 540 | 0.005 | 0.005 | 50,000 | 360 | 0.003 | 0.003 | 50,000 | 310 | 0.002 | 0.003 |
| R 0.25 | 0.4 | 50,000 | 1,420 | 0.010 | 0.020 | 50,000 | 1,210 | 0.005 | 0.010 | 50,000 | 1,030 | 0.005 | 0.010 |
| 〃 | 1 | 50,000 | 1,290 | 0.010 | 0.015 | 50,000 | 1,100 | 0.005 | 0.010 | 50,000 | 980 | 0.005 | 0.010 |
| 〃 | 3 | 50,000 | 1,090 | 0.010 | 0.015 | 50,000 | 850 | 0.005 | 0.010 | 50,000 | 730 | 0.005 | 0.010 |
| R 0.3 | 0.5 | 50,000 | 2,300 | 0.020 | 0.020 | 50,000 | 1,890 | 0.015 | 0.015 | 50,000 | 1,520 | 0.010 | 0.010 |
| 〃 | 1 | 50,000 | 2,180 | 0.020 | 0.020 | 50,000 | 1,760 | 0.010 | 0.010 | 50,000 | 1,490 | 0.010 | 0.010 |
| 〃 | 3 | 40,000 | 1,300 | 0.015 | 0.020 | 40,000 | 1,060 | 0.010 | 0.010 | 40,000 | 870 | 0.010 | 0.010 |
| 〃 | 5 | 30,000 | 650 | 0.015 | 0.015 | 30,000 | 590 | 0.010 | 0.010 | 30,000 | 390 | 0.005 | 0.005 |
| R 0.4 | 0.6 | 50,000 | 2,600 | 0.020 | 0.030 | 50,000 | 1,980 | 0.020 | 0.020 | 50,000 | 1,720 | 0.010 | 0.020 |
| 〃 | 2 | 40,000 | 2,100 | 0.015 | 0.020 | 40,000 | 1,450 | 0.015 | 0.015 | 40,000 | 1,210 | 0.010 | 0.010 |
| 〃 | 4 | 30,000 | 1,540 | 0.015 | 0.015 | 30,000 | 940 | 0.010 | 0.015 | 30,000 | 840 | 0.010 | 0.010 |
| 〃 | 8 | 24,000 | 970 | 0.010 | 0.010 | 24,000 | 650 | 0.005 | 0.010 | 24,000 | 470 | 0.005 | 0.005 |
| R 0.5 | 1.5 | 40,000 | 2,560 | 0.030 | 0.040 | 40,000 | 1,980 | 0.020 | 0.030 | 40,000 | 1,590 | 0.020 | 0.020 |
| 〃 | 3 | 30,000 | 2,100 | 0.030 | 0.030 | 30,000 | 1,650 | 0.020 | 0.030 | 30,000 | 1,240 | 0.020 | 0.020 |
| 〃 | 5 | 30,000 | 1,700 | 0.030 | 0.030 | 30,000 | 1,360 | 0.015 | 0.020 | 30,000 | 1,080 | 0.010 | 0.015 |
| 〃 | 10 | 25,000 | 780 | 0.015 | 0.015 | 25,000 | 620 | 0.010 | 0.015 | 16,000 | 500 | 0.010 | 0.010 |
| R 0.75 | 2 | 40,000 | 2,300 | 0.040 | 0.040 | 40,000 | 1,920 | 0.030 | 0.030 | 40,000 | 1,530 | 0.020 | 0.030 |
| 〃 | 4 | 30,000 | 2,010 | 0.030 | 0.030 | 30,000 | 1,600 | 0.025 | 0.025 | 30,000 | 1,280 | 0.020 | 0.020 |
| 〃 | 8 | 30,000 | 1,700 | 0.030 | 0.030 | 30,000 | 1,360 | 0.020 | 0.020 | 30,000 | 1,080 | 0.010 | 0.010 |
| R 1 | 2 | 40,000 | 3,310 | 0.050 | 0.050 | 40,000 | 2,640 | 0.040 | 0.040 | 40,000 | 2,110 | 0.030 | 0.040 |
| 〃 | 6 | 40,000 | 3,020 | 0.030 | 0.040 | 40,000 | 2,410 | 0.030 | 0.030 | 40,000 | 1,930 | 0.020 | 0.030 |
| 〃 | 10 | 24,000 | 1,210 | 0.020 | 0.030 | 24,000 | 970 | 0.010 | 0.030 | 24,000 | 770 | 0.010 | 0.020 |
| 〃 | 14 | 16,000 | 920 | 0.010 | 0.020 | 16,000 | 780 | 0.010 | 0.010 | 16,000 | 630 | 0.010 | 0.010 |
| R 1.5 | 3 | 40,000 | 2,500 | 0.030 | 0.040 | 40,000 | 2,000 | 0.030 | 0.030 | 40,000 | 1,600 | 0.020 | 0.030 |
| 〃 | 6 | 32,000 | 2,100 | 0.030 | 0.030 | 32,000 | 1,680 | 0.020 | 0.030 | 32,000 | 1,340 | 0.020 | 0.030 |
| 〃 | 10 | 21,000 | 1,700 | 0.020 | 0.030 | 21,000 | 1,360 | 0.020 | 0.020 | 21,000 | 1,080 | 0.010 | 0.020 |
| 〃 | 16 | 16,000 | 1,100 | 0.020 | 0.030 | 16,000 | 880 | 0.010 | 0.020 | 16,000 | 700 | 0.010 | 0.010 |
| R 2 | 4 | 40,000 | 2,100 | 0.030 | 0.040 | 40,000 | 1,680 | 0.030 | 0.030 | 40,000 | 1,340 | 0.020 | 0.030 |
| 〃 | 10 | 21,000 | 1,620 | 0.020 | 0.030 | 21,000 | 1,290 | 0.020 | 0.020 | 21,000 | 1,030 | 0.010 | 0.020 |
| 〃 | 16 | 16,000 | 1,060 | 0.010 | 0.020 | 16,000 | 840 | 0.010 | 0.020 | 16,000 | 670 | 0.010 | 0.010 |
| R 3 | | 16,000~ 50,000 | 960~ 3,000 | 0.050 | 0.060 | 13,000~ 50,000 | 780~ 2,000 | 0.050 | 0.060 | 11,000~ 50,000 | 540~ 1,500 | 0.050 | 0.060 |

**절입량**
Depth of Cut




Ap : Axial Depth 축 방향의 절입 깊이(mm)
Ae : Radial Depth 반경 방향의 절입 깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전 속도 ($min^{-1}$)
Vf : Feed 이송 속도 (mm/min)

- HRC68 이상 고경도강 가공 시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실제 가공시에는 가공 형상, 가공 목적, 적용 기계 등에 따라 조건을 조정 하십시오.
- 절삭조건이 없는 유효장은 비슷한 유효장에 비례하여 사용 하십시오.
- 길이가 긴 엔드밀의 경우 떨림, 이상음이 발생할 경우에는 상기표의 회전속도와 이송속도를 같은 비율로 내려서 사용해 주십시오.

- In case machining Hardened steel HRC upper 68, reduce 20% of cutting parameter on the table.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If there is no effective length of your endmill on the table, use a similar type of effective length and apply the same proportion.
- In case of long length endmill shaking or abnormal sound, lower the rotation speed and feed speed of the table above by the same ratio.

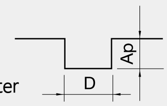
# 2ECBN Cutting Condition

• RPM : rev./min • Feed : mm/min

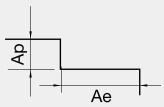
| 피삭재 Material | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | |
| 외경 Outside Diameter | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.2 | 0.2 | 50,000 | 211 | 0.005 | 0.005 | 50,000 | 140 | 0.004 | 0.004 | 50,000 | 78 | 0.003 | 0.003 |
| 〃 | 0.5 | 50,000 | 200 | 0.004 | 0.004 | 50,000 | 130 | 0.003 | 0.003 | 50,000 | 71 | 0.002 | 0.003 |
| ø 0.3 | 0.3 | 50,000 | 520 | 0.006 | 0.010 | 50,000 | 290 | 0.004 | 0.005 | 50,000 | 260 | 0.003 | 0.005 |
| 〃 | 0.5 | 50,000 | 460 | 0.006 | 0.010 | 50,000 | 270 | 0.003 | 0.005 | 50,000 | 250 | 0.003 | 0.005 |
| 〃 | 1 | 50,000 | 422 | 0.006 | 0.010 | 50,000 | 260 | 0.003 | 0.005 | 50,000 | 220 | 0.003 | 0.004 |
| ø 0.4 | 0.3 | 50,000 | 840 | 0.010 | 0.010 | 50,000 | 490 | 0.005 | 0.006 | 50,000 | 430 | 0.005 | 0.005 |
| 〃 | 1 | 50,000 | 690 | 0.010 | 0.010 | 50,000 | 470 | 0.005 | 0.005 | 50,000 | 420 | 0.005 | 0.005 |
| 〃 | 2 | 50,000 | 370 | 0.005 | 0.005 | 50,000 | 240 | 0.003 | 0.003 | 50,000 | 209 | 0.002 | 0.003 |
| ø 0.5 | 0.4 | 50,000 | 940 | 0.010 | 0.020 | 50,000 | 810 | 0.005 | 0.010 | 50,000 | 732 | 0.005 | 0.010 |
| 〃 | 1 | 50,000 | 850 | 0.010 | 0.015 | 50,000 | 560 | 0.005 | 0.010 | 50,000 | 523 | 0.005 | 0.010 |
| 〃 | 3 | 50,000 | 560 | 0.010 | 0.015 | 50,000 | 530 | 0.005 | 0.010 | 50,000 | 504 | 0.005 | 0.010 |
| ø 0.8 | 0.6 | 50,000 | 1,530 | 0.020 | 0.020 | 50,000 | 1,254 | 0.015 | 0.015 | 50,000 | 1,083 | 0.010 | 0.010 |
| 〃 | 2 | 50,000 | 1,440 | 0.020 | 0.020 | 50,000 | 1,169 | 0.010 | 0.010 | 50,000 | 1,064 | 0.010 | 0.010 |
| 〃 | 4 | 40,000 | 860 | 0.015 | 0.020 | 40,000 | 703 | 0.010 | 0.010 | 40,000 | 620 | 0.010 | 0.010 |
| 〃 | 6 | 30,000 | 440 | 0.015 | 0.015 | 30,000 | 390 | 0.010 | 0.010 | 30,000 | 280 | 0.005 | 0.005 |
| ø 1 | 0.7 | 50,000 | 1,730 | 0.020 | 0.030 | 50,000 | 1,311 | 0.020 | 0.020 | 50,000 | 1,230 | 0.010 | 0.020 |
| 〃 | 2 | 40,000 | 1,390 | 0.015 | 0.020 | 40,000 | 960 | 0.015 | 0.015 | 40,000 | 870 | 0.010 | 0.010 |
| 〃 | 4 | 30,000 | 1,030 | 0.015 | 0.015 | 30,000 | 620 | 0.010 | 0.015 | 30,000 | 600 | 0.010 | 0.010 |
| 〃 | 8 | 24,000 | 650 | 0.010 | 0.010 | 24,000 | 440 | 0.005 | 0.010 | 24,000 | 340 | 0.005 | 0.005 |
| ø 1.5 | 0.8 | 40,000 | 1,700 | 0.030 | 0.040 | 40,000 | 1,090 | 0.020 | 0.030 | 40,000 | 1,130 | 0.020 | 0.020 |
| 〃 | 2 | 30,000 | 1,400 | 0.030 | 0.030 | 30,000 | 1,100 | 0.020 | 0.030 | 30,000 | 880 | 0.020 | 0.020 |
| 〃 | 4 | 30,000 | 1,130 | 0.030 | 0.030 | 30,000 | 900 | 0.015 | 0.020 | 30,000 | 770 | 0.010 | 0.015 |
| 〃 | 8 | 16,000 | 520 | 0.015 | 0.015 | 16,000 | 410 | 0.010 | 0.015 | 16,000 | 350 | 0.010 | 0.010 |
| ø 2 | 2 | 40,000 | 1,530 | 0.040 | 0.040 | 40,000 | 1,270 | 0.030 | 0.030 | 40,000 | 1,090 | 0.020 | 0.030 |
| 〃 | 4 | 30,000 | 1,330 | 0.030 | 0.030 | 30,000 | 1,060 | 0.025 | 0.025 | 30,000 | 910 | 0.020 | 0.020 |
| 〃 | 8 | 26,000 | 1,130 | 0.030 | 0.030 | 26,000 | 900 | 0.020 | 0.025 | 26,000 | 770 | 0.010 | 0.010 |
| ø 2.5 | 1.2 | 40,000 | 2,200 | 0.050 | 0.050 | 40,000 | 1,760 | 0.040 | 0.040 | 40,000 | 1,500 | 0.030 | 0.040 |
| 〃 | 4 | 40,000 | 1,540 | 0.030 | 0.040 | 40,000 | 1,240 | 0.030 | 0.030 | 40,000 | 1,150 | 0.020 | 0.030 |
| 〃 | 10 | 24,000 | 810 | 0.020 | 0.030 | 24,000 | 650 | 0.010 | 0.030 | 24,000 | 260 | 0.010 | 0.020 |
| ø 3 | 6 | 40,000 | 1,400 | 0.030 | 0.030 | 40,000 | 1,120 | 0.020 | 0.030 | 40,000 | 960 | 0.020 | 0.030 |
| 〃 | 10 | 21,000 | 1,130 | 0.020 | 0.030 | 21,000 | 900 | 0.020 | 0.020 | 21,000 | 770 | 0.010 | 0.020 |
| 〃 | 16 | 16,000 | 730 | 0.020 | 0.030 | 16,000 | 590 | 0.010 | 0.020 | 16,000 | 500 | 0.010 | 0.010 |
| ø 4 | 6 | 40,000 | 1,430 | 0.030 | 0.040 | 40,000 | 1,120 | 0.030 | 0.030 | 40,000 | 1,040 | 0.020 | 0.030 |
| 〃 | 10 | 21,000 | 1,080 | 0.020 | 0.030 | 21,000 | 850 | 0.020 | 0.020 | 21,000 | 740 | 0.010 | 0.020 |
| 〃 | 16 | 16,000 | 700 | 0.010 | 0.020 | 21,000 | 560 | 0.010 | 0.020 | 16,000 | 470 | 0.010 | 0.010 |
| ø 6 | | 16,000~ 50,000 | 740~ 3,000 | 0.050 | 0.060 | 13,000~ 50,000 | 590~ 2,000 | 0.050 | 0.060 | 11,000~ 50,000 | 390~ 1,500 | 0.050 | 0.060 |

**절입량**
Depth of Cut

Slotting
• Ap : Axial Depth
• D : Outside Diameter




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




- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC68 이상 고경도강 가공 시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실제 가공시에는 가공 형상, 가공 목적, 적용 기계 등에 따라 조건을 조정 하십시오.
- 절삭조건이 없는 유효장은 비슷한 유효장에 비례하여 사용 하십시오.
- 길이가 긴 엔드밀의 경우 떨림, 이상음이 발생할 경우에는 상기표의 회전속도와 이송속도를 같은 비율로 내려서 사용해 주십시오.

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- In case machining Hardened steel HRC upper 68, reduce 20% of cutting parameter on the table.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If there is no effective length of your endmill on the table, use a similar type of effective length and apply the same proportion.
- In case of long length endmill shaking or abnormal sound, lower the rotation speed and feed speed of the table above by the same ratio.

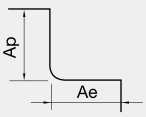
# 2CCBN/2SCCBN/4SCCBN Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | |
| 외경 Outside Diameter | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.4 | 0.3 | 50,000 | 890 | 0.010 | 0.010 | 50,000 | 520 | 0.005 | 0.006 | 50,000 | 450 | 0.005 | 0.005 |
| 〃 | 1 | 50,000 | 730 | 0.010 | 0.010 | 50,000 | 500 | 0.005 | 0.005 | 50,000 | 430 | 0.005 | 0.005 |
| 〃 | 2 | 50,000 | 390 | 0.005 | 0.005 | 50,000 | 250 | 0.003 | 0.003 | 50,000 | 220 | 0.002 | 0.003 |
| ø 0.5 | 0.4 | 50,000 | 990 | 0.010 | 0.020 | 50,000 | 850 | 0.005 | 0.010 | 50,000 | 770 | 0.005 | 0.010 |
| 〃 | 1 | 50,000 | 900 | 0.010 | 0.015 | 50,000 | 590 | 0.005 | 0.010 | 50,000 | 550 | 0.005 | 0.010 |
| 〃 | 3 | 50,000 | 630 | 0.010 | 0.015 | 50,000 | 560 | 0.005 | 0.010 | 50,000 | 530 | 0.005 | 0.010 |
| ø 0.8 | 0.6 | 50,000 | 1,610 | 0.020 | 0.020 | 50,000 | 1,320 | 0.015 | 0.015 | 50,000 | 1,140 | 0.010 | 0.010 |
| 〃 | 2 | 50,000 | 1,520 | 0.020 | 0.020 | 50,000 | 1,230 | 0.010 | 0.010 | 50,000 | 1,120 | 0.010 | 0.010 |
| 〃 | 4 | 40,000 | 910 | 0.015 | 0.020 | 40,000 | 740 | 0.010 | 0.010 | 40,000 | 650 | 0.010 | 0.010 |
| 〃 | 6 | 30,000 | 460 | 0.015 | 0.015 | 30,000 | 410 | 0.010 | 0.010 | 30,000 | 290 | 0.005 | 0.005 |
| ø 1 | 0.7 | 50,000 | 1,820 | 0.020 | 0.030 | 50,000 | 1,380 | 0.020 | 0.020 | 50,000 | 1,290 | 0.010 | 0.020 |
| 〃 | 2 | 40,000 | 1,470 | 0.015 | 0.020 | 40,000 | 1,010 | 0.015 | 0.015 | 40,000 | 910 | 0.010 | 0.010 |
| 〃 | 4 | 30,000 | 1,080 | 0.015 | 0.015 | 30,000 | 660 | 0.010 | 0.015 | 30,000 | 630 | 0.010 | 0.010 |
| 〃 | 8 | 24,000 | 680 | 0.010 | 0.010 | 24,000 | 460 | 0.005 | 0.010 | 24,000 | 360 | 0.005 | 0.005 |
| ø 1.5 | 0.8 | 40,000 | 1,790 | 0.030 | 0.040 | 40,000 | 1,150 | 0.020 | 0.030 | 40,000 | 1,190 | 0.020 | 0.020 |
| 〃 | 2 | 30,000 | 1,470 | 0.030 | 0.030 | 30,000 | 1,160 | 0.020 | 0.030 | 30,000 | 930 | 0.020 | 0.020 |
| 〃 | 4 | 30,000 | 1,190 | 0.030 | 0.030 | 30,000 | 950 | 0.015 | 0.020 | 30,000 | 810 | 0.010 | 0.015 |
| 〃 | 8 | 24,000 | 550 | 0.015 | 0.015 | 24,000 | 430 | 0.010 | 0.015 | 24,000 | 370 | 0.010 | 0.010 |
| ø 2 | 2 | 40,000 | 1,610 | 0.040 | 0.040 | 40,000 | 1,340 | 0.030 | 0.030 | 40,000 | 1,150 | 0.020 | 0.030 |
| 〃 | 4 | 30,000 | 1,400 | 0.030 | 0.030 | 30,000 | 1,120 | 0.025 | 0.025 | 30,000 | 960 | 0.020 | 0.020 |
| 〃 | 8 | 30,000 | 1,190 | 0.030 | 0.030 | 30,000 | 950 | 0.020 | 0.030 | 30,000 | 810 | 0.010 | 0.010 |
| ø 2.5 | 1.2 | 40,000 | 2,317 | 0.050 | 0.050 | 40,000 | 1,850 | 0.040 | 0.040 | 40,000 | 1,580 | 0.030 | 0.040 |
| 〃 | 4 | 40,000 | 1,620 | 0.030 | 0.040 | 40,000 | 1,300 | 0.030 | 0.030 | 40,000 | 1,210 | 0.020 | 0.030 |
| 〃 | 10 | 24,000 | 850 | 0.020 | 0.030 | 24,000 | 680 | 0.010 | 0.030 | 24,000 | 280 | 0.010 | 0.020 |
| ø 3 | 6 | 40,000 | 1,470 | 0.030 | 0.030 | 40,000 | 1,180 | 0.020 | 0.030 | 40,000 | 1,010 | 0.020 | 0.030 |
| 〃 | 10 | 21,000 | 1,190 | 0.020 | 0.030 | 21,000 | 950 | 0.020 | 0.020 | 21,000 | 810 | 0.010 | 0.020 |
| 〃 | 16 | 16,000 | 770 | 0.020 | 0.030 | 16,000 | 620 | 0.010 | 0.020 | 16,000 | 530 | 0.010 | 0.010 |
| ø 4 | 6 | 40,000 | 1,510 | 0.030 | 0.040 | 40,000 | 1,180 | 0.030 | 0.030 | 40,000 | 1,100 | 0.020 | 0.030 |
| 〃 | 10 | 21,000 | 1,140 | 0.020 | 0.030 | 21,000 | 900 | 0.020 | 0.020 | 21,000 | 780 | 0.010 | 0.020 |
| 〃 | 16 | 16,000 | 740 | 0.010 | 0.020 | 16,000 | 590 | 0.010 | 0.020 | 16,000 | 500 | 0.010 | 0.010 |
| ø 6 | | 16,000~ 50,000 | 740~ 3,000 | 0.050 | 0.060 | 13,000~ 50,000 | 590~ 2,000 | 0.050 | 0.060 | 11,000~ 50,000 | 390~ 1,500 | 0.050 | 0.060 |

**절입량 Depth of Cut**

• Ap : Axial Depth
• Ae : Radial Depth




- HRC68 이상 고경도강 가공 시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- 4날 사용시 Feed 20% 증가, 절입량을 5% 감소하여 사용 하십시오.
- 측면 절삭시 코너R 부분과 각도 내용을 참고하여 절삭 하시기 바랍니다.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시에는가공형상, 가공 목적, 적용 기계 등에 따라 조건을 조정 하십시오.
- 절삭조건이 없는 유효장은 비슷한 유효장에 비례하여 사용 하십시오.
- 길이가 긴 엔드밀의 경우 떨림, 이상음이 발생할 경우에는 상기표의 회전속도와 이송속도를 같은 비율로 내려서 사용해 주십시오.

- In case machining Hardened steel HRC upper 68, reduce 20% of cutting parameter on the table.
- In case of long effective length, reduce the RPM and feed by 30% or less.
- For using 4 flutes, reduce the feed by 20% and the depth of cut by 5%.
- For side milling, refer to the corner R section and the angle.
- For curved milling, set up a pitch below than corner radius of the tool diameter.
- For curved milling, raise the feed upto 30% at a stable speed.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If there is no effective length of your endmill on the table, use a similar type of effective length and apply the same proportion.
- In case of long length endmill shaking or abnormal sound, lower the rotation speed and feed speed of the table above by the same ratio.

# 2JJRB Cutting Condition

• RPM : rev./min • Feed : mm/min

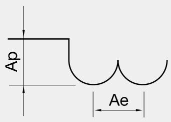
| 피삭재 Material | | 고경도강 Hardened Steels STAVX / SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | | 62 ~ 70HRc | | | |
| 반경 Radius | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 0.1 | 0.5 | 60,000 | 176 | 0.002 | 0.005 | 66,000 | 104 | 0.002 | 0.005 | 49,500 | 52 | 0.002 | 0.005 |
| 〃 | 1 | 60,000 | 176 | 0.002 | 0.005 | 66,000 | 104 | 0.002 | 0.005 | 49,500 | 52 | 0.002 | 0.005 |
| 〃 | 1.5 | 48,000 | 70 | 0.001 | 0.003 | 52,000 | 52 | 0.001 | 0.003 | 39,600 | 24 | 0.001 | 0.003 |
| 〃 | 2 | 48,000 | 44 | 0.001 | 0.003 | 52,000 | 32 | 0.001 | 0.003 | 39,600 | 16 | 0.001 | 0.003 |
| R 0.15 | 1 | 45,000 | 273 | 0.004 | 0.010 | 47,850 | 144 | 0.003 | 0.008 | 35,750 | 72 | 0.003 | 0.008 |
| 〃 | 1.5 | 45,000 | 273 | 0.004 | 0.010 | 47,850 | 144 | 0.003 | 0.008 | 35,750 | 72 | 0.003 | 0.008 |
| 〃 | 2 | 45,000 | 167 | 0.003 | 0.008 | 47,850 | 88 | 0.002 | 0.005 | 35,750 | 44 | 0.002 | 0.005 |
| 〃 | 3 | 32,000 | 70 | 0.002 | 0.005 | 35,200 | 52 | 0.001 | 0.003 | 26,400 | 24 | 0.001 | 0.003 |
| R 0.2 | 1 | 37,500 | 370 | 0.007 | 0.018 | 38,500 | 192 | 0.005 | 0.013 | 28,875 | 96 | 0.005 | 0.013 |
| 〃 | 2 | 37,500 | 370 | 0.007 | 0.018 | 38,500 | 192 | 0.005 | 0.013 | 28,875 | 96 | 0.005 | 0.013 |
| 〃 | 3 | 31,900 | 185 | 0.004 | 0.010 | 33,550 | 128 | 0.003 | 0.008 | 25,080 | 64 | 0.002 | 0.005 |
| 〃 | 4 | 25,500 | 132 | 0.002 | 0.005 | 26,730 | 96 | 0.002 | 0.005 | 20,020 | 48 | 0.002 | 0.005 |
| R 0.25 | 1 | 33,000 | 466 | 0.010 | 0.025 | 33,000 | 240 | 0.007 | 0.018 | 24,750 | 120 | 0.007 | 0.018 |
| 〃 | 2 | 33,000 | 466 | 0.010 | 0.025 | 33,000 | 240 | 0.007 | 0.018 | 24,750 | 120 | 0.007 | 0.018 |
| 〃 | 3 | 31,000 | 352 | 0.007 | 0.018 | 31,405 | 184 | 0.005 | 0.013 | 23,540 | 60 | 0.005 | 0.013 |
| 〃 | 4 | 27,150 | 132 | 0.003 | 0.008 | 28,215 | 80 | 0.002 | 0.005 | 21,890 | 40 | 0.002 | 0.005 |
| 〃 | 5 | 24,200 | 97 | 0.002 | 0.005 | 25,850 | 60 | 0.002 | 0.005 | 19,360 | 28 | 0.002 | 0.005 |
| 〃 | 6 | 21,300 | 66 | 0.001 | 0.003 | 23,430 | 40 | 0.001 | 0.003 | 17,600 | 20 | 0.001 | 0.003 |
| 〃 | 8 | 15,900 | 35 | 0.001 | 0.003 | 17,490 | 20 | 0.001 | 0.003 | 13,145 | 10 | 0.001 | 0.003 |
| R 0.3 | 1 | 30,000 | 1,320 | 0.030 | 0.075 | 29,150 | 800 | 0.015 | 0.038 | 22,000 | 400 | 0.015 | 0.038 |
| 〃 | 2 | 30,000 | 1,056 | 0.020 | 0.050 | 29,150 | 640 | 0.010 | 0.025 | 22,000 | 320 | 0.010 | 0.025 |
| 〃 | 3 | 30,000 | 704 | 0.015 | 0.038 | 29,150 | 416 | 0.008 | 0.020 | 22,000 | 208 | 0.008 | 0.020 |
| 〃 | 4 | 30,000 | 440 | 0.010 | 0.025 | 29,150 | 272 | 0.006 | 0.015 | 22,000 | 136 | 0.006 | 0.015 |
| 〃 | 5 | 25,000 | 343 | 0.007 | 0.018 | 25,300 | 208 | 0.005 | 0.013 | 19,800 | 104 | 0.005 | 0.013 |
| 〃 | 6 | 21,000 | 282 | 0.005 | 0.013 | 21,450 | 168 | 0.004 | 0.010 | 16,500 | 84 | 0.004 | 0.010 |
| 〃 | 8 | 16,000 | 211 | 0.003 | 0.008 | 17,600 | 128 | 0.003 | 0.008 | 13,200 | 64 | 0.003 | 0.008 |
| 〃 | 10 | 14,900 | 154 | 0.002 | 0.005 | 16,390 | 92 | 0.002 | 0.005 | 12,210 | 44 | 0.002 | 0.005 |
| 〃 | 12 | 13,800 | 97 | 0.001 | 0.003 | 15,180 | 56 | 0.001 | 0.003 | 11,385 | 28 | 0.001 | 0.003 |
| R 0.4 | 2 | 27,000 | 1,408 | 0.040 | 0.100 | 25,850 | 800 | 0.020 | 0.050 | 19,250 | 400 | 0.020 | 0.050 |
| 〃 | 4 | 27,000 | 1,056 | 0.025 | 0.063 | 25,850 | 480 | 0.012 | 0.030 | 19,250 | 240 | 0.012 | 0.030 |
| 〃 | 6 | 23,000 | 528 | 0.012 | 0.030 | 22,550 | 320 | 0.006 | 0.015 | 17,050 | 160 | 0.006 | 0.015 |
| 〃 | 8 | 18,000 | 330 | 0.007 | 0.018 | 18,700 | 228 | 0.005 | 0.013 | 14,025 | 112 | 0.005 | 0.013 |
| 〃 | 10 | 14,700 | 299 | 0.005 | 0.013 | 16,115 | 180 | 0.004 | 0.010 | 12,100 | 88 | 0.004 | 0.010 |
| R 0.5 | 2 | 24,000 | 1,760 | 0.100 | 0.250 | 23,100 | 1,400 | 0.050 | 0.125 | 17,600 | 700 | 0.050 | 0.125 |
| 〃 | 3 | 24,000 | 1,760 | 0.050 | 0.125 | 23,100 | 1,400 | 0.030 | 0.075 | 17,600 | 700 | 0.030 | 0.075 |
| 〃 | 4 | 24,000 | 1,760 | 0.050 | 0.125 | 23,100 | 1,400 | 0.030 | 0.075 | 17,600 | 700 | 0.030 | 0.075 |
| 〃 | 5 | 24,000 | 1,760 | 0.050 | 0.125 | 23,100 | 1,400 | 0.030 | 0.075 | 17,600 | 700 | 0.030 | 0.075 |
| 〃 | 6 | 21,500 | 1,100 | 0.030 | 0.075 | 21,670 | 840 | 0.025 | 0.063 | 15,950 | 420 | 0.025 | 0.063 |
| 〃 | 8 | 18,500 | 510 | 0.015 | 0.038 | 20,240 | 384 | 0.015 | 0.038 | 15,180 | 192 | 0.015 | 0.038 |
| 〃 | 10 | 14,800 | 378 | 0.010 | 0.025 | 16,170 | 288 | 0.010 | 0.025 | 12,210 | 144 | 0.010 | 0.025 |
| 〃 | 12 | 13,400 | 334 | 0.008 | 0.020 | 14,630 | 232 | 0.008 | 0.020 | 10,945 | 112 | 0.008 | 0.020 |
| 〃 | 14 | 12,000 | 308 | 0.007 | 0.018 | 13,200 | 176 | 0.007 | 0.018 | 9,900 | 88 | 0.007 | 0.018 |
| 〃 | 16 | 10,500 | 220 | 0.005 | 0.013 | 11,550 | 128 | 0.005 | 0.013 | 8,635 | 64 | 0.005 | 0.013 |
| 〃 | 18 | 9,750 | 176 | 0.004 | 0.010 | 10,725 | 104 | 0.004 | 0.010 | 8,030 | 68 | 0.004 | 0.010 |
| 〃 | 20 | 9,000 | 132 | 0.003 | 0.008 | 9,900 | 80 | 0.003 | 0.008 | 7,425 | 40 | 0.003 | 0.008 |
| 〃 | 22 | 9,000 | 97 | 0.002 | 0.005 | 9,900 | 60 | 0.002 | 0.005 | 7,425 | 28 | 0.002 | 0.005 |
| R 0.6 | 6 | 20,000 | 1,760 | 0.060 | 0.150 | 19,250 | 1,400 | 0.036 | 0.090 | 14,410 | 700 | 0.036 | 0.090 |
| 〃 | 8 | 16,600 | 792 | 0.025 | 0.063 | 17,435 | 600 | 0.025 | 0.063 | 13,090 | 300 | 0.025 | 0.063 |
| 〃 | 10 | 15,500 | 510 | 0.015 | 0.038 | 16,885 | 384 | 0.015 | 0.038 | 12,650 | 192 | 0.015 | 0.038 |
| R 0.7 | 8 | 15,350 | 1,100 | 0.040 | 0.100 | 15,455 | 840 | 0.030 | 0.075 | 11,605 | 420 | 0.030 | 0.075 |
| R 0.75 | 3 | 17,000 | 1,760 | 0.120 | 0.300 | 16,500 | 1,400 | 0.060 | 0.150 | 12,375 | 700 | 0.060 | 0.150 |
| 〃 | 4 | 17,000 | 1,760 | 0.120 | 0.300 | 16,500 | 1,400 | 0.060 | 0.150 | 12,375 | 700 | 0.060 | 0.150 |
| 〃 | 6 | 17,000 | 1,760 | 0.070 | 0.175 | 16,500 | 1,400 | 0.040 | 0.100 | 12,375 | 700 | 0.040 | 0.100 |
| 〃 | 8 | 15,000 | 1,100 | 0.045 | 0.113 | 15,400 | 840 | 0.030 | 0.075 | 11,550 | 420 | 0.030 | 0.075 |
| 〃 | 10 | 15,000 | 1,100 | 0.045 | 0.113 | 15,400 | 840 | 0.030 | 0.075 | 11,550 | 420 | 0.030 | 0.075 |
| 〃 | 12 | 13,000 | 510 | 0.020 | 0.050 | 14,300 | 384 | 0.020 | 0.050 | 10,725 | 192 | 0.020 | 0.050 |
| 〃 | 14 | 10,900 | 427 | 0.015 | 0.038 | 11,990 | 308 | 0.015 | 0.038 | 9,020 | 152 | 0.015 | 0.038 |
| 〃 | 16 | 8,850 | 343 | 0.012 | 0.030 | 9,680 | 232 | 0.012 | 0.030 | 7,260 | 116 | 0.012 | 0.030 |
| 〃 | 20 | 8,000 | 308 | 0.010 | 0.025 | 8,800 | 176 | 0.010 | 0.025 | 6,600 | 88 | 0.010 | 0.025 |
| R 0.8 | 8 | 17,500 | 1,848 | 0.080 | 0.200 | 16,830 | 1,440 | 0.050 | 0.125 | 12,650 | 720 | 0.050 | 0.125 |
| 〃 | 12 | 13,500 | 528 | 0.024 | 0.060 | 14,740 | 392 | 0.024 | 0.060 | 11,055 | 196 | 0.025 | 0.063 |
| 〃 | 16 | 10,800 | 396 | 0.016 | 0.040 | 11,770 | 296 | 0.016 | 0.040 | 8,800 | 148 | 0.016 | 0.040 |
| R 1 | 4 | 14,000 | 1,848 | 0.150 | 0.375 | 13,475 | 1,440 | 0.080 | 0.200 | 10,120 | 720 | 0.080 | 0.200 |
| 〃 | 6 | 14,000 | 1,848 | 0.100 | 0.250 | 13,475 | 1,440 | 0.060 | 0.150 | 10,120 | 720 | 0.060 | 0.150 |
| 〃 | 8 | 14,000 | 1,848 | 0.100 | 0.250 | 13,475 | 1,440 | 0.060 | 0.150 | 10,120 | 720 | 0.060 | 0.150 |
| 〃 | 10 | 14,000 | 1,848 | 0.100 | 0.250 | 13,475 | 1,440 | 0.060 | 0.150 | 10,120 | 720 | 0.600 | 1.500 |
| 〃 | 12 | 12,400 | 1,188 | 0.060 | 0.150 | 12,650 | 880 | 0.045 | 0.113 | 9,515 | 440 | 0.045 | 0.113 |
| 〃 | 14 | 12,400 | 1,188 | 0.060 | 0.150 | 12,650 | 880 | 0.045 | 0.113 | 9,515 | 440 | 0.045 | 0.113 |

# 2JJRB Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 고경도강 Hardened Steels STAVX / SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | | 62 ~ 70HRc | | | |
| 반경 Radius | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| 〃 | 16 | 10,800 | 528 | 0.030 | 0.075 | 11,770 | 392 | 0.030 | 0.075 | 8,800 | 196 | 0.030 | 0.075 |
| 〃 | 18 | 9,700 | 458 | 0.025 | 0.063 | 10,615 | 344 | 0.025 | 0.063 | 7,975 | 172 | 0.025 | 0.063 |
| 〃 | 20 | 8,650 | 396 | 0.020 | 0.050 | 9,416 | 296 | 0.020 | 0.050 | 7,040 | 148 | 0.020 | 0.050 |
| 〃 | 22 | 8,200 | 387 | 0.018 | 0.045 | 9,020 | 264 | 0.018 | 0.045 | 6,765 | 132 | 0.018 | 0.045 |
| 〃 | 25 | 7,800 | 387 | 0.016 | 0.040 | 8,580 | 232 | 0.016 | 0.040 | 6,435 | 116 | 0.016 | 0.040 |
| 〃 | 30 | 7,000 | 308 | 0.014 | 0.035 | 7,700 | 176 | 0.014 | 0.035 | 5,775 | 88 | 0.014 | 0.035 |
| R 1.25 | 20 | 9,600 | 554 | 0.040 | 0.100 | 10,560 | 408 | 0.040 | 0.100 | 7,920 | 204 | 0.040 | 0.100 |
| R 1.5 | 6 | 10,500 | 1,936 | 0.200 | 0.500 | 10,120 | 1,520 | 0.120 | 0.300 | 7,590 | 760 | 0.120 | 0.300 |
| 〃 | 8 | 10,500 | 1,936 | 0.200 | 0.500 | 10,120 | 1,520 | 0.120 | 0.300 | 7,590 | 760 | 0.120 | 0.300 |
| 〃 | 10 | 10,500 | 1,936 | 0.150 | 0.375 | 10,120 | 1,520 | 0.100 | 0.250 | 7,590 | 760 | 0.100 | 0.250 |
| 〃 | 12 | 10,500 | 1,936 | 0.150 | 0.375 | 10,120 | 1,520 | 0.100 | 0.250 | 7,590 | 760 | 0.100 | 0.250 |
| 〃 | 16 | 10,500 | 1,936 | 0.150 | 0.375 | 10,120 | 1,520 | 0.100 | 0.250 | 7,590 | 760 | 0.100 | 0.250 |
| 〃 | 20 | 9,250 | 1,232 | 0.100 | 0.250 | 9,460 | 920 | 0.075 | 0.188 | 7,095 | 460 | 0.075 | 0.188 |
| 〃 | 25 | 8,000 | 554 | 0.050 | 0.125 | 8,800 | 408 | 0.050 | 0.125 | 6,600 | 204 | 0.050 | 0.125 |
| 〃 | 30 | 5,750 | 396 | 0.030 | 0.075 | 6,270 | 296 | 0.030 | 0.075 | 4,703 | 148 | 0.030 | 0.075 |
| 〃 | 35 | 5,350 | 387 | 0.025 | 0.063 | 5,885 | 248 | 0.025 | 0.063 | 4,400 | 124 | 0.025 | 0.063 |
| 〃 | 40 | 4,900 | 343 | 0.020 | 0.050 | 5,445 | 200 | 0.020 | 0.050 | 4,070 | 100 | 0.020 | 0.050 |
| R 2 | 8 | 9,000 | 2,024 | 0.250 | 0.625 | 8,690 | 1,600 | 0.150 | 0.375 | 6,490 | 800 | 0.150 | 0.375 |
| 〃 | 10 | 9,000 | 2,024 | 0.250 | 0.625 | 8,690 | 1,600 | 0.150 | 0.375 | 6,490 | 800 | 0.150 | 0.375 |
| 〃 | 12 | 9,000 | 2,024 | 0.200 | 0.500 | 8,690 | 1,600 | 0.130 | 0.325 | 6,490 | 800 | 0.130 | 0.325 |
| 〃 | 16 | 9,000 | 2,024 | 0.200 | 0.500 | 8,690 | 1,600 | 0.130 | 0.325 | 6,490 | 800 | 0.130 | 0.325 |
| 〃 | 20 | 9,000 | 2,024 | 0.200 | 0.500 | 8,690 | 1,600 | 0.130 | 0.325 | 6,490 | 800 | 0.130 | 0.325 |
| 〃 | 25 | 8.000 | 1,276 | 0.130 | 0.325 | 8,195 | 1,000 | 0.090 | 0.225 | 6,160 | 500 | 0.090 | 0.225 |
| 〃 | 30 | 7,000 | 581 | 0.060 | 0.150 | 7,700 | 432 | 0.060 | 0.150 | 5,775 | 216 | 0.060 | 0.150 |
| 〃 | 35 | 6,000 | 554 | 0.055 | 0.138 | 6,600 | 408 | 0.055 | 0.138 | 4,950 | 204 | 0.055 | 0.138 |
| 〃 | 40 | 4,300 | 396 | 0.040 | 0.100 | 4,730 | 296 | 0.040 | 0.100 | 3,520 | 148 | 0.040 | 0.100 |
| R 2.5 | 20 | 7,200 | 2,024 | 0.250 | 0.625 | 6,985 | 1,600 | 0.160 | 0.400 | 5,225 | 800 | 0.160 | 0.400 |
| 〃 | 30 | 6,400 | 1,276 | 0.160 | 0.400 | 6,820 | 1,000 | 0.110 | 0.275 | 5,115 | 500 | 0.110 | 0.275 |
| 〃 | 40 | 6,000 | 607 | 0.080 | 0.200 | 6,600 | 456 | 0.080 | 0.200 | 4,950 | 228 | 0.080 | 0.200 |
| R 3 | 15 | 6,500 | 2,200 | 0.300 | 0.750 | 6,270 | 1,760 | 0.200 | 0.500 | 4,730 | 880 | 0.200 | 0.500 |
| R 4 | 25 | 5,200 | 1,936 | 0.400 | 1.000 | 4,950 | 1,520 | 0.250 | 0.625 | 3,740 | 760 | 0.250 | 0.625 |
| R 5 | 30 | 4,300 | 1,760 | 0.500 | 1.250 | 4,125 | 1,400 | 0.300 | 0.750 | 3,080 | 700 | 0.300 | 0.750 |
| R 6 | 30 | 3,600 | 1,540 | 0.600 | 1.500 | 3,465 | 1,200 | 0.350 | 0.875 | 2,585 | 600 | 0.350 | 0.875 |

**절입량**
Depth of Cut



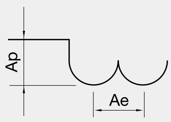

Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 ($min^{-1}$)
Vf : Feed 이송속도 (mm/min)

- HRC55 이하 피삭재(합금강, 공구강) 가공시 같은 파이에 대비 상기절삭조건의 20% UP 해주십시오.
- 에어브로 혹은 미스트 쿨런트를 추천하며, 동 가공시 습식 쿨런트 추천 합니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 진동이 적고 강성이 좋은 공작 기계 사용 요망 합니다(Ø1 이하 사용 시 진동 허용 관리 5㎛ 이내일 것.)
- 칩 제거 주의 및 가 공시 발열, 발화에 주의하십시오.

- When milling workpiece HRC below 55 (Alloy steel, tool steel), Raise up 20% RPM and feed compared to the same diameter.
- Air blow or mist coolant is recommended, and wet coolants are recommended for copper milling.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management will be within 5㎛).
- Note for chip emission, heat, or ignition.

## 3JJRB Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재<br>Material | | 고경도강<br>Hardened Steels<br>STAVX / SKD11 | | | | 열처리 / 고경도강<br>Heat-treated steels / Hardened Steels<br>SKD11 / SKD61 | | | | 열처리 / 고경도강<br>Heat-treated steels / Hardened Steels<br>YXR7 / SKH51 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | | 62 ~ 70HRc | | | |
| 반경<br>Radius | 유효장<br>Effective Length | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth |
| R 0.5 | 4 | 25,500 | 2,360 | 0.050 | 0.200 | 21,000 | 2,000 | 0.030 | 0.170 | 16,000 | 960 | 0.030 | 0.170 |
| 〃 | 8 | 18,500 | 760 | 0.015 | 0.120 | 18,400 | 710 | 0.015 | 0.120 | 13,800 | 287 | 0.015 | 0.120 |
| 〃 | 12 | 13,400 | 540 | 0.008 | 0.080 | 13,300 | 405 | 0.008 | 0.080 | 9,950 | 189 | 0.008 | 0.080 |
| 〃 | 16 | 10,500 | 320 | 0.005 | 0.045 | 10,500 | 225 | 0.005 | 0.045 | 7,850 | 115 | 0.005 | 0.045 |
| R 0.75 | 8 | 15,000 | 1,389 | 0.045 | 0.250 | 14,000 | 1,280 | 0.030 | 0.210 | 10,500 | 648 | 0.030 | 0.210 |
| 〃 | 16 | 8,850 | 530 | 0.012 | 0.130 | 8,800 | 489 | 0.012 | 0.130 | 6,600 | 208 | 0.012 | 0.130 |
| R 1 | 8 | 14,000 | 2,350 | 0.100 | 0.400 | 12,250 | 1,960 | 0.060 | 0.300 | 9,200 | 1,060 | 0.060 | 0.300 |
| 〃 | 16 | 10,800 | 776 | 0.030 | 0.240 | 10,700 | 580 | 0.030 | 0.240 | 8,000 | 335 | 0.030 | 0.240 |
| 〃 | 25 | 7,800 | 530 | 0.016 | 0.160 | 7,800 | 380 | 0.016 | 0.160 | 5,850 | 320 | 0.016 | 0.160 |
| R 1.5 | 16 | 10,500 | 2,500 | 0.150 | 0.650 | 9,200 | 2,100 | 0.100 | 0.500 | 6,900 | 1,100 | 0.100 | 0.500 |
| 〃 | 25 | 8,000 | 820 | 0.050 | 0.380 | 8,000 | 640 | 0.050 | 0.380 | 6,000 | 355 | 0.050 | 0.380 |
| 〃 | 40 | 4,900 | 530 | 0.020 | 0.240 | 4,950 | 360 | 0.020 | 0.240 | 3,700 | 220 | 0.020 | 0.240 |
| R 2 | 20 | 9,000 | 2,680 | 0.200 | 0.850 | 7,900 | 2,250 | 0.130 | 0.700 | 5,900 | 1,240 | 0.130 | 0.700 |
| 〃 | 30 | 7,000 | 845 | 0.060 | 0.450 | 7,000 | 710 | 0.060 | 0.450 | 5,250 | 374 | 0.060 | 0.450 |
| 〃 | 40 | 4,300 | 640 | 0.040 | 0.390 | 4,300 | 420 | 0.040 | 0.390 | 3,200 | 267 | 0.040 | 0.390 |
| R 2.5 | 30 | 6,400 | 1,630 | 0.160 | 0.880 | 6,200 | 1,430 | 0.110 | 0.730 | 4,650 | 775 | 0.110 | 0.730 |
| 〃 | 40 | 6,000 | 820 | 0.080 | 0.625 | 5,900 | 760 | 0.080 | 0.625 | 4,500 | 415 | 0.080 | 0.625 |
| 〃 | 50 | 5,300 | 530 | 0.050 | 0.410 | 5,200 | 490 | 0.040 | 0.400 | 4,300 | 295 | 0.035 | 0.370 |
| R 3 | 20 | 6,500 | 2,820 | 0.300 | 1.300 | 5,700 | 2,390 | 0.200 | 1.000 | 4,300 | 1,360 | 0.200 | 1.000 |
| 〃 | 30 | 6,400 | 1,720 | 0.160 | 0.880 | 6,200 | 1,538 | 0.110 | 0.730 | 4,650 | 843 | 0.110 | 0.730 |
| R 4 | 25 | 5,200 | 2,350 | 0.400 | 1.700 | 4,500 | 2,100 | 0.250 | 1.350 | 3,400 | 1,060 | 0.250 | 1.350 |
| 〃 | 40 | 3,600 | 1,570 | 0.300 | 0.850 | 2,700 | 1,260 | 0.150 | 0.720 | 2,040 | 636 | 0.120 | 0.700 |
| R 5 | 30 | 4,300 | 2,170 | 0.500 | 2.100 | 3,750 | 1,860 | 0.300 | 1.700 | 2,800 | 986 | 0.300 | 1.700 |
| 〃 | 50 | 3,400 | 1,330 | 0.400 | 1.050 | 2,419 | 1,200 | 0.200 | 0.750 | 1,806 | 636 | 0.190 | 0.680 |
| R 6 | 35 | 3,600 | 1,890 | 0.600 | 2.600 | 3,150 | 1,680 | 0.350 | 2.000 | 2,350 | 840 | 0.350 | 2.000 |
| 〃 | 60 | 2,700 | 1,180 | 0.500 | 1.300 | 1,956 | 1,043 | 0.250 | 0.900 | 1,459 | 522 | 0.220 | 0.850 |
| 절입량<br>Depth of Cut | |   | | | | Ap : Axial Depth 축방향의절입깊이(mm)<br>Ae : Radial Depth 반경방향의절입깊이(mm)<br>D : Outside Diameter 외경(mm)<br>n : Speed 회전속도 ($min^{-1}$)<br>Vf : Feed 이송속도 (mm/min) | | | | | | | |

- HRC55 이하 피삭재(합금강, 공구강) 가공시 같은 파이에 대비 상기 절삭조건의 20% UP 해주십시오.
- 에어브로 혹은 미스트 쿨런트를 추천하며, 동 가공시 습식 쿨런트 추천 합니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 진동이 적고 강성이 좋은 공작 기계 사용 요망 합니다(Ø1 이하 사용 시 진동 허용 관리 5㎛ 이내일 것.)
- 칩 제거 주의 및 가 공시 발열, 발화에 주의하십시오.

- When milling workpiece HRC below 55 (Alloy steel, tool steel), Raise up 20% RPM and feed compared to the same diameter.
- Air blow or mist coolant is recommended, and wet coolants are recommended for copper milling.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management will be within 5㎛).
- Note for chip emission, heat, or ignition.

# 2JJTB Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | 40 ~ 45HRc | | | 45 ~ 55HRc | | | 55 ~ 62HRc | | | 62 ~ 70HRc | | |
| 반경 Radius | 유효장 Effective Length | 각도 Taper Angle | RPM | FEED | Ap Axial Depth | RPM | FEED | Ap Axial Depth | RPM | FEED | Ap Axial Depth | RPM | FEED | Ap Axial Depth |
| R 0.1 | 1.5 | 0°30 | 42,000 | 630 | 0.007 | 28,350 | 431 | 0.005 | 27,300 | 326 | 0.005 | 27,300 | 252 | 0.004 |
| 〃 | 2 | 0°30 | 32,550 | 368 | 0.005 | 22,575 | 252 | 0.004 | 21,000 | 200 | 0.003 | 21,000 | 179 | 0.003 |
| 〃 | 1.5 | 1° | 42,000 | 630 | 0.007 | 28,350 | 431 | 0.005 | 27,300 | 326 | 0.005 | 27,300 | 252 | 0.004 |
| 〃 | 2 | 1° | 32,550 | 368 | 0.005 | 22,575 | 252 | 0.004 | 21,000 | 200 | 0.003 | 21,000 | 179 | 0.003 |
| 〃 | 2.5 | 1° | 28,000 | 230 | 0.002 | 19,500 | 180 | 0.001 | 17,000 | 155 | 0.001 | 17,000 | 155 | 0.001 |
| 〃 | 1.5 | 1°30 | 42,000 | 630 | 0.007 | 28,350 | 431 | 0.005 | 27,300 | 326 | 0.005 | 27,300 | 252 | 0.004 |
| 〃 | 2 | 1°30 | 32,550 | 368 | 0.005 | 22,575 | 252 | 0.004 | 21,000 | 200 | 0.003 | 21,000 | 179 | 0.003 |
| 〃 | 2.5 | 1°30 | 28,000 | 230 | 0.003 | 19,500 | 180 | 0.001 | 17,000 | 155 | 0.001 | 17,000 | 155 | 0.001 |
| 〃 | 1.5 | 2° | 42,000 | 630 | 0.007 | 28,350 | 431 | 0.005 | 27,300 | 326 | 0.005 | 27,300 | 252 | 0.004 |
| 〃 | 2 | 2° | 32,550 | 368 | 0.005 | 22,575 | 252 | 0.004 | 21,000 | 200 | 0.003 | 21,000 | 179 | 0.003 |
| 〃 | 2.5 | 2° | 28,000 | 230 | 0.004 | 19,500 | 180 | 0.002 | 17,000 | 155 | 0.001 | 17,000 | 155 | 0.001 |
| 〃 | 1.5 | 3° | 42,000 | 630 | 0.007 | 28,350 | 431 | 0.005 | 27,300 | 326 | 0.005 | 27,300 | 252 | 0.004 |
| 〃 | 2 | 3° | 32,550 | 368 | 0.005 | 22,575 | 252 | 0.004 | 21,000 | 200 | 0.003 | 21,000 | 179 | 0.003 |
| 〃 | 2.5 | 3° | 28,000 | 230 | 0.004 | 19,500 | 180 | 0.002 | 17,000 | 155 | 0.001 | 17,000 | 155 | 0.001 |
| R 0.15 | 3 | 0°30 | 34,650 | 641 | 0.008 | 23,310 | 399 | 0.006 | 21,525 | 336 | 0.005 | 21,525 | 294 | 0.004 |
| 〃 | 2 | 1° | 34,650 | 641 | 0.008 | 23,310 | 399 | 0.006 | 21,525 | 336 | 0.005 | 21,525 | 294 | 0.004 |
| 〃 | 3 | 1° | 34,650 | 641 | 0.008 | 23,310 | 399 | 0.006 | 21,525 | 336 | 0.005 | 21,525 | 294 | 0.004 |
| 〃 | 4 | 1° | 32,550 | 494 | 0.005 | 22,050 | 326 | 0.004 | 19,950 | 242 | 0.003 | 19,950 | 189 | 0.001 |
| 〃 | 5 | 1° | 32,550 | 494 | 0.003 | 22,050 | 326 | 0.002 | 19,950 | 242 | 0.002 | 19,950 | 189 | 0.001 |
| 〃 | 2 | 1°30 | 34,650 | 641 | 0.008 | 23,310 | 399 | 0.006 | 21,525 | 336 | 0.005 | 21,525 | 294 | 0.004 |
| 〃 | 3 | 1°30 | 34,650 | 641 | 0.008 | 23,310 | 399 | 0.006 | 21,525 | 336 | 0.005 | 21,525 | 294 | 0.004 |
| 〃 | 4 | 1°30 | 32,550 | 494 | 0.003 | 22,050 | 326 | 0.002 | 19,950 | 242 | 0.002 | 19,950 | 189 | 0.002 |
| 〃 | 5 | 1°30 | 32,550 | 494 | 0.003 | 22,050 | 326 | 0.002 | 19,950 | 242 | 0.002 | 19,950 | 189 | 0.002 |
| 〃 | 2 | 2° | 34,650 | 641 | 0.008 | 23,310 | 399 | 0.006 | 21,525 | 336 | 0.005 | 21,525 | 294 | 0.004 |
| 〃 | 3 | 2° | 34,650 | 641 | 0.008 | 23,310 | 399 | 0.006 | 21,525 | 336 | 0.005 | 21,525 | 294 | 0.004 |
| 〃 | 4 | 2° | 32,550 | 494 | 0.003 | 22,050 | 326 | 0.002 | 19,950 | 242 | 0.002 | 19,950 | 189 | 0.002 |
| 〃 | 5 | 2° | 32,550 | 494 | 0.003 | 22,050 | 326 | 0.002 | 19,950 | 242 | 0.002 | 19,950 | 189 | 0.002 |
| 〃 | 2 | 3° | 34,650 | 641 | 0.008 | 23,310 | 399 | 0.006 | 21,525 | 336 | 0.005 | 21,525 | 294 | 0.004 |
| 〃 | 3 | 3° | 34,650 | 641 | 0.008 | 23,310 | 399 | 0.006 | 21,525 | 336 | 0.005 | 21,525 | 294 | 0.004 |
| 〃 | 4 | 3° | 32,550 | 494 | 0.004 | 22,050 | 326 | 0.003 | 19,950 | 242 | 0.002 | 19,950 | 189 | 0.003 |
| 〃 | 5 | 3° | 32,550 | 494 | 0.004 | 22,050 | 326 | 0.003 | 19,950 | 242 | 0.002 | 19,950 | 189 | 0.003 |
| R 0.2 | 2 | 0°30 | 32,000 | 1,155 | 0.016 | 28,350 | 788 | 0.013 | 26,250 | 672 | 0.011 | 26,250 | 473 | 0.008 |
| 〃 | 3 | 0°30 | 30,000 | 950 | 0.016 | 26,300 | 650 | 0.013 | 23,800 | 580 | 0.011 | 23,800 | 395 | 0.008 |
| 〃 | 4 | 0°30 | 28,000 | 780 | 0.010 | 21,000 | 500 | 0.008 | 19,000 | 475 | 0.007 | 19,000 | 325 | 0.005 |
| 〃 | 5 | 0°30 | 25,200 | 525 | 0.004 | 17,850 | 326 | 0.003 | 16,800 | 294 | 0.003 | 16,800 | 252 | 0.002 |
| 〃 | 6 | 0°30 | 25,200 | 525 | 0.004 | 17,850 | 326 | 0.003 | 16,800 | 294 | 0.003 | 16,800 | 252 | 0.002 |
| 〃 | 2 | 1° | 32,000 | 1,155 | 0.016 | 28,350 | 788 | 0.013 | 26,250 | 672 | 0.011 | 26,250 | 473 | 0.008 |
| 〃 | 3 | 1° | 30,000 | 950 | 0.016 | 26,300 | 650 | 0.013 | 23,800 | 580 | 0.011 | 23,800 | 395 | 0.008 |
| 〃 | 4 | 1° | 28,000 | 780 | 0.010 | 21,000 | 500 | 0.008 | 19,000 | 475 | 0.007 | 19,000 | 325 | 0.005 |
| 〃 | 5 | 1° | 25,200 | 525 | 0.004 | 17,850 | 326 | 0.003 | 16,800 | 294 | 0.003 | 16,800 | 252 | 0.002 |
| 〃 | 6 | 1° | 25,200 | 525 | 0.004 | 17,850 | 326 | 0.003 | 16,800 | 294 | 0.003 | 16,800 | 252 | 0.002 |
| 〃 | 2 | 2° | 32,000 | 1,155 | 0.016 | 28,350 | 788 | 0.013 | 26,250 | 672 | 0.011 | 26,250 | 473 | 0.008 |
| 〃 | 3 | 2° | 30,000 | 950 | 0.016 | 26,300 | 650 | 0.013 | 23,800 | 580 | 0.011 | 23,800 | 395 | 0.008 |
| 〃 | 4 | 2° | 28,000 | 780 | 0.010 | 21,000 | 500 | 0.008 | 19,000 | 475 | 0.007 | 19,000 | 325 | 0.005 |
| 〃 | 5 | 2° | 25,200 | 525 | 0.004 | 17,850 | 326 | 0.003 | 16,800 | 294 | 0.003 | 16,800 | 252 | 0.002 |
| 〃 | 6 | 2° | 25,200 | 525 | 0.004 | 17,850 | 326 | 0.003 | 16,800 | 294 | 0.003 | 16,800 | 252 | 0.002 |
| R 0.25 | 4 | 0°30 | 34,650 | 1,187 | 0.019 | 28,350 | 861 | 0.015 | 24,675 | 630 | 0.013 | 24,675 | 609 | 0.011 |
| 〃 | 6 | 0°30 | 21,525 | 609 | 0.006 | 17,850 | 431 | 0.005 | 15,750 | 368 | 0.004 | 15,750 | 326 | 0.003 |
| 〃 | 4 | 1° | 34,650 | 1,187 | 0.019 | 28,350 | 861 | 0.015 | 24,675 | 630 | 0.013 | 24,675 | 609 | 0.011 |
| 〃 | 6 | 1° | 21,525 | 609 | 0.006 | 17,850 | 431 | 0.005 | 15,750 | 368 | 0.004 | 15,750 | 326 | 0.003 |
| 〃 | 8 | 1° | 21,525 | 609 | 0.005 | 17,850 | 431 | 0.004 | 15,750 | 368 | 0.003 | 15,750 | 326 | 0.003 |
| 〃 | 10 | 1° | 21,525 | 609 | 0.004 | 17,850 | 431 | 0.003 | 15,750 | 368 | 0.003 | 15,750 | 326 | 0.003 |
| 〃 | 4 | 1°30 | 34,650 | 1,187 | 0.019 | 28,350 | 861 | 0.015 | 24,675 | 630 | 0.013 | 24,675 | 609 | 0.011 |
| 〃 | 6 | 1°30 | 21,525 | 609 | 0.008 | 17,850 | 431 | 0.005 | 15,750 | 368 | 0.006 | 15,750 | 326 | 0.005 |
| 〃 | 8 | 1°30 | 21,525 | 609 | 0.007 | 17,850 | 431 | 0.005 | 15,750 | 368 | 0.005 | 15,750 | 326 | 0.004 |
| 〃 | 10 | 1°30 | 21,525 | 609 | 0.006 | 17,850 | 431 | 0.005 | 15,750 | 368 | 0.004 | 15,750 | 326 | 0.003 |
| 〃 | 4 | 2° | 34,650 | 1,187 | 0.019 | 28,350 | 861 | 0.015 | 24,675 | 630 | 0.013 | 24,675 | 609 | 0.011 |
| 〃 | 6 | 2° | 21,525 | 609 | 0.006 | 17,850 | 431 | 0.005 | 15,750 | 368 | 0.004 | 15,750 | 326 | 0.003 |
| 〃 | 8 | 2° | 21,525 | 609 | 0.006 | 17,850 | 431 | 0.005 | 15,750 | 368 | 0.004 | 15,750 | 326 | 0.003 |
| 〃 | 10 | 2° | 21,525 | 609 | 0.006 | 17,850 | 431 | 0.005 | 15,750 | 368 | 0.004 | 15,750 | 326 | 0.003 |
| R 0.3 | 4 | 0°30 | 43,050 | 2,142 | 0.032 | 31,500 | 1,418 | 0.022 | 23,625 | 788 | 0.021 | 23,625 | 704 | 0.016 |
| 〃 | 8 | 0°30 | 26,775 | 998 | 0.016 | 22,050 | 735 | 0.013 | 16,800 | 515 | 0.011 | 16,800 | 410 | 0.008 |
| 〃 | 12 | 0°30 | 26,250 | 893 | 0.008 | 22,575 | 714 | 0.006 | 14,700 | 399 | 0.005 | 13,650 | 336 | 0.004 |
| 〃 | 4 | 1° | 43,050 | 2,142 | 0.032 | 31,500 | 1,418 | 0.022 | 23,625 | 788 | 0.021 | 23,625 | 704 | 0.016 |
| 〃 | 8 | 1° | 26,775 | 998 | 0.020 | 22,050 | 735 | 0.015 | 16,800 | 515 | 0.013 | 16,800 | 410 | 0.009 |
| 〃 | 12 | 1° | 26,250 | 893 | 0.010 | 22,575 | 714 | 0.012 | 14,700 | 399 | 0.008 | 13,650 | 336 | 0.005 |

# 2JJTB Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | 40 ~ 45HRc | | | 45 ~ 55HRc | | | 55 ~ 62HRc | | | 62 ~ 70HRc | | |
| 반경 Radius | 유효장 Effective Length | 각도 Taper Angle | RPM | FEED | Ap Axial Depth | RPM | FEED | Ap Axial Depth | RPM | FEED | Ap Axial Depth | RPM | FEED | Ap Axial Depth |
| R 0.3 | 4 | 1°30 | 43,050 | 2,142 | 0.032 | 31,500 | 1,418 | 0.022 | 23,625 | 788 | 0.021 | 23,625 | 704 | 0.016 |
| 〃 | 8 | 1°30 | 26,775 | 998 | 0.020 | 22,050 | 735 | 0.015 | 16,800 | 515 | 0.015 | 16,800 | 410 | 0.010 |
| 〃 | 12 | 1°30 | 26,250 | 893 | 0.010 | 22,575 | 714 | 0.012 | 14,700 | 399 | 0.010 | 13,650 | 336 | 0.007 |
| 〃 | 4 | 2° | 43,050 | 2,142 | 0.032 | 31,500 | 1,418 | 0.022 | 23,625 | 788 | 0.021 | 23,625 | 704 | 0.016 |
| 〃 | 8 | 2° | 26,775 | 998 | 0.022 | 22,050 | 735 | 0.017 | 16,800 | 515 | 0.016 | 16,800 | 410 | 0.010 |
| 〃 | 12 | 2° | 26,250 | 893 | 0.012 | 22,575 | 714 | 0.014 | 14,700 | 399 | 0.012 | 13,650 | 336 | 0.007 |
| R 0.4 | 4 | 0°30 | 43,050 | 2,310 | 0.037 | 29,400 | 1,470 | 0.028 | 24,150 | 861 | 0.026 | 24,150 | 714 | 0.016 |
| 〃 | 8 | 0°30 | 26,775 | 1,365 | 0.021 | 18,900 | 945 | 0.016 | 15,750 | 630 | 0.016 | 15,750 | 578 | 0.011 |
| 〃 | 12 | 0°30 | 26,775 | 1,050 | 0.016 | 16,275 | 525 | 0.013 | 12,600 | 462 | 0.011 | 12,600 | 420 | 0.007 |
| 〃 | 4 | 1° | 43,050 | 2,310 | 0.037 | 29,400 | 1,470 | 0.028 | 24,150 | 861 | 0.026 | 24,150 | 714 | 0.016 |
| 〃 | 8 | 1° | 26,775 | 1,365 | 0.021 | 18,900 | 945 | 0.016 | 15,750 | 630 | 0.016 | 15,750 | 578 | 0.011 |
| 〃 | 12 | 1° | 26,775 | 1,050 | 0.016 | 16,275 | 525 | 0.013 | 12,600 | 462 | 0.011 | 12,600 | 420 | 0.007 |
| 〃 | 4 | 1°30 | 43,050 | 2,310 | 0.037 | 29,400 | 1,470 | 0.028 | 24,150 | 861 | 0.026 | 24,150 | 714 | 0.016 |
| 〃 | 8 | 1°30 | 26,775 | 1,365 | 0.021 | 18,900 | 945 | 0.016 | 15,750 | 630 | 0.016 | 15,750 | 578 | 0.011 |
| 〃 | 12 | 1°30 | 26,775 | 1,050 | 0.016 | 16,275 | 525 | 0.013 | 12,600 | 462 | 0.011 | 12,600 | 420 | 0.007 |
| 〃 | 4 | 2° | 43,050 | 2,310 | 0.037 | 29,400 | 1,470 | 0.028 | 24,150 | 861 | 0.026 | 24,150 | 714 | 0.016 |
| 〃 | 8 | 2° | 26,775 | 1,365 | 0.021 | 18,900 | 945 | 0.016 | 15,750 | 630 | 0.016 | 15,750 | 578 | 0.011 |
| 〃 | 12 | 2° | 26,775 | 1,050 | 0.016 | 16,275 | 525 | 0.013 | 12,600 | 462 | 0.011 | 12,600 | 420 | 0.007 |

# 2JJTB/3JJTBS Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KPM4M | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | 40 ~ 45HRc | | | 45 ~ 55HRc | | | 55 ~ 62HRc | | | 62 ~ 70HRc | | |
| 반경 Radius | 유효장 Effective Length | 각도 Taper Angle | RPM | FEED | Ap Axial Depth | RPM | FEED | Ap Axial Depth | RPM | FEED | Ap Axial Depth | RPM | FEED | Ap Axial Depth |
| R 0.5 | 6 | 0°30 | 26,250 | 2,100 | 0.047 | 17,850 | 1,365 | 0.037 | 17,850 | 1,050 | 0.032 | 16,800 | 861 | 0.026 |
| 〃 | 10 | 0°30 | 17,850 | 1,103 | 0.023 | 12,600 | 767 | 0.019 | 11,550 | 683 | 0.017 | 11,550 | 525 | 0.013 |
| 〃 | 20 | 0°30 | 15,750 | 945 | 0.014 | 10,500 | 683 | 0.011 | 9,450 | 567 | 0.008 | 9,450 | 462 | 0.008 |
| 〃 | 6 | 1° | 26,250 | 2,100 | 0.047 | 17,850 | 1,365 | 0.037 | 17,850 | 1,050 | 0.032 | 16,800 | 861 | 0.026 |
| 〃 | 10 | 1° | 17,850 | 1,103 | 0.023 | 12,600 | 767 | 0.019 | 11,550 | 683 | 0.017 | 11,550 | 525 | 0.013 |
| 〃 | 20 | 1° | 15,750 | 945 | 0.014 | 10,500 | 683 | 0.011 | 9,450 | 567 | 0.008 | 9,450 | 462 | 0.008 |
| 〃 | 30 | 1° | 15,750 | 750 | 0.007 | 10,500 | 540 | 0.005 | 9,450 | 430 | 0.004 | 9,450 | 360 | 0.004 |
| 〃 | 6 | 1°30 | 26,250 | 2,100 | 0.047 | 17,850 | 1,365 | 0.037 | 17,850 | 1,050 | 0.032 | 16,800 | 861 | 0.026 |
| 〃 | 10 | 1°30 | 17,850 | 1,103 | 0.023 | 12,600 | 767 | 0.019 | 11,550 | 683 | 0.017 | 11,550 | 525 | 0.013 |
| 〃 | 20 | 1°30 | 15,750 | 945 | 0.014 | 10,500 | 683 | 0.011 | 9,450 | 567 | 0.008 | 9,450 | 462 | 0.008 |
| 〃 | 30 | 1°30 | 15,750 | 750 | 0.007 | 10,500 | 540 | 0.005 | 9,450 | 430 | 0.004 | 9,450 | 360 | 0.004 |
| 〃 | 20 | 2° | 15,750 | 945 | 0.014 | 10,500 | 683 | 0.011 | 9,450 | 567 | 0.008 | 9,450 | 462 | 0.008 |
| 〃 | 30 | 2° | 15,750 | 750 | 0.007 | 10,500 | 540 | 0.005 | 9,450 | 430 | 0.004 | 9,450 | 360 | 0.004 |
| 〃 | 20 | 3° | 15,750 | 945 | 0.014 | 10,500 | 683 | 0.011 | 9,450 | 567 | 0.008 | 9,450 | 462 | 0.008 |
| 〃 | 30 | 3° | 15,750 | 750 | 0.007 | 10,500 | 540 | 0.005 | 9,450 | 430 | 0.004 | 9,450 | 360 | 0.004 |
| 〃 | 40 | 3° | 12,250 | 550 | 0.004 | 8,550 | 420 | 0.002 | 7,800 | 365 | 0.002 | 7,800 | 285 | 0.002 |
| R 0.75 | 10 | 0°30 | 18,900 | 2,205 | 0.063 | 12,600 | 1,470 | 0.042 | 12,600 | 1,155 | 0.037 | 12,600 | 893 | 0.032 |
| 〃 | 20 | 0°30 | 13,650 | 1,260 | 0.032 | 9,450 | 945 | 0.021 | 9,450 | 735 | 0.016 | 9,450 | 630 | 0.014 |
| 〃 | 30 | 0°30 | 9,450 | 893 | 0.016 | 7,350 | 651 | 0.013 | 7,350 | 546 | 0.011 | 7,350 | 504 | 0.011 |
| 〃 | 10 | 1° | 18,900 | 2,205 | 0.063 | 12,600 | 1,470 | 0.042 | 12,600 | 1,155 | 0.037 | 12,600 | 893 | 0.032 |
| 〃 | 20 | 1° | 13,650 | 1,260 | 0.032 | 9,450 | 945 | 0.021 | 9,450 | 735 | 0.016 | 9,450 | 630 | 0.014 |
| 〃 | 30 | 1° | 9,450 | 893 | 0.016 | 7,350 | 651 | 0.013 | 7,350 | 546 | 0.011 | 7,350 | 504 | 0.011 |
| 〃 | 10 | 1°30 | 18,900 | 2,205 | 0.063 | 12,600 | 1,470 | 0.042 | 12,600 | 1,155 | 0.037 | 12,600 | 893 | 0.032 |
| 〃 | 20 | 1°30 | 13,650 | 1,260 | 0.036 | 9,450 | 945 | 0.024 | 9,450 | 735 | 0.018 | 9,450 | 630 | 0.016 |
| 〃 | 30 | 1°30 | 9,450 | 893 | 0.017 | 7,350 | 651 | 0.014 | 7,350 | 546 | 0.012 | 7,350 | 504 | 0.011 |
| 〃 | 40 | 1°30 | 8,400 | 675 | 0.010 | 6,300 | 510 | 0.008 | 6,300 | 420 | 0.007 | 6,300 | 400 | 0.006 |
| 〃 | 10 | 2° | 18,900 | 2,205 | 0.063 | 12,600 | 1,470 | 0.042 | 12,600 | 1,155 | 0.037 | 12,600 | 893 | 0.032 |
| 〃 | 20 | 2° | 13,650 | 1,260 | 0.036 | 9,450 | 945 | 0.024 | 9,450 | 735 | 0.018 | 9,450 | 630 | 0.016 |
| 〃 | 30 | 2° | 9,450 | 893 | 0.017 | 7,350 | 651 | 0.014 | 7,350 | 546 | 0.012 | 7,350 | 504 | 0.011 |
| 〃 | 40 | 2° | 8,400 | 675 | 0.010 | 6,300 | 510 | 0.008 | 6,300 | 420 | 0.007 | 6,300 | 400 | 0.006 |
| R 1 | 12 | 0°30 | 15,750 | 2,468 | 0.084 | 11,550 | 1,785 | 0.068 | 11,025 | 1,428 | 0.059 | 11,025 | 1,124 | 0.048 |
| 〃 | 20 | 0°30 | 10,500 | 1,470 | 0.063 | 8,400 | 1,050 | 0.053 | 9,450 | 1,050 | 0.047 | 9,450 | 924 | 0.037 |
| 〃 | 30 | 0°30 | 9,450 | 1,260 | 0.047 | 7,350 | 840 | 0.037 | 7,350 | 819 | 0.032 | 7,350 | 672 | 0.026 |
| 〃 | 40 | 0°30 | 9,450 | 1,260 | 0.037 | 7,035 | 819 | 0.032 | 6,300 | 735 | 0.026 | 6,300 | 609 | 0.021 |
| 〃 | 12 | 1° | 15,750 | 2,468 | 0.084 | 11,550 | 1,785 | 0.068 | 11,025 | 1,428 | 0.059 | 11,025 | 1,124 | 0.048 |
| 〃 | 20 | 1° | 10,500 | 1,470 | 0.063 | 8,400 | 1,050 | 0.053 | 9,450 | 1,050 | 0.047 | 9,450 | 924 | 0.037 |

# 2JJTB/3JJTBS Cutting Condition

• RPM : rev./min • Feed : mm/min

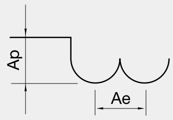
| 피삭재 Material | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | 40 ~ 45HRc | | | 45 ~ 55HRc | | | 55 ~ 62HRc | | | 62 ~ 70HRc | | |
| 반경 Radius | 유효장 Effective Length | 각도 Taper Angle | RPM | FEED | Ap Axial Depth | RPM | FEED | Ap Axial Depth | RPM | FEED | Ap Axial Depth | RPM | FEED | Ap Axial Depth |
| R 1 | 30 | 1° | 9,450 | 1,260 | 0.047 | 7,350 | 840 | 0.037 | 7,350 | 819 | 0.032 | 7,350 | 672 | 0.026 |
| 〃 | 40 | 1° | 9,450 | 1,260 | 0.037 | 7,035 | 819 | 0.032 | 6,300 | 735 | 0.026 | 6,300 | 609 | 0.021 |
| 〃 | 50 | 1° | 7,900 | 990 | 0.027 | 6,650 | 770 | 0.025 | 5,600 | 655 | 0.022 | 5,600 | 525 | 0.015 |
| 〃 | 12 | 1° 30 | 15,750 | 2,468 | 0.090 | 11,550 | 1,785 | 0.068 | 11,025 | 1,428 | 0.065 | 11,025 | 1,124 | 0.052 |
| 〃 | 20 | 1° 30 | 10,500 | 1,470 | 0.074 | 8,400 | 1,050 | 0.060 | 9,450 | 1,050 | 0.054 | 9,450 | 924 | 0.042 |
| 〃 | 30 | 1° 30 | 9,450 | 1,260 | 0.055 | 7,350 | 840 | 0.043 | 7,350 | 819 | 0.038 | 7,350 | 672 | 0.031 |
| 〃 | 40 | 1° 30 | 9,450 | 1,260 | 0.043 | 7,035 | 819 | 0.037 | 6,300 | 735 | 0.033 | 6,300 | 609 | 0.026 |
| 〃 | 50 | 1° 30 | 7,900 | 990 | 0.030 | 6,650 | 770 | 0.028 | 5,600 | 655 | 0.029 | 5,600 | 525 | 0.021 |
| 〃 | 30 | 2° | 9,450 | 1,260 | 0.055 | 7,350 | 840 | 0.043 | 7,350 | 819 | 0.038 | 7,350 | 672 | 0.031 |
| 〃 | 40 | 2° | 9,450 | 1,260 | 0.043 | 7,035 | 819 | 0.037 | 6,300 | 735 | 0.033 | 6,300 | 609 | 0.026 |
| 〃 | 50 | 2° | 7,900 | 990 | 0.030 | 6,650 | 770 | 0.028 | 5,600 | 655 | 0.029 | 5,600 | 525 | 0.021 |
| 〃 | 30 | 3° | 9,450 | 1,260 | 0.055 | 7,350 | 840 | 0.043 | 7,350 | 819 | 0.038 | 7,350 | 672 | 0.031 |
| 〃 | 40 | 3° | 9,450 | 1,260 | 0.043 | 7,035 | 819 | 0.037 | 6,300 | 735 | 0.033 | 6,300 | 609 | 0.026 |
| 〃 | 50 | 3° | 7,900 | 990 | 0.030 | 6,650 | 770 | 0.028 | 5,600 | 655 | 0.029 | 5,600 | 525 | 0.021 |
| R 1.5 | 20 | 0° 30 | 10,500 | 2,310 | 0.095 | 8,400 | 1,365 | 0.074 | 7,350 | 1,260 | 0.063 | 7,350 | 1,155 | 0.053 |
| 〃 | 30 | 0° 30 | 9,450 | 1,890 | 0.079 | 7,350 | 1,103 | 0.063 | 6,300 | 1,050 | 0.053 | 6,300 | 924 | 0.044 |
| 〃 | 40 | 0° 30 | 7,875 | 1,470 | 0.063 | 5,250 | 924 | 0.053 | 5,355 | 840 | 0.042 | 5,355 | 735 | 0.037 |
| 〃 | 50 | 0° 30 | 7,875 | 1,365 | 0.042 | 5,250 | 840 | 0.032 | 5,355 | 788 | 0.026 | 5,355 | 683 | 0.024 |
| 〃 | 20 | 1° | 10,500 | 2,310 | 0.095 | 8,400 | 1,365 | 0.074 | 7,350 | 1,260 | 0.063 | 7,350 | 1,155 | 0.053 |
| 〃 | 30 | 1° | 9,450 | 1,890 | 0.079 | 7,350 | 1,103 | 0.063 | 6,300 | 1,050 | 0.053 | 6,300 | 924 | 0.044 |
| 〃 | 40 | 1° | 7,875 | 1,470 | 0.063 | 5,250 | 924 | 0.053 | 5,155 | 840 | 0.042 | 5,155 | 735 | 0.037 |
| 〃 | 50 | 1° | 7,875 | 1,365 | 0.042 | 5,250 | 840 | 0.032 | 5,155 | 788 | 0.026 | 5,155 | 683 | 0.024 |
| 〃 | 60 | 1° | 6,400 | 1,225 | 0.028 | 4,325 | 710 | 0.021 | 4,300 | 670 | 0.018 | 4,300 | 540 | 0.016 |
| 〃 | 20 | 1° 30 | 10,500 | 2,310 | 0.095 | 8,400 | 1,365 | 0.074 | 7,350 | 1,260 | 0.063 | 7,350 | 1,155 | 0.053 |
| 〃 | 30 | 1° 30 | 9,450 | 1,890 | 0.079 | 7,350 | 1,103 | 0.063 | 6,300 | 1,050 | 0.053 | 6,300 | 924 | 0.044 |
| 〃 | 40 | 1° 30 | 7,875 | 1,470 | 0.063 | 5,250 | 924 | 0.053 | 5,355 | 840 | 0.042 | 5,355 | 735 | 0.037 |
| 〃 | 50 | 1° 30 | 7,875 | 1,365 | 0.042 | 5,250 | 840 | 0.032 | 5,355 | 788 | 0.026 | 5,355 | 683 | 0.024 |
| 〃 | 60 | 1° 30 | 6,400 | 1,225 | 0.028 | 4,325 | 710 | 0.021 | 4,300 | 670 | 0.018 | 4,300 | 540 | 0.016 |
| 〃 | 20 | 2° | 10,500 | 2,310 | 0.095 | 8,400 | 1,365 | 0.074 | 7,350 | 1,260 | 0.063 | 7,350 | 1,155 | 0.053 |
| 〃 | 30 | 2° | 9,450 | 1,890 | 0.079 | 7,350 | 1,103 | 0.063 | 6,300 | 1,050 | 0.053 | 6,300 | 924 | 0.044 |
| 〃 | 48 | 2° | 7,875 | 1,365 | 0.042 | 5,250 | 840 | 0.032 | 5,355 | 788 | 0.026 | 5,355 | 683 | 0.024 |
| 〃 | 60 | 2° | 6,400 | 1,225 | 0.028 | 4,325 | 710 | 0.021 | 4,300 | 670 | 0.018 | 4,300 | 540 | 0.016 |
| 〃 | 30 | 3° | 9,450 | 1,890 | 0.079 | 7,350 | 1,103 | 0.063 | 6,300 | 1,050 | 0.053 | 6,300 | 924 | 0.044 |
| 〃 | 50 | 3° | 7,875 | 1,365 | 0.042 | 5,250 | 840 | 0.032 | 5,355 | 788 | 0.026 | 5,355 | 683 | 0.024 |
| R 2 | 40 | 0° 30 | 6,300 | 1,260 | 0.085 | 3,675 | 630 | 0.068 | 3,360 | 557 | 0.053 | 3,360 | 525 | 0.045 |
| 〃 | 60 | 0° 30 | 4,200 | 767 | 0.063 | 3,150 | 473 | 0.047 | 2,940 | 420 | 0.042 | 2,940 | 368 | 0.033 |
| 〃 | 50 | 1° | 5,250 | 1,010 | 0.074 | 3,450 | 550 | 0.058 | 3,120 | 480 | 0.048 | 3,110 | 445 | 0.038 |
| 〃 | 60 | 1° | 4,200 | 767 | 0.063 | 3,150 | 473 | 0.047 | 2,940 | 420 | 0.042 | 2,940 | 368 | 0.033 |
| 〃 | 70 | 1° | 3,200 | 540 | 0.048 | 2,760 | 320 | 0.036 | 2,770 | 360 | 0.036 | 2,770 | 300 | 0.028 |
| 〃 | 45 | 1° 30 | 5,250 | 1,010 | 0.074 | 3,450 | 550 | 0.058 | 3,120 | 480 | 0.048 | 3,110 | 445 | 0.038 |
| 〃 | 60 | 1° 30 | 4,200 | 767 | 0.063 | 3,150 | 473 | 0.047 | 2,940 | 420 | 0.042 | 2,940 | 368 | 0.033 |
| 〃 | 70 | 1° 30 | 3,200 | 540 | 0.048 | 2,760 | 320 | 0.036 | 2,770 | 360 | 0.036 | 2,770 | 300 | 0.028 |
| 〃 | 25 | 3° | 9,450 | 1,890 | 0.079 | 7,350 | 1,103 | 0.063 | 6,300 | 1,050 | 0.053 | 6,300 | 924 | 0.044 |
| 〃 | 42 | 3° | 7,875 | 1,365 | 0.042 | 5,250 | 840 | 0.032 | 5,355 | 788 | 0.026 | 5,355 | 683 | 0.024 |
| R 2.5 | 40 | 1° | 6,300 | 1,260 | 0.085 | 3,675 | 630 | 0.068 | 3,360 | 557 | 0.053 | 3,360 | 525 | 0.045 |
| 〃 | 60 | 1° | 4,200 | 767 | 0.063 | 3,150 | 473 | 0.047 | 2,940 | 420 | 0.042 | 2,940 | 368 | 0.033 |
| 〃 | 90 | 1° | 2,200 | 480 | 0.041 | 2,450 | 280 | 0.030 | 2,470 | 250 | 0.028 | 2,200 | 237 | 0.023 |
| 〃 | 40 | 1° 30 | 6,300 | 1,260 | 0.085 | 3,675 | 630 | 0.068 | 3,360 | 557 | 0.053 | 3,360 | 525 | 0.045 |
| 〃 | 60 | 1° 30 | 4,200 | 767 | 0.063 | 3,150 | 473 | 0.047 | 2,940 | 420 | 0.042 | 2,940 | 368 | 0.033 |
| 〃 | 90 | 1° 30 | 2,200 | 480 | 0.041 | 2,450 | 280 | 0.030 | 2,470 | 250 | 0.028 | 2,200 | 237 | 0.023 |
| R 3 | 40 | 1° | 9,450 | 2,205 | 0.147 | 7,350 | 1,103 | 0.105 | 6,300 | 998 | 0.084 | 6,300 | 893 | 0.061 |
| 〃 | 50 | 1° | 7,800 | 1,910 | 0.122 | 5,980 | 980 | 0.088 | 5,000 | 845 | 0.070 | 5,300 | 760 | 0.055 |
| 〃 | 60 | 1° | 6,100 | 1,670 | 0.105 | 5,285 | 820 | 0.070 | 4,180 | 760 | 0.062 | 4,300 | 620 | 0.048 |
| 〃 | 70 | 1° | 4,725 | 1,470 | 0.074 | 4,095 | 735 | 0.063 | 3,570 | 683 | 0.053 | 3,570 | 578 | 0.042 |
| 〃 | 80 | 1° | 3,540 | 1,320 | 0.061 | 3,400 | 640 | 0.046 | 2,100 | 510 | 0.040 | 2,100 | 468 | 0.033 |
| 〃 | 49 | 1° 30 | 7,800 | 1,910 | 0.122 | 5,980 | 980 | 0.088 | 5,000 | 845 | 0.070 | 5,300 | 760 | 0.055 |
| 〃 | 85 | 1° 30 | 3,360 | 1,220 | 0.055 | 3,100 | 580 | 0.040 | 1,880 | 460 | 0.035 | 1,880 | 448 | 0.028 |
| 〃 | 60 | 2° | 6,100 | 1,670 | 0.105 | 5,285 | 820 | 0.070 | 4,180 | 760 | 0.062 | 4,300 | 620 | 0.048 |
| 〃 | 90 | 2° | 3,000 | 1,050 | 0.055 | 2,870 | 520 | 0.040 | 1,720 | 410 | 0.035 | 1,720 | 400 | 0.028 |
| R 4 | 50 | 1° | 9,345 | 2,310 | 0.189 | 7,350 | 1,155 | 0.147 | 6,300 | 1,050 | 0.105 | 6,300 | 840 | 0.086 |
| 〃 | 60 | 1° | 7,150 | 1,846 | 0.138 | 5,330 | 916 | 0.114 | 4,550 | 820 | 0.080 | 4,550 | 655 | 0.064 |
| 〃 | 80 | 1° | 4,515 | 1,365 | 0.095 | 3,360 | 683 | 0.084 | 3,045 | 578 | 0.068 | 3,045 | 473 | 0.042 |
| 〃 | 52 | 1° 30 | 9,345 | 2,310 | 0.197 | 7,350 | 1,155 | 0.154 | 6,300 | 1,050 | 0.113 | 6,300 | 840 | 0.094 |
| 〃 | 89 | 1° 30 | 3,400 | 1,090 | 0.073 | 2,970 | 578 | 0.046 | 1,890 | 454 | 0.041 | 1,860 | 443 | 0.033 |

## 2JJTB/3JJTBS Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | 40 ~ 45HRc | | | 45 ~ 55HRc | | | 55 ~ 62HRc | | | 62 ~ 70HRc | | |
| 반경 Radius | 유효장 Effective Length | 각도 Taper Angle | RPM | FEED | Ap Axial Depth | RPM | FEED | Ap Axial Depth | RPM | FEED | Ap Axial Depth | RPM | FEED | Ap Axial Depth |
| R 5 | 60 | 1° | 5,775 | 1,785 | 0.194 | 3,675 | 893 | 0.168 | 3,570 | 735 | 0.126 | 3,570 | 630 | 0.084 |
| 〃 | 75 | 1° | 4,200 | 998 | 0.093 | 3,150 | 504 | 0.068 | 2,940 | 420 | 0.053 | 2,940 | 336 | 0.034 |
| 〃 | 54 | 1° 30 | 6,175 | 1,850 | 0.220 | 3,935 | 923 | 0.185 | 3,760 | 768 | 0.146 | 3,760 | 678 | 0.097 |
| R 6 | 85 | 1° 30 | 2,940 | 336 | 0.063 | 1,995 | 168 | 0.032 | 1,575 | 158 | 0.016 | 1,575 | 105 | 0.011 |
| 〃 | 63 | 3° | 3,990 | 735 | 0.126 | 2,940 | 368 | 0.086 | 2,625 | 326 | 0.063 | 2,625 | 231 | 0.047 |

절입량
Depth of Cut




Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 ($min^{-1}$)
Vf : Feed 이송속도 (mm/min)

- 절삭조건에 없는 각도는 같은 직경에 이전 각도와 비례하여 사용하십시오.
- 이송속도 및 축방향의 절입깊이는 리브창과 테이퍼각에 따라 고려하시고, 절삭상황에 맞추어 조정하십시오.
- 에어브로 혹은 미스트 쿨런트를 추천하며, 동 가공 시 습식 쿨런트 추천합니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 적용 기계의 회전속도가 부족한 경우에는 회전속도와 이송속도를 같은 비율로 줄여서 적용합니다.
- 칩 제거 주의 및 가공시 발열, 발화에 주의하십시오.

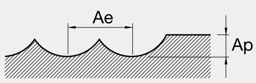
- If there is no same taper angle of your endmill on the table, refer to the previous taper angle of diameter and apply the same proportion.
- Adjust the value of the feed and Ap based on the effective length and taper angle, and adjust the milling condition.
- Air blow or mist coolant is recommended, and wet coolants are recommended for copper milling.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Where the parameters exceed the machine's maximum spindle speed, the RPM and feedrate should be reduced proportionally.
- Note for chip emission, heat or ignition.

## 2JJSP Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 공구강 / 금형강 Tool Steels / Alloy Steels SCM/HPM | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | 스테인레스강 Stainless Steels SUS304/SUS316 | | 고경도강 Hardened Steels STAVAX/SKD11 | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11/ SKD61/ YXR7/ R7 / SKH51 | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11/ SKD61/ YXR7/ R7 / SKH51 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | 40 ~ 45HRc | | - | | 45 ~ 55HRc | | 55 ~ 60HRc | | 60 ~ 70HRc | |
| 반경 Radius | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| R 0.5 | 25,600 | 680 | 25,600 | 680 | 25,600 | 680 | 25,600 | 680 | 25,600 | 610 | 25,600 | 610 |
| R 0.75 | 22,000 | 850 | 22,000 | 850 | 22,000 | 850 | 22,000 | 850 | 22,000 | 750 | 22,000 | 750 |
| R 1 | 19,200 | 1,080 | 19,200 | 1,080 | 19,200 | 1,080 | 19,200 | 1,080 | 19,200 | 960 | 17,600 | 960 |
| R 2 | 12,400 | 1,440 | 11,200 | 1,240 | 10,800 | 1,160 | 10,000 | 1,080 | 10,000 | 920 | 8,800 | 920 |
| R 3 | 8,400 | 1,480 | 7,600 | 1,360 | 7,200 | 1,280 | 6,800 | 1,200 | 6,800 | 1,040 | 5,900 | 1,040 |
| R 4 | 6,400 | 1,120 | 5,700 | 1,000 | 5,500 | 960 | 5,100 | 880 | 5,100 | 790 | 4,400 | 790 |
| R 5 | 5,100 | 880 | 4,600 | 800 | 4,400 | 784 | 4,000 | 720 | 4,000 | 640 | 3,600 | 640 |
| R 6 | 4,800 | 840 | 3,800 | 670 | 3,640 | 640 | 3,400 | 600 | 3,400 | 540 | 3,000 | 540 |

절입량
Depth of Cut




| Ap | Ae |
|---|---|
| 0.05D | 0.05D |

~ 55HRC

| Ap | Ae |
|---|---|
| 0.02D | 0.05D |

~ 70HRC

- 절삭조건의 ap, ae 수치는 황삭 및 황중삭의 수치 이므로, 견고한 조도의 가공을 원하시면 황삭 값의 50%를 적용 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건 표가 기계의 최대스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.

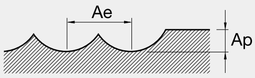
- The values of ap and ae on the table are for roughing or semi-roughing. If you need a great surface roughness, apply 50% of the value.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

# 4JJSP/4JJSPM Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 공구강 / 금형강 Tool Steels / Alloy Steels SCM/HPM | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | 스테인레스강 Stainless Steels SUS304/SUS316 | | 고경도강 Hardened Steels STAVAX/SKD11 | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11/ SKD61/ YXR7/ R7 / SKH51 | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11/ SKD61/ YXR7/ R7 / SKH51 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | 40 ~ 45HRc | | - | | 45 ~ 55HRc | | 55 ~ 60HRc | | 60 ~ 70HRc | |
| 반경 Radius | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| R 0.5 | 25,600 | 806 | 25,600 | 806 | 25,600 | 806 | 25,600 | 806 | 25,600 | 723 | 25,600 | 723 |
| R 0.75 | 22,000 | 1,007 | 22,000 | 1,007 | 22,000 | 1,007 | 22,000 | 1,007 | 22,000 | 889 | 22,000 | 889 |
| R 1 | 19,200 | 1,280 | 19,200 | 1,280 | 19,200 | 1,280 | 19,200 | 1,280 | 19,200 | 1,138 | 17,600 | 1,138 |
| R 2 | 12,400 | 1,706 | 11,200 | 1,469 | 10,800 | 1,375 | 10,000 | 1,280 | 10,000 | 1,090 | 8,800 | 1,090 |
| R 3 | 8,400 | 1,754 | 7,600 | 1,612 | 7,200 | 1,517 | 6,800 | 1,422 | 6,800 | 1,232 | 5,900 | 1,232 |
| R 4 | 6,400 | 1,327 | 5,700 | 1,185 | 5,500 | 1,138 | 5,100 | 1,043 | 5,100 | 936 | 4,400 | 936 |
| R 5 | 5,100 | 1043 | 4,600 | 948 | 4,400 | 929 | 4,000 | 853 | 4,000 | 758 | 3,600 | 758 |
| R 6 | 4,800 | 995 | 3,800 | 794 | 3,640 | 758 | 3,400 | 711 | 3,400 | 640 | 3,000 | 640 |

절입량 Depth of Cut




| Ap | Ae |
|---|---|
| 0.05D | 0.05D |

~ 55HRC

| Ap | Ae |
|---|---|
| 0.02D | 0.05D |

~ 70HRC

- 절삭조건의 ap, ae 수치는 황색 및 황중삭의 수치 이므로, 견고한 조도의 가공을 원하시면 황삭 값의 50%를 적용 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시에는 가공 형상, 가공 목적, 적용 기계 등에 따라 조건을 조정 하십시오.
- 조건 표가 기계의 최대스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.

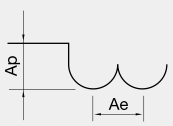
- The values of ap and ae on the table are for roughing or semi-roughing. If you need a great surface roughness, apply 50% of the value.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

# 2JJSB/2JJB/3JJB/4JJSB/4JJB

- **3JJB/4JJSB/4JJB** 는RPM 동일 , FEED만최대 **50% Up** 적용
- Use the same RPM and raise up the feed up to 50% for 3JJB/ 4JJSB/ 4JJB

| 피삭재 Material | 고경도강 Hardened Steels STAVAX/SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | | 62 ~ 70HRc | | | |
| 반경 Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 0.05 | 60,000 | 150 | 0.002 | 0.003 | 60,000 | 100 | 0.001 | 0.0012 | 52,500 | 30 | 0.001 | 0.002 |
| R 0.1 | 60,000 | 180 | 0.002 | 0.003 | 60,000 | 120 | 0.002 | 0.003 | 45,000 | 60 | 0.002 | 0.003 |
| R 0.15 | 45,000 | 310 | 0.004 | 0.007 | 43,500 | 180 | 0.003 | 0.005 | 32,500 | 90 | 0.003 | 0.005 |
| R 0.2 | 37,500 | 420 | 0.007 | 0.012 | 35,000 | 240 | 0.005 | 0.008 | 26,250 | 120 | 0.005 | 0.008 |
| R 0.25 | 33,000 | 530 | 0.010 | 0.02 | 30,000 | 300 | 0.007 | 0.01 | 22,500 | 150 | 0.007 | 0.01 |
| R 0.3 | 30,000 | 1,200 | 0.02 | 0.1 | 26,500 | 800 | 0.01 | 0.075 | 20,000 | 400 | 0.01 | 0.075 |
| R 0.4 | 27,000 | 1,600 | 0.04 | 0.17 | 23,500 | 1,000 | 0.02 | 0.12 | 17,500 | 500 | 0.02 | 0.12 |
| R 0.5 | 24,000 | 2,000 | 0.1 | 0.3 | 21,000 | 1,750 | 0.05 | 0.2 | 16,000 | 875 | 0.05 | 0.2 |
| R 0.6 | 21,000 | 2,000 | 0.1 | 0.3 | 18,000 | 1,750 | 0.05 | 0.2 | 14,500 | 875 | 0.05 | 0.2 |
| R 0.75 | 17,000 | 2,000 | 0.12 | 0.4 | 15,000 | 1,750 | 0.06 | 0.29 | 11,250 | 875 | 0.06 | 0.29 |
| R 1 | 14,000 | 2,100 | 0.15 | 0.5 | 12,250 | 1,800 | 0.08 | 0.35 | 9,200 | 900 | 0.08 | 0.35 |
| R 1.25 | 12,250 | 2,150 | 0.17 | 0.6 | 10,700 | 1,850 | 0.1 | 0.45 | 8,050 | 925 | 0.1 | 0.45 |
| R 1.5 | 10,500 | 2,200 | 0.2 | 0.7 | 9,200 | 1,900 | 0.12 | 0.55 | 6,900 | 950 | 0.12 | 0.55 |
| R 2 | 9,000 | 2,300 | 0.25 | 0.95 | 7,900 | 2,000 | 0.15 | 0.75 | 5,900 | 1,000 | 0.15 | 0.75 |
| R 2.5 | 7,800 | 2,500 | 0.25 | 1.05 | 6,800 | 2,100 | 0.15 | 0.85 | 5,100 | 1,050 | 0.15 | 0.85 |
| R 3 | 6,500 | 2,500 | 0.3 | 1.3 | 5,700 | 2,200 | 0.2 | 1 | 4,300 | 1,100 | 0.2 | 1 |
| R 4 | 5,200 | 2,200 | 0.4 | 1.7 | 4,500 | 1,900 | 0.25 | 1.35 | 3,400 | 950 | 0.25 | 1.35 |
| R 5 | 4,300 | 2,000 | 0.5 | 2.1 | 3,750 | 1,750 | 0.3 | 1.7 | 2,800 | 875 | 0.3 | 1.7 |
| R 6 | 3,600 | 1,750 | 0.6 | 2.6 | 3,150 | 1,500 | 0.35 | 2 | 2,350 | 750 | 0.35 | 2 |

절입량 Depth of Cut




Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 ($min^{-1}$)
Vf : Feed 이송속도 (mm/min)

- HRC55 이하 피삭재(합금강, 공구강) 가공시 같은 파이에 대비 상기 절삭조건의 20% UP 해주십시오.
- 날수 변화시 회전수는 유지하고, 피드는 안정적인 속도내에서 최대 50%까지 UP 해주십시오. (3JJB, 4JJSB, 4JJB)
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작 기계 사용 요망 합니다(Ø1 이하 사용 시 진동 허용 관리 5㎛ 이내일 것.)
- 에어브로 혹은 미스트 쿨런트를 추천 합니다.

- When milling workpiece, HRC below 55 (Alloy steel, tool steel), Raise up 20% RPM and feed compared to the same diameter.
- Changing flutes from 3 to 4, use the same RPM and raise up the feed up to 50% in stable condition (3JJB, 4JJSB, 4JJB).
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management will be within 5㎛).
- Air blow or mist coolants are recommended.

# 2JJRE/4JJRE

■ 4JJRE는RPM 동일, FEED만 최대 **50% Up** 적용.
■ Use the same RPM and raise up the feed up to 50% for 4JJRE.

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | |
| 외경 Outside Diameter | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 4 | 24,480 | 936 | 0.100 | 0.100 | 21,600 | 699 | 0.100 | 0.100 | 20,160 | 563 | 0.100 | 0.100 |
| 〃 | 6 | 22,032 | 773 | 0.040 | 0.040 | 19,440 | 577 | 0.040 | 0.040 | 18,144 | 465 | 0.040 | 0.040 |
| 〃 | 8 | 22,032 | 773 | 0.040 | 0.040 | 19,440 | 577 | 0.040 | 0.040 | 18,144 | 465 | 0.040 | 0.040 |
| 〃 | 10 | 22,032 | 773 | 0.025 | 0.025 | 19,440 | 577 | 0.025 | 0.025 | 18,144 | 465 | 0.025 | 0.025 |
| 〃 | 12 | 19,584 | 502 | 0.025 | 0.025 | 17,280 | 443 | 0.025 | 0.025 | 16,128 | 348 | 0.025 | 0.025 |
| 〃 | 14 | 19,584 | 502 | 0.025 | 0.025 | 17,280 | 443 | 0.025 | 0.025 | 16,128 | 348 | 0.025 | 0.025 |
| 〃 | 16 | 19,584 | 476 | 0.015 | 0.015 | 17,280 | 373 | 0.015 | 0.015 | 16,128 | 283 | 0.015 | 0.015 |
| ø 1.2 | 6 | 21,760 | 764 | 0.084 | 0.084 | 19,200 | 570 | 0.084 | 0.084 | 17,920 | 460 | 0.084 | 0.084 |
| 〃 | 8 | 19,584 | 687 | 0.048 | 0.048 | 17,280 | 513 | 0.048 | 0.048 | 16,128 | 414 | 0.048 | 0.048 |
| 〃 | 10 | 19,584 | 687 | 0.030 | 0.030 | 17,280 | 513 | 0.030 | 0.030 | 16,128 | 414 | 0.030 | 0.030 |
| 〃 | 12 | 19,584 | 687 | 0.030 | 0.030 | 17,280 | 513 | 0.030 | 0.030 | 16,128 | 414 | 0.030 | 0.030 |
| 〃 | 16 | 17,408 | 611 | 0.020 | 0.020 | 15,360 | 456 | 0.020 | 0.020 | 14,336 | 368 | 0.020 | 0.020 |
| ø 1.4 | 8 | 19,040 | 668 | 0.100 | 0.100 | 16,800 | 499 | 0.100 | 0.100 | 15,680 | 402 | 0.100 | 0.100 |
| 〃 | 10 | 17,136 | 601 | 0.056 | 0.056 | 15,120 | 449 | 0.056 | 0.056 | 14,112 | 362 | 0.056 | 0.056 |
| 〃 | 14 | 17,136 | 601 | 0.035 | 0.035 | 15,120 | 449 | 0.035 | 0.035 | 14,112 | 362 | 0.035 | 0.035 |
| 〃 | 16 | 15,232 | 391 | 0.035 | 0.035 | 13,440 | 345 | 0.035 | 0.035 | 12,544 | 271 | 0.035 | 0.035 |
| ø 1.5 | 6 | 19,040 | 668 | 0.110 | 0.110 | 16,800 | 499 | 0.110 | 0.110 | 15,680 | 402 | 0.110 | 0.110 |
| 〃 | 8 | 19,040 | 668 | 0.110 | 0.110 | 16,800 | 499 | 0.110 | 0.110 | 15,680 | 402 | 0.110 | 0.110 |
| 〃 | 10 | 17,136 | 601 | 0.060 | 0.060 | 15,120 | 449 | 0.060 | 0.060 | 14,112 | 362 | 0.060 | 0.060 |
| 〃 | 12 | 17,136 | 601 | 0.060 | 0.060 | 15,120 | 449 | 0.060 | 0.060 | 14,112 | 362 | 0.060 | 0.060 |
| 〃 | 14 | 17,136 | 601 | 0.060 | 0.060 | 15,120 | 449 | 0.060 | 0.060 | 14,112 | 362 | 0.060 | 0.060 |
| 〃 | 16 | 15,232 | 391 | 0.038 | 0.038 | 13,440 | 345 | 0.038 | 0.038 | 12,544 | 271 | 0.038 | 0.038 |
| 〃 | 18 | 15,232 | 391 | 0.038 | 0.038 | 13,440 | 345 | 0.038 | 0.038 | 12,544 | 271 | 0.038 | 0.038 |
| 〃 | 20 | 15,232 | 391 | 0.038 | 0.038 | 13,440 | 345 | 0.038 | 0.038 | 12,544 | 271 | 0.038 | 0.038 |
| 〃 | 25 | 11,424 | 278 | 0.023 | 0.023 | 10,080 | 218 | 0.023 | 0.023 | 9,408 | 165 | 0.023 | 0.023 |
| ø 1.6 | 10 | 15,912 | 621 | 0.040 | 0.040 | 14,040 | 463 | 0.040 | 0.040 | 13,104 | 373 | 0.040 | 0.040 |
| 〃 | 14 | 15,912 | 621 | 0.040 | 0.040 | 14,040 | 463 | 0.040 | 0.040 | 13,104 | 373 | 0.040 | 0.040 |
| 〃 | 18 | 15,912 | 621 | 0.040 | 0.040 | 14,040 | 463 | 0.040 | 0.040 | 13,104 | 373 | 0.040 | 0.040 |
| ø 1.8 | 10 | 15,912 | 621 | 0.072 | 0.072 | 14,040 | 463 | 0.072 | 0.072 | 13,104 | 373 | 0.072 | 0.072 |
| 〃 | 14 | 15,912 | 621 | 0.072 | 0.072 | 14,040 | 463 | 0.072 | 0.072 | 13,104 | 373 | 0.072 | 0.072 |
| 〃 | 18 | 15,912 | 621 | 0.072 | 0.072 | 14,040 | 463 | 0.072 | 0.072 | 13,104 | 373 | 0.072 | 0.072 |
| ø 2 | 6 | 14,280 | 668 | 0.200 | 0.200 | 12,600 | 499 | 0.200 | 0.200 | 11,760 | 402 | 0.200 | 0.200 |
| 〃 | 8 | 14,280 | 668 | 0.140 | 0.140 | 12,600 | 499 | 0.140 | 0.140 | 11,760 | 402 | 0.140 | 0.140 |
| 〃 | 10 | 14,280 | 668 | 0.140 | 0.140 | 12,600 | 499 | 0.140 | 0.140 | 11,760 | 402 | 0.140 | 0.140 |
| 〃 | 12 | 12,852 | 601 | 0.080 | 0.080 | 11,340 | 449 | 0.080 | 0.080 | 10,584 | 362 | 0.080 | 0.080 |
| 〃 | 14 | 12,852 | 601 | 0.080 | 0.080 | 11,340 | 449 | 0.080 | 0.080 | 10,584 | 362 | 0.080 | 0.080 |
| 〃 | 16 | 12,852 | 601 | 0.080 | 0.080 | 11,340 | 449 | 0.080 | 0.080 | 10,584 | 362 | 0.080 | 0.080 |
| 〃 | 18 | 12,852 | 601 | 0.050 | 0.050 | 11,340 | 449 | 0.050 | 0.050 | 10,584 | 362 | 0.050 | 0.050 |
| 〃 | 20 | 12,852 | 601 | 0.050 | 0.050 | 11,340 | 449 | 0.050 | 0.050 | 10,584 | 362 | 0.050 | 0.050 |
| 〃 | 25 | 11,424 | 391 | 0.050 | 0.050 | 10,080 | 345 | 0.050 | 0.050 | 9,408 | 271 | 0.050 | 0.050 |
| 〃 | 30 | 11,424 | 391 | 0.030 | 0.030 | 10,080 | 345 | 0.030 | 0.030 | 9,408 | 271 | 0.030 | 0.030 |
| ø 2.5 | 12 | 12,240 | 716 | 0.180 | 0.180 | 10,800 | 535 | 0.180 | 0.180 | 10,080 | 431 | 0.180 | 0.180 |
| 〃 | 16 | 11,116 | 644 | 0.100 | 0.100 | 9,720 | 388 | 0.100 | 0.100 | 9,072 | 388 | 0.100 | 0.100 |
| 〃 | 20 | 11,116 | 644 | 0.100 | 0.100 | 9,720 | 481 | 0.100 | 0.100 | 9,072 | 388 | 0.100 | 0.100 |
| ø 3 | 12 | 10,880 | 636 | 0.210 | 0.210 | 9,600 | 475 | 0.210 | 0.210 | 8,960 | 383 | 0.210 | 0.210 |
| 〃 | 16 | 9,792 | 573 | 0.120 | 0.120 | 8,640 | 428 | 0.120 | 0.120 | 8,064 | 345 | 0.120 | 0.120 |
| 〃 | 20 | 9792 | 573 | 0.12 | 0.120 | 8640 | 428 | 0.12 | 0.120 | 8064 | 345 | 0.12 | 0.120 |
| 〃 | 25 | 9792 | 573 | 0.08 | 0.080 | 8640 | 428 | 0.08 | 0.080 | 8064 | 345 | 0.08 | 0.080 |
| 〃 | 30 | 9792 | 573 | 0.08 | 0.080 | 8640 | 428 | 0.08 | 0.080 | 8064 | 345 | 0.08 | 0.080 |
| 〃 | 40 | 8704 | 509 | 0.05 | 0.050 | 7680 | 380 | 0.05 | 0.050 | 7168 | 307 | 0.05 | 0.050 |
| ø 4 | 12 | 8000 | 1358 | 0.4 | 0.400 | 7050 | 902 | 0.4 | 0.400 | 6580 | 727 | 0.4 | 0.400 |
| 〃 | 16 | 8000 | 1358 | 0.4 | 0.400 | 7050 | 902 | 0.4 | 0.400 | 6580 | 727 | 0.4 | 0.400 |
| 〃 | 20 | 7800 | 1200 | 0.3 | 0.300 | 6800 | 800 | 0.3 | 0.300 | 6200 | 720 | 0.3 | 0.300 |
| 〃 | 25 | 7800 | 1200 | 0.3 | 0.300 | 6800 | 800 | 0.3 | 0.300 | 6200 | 720 | 0.3 | 0.300 |
| 〃 | 30 | 7800 | 1200 | 0.3 | 0.300 | 6800 | 800 | 0.3 | 0.300 | 6200 | 720 | 0.3 | 0.300 |
| 〃 | 35 | 7600 | 1150 | 0.2 | 0.200 | 6700 | 780 | 0.2 | 0.200 | 6000 | 700 | 0.2 | 0.200 |
| 〃 | 40 | 7600 | 1150 | 0.2 | 0.200 | 6700 | 780 | 0.2 | 0.200 | 6000 | 700 | 0.2 | 0.200 |
| 〃 | 45 | 7600 | 1150 | 0.2 | 0.200 | 6700 | 780 | 0.2 | 0.200 | 6000 | 700 | 0.2 | 0.200 |
| 〃 | 50 | 7600 | 1150 | 0.2 | 0.200 | 6700 | 780 | 0.2 | 0.200 | 6000 | 700 | 0.2 | 0.200 |
| ø 5 | 16 | 7400 | 1060 | 0.60 | 0.600 | 6600 | 760 | 0.4 | 0.400 | 5900 | 680 | 0.4 | 0.400 |
| 〃 | 20 | 7400 | 1060 | 0.60 | 0.600 | 6600 | 760 | 0.4 | 0.400 | 5900 | 680 | 0.4 | 0.400 |
| 〃 | 25 | 7400 | 1060 | 0.450 | 0.450 | 6600 | 760 | 0.3 | 0.300 | 5900 | 680 | 0.3 | 0.300 |
| 〃 | 30 | 7200 | 1000 | 0.300 | 0.300 | 6200 | 740 | 0.2 | 0.200 | 5800 | 650 | 0.2 | 0.200 |
| 〃 | 35 | 7200 | 1000 | 0.300 | 0.300 | 6200 | 740 | 0.2 | 0.200 | 5800 | 650 | 0.2 | 0.200 |
| 〃 | 40 | 7000 | 980 | 0.300 | 0.300 | 6000 | 700 | 0.2 | 0.200 | 5600 | 620 | 0.2 | 0.200 |
| 〃 | 50 | 7000 | 980 | 0.300 | 0.300 | 6000 | 700 | 0.2 | 0.200 | 5600 | 620 | 0.2 | 0.200 |
| ø 6 | 20 | 6800 | 950 | 0.150 | 0.150 | 5800 | 680 | 0.1 | 0.100 | 5400 | 600 | 0.1 | 0.100 |
| 〃 | 30 | 6800 | 950 | 0.150 | 0.150 | 5800 | 680 | 0.1 | 0.100 | 5400 | 600 | 0.1 | 0.100 |

## 2JJRE/4JJRE

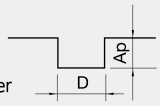
■ 4JJRE는 RPM 동일 , FEED만최대 **50% Up** 적용.
■ Use the same RPM and raise up the feed up to 50% for 4JJRE.

• RPM : rev./min • Feed : mm/min

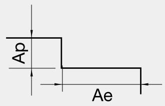
| 피삭재 Material | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 38 ~ 45HRc | | | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | |
| 외경 Outside Diameter | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| 〃 | 40 | 6800 | 950 | 0.150 | 0.150 | 5800 | 680 | 0.1 | 0.100 | 5400 | 600 | 0.1 | 0.100 |
| 〃 | 50 | 6500 | 900 | 0.135 | 0.135 | 5600 | 650 | 0.09 | 0.090 | 5000 | 560 | 0.09 | 0.090 |
| 〃 | 60 | 6500 | 900 | 0.135 | 0.135 | 5600 | 650 | 0.09 | 0.090 | 5000 | 560 | 0.09 | 0.090 |

**절입량**
Depth of Cut

Slotting
• Ap : Axial Depth
• D : Outside Diameter




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




• 4날시 회전수는 유지하고, 피드는 안정적인 속도내에서 최대 50%까지 UP 해주십시오.
• 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
• HRC65 이상 고경도강 가공 시 같은 직경의 같은 비율로 20% DOWN 해주십시오.
• 상기 절삭조건은 참고 수치이므로 실 가공시에는 가공 형상, 가공 목적, 적용 기계 등에 따라 조건을 조정 하십시오.
• 조건 표가 기계의 최대스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
• 진동이 적고 강성이 좋은 공작 기계 사용 요망 합니다(Ø1 이하 사용 시 진동 허용 관리 5㎛ 이내일 것.)
• 에어브로, 절삭유, 오일미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

• For 4JJRE, use the same RPM and raise up the feed up to 50% in stable condition.
• The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
• When milling hardened material, HRC over 65, decrease by 20% RPM and feed compared to the same diameter.
• Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
• If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
• Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management will be within 5㎛.)
• Air blow or mist coolants are recommended and note for chip emission, heat or ignition.

## 4JJE Cutting Condition

| 피삭재 Material | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | 고경도강 Hardened Steels STAVAX/SKD11 | |
|---|---|---|---|---|
| 경도 Hardness | 40 ~ 45HRc | | 45 ~ 55HRc | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED |
| ø 1 | 31,500 | 1,050 | 20,300 | 710 |
| ø 2 | 20,200 | 1,250 | 14,300 | 840 |
| ø 3 | 14,300 | 1,250 | 8,500 | 840 |
| ø 4 | 11,400 | 1,300 | 7,200 | 880 |
| ø 5 | 10,500 | 1,500 | 6,700 | 1,000 |
| ø 6 | 8,450 | 1,400 | 5,600 | 950 |
| ø 7 | 7,800 | 1,380 | 4,200 | 900 |
| ø 8 | 6,500 | 1,350 | 3,830 | 840 |
| ø 9 | 6,150 | 1,260 | 3,500 | 840 |
| ø 10 | 5,250 | 1,260 | 2,800 | 800 |
| ø 11 | 4,300 | 1,150 | 2,500 | 800 |
| ø 12 | 4,300 | 1,150 | 2,300 | 760 |
| ø 14 | 3,500 | 1,050 | 2,100 | 760 |
| ø 16 | 3,500 | 1,050 | 2,000 | 700 |
| ø 18 | 2,800 | 1,000 | 2,000 | 700 |
| ø 20 | 2,600 | 980 | 1,800 | 650 |

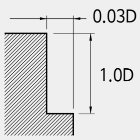
## 4JJHE

**6&8JJHE** : RPM 동일, FEED만 최대 **50% Up** 적용.
Use the same RPM, raise up the feed up to 50%

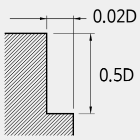
| 피삭재 Material | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 55 ~ 62HRc | | | | 62 ~ 70HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 32,000 | 800 | 0.5 | 0.02 | 28,000 | 500 | 0.5 | 0.02 |
| ø 1.5 | 30,000 | 900 | 0.75 | 0.03 | 25,000 | 550 | 0.75 | 0.03 |
| ø 2 | 24,000 | 1,000 | 1 | 0.04 | 16,000 | 600 | 1 | 0.04 |
| ø 3 | 38,400 | 1,600 | 1.5 | 0.06 | 19,200 | 1,140 | 1.5 | 0.06 |
| ø 4 | 28,800 | 1,850 | 2 | 0.08 | 14,400 | 1,320 | 2 | 0.08 |
| ø 5 | 24,000 | 2,100 | 2.5 | 0.1 | 12,000 | 1,500 | 2.5 | 0.1 |
| ø 6 | 19,200 | 2,430 | 3 | 0.12 | 9,600 | 1,740 | 3 | 0.12 |
| ø 8 | 14,400 | 2,430 | 4 | 0.16 | 7,200 | 1,740 | 4 | 0.16 |
| ø 10 | 11,520 | 2,430 | 5 | 0.2 | 5,760 | 1,740 | 5 | 0.2 |
| ø 12 | 9,600 | 2,010 | 6 | 0.24 | 4,800 | 1,440 | 6 | 0.24 |
| ø 16 | 7,200 | 1,500 | 8 | 0.32 | 3,600 | 1,080 | 8 | 0.32 |
| ø 20 | 5,760 | 1,200 | 10 | 0.4 | 2,880 | 850 | 10 | 0.4 |

**절입량**
Depth of Cut

~ 55HRC




55HRC ~




• HRC55 이하 피삭재(합금강, 공구강) 가공시 같은 파이에 대비 상기 절삭조건의 20% UP 해주십시오.
• JJHE의 6~8날 가공시 회전수는 유지하고, 안정적인 속도내에서 피드를 최대 50%까지 UP 해주십시오.
• JJHE Series 제품은 홈절삭보다 측면절삭에 효율이 높은점 참고 바랍니다.
• 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
• 조건표가 기계의 최대스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
• 소재 및 가공 형상에 적합한 절삭유를 사용하십시오.

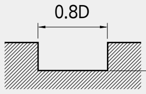
• When milling workpiece, HRC below 55 (Alloy steel, tool steel), Raise up 20% RPM and feed compared to the same diameter.
• For 6-8 flutes of JJHE, keep the RPM and raise up the feed up to 50% in the stable milling condition.
• Note that JJHE series performs better in side milling rather than groove milling.
• Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
• If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
• Use suitable cutting oil for material and machining geometry.

# 2JJE Cutting Condition

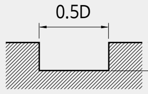
• RPM : rev./min • Feed : mm/min

| | 홈 절삭 Slotting | | | | | | 측면절삭 Side Cutting | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 피삭재 Material | 고경도강 Hardened Steels STAVAX/SKD11 | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | 고경도강 Hardened Steels STAVAX/SKD11 | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | |
| 경도 Hardness | 45 ~ 55HRc | | 55 ~ 65HRc | | 62 ~ 70HRc | | 45 ~ 55HRc | | 55 ~ 62HRc | | 62 ~ 70HRc | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| ø 0.1 | 33,000 | 50 | 33,000 | 40 | 26,400 | 30 | • 측면절삭불가<br>• Side cutting is not possible. | | | | | |
| ø 0.2 | 33,000 | 60 | 33,000 | 45 | 20,000 | 35 | | | | | | |
| ø 0.3 | 33,000 | 70 | 25,000 | 50 | 20,000 | 40 | | | | | | |
| ø 0.4 | 33,000 | 90 | 25,000 | 55 | 20,000 | 60 | | | | | | |
| ø 0.5 | 33,000 | 140 | 25,000 | 85 | 20,000 | 75 | | | | | | |
| ø 0.6 | 30,000 | 160 | 25,000 | 105 | 15,200 | 80 | | | | | | |
| ø 0.8 | 25,000 | 185 | 19,000 | 110 | 14,000 | 90 | | | | | | |
| ø 0.9 | 22,700 | 205 | 17,500 | 125 | 12,500 | 85 | | | | | | |
| ø 1 | 20,500 | 670 | 16,000 | 340 | 12,500 | 160 | 20,500 | 775 | 16,000 | 340 | 12,500 | 323 |
| ø 2 | 14,500 | 800 | 11,000 | 400 | 9,500 | 210 | 14,500 | 925 | 11,000 | 415 | 9,500 | 394 |
| ø 3 | 9,500 | 800 | 7,500 | 400 | 6,400 | 210 | 9,500 | 925 | 7,500 | 415 | 6,400 | 394 |
| ø 4 | 7,200 | 840 | 5,600 | 425 | 4,750 | 220 | 7,200 | 960 | 5,600 | 430 | 4,750 | 409 |
| ø 5 | 6,400 | 885 | 5,100 | 450 | 4,450 | 245 | 6,400 | 1,020 | 5,100 | 470 | 4,450 | 447 |
| ø 6 | 5,300 | 870 | 4,200 | 450 | 3,700 | 240 | 5,300 | 1,000 | 4,200 | 460 | 3,700 | 437 |
| ø 8 | 4,000 | 800 | 3,200 | 400 | 2,800 | 220 | 4,000 | 910 | 3,200 | 425 | 2,800 | 404 |
| ø 10 | 3,200 | 750 | 2,550 | 390 | 2,200 | 210 | 3,200 | 850 | 2,550 | 400 | 2,200 | 380 |
| ø 12 | 2,650 | 750 | 2,100 | 390 | 1,860 | 210 | 2,650 | 850 | 2,100 | 400 | 1,860 | 380 |
| ø 16 | 1,840 | 560 | 1,800 | 250 | 1,460 | 185 | 1,840 | 750 | 1,800 | 340 | 1,800 | 323 |
| ø 18 | 1,840 | 560 | 1,800 | 250 | 1,460 | 185 | 1,840 | 750 | 1,800 | 340 | 1,800 | 323 |
| ø 20 | 1,460 | 560 | 1,400 | 250 | 1,100 | 185 | 1,460 | 750 | 1,400 | 325 | 1,400 | 309 |

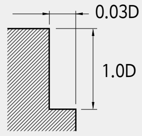
**절입량 Depth of Cut**

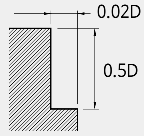


~ 60HRC



60HRC ~

~ 60HRC



60HRC ~



- HRC55 이하 피삭재(합금강, 공구강) 가공시 같은 파이에 대비 상기 절삭조건의 20% UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로  실가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 소재 및 가공 형상에 적합한 절삭유를 사용하십시오.

- When milling workpiece, HRC below 55 (Alloy steel, tool steel), Raise up 20% RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use suitable cutting oil for material and machining geometry.

# 2JJCR / 2JJTC Cutting Condition

• RPM : rev./min • Feed : mm/min

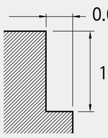
## 홈절삭 Slotting

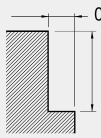
| 피삭재 Material | | 고경도강 Hardened Steels STAVAX/SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | | 62 ~ 70HRc | | | |
| 외경 Outside Diameter | 반경 Corner Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.4 | R 0.1 | 33,000 | 105 | 0.01 | 0.01 | 25,000 | 60 | 0.005 | 0.008 | 25,000 | 60 | 0.005 | 0.008 |
| ø 0.5 | R 0.1 | 33,000 | 110 | 0.015 | 0.02 | 25,000 | 65 | 0.007 | 0.010 | 20,000 | 40 | 0.007 | 0.010 |
| ø 0.8 | R 0.2 | 30,000 | 125 | 0.02 | 0.10 | 25,000 | 85 | 0.01 | 0.075 | 20,000 | 50 | 0.01 | 0.075 |
| ø 1 | R 0.3 | 25,000 | 226 | 0.04 | 0.15 | 19,000 | 131 | 0.02 | 0.12 | 16,000 | 74 | 0.02 | 0.12 |
| ø 1.5 | R 0.5 | 20,500 | 268 | 0.10 | 0.30 | 16,000 | 157 | 0.05 | 0.20 | 12,500 | 95 | 0.05 | 0.20 |
| ø 2 | R 0.5 | 14,500 | 324 | 0.15 | 0.50 | 11,000 | 186 | 0.1 | 0.25 | 9,500 | 124 | 0.10 | 0.30 |
| ø 2.5 | R 0.5 | 9,500 | 324 | 0.20 | 0.50 | 7,500 | 186 | 0.12 | 0.35 | 6,400 | 124 | 0.12 | 0.40 |
| ø 3 | R 0.5 | 9,500 | 324 | 0.20 | 0.50 | 7,500 | 186 | 0.12 | 0.35 | 6,400 | 124 | 0.12 | 0.40 |
| ø 4 | R 0.3 | 7,200 | 337 | 0.25 | 0.30 | 5,600 | 197 | 0.15 | 0.20 | 4,750 | 127 | 0.15 | 0.30 |
| ø 5 | R 0.5 | 6,400 | 356 | 0.25 | 0.50 | 5,100 | 209 | 0.15 | 0.50 | 4,450 | 142 | 0.15 | 0.40 |
| 〃 | R 1 | 6,400 | 356 | 0.40 | 1.05 | 5,100 | 209 | 0.35 | 0.80 | 4,450 | 142 | 0.30 | 0.70 |
| ø 6 | R 0.5 | 5,300 | 349 | 0.20 | 0.70 | 4,200 | 209 | 0.2 | 0.60 | 3,700 | 140 | 0.20 | 0.50 |
| 〃 | R 1 | 5,300 | 349 | 0.30 | 1.00 | 4,200 | 209 | 0.3 | 0.80 | 3,700 | 140 | 0.20 | 0.65 |
| 〃 | R 1.5 | 5,300 | 349 | 0.50 | 1.30 | 4,200 | 209 | 0.4 | 1.00 | 3,700 | 140 | 0.30 | 0.80 |
| ø 8 | R 0.5 | 4,000 | 318 | 0.30 | 0.70 | 3,200 | 191 | 0.20 | 0.60 | 2,800 | 130 | 0.20 | 0.50 |
| 〃 | R 1 | 4,000 | 318 | 0.40 | 1.00 | 3,200 | 191 | 0.25 | 0.90 | 2,800 | 130 | 0.25 | 0.70 |
| 〃 | R 1.5 | 4,000 | 318 | 0.40 | 1.30 | 3,200 | 191 | 0.25 | 1.20 | 2,800 | 130 | 0.25 | 0.80 |
| ø 10 | R 0.5 | 3,200 | 300 | 0.40 | 0.80 | 2,550 | 180 | 0.2 | 0.60 | 2,200 | 122 | 0.20 | 0.50 |
| 〃 | R 1 | 3,200 | 300 | 0.50 | 1.00 | 2,550 | 180 | 0.3 | 0.80 | 2,200 | 122 | 0.30 | 0.80 |
| 〃 | R 2 | 3,200 | 300 | 0.50 | 1.70 | 2,550 | 180 | 0.3 | 1.50 | 2,200 | 122 | 0.30 | 1.30 |
| ø 12 | R 0.5 | 2,650 | 300 | 0.50 | 1.00 | 2,100 | 180 | 0.35 | 0.80 | 1,860 | 122 | 0.20 | 0.60 |
| 〃 | R 1 | 2,650 | 300 | 0.60 | 1.30 | 2,100 | 180 | 0.35 | 1.20 | 1,860 | 122 | 0.30 | 1.00 |
| 〃 | R 2 | 2,650 | 300 | 0.60 | 1.80 | 2,100 | 180 | 0.35 | 1.70 | 1,860 | 122 | 0.30 | 1.40 |
| 〃 | R 3 | 2,650 | 300 | 0.60 | 2.50 | 2,100 | 180 | 0.40 | 2.00 | 1,860 | 122 | 0.30 | 1.80 |

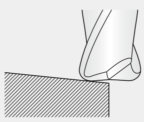
## 측면절삭 Side Cutting

| 피삭재 Material | 고경도강 Hardened Steels STAVAX/SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | | 62 ~ 70HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.4 | 33,000 | 105 | 0.40 | 0.012 | 25,000 | 60 | 0.2 | 0.008 | 25,000 | 60 | 0.2 | 0.008 |
| ø 0.5 | 33,000 | 110 | 0.50 | 0.015 | 25,000 | 65 | 0.25 | 0.010 | 20,000 | 40 | 0.25 | 0.010 |
| ø 0.8 | 30,000 | 125 | 0.80 | 0.024 | 25,000 | 85 | 0.4 | 0.016 | 20,000 | 50 | 0.4 | 0.016 |
| ø 1 | 25,000 | 145 | 1.00 | 0.030 | 19,000 | 128 | 0.5 | 0.02 | 16,000 | 74 | 0.5 | 0.02 |
| ø 2 | 14,500 | 208 | 2.00 | 0.060 | 11,000 | 129 | 1 | 0.04 | 9,500 | 76 | 1 | 0.04 |
| ø 3 | 9,500 | 208 | 3.00 | 0.090 | 7,500 | 131 | 1.5 | 0.06 | 6,400 | 77 | 1.5 | 0.06 |
| ø 4 | 7,200 | 216 | 4.00 | 0.120 | 5,600 | 132 | 2 | 0.08 | 4,750 | 78 | 2 | 0.08 |
| ø 6 | 5,300 | 224 | 6.00 | 0.180 | 4,200 | 133 | 3 | 0.12 | 3,700 | 80 | 3 | 0.12 |
| ø 8 | 4,000 | 204 | 8.00 | 0.240 | 3,200 | 135 | 4 | 0.16 | 2,800 | 81 | 4 | 0.16 |
| ø 10 | 3,200 | 192 | 10.00 | 0.300 | 2,550 | 136 | 5 | 0.20 | 2,200 | 82 | 5 | 0.20 |
| ø 12 | 2,650 | 192 | 12.00 | 0.360 | 2,100 | 138 | 6 | 0.24 | 1,860 | 84 | 6 | 0.24 |

절입량 Depth of Cut

~ 60HRC



60HRC ~


경사진면절삭
Inclined Cutting

- HRC55 이하 피삭재(합금강, 공구강) 가공시 같은 파이에 대비 상기 절삭조건의 20% UP 해주십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- 측면 절삭시 코너R 부분과 각도내용을 참고하여 절삭 하시기 바랍니다.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 에어브로, 절삭유, 오일미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- When milling workpiece, HRC below 55 (Alloy steel, tool steel), Raise up 20% RPM and feed compared to the same diameter.
- In case of long effective length, reduce the RPM and feed by 30% or less.
- For side milling, refer to the corner radius and
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed by 30% in stable condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

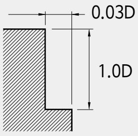
# 4JJCR/6JJCR/4JJTC

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

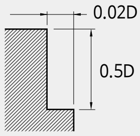
| 피삭재 Material | | 고경도강 Hardened Steels STAVAX/SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | | 62~ 70HRc | | | |
| 외경 Outside Diameter | 반경 Corner Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.5 | R 0.1 | 33,000 | 365 | 0.015 | 0.013 | 25,000 | 245 | 0.007 | 0.010 | 20,000 | 140 | 0.007 | 0.010 |
| ø 0.6 | R 0.1 | 30,000 | 380 | 0.02 | 0.098 | 25,000 | 250 | 0.01 | 0.075 | 20,000 | 150 | 0.01 | 0.075 |
| ø 0.7 | R 0.1 | 28,000 | 390 | 0.03 | 0.104 | 21,000 | 255 | 0.01 | 0.080 | 18,000 | 150 | 0.01 | 0.080 |
| ø 0.8 | R 0.1 | 25,500 | 400 | 0.04 | 0.120 | 19,000 | 260 | 0.02 | 0.10 | 16,000 | 155 | 0.02 | 0.10 |
| ø 1 | R 0.1 | 20,500 | 710 | 0.08 | 0.156 | 16,000 | 392 | 0.04 | 0.12 | 12,500 | 236 | 0.03 | 0.12 |
| 〃 | R 0.3 | 20,500 | 710 | 0.10 | 0.104 | 16,000 | 393 | 0.05 | 0.08 | 12,500 | 238 | 0.05 | 0.06 |
| ø 1.5 | R 0.1 | 18,000 | 759 | 0.12 | 0.125 | 13,000 | 394 | 0.07 | 0.10 | 10,500 | 239 | 0.05 | 0.08 |
| 〃 | R 0.5 | 18,000 | 759 | 0.15 | 0.156 | 13,000 | 396 | 0.10 | 0.12 | 10,500 | 240 | 0.07 | 0.10 |
| ø 2 | R 0.1 | 14,500 | 858 | 0.15 | 0.156 | 11,000 | 397 | 0.10 | 0.12 | 9,500 | 242 | 0.10 | 0.10 |
| 〃 | R 0.5 | 14,500 | 858 | 0.18 | 0.187 | 11,000 | 399 | 0.10 | 0.14 | 9,500 | 243 | 0.10 | 0.12 |
| ø 2.5 | R 0.1 | 11,500 | 858 | 0.16 | 0.166 | 8,500 | 400 | 0.10 | 0.13 | 7,500 | 244 | 0.10 | 0.10 |
| 〃 | R 0.5 | 11,500 | 858 | 0.19 | 0.198 | 8,500 | 402 | 0.10 | 0.15 | 7,500 | 246 | 0.10 | 0.12 |
| ø 3 | R 0.1 | 9,500 | 858 | 0.16 | 0.166 | 7,500 | 403 | 0.12 | 0.13 | 6,400 | 247 | 0.12 | 0.10 |
| 〃 | R 0.5 | 9,500 | 858 | 0.18 | 0.187 | 7,500 | 405 | 0.12 | 0.14 | 6,400 | 248 | 0.12 | 0.12 |
| 〃 | R 1 | 9,500 | 858 | 0.20 | 0.208 | 7,500 | 406 | 0.12 | 0.16 | 6,400 | 250 | 0.12 | 0.13 |
| ø 4 | R 0.1 | 7,200 | 891 | 0.20 | 0.208 | 5,600 | 407 | 0.12 | 0.16 | 4,750 | 251 | 0.12 | 0.13 |
| 〃 | R 0.5 | 7,200 | 891 | 0.25 | 0.260 | 5,600 | 409 | 0.12 | 0.20 | 4,750 | 252 | 0.15 | 0.16 |
| 〃 | R 1 | 7,200 | 891 | 0.25 | 0.260 | 5,600 | 410 | 0.15 | 0.20 | 4,750 | 254 | 0.15 | 0.16 |
| ø 5 | R 0.1 | 6,400 | 957 | 0.25 | 0.260 | 5,100 | 412 | 0.12 | 0.20 | 4,450 | 255 | 0.12 | 0.16 |
| 〃 | R 0.5 | 6,400 | 957 | 0.28 | 0.291 | 5,100 | 413 | 0.15 | 0.22 | 4,450 | 257 | 0.15 | 0.18 |
| 〃 | R 1 | 6,400 | 957 | 0.30 | 0.312 | 5,100 | 415 | 0.15 | 0.24 | 4,450 | 258 | 0.15 | 0.19 |
| ø 6 | R 0.1 | 5,300 | 924 | 0.30 | 0.312 | 4,200 | 416 | 0.20 | 0.24 | 3,700 | 259 | 0.20 | 0.19 |
| 〃 | R 0.5 | 5,300 | 924 | 0.30 | 0.312 | 4,200 | 418 | 0.20 | 0.24 | 3,700 | 261 | 0.20 | 0.19 |
| 〃 | R 1 | 5,300 | 924 | 0.40 | 0.416 | 4,200 | 419 | 0.25 | 0.32 | 3,700 | 262 | 0.25 | 0.26 |
| 〃 | R 1.5 | 5,300 | 924 | 0.40 | 0.416 | 4,200 | 421 | 0.25 | 0.32 | 3,700 | 263 | 0.25 | 0.26 |
| ø 8 | R 0.5 | 4,000 | 858 | 0.30 | 0.312 | 3,200 | 422 | 0.20 | 0.24 | 2,800 | 265 | 0.20 | 0.19 |
| 〃 | R 1 | 4,000 | 858 | 0.30 | 0.312 | 3,200 | 423 | 0.20 | 0.24 | 2,800 | 266 | 0.20 | 0.19 |
| 〃 | R 1.5 | 4,000 | 858 | 0.40 | 0.416 | 3,200 | 425 | 0.25 | 0.32 | 2,800 | 267 | 0.25 | 0.26 |
| 〃 | R 2 | 4,000 | 858 | 0.50 | 0.520 | 3,200 | 426 | 0.30 | 0.40 | 2,800 | 269 | 0.25 | 0.32 |
| ø 10 | R 0.5 | 3,200 | 792 | 0.40 | 0.416 | 2,550 | 428 | 0.20 | 0.32 | 2,200 | 270 | 0.20 | 0.26 |
| 〃 | R 1 | 3,200 | 792 | 0.45 | 0.468 | 2,550 | 429 | 0.25 | 0.36 | 2,200 | 271 | 0.25 | 0.29 |
| 〃 | R 1.5 | 3,200 | 792 | 0.50 | 0.520 | 2,550 | 431 | 0.30 | 0.40 | 2,200 | 273 | 0.30 | 0.32 |
| 〃 | R 2 | 3,200 | 792 | 0.50 | 0.520 | 2,550 | 432 | 0.30 | 0.40 | 2,200 | 274 | 0.30 | 0.32 |
| 〃 | R 2.5 | 3,200 | 792 | 0.50 | 0.520 | 2,550 | 434 | 0.30 | 0.40 | 2,200 | 275 | 0.30 | 0.32 |
| ø 12 | R 0.5 | 2,650 | 792 | 0.50 | 0.520 | 2,100 | 435 | 0.35 | 0.40 | 1,860 | 277 | 0.30 | 0.32 |
| 〃 | R 1 | 2,650 | 792 | 0.70 | 0.728 | 2,100 | 436 | 0.35 | 0.56 | 1,860 | 278 | 0.35 | 0.45 |
| 〃 | R 1.5 | 2,650 | 792 | 0.80 | 0.832 | 2,100 | 438 | 0.40 | 0.64 | 1,860 | 279 | 0.35 | 0.51 |
| 〃 | R 2 | 2,650 | 792 | 0.80 | 0.832 | 2,100 | 439 | 0.40 | 0.64 | 1,860 | 281 | 0.35 | 0.51 |
| 〃 | R 3 | 2,650 | 792 | 0.80 | 0.832 | 2,100 | 441 | 0.40 | 0.64 | 1,860 | 282 | 0.35 | 0.51 |

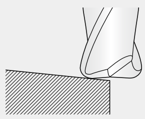
절입량 Depth of Cut

~ 60HRC




60HRC ~



경사진면절삭
Inclined Cutting

- 상기 조건표는 홈 절삭 조건표이며, 측면 절삭시 절입기준표를 참고바랍니다.
- HRC55 이하 피삭재(합금강, 공구강) 가공시 같은 파이에 대비 상기 절삭조건의 20% UP 해주십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 6날시 회전수는 유지하고, 피드는 안정적인 속도 내에서 최대 50%까지 UP 해주십시오.

- Above the table is a reference for groove milling, and refer to the depth of cut for side milling.
- When milling workpiece, HRC below 55 (Alloy steel, tool steel), Raise up 20% RPM and feed compared to the same diameter.
- In case of long effective length, reduce the RPM and feed by 30% or less.
- For curved milling, use the lower value of pitch than corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable condition.
- With 6flutes milling, raise up the feed up to 50% in stable condition.

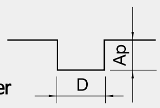
# 2JJC Cutting Condition

• RPM : rev./min • Feed : mm/min

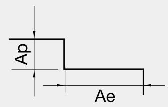
| 피삭재 Material | | 고경도강 Hardened Steels STAVAX/SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | | 62 ~ 70HRc | | | |
| 외경 Outside Diameter | 반경 Corner Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.2 | R 0.02 | 40,000 | 55 | 0.005 | 0.005 | 37,000 | 30 | 0.002 | 0.005 | 36,000 | 30 | 0.003 | 0.005 |
| ø 0.3 | R 0.02 | 40,000 | 60 | 0.007 | 0.007 | 37,000 | 35 | 0.003 | 0.006 | 36,000 | 35 | 0.004 | 0.006 |
| ø 0.4 | R 0.1 | 33,000 | 70 | 0.010 | 0.01 | 25,000 | 40 | 0.005 | 0.008 | 25,000 | 40 | 0.005 | 0.008 |
| ø 0.5 | R 0.1 | 33,000 | 80 | 0.015 | 0.02 | 25,000 | 45 | 0.007 | 0.010 | 20,000 | 30 | 0.007 | 0.010 |
| ø 0.6 | R 0.2 | 30,000 | 90 | 0.02 | 0.10 | 25,000 | 60 | 0.01 | 0.075 | 20,000 | 35 | 0.01 | 0.075 |
| ø 0.8 | R 0.2 | 25,000 | 100 | 0.04 | 0.15 | 19,000 | 65 | 0.02 | 0.12 | 16,000 | 40 | 0.02 | 0.12 |
| ø 1 | R 0.3 | 20,500 | 583 | 0.10 | 0.30 | 16,000 | 281 | 0.05 | 0.20 | 12,500 | 175 | 0.05 | 0.20 |
| ø 1.5 | R 0.1 | 16,500 | 623 | 0.12 | 0.35 | 13,000 | 283 | 0.07 | 0.30 | 10,500 | 177 | 0.07 | 0.30 |
| ø 2 | R 0.1 | 14,500 | 696 | 0.15 | 0.40 | 11,000 | 285 | 0.10 | 0.35 | 9,500 | 179 | 0.10 | 0.30 |
| ø 2.5 | R 0.1 | 11,500 | 696 | 0.20 | 0.60 | 8,800 | 287 | 0.12 | 0.40 | 7,400 | 180 | 0.10 | 0.35 |
| 〃 | R 0.5 | 11,500 | 696 | 0.21 | 0.60 | 8,800 | 289 | 0.12 | 0.45 | 7,400 | 182 | 0.10 | 0.40 |
| ø 3 | R 0.1 | 9,500 | 705 | 0.20 | 0.50 | 7,500 | 290 | 0.15 | 0.55 | 6,400 | 184 | 0.12 | 0.45 |
| 〃 | R 0.5 | 9,500 | 705 | 0.22 | 0.50 | 7,500 | 292 | 0.15 | 0.55 | 6,400 | 186 | 0.12 | 0.45 |
| 〃 | R 1 | 9,500 | 705 | 0.25 | 0.70 | 7,500 | 294 | 0.20 | 0.65 | 6,400 | 187 | 0.16 | 0.55 |
| ø 4 | R 0.1 | 7,200 | 724 | 0.25 | 0.95 | 5,600 | 296 | 0.15 | 0.75 | 4,750 | 189 | 0.15 | 0.65 |
| 〃 | R 0.5 | 7,200 | 724 | 0.25 | 0.95 | 5,600 | 298 | 0.15 | 0.75 | 4,750 | 191 | 0.15 | 0.65 |
| 〃 | R 1 | 7,200 | 724 | 0.30 | 1.20 | 5,600 | 300 | 0.20 | 1.00 | 4,750 | 193 | 0.20 | 0.90 |
| ø 5 | R 0.1 | 6,400 | 771 | 0.20 | 0.90 | 5,100 | 302 | 0.15 | 0.70 | 4,450 | 194 | 0.15 | 0.85 |
| 〃 | R 0.5 | 6,400 | 771 | 0.20 | 0.90 | 5,100 | 303 | 0.15 | 0.70 | 4,450 | 196 | 0.15 | 0.85 |
| 〃 | R 1 | 6,400 | 771 | 0.25 | 1.10 | 5,100 | 305 | 0.20 | 0.90 | 4,450 | 198 | 0.20 | 1.00 |
| ø 6 | R 0.5 | 5,300 | 752 | 0.30 | 1.30 | 4,200 | 307 | 0.20 | 0.80 | 3,700 | 200 | 0.20 | 0.80 |
| 〃 | R 1 | 5,300 | 752 | 0.30 | 1.30 | 4,200 | 309 | 0.20 | 0.80 | 3,700 | 201 | 0.20 | 0.80 |
| 〃 | R 1.5 | 5,300 | 752 | 0.30 | 1.40 | 4,200 | 311 | 0.25 | 1.20 | 3,700 | 203 | 0.25 | 1.20 |
| 〃 | R 2.5 | 5,300 | 752 | 0.30 | 1.40 | 4,200 | 313 | 0.25 | 1.20 | 3,700 | 205 | 0.25 | 1.20 |
| ø 8 | R 0.5 | 4,000 | 686 | 0.30 | 1.70 | 3,200 | 315 | 0.25 | 1.35 | 2,800 | 207 | 0.25 | 1.35 |
| 〃 | R 1 | 4,000 | 686 | 0.30 | 1.70 | 3,200 | 316 | 0.25 | 1.35 | 2,800 | 208 | 0.25 | 1.35 |
| 〃 | R 1.5 | 4,000 | 686 | 0.30 | 1.70 | 3,200 | 318 | 0.25 | 1.35 | 2,800 | 210 | 0.25 | 1.35 |
| 〃 | R 2 | 4,000 | 686 | 0.40 | 2.00 | 3,200 | 320 | 0.25 | 1.50 | 2,800 | 212 | 0.30 | 1.40 |
| 〃 | R 2.5 | 4,000 | 686 | 0.40 | 2.00 | 3,200 | 322 | 0.25 | 1.50 | 2,800 | 214 | 0.30 | 1.40 |
| 〃 | R 3 | 4,000 | 686 | 0.40 | 2.00 | 3,200 | 324 | 0.25 | 1.50 | 2,800 | 215 | 0.30 | 1.40 |
| ø 10 | R 0.5 | 3,200 | 639 | 0.50 | 2.10 | 2,550 | 326 | 0.30 | 1.70 | 2,200 | 217 | 0.30 | 1.50 |
| 〃 | R 1 | 3,200 | 639 | 0.50 | 2.10 | 2,550 | 327 | 0.30 | 1.70 | 2,200 | 219 | 0.30 | 1.50 |
| 〃 | R 1.5 | 3,200 | 639 | 0.60 | 2.40 | 2,550 | 329 | 0.30 | 1.80 | 2,200 | 221 | 0.30 | 1.60 |
| 〃 | R 2 | 3,200 | 639 | 0.60 | 2.40 | 2,550 | 331 | 0.30 | 1.80 | 2,200 | 222 | 0.30 | 1.60 |
| 〃 | R 2.5 | 3,200 | 639 | 0.60 | 2.40 | 2,550 | 333 | 0.30 | 1.80 | 2,200 | 224 | 0.30 | 1.60 |
| ø 12 | R 0.5 | 2,650 | 639 | 0.80 | 2.50 | 2,100 | 335 | 0.40 | 2.00 | 1,860 | 226 | 0.35 | 1.80 |
| 〃 | R 1 | 2,650 | 639 | 0.80 | 2.50 | 2,100 | 337 | 0.40 | 2.00 | 1,860 | 228 | 0.35 | 1.80 |
| 〃 | R 1.5 | 2,650 | 639 | 0.80 | 2.50 | 2,100 | 339 | 0.40 | 2.00 | 1,860 | 229 | 0.35 | 1.80 |
| 〃 | R 2 | 2,650 | 639 | 1.00 | 2.60 | 2,100 | 340 | 0.50 | 2.10 | 1,860 | 231 | 0.40 | 2.00 |
| 〃 | R 2.5 | 2,650 | 639 | 1.00 | 2.60 | 2,100 | 342 | 0.50 | 2.10 | 1,860 | 233 | 0.40 | 2.00 |
| 〃 | R 3 | 2,650 | 639 | 1.00 | 2.60 | 2,100 | 344 | 0.50 | 2.10 | 1,860 | 235 | 0.40 | 2.00 |

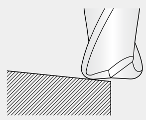
**절입량**
Depth of Cut

Slotting
• Ap : Axial Depth
• D : Outside Diameter




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



**경사진면절삭**
Inclined Cutting

- 상기 조건표는 홈 절삭 조건표이며, 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대30%까지 UP 해주십시오.
- 적용 기계의 회전속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용합니다.
- 에어브로 혹은 미스트 쿨런트를 추천하며 칩 제거 주의 및 가공시 발열, 발화에 주의 하십시오.

- Above the table is a reference for groove milling, and adjust parameters depending on material shape, milling purpose, and CNC machine.
- For curved milling, set up the pitch value lower than corner radius value.
- For curved milling, raise up the feed up to 30% in stable condition.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.
- Air blow or mist coolant is recommended and note for chip emission, heat, or ignition.

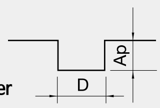
# 4JJC Cutting Condition

• RPM : rev./min • Feed : mm/min

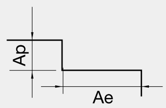
| 피삭재 Material | | 고경도강 Hardened Steels STAVAX/SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | | 62 ~ 70HRc | | | |
| 외경 Outside Diameter | 반경 Corner Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.5 | R 0.1 | 33,000 | 85 | 0.01 | 0.01 | 25,000 | 55 | 0.01 | 0.01 | 25,000 | 45 | 0.01 | 0.01 |
| ø 0.6 | R 0.1 | 33,000 | 95 | 0.02 | 0.02 | 25,000 | 60 | 0.01 | 0.01 | 20,000 | 50 | 0.01 | 0.01 |
| ø 0.7 | R 0.1 | 30,000 | 115 | 0.02 | 0.10 | 25,000 | 75 | 0.01 | 0.08 | 20,000 | 55 | 0.01 | 0.08 |
| ø 0.8 | R 01 | 25,000 | 120 | 0.04 | 0.15 | 19,000 | 85 | 0.02 | 0.12 | 16,000 | 60 | 0.02 | 0.12 |
| ø 0.9 | R 0.1 | 23,000 | 160 | 0.06 | 0.18 | 17,500 | 110 | 0.03 | 0.15 | 14,500 | 95 | 0.03 | 0.14 |
| ø 1 | R 0.3 | 20,500 | 344 | 0.10 | 0.30 | 16,000 | 216 | 0.05 | 0.20 | 12,500 | 140 | 0.05 | 0.20 |
| ø 1.5 | R 0.1 | 18,000 | 388 | 0.10 | 0.30 | 13,000 | 235 | 0.07 | 0.30 | 10,500 | 160 | 0.08 | 0.25 |
| 〃 | R 0.5 | 18,000 | 388 | 0.13 | 0.40 | 13,000 | 235 | 0.07 | 0.30 | 10,500 | 160 | 0.08 | 0.25 |
| ø 2 | R 0.1 | 14,500 | 416 | 0.15 | 0.50 | 11,000 | 256 | 0.10 | 0.45 | 9,500 | 184 | 0.10 | 0.45 |
| 〃 | R 0.5 | 14,500 | 416 | 0.15 | 0.50 | 11,000 | 256 | 0.10 | 0.45 | 9,500 | 184 | 0.10 | 0.45 |
| ø 2.5 | R 0.1 | 9,500 | 416 | 0.20 | 0.70 | 7,500 | 256 | 0.12 | 0.55 | 6,400 | 184 | 0.12 | 0.55 |
| 〃 | R 0.5 | 9,500 | 416 | 0.20 | 0.70 | 7,500 | 256 | 0.12 | 0.55 | 6,400 | 184 | 0.12 | 0.55 |
| ø 3 | R 0.5 | 8,300 | 424 | 0.23 | 0.80 | 6,400 | 268 | 0.13 | 0.60 | 5,600 | 192 | 0.13 | 0.60 |
| 〃 | R 1 | 8,300 | 424 | 0.23 | 0.80 | 6,400 | 268 | 0.13 | 0.60 | 5,600 | 192 | 0.13 | 0.60 |
| ø 3.5 | R 0.5 | 7,800 | 432 | 0.25 | 0.90 | 6,000 | 268 | 0.13 | 0.70 | 5,200 | 192 | 0.14 | 0.70 |
| ø 4 | R 0.5 | 7,200 | 432 | 0.25 | 0.95 | 5,600 | 268 | 0.15 | 0.75 | 4,750 | 192 | 0.15 | 0.75 |
| 〃 | R 1 | 7,200 | 432 | 0.25 | 1.00 | 5,600 | 268 | 0.15 | 0.80 | 4,750 | 192 | 0.15 | 0.80 |
| ø 4.5 | R 0.5 | 6,400 | 464 | 0.25 | 1.05 | 5,100 | 296 | 0.15 | 0.85 | 4,450 | 216 | 0.15 | 0.85 |
| ø 5 | R 0.5 | 6,400 | 464 | 0.25 | 1.05 | 5,100 | 296 | 0.15 | 0.85 | 4,450 | 216 | 0.15 | 0.85 |
| 〃 | R 1 | 6,400 | 464 | 0.30 | 1.20 | 5,100 | 296 | 0.17 | 0.90 | 4,450 | 216 | 0.17 | 0.85 |
| ø 6 | R 0.5 | 5,300 | 448 | 0.30 | 1.30 | 4,200 | 280 | 0.20 | 1.00 | 3,700 | 208 | 0.20 | 0.90 |
| 〃 | R 1 | 5,300 | 448 | 0.30 | 1.40 | 4,200 | 296 | 0.20 | 1.00 | 3,700 | 216 | 0.20 | 0.90 |
| 〃 | R 1.5 | 5,300 | 448 | 0.35 | 1.50 | 4,200 | 280 | 0.23 | 1.20 | 3,700 | 208 | 0.22 | 1.20 |
| 〃 | R 2 | 5,300 | 448 | 0.35 | 1.60 | 4,200 | 296 | 0.23 | 1.20 | 3,700 | 216 | 0.22 | 1.20 |
| ø 8 | R 0.5 | 4,000 | 416 | 0.40 | 1.70 | 3,200 | 264 | 0.25 | 1.35 | 2,800 | 192 | 0.25 | 1.30 |
| 〃 | R 1 | 4,000 | 416 | 0.40 | 1.70 | 3,200 | 264 | 0.25 | 1.35 | 2,800 | 192 | 0.25 | 1.30 |
| 〃 | R 1.5 | 4,000 | 416 | 0.45 | 2.00 | 3,200 | 264 | 0.28 | 1.50 | 2,800 | 192 | 0.27 | 1.40 |
| 〃 | R 2 | 4,000 | 416 | 0.45 | 2.00 | 3,200 | 264 | 0.28 | 1.50 | 2,800 | 192 | 0.27 | 1.40 |
| ø 10 | R 0.5 | 3,200 | 384 | 0.50 | 2.10 | 2,550 | 248 | 0.30 | 1.70 | 2,200 | 176 | 0.30 | 1.70 |
| 〃 | R 1 | 3,200 | 384 | 0.50 | 2.10 | 2,550 | 248 | 0.30 | 1.70 | 2,200 | 176 | 0.30 | 1.70 |
| 〃 | R 1.5 | 3,200 | 384 | 0.55 | 2.30 | 2,550 | 248 | 0.35 | 1.80 | 2,200 | 176 | 0.35 | 1.80 |
| 〃 | R 2 | 3,200 | 384 | 0.55 | 2.30 | 2,550 | 248 | 0.35 | 1.90 | 2,200 | 176 | 0.35 | 1.90 |
| 〃 | R 2.5 | 3,200 | 384 | 0.60 | 2.30 | 2,550 | 248 | 0.35 | 1.90 | 2,200 | 176 | 0.35 | 1.90 |
| ø 12 | R 0.5 | 2,650 | 384 | 0.60 | 2.60 | 2,100 | 240 | 0.35 | 2.00 | 1,860 | 176 | 0.35 | 2.00 |
| 〃 | R 1 | 2,650 | 384 | 0.60 | 2.60 | 2,100 | 240 | 0.35 | 2.00 | 1,860 | 176 | 0.35 | 2.00 |
| 〃 | R 1.5 | 2,650 | 384 | 0.60 | 2.60 | 2,100 | 240 | 0.35 | 2.00 | 1,860 | 176 | 0.35 | 2.00 |
| 〃 | R 2 | 2,650 | 384 | 0.60 | 2.60 | 2,100 | 240 | 0.35 | 2.00 | 1,860 | 176 | 0.35 | 2.00 |
| 〃 | R 2.5 | 2,650 | 384 | 0.80 | 3.00 | 2,100 | 240 | 0.50 | 2.20 | 1,860 | 176 | 0.45 | 2.30 |
| 〃 | R 3 | 2,650 | 384 | 1.00 | 3.00 | 2,100 | 240 | 0.65 | 2.40 | 1,860 | 176 | 0.55 | 2.50 |

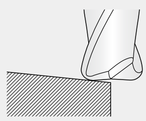
**절입량 Depth of Cut**

Slotting
• Ap : Axial Depth
• D : Outside Diameter




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



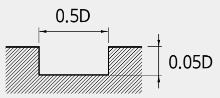
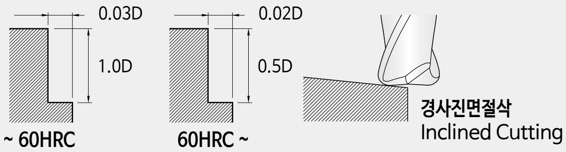
경사진면절삭 Inclined Cutting

- 상기 조건표는 홈 절삭 조건표이며, 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대30%까지 UP 해주십시오.
- 적용 기계의 회전속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용합니다.
- 에어브로 혹은 미스트 쿨런트를 추천하며 칩 제거 주의 및 가공시 발열, 발화에 주의 하십시오.

- Above the table is a reference for groove milling, and adjust parameters depending on material shape, milling purpose, and CNC machine.
- For curved milling, set up the pitch value lower than corner radius value.
- For curved milling, raise up the feed up to 30% in stable condition.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.
- Air blow or mist coolant is recommended and note for chip emission, heat, or ignition.

## 4&6JJCRL Cutting Condition

• RPM : rev./min • Feed : mm/min

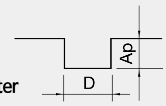
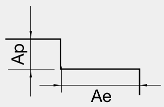
| 피삭재 Material | 홈절삭 Slotting | | | | | | 측면절삭 Side Cutting | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | 고경도강 Hardened Steels STAVAX/SKD11 | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | 고경도강 Hardened Steels STAVAX/SKD11 | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | |
| 경도 Hardness | 40 ~ 45HRc | | 45 ~ 55HRc | | 55 ~ 62HRc | | 40 ~ 45HRc | | 45 ~ 55HRc | | 55 ~ 62HRc | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| ø 1 | 28,000 | 500 | 25,500 | 300 | 18,500 | 150 | 30,000 | 500 | 28,000 | 430 | 24,500 | 300 |
| ø 2 | 14,820 | 700 | 13,500 | 400 | 9,500 | 200 | 16,500 | 700 | 14,300 | 600 | 12,500 | 450 |
| ø 3 | 7,800 | 800 | 6,900 | 400 | 6,000 | 220 | 11,500 | 1,100 | 10,500 | 860 | 9,500 | 650 |
| ø 4 | 7,150 | 800 | 6,100 | 450 | 5,750 | 250 | 9,200 | 1,100 | 7,600 | 900 | 7,100 | 680 |
| ø 5 | 6,500 | 900 | 5,700 | 510 | 5,100 | 300 | 7,200 | 1,200 | 6,400 | 950 | 6,000 | 720 |
| ø 6 | 6,100 | 1,000 | 5,150 | 520 | 4,850 | 320 | 6,200 | 1,300 | 5,300 | 1,040 | 4,950 | 810 |
| ø 8 | 5,800 | 1,100 | 4,810 | 520 | 4,150 | 330 | 4,800 | 1,400 | 4,100 | 1,120 | 3,900 | 820 |
| ø 10 | 5,500 | 1,200 | 4,200 | 500 | 3,850 | 310 | 3,700 | 1,300 | 3,000 | 1,030 | 2,600 | 810 |
| ø 12 | 5,100 | 1,100 | 3,950 | 450 | 3,500 | 290 | 3,000 | 1,200 | 2,700 | 980 | 2,100 | 780 |
| ø 16 | 4,750 | 1,100 | 3,700 | 430 | 3,200 | 290 | 2,750 | 1,200 | 2,450 | 980 | 1,950 | 760 |
| 절입량 Depth of Cut |   | | | | | |   | | | | | |

- 안정적인 절삭을 위해 홈 가공시 날경의 코너R을 유의하여 ae 값을 설정 하십시오.
- 유효장이 긴 경우에는 회전수와 이송 속도를 최대 30%이하로 줄이십시오.
- HRC60 이상인 경우 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 피삭재와 절삭형상을 위한 적절한 쿨런트 사용과 가공시 발열, 발화에 주의 하십시오.

- For stable cutting, set the ae value by paying attention to the corner radius during grooving machining.
- In case of long effective length, reduce the RPM and feed by 30% or less.
- In case the material of HRC over 60, reduce the RPM and feed by 20%.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolant is recommended and note for chip emission, heat, or ignition.

## 4&6JJDRC Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 고경도강 Hardened Steels STAVAX/SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 50 ~ 55HRC | | | | 55 ~ 62HRc | | | | 62 ~ 66HRc | | | | 66 ~ 72HRc | | | |
| 외경 Outside Diameter | 날수 No. of flutes | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 4 | 30,250 | 8,250 | 0.04 | 0.6 | 20,700 | 5,500 | 0.02 | 0.6 | 17,510 | 5,200 | 0.018 | 0.6 | 14,330 | 2,250 | 0.013 | 0.5 |
| ø 2 | 4 | 15,100 | 8,250 | 0.08 | 1.2 | 10,350 | 5,500 | 0.04 | 1.2 | 8,760 | 5,100 | 0.036 | 1.2 | 7,170 | 2,250 | 0.026 | 1.0 |
| ø 3 | 4 | 10,000 | 8,580 | 0.12 | 1.8 | 6,900 | 5,750 | 0.06 | 1.8 | 5,840 | 4,850 | 0.054 | 1.8 | 4,780 | 2,320 | 0.039 | 1.5 |
| ø 4 | 4 | 7,560 | 8,190 | 0.16 | 2.4 | 5,170 | 7,000 | 0.08 | 2.4 | 4,380 | 4,250 | 0.072 | 2.4 | 3,580 | 2,800 | 0.052 | 2.0 |
| ø 5 | 4 | 6,050 | 8,520 | 0.20 | 3.0 | 4,140 | 7,250 | 0.10 | 3.0 | 3,500 | 4,250 | 0.090 | 3.0 | 2,870 | 3,000 | 0.065 | 2.5 |
| ø 6 | 6 | 5,040 | 13,170 | 0.24 | 3.6 | 3,450 | 9,250 | 0.12 | 3.6 | 2,920 | 6,500 | 0.108 | 3.6 | 2,390 | 3,700 | 0.078 | 3.0 |
| ø 8 | 6 | 3,780 | 13,800 | 0.28 | 4.2 | 2,590 | 9,250 | 0.14 | 4.2 | 2,190 | 6,825 | 0.144 | 4.2 | 1,790 | 3,950 | 0.091 | 3.5 |
| ø 10 | 6 | 3,025 | 13,590 | 0.32 | 4.8 | 2,070 | 9,100 | 0.16 | 4.8 | 1,750 | 6,500 | 0.181 | 4.8 | 1,430 | 4,000 | 0.104 | 4.0 |
| ø 12 | 6 | 2,520 | 12,990 | 0.36 | 5.4 | 1,720 | 10,725 | 0.18 | 5.4 | 1,460 | 6,000 | 0.217 | 5.4 | 1,200 | 3,900 | 0.117 | 4.5 |
| 절입량 Depth of Cut | | Slotting<br>• Ap : Axial Depth<br>• D : Outside Diameter | | | |   | | | | Side Milling<br>• Ap : Axial Depth<br>• Ae : Radial Depth | | | |   | | | |

- 날경 보다 낮은 이동 PITCH를 설정 하십시오. (날경 보다 클 시 경우 CUSP가 남는다)
- 윤곽 가공에 가장 적합한 제품으로, 가능한 가공성이 좋은 기계를 사용 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 적용 기계의 회전속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.

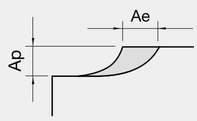
- Use lower value of pitch than tool diameter. If not, cusp will appear on the workpiece.
- Contouring machining method is the most recommended, and use great rigidity of CNC.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If your CNC machine cannot run enough RPM and Feed, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.

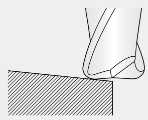
# 4&6JJRC Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | |
| 외경 Outside Diameter | 반경 Corner Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | R 0.2 | 42,000 | 7,605 | 0.02 | 0.40 | 35,000 | 6,375 | 0.015 | 0.30 | 25,000 | 5,689 | 0.015 | 0.30 |
| ø 1.5 | R 0.5 | 40,000 | 7,800 | 0.02 | 0.60 | 30,000 | 6,376 | 0.025 | 0.50 | 21,000 | 5,691 | 0.023 | 0.50 |
| ø 2 | R 0.5 | 27,000 | 8,190 | 0.03 | 0.80 | 24,000 | 6,377 | 0.030 | 0.60 | 16,000 | 5,693 | 0.030 | 0.60 |
| ø 3 | R 0.5 | 18,000 | 8,775 | 0.03 | 1.20 | 16,000 | 6,378 | 0.045 | 0.90 | 11,000 | 5,695 | 0.045 | 0.90 |
| ø 4 | R 0.5 | 16,000 | 9,750 | 0.05 | 1.60 | 13,000 | 6,379 | 0.060 | 1.20 | 9,000 | 5,697 | 0.060 | 1.20 |
| 〃 | R 1.0 | 14,000 | 9,263 | 0.06 | 1.60 | 12,000 | 6,380 | 0.060 | 1.20 | 8,000 | 5,699 | 0.060 | 1.20 |
| ø 5 | R 0.5 | 12,000 | 11,700 | 0.08 | 2.00 | 11,000 | 6,381 | 0.075 | 1.50 | 7,300 | 5,702 | 0.075 | 1.50 |
| 〃 | R 1.0 | 11,000 | 10,725 | 0.08 | 2.00 | 9,600 | 6,382 | 0.075 | 1.50 | 6,400 | 5,704 | 0.075 | 1.50 |
| ø 6 | R 0.3 | 10,900 | 12,870 | 0.09 | 2.40 | 10,000 | 6,383 | 0.090 | 1.80 | 6,500 | 5,706 | 0.090 | 1.80 |
| 〃 | R 0.5 | 10,600 | 12,675 | 0.09 | 2.40 | 9,500 | 6,383 | 0.090 | 1.80 | 6,300 | 5,708 | 0.090 | 1.80 |
| 〃 | R 1.0 | 12,654 | 12,285 | 0.09 | 2.40 | 9,000 | 6,384 | 0.090 | 1.80 | 5,800 | 5,710 | 0.090 | 1.80 |
| 〃 | R 1.5 | 9,000 | 10,725 | 0.09 | 2.40 | 8,000 | 6,385 | 0.090 | 1.80 | 5,300 | 5,713 | 0.090 | 1.80 |
| ø 8 | R 0.3 | 8,400 | 13,163 | 0.12 | 3.20 | 7,300 | 6,386 | 0.120 | 2.40 | 4,700 | 5,715 | 0.120 | 2.40 |
| 〃 | R 0.5 | 8,200 | 12,675 | 0.12 | 3.20 | 7,100 | 6,387 | 0.120 | 2.40 | 4,600 | 5,717 | 0.120 | 2.40 |
| 〃 | R 1.0 | 8,000 | 11,700 | 0.12 | 3.20 | 6,700 | 6,388 | 0.120 | 2.40 | 4,520 | 5,719 | 0.120 | 2.40 |
| 〃 | R 2.0 | 7,000 | 10,725 | 0.12 | 3.20 | 6,000 | 6,389 | 0.120 | 2.40 | 4,000 | 5,721 | 0.120 | 2.40 |
| ø 10 | R 0.3 | 6,490 | 12,656 | 0.15 | 4.00 | 5,664 | 6,390 | 0.150 | 3.00 | 3,776 | 5,724 | 0.150 | 3.00 |
| 〃 | R 0.5 | 6,325 | 12,334 | 0.15 | 4.00 | 5,520 | 6,391 | 0.150 | 3.00 | 3,680 | 5,726 | 0.150 | 3.00 |
| 〃 | R 1.0 | 6,160 | 12,012 | 0.15 | 4.00 | 5,376 | 6,392 | 0.150 | 3.00 | 3,584 | 5,728 | 0.150 | 3.00 |
| 〃 | R 2.0 | 5,500 | 10,725 | 0.15 | 4.00 | 4,800 | 6,393 | 0.150 | 3.00 | 3,200 | 5,730 | 0.150 | 3.00 |
| ø 12 | R 0.5 | 5,428 | 11,505 | 0.18 | 4.80 | 4,838 | 6,394 | 0.180 | 3.60 | 3,186 | 5,732 | 0.180 | 3.60 |
| 〃 | R 1.0 | 5,290 | 11,213 | 0.18 | 4.80 | 4,715 | 6,395 | 0.180 | 3.60 | 3,105 | 5,734 | 0.180 | 3.60 |
| 〃 | R 2.0 | 5,152 | 10,920 | 0.18 | 4.80 | 4,592 | 6,396 | 0.180 | 3.60 | 3,024 | 5,737 | 0.180 | 3.60 |
| 〃 | R 3.0 | 4,600 | 9,750 | 0.18 | 4.80 | 4,100 | 6,397 | 0.180 | 3.60 | 2,700 | 5,739 | 0.180 | 3.60 |
| ø 16 | R 1.0 | 4,012 | 10,124 | 0.24 | 6.40 | 3,540 | 6,398 | 0.240 | 4.80 | 2,360 | 5,741 | 0.240 | 4.80 |
| 〃 | R 2.0 | 3,400 | 8,580 | 0.24 | 6.40 | 3,000 | 6,398 | 0.240 | 4.80 | 2,000 | 5,743 | 0.240 | 4.80 |

절입량
Depth of Cut



경사진면절삭
Inclined Cutting

## ■ Coefficients respective of tool overhang

| Type | Overhang | Revolution | Feed rate | Depth of Cut ap |
|---|---|---|---|---|
| Straight | L/D ≦ 5 | 100% | 100% | 100% |
| | L/D = 6 | 90% | 80% | 80% |
| | L/D = 7 | 80% | 70% | 70% |
| Taper neck | L/D = 6 | 100% | 100% | 100% |
| | L/D = 8 | 90% | 80% | 80% |
| | L/D ≧ 10 | 80% | 70% | 70% |

- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 상기 조건표는 4날 기준 입니다.
- 날수에 따라 회전수는 유지하고, 피드는 안정적인 속도 내에서 최대 50%까지 UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용기계에 따라 조건 변경 요망 합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여 주십시오.
- 유효장 길이가 긴 경우, 위 표와같이 RPM과 FEED를 낮춰주세요.
- 절입 깊이가 얕은 경우, RPM과 FEED를 증가해 주세요.
- 원활한 칩배출을 위하여 에어브로우나 오일 미스트를 추천 합니다.

- For curved milling, raise up the feed up to 30% in stable condition.
- The parameters on the table are based on 4 flutes.
- With 6 flutes milling, raise up the feed up to 50% in stable condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If your CNC machine cannot run enough RPM and Feed, reduce the RPM and feed in same proportion.
- In case of long effective length, reduce the RPM and feed by 30% or less.
- If you use small value of Ap, raise up the RPM and feed.
- Air blow or oil mist is recommended for smooth chip emission.

# 5JJROU Cutting Condition

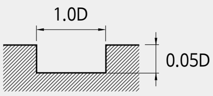
• RPM : rev./min • Feed : mm/min

## 홈절삭 Slotting

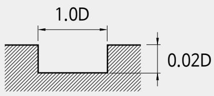
| 피삭재 Material | 공구강 / 금형강 Tool steels / Mold steels | | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels | | | | 스테인레스강 Stainless Steels | | | | 스테인레스강 Stainless Steels | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | SCM / HPM 30 ~40HRc | | | | NAK80 / KP4M 40~45HRc | | | | SUS304 / SUS316 | | | | SUS630 / SUS631 | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 6 | 5,940 | 970 | 0.3 | 6.0 | 4,950 | 500 | 0.3 | 6.0 | 4,050 | 390 | 0.12 | 6.0 | 3,105 | 280 | 0.12 | 6.0 |
| ø 8 | 4,410 | 1,110 | 0.4 | 8.0 | 3,762 | 620 | 0.4 | 8.0 | 3,042 | 495 | 0.16 | 8.0 | 2,322 | 315 | 0.16 | 8.0 |
| ø 10 | 3,582 | 1,025 | 0.5 | 10.0 | 2,970 | 620 | 0.5 | 10.0 | 2,430 | 460 | 0.20 | 10.0 | 1,863 | 300 | 0.20 | 10.0 |
| ø 12 | 2,979 | 1,000 | 0.6 | 12.0 | 2,502 | 520 | 0.6 | 12.0 | 2,025 | 460 | 0.24 | 12.0 | 1,548 | 300 | 0.24 | 12.0 |
| ø 16 | 2,250 | 835 | 0.8 | 16.0 | 1,881 | 430 | 0.8 | 16.0 | 1,521 | 325 | 0.32 | 16.0 | 1,170 | 260 | 0.32 | 16.0 |
| ø 20 | 1,791 | 720 | 1.0 | 20.0 | 1,503 | 400 | 1.0 | 20.0 | 1,215 | 325 | 0.40 | 20.0 | 927 | 225 | 0.40 | 20.0 |

절입량 Depth of Cut

일반강 General Steel




SUS

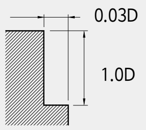


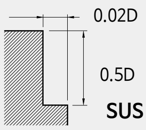

## 측면절삭 Side Cutting

| 피삭재 Material | 공구강 / 금형강 Tool steels / Mold steels | | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels | | | | 스테인레스강 Stainless Steels | | | | 스테인레스강 Stainless Steels | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | SCM / HPM 30 ~40HRc | | | | NAK80 / KP4M 40~45HRc | | | | SUS304 / SUS316 | | | | SUS630 / SUS631 | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 6 | 6,600 | 745 | 6 | 0.18 | 5,500 | 450 | 6 | 0.18 | 4,500 | 300 | 3 | 0.12 | 3,450 | 250 | 3 | 0.1 |
| ø 8 | 4,900 | 850 | 8 | 0.25 | 4,180 | 550 | 8 | 0.25 | 3,380 | 380 | 4 | 0.16 | 2,580 | 280 | 4 | 0.2 |
| ø 10 | 3,980 | 785 | 10 | 0.3 | 3,300 | 550 | 10 | 0.3 | 2,700 | 350 | 5 | 0.2 | 2,070 | 260 | 5 | 0.2 |
| ø 12 | 3,310 | 765 | 12 | 0.36 | 2,780 | 460 | 12 | 0.36 | 2,250 | 350 | 6 | 0.24 | 1,720 | 270 | 6 | 0.2 |
| ø 16 | 1,990 | 640 | 16 | 0.48 | 2,090 | 380 | 16 | 0.48 | 1,690 | 250 | 8 | 0.32 | 1,300 | 230 | 8 | 0.3 |
| ø 20 | 2,500 | 550 | 20 | 0.6 | 1,670 | 350 | 20 | 0.6 | 1,350 | 250 | 10 | 0.4 | 1,030 | 200 | 10 | 0.4 |

절입량 Depth of Cut

일반강 General Steel




SUS

- 가능한 공구 길이 측정시 유압식 측정이 아닌 레이저식 도구 세터를 사용 하십시오.
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우 진동이 발생할 시 조건표에 회전속도와 이송 속도를 같은 비율로 줄여서 적용 합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.
- 스테인레스, 내열합금강 등의 절단 가공 시 수용성 절삭유가 가장 효과적 입니다.

- Use laser tool measurement instead of hydraulic measurement when measuring tool length as possible.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigdity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.
- For stainless and heat resistant alloy, water-soluble oil is the most effective.

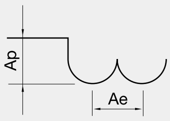
# 2HRB Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 동 Copper C1100 | | | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | |
| 반경 Radius | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R0.05 | 0.3 | 50,000 | 85 | 0.004 | 0.004 | 45,000 | 70 | 0.004 | 0.004 | 45,000 | 50 | 0.002 | 0.002 | 45,000 | 40 | 0.002 | 0.002 |
| 〃 | 0.5 | 50,000 | 75 | 0.004 | 0.004 | 45,000 | 60 | 0.002 | 0.002 | 45,000 | 30 | 0.002 | 0.002 | 45,000 | 30 | 0.002 | 0.002 |
| R0.1 | 0.5 | 50,000 | 492 | 0.010 | 0.010 | 45,000 | 396 | 0.006 | 0.007 | 45,000 | 260 | 0.006 | 0.006 | 45,000 | 220 | 0.005 | 0.006 |
| 〃 | 1 | 50,000 | 432 | 0.007 | 0.008 | 45,000 | 372 | 0.004 | 0.005 | 45,000 | 276 | 0.004 | 0.004 | 45,000 | 200 | 0.004 | 0.004 |
| 〃 | 1.5 | 50,000 | 360 | 0.006 | 0.006 | 42,000 | 276 | 0.003 | 0.004 | 42,000 | 216 | 0.003 | 0.004 | 42,000 | 180 | 0.003 | 0.003 |
| R0.15 | 1 | 50,000 | 744 | 0.012 | 0.013 | 45,000 | 552 | 0.010 | 0.010 | 38,000 | 420 | 0.009 | 0.010 | 38,000 | 348 | 0.007 | 0.009 |
| 〃 | 3 | 48,000 | 528 | 0.008 | 0.009 | 40,800 | 360 | 0.006 | 0.007 | 33,600 | 264 | 0.005 | 0.005 | 33,600 | 216 | 0.004 | 0.005 |
| 〃 | 5 | 39,600 | 336 | 0.004 | 0.005 | 28,800 | 216 | 0.003 | 0.003 | 24,000 | 168 | 0.003 | 0.003 | 21,600 | 120 | 0.002 | 0.002 |
| R0.2 | 1 | 61,200 | 1,020 | 0.021 | 0.034 | 54,000 | 768 | 0.016 | 0.022 | 39,600 | 516 | 0.013 | 0.022 | 39,600 | 432 | 0.011 | 0.021 |
| 〃 | 3 | 55,200 | 768 | 0.015 | 0.016 | 44,400 | 480 | 0.010 | 0.010 | 32,400 | 312 | 0.009 | 0.010 | 32,400 | 264 | 0.008 | 0.010 |
| 〃 | 5 | 39,600 | 468 | 0.008 | 0.016 | 30,000 | 372 | 0.008 | 0.010 | 26,400 | 288 | 0.006 | 0.010 | 26,400 | 228 | 0.004 | 0.005 |
| R0.25 | 1 | 63,600 | 1,560 | 0.026 | 0.047 | 45,600 | 960 | 0.020 | 0.033 | 33,600 | 636 | 0.014 | 0.032 | 33,600 | 312 | 0.007 | 0.020 |
| 〃 | 5 | 52,800 | 1,032 | 0.012 | 0.014 | 34,800 | 552 | 0.008 | 0.008 | 31,200 | 444 | 0.007 | 0.010 | 31,200 | 216 | 0.006 | 0.009 |
| 〃 | 10 | 38,400 | 528 | 0.008 | 0.016 | 28,800 | 456 | 0.007 | 0.010 | 28,800 | 372 | 0.005 | 0.010 | 27,600 | 216 | 0.005 | 0.009 |
| R0.3 | 1 | 63,600 | 1,956 | 0.030 | 0.140 | 39,600 | 960 | 0.022 | 0.091 | 27,600 | 600 | 0.019 | 0.091 | 26,400 | 516 | 0.014 | 0.091 |
| 〃 | 5 | 50,400 | 1,104 | 0.014 | 0.068 | 28,800 | 504 | 0.012 | 0.043 | 26,400 | 396 | 0.008 | 0.042 | 26,400 | 336 | 0.007 | 0.040 |
| 〃 | 10 | 31,200 | 540 | 0.006 | 0.032 | 24,000 | 360 | 0.005 | 0.020 | 22,800 | 312 | 0.004 | 0.020 | 22,800 | 240 | 0.003 | 0.018 |
| R0.4 | 2 | 61,200 | 2,280 | 0.054 | 0.160 | 34,800 | 816 | 0.045 | 0.100 | 27,600 | 552 | 0.038 | 0.100 | 26,400 | 456 | 0.030 | 0.100 |
| 〃 | 6 | 51,600 | 1,452 | 0.035 | 0.100 | 28,800 | 636 | 0.028 | 0.068 | 21,600 | 420 | 0.020 | 0.068 | 21,600 | 348 | 0.015 | 0.065 |
| 〃 | 10 | 31,000 | 630 | 0.022 | 0.080 | 23,400 | 468 | 0.020 | 0.050 | 17,300 | 408 | 0.015 | 0.050 | 16,800 | 336 | 0.010 | 0.050 |
| R0.5 | 2 | 50,400 | 2,160 | 0.068 | 0.320 | 33,600 | 900 | 0.052 | 0.220 | 21,600 | 540 | 0.040 | 0.220 | 18,000 | 540 | 0.008 | 0.140 |
| 〃 | 5 | 50,400 | 2,160 | 0.068 | 0.320 | 33,600 | 900 | 0.052 | 0.220 | 21,600 | 540 | 0.040 | 0.220 | 18,000 | 540 | 0.008 | 0.140 |
| 〃 | 10 | 30,000 | 1,164 | 0.024 | 0.086 | 16,320 | 600 | 0.020 | 0.056 | 15,000 | 456 | 0.014 | 0.056 | 13,680 | 312 | 0.008 | 0.050 |
| 〃 | 16 | 17,640 | 720 | 0.018 | 0.086 | 13,680 | 480 | 0.016 | 0.056 | 12,360 | 384 | 0.012 | 0.056 | 11,520 | 252 | 0.005 | 0.030 |
| R0.75 | 3 | 31,200 | 2,400 | 0.167 | 0.320 | 21,600 | 1,152 | 0.120 | 0.210 | 12,960 | 672 | 0.100 | 0.210 | 12,000 | 600 | 0.090 | 0.210 |
| 〃 | 10 | 26,400 | 1,680 | 0.100 | 0.220 | 14,760 | 780 | 0.080 | 0.170 | 9,720 | 480 | 0.062 | 0.170 | 9,720 | 456 | 0.050 | 0.160 |
| 〃 | 18 | 12,120 | 624 | 0.030 | 0.160 | 12,120 | 504 | 0.022 | 0.110 | 9,600 | 432 | 0.020 | 0.110 | 9,600 | 408 | 0.012 | 0.110 |
| 〃 | 30 | 9,840 | 516 | 0.014 | 0.080 | 9,840 | 456 | 0.012 | 0.050 | 9,480 | 420 | 0.010 | 0.050 | 9,480 | 396 | 0.010 | 0.050 |
| R1 | 4 | 26,400 | 2,448 | 0.220 | 0.520 | 21,000 | 1,392 | 0.180 | 0.350 | 14,640 | 1,080 | 0.140 | 0.350 | 14,640 | 900 | 0.120 | 0.350 |
| 〃 | 10 | 26,400 | 2,256 | 0.180 | 0.350 | 21,000 | 1,224 | 0.140 | 0.230 | 14,640 | 972 | 0.110 | 0.230 | 14,640 | 792 | 0.090 | 0.230 |
| 〃 | 20 | 15,960 | 1,164 | 0.090 | 0.165 | 15,960 | 600 | 0.060 | 0.110 | 12,720 | 600 | 0.055 | 0.110 | 12,720 | 492 | 0.035 | 0.110 |
| 〃 | 30 | 10,200 | 636 | 0.025 | 0.070 | 10,200 | 480 | 0.020 | 0.050 | 10,200 | 480 | 0.015 | 0.050 | 10,200 | 384 | 0.015 | 0.045 |
| R1.5 | 6 | 16,800 | 3,240 | 0.250 | 0.500 | 14,400 | 1,824 | 0.200 | 0.340 | 9,840 | 1,320 | 0.160 | 0.320 | 6,480 | 732 | 0.160 | 0.320 |
| 〃 | 10 | 16,800 | 3,240 | 0.250 | 0.500 | 14,400 | 1,824 | 0.200 | 0.340 | 9,840 | 1,320 | 0.160 | 0.320 | 6,480 | 732 | 0.160 | 0.300 |
| 〃 | 20 | 14,040 | 2,244 | 0.200 | 0.450 | 12,360 | 1,476 | 0.145 | 0.320 | 8,520 | 1,128 | 0.120 | 0.310 | 5,760 | 660 | 0.080 | 0.300 |
| 〃 | 30 | 10,920 | 1,620 | 0.120 | 0.220 | 9,360 | 816 | 0.100 | 0.150 | 8,520 | 816 | 0.080 | 0.150 | 5,760 | 384 | 0.070 | 0.300 |
| R2 | 8 | 12,600 | 3,012 | 0.350 | 0.850 | 10,440 | 1,752 | 0.290 | 0.550 | 7,200 | 1,332 | 0.220 | 0.500 | 7,200 | 1,056 | 0.150 | 0.500 |
| 〃 | 20 | 12,600 | 3,012 | 0.350 | 0.850 | 10,440 | 1,752 | 0.290 | 0.550 | 7,200 | 1,332 | 0.220 | 0.500 | 7,200 | 1,056 | 0.150 | 0.500 |
| 〃 | 30 | 11,160 | 2,040 | 0.250 | 0.500 | 8,880 | 1,380 | 0.200 | 0.320 | 6,600 | 1,056 | 0.150 | 0.300 | 6,600 | 816 | 0.130 | 0.300 |
| 〃 | 40 | 8,160 | 1,464 | 0.150 | 0.500 | 7,200 | 1,056 | 0.132 | 0.320 | 6,600 | 1,056 | 0.100 | 0.300 | 6,600 | 816 | 0.090 | 0.300 |
| R2.5 | 15 | 10,800 | 2,880 | 0.380 | 0.800 | 8,400 | 1,500 | 0.300 | 0.700 | 6,000 | 1,140 | 0.220 | 0.700 | 6,000 | 900 | 0.200 | 0.650 |
| 〃 | 25 | 10,800 | 2,400 | 0.380 | 0.800 | 8,400 | 1,380 | 0.300 | 0.550 | 6,000 | 1,080 | 0.220 | 0.550 | 6,000 | 816 | 0.200 | 0.500 |
| 〃 | 40 | 9,360 | 1,320 | 0.250 | 0.800 | 6,720 | 840 | 0.200 | 0.550 | 4,920 | 660 | 0.150 | 0.550 | 4,920 | 504 | 0.130 | 0.500 |
| R3 | 15 | 8,400 | 2,676 | 0.500 | 1.000 | 8,160 | 1,764 | 0.420 | 0.800 | 5,760 | 1,320 | 0.300 | 0.800 | 4,440 | 864 | 0.300 | 0.800 |
| 〃 | 30 | 8,400 | 1,812 | 0.380 | 0.900 | 7,200 | 1,680 | 0.300 | 0.650 | 5,040 | 1,176 | 0.220 | 0.650 | 4,440 | 792 | 0.220 | 0.600 |
| R4 | 25 | 8,160 | 1,764 | 0.410 | 1.000 | 7,200 | 1,176 | 0.350 | 0.750 | 4,920 | 912 | 0.180 | 0.600 | 4,560 | 732 | 0.200 | 0.630 |
| 〃 | 30 | 7,680 | 1,680 | 0.380 | 1.000 | 6,960 | 1,128 | 0.300 | 0.750 | 4,800 | 864 | 0.160 | 0.600 | 4,320 | 720 | 0.200 | 0.600 |
| R5 | 30 | 6,240 | 1,344 | 0.560 | 1.200 | 5,880 | 1,128 | 0.370 | 0.900 | 4,800 | 852 | 0.200 | 0.670 | 4,200 | 708 | 0.200 | 0.650 |
| 〃 | 35 | 6,000 | 1,296 | 0.500 | 1.000 | 5,400 | 1,080 | 0.350 | 0.850 | 4,560 | 816 | 0.150 | 0.600 | 3,840 | 648 | 0.200 | 0.600 |
| R6 | 30 | 5,160 | 1,104 | 0.650 | 1.400 | 4,800 | 984 | 0.420 | 0.900 | 4,320 | 828 | 0.250 | 0.600 | 3,600 | 600 | 0.250 | 0.600 |
| 〃 | 40 | 4,920 | 1,080 | 0.600 | 1.200 | 4,560 | 960 | 0.400 | 0.850 | 4,080 | 780 | 0.200 | 0.600 | 3,600 | 600 | 0.200 | 0.600 |

**절입량 Depth of Cut**

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




- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 주세요.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용 합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다(Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 원활한 칩배출을 위하여 에어브로 혹은 미스트 쿨런트 사용을 추천하며, 동 가공시 습식 쿨런트를 추천 합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or oil mist is recommended for smooth chip emission, and wet coolant milling is recommended for copper material.

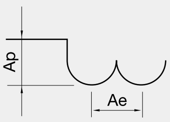
# 2PHCB/2HSB/2HCB Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 동 Copper C1100 | | | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | |
| 반경 Radius | 날장 Cutting Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R0.05 | 0.2 | 40,000 | 300 | 0.005 | 0.040 | 40,000 | 300 | 0.004 | 0.004 | 30,000 | 200 | 0.004 | 0.040 | Cutting is not possible. | | | |
| R0.1 | 0.2 | 54,000 | 430 | 0.020 | 0.060 | 54,000 | 630 | 0.016 | 0.012 | 44,300 | 450 | 0.023 | 0.008 | 30,000 | 300 | 0.012 | 0.008 |
| 〃 | 0.4 | 54,000 | 430 | 0.020 | 0.051 | 54,000 | 430 | 0.016 | 0.040 | 44,300 | 345 | 0.010 | 0.023 | 32,800 | 260 | 0.007 | 0.008 |
| R0.15 | 0.3 | 54,000 | 720 | 0.030 | 0.090 | 54,000 | 750 | 0.024 | 0.072 | 44,300 | 600 | 0.015 | 0.042 | 32,800 | 450 | 0.020 | 0.013 |
| 〃 | 0.6 | 54,000 | 720 | 0.030 | 0.075 | 54,000 | 715 | 0.024 | 0.060 | 44,300 | 575 | 0.015 | 0.035 | 32,800 | 430 | 0.012 | 0.013 |
| R0.2 | 0.4 | 54,000 | 870 | 0.040 | 0.120 | 54,000 | 1,000 | 0.032 | 0.096 | 44,300 | 800 | 0.020 | 0.056 | 32,800 | 600 | 0.028 | 0.016 |
| 〃 | 0.8 | 54,000 | 870 | 0.040 | 0.105 | 54,000 | 880 | 0.032 | 0.084 | 44,300 | 700 | 0.020 | 0.049 | 32,800 | 525 | 0.016 | 0.016 |
| R0.25 | 0.5 | 56,000 | 1,250 | 0.050 | 0.150 | 53,000 | 1,250 | 0.040 | 0.120 | 43,500 | 1,000 | 0.025 | 0.070 | 32,200 | 750 | 0.035 | 0.022 |
| 〃 | 1 | 56,000 | 1,380 | 0.050 | 0.125 | 50,000 | 1,000 | 0.040 | 0.100 | 41,350 | 800 | 0.025 | 0.058 | 30,600 | 600 | 0.021 | 0.022 |
| R0.3 | 0.6 | 58,000 | 1,510 | 0.060 | 0.180 | 52,000 | 1,380 | 0.048 | 0.144 | 42,650 | 1,100 | 0.030 | 0.084 | 31,500 | 825 | 0.042 | 0.026 |
| 〃 | 1.2 | 58,000 | 1,710 | 0.060 | 0.155 | 48,500 | 1,020 | 0.048 | 0.124 | 40,500 | 810 | 0.030 | 0.072 | 30,000 | 610 | 0.025 | 0.026 |
| R0.4 | 0.8 | 52,000 | 1,870 | 0.080 | 0.240 | 48,000 | 1,500 | 0.064 | 0.192 | 39,500 | 1,200 | 0.040 | 0.112 | 29,250 | 900 | 0.056 | 0.036 |
| 〃 | 2 | 52,000 | 1,970 | 0.080 | 0.200 | 45,000 | 1,085 | 0.064 | 0.160 | 37,500 | 870 | 0.040 | 0.093 | 27,800 | 650 | 0.033 | 0.036 |
| R0.5 | 1 | 41,000 | 1,660 | 0.100 | 0.300 | 38,540 | 1,560 | 0.080 | 0.240 | 36,900 | 1,250 | 0.050 | 0.140 | 27,300 | 940 | 0.063 | 0.040 |
| 〃 | 2.5 | 41,000 | 1,880 | 0.100 | 0.200 | 38,540 | 1,000 | 0.080 | 0.160 | 31,500 | 800 | 0.050 | 0.090 | 23,000 | 600 | 0.022 | 0.040 |
| R0.6 | 3 | 34,000 | 2,120 | 0.120 | 0.360 | 31,960 | 1,550 | 0.096 | 0.288 | 32,800 | 1,250 | 0.060 | 0.168 | 24,400 | 940 | 0.072 | 0.051 |
| R0.75 | 1.5 | 27,000 | 2,280 | 0.150 | 0.450 | 25,380 | 1,600 | 0.120 | 0.360 | 28,700 | 1,280 | 0.075 | 0.210 | 21,500 | 960 | 0.087 | 0.068 |
| 〃 | 4 | 27,000 | 1,830 | 0.150 | 0.325 | 25,380 | 1,000 | 0.120 | 0.260 | 26,000 | 800 | 0.075 | 0.152 | 19,250 | 600 | 0.052 | 0.068 |
| R1 | 2 | 32,700 | 3,560 | 0.200 | 0.600 | 30,738 | 1,850 | 0.160 | 0.480 | 24,600 | 1,480 | 0.100 | 0.280 | 18,250 | 1,110 | 0.112 | 0.089 |
| 〃 | 5 | 32,700 | 2,980 | 0.200 | 0.435 | 30,738 | 1,350 | 0.160 | 0.348 | 22,000 | 1,080 | 0.100 | 0.203 | 16,250 | 810 | 0.067 | 0.089 |
| R1.25 | 6 | 30,600 | 3,680 | 0.250 | 0.542 | 28,764 | 1,600 | 0.200 | 0.430 | 27,901 | 1,280 | 0.125 | 0.251 | 15,500 | 960 | 0.067 | 0.115 |
| R1.5 | 3 | 26,100 | 4,400 | 0.300 | 0.957 | 24,534 | 2,520 | 0.240 | 0.766 | 23,798 | 2,050 | 0.150 | 0.447 | 15,500 | 1,530 | 0.197 | 0.171 |
| 〃 | 8 | 26,100 | 4,110 | 0.300 | 0.765 | 24,534 | 2,350 | 0.240 | 0.612 | 23,798 | 1,880 | 0.150 | 0.357 | 15,500 | 1,410 | 0.100 | 0.171 |
| R2 | 4 | 18,800 | 4,160 | 0.400 | 1.380 | 17,672 | 2,450 | 0.320 | 1.100 | 17,142 | 1,960 | 0.200 | 0.644 | 12,800 | 1,470 | 0.266 | 0.208 |
| 〃 | 8 | 18,800 | 3,920 | 0.400 | 1.020 | 17,672 | 2,350 | 0.320 | 0.816 | 17,142 | 1,880 | 0.200 | 0.476 | 12,800 | 1,410 | 0.134 | 0.208 |
| R2.5 | 5 | 17,300 | 3,980 | 0.500 | 1.660 | 16,262 | 2,560 | 0.400 | 1.330 | 15,774 | 2,050 | 0.250 | 0.770 | 11,000 | 1,530 | 0.215 | 0.240 |
| 〃 | 10 | 17,300 | 3,660 | 0.500 | 1.275 | 16,262 | 2,300 | 0.400 | 1.020 | 15,774 | 1,840 | 0.250 | 0.595 | 11,000 | 1,380 | 0.180 | 0.240 |
| R3 | 6 | 16,500 | 3,880 | 0.600 | 2.340 | 15,510 | 2,700 | 0.480 | 1.870 | 15,045 | 2,160 | 0.300 | 1.090 | 9,600 | 1,620 | 0.290 | 0.281 |
| 〃 | 12 | 16,500 | 3,500 | 0.600 | 1.530 | 15,510 | 2,400 | 0.480 | 1.225 | 15,045 | 1,920 | 0.300 | 0.715 | 9,600 | 1,440 | 0.230 | 0.281 |
| R4 | 8 | 11,660 | 4,000 | 0.800 | 3.100 | 10,960 | 2,300 | 0.640 | 2.480 | 10,632 | 1,840 | 0.400 | 1.446 | 7,600 | 1,380 | 0.400 | 0.175 |
| 〃 | 14 | 11,660 | 3,850 | 0.800 | 2.050 | 10,960 | 2,000 | 0.640 | 1.640 | 10,632 | 1,600 | 0.400 | 0.957 | 7,600 | 1,200 | 0.400 | 0.175 |
| R5 | 10 | 9,560 | 4,100 | 1.000 | 3.750 | 8,986 | 2,200 | 0.800 | 3.000 | 8,717 | 1,780 | 0.500 | 1.750 | 6,400 | 1,340 | 0.500 | 0.154 |
| 〃 | 18 | 9,560 | 3,720 | 1.000 | 2.550 | 8,986 | 1,700 | 0.800 | 2.040 | 8,717 | 1,360 | 0.500 | 1.190 | 6,400 | 1,020 | 0.500 | 0.154 |
| R6 | 12 | 7,100 | 4,000 | 1.200 | 4.420 | 6,674 | 1,850 | 0.960 | 3.540 | 6,474 | 1,480 | 0.600 | 2.060 | 5,450 | 1,110 | 0.600 | 0.159 |
| 〃 | 22 | 7,100 | 3,250 | 1.200 | 3.050 | 6,674 | 1,600 | 0.960 | 2,440 | 6,474 | 1,280 | 0.600 | 1.423 | 5,450 | 960 | 0.600 | 0.159 |
| R8 | 30 | 4,650 | 2,000 | 1.120 | 3.870 | 4,371 | 1,630 | 0.790 | 2,350 | 4,240 | 1,100 | 0.500 | 1.742 | 4,000 | 810 | 0.450 | 1.150 |
| R10 | 38 | 3,200 | 2,200 | 1.100 | 4.120 | 3,008 | 1,450 | 0.840 | 2,530 | 2,918 | 1,100 | 0.520 | 1.866 | 3,100 | 800 | 0.400 | 1.000 |

**절입량**
Depth of Cut

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




- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 주세요.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용 합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다(Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 원활한 칩배출을 위하여 에어브로 혹은 미스트 쿨런트 사용을 추천하며, 동 가공시 습식 쿨런트를 추천 합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or oil mist is recommended for smooth chip emission, and wet coolant milling is recommended for copper material.

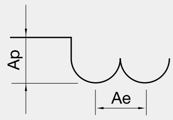
# 3HCB/4HSB/4HCB

- ■ **3HCB**는 RPM 동일, FEED만 최대 **20% Down** 적용.
- ■ Use the same RPM, reduce the feed rate up to 20% for 3HCB

| 피삭재 Material | 동 Copper C1100 | | | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | |
| 반경 Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 0.5 | 41,000 | 1990 | 0.100 | 0.300 | 38,540 | 1870 | 0.080 | 0.240 | 36,900 | 1500 | 0.050 | 0.140 | 27,300 | 1120 | 0.040 | 0.063 |
| R 0.75 | 27,000 | 2740 | 0.150 | 0.450 | 25,380 | 1920 | 0.120 | 0.360 | 28,700 | 1530 | 0.075 | 0.210 | 21,500 | 1150 | 0.068 | 0.087 |
| R 1 | 32,700 | 4200 | 0.200 | 0.600 | 30,738 | 2220 | 0.160 | 0.480 | 24,600 | 1770 | 0.100 | 0.280 | 18,250 | 1330 | 0.089 | 0.112 |
| R 1.25 | 30,600 | 4400 | 0.250 | 0.542 | 28,764 | 1920 | 0.200 | 0.430 | 27,901 | 1540 | 0.125 | 0.251 | 15,500 | 1150 | 0.115 | 0.167 |
| R 1.5 | 26,100 | 5280 | 0.300 | 0.957 | 24,534 | 3020 | 0.240 | 0.766 | 23,798 | 1820 | 0.150 | 0.447 | 15,500 | 1840 | 0.171 | 0.197 |
| R 2 | 18,800 | 4990 | 0.400 | 1.380 | 17,672 | 2940 | 0.320 | 1.100 | 17,142 | 1850 | 0.200 | 0.644 | 12,800 | 1760 | 0.208 | 0.215 |
| R 2.5 | 17,300 | 4770 | 0.500 | 1.660 | 16,262 | 3070 | 0.400 | 1.330 | 15,774 | 1870 | 0.250 | 0.770 | 11,000 | 1800 | 0.240 | 0.266 |
| R 3 | 16,500 | 4650 | 0.600 | 2.340 | 15,510 | 3240 | 0.480 | 1.870 | 15,045 | 1900 | 0.300 | 1.090 | 9,600 | 2000 | 0.281 | 0.290 |
| R 4 | 11,660 | 4800 | 0.800 | 3.100 | 10,960 | 2760 | 0.640 | 2.480 | 10,632 | 1820 | 0.400 | 1.446 | 7,600 | 1650 | 0.175 | 0.400 |
| R 5 | 9,560 | 4920 | 1.000 | 3.750 | 8,986 | 2640 | 0.800 | 3.000 | 8,717 | 1850 | 0.500 | 1.750 | 6,400 | 1600 | 0.154 | 0.500 |
| R 6 | 7,100 | 4800 | 1.200 | 4.420 | 6,674 | 2220 | 0.960 | 3.540 | 6,474 | 1770 | 0.600 | 2.060 | 5,450 | 1650 | 0.159 | 0.600 |
| R 8 | 4,650 | 3900 | 1.400 | 4.420 | 4,371 | 1950 | 0.960 | 3.540 | 4,240 | 1760 | 0.600 | 2.060 | 4,000 | 1670 | 0.250 | 1.150 |
| R 10 | 3,200 | 3950 | 1.600 | 4.420 | 3,008 | 1740 | 0.960 | 3.540 | 2,918 | 1750 | 0.600 | 2.060 | 3,100 | 1680 | 0.300 | 1.000 |

**절입량**
Depth of Cut

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




- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 주세요.
- 상기 조건표는 4날 기준이며, 3날시 회전수는 유지하고, 피드는 안정적인 속도내로 최대 20%까지 DOWN 해주십시오. (3HCB)
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용 합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다(Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 원활한 칩 배출을 위하여 에어브로 혹은 미스트 쿨런트 사용을 추천하며, 동 가공시 습식 쿨런트를 추천 합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- The parameters on the table is based on 4flutes. For using 3 flutes (3HCB), use the same RPM and reduce the feed maximum 20% in stable milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or oil mist is recommended for smooth chip emission, and wet coolant milling is recommended for copper material.

# 2HRE Cutting Condition

• RPM : rev. / min • Feed : mm / min

| 피삭재 Material | | 구조용강 / 탄소강 / 회주철 Mild steels / Carbon Steels / Gray cast irons SS / SC / FC | | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | ~30HRc | | | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.2 | 0.5 | 56,000 | 340 | 0.006 | 0.002 | 56,000 | 310 | 0.005 | 0.002 | 56,000 | 270 | 0.003 | 0.016 | 44,800 | 180 | 0.002 | 0.0118 |
| 〃 | 1 | 50,900 | 290 | 0.005 | 0.016 | 50,900 | 260 | 0.005 | 0.016 | 50,900 | 230 | 0.004 | 0.02 | 40,800 | 160 | 0.003 | 0.0144 |
| 〃 | 1.5 | 48,200 | 250 | 0.003 | 0.006 | 48,200 | 230 | 0.003 | 0.006 | 48,200 | 200 | 0.002 | 0.006 | 38,500 | 140 | 0.002 | 0.0054 |
| ø 0.3 | 1 | 60,000 | 560 | 0.009 | 0.101 | 60,000 | 500 | 0.008 | 0.101 | 60,000 | 400 | 0.006 | 0.101 | 52,100 | 330 | 0.004 | 0.0909 |
| 〃 | 1.5 | 50,800 | 460 | 0.008 | 0.057 | 50,800 | 410 | 0.007 | 0.057 | 50,800 | 360 | 0.005 | 0.057 | 42,700 | 260 | 0.004 | 0.0513 |
| 〃 | 2 | 41,500 | 350 | 0.006 | 0.013 | 41,500 | 320 | 0.005 | 0.013 | 41,500 | 280 | 0.004 | 0.013 | 33,200 | 190 | 0.003 | 0.0117 |
| 〃 | 3 | 31,900 | 240 | 0.002 | 0.004 | 31,900 | 220 | 0.002 | 0.004 | 31,900 | 190 | 0.001 | 0.004 | 25,500 | 130 | 0.001 | 0.0036 |
| 〃 | 4 | 26,200 | 170 | 0.001 | 0.003 | 26,200 | 160 | 0.001 | 0.003 | 26,200 | 140 | 0.001 | 0.003 | 20,900 | 100 | 0.001 | 0.0027 |
| 〃 | 5 | 20,400 | 100 | 0.001 | 0.002 | 20,400 | 90 | 0.001 | 0.002 | 20,400 | 80 | 0.001 | 0.002 | 16,300 | 60 | 0.001 | 0.0018 |
| ø 0.4 | 1 | 52,700 | 660 | 0.012 | 0.054 | 57,700 | 640 | 0.010 | 0.054 | 48,100 | 470 | 0.008 | 0.054 | 38,500 | 320 | 0.005 | 0.0486 |
| 〃 | 5 | 38,500 | 380 | 0.003 | 0.003 | 34,200 | 300 | 0.003 | 0.003 | 30,100 | 240 | 0.002 | 0.003 | 24,100 | 160 | 0.001 | 0.0027 |
| 〃 | 10 | 33,700 | 260 | 0.001 | 0.001 | 27,300 | 190 | 0.001 | 0.001 | 24,600 | 150 | 0.001 | 0.001 | 19,700 | 100 | 0.001 | 0.0009 |
| ø 0.5 | 2 | 56,800 | 900 | 0.020 | 0.098 | 54,000 | 760 | 0.016 | 0.098 | 40,600 | 510 | 0.014 | 0.098 | 32,500 | 350 | 0.010 | 0.0882 |
| 〃 | 3 | 44,200 | 660 | 0.080 | 0.016 | 39,900 | 530 | 0.090 | 0.016 | 32,200 | 370 | 0.008 | 0.016 | 25,700 | 260 | 0.006 | 0.0144 |
| 〃 | 4 | 40,600 | 580 | 0.009 | 0.012 | 36,100 | 460 | 0.008 | 0.012 | 29,700 | 330 | 0.008 | 0.012 | 23,700 | 230 | 0.005 | 0.0108 |
| 〃 | 5 | 37,000 | 500 | 0.080 | 0.008 | 32,300 | 390 | 0.008 | 0.008 | 27,200 | 290 | 0.006 | 0.008 | 21,700 | 200 | 0.004 | 0.0072 |
| 〃 | 6 | 33,400 | 420 | 0.005 | 0.004 | 28,500 | 320 | 0.005 | 0.004 | 24,700 | 250 | 0.003 | 0.004 | 19,700 | 170 | 0.002 | 0.0036 |
| 〃 | 8 | 29,100 | 320 | 0.002 | 0.002 | 24,100 | 240 | 0.002 | 0.002 | 21,600 | 190 | 0.001 | 0.002 | 17,400 | 130 | 0.001 | 0.0018 |
| 〃 | 10 | 26,100 | 250 | 0.001 | 0.001 | 21,200 | 180 | 0.001 | 0.001 | 19,600 | 150 | 0.001 | 0.001 | 15,600 | 100 | 0.001 | 0.0009 |
| 〃 | 14 | 21,500 | 120 | 0.001 | 0.001 | 16,700 | 80 | 0.001 | 0.001 | 16,300 | 70 | 0.001 | 0.001 | 13,000 | 50 | 0.001 | 0.0009 |
| ø 0.6 | 2 | 63,600 | 1,240 | 0.025 | 0.203 | 53,300 | 930 | 0.020 | 0.203 | 39,100 | 600 | 0.016 | 0.203 | 31,300 | 410 | 0.011 | 0.1827 |
| 〃 | 3 | 52,500 | 990 | 0.018 | 0.114 | 44,000 | 740 | 0.016 | 0.114 | 33,500 | 500 | 0.013 | 0.114 | 26,800 | 340 | 0.009 | 0.1026 |
| 〃 | 4 | 41,300 | 740 | 0.012 | 0.025 | 34,700 | 550 | 0.011 | 0.025 | 27,900 | 390 | 0.009 | 0.025 | 22,300 | 270 | 0.006 | 0.0225 |
| 〃 | 5 | 36,700 | 630 | 0.010 | 0.017 | 30,900 | 470 | 0.009 | 0.017 | 25,500 | 340 | 0.007 | 0.017 | 20,400 | 240 | 0.005 | 0.0153 |
| 〃 | 6 | 32,100 | 520 | 0.007 | 0.008 | 27,000 | 390 | 0.006 | 0.008 | 23,000 | 290 | 0.005 | 0.008 | 18,400 | 200 | 0.003 | 0.0072 |
| 〃 | 8 | 26,800 | 390 | 0.004 | 0.003 | 22,600 | 300 | 0.004 | 0.003 | 20,000 | 230 | 0.003 | 0.003 | 16,000 | 160 | 0.002 | 0.0027 |
| 〃 | 10 | 23,400 | 300 | 0.002 | 0.002 | 19,700 | 230 | 0.002 | 0.002 | 17,900 | 180 | 0.002 | 0.002 | 14,300 | 130 | 0.001 | 0.0018 |
| 〃 | 12 | 20,900 | 240 | 0.002 | 0.001 | 17,600 | 180 | 0.001 | 0.001 | 16,400 | 150 | 0.001 | 0.001 | 13,100 | 100 | 0.001 | 0.0009 |
| 〃 | 16 | 16,200 | 100 | 0.001 | 0.001 | 13,700 | 80 | 0.001 | 0.001 | 13,500 | 70 | 0.001 | 0.001 | 10,800 | 50 | 0.001 | 0.0009 |
| ø 0.7 | 2 | 59,800 | 1,380 | 0.030 | 0.047 | 50,200 | 1,040 | 0.027 | 0.047 | 36,100 | 660 | 0.021 | 0.047 | 28,800 | 430 | 0.015 | 0.0423 |
| 〃 | 4 | 38,900 | 840 | 0.017 | 0.038 | 32,700 | 630 | 0.015 | 0.038 | 25,800 | 440 | 0.012 | 0.038 | 20,600 | 290 | 0.009 | 0.0342 |
| 〃 | 6 | 30,200 | 600 | 0.010 | 0.014 | 25,400 | 450 | 0.009 | 0.014 | 21,200 | 330 | 0.007 | 0.014 | 16,900 | 230 | 0.005 | 0.0126 |
| 〃 | 8 | 25,300 | 460 | 0.006 | 0.006 | 21,300 | 350 | 0.005 | 0.006 | 18,400 | 260 | 0.004 | 0.006 | 14,700 | 190 | 0.003 | 0.0054 |
| 〃 | 10 | 22,000 | 360 | 0.004 | 0.003 | 18,500 | 270 | 0.003 | 0.003 | 16,500 | 220 | 0.003 | 0.003 | 13,200 | 160 | 0.002 | 0.0027 |
| ø 0.8 | 2 | 41,200 | 1,050 | 0.033 | 0.108 | 34,500 | 460 | 0.029 | 0.108 | 26,200 | 530 | 0.023 | 0.108 | 21,000 | 370 | 0.016 | 0.0972 |
| 〃 | 4 | 37,100 | 930 | 0.027 | 0.08 | 31,100 | 700 | 0.024 | 0.08 | 24,100 | 480 | 0.019 | 0.08 | 19,300 | 330 | 0.013 | 0.072 |
| 〃 | 6 | 28,800 | 680 | 0.015 | 0.024 | 24,200 | 510 | 0.013 | 0.024 | 19,800 | 370 | 0.010 | 0.024 | 15,800 | 250 | 0.007 | 0.0216 |
| 〃 | 8 | 24,100 | 520 | 0.009 | 0.01 | 20,300 | 390 | 0.008 | 0.01 | 17,200 | 300 | 0.006 | 0.01 | 13,800 | 200 | 0.004 | 0.009 |
| 〃 | 10 | 21,000 | 420 | 0.006 | 0.005 | 17,700 | 320 | 0.005 | 0.005 | 15,500 | 240 | 0.040 | 0.005 | 12,400 | 170 | 0.003 | 0.0045 |
| 〃 | 12 | 18,700 | 340 | 0.004 | 0.003 | 15,800 | 260 | 0.003 | 0.003 | 14,100 | 200 | 0.003 | 0.003 | 11,300 | 140 | 0.002 | 0.0027 |
| 〃 | 14 | 15,600 | 230 | 0.002 | 0.001 | 13,200 | 180 | 0.020 | 0.001 | 12,300 | 150 | 0.001 | 0.001 | 980 | 100 | 0.001 | 0.0009 |
| ø 0.9 | 6 | 27,600 | 790 | 0.019 | 0.019 | 23,000 | 590 | 0.017 | 0.019 | 18,500 | 420 | 0.013 | 0.019 | 14,800 | 290 | 0.010 | 0.0171 |
| 〃 | 8 | 23,000 | 600 | 0.012 | 0.012 | 19,300 | 450 | 0.011 | 0.012 | 16,100 | 330 | 0.008 | 0.012 | 12,900 | 230 | 0.006 | 0.0108 |
| 〃 | 10 | 20,000 | 470 | 0.008 | 0.008 | 16,800 | 360 | 0.007 | 0.008 | 14,500 | 270 | 0.005 | 0.008 | 11,600 | 190 | 0.004 | 0.0072 |
| ø 1.0 | 2 | 37,900 | 1,340 | 0.048 | 0.263 | 31,500 | 990 | 0.043 | 0.263 | 23,400 | 6,500 | 0.034 | 0.263 | 18,700 | 440 | 0.031 | 0.237 |
| 〃 | 3 | 37,900 | 1,340 | 0.048 | 0.263 | 31,500 | 990 | 0.043 | 0.263 | 23,400 | 6,500 | 0.034 | 0.263 | 18,700 | 440 | 0.031 | 0.237 |
| 〃 | 4 | 34,100 | 1,170 | 0.040 | 0.195 | 28,400 | 870 | 0.036 | 0.195 | 21,500 | 580 | 0.028 | 0.195 | 17,200 | 400 | 0.025 | 0.176 |
| 〃 | 5 | 30,300 | 1,000 | 0.032 | 0.058 | 25,300 | 750 | 0.029 | 0.058 | 19,600 | 510 | 0.022 | 0.058 | 15,700 | 360 | 0.020 | 0.052 |
| 〃 | 6 | 26,500 | 850 | 0.023 | 0.024 | 22,100 | 630 | 0.021 | 0.024 | 17,600 | 440 | 0.016 | 0.024 | 14,100 | 310 | 0.014 | 0.022 |
| 〃 | 8 | 22,100 | 660 | 0.014 | 0.013 | 18,600 | 490 | 0.013 | 0.013 | 15,300 | 360 | 0.010 | 0.013 | 12,300 | 250 | 0.009 | 0.012 |
| 〃 | 10 | 19,200 | 530 | 0.010 | 0.013 | 16,200 | 400 | 0.009 | 0.013 | 13,800 | 300 | 0.007 | 0.013 | 11,000 | 210 | 0.006 | 0.012 |
| 〃 | 12 | 17,200 | 440 | 0.007 | 0.007 | 14,500 | 330 | 0.006 | 0.007 | 12,600 | 250 | 0.005 | 0.007 | 10,100 | 170 | 0.005 | 0.006 |
| 〃 | 14 | 15,600 | 360 | 0.005 | 0.005 | 13,200 | 270 | 0.004 | 0.005 | 11,700 | 210 | 0.003 | 0.005 | 9,400 | 150 | 0.003 | 0.005 |
| 〃 | 16 | 14,300 | 300 | 0.004 | 0.003 | 12,100 | 230 | 0.003 | 0.003 | 11,000 | 180 | 0.003 | 0.003 | 8,800 | 130 | 0.003 | 0.003 |
| 〃 | 20 | 12,500 | 200 | 0.003 | 0.001 | 10,600 | 160 | 0.003 | 0.001 | 9,800 | 130 | 0.002 | 0.001 | 7,900 | 90 | 0.002 | 0.001 |
| 〃 | 25 | 10,800 | 120 | 0.003 | 0.001 | 9,200 | 90 | 0.002 | 0.001 | 8,800 | 80 | 0.002 | 0.001 | 7,100 | 50 | 0.002 | 0.001 |
| 〃 | 30 | 9,700 | 50 | 0.002 | 0.001 | 8,200 | 40 | 0.002 | 0.001 | 8,100 | 30 | 0.001 | 0.001 | 6,500 | 30 | 0.001 | 0.0009 |
| ø 1.2 | 4 | 28,900 | 1,180 | 0.050 | 0.189 | 24,100 | 870 | 0.047 | 0.189 | 18,300 | 580 | 0.036 | 0.189 | 14,500 | 400 | 0.032 | 0.170 |
| 〃 | 6 | 24,800 | 970 | 0.037 | 0.120 | 20,700 | 720 | 0.034 | 0.120 | 16,100 | 490 | 0.026 | 0.120 | 12,800 | 340 | 0.023 | 0.108 |
| 〃 | 8 | 20,700 | 760 | 0.024 | 0.051 | 17,300 | 570 | 0.021 | 0.051 | 13,900 | 400 | 0.016 | 0.051 | 11,100 | 280 | 0.014 | 0.046 |
| 〃 | 10 | 18,000 | 620 | 0.016 | 0.026 | 15,100 | 470 | 0.014 | 0.026 | 12,400 | 340 | 0.011 | 0.026 | 9,900 | 230 | 0.010 | 0.023 |
| 〃 | 12 | 16,100 | 520 | 0.011 | 0.015 | 13,500 | 390 | 0.010 | 0.015 | 11,400 | 290 | 0.008 | 0.015 | 9,100 | 200 | 0.007 | 0.014 |
| 〃 | 16 | 13,400 | 380 | 0.006 | 0.006 | 11,300 | 290 | 0.005 | 0.006 | 9,800 | 220 | 0.004 | 0.006 | 7,900 | 150 | 0.004 | 0.005 |
| 〃 | 20 | 11,700 | 280 | 0.004 | 0.003 | 9,900 | 210 | 0.004 | 0.003 | 8,800 | 170 | 0.003 | 0.003 | 7,000 | 120 | 0.003 | 0.003 |
| 〃 | 25 | 10,800 | 120 | 0.003 | 0.001 | 9,200 | 90 | 0.002 | 0.001 | 8,800 | 80 | 0.002 | 0.001 | 7,100 | 50 | 0.002 | 0.001 |
| 〃 | 30 | 9,700 | 50 | 0.002 | 0.001 | 8,200 | 40 | 0.002 | 0.001 | 8,100 | 30 | 0.001 | 0.001 | 6,500 | 30 | 0.001 | 0.0009 |

## 2HRE Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 구조용강 / 탄소강 / 회주철 Mild steels / Carbon Steels / Gray cast irons SS / SC / FC | | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | ~30HRc | | | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1.4 | 6 | 23,300 | 1,070 | 0.052 | 0.222 | 19,400 | 800 | 0.047 | 0.222 | 14,800 | 540 | 0.060 | 0.222 | 11,900 | 370 | 0.054 | 0.200 |
| 〃 | 8 | 19,500 | 850 | 0.035 | 0.094 | 16,300 | 640 | 0.032 | 0.094 | 12,900 | 440 | 0.025 | 0.094 | 10,300 | 310 | 0.023 | 0.085 |
| 〃 | 10 | 16,900 | 710 | 0.025 | 0.048 | 14,200 | 530 | 0.022 | 0.048 | 11,500 | 380 | 0.017 | 0.048 | 9,200 | 260 | 0.015 | 0.043 |
| 〃 | 14 | 13,700 | 510 | 0.013 | 0.018 | 11,500 | 390 | 0.012 | 0.018 | 9,700 | 290 | 0.009 | 0.018 | 7,800 | 200 | 0.008 | 0.016 |
| 〃 | 16 | 12,600 | 450 | 0.010 | 0.012 | 10,600 | 340 | 0.009 | 0.012 | 9,100 | 250 | 0.007 | 0.012 | 7,300 | 180 | 0.006 | 0.011 |
| 〃 | 20 | 10,300 | 300 | 0.006 | 0.005 | 8,700 | 230 | 0.005 | 0.005 | 7,800 | 180 | 0.004 | 0.005 | 6,200 | 120 | 0.004 | 0.005 |
| ø 1.5 | 4 | 26,600 | 1,340 | 0.073 | 0.462 | 22,100 | 1,000 | 0.065 | 0.462 | 16,300 | 640 | 0.051 | 0.462 | 13,000 | 440 | 0.046 | 0.416 |
| 〃 | 6 | 22,800 | 1,120 | 0.057 | 0.293 | 19,000 | 840 | 0.051 | 0.293 | 14,400 | 550 | 0.040 | 0.293 | 11,500 | 380 | 0.036 | 0.264 |
| 〃 | 8 | 19,000 | 900 | 0.041 | 0.124 | 15,900 | 670 | 0.037 | 0.124 | 12,500 | 460 | 0.029 | 0.124 | 10,000 | 320 | 0.026 | 0.112 |
| 〃 | 10 | 16,600 | 750 | 0.030 | 0.063 | 13,800 | 560 | 0.027 | 0.063 | 11,200 | 390 | 0.021 | 0.063 | 8,900 | 270 | 0.019 | 0.057 |
| 〃 | 12 | 14,800 | 630 | 0.023 | 0.037 | 12,400 | 470 | 0.020 | 0.037 | 10,200 | 340 | 0.016 | 0.037 | 8,200 | 240 | 0.014 | 0.033 |
| 〃 | 14 | 13,400 | 550 | 0.017 | 0.023 | 11,200 | 410 | 0.016 | 0.023 | 9,500 | 300 | 0.012 | 0.023 | 7,600 | 210 | 0.011 | 0.021 |
| 〃 | 16 | 12,300 | 480 | 0.013 | 0.015 | 10,300 | 360 | 0.012 | 0.015 | 8,900 | 270 | 0.009 | 0.015 | 7,100 | 190 | 0.008 | 0.014 |
| 〃 | 18 | 11,500 | 420 | 0.011 | 0.011 | 9,600 | 310 | 0.010 | 0.011 | 8,400 | 240 | 0.007 | 0.011 | 6,700 | 170 | 0.006 | 0.010 |
| 〃 | 20 | 10,700 | 370 | 0.009 | 0.008 | 9,000 | 280 | 0.008 | 0.008 | 7,900 | 220 | 0.006 | 0.008 | 6,300 | 150 | 0.005 | 0.007 |
| 〃 | 25 | 9,300 | 270 | 0.005 | 0.004 | 7,800 | 200 | 0.005 | 0.004 | 7,100 | 160 | 0.004 | 0.004 | 5,700 | 110 | 0.004 | 0.004 |
| 〃 | 30 | 8,300 | 200 | 0.004 | 0.002 | 7,000 | 150 | 0.004 | 0.002 | 6,500 | 120 | 0.003 | 0.002 | 5,200 | 90 | 0.003 | 0.002 |
| ø 1.6 | 10 | 16,100 | 780 | 0.035 | 0.082 | 13,500 | 580 | 0.032 | 0.082 | 10,800 | 410 | 0.025 | 0.082 | 8,600 | 280 | 0.018 | 0.074 |
| 〃 | 14 | 13,000 | 580 | 0.020 | 0.030 | 10,900 | 430 | 0.018 | 0.030 | 9,100 | 320 | 0.014 | 0.030 | 7,300 | 220 | 0.010 | 0.027 |
| 〃 | 18 | 11,100 | 450 | 0.013 | 0.014 | 9,300 | 340 | 0.012 | 0.014 | 8,000 | 260 | 0.009 | 0.014 | 6,400 | 180 | 0.006 | 0.013 |
| ø 2 | 4 | 23,000 | 1,500 | 0.070 | 0.966 | 20,000 | 1,200 | 0.060 | 0.966 | 14,000 | 750 | 0.052 | 0.966 | 12,000 | 500 | 0.040 | 0.869 |
| 〃 | 6 | 20,300 | 1,350 | 0.064 | 0.926 | 17,400 | 1,030 | 0.058 | 0.926 | 12,500 | 650 | 0.045 | 0.926 | 10,000 | 450 | 0.032 | 0.833 |
| 〃 | 8 | 17,000 | 1,090 | 0.054 | 0.391 | 14,500 | 830 | 0.048 | 0.391 | 10,800 | 540 | 0.038 | 0.391 | 8,700 | 380 | 0.027 | 0.352 |
| 〃 | 10 | 14,800 | 920 | 0.045 | 0.200 | 12,600 | 700 | 0.040 | 0.200 | 9,700 | 470 | 0.031 | 0.200 | 7,800 | 330 | 0.022 | 0.180 |
| 〃 | 12 | 13,200 | 790 | 0.037 | 0.116 | 11,200 | 600 | 0.034 | 0.116 | 8,900 | 420 | 0.026 | 0.116 | 7,100 | 290 | 0.019 | 0.104 |
| 〃 | 14 | 12,000 | 700 | 0.031 | 0.073 | 10,200 | 530 | 0.028 | 0.073 | 8,200 | 370 | 0.022 | 0.073 | 6,600 | 260 | 0.016 | 0.066 |
| 〃 | 16 | 11,100 | 620 | 0.026 | 0.049 | 9,400 | 470 | 0.024 | 0.049 | 7,700 | 340 | 0.018 | 0.049 | 6,100 | 230 | 0.013 | 0.044 |
| 〃 | 18 | 10,300 | 550 | 0.022 | 0.034 | 8,700 | 420 | 0.020 | 0.034 | 7,200 | 310 | 0.015 | 0.034 | 5,800 | 210 | 0.011 | 0.031 |
| 〃 | 20 | 9,600 | 500 | 0.018 | 0.025 | 8,100 | 380 | 0.016 | 0.025 | 6,900 | 280 | 0.013 | 0.025 | 5,500 | 190 | 0.009 | 0.023 |
| 〃 | 22 | 8,700 | 420 | 0.014 | 0.018 | 7,500 | 320 | 0.014 | 0.018 | 6,500 | 250 | 0.010 | 0.018 | 5,200 | 170 | 0.008 | 0.016 |
| 〃 | 25 | 8,400 | 390 | 0.012 | 0.013 | 7,100 | 290 | 0.011 | 0.013 | 6,200 | 230 | 0.008 | 0.013 | 4,900 | 160 | 0.006 | 0.012 |
| 〃 | 30 | 7,500 | 310 | 0.008 | 0.007 | 6,300 | 230 | 0.007 | 0.007 | 5,600 | 180 | 0.005 | 0.007 | 4,500 | 130 | 0.004 | 0.006 |
| ø 2.5 | 8 | 15,000 | 1,340 | 0.077 | 0.954 | 12,800 | 1,020 | 0.069 | 0.954 | 9,600 | 670 | 0.054 | 0.954 | 7,700 | 460 | 0.039 | 0.859 |
| 〃 | 10 | 13,100 | 1,140 | 0.068 | 0.488 | 11,100 | 860 | 0.061 | 0.488 | 8,600 | 590 | 0.048 | 0.488 | 6,900 | 400 | 0.034 | 0.439 |
| 〃 | 12 | 11,800 | 1,000 | 0.060 | 0.283 | 10,000 | 750 | 0.054 | 0.283 | 7,900 | 520 | 0.042 | 0.283 | 6,300 | 360 | 0.030 | 0.255 |
| 〃 | 16 | 9,900 | 790 | 0.045 | 0.119 | 8,400 | 590 | 0.040 | 0.119 | 6,800 | 430 | 0.031 | 0.119 | 5,500 | 290 | 0.022 | 0.107 |
| 〃 | 20 | 8,700 | 650 | 0.033 | 0.061 | 7,300 | 490 | 0.030 | 0.061 | 6,100 | 360 | 0.023 | 0.061 | 4,900 | 250 | 0.017 | 0.055 |
| 〃 | 25 | 7,600 | 520 | 0.022 | 0.031 | 6,400 | 390 | 0.019 | 0.031 | 5,500 | 300 | 0.015 | 0.031 | 4,400 | 210 | 0.011 | 0.028 |
| 〃 | 30 | 6,800 | 430 | 0.014 | 0.018 | 5,700 | 320 | 0.012 | 0.018 | 5,000 | 250 | 0.010 | 0.018 | 4,000 | 1,700 | 0.007 | 0.016 |
| 〃 | 35 | 6,200 | 380 | 0.009 | 0.012 | 5,200 | 280 | 0.008 | 0.012 | 4,800 | 190 | 0.007 | 0.012 | 3,800 | 1,400 | 0.005 | 0.011 |
| 〃 | 40 | 5,700 | 290 | 0.005 | 0.008 | 4,800 | 220 | 0.004 | 0.008 | 4,400 | 170 | 0.003 | 0.008 | 3,500 | 120 | 0.002 | 0.007 |
| 〃 | 50 | 5,000 | 190 | 0.001 | 0.004 | 4,200 | 140 | 0.001 | 0.004 | 3,900 | 120 | 0.001 | 0.004 | 3,100 | 80 | 0.001 | 0.004 |
| ø 3 | 6 | 13,200 | 1,470 | 0.103 | 1.978 | 10,900 | 1,080 | 0.093 | 1.978 | 8,000 | 700 | 0.072 | 1.978 | 6,400 | 480 | 0.052 | 1.780 |
| 〃 | 10 | 11,600 | 1,270 | 0.092 | 1.013 | 9,600 | 930 | 0.083 | 1.013 | 7,200 | 620 | 0.064 | 1.013 | 5,800 | 430 | 0.046 | 0.912 |
| 〃 | 12 | 10,500 | 1,110 | 0.081 | 0.586 | 8,700 | 830 | 0.073 | 0.586 | 6,700 | 560 | 0.057 | 0.586 | 5,300 | 380 | 0.041 | 0.527 |
| 〃 | 16 | 8,900 | 900 | 0.064 | 0.247 | 7,400 | 670 | 0.058 | 0.247 | 5,900 | 470 | 0.045 | 0.247 | 4,700 | 320 | 0.032 | 0.222 |
| 〃 | 20 | 7,800 | 750 | 0.050 | 0.127 | 6,600 | 560 | 0.045 | 0.127 | 5,300 | 400 | 0.035 | 0.127 | 4,300 | 280 | 0.025 | 0.114 |
| 〃 | 25 | 6,900 | 620 | 0.036 | 0.065 | 5,800 | 460 | 0.032 | 0.065 | 4,800 | 340 | 0.025 | 0.065 | 3,900 | 230 | 0.018 | 0.059 |
| 〃 | 30 | 6,200 | 520 | 0.026 | 0.038 | 5,200 | 390 | 0.023 | 0.038 | 4,500 | 290 | 0.018 | 0.038 | 3,600 | 200 | 0.013 | 0.034 |
| 〃 | 35 | 5,700 | 440 | 0.018 | 0.024 | 4,800 | 330 | 0.016 | 0.024 | 4,200 | 250 | 0.013 | 0.024 | 3,300 | 170 | 0.009 | 0.022 |
| 〃 | 40 | 5,300 | 370 | 0.013 | 0.016 | 4,500 | 280 | 0.012 | 0.016 | 3,900 | 220 | 0.009 | 0.016 | 3,100 | 150 | 0.006 | 0.014 |
| 〃 | 45 | 5,000 | 330 | 0.008 | 0.012 | 4,200 | 230 | 0.008 | 0.012 | 3,700 | 180 | 0.006 | 0.012 | 2,900 | 130 | 0.005 | 0.011 |
| 〃 | 50 | 4,700 | 270 | 0.006 | 0.008 | 3,900 | 200 | 0.005 | 0.008 | 3,600 | 160 | 0.004 | 0.008 | 2,800 | 110 | 0.003 | 0.007 |
| 〃 | 60 | 4,500 | 250 | 0.003 | 0.005 | 3,600 | 180 | 0.003 | 0.005 | 3,200 | 130 | 0.003 | 0.005 | 2,500 | 90 | 0.002 | 0.005 |
| ø 4 | 8 | 10,000 | 1,600 | 0.140 | 1.990 | 8,800 | 1,100 | 0.140 | 1.990 | 6,800 | 770 | 0.093 | 1.990 | 5,300 | 500 | 0.070 | 1.791 |
| 〃 | 10 | 9,200 | 1,400 | 0.120 | 1.960 | 8,000 | 1,000 | 0.120 | 1.960 | 5,900 | 690 | 0.085 | 1.960 | 4,700 | 460 | 0.066 | 1.764 |
| 〃 | 12 | 8,500 | 1,280 | 0.112 | 1.852 | 7,100 | 950 | 0.101 | 1.852 | 5,100 | 600 | 0.078 | 1.852 | 4,100 | 410 | 0.056 | 1.667 |
| 〃 | 16 | 7,200 | 1,050 | 0.093 | 0.781 | 6,000 | 770 | 0.084 | 0.781 | 4,400 | 510 | 0.065 | 0.781 | 3,600 | 350 | 0.046 | 0.703 |
| 〃 | 20 | 6,300 | 880 | 0.077 | 0.400 | 5,200 | 650 | 0.069 | 0.400 | 4,000 | 440 | 0.054 | 0.400 | 3,200 | 300 | 0.038 | 0.360 |
| 〃 | 25 | 5,600 | 750 | 0.061 | 0.205 | 4,600 | 540 | 0.055 | 0.205 | 3,600 | 380 | 0.042 | 0.205 | 2,900 | 260 | 0.030 | 0.185 |
| 〃 | 30 | 5,000 | 630 | 0.048 | 0.119 | 4,100 | 460 | 0.043 | 0.119 | 3,300 | 330 | 0.033 | 0.119 | 2,600 | 230 | 0.024 | 0.107 |
| 〃 | 35 | 4,600 | 540 | 0.038 | 0.075 | 3,800 | 400 | 0.034 | 0.075 | 3,100 | 290 | 0.026 | 0.075 | 2,500 | 200 | 0.019 | 0.068 |
| 〃 | 40 | 4,200 | 470 | 0.030 | 0.050 | 3,500 | 350 | 0.027 | 0.050 | 2,900 | 250 | 0.021 | 0.050 | 2,300 | 180 | 0.015 | 0.045 |
| 〃 | 45 | 3,900 | 410 | 0.023 | 0.035 | 3,300 | 300 | 0.021 | 0.035 | 2,700 | 230 | 0.016 | 0.035 | 2,200 | 160 | 0.012 | 0.032 |
| 〃 | 50 | 3,700 | 360 | 0.018 | 0.026 | 3,100 | 270 | 0.016 | 0.026 | 2,600 | 200 | 0.013 | 0.026 | 2,100 | 140 | 0.009 | 0.023 |
| 〃 | 55 | 3,500 | 320 | 0.015 | 0.020 | 2,950 | 250 | 0.015 | 0.020 | 2,500 | 180 | 0.010 | 0.020 | 2,000 | 130 | 0.007 | 0.018 |
| 〃 | 60 | 3,300 | 280 | 0.011 | 0.015 | 2,800 | 210 | 0.010 | 0.015 | 2,400 | 160 | 0.008 | 0.015 | 1,900 | 110 | 0.006 | 0.014 |

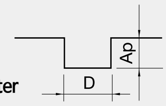
# 2HRE Cutting Condition

• RPM : rev./min • Feed : mm/min

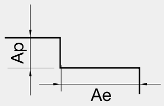
| 피삭재 Material | | 구조용강 / 탄소강 / 회주철 Mild steels / Carbon Steels / Gray cast irons SS / SC / FC | | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | ~30HRc | | | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 5 | 16 | 6,000 | 1,140 | 0.127 | 1.907 | 5,100 | 860 | 0.114 | 1.907 | 3,500 | 520 | 0.089 | 1.907 | 2,800 | 360 | 0.064 | 1.716 |
| 〃 | 20 | 5,300 | 980 | 0.121 | 0.977 | 4,400 | 730 | 0.109 | 0.977 | 3,100 | 440 | 0.085 | 0.977 | 2,500 | 310 | 0.061 | 0.879 |
| 〃 | 25 | 4,600 | 820 | 0.109 | 0.500 | 3,800 | 600 | 0.099 | 0.500 | 2,800 | 390 | 0.077 | 0.500 | 2,200 | 270 | 0.055 | 0.450 |
| 〃 | 30 | 4,200 | 710 | 0.094 | 0.289 | 3,400 | 510 | 0.085 | 0.289 | 2,500 | 340 | 0.066 | 0.289 | 2,000 | 230 | 0.047 | 0.260 |
| 〃 | 35 | 3,800 | 620 | 0.077 | 0.182 | 3,100 | 450 | 0.069 | 0.182 | 2,300 | 300 | 0.054 | 0.182 | 1,900 | 210 | 0.038 | 0.164 |
| 〃 | 40 | 3,500 | 540 | 0.060 | 0.122 | 2,800 | 390 | 0.054 | 0.122 | 2,200 | 270 | 0.042 | 0.122 | 1,700 | 180 | 0.030 | 0.110 |
| 〃 | 50 | 3,100 | 430 | 0.031 | 0.063 | 2,400 | 300 | 0.028 | 0.063 | 1,900 | 210 | 0.022 | 0.063 | 1,500 | 150 | 0.016 | 0.057 |
| 〃 | 60 | 2,800 | 350 | 0.013 | 0.036 | 2,100 | 240 | 0.012 | 0.036 | 1,800 | 170 | 0.009 | 0.036 | 1,400 | 120 | 0.007 | 0.032 |
| ø 6 | 20 | 4,200 | 960 | 0.126 | 2.025 | 3,800 | 780 | 0.114 | 2.025 | 2,600 | 470 | 0.088 | 2.025 | 2,100 | 330 | 0.063 | 1.823 |
| 〃 | 30 | 3,400 | 730 | 0.109 | 0.600 | 2,800 | 540 | 0.099 | 0.600 | 2,000 | 340 | 0.077 | 0.600 | 1,600 | 240 | 0.055 | 0.540 |
| 〃 | 40 | 3,000 | 600 | 0.083 | 0.253 | 2,300 | 410 | 0.074 | 0.253 | 1,700 | 260 | 0.058 | 0.253 | 1,300 | 170 | 0.041 | 0.228 |
| 〃 | 50 | 2,600 | 480 | 0.054 | 0.130 | 1,900 | 310 | 0.049 | 0.130 | 1,500 | 220 | 0.038 | 0.130 | 1,200 | 160 | 0.027 | 0.117 |
| 〃 | 60 | 2,400 | 410 | 0.031 | 0.075 | 1,700 | 260 | 0.028 | 0.075 | 1,300 | 170 | 0.022 | 0.075 | 1,000 | 120 | 0.016 | 0.068 |
| ø 8 | 20 | 3,200 | 910 | 0.180 | 1.600 | 2,800 | 710 | 0.160 | 1.600 | 2,300 | 450 | 0.130 | 1.600 | 1,700 | 330 | 0.090 | 1.440 |
| 〃 | 40 | 2,600 | 600 | 0.120 | 0.200 | 2,000 | 410 | 0.100 | 0.200 | 1,500 | 250 | 0.080 | 0.200 | 1,100 | 160 | 0.060 | 0.180 |
| ø 10 | 25 | 2,900 | 890 | 0.200 | 1.760 | 2,700 | 680 | 0.180 | 1.760 | 2,100 | 430 | 0.130 | 1.760 | 1,500 | 310 | 0.080 | 1.584 |
| 〃 | 45 | 2,200 | 580 | 0.140 | 0.240 | 2,000 | 400 | 0.120 | 0.240 | 1,300 | 220 | 0.700 | 0.240 | 900 | 150 | 0.050 | 0.216 |

**절입량** Depth of Cut

Slotting
• Ap : Axial Depth
• D : Outside Diameter




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




- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC60 이상 고경도강 가공 시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다(Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece, HRC over 60 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

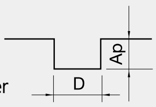
# 4HRE Cutting Condition

• RPM : rev./min • Feed : mm/min

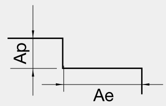
| 피삭재<br>Material | | 구조용강 / 탄소강 /회주철<br>Mild steels / Carbon Steels / Gray cast irons<br>SS / SC /FC | | | | 공구강 / 금형강<br>Tool steels / Mold steels<br>SCM / HPM | | | | 합금강 / 프리하든강<br>Alloy Steels / Pre-hardened Steels<br>NAK80 / KP4M | | | | 고경도강<br>Hardened Steels<br>STAVAX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | ~30HRc | | | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경<br>Outside Diameter | 유효장<br>Effective Length | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth |
| ø 0.8 | 8 | 25,000 | 750 | 0.009 | 0.01 | 21,600 | 560 | 0.008 | 0.01 | 18,300 | 450 | 0.006 | 0.01 | 15,900 | 300 | 0.004 | 0.009 |
| 〃 | 16 | 16,800 | 340 | 0.002 | 0.001 | 15,700 | 270 | 0.002 | 0.001 | 13,300 | 240 | 0.001 | 0.001 | 10,400 | 200 | 0.001 | 0.001 |
| ø 1 | 8 | 24,000 | 720 | 0.014 | 0.024 | 20,300 | 490 | 0.013 | 0.024 | 16,900 | 390 | 0.010 | 0.024 | 14,200 | 265 | 0.007 | 0.022 |
| 〃 | 16 | 15,800 | 325 | 0.004 | 0.003 | 14,300 | 250 | 0.003 | 0.003 | 12,200 | 220 | 0.003 | 0.003 | 9,200 | 178 | 0.002 | 0.003 |
| 〃 | 25 | 12,600 | 165 | 0.003 | 0.001 | 11,200 | 120 | 0.002 | 0.001 | 10,800 | 105 | 0.002 | 0.001 | 8,300 | 88 | 0.001 | 0.001 |
| ø 1.5 | 8 | 21,000 | 980 | 0.041 | 0.124 | 18,800 | 740 | 0.037 | 0.124 | 14,600 | 520 | 0.029 | 0.124 | 12,400 | 355 | 0.020 | 0.112 |
| 〃 | 16 | 13,600 | 544 | 0.013 | 0.015 | 12,200 | 410 | 0.012 | 0.015 | 10,500 | 322 | 0.009 | 0.015 | 8,000 | 230 | 0.007 | 0.014 |
| 〃 | 25 | 11,400 | 318 | 0.005 | 0.004 | 10,500 | 240 | 0.005 | 0.004 | 8,600 | 196 | 0.004 | 0.004 | 6,200 | 138 | 0.003 | 0.004 |
| ø 2 | 8 | 19,600 | 1,197 | 0.054 | 0.391 | 17,000 | 970 | 0.048 | 0.391 | 12,800 | 630 | 0.038 | 0.391 | 10,600 | 470 | 0.027 | 0.352 |
| 〃 | 16 | 12,300 | 740 | 0.026 | 0.049 | 11,600 | 574 | 0.024 | 0.049 | 9,800 | 378 | 0.018 | 0.049 | 7,300 | 268 | 0.013 | 0.044 |
| 〃 | 25 | 10,100 | 456 | 0.012 | 0.013 | 9,700 | 348 | 0.011 | 0.013 | 7,900 | 262 | 0.008 | 0.013 | 6,400 | 184 | 0.006 | 0.012 |
| ø 2.5 | 10 | 16,600 | 1,240 | 0.068 | 0.488 | 14,300 | 1,035 | 0.061 | 0.488 | 10,200 | 689 | 0.048 | 0.488 | 8,350 | 510 | 0.034 | 0.439 |
| 〃 | 16 | 11,600 | 890 | 0.045 | 0.119 | 9,800 | 710 | 0.040 | 0.119 | 7,220 | 480 | 0.031 | 0.119 | 6,700 | 326 | 0.022 | 0.107 |
| 〃 | 25 | 8,700 | 630 | 0.022 | 0.031 | 8,300 | 460 | 0.019 | 0.031 | 6,360 | 338 | 0.015 | 0.031 | 5,500 | 273 | 0.011 | 0.028 |
| ø 3 | 8 | 14,800 | 1,390 | 0.092 | 0.350 | 12,100 | 1,100 | 0.083 | 0.350 | 8,800 | 736 | 0.064 | 0.350 | 6,900 | 553 | 0.046 | 0.315 |
| 〃 | 16 | 10,200 | 968 | 0.064 | 0.247 | 8,600 | 816 | 0.058 | 0.247 | 6,300 | 543 | 0.045 | 0.247 | 5,890 | 362 | 0.032 | 0.222 |
| 〃 | 25 | 7,600 | 740 | 0.036 | 0.038 | 7,100 | 518 | 0.032 | 0.038 | 5,880 | 397 | 0.025 | 0.038 | 3,900 | 293 | 0.018 | 0.034 |
| 〃 | 35 | 6,200 | 415 | 0.018 | 0.024 | 5,300 | 374 | 0.016 | 0.024 | 4,730 | 322 | 0.013 | 0.024 | 3,300 | 216 | 0.009 | 0.022 |
| ø 4 | 8 | 12,300 | 1,830 | 0.140 | 0.950 | 10,200 | 1,210 | 0.140 | 0.950 | 7,400 | 848 | 0.093 | 0.900 | 6,300 | 500 | 0.070 | 0.810 |
| 〃 | 16 | 8,600 | 1,240 | 0.093 | 0.580 | 7,200 | 860 | 0.084 | 0.580 | 5,100 | 573 | 0.065 | 0.580 | 5,150 | 397 | 0.046 | 0.522 |
| 〃 | 25 | 6,400 | 890 | 0.061 | 0.205 | 5,000 | 590 | 0.055 | 0.205 | 4,180 | 433 | 0.042 | 0.205 | 3,180 | 304 | 0.030 | 0.185 |
| 〃 | 40 | 4,950 | 510 | 0.030 | 0.050 | 3,900 | 385 | 0.027 | 0.050 | 3,300 | 341 | 0.021 | 0.050 | 2,770 | 208 | 0.015 | 0.045 |
| ø 5 | 16 | 7,200 | 1,280 | 0.127 | 1.250 | 6,400 | 944 | 0.114 | 1.250 | 4,387 | 554 | 0.089 | 1.250 | 4,220 | 378 | 0.064 | 1.125 |
| 〃 | 25 | 5,400 | 955 | 0.109 | 0.500 | 4,600 | 665 | 0.099 | 0.500 | 3,668 | 412 | 0.077 | 0.500 | 2,740 | 280 | 0.055 | 0.450 |
| 〃 | 40 | 4,100 | 660 | 0.060 | 0.122 | 3,300 | 470 | 0.054 | 0.122 | 3,655 | 298 | 0.042 | 0.122 | 2,320 | 180 | 0.030 | 0.110 |
| ø 6 | 20 | 4,880 | 1,088 | 0.126 | 2.025 | 4,433 | 726 | 0.114 | 2.025 | 2,980 | 528 | 0.088 | 2.025 | 2,640 | 356 | 0.063 | 1.823 |
| 〃 | 40 | 3,800 | 720 | 0.083 | 0.253 | 2,950 | 497 | 0.074 | 0.253 | 2,100 | 326 | 0.058 | 0.253 | 2,078 | 226 | 0.041 | 0.228 |
| ø 8 | 20 | 4,460 | 980 | 0.180 | 1.600 | 3,600 | 787 | 0.160 | 1.600 | 2,540 | 487 | 0.130 | 1.600 | 2,430 | 343 | 0.090 | 1.440 |
| 〃 | 40 | 3,400 | 780 | 0.120 | 0.200 | 2,460 | 516 | 0.100 | 0.200 | 1,890 | 297 | 0.080 | 0.200 | 1,770 | 211 | 0.060 | 0.180 |
| ø 10 | 25 | 3,400 | 926 | 0.200 | 1.760 | 3,160 | 726 | 0.180 | 1.760 | 2,360 | 467 | 0.130 | 1.760 | 1,650 | 326 | 0.080 | 1.584 |
| 〃 | 35 | 2,170 | 640 | 0.140 | 0.240 | 2,120 | 615 | 0.120 | 0.240 | 1,780 | 412 | 0.090 | 0.240 | 1,180 | 192 | 0.070 | 0.216 |
| ø 12 | 30 | 2,500 | 710 | 0.220 | 1.840 | 2,300 | 580 | 0.200 | 1.840 | 2,000 | 400 | 0.140 | 1.840 | 1,400 | 280 | 0.080 | 1.656 |
| 〃 | 40 | 1,880 | 526 | 0.120 | 0.280 | 1,820 | 474 | 0.110 | 0.280 | 1,690 | 345 | 0.080 | 0.280 | 1,020 | 184 | 0.060 | 0.252 |

**절입량**
Depth of Cut

Slotting
• Ap : Axial Depth
• D : Outside Diameter




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




- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC60 이상 고경도강 가공 시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다(Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece, HRC over 60 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

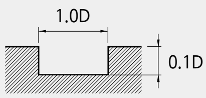
# 2HSE/2HCE Cutting Condition

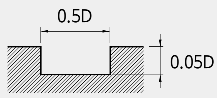
• RPM : rev./min • Feed : mm/min

## 홈절삭 Slotting

| 피삭재 Material | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | 고경도강 Hardened Steels STAVAX / SKD11 | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | 40 ~ 45HRc | | 45 ~ 55HRc | | 55 ~ 62HRc | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| Ø0.1 | 50,000 | 150 | 45,000 | 150 | 40,000 | 135 | 33,000 | 75 |
| Ø0.2 | 50,000 | 195 | 45,000 | 173 | 40,000 | 143 | 33,000 | 90 |
| Ø0.3 | 50,000 | 285 | 45,000 | 210 | 40,000 | 173 | 33,000 | 105 |
| Ø0.4 | 50,000 | 353 | 45,000 | 270 | 40,000 | 210 | 33,000 | 135 |
| Ø0.5 | 50,000 | 555 | 45,000 | 420 | 40,000 | 330 | 33,000 | 210 |
| Ø0.6 | 50,000 | 705 | 45,000 | 540 | 40,000 | 428 | 30,000 | 240 |
| Ø0.8 | 50,000 | 900 | 40,000 | 660 | 30,000 | 443 | 25,000 | 278 |
| Ø0.9 | 49,000 | 983 | 39,000 | 780 | 27,800 | 495 | 22,700 | 308 |
| Ø1 | 48,000 | 1,125 | 38,000 | 855 | 25,500 | 540 | 20,500 | 323 |
| Ø2 | 33,300 | 1,275 | 26,000 | 1,020 | 17,500 | 630 | 14,500 | 390 |
| Ø3 | 21,800 | 1,275 | 17,300 | 1,020 | 11,500 | 630 | 9,500 | 390 |
| Ø4 | 16,700 | 1,320 | 13,200 | 1,050 | 8,800 | 660 | 7,200 | 405 |
| Ø5 | 15,700 | 1,500 | 12,500 | 1,208 | 8,300 | 750 | 6,400 | 428 |
| Ø6 | 13,100 | 1,425 | 10,350 | 1,155 | 6,900 | 720 | 5,300 | 420 |
| Ø8 | 9,880 | 1,395 | 7,800 | 1,080 | 5,200 | 668 | 4,000 | 383 |
| Ø10 | 7,800 | 1,275 | 6,150 | 1,020 | 4,100 | 623 | 3,200 | 360 |
| Ø12 | 6,650 | 1,275 | 5,250 | 1,020 | 3,500 | 623 | 2,650 | 360 |
| Ø16 | 5,540 | 1,170 | 4,340 | 915 | 2,600 | 540 | 1,840 | 270 |
| Ø18 | 5,540 | 1,170 | 4,340 | 915 | 2,600 | 540 | 1,840 | 270 |
| Ø20 | 4,640 | 1,080 | 4,340 | 855 | 2,100 | 450 | 1,460 | 270 |

절입량 Depth of Cut

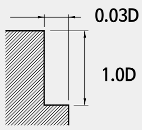
~ 55HRC 

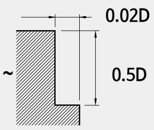

55HRC ~ 


## 측면절삭 Side Cutting

| 피삭재 Material | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | 고경도강 Hardened Steels STAVAX / SKD11 | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | 40 ~ 45HRc | | 45 ~ 55HRc | | 55 ~ 62HRc | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| Ø1 | 48,000 | 788 | 38,000 | 615 | 25,500 | 383 | 20,500 | 233 |
| Ø2 | 33,300 | 900 | 26,000 | 728 | 17,500 | 450 | 14,500 | 278 |
| Ø3 | 21,800 | 900 | 17,300 | 728 | 11,500 | 450 | 9,500 | 278 |
| Ø4 | 16,700 | 938 | 13,200 | 750 | 8,800 | 469 | 7,200 | 289 |
| Ø5 | 15,700 | 1088 | 12,500 | 863 | 8,300 | 533 | 6,400 | 308 |
| Ø6 | 13,100 | 1013 | 10,350 | 825 | 6,900 | 518 | 5,300 | 300 |
| Ø8 | 9,880 | 990 | 7,800 | 773 | 5,200 | 476 | 4,000 | 274 |
| Ø10 | 7,800 | 900 | 6,150 | 728 | 4,100 | 443 | 3,200 | 255 |
| Ø12 | 6,650 | 900 | 5,250 | 728 | 3,500 | 443 | 2,650 | 255 |
| Ø16 | 5,540 | 750 | 4,340 | 660 | 2,600 | 398 | 1,840 | 255 |
| Ø18 | 5,540 | 750 | 4,200 | 660 | 2,450 | 398 | 1,650 | 225 |
| Ø20 | 4,640 | 713 | 3,650 | 600 | 2,100 | 375 | 1,460 | 221 |

절입량 Depth of Cut

~ 55HRC 


55HRC ~ 


- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC60 이상 고경도강 가공 시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다(Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일미스트쿨런트를추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece, HRC over 60 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

# 4HSE/4HCE Cutting Condition

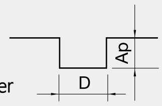
• RPM : rev./min • Feed : mm/min

## 홈절삭 Slotting

| 피삭재 Material | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.3 | 50,000 | 238 | 0.03 | 0.3 | 45,000 | 175 | 0.03 | 0.3 | 40,000 | 144 | 0.02 | 0.150 | 33,000 | 88 | 0.01 | 0.075 |
| ø 0.4 | 50,000 | 294 | 0.04 | 0.4 | 45,000 | 225 | 0.04 | 0.4 | 40,000 | 175 | 0.02 | 0.200 | 33,000 | 113 | 0.01 | 0.100 |
| ø 0.5 | 50,000 | 463 | 0.05 | 0.5 | 45,000 | 350 | 0.05 | 0.5 | 40,000 | 275 | 0.03 | 0.250 | 33,000 | 175 | 0.01 | 0.125 |
| ø 0.6 | 50,000 | 588 | 0.06 | 0.6 | 45,000 | 450 | 0.06 | 0.6 | 40,000 | 356 | 0.03 | 0.300 | 30,000 | 200 | 0.02 | 0.150 |
| ø 0.8 | 50,000 | 750 | 0.08 | 0.8 | 40,000 | 550 | 0.08 | 0.8 | 30,000 | 369 | 0.04 | 0.400 | 25,000 | 231 | 0.02 | 0.200 |
| ø 0.9 | 49,000 | 819 | 0.09 | 0.9 | 39,000 | 650 | 0.09 | 0.9 | 27,800 | 413 | 0.05 | 0.450 | 22,700 | 256 | 0.02 | 0.225 |
| ø 1 | 48,000 | 1,313 | 0.1 | 1.0 | 38,000 | 855 | 0.1 | 1.0 | 25,500 | 538 | 0.05 | 0.500 | 20,500 | 325 | 0.03 | 0.250 |
| ø 2 | 33,300 | 1,488 | 0.2 | 2.0 | 26,000 | 1,020 | 0.2 | 2.0 | 17,500 | 625 | 0.10 | 1.000 | 14,500 | 388 | 0.05 | 0.500 |
| ø 3 | 21,800 | 1,488 | 0.3 | 3.0 | 17,300 | 1,020 | 0.3 | 3.0 | 11,500 | 625 | 0.15 | 1.500 | 9,500 | 388 | 0.08 | 0.750 |
| ø 4 | 16,700 | 1,540 | 0.4 | 4.0 | 13,200 | 1,050 | 0.4 | 4.0 | 8,800 | 663 | 0.20 | 2.000 | 7,200 | 406 | 0.10 | 1.000 |
| ø 5 | 15,700 | 1,750 | 0.5 | 5.0 | 12,500 | 1,208 | 0.5 | 5.0 | 8,300 | 750 | 0.25 | 2.500 | 6,400 | 425 | 0.13 | 1.250 |
| ø 6 | 13,100 | 1,663 | 0.6 | 6.0 | 10,350 | 1,155 | 0.6 | 6.0 | 6,900 | 719 | 0.30 | 3.000 | 5,300 | 419 | 0.15 | 1.500 |
| ø 8 | 9,880 | 1,625 | 0.8 | 8.0 | 7,800 | 1,080 | 0.8 | 8.0 | 5,200 | 669 | 0.40 | 4.000 | 4,000 | 375 | 0.20 | 2.000 |
| ø 10 | 7,800 | 1,488 | 1.0 | 10.0 | 6,150 | 1,020 | 1.0 | 10.0 | 4,100 | 625 | 0.50 | 5.000 | 3,200 | 363 | 0.25 | 2.500 |
| ø 12 | 6,650 | 1,488 | 1.2 | 12.0 | 5,250 | 1,020 | 1.2 | 12.0 | 3,500 | 625 | 0.60 | 6.000 | 2,650 | 363 | 0.30 | 3.000 |
| ø 16 | 5,540 | 1,363 | 1.6 | 16.0 | 4,340 | 915 | 1.6 | 16.0 | 2,600 | 538 | 0.80 | 8.000 | 1,840 | 269 | 0.40 | 4.000 |
| ø 18 | 5,540 | 1,363 | 1.8 | 18.0 | 4,340 | 913 | 1.8 | 18.0 | 2,600 | 538 | 0.90 | 9.000 | 1,840 | 269 | 0.45 | 4.500 |
| ø 20 | 4,640 | 1,260 | 2.0 | 20.0 | 4,340 | 912 | 2.0 | 20.0 | 2,600 | 538 | 1.00 | 10.000 | 1,840 | 269 | 0.50 | 5.000 |

절입량 Depth of Cut

Slotting
• Ap : Axial Depth
• D : Outside Diameter

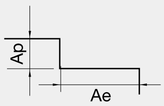



## 측면절삭 Side Cutting

| 피삭재 Material | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 50HRc | | | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.3 | 50,000 | 214 | 0.3 | 0.009 | 45,000 | 158 | 0.3 | 0.009 | 40,000 | 129 | 0.15 | 0.006 | 33,000 | 79 | 0.08 | 0.003 |
| ø 0.4 | 50,000 | 264 | 0.4 | 0.012 | 45,000 | 203 | 0.4 | 0.012 | 40,000 | 158 | 0.20 | 0.008 | 33,000 | 101 | 0.10 | 0.004 |
| ø 0.5 | 50,000 | 416 | 0.5 | 0.015 | 45,000 | 315 | 0.5 | 0.015 | 40,000 | 248 | 0.25 | 0.010 | 33,000 | 158 | 0.13 | 0.005 |
| ø 0.6 | 50,000 | 529 | 0.6 | 0.018 | 45,000 | 405 | 0.6 | 0.018 | 40,000 | 321 | 0.30 | 0.012 | 30,000 | 180 | 0.15 | 0.006 |
| ø 0.8 | 50,000 | 675 | 0.8 | 0.024 | 40,000 | 495 | 0.8 | 0.024 | 30,000 | 332 | 0.40 | 0.016 | 25,000 | 208 | 0.20 | 0.008 |
| ø 0.9 | 49,000 | 737 | 0.9 | 0.027 | 39,000 | 585 | 0.9 | 0.027 | 27,800 | 371 | 0.45 | 0.018 | 22,700 | 231 | 0.23 | 0.009 |
| ø 1 | 48,000 | 1,181 | 1.0 | 0.030 | 38,000 | 770 | 1.0 | 0.030 | 25,500 | 484 | 0.50 | 0.020 | 20,500 | 293 | 0.25 | 0.010 |
| ø 2 | 33,300 | 1,339 | 2.0 | 0.060 | 26,000 | 918 | 2.0 | 0.060 | 17,500 | 563 | 1.00 | 0.040 | 14,500 | 349 | 0.50 | 0.020 |
| ø 3 | 21,800 | 1,339 | 3.0 | 0.090 | 17,300 | 918 | 3.0 | 0.090 | 11,500 | 563 | 1.50 | 0.060 | 9,500 | 349 | 0.75 | 0.030 |
| ø 4 | 16,700 | 1,386 | 4.0 | 0.120 | 13,200 | 945 | 4.0 | 0.120 | 8,800 | 596 | 2.00 | 0.080 | 7,200 | 366 | 1.00 | 0.040 |
| ø 5 | 15,700 | 1,575 | 5.0 | 0.150 | 12,500 | 1,087 | 5.0 | 0.150 | 8,300 | 675 | 2.50 | 0.100 | 6,400 | 383 | 1.25 | 0.050 |
| ø 6 | 13,100 | 1,496 | 6.0 | 0.180 | 10,350 | 1,040 | 6.0 | 0.180 | 6,900 | 647 | 3.00 | 0.120 | 5,300 | 377 | 1.50 | 0.060 |
| ø 8 | 9,880 | 1,463 | 8.0 | 0.240 | 7,800 | 972 | 8.0 | 0.240 | 5,200 | 602 | 4.00 | 0.160 | 4,000 | 338 | 2.00 | 0.080 |
| ø 10 | 7,800 | 1,339 | 10.0 | 0.300 | 6,150 | 918 | 10.0 | 0.300 | 4,100 | 563 | 5.00 | 0.200 | 3,200 | 326 | 2.50 | 0.100 |
| ø 12 | 6,650 | 1,339 | 12.0 | 0.360 | 5,250 | 918 | 12.0 | 0.360 | 3,500 | 563 | 6.00 | 0.240 | 2,650 | 326 | 3.00 | 0.120 |
| ø 16 | 5,540 | 1,226 | 16.0 | 0.480 | 4,340 | 824 | 16.0 | 0.480 | 2,600 | 484 | 8.00 | 0.320 | 1,840 | 242 | 4.00 | 0.160 |
| ø 18 | 5,540 | 1,226 | 18.0 | 0.540 | 4,340 | 821 | 18.0 | 0.540 | 2,600 | 484 | 9.00 | 0.360 | 1,840 | 242 | 4.50 | 0.180 |
| ø 20 | 4,640 | 1,134 | 20.0 | 0.600 | 4,340 | 821 | 20.0 | 0.600 | 2,600 | 484 | 10.00 | 0.400 | 1,840 | 242 | 5.00 | 0.200 |

절입량 Depth of Cut

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

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- HRC60 이상 고경도강 가공 시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
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- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece, HRC over 60 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

# 2LEM/4LEM

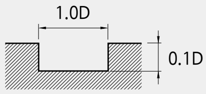
- ■ 4LEM은 RPM 동일, FEED만 최대 **50% Up** 적용.
- ■ Use the same RPM and raise up the feed up to 50% for 4LEM.

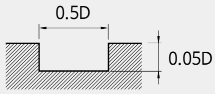
• RPM : rev./min • Feed : mm/min

## 홈절삭 Slotting

| 피삭재 Material | 공구강/금형강 Tool steels / Mold steels SCM/HPM | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | 고경도강 Hardened Steels STAVAX / SKD11 | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | 40 ~ 45HRc | | 45 ~ 55HRc | | 55 ~ 62HRc | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| Ø1 | 40,000 | 293 | 40,000 | 264 | 40,000 | 237 | 40,000 | 71 |
| Ø1.5 | 35,000 | 320 | 35,000 | 288 | 35,000 | 259 | 32,000 | 78 |
| Ø2 | 32,000 | 330 | 24,000 | 297 | 15,000 | 267 | 17,500 | 80 |
| Ø3 | 21,000 | 340 | 17,000 | 306 | 10,500 | 275 | 13,000 | 83 |
| Ø4 | 17,000 | 460 | 13,500 | 414 | 8,500 | 373 | 8,000 | 112 |
| Ø5 | 14,500 | 520 | 11,500 | 468 | 7,500 | 421 | 6,750 | 126 |
| Ø6 | 12,500 | 550 | 10,000 | 495 | 6,500 | 446 | 5,500 | 134 |
| Ø8 | 9,500 | 630 | 7,500 | 567 | 5,000 | 510 | 4,500 | 153 |
| Ø10 | 8,000 | 829 | 6,500 | 721 | 4,000 | 577 | 3,550 | 173 |
| Ø12 | 6,500 | 761 | 5,500 | 662 | 3,350 | 529 | 3,000 | 159 |
| Ø16 | 5,000 | 761 | 4,100 | 662 | 2,500 | 529 | 2,250 | 159 |
| Ø20 | 4,000 | 702 | 3,250 | 611 | 2,000 | 489 | 1,800 | 147 |
| Ø25 | 3,250 | 630 | 2,600 | 548 | 1,600 | 438 | 1,400 | 132 |

절입량 Depth of Cut

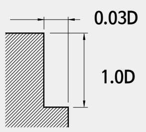
~ 50HRC 

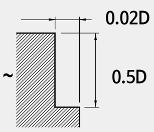

50HRC ~ 


## 측면절삭 Side Cutting

| 피삭재 Material | 공구강/금형강 Tool steels / Mold steels SCM/HPM | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | 고경도강 Hardened Steels STAVAX / SKD11 | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | 40 ~ 45HRc | | 45 ~ 55HRc | | 55 ~ 62HRc | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| Ø1 | 40,000 | 337 | 40,000 | 286 | 40,000 | 229 | 40,000 | 195 |
| Ø1.5 | 35,000 | 368 | 35,000 | 313 | 35,000 | 250 | 35,000 | 213 |
| Ø2 | 32,000 | 380 | 24,000 | 323 | 15,000 | 258 | 17,500 | 219 |
| Ø3 | 21,000 | 391 | 17,000 | 332 | 10,500 | 266 | 13,000 | 226 |
| Ø4 | 17,000 | 529 | 13,500 | 450 | 8.500 | 360 | 8,000 | 306 |
| Ø5 | 14,500 | 598 | 11,500 | 508 | 7,500 | 407 | 6,750 | 346 |
| Ø6 | 12,500 | 633 | 10,000 | 538 | 6.500 | 430 | 5,500 | 366 |
| Ø8 | 9,500 | 725 | 7,500 | 616 | 5,000 | 493 | 4,500 | 419 |
| Ø10 | 8,000 | 765 | 6,500 | 650 | 4,000 | 520 | 3,550 | 442 |
| Ø12 | 6,500 | 638 | 5,500 | 542 | 3,350 | 434 | 3,000 | 368 |
| Ø16 | 5,000 | 638 | 4,100 | 542 | 2,500 | 434 | 2,250 | 368 |
| Ø20 | 4,000 | 606 | 3,250 | 515 | 2,000 | 412 | 1,800 | 350 |
| Ø25 | 3,250 | 570 | 2,600 | 485 | 1,600 | 388 | 1,400 | 329 |

절입량 Depth of Cut

~ 50HRC 


50HRC ~ 


- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 조건표는 2날 기준이며, 4날시 회전수는 유지하고, 피드는 안정적인 속도 내에서 최대 50% 까지 UP 해주십시오.
- HRC55 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다(Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일미스트쿨런트를추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- The parameters on the table is based on 2 flutes. For using 4 flutes, use the same RPM and raise up the feed up to 50% in stable milling condition.
- When milling workpiece, HRC over 60 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- When milling workpiece, HRC over 60 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

# 4HEM/6&8HEM

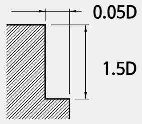
■ 6&8EM은 RPM 동일, FEED만 최대 **50% Up** 적용.
■ Use the same RPM and raise up the feed up to 50% for 6&8HEM.

• RPM : rev./min • Feed : mm/min

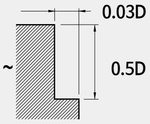
| 측면절삭 Side Cutting | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 피삭재 Material | 공구강 / 금형강<br>Tool steels / Mold steels<br>SCM / HPM | | | | 합금강/프리하든강<br>Alloy Steels / Pre-hardened Steels<br>NAK80 / KP4M | | | | 고경도강<br>Hardened Steels<br>STAVAX / SKD11 | | | | 열처리 / 고경도강<br>Heat-treated steels / Hardened Steels<br>SKD11 / SKD61 | | | |
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 50 ~ 55HRc | | | | 55 ~ 62HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 24,000 | 149 | 1.5 | 0.05 | 9,600 | 33 | 0.5 | 0.03 | 19,200 | 111 | 1.5 | 0.05 | 9,300 | 28 | 0.5 | 0.03 |
| ø 1.5 | 24,000 | 186 | 2.25 | 0.075 | 9,600 | 42 | 0.75 | 0.045 | 19,200 | 139 | 2.25 | 0.075 | 9,000 | 36 | 0.75 | 0.045 |
| ø 2 | 24,000 | 248 | 3 | 0.1 | 9,600 | 56 | 1 | 0.06 | 19,200 | 186 | 3 | 0.1 | 8,200 | 47 | 1 | 0.06 |
| ø 3 | 23,040 | 564 | 4.5 | 0.15 | 9,216 | 127 | 1.5 | 0.09 | 18,432 | 423 | 4.5 | 0.15 | 7,373 | 108 | 1.5 | 0.09 |
| ø 4 | 17,280 | 653 | 6 | 0.2 | 6,912 | 147 | 2 | 0.12 | 13,824 | 490 | 6 | 0.2 | 5,530 | 125 | 2 | 0.12 |
| ø 5 | 8,640 | 743 | 7.5 | 0.25 | 3,456 | 167 | 2.5 | 0.15 | 6,912 | 557 | 7.5 | 0.25 | 2,765 | 142 | 2.5 | 0.15 |
| ø 6 | 6,480 | 861 | 9 | 0.3 | 2,592 | 194 | 3 | 0.18 | 5,184 | 646 | 9 | 0.3 | 2,074 | 165 | 3 | 0.18 |
| ø 8 | 5,184 | 861 | 12 | 0.4 | 2,074 | 194 | 4 | 0.24 | 4,147 | 646 | 12 | 0.4 | 1,659 | 165 | 4 | 0.24 |
| ø 10 | 4,320 | 861 | 15 | 0.5 | 1,728 | 194 | 5 | 0.3 | 3,456 | 646 | 15 | 0.5 | 1,382 | 165 | 5 | 0.30 |
| ø 12 | 3,240 | 713 | 18 | 0.6 | 1,296 | 160 | 6 | 0.36 | 2,592 | 535 | 18 | 0.6 | 1,037 | 136 | 6 | 0.36 |
| ø 16 | 2,592 | 535 | 24 | 0.8 | 1,037 | 120 | 8 | 0.48 | 2,074 | 401 | 24 | 0.8 | 829 | 102 | 8 | 0.48 |
| ø 20 | 2,318 | 431 | 30 | 1 | 927 | 97 | 10 | 0.6 | 1,854 | 323 | 30 | 1 | 742 | 82 | 10 | 0.60 |
| ø 25 | 3,090 | 386 | 37.5 | 1.25 | 1,236 | 87 | 12.5 | 0.75 | 2,472 | 290 | 37.5 | 1.25 | 989 | 74 | 12.5 | 0.75 |

**절입량 Depth of Cut**

~ 50HRC




50HRC ~




- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 조건표는 4날 기준이며 , 6&8날시 회전수는 유지하고 피드는 안정적인 속도 내에서 최대 50%까지 UP 해주십시오.
- HRC62 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 유효장이 길게 체결할시 회전수와 피드를 같은 비율로 DOWN 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일미스트쿨런트를추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- The parameters on the table is based on 4flutes. For using 6 or 8flutes, use the same RPM and raise up the feed up to 50% in stable milling condition.
- When milling workpiece, HRC over 60 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

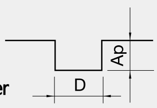
# 2CRE Cutting Condition

• RPM : rev./min • Feed : mm/min

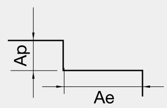
| 피삭재 Material | | 동 Copper C1100 | | | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | | 40 ~ 45HRC | | | | 45 ~ 55HRC | | | | 55 ~ 62HRC | | | |
| 외경 Outside Diameter | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.2 | 1 | 50,000 | 800 | 0.026 | 0.020 | 50,000 | 263 | 0.006 | 0.020 | 34,500 | 197 | 0.004 | 0.020 | 14,950 | 108 | 0.001 | 0.015 |
| 〃 | 1.5 | 50,000 | 750 | 0.017 | 0.010 | 50,000 | 210 | 0.005 | 0.010 | 26,450 | 158 | 0.003 | 0.010 | 11,730 | 87 | 0.001 | 0.007 |
| ø 0.3 | 1 | 50,000 | 800 | 0.029 | 0.020 | 50,000 | 224 | 0.007 | 0.020 | 34,500 | 168 | 0.005 | 0.015 | 21,505 | 92 | 0.004 | 0.015 |
| 〃 | 3 | 50,000 | 650 | 0.029 | 0.015 | 50,000 | 182 | 0.006 | 0.015 | 24,150 | 137 | 0.003 | 0.010 | 14,605 | 75 | 0.002 | 0.010 |
| ø 0.4 | 1 | 47,150 | 800 | 0.047 | 0.062 | 50,000 | 224 | 0.013 | 0.070 | 39,675 | 168 | 0.011 | 0.070 | 23,575 | 92 | 0.004 | 0.070 |
| 〃 | 3 | 33,350 | 700 | 0.026 | 0.053 | 26,450 | 196 | 0.008 | 0.026 | 26,450 | 147 | 0.007 | 0.026 | 15,755 | 81 | 0.003 | 0.026 |
| ø 0.5 | 1 | 48,300 | 850 | 0.079 | 0.114 | 48,300 | 238 | 0.033 | 0.119 | 39,100 | 179 | 0.029 | 0.119 | 24,150 | 98 | 0.013 | 0.119 |
| 〃 | 3 | 31,050 | 750 | 0.056 | 0.088 | 31,050 | 210 | 0.022 | 0.110 | 25,415 | 158 | 0.020 | 0.110 | 15,755 | 87 | 0.008 | 0.110 |
| 〃 | 5 | 25,760 | 700 | 0.026 | 0.044 | 25,760 | 196 | 0.011 | 0.010 | 20,700 | 147 | 0.010 | 0.010 | 12,995 | 81 | 0.004 | 0.010 |
| ø 0.6 | 2 | 27,945 | 850 | 0.111 | 0.158 | 27,945 | 238 | 0.010 | 0.214 | 23,000 | 179 | 0.010 | 0.214 | 14,835 | 98 | 0.004 | 0.214 |
| 〃 | 6 | 16,445 | 750 | 0.035 | 0.044 | 16,445 | 210 | 0.003 | 0.010 | 13,570 | 158 | 0.003 | 0.010 | 8,740 | 87 | 0.001 | 0.010 |
| ø 0.8 | 4 | 17,250 | 900 | 0.129 | 0.194 | 17,020 | 252 | 0.014 | 0.114 | 14,720 | 189 | 0.015 | 0.114 | 9,890 | 104 | 0.007 | 0.114 |
| 〃 | 8 | 12,650 | 750 | 0.029 | 0.098 | 12,650 | 210 | 0.005 | 0.088 | 10,695 | 158 | 0.005 | 0.088 | 7,475 | 87 | 0.002 | 0.088 |
| ø 1 | 4 | 13,800 | 950 | 0.196 | 0.396 | 13,800 | 266 | 0.029 | 0.264 | 11,730 | 200 | 0.029 | 0.264 | 8,280 | 110 | 0.017 | 0.264 |
| 〃 | 10 | 8,625 | 750 | 0.047 | 0.308 | 8,625 | 210 | 0.011 | 0.123 | 7,475 | 158 | 0.011 | 0.123 | 5,290 | 87 | 0.006 | 0.123 |
| 〃 | 16 | 6,900 | 650 | 0.018 | 0.220 | 6,900 | 182 | 0.004 | 0.026 | 5,980 | 137 | 0.004 | 0.026 | 4,255 | 75 | 0.002 | 0.026 |
| ø 1.2 | 6 | 9,200 | 1,035 | 0.182 | 0.457 | 9,200 | 575 | 0.018 | 0.088 | 8,165 | 483 | 0.018 | 0.088 | 6,095 | 59 | 0.011 | 0.088 |
| 〃 | 12 | 6,670 | 662 | 0.053 | 0.396 | 6,670 | 368 | 0.007 | 0.070 | 5,980 | 299 | 0.007 | 0.070 | 4,370 | 37 | 0.004 | 0.070 |
| ø 1.5 | 4 | 12,880 | 1,925 | 0.293 | 0.660 | 12,880 | 1,070 | 0.044 | 0.440 | 11,730 | 920 | 0.044 | 0.440 | 8,970 | 121 | 0.032 | 0.440 |
| 〃 | 10 | 8,280 | 1,325 | 0.147 | 0.554 | 8,280 | 736 | 0.031 | 0.282 | 7,590 | 633 | 0.031 | 0.282 | 5,865 | 83 | 0.022 | 0.282 |
| 〃 | 20 | 5,865 | 725 | 0.041 | 0.352 | 6,350 | 403 | 0.005 | 0.106 | 4,160 | 345 | 0.005 | 0.106 | 3,870 | 45 | 0.003 | 0.106 |
| ø 2 | 6 | 12,535 | 1,801 | 0.314 | 0.836 | 12,535 | 1,001 | 0.042 | 0.792 | 11,730 | 909 | 0.042 | 0.792 | 9,430 | 130 | 0.035 | 0.792 |
| 〃 | 12 | 9,200 | 1,449 | 0.182 | 0.704 | 9,200 | 805 | 0.030 | 0.440 | 8,280 | 725 | 0.030 | 0.440 | 6,785 | 105 | 0.025 | 0.440 |
| 〃 | 20 | 6,900 | 1,139 | 0.091 | 0.651 | 6,200 | 633 | 0.017 | 0.194 | 3,520 | 564 | 0.017 | 0.194 | 3,226 | 82 | 0.014 | 0.194 |
| 〃 | 30 | 5,865 | 973 | 0.049 | 0.440 | 3,300 | 541 | 0.005 | 0.132 | 2,860 | 495 | 0.005 | 0.132 | 2,386 | 68 | 0.002 | 0.132 |
| ø 2.5 | 10 | 10,350 | 1,801 | 0.331 | 0.836 | 10,350 | 1,001 | 0.051 | 0.528 | 9,775 | 943 | 0.051 | 0.528 | 8,165 | 151 | 0.047 | 0.528 |
| 〃 | 30 | 6,210 | 787 | 0.067 | 0.616 | 6,210 | 437 | 0.011 | 0.176 | 5,865 | 414 | 0.011 | 0.176 | 4,830 | 65 | 0.010 | 0.176 |
| ø 3 | 12 | 10,350 | 2,029 | 0.381 | 0.831 | 10,350 | 1,127 | 0.103 | 0.616 | 9,775 | 874 | 0.103 | 0.655 | 8,740 | 196 | 0.073 | 0.655 |
| 〃 | 20 | 8,165 | 1,553 | 0.254 | 0.762 | 6,050 | 863 | 0.071 | 0.567 | 3,420 | 667 | 0.071 | 0.567 | 3,108 | 147 | 0.043 | 0.567 |
| 〃 | 30 | 6,900 | 1,263 | 0.137 | 0.674 | 3,300 | 702 | 0.049 | 0.371 | 2,890 | 541 | 0.049 | 0.371 | 2,440 | 115 | 0.028 | 0.352 |
| ø 4 | 12 | 8,740 | 1,904 | 0.401 | 1.525 | 8,740 | 1,058 | 0.081 | 1.124 | 7,360 | 920 | 0.081 | 1.124 | 6,210 | 210 | 0.083 | 1.124 |
| 〃 | 20 | 6,785 | 1,458 | 0.375 | 1.325 | 5,880 | 810 | 0.053 | 0.880 | 5,750 | 840 | 0.053 | 0.880 | 4,830 | 194 | 0.057 | 0.880 |
| 〃 | 30 | 5,750 | 752 | 0.196 | 1.210 | 2,950 | 418 | 0.028 | 0.671 | 2,540 | 656 | 0.028 | 0.671 | 2,160 | 149 | 0.030 | 0.708 |
| 〃 | 45 | 4,715 | 500 | 0.096 | 1.118 | 2,300 | 278 | 0.007 | 0.326 | 2,015 | 322 | 0.007 | 0.326 | 1,800 | 75 | 0.007 | 0.326 |
| ø 5 | 15 | 7,705 | 3,064 | 0.697 | 2.277 | 7,705 | 1,702 | 0.106 | 1.346 | 5,520 | 1,139 | 0.106 | 1.346 | 4,600 | 342 | 0.110 | 1.346 |
| 〃 | 30 | 5,290 | 1,470 | 0.342 | 1.760 | 2,780 | 817 | 0.053 | 1.035 | 3,795 | 541 | 0.053 | 1.035 | 3,220 | 164 | 0.055 | 1.035 |
| ø 6 | 20 | 5,980 | 2,194 | 0.600 | 2.194 | 5,460 | 1,219 | 0.476 | 1.356 | 3,565 | 1,035 | 0.186 | 1.356 | 3,105 | 393 | 0.145 | 1.356 |
| 〃 | 40 | 4,600 | 1,635 | 0.565 | 2.049 | 2,380 | 909 | 0.410 | 1.304 | 2,160 | 759 | 0.164 | 1.304 | 2,040 | 304 | 0.123 | 1.304 |
| ø 8 | 22 | 5,520 | 1,946 | 0.528 | 2.542 | 5,520 | 1,081 | 0.419 | 1.518 | 3,220 | 909 | 0.164 | 1.518 | 2,760 | 346 | 0.128 | 1.518 |
| 〃 | 40 | 4,140 | 1,449 | 0.497 | 2.277 | 2,120 | 805 | 0.361 | 1.323 | 2,080 | 667 | 0.144 | 1.323 | 1,955 | 268 | 0.108 | 1.323 |
| ø 10 | 24 | 4,600 | 1,656 | 0.449 | 2.887 | 4,485 | 920 | 0.356 | 1.645 | 2,760 | 771 | 0.139 | 1.645 | 2,300 | 294 | 0.108 | 1.645 |
| 〃 | 45 | 3,450 | 1,221 | 0.423 | 2.438 | 3,450 | 679 | 0.307 | 1.334 | 1,955 | 564 | 0.122 | 1.334 | 1,725 | 228 | 0.092 | 1.334 |
| ø 12 | 26 | 3,795 | 1,387 | 0.377 | 3.013 | 3,795 | 771 | 0.299 | 2.024 | 2,300 | 644 | 0.117 | 2.024 | 1,955 | 247 | 0.091 | 2.024 |
| 〃 | 50 | 2,875 | 1,035 | 0.355 | 2.415 | 2,875 | 575 | 0.258 | 1.403 | 1,725 | 483 | 0.103 | 1.403 | 1,380 | 191 | 0.077 | 1.403 |
| ø 16 | 35 | 2,990 | 1,097 | 0.302 | 2.921 | 2,990 | 610 | 0.239 | 2.162 | 1,725 | 518 | 0.094 | 2.162 | 1,610 | 198 | 0.073 | 2.162 |

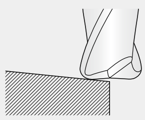
**절입량**
**Depth of Cut**

Slotting
• Ap : Axial Depth
• D : Outside Diameter




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



경사진면절삭
Inclined Cutting

- HRC62 이상인 경우 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 유효장이 긴 경우에는 회전수와 이송 속도를 최대 30% 이하로 줄이십시오.
- Ae값 설정시 코너R 치수를 고려 해주십시오.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도내 에서 피드를 최대 30%까지 UP 해주십시오.

- When milling workpiece HRC over 62, reduce 20% of the RPM and feed with the same diameter.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- Consider the corner radius value when you set up the Ae value.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.

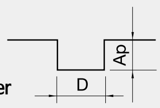
# 4CRE Cutting Condition

• RPM : rev./min • Feed : mm/min

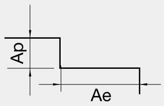
| 피삭재 Material | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 4 | 13,455 | 1,265 | 0.038 | 0.264 | 11,730 | 1,046 | 0.030 | 0.238 |
| 〃 | 10 | 8,625 | 495 | 0.011 | 0.123 | 7,475 | 495 | 0.009 | 0.098 |
| ø 1.2 | 4 | 12,880 | 1,380 | 0.031 | 0.440 | 11,730 | 1,070 | 0.023 | 0.293 |
| 〃 | 10 | 8,855 | 782 | 0.017 | 0.176 | 7,130 | 587 | 0.009 | 0.147 |
| ø 1.5 | 6 | 11,385 | 1,265 | 0.040 | 0.475 | 10,350 | 1,150 | 0.037 | 0.435 |
| 〃 | 12 | 9,280 | 817 | 0.028 | 0.317 | 6,790 | 759 | 0.025 | 0.290 |
| ø 2 | 6 | 12,650 | 1,265 | 0.063 | 0.713 | 11,730 | 1,173 | 0.059 | 0.633 |
| 〃 | 12 | 9,970 | 1,012 | 0.045 | 0.396 | 8,280 | 943 | 0.043 | 0.396 |
| ø 2.5 | 10 | 10,580 | 1,380 | 0.065 | 0.528 | 9,775 | 1,150 | 0.065 | 0.528 |
| 〃 | 20 | 8,160 | 1,150 | 0.047 | 0.264 | 7,845 | 655 | 0.030 | 0.220 |
| ø 3 | 10 | 11,040 | 2,070 | 0.094 | 0.684 | 10,235 | 2,070 | 0.059 | 0.684 |
| 〃 | 20 | 7,340 | 1,495 | 0.057 | 0.567 | 6,230 | 1,495 | 0.035 | 0.567 |
| ø 4 | 13 | 9,085 | 1,576 | 0.105 | 1.150 | 7,590 | 1,530 | 0.082 | 1.150 |
| 〃 | 20 | 7,130 | 1,380 | 0.069 | 0.920 | 5,980 | 1,288 | 0.054 | 0.920 |
| 〃 | 30 | 6,325 | 1,104 | 0.043 | 0.745 | 5,290 | 1,058 | 0.033 | 0.745 |
| ø 6 | 20 | 5,635 | 1,691 | 0.176 | 2.305 | 3,335 | 978 | 0.176 | 1.281 |
| 〃 | 40 | 2,875 | 782 | 0.098 | 1.320 | 1,610 | 460 | 0.098 | 0.733 |
| ø 8 | 22 | 4,600 | 1,840 | 0.212 | 2.921 | 2,760 | 782 | 0.212 | 1.518 |
| ø 10 | 24 | 3,680 | 2,013 | 0.253 | 3.140 | 2,185 | 621 | 0.242 | 1.645 |
| ø 12 | 26 | 2,875 | 2,070 | 0.276 | 3.105 | 1,725 | 495 | 0.265 | 1.714 |

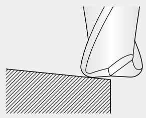
**절입량 Depth of Cut**

Slotting
• Ap : Axial Depth
• D : Outside Diameter




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



경사진면절삭
Inclined Cutting

- HRC62 이상인 경우 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 유효장이 긴 경우에는 회전수와 이송 속도를 최대30% 이하로 줄이십시오.
- Ae값 설정시 코너R 치수를 고려해 주십시오.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.

- When milling workpiece HRC over 62, reduce 20% of the RPM and feed with the same diameter.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- Consider the corner radius value when you set up the Ae value.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.

# 2NCR/4NCR

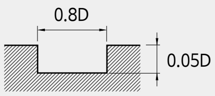
■ 4NCR은 RPM 동일, FEED만 최대 **30% Up** 적용.
■ Use the same RPM and raise up the feed up to 30% for 4NCR.

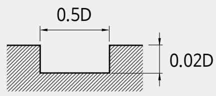
• RPM : rev./min • Feed : mm/min

## 홈절삭 Slotting

| 피삭재 Material | 공구강/금형강 Tool steels / Mold steels SCM/HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.4 | 50,000 | 1,065 | 0.020 | 0.32 | 45,000 | 507 | 0.020 | 0.32 | 40,000 | 221 | 0.008 | 0.20 | 33,000 | 187 | 0.008 | 0.20 |
| ø 0.5 | 50,000 | 1,217 | 0.025 | 0.4 | 45,000 | 580 | 0.025 | 0.4 | 40,000 | 252 | 0.01 | 0.25 | 33,000 | 214 | 0.01 | 0.25 |
| ø 0.6 | 50,000 | 1,369 | 0.03 | 0.48 | 45,000 | 652 | 0.03 | 0.48 | 40,000 | 284 | 0.012 | 0.3 | 30,000 | 241 | 0.012 | 0.3 |
| ø 0.8 | 50,000 | 1,521 | 0.04 | 0.64 | 45,000 | 725 | 0.04 | 0.64 | 30,000 | 315 | 0.016 | 0.4 | 25,000 | 268 | 0.016 | 0.4 |
| ø 1 | 48,000 | 3,773 | 0.05 | 0.8 | 38,000 | 1,797 | 0.05 | 0.8 | 25,500 | 781 | 0.02 | 0.5 | 20,500 | 664 | 0.02 | 0.5 |
| ø 2 | 33,300 | 4,503 | 0.1 | 1.6 | 26,000 | 2,145 | 0.1 | 1.6 | 17,500 | 932 | 0.04 | 1 | 14,500 | 793 | 0.04 | 1 |
| ø 3 | 21,800 | 4,564 | 0.15 | 2.4 | 17,300 | 2,174 | 0.15 | 2.4 | 11,500 | 945 | 0.06 | 1.5 | 9,500 | 803 | 0.06 | 1.5 |
| ø 4 | 16,700 | 4,686 | 0.2 | 3.2 | 13,200 | 2,231 | 0.2 | 3.2 | 8,800 | 970 | 0.08 | 2 | 7,200 | 825 | 0.08 | 2 |
| ø 5 | 15,700 | 4,990 | 0.25 | 4 | 12,500 | 2,376 | 0.25 | 4 | 8,300 | 1,033 | 0.1 | 2.5 | 6,400 | 878 | 0.1 | 2.5 |
| ø 6 | 13,100 | 4,869 | 0.3 | 4.8 | 10,350 | 2,318 | 0.3 | 4.8 | 6,900 | 1,008 | 0.12 | 3 | 5,300 | 857 | 0.12 | 3 |
| ø 8 | 9,880 | 4,443 | 0.4 | 6.4 | 7,800 | 2,116 | 0.4 | 6.4 | 5,200 | 920 | 0.16 | 4 | 4,000 | 782 | 0.16 | 4 |
| ø 10 | 7,800 | 4,138 | 0.5 | 8 | 6,150 | 1,971 | 0.5 | 8 | 4,100 | 857 | 0.2 | 5 | 3,200 | 728 | 0.2 | 5 |
| ø 12 | 6,650 | 4,138 | 0.6 | 9.6 | 5,250 | 1,971 | 0.6 | 9.6 | 3,500 | 857 | 0.24 | 6 | 2,650 | 728 | 0.24 | 6 |
| ø 16 | 6,150 | 2,400 | 0.8 | 12.8 | 5,500 | 1,811 | 0.8 | 12.8 | 3,210 | 788 | 0.32 | 8 | 2,420 | 669 | 0.32 | 8 |

절입량 Depth of Cut

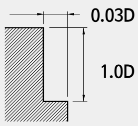
~ 45HRC 

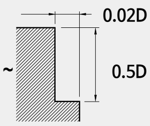

45HRC ~ 


## 측면절삭 Side Cutting

| 피삭재 Material | 공구강/금형강 Tool steels / Mold steels SCM/HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | | 55 ~ 62HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.4 | 50,000 | 1,438 | 0.4 | 0.012 | 45,000 | 735 | 0.4 | 0.012 | 40,000 | 265 | 0.20 | 0.008 | 33,000 | 252 | 0.20 | 0.008 |
| ø 0.5 | 50,000 | 1,643 | 0.5 | 0.015 | 45,000 | 841 | 0.5 | 0.015 | 40,000 | 302 | 0.25 | 0.01 | 33,000 | 289 | 0.25 | 0.01 |
| ø 0.6 | 50,000 | 1,848 | 0.6 | 0.018 | 45,000 | 945 | 0.6 | 0.018 | 40,000 | 341 | 0.30 | 0.012 | 30,000 | 325 | 0.30 | 0.012 |
| ø 0.8 | 50,000 | 2,053 | 0.8 | 0.024 | 40,000 | 1,051 | 0.8 | 0.024 | 30,000 | 378 | 0.40 | 0.016 | 25,000 | 362 | 0.40 | 0.016 |
| ø 1 | 48,000 | 5,094 | 1 | 0.03 | 38,000 | 2,606 | 1 | 0.03 | 25,500 | 937 | 0.50 | 0.02 | 20,500 | 896 | 0.50 | 0.02 |
| ø 2 | 33,300 | 6,079 | 2 | 0.06 | 26,000 | 3,110 | 2 | 0.06 | 17,500 | 1,118 | 1.00 | 0.04 | 14,500 | 1,071 | 1.00 | 0.04 |
| ø 3 | 21,800 | 6,161 | 3 | 0.09 | 17,300 | 3,152 | 3 | 0.09 | 11,500 | 1,134 | 1.50 | 0.06 | 9,500 | 1,804 | 1.50 | 0.06 |
| ø 4 | 16,700 | 6,326 | 4 | 0.12 | 13,200 | 3,235 | 4 | 0.12 | 8,800 | 1,164 | 2.00 | 0.08 | 7,200 | 1,114 | 2.00 | 0.08 |
| ø 5 | 15,700 | 6,737 | 5 | 0.15 | 12,500 | 3,445 | 5 | 0.15 | 8,300 | 1,240 | 2.50 | 0.1 | 6,400 | 1,185 | 2.50 | 0.1 |
| ø 6 | 13,100 | 6,573 | 6 | 0.18 | 10,350 | 3,361 | 6 | 0.18 | 6,900 | 1,210 | 3.00 | 0.12 | 5,300 | 1,157 | 3.00 | 0.12 |
| ø 8 | 9,880 | 5,998 | 8 | 0.24 | 7,800 | 3,068 | 8 | 0.24 | 5,200 | 1,104 | 4.00 | 0.16 | 4,000 | 1,056 | 4.00 | 0.16 |
| ø 10 | 7,800 | 5,586 | 10 | 0.3 | 6,150 | 2,858 | 10 | 0.3 | 4,100 | 1,028 | 5.00 | 0.2 | 3,200 | 983 | 5.00 | 0.2 |
| ø 12 | 6,650 | 5,586 | 12 | 0.36 | 5,250 | 2,858 | 12 | 0.36 | 3,500 | 1,028 | 6.00 | 0.24 | 2,650 | 983 | 6.00 | 0.24 |
| ø 16 | 6,280 | 3,240 | 16 | 0.48 | 5,100 | 2,626 | 16 | 0.48 | 3,410 | 946 | 8.00 | 0.32 | 2,440 | 903 | 8.00 | 0.32 |

절입량 Depth of Cut

~ 45HRC 


45HRC ~ 


- HRC62 이상인 경우 같은 직경의 같은 비율로 20% DOWN 시켜 주십시오.
- 유효장이 긴 경우에는 회전수와 이송 속도를 최대 30% 이하로 줄이십시오.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30% 까지 UP 해주십시오.
- 상기 절삭 조건표는 2날 기준이며, 4날시 회전수는 유지하고, 피드는 안정적인 속도 내에서 최대 30%까지 UP 해주십시오.
- 홈 절삭시 날경의 코너R 대비 Ae 값을 설정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 피삭재와 절삭 형상을 위한 적절한 쿨런트 사용과 가공시 발열, 발화에 주의 하십시오.

- When milling workpiece HRC over 62, reduce 20% of the RPM and feed with the same diameter.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.
- The parameters on the table is based on 2flutes. For using 4flutes, use the same RPM and raise up the feed up to 50% in stable milling condition.
- For groove milling, set up the Ae value by considering of corner radius value.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

# 4CRL/6CRL

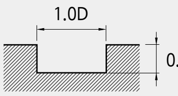
■ 6CRL은 RPM 동일, FEED만 최대 **30% Up** 적용.
■ Use the same RPM and raise up the feed up to 30% for 6CRL.

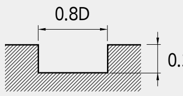
• RPM : rev./min • Feed : mm/min

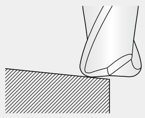
## 홈절삭 Slotting

| 피삭재 Material | 구조용강/탄소강/회주철 Mild steels / Carbon Steels / Gray cast irons SS/SC/FC | | | | 공구강/금형강 Tool steels / Mold steels SCM/HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~30HRc | | | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 19,250 | 150 | 0.50 | 1 | 19,250 | 150 | 0.50 | 1 | 17,280 | 122 | 0.50 | 1 | 15,552 | 98 | 0.2 | 0.8 |
| ø 1.5 | 12,845 | 230 | 0.75 | 2 | 12,800 | 220 | 0.75 | 2 | 11,520 | 178 | 0.75 | 2 | 10,368 | 142 | 0.3 | 1.2 |
| ø 2 | 9,600 | 345 | 1.00 | 2 | 9,500 | 330 | 1.00 | 2 | 8,550 | 267 | 1.00 | 2 | 7,695 | 212 | 0.4 | 1.6 |
| ø 3 | 6,400 | 490 | 1.50 | 3 | 6,400 | 440 | 1.50 | 3 | 5,800 | 360 | 1.50 | 3 | 5,300 | 240 | 0.6 | 2.4 |
| ø 4 | 4,800 | 550 | 2.00 | 4 | 4,800 | 500 | 2.00 | 4 | 4,400 | 410 | 2.00 | 4 | 4,000 | 280 | 0.8 | 3.2 |
| ø 5 | 3,850 | 600 | 2.50 | 5 | 3,800 | 550 | 2.50 | 5 | 3,420 | 446 | 2.50 | 5 | 3,078 | 356 | 1.0 | 4.0 |
| ø 6 | 3,200 | 610 | 3.00 | 6 | 3,200 | 550 | 3.00 | 6 | 2,900 | 450 | 3.00 | 6 | 2,700 | 310 | 1.2 | 4.8 |
| ø 8 | 2,400 | 650 | 4.00 | 8 | 2,400 | 590 | 4.00 | 8 | 2,200 | 480 | 4.00 | 8 | 2,000 | 330 | 1.6 | 6.4 |
| ø 10 | 1,900 | 580 | 5.00 | 10 | 1,900 | 520 | 5.00 | 10 | 1,800 | 440 | 5.00 | 10 | 1,600 | 290 | 2.0 | 8.0 |
| ø 12 | 1,600 | 540 | 6.00 | 12 | 1,600 | 480 | 6.00 | 12 | 1,500 | 400 | 6.00 | 12 | 1,300 | 260 | 2.4 | 9.6 |
| ø 16 | 1,200 | 520 | 8.00 | 16 | 1,200 | 510 | 8.00 | 16 | 1,080 | 413 | 8.00 | 16 | 972 | 328 | 3.2 | 12.8 |
| ø 20 | 960 | 510 | 10.00 | 20 | 950 | 500 | 10.00 | 20 | 855 | 405 | 10.00 | 20 | 770 | 324 | 4.0 | 16.0 |

절입량 Depth of Cut

~ 45HRC


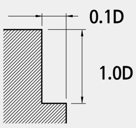

45HRC ~


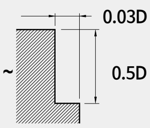


경사진면절삭 Inclined Cutting

## 측면절삭 Side Cutting

| 피삭재 Material | 구조용강/탄소강/회주철 Mild steels / Carbon Steels / Gray cast irons SS/SC/FC | | | | 공구강/금형강 Tool steels / Mold steels SCM/HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~30HRc | | | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 28,790 | 115 | 1 | 0.1 | 25,911 | 104 | 1 | 0.1 | 22,024 | 88 | 0.5 | 0.03 | 17,619 | 70 | 0.5 | 0.03 |
| ø 1.5 | 19,200 | 403 | 2 | 0.2 | 17,280 | 363 | 2 | 0.2 | 14,688 | 308 | 0.8 | 0.045 | 11,750 | 247 | 0.8 | 0.045 |
| ø 2 | 14,400 | 690 | 2 | 0.2 | 12,960 | 621 | 2 | 0.2 | 11,016 | 528 | 1.0 | 0.06 | 8,813 | 422 | 1.0 | 0.06 |
| ø 3 | 9,600 | 860 | 3 | 0.3 | 9,600 | 770 | 3 | 0.3 | 8,500 | 610 | 1.5 | 0.09 | 7,400 | 460 | 1.5 | 0.09 |
| ø 4 | 7,200 | 920 | 4 | 0.4 | 7,200 | 830 | 4 | 0.4 | 6,400 | 660 | 2.0 | 0.12 | 5,600 | 500 | 2.0 | 0.12 |
| ø 5 | 5,750 | 960 | 5 | 0.5 | 5,175 | 864 | 5 | 0.5 | 4,399 | 734 | 2.5 | 0.15 | 3,519 | 588 | 2.5 | 0.15 |
| ø 6 | 4,800 | 1,080 | 6 | 0.6 | 4,800 | 970 | 6 | 0.6 | 5,100 | 720 | 3.0 | 0.18 | 3,700 | 580 | 3.0 | 0.18 |
| ø 8 | 3,600 | 1,150 | 8 | 0.8 | 3,600 | 1,040 | 8 | 0.8 | 4,200 | 750 | 4.0 | 0.24 | 2,800 | 630 | 4.0 | 0.24 |
| ø 10 | 2,900 | 1,070 | 10 | 1.0 | 2,900 | 960 | 10 | 1.0 | 2,500 | 740 | 5.0 | 0.3 | 2,200 | 570 | 5.0 | 0.3 |
| ø 12 | 2,400 | 1,000 | 12 | 1.2 | 2,400 | 900 | 12 | 1.2 | 2,100 | 700 | 6.0 | 0.36 | 1,900 | 550 | 6.0 | 0.36 |
| ø 16 | 1,800 | 1,000 | 16 | 1.6 | 1,620 | 900 | 16 | 1.6 | 1,377 | 765 | 8.0 | 0.48 | 1,102 | 612 | 8.0 | 0.48 |
| ø 20 | 1,440 | 930 | 20 | 2.0 | 1,296 | 837 | 20 | 2.0 | 1,102 | 711 | 10.0 | 0.6 | 881 | 569 | 10.0 | 0.6 |

절입량 Depth of Cut

~ 35HRC



35HRC ~



- 상기 조건표는 4날 기준이며, 6날 가공시 회전수는 유지하고, 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 유효장이 긴 경우에는 회전수와 이송 속도를 최대30% 이하로 줄이십시오.
- 측면 절삭시 코너R 참고하여 절삭 하시기 바랍니다.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 소재 및 가공 형상에 적합한 절삭유를 사용 하십시오.

- The parameters on the table is based on 4flutes. For using 6flutes, use the same RPM and raise up the feed up to 30% in stable milling condition.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- For side milling, refer to the corner radius value.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use suitable cutting oil for material and machining geometry.

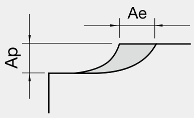
# 4RCU/6RCU

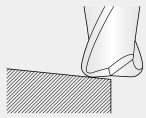
- ■ 6RCU은 RPM 동일, FEED만 최대 **30% Up** 적용.
- ■ Use the same RPM and raise up the feed up to 30% for 6RCU.

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 구조용강 / 탄소강 /회주철 Mild steels / Carbon Steels / Gray cast irons SS / SC /FC | | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | ~ 30HRc | | | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | 반경 Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | R0.2 | 42,840 | 7,871 | 0.02 | 0.4 | 35,700 | 6,845 | 0.02 | 0.4 | 29,750 | 5,738 | 0.015 | 0.3 | 22,500 | 4,835 | 0.015 | 0.3 |
| ø 1.5 | R0.5 | 40,800 | 8,073 | 0.02 | 0.6 | 34,000 | 7,020 | 0.02 | 0.6 | 25,500 | 5,738 | 0.023 | 0.5 | 18,900 | 4,837 | 0.023 | 0.5 |
| ø 2 | R0.5 | 27,540 | 8,477 | 0.03 | 0.8 | 22,950 | 7,371 | 0.03 | 0.8 | 20,400 | 5,739 | 0.03 | 0.6 | 14,400 | 4,839 | 0.03 | 0.6 |
| ø 3 | R0.5 | 18,360 | 9,082 | 0.05 | 1.2 | 15,300 | 7,898 | 0.05 | 1.2 | 13,600 | 5,740 | 0.045 | 0.9 | 9,900 | 4,841 | 0.045 | 0.9 |
| ø 4 | R0.5 | 16,320 | 10,091 | 0.06 | 1.6 | 13,600 | 8,775 | 0.06 | 1.6 | 11,050 | 5,741 | 0.06 | 1.2 | 8,100 | 4,843 | 0.06 | 1.2 |
| 〃 | R1.0 | 14,280 | 9,587 | 0.06 | 1.6 | 11,900 | 8,336 | 0.06 | 1.6 | 10,200 | 5,742 | 0.06 | 1.2 | 7,200 | 4,845 | 0.06 | 1.2 |
| ø 5 | R0.5 | 12,240 | 12,110 | 0.08 | 2.0 | 10,200 | 10,530 | 0.08 | 2.0 | 9,350 | 5,743 | 0.075 | 1.5 | 6,570 | 4,846 | 0.075 | 1.5 |
| 〃 | R1.0 | 11,220 | 11,100 | 0.08 | 2.0 | 9,350 | 9,653 | 0.08 | 2.0 | 8,160 | 5,743 | 0.075 | 1.5 | 5,760 | 4,848 | 0.075 | 1.5 |
| ø 6 | R0.3 | 11,118 | 13,320 | 0.09 | 2.4 | 9,265 | 11,583 | 0.09 | 2.4 | 8,500 | 5,744 | 0.09 | 1.8 | 5,850 | 4,850 | 0.09 | 1.8 |
| 〃 | R0.5 | 10,812 | 13,119 | 0.09 | 2.4 | 9,010 | 11,408 | 0.09 | 2.4 | 8,075 | 5,745 | 0.09 | 1.8 | 5,670 | 4,852 | 0.09 | 1.8 |
| 〃 | R1.0 | 12,907 | 12,715 | 0.09 | 2.4 | 10,756 | 11,057 | 0.09 | 2.4 | 7,650 | 5,747 | 0.09 | 1.8 | 5,220 | 4,854 | 0.09 | 1.8 |
| 〃 | R1.5 | 9,180 | 11,100 | 0.09 | 2.4 | 7,650 | 9,653 | 0.09 | 2.4 | 6,800 | 5,747 | 0.09 | 1.8 | 4,770 | 4,856 | 0.09 | 1.8 |
| ø 8 | R0.3 | 8,568 | 13,623 | 0.12 | 3.2 | 7,140 | 11,846 | 0.12 | 3.2 | 6,205 | 5,748 | 0.12 | 2.4 | 4,230 | 4,858 | 0.09 | 2.4 |
| 〃 | R0.5 | 8,364 | 13,119 | 0.12 | 3.2 | 6,970 | 11,408 | 0.12 | 3.2 | 6,035 | 5,748 | 0.12 | 2.4 | 4,140 | 4,859 | 0.12 | 2.4 |
| 〃 | R1.0 | 8,160 | 12,110 | 0.12 | 3.2 | 6,800 | 10,530 | 0.12 | 3.2 | 5,695 | 5,749 | 0.12 | 2.4 | 4,068 | 4,861 | 0.12 | 2.4 |
| 〃 | R2.0 | 7,140 | 11,100 | 0.12 | 3.2 | 5,950 | 9,653 | 0.12 | 3.2 | 5,100 | 5,750 | 0.12 | 2.4 | 3,600 | 4,863 | 0.12 | 2.4 |
| ø 10 | R0.3 | 6,620 | 13,098 | 0.15 | 4.0 | 5,517 | 11,390 | 0.15 | 4.0 | 4,814 | 5,751 | 0.15 | 3.0 | 3,398 | 4,865 | 0.15 | 3.0 |
| 〃 | R0.5 | 6,452 | 12,765 | 0.15 | 4.0 | 5,376 | 11,100 | 0.15 | 4.0 | 4,692 | 8,752 | 0.15 | 3.0 | 3,312 | 4,867 | 0.15 | 3.0 |
| 〃 | R1.0 | 6,283 | 12,432 | 0.15 | 4.0 | 5,236 | 10,811 | 0.15 | 4.0 | 4,570 | 5,753 | 0.15 | 3.0 | 3,226 | 4,869 | 0.15 | 3.0 |
| 〃 | R2.0 | 5,610 | 11,100 | 0.15 | 4.0 | 4,675 | 9,653 | 0.15 | 4.0 | 4,080 | 5,754 | 0.15 | 3.0 | 2,880 | 4,871 | 0.15 | 3.0 |
| ø 12 | R0.5 | 5,537 | 11,908 | 0.18 | 4.8 | 4,614 | 10,355 | 0.18 | 4.8 | 4,112 | 5,754 | 0.18 | 3.6 | 2,867 | 4,872 | 0.18 | 3.6 |
| 〃 | R1.0 | 5,396 | 11,605 | 0.18 | 4.8 | 4,497 | 10,091 | 0.18 | 4.8 | 4,008 | 5,755 | 0.18 | 3.6 | 2,795 | 4,874 | 0.18 | 3.6 |
| 〃 | R2.0 | 5,255 | 11,302 | 0.18 | 4.8 | 4,379 | 9,828 | 0.18 | 4.8 | 3,903 | 5,756 | 0.18 | 3.6 | 2,722 | 4,876 | 0.18 | 3.6 |
| 〃 | R3.0 | 4,692 | 10,091 | 0.18 | 4.8 | 3,910 | 8,775 | 0.18 | 4.8 | 3,485 | 5,757 | 0.18 | 3.6 | 2,430 | 4,878 | 0.18 | 3.6 |
| ø 16 | R1.0 | 4,092 | 10,479 | 0.24 | 6.4 | 3,410 | 9,112 | 0.24 | 6.4 | 3,009 | 5,758 | 0.24 | 4.8 | 2,124 | 4,880 | 0.24 | 4.8 |
| 〃 | R2.0 | 3,468 | 8,880 | 0.24 | 6.4 | 2,890 | 7,722 | 0.24 | 6.4 | 2,550 | 5,759 | 0.24 | 4.8 | 1,800 | 4,882 | 0.24 | 4.8 |

**절입량**
Depth of Cut



**경사진면절삭**
Inclined Cutting

## ■ Coefficients respective of tool overhang

| Type | Overhang | Revolution | Feed rate | Depth of Cut ap |
|---|---|---|---|---|
| Straight | L/D ≦ 5 | 100% | 100% | 100% |
| | L/D = 6 | 90% | 80% | 80% |
| | L/D = 7 | 80% | 70% | 70% |
| Taper neck | L/D = 6 | 100% | 100% | 100% |
| | L/D = 8 | 90% | 80% | 80% |
| | L/D ≧ 10 | 80% | 70% | 70% |

- 상기 조건표는 4날 기준이며, 6날 가공시 회전수는 유지하고, 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 유효장이 긴 경우에는 회전수와 이송 속도를 최대30% 이하로 줄이십시오.
- 측면 절삭시 코너R 참고하여 절삭 하시기 바랍니다.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용합니다.
- 유효장 길이가 긴 경우, 위 표와같이 RPM과 FEED를 낮춰주세요.
- 절입깊이가 얕은 경우, RPM과 FEED를 증가해주세요
- 원활한 칩배출을 위하여 에어브로우나 오일 미스트를 추천합니다.

- The parameters on the table is based on 4flutes. For using 6flutes, use the same RPM and raise up the feed up to 30% in stable milling condition.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- For side milling, refer to the corner radius value.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.
- If the effective length is long, refer to the table (Coefficients respective of tool overhang) and adjust the RPM and feed.
- If you use small value of Ap, raise up the RPM and feed.
- Air blow or oil mist is recommended for smooth chip emission.

# 3&4ROU Cutting Condition

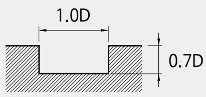
• RPM : rev./min • Feed : mm/min

## 홈절삭 Slotting

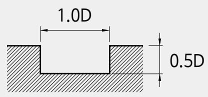
| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | | | 구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels /Gray cast iron SS / SC / FC | | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강 / 프리하든강 / 스테인레스강 Alloy Steels / Pre-hardened Steels / Stainless Steel NAK80 / KP4M / SUS304/ SUS316 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~ 200HB | | | | ~ 30HRc | | | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 4 | 4,000 | 211 | 0.25 | 4 | 4,000 | 430 | 2.8 | 4 | 3,800 | 200 | 2.8 | 4 | 2,800 | 110 | 2 | 4 |
| ø 5 | 4,000 | 242 | 0.35 | 5 | 4,000 | 430 | 3.5 | 5 | 3,400 | 220 | 3.5 | 5 | 2,500 | 130 | 2.5 | 5 |
| ø 6 | 3,600 | 281 | 0.40 | 6 | 3,600 | 430 | 4.2 | 6 | 3,000 | 240 | 4.2 | 6 | 2,300 | 150 | 3 | 6 |
| ø 8 | 2,700 | 338 | 0.55 | 8 | 2,700 | 430 | 5.6 | 8 | 2,200 | 270 | 5.6 | 8 | 1,800 | 180 | 4 | 8 |
| ø 10 | 2,200 | 380 | 0.70 | 10 | 2,200 | 430 | 7 | 10 | 1,800 | 290 | 7 | 10 | 1,400 | 185 | 5 | 10 |
| ø 12 | 1,800 | 332 | 0.85 | 12 | 1,800 | 430 | 8.4 | 12 | 1,500 | 300 | 8.4 | 12 | 1,200 | 190 | 6 | 12 |
| ø 16 | 1,400 | 305 | 1.10 | 16 | 1,400 | 430 | 11.2 | 16 | 1,100 | 310 | 11.2 | 16 | 900 | 200 | 8 | 16 |
| ø 20 | 1,100 | 281 | 1.40 | 20 | 1,100 | 430 | 14 | 20 | 900 | 310 | 14 | 20 | 700 | 185 | 10 | 20 |

절입량 Depth of Cut

~ 30HRC




30HRC ~

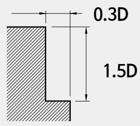



## 측면절삭 Side Cutting

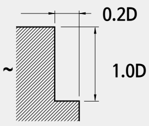
| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | | | 구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels /Gray cast iron SS / SC /FC | | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강 / 프리하든강 / 스테인레스강 Alloy Steels / Pre-hardened Steels / Stainless Steel NAK80 / KP4M / SUS304/ SUS316 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~ 200HB | | | | ~ 30HRc | | | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 4 | 5,000 | 469 | 6 | 0.12 | 4,200 | 398 | 6 | 0.12 | 3,600 | 359 | 6 | 0.12 | 2,800 | 305 | 4 | 0.08 |
| ø 5 | 5,000 | 538 | 7.5 | 0.15 | 4,200 | 457 | 7.5 | 0.15 | 3,200 | 411 | 7.5 | 0.15 | 2,400 | 350 | 5 | 0.10 |
| ø 6 | 4,200 | 625 | 9 | 0.18 | 3,600 | 531 | 9 | 0.18 | 2,800 | 478 | 9 | 0.18 | 2,100 | 406 | 6 | 0.12 |
| ø 8 | 3,200 | 750 | 12 | 0.24 | 2,700 | 638 | 12 | 0.24 | 2,100 | 574 | 12 | 0.24 | 1,600 | 488 | 8 | 0.16 |
| ø 10 | 2,600 | 844 | 15 | 0.3 | 2,200 | 717 | 15 | 0.3 | 1,600 | 645 | 15 | 0.3 | 1,300 | 549 | 10 | 0.20 |
| ø 12 | 2,100 | 738 | 18 | 0.36 | 1,800 | 627 | 18 | 0.36 | 1,400 | 564 | 18 | 0.36 | 1,100 | 480 | 12 | 0.24 |
| ø 16 | 1,600 | 678 | 21 | 0.48 | 1,400 | 576 | 21 | 0.48 | 1,000 | 519 | 21 | 0.48 | 800 | 441 | 16 | 0.32 |
| ø 20 | 1,300 | 625 | 30 | 0.6 | 1,100 | 531 | 30 | 0.6 | 800 | 478 | 30 | 0.6 | 640 | 406 | 20 | 0.40 |

절입량 Depth of Cut

~ 38HRC




38HRC ~




- 가능한 공구 길이 측정시 유압식 측정이 아닌 레이저식 도구 세터를 사용 하십시오.
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대 30% 이하로 줄이십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우, 진동이 발생할시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.
- 스테인레스, 내열합금강 등의 절단 가공시 수용성 절삭유가 가장 효과적 입니다.

- Use laser tool measurement instead of hydraulic measurement when measuring tool length as possible.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.
- For stainless and heat resistant alloy, water-soluble oil is the most effective.

# 3&4HROU Cutting Condition

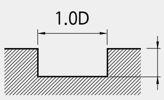
• RPM : rev./min • Feed : mm/min

## 홈절삭 Slotting

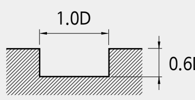
| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | | | 구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels /Gray cast iron SS / SC / FC | | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강 / 프리하든강 / 스테인레스강 Alloy Steels / Pre-hardened Steels / Stainless Steel NAK80 / KP4M / SUS304/ SUS316 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~ 200HB | | | | ~ 30HRc | | | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 4 | 4,600 | 264 | 3.2 | 4 | 4,400 | 224 | 3.2 | 4 | 3,200 | 179 | 3.2 | 4 | 2,800 | 117 | 2.4 | 4 |
| ø 5 | 4,600 | 302 | 4 | 5 | 4,000 | 257 | 4 | 5 | 2,900 | 206 | 4 | 5 | 2,500 | 134 | 3.0 | 5 |
| ø 6 | 4,100 | 352 | 4.8 | 6 | 3,500 | 299 | 4.8 | 6 | 2,700 | 239 | 4.8 | 6 | 2,200 | 155 | 3.6 | 6 |
| ø 8 | 3,100 | 422 | 6.4 | 8 | 2,500 | 359 | 6.4 | 8 | 2,100 | 287 | 6.4 | 8 | 1,700 | 186 | 4.8 | 8 |
| ø 10 | 2,500 | 475 | 8 | 10 | 2,100 | 403 | 8 | 10 | 1,600 | 323 | 8 | 10 | 1,300 | 210 | 6.0 | 10 |
| ø 12 | 2,100 | 415 | 9.6 | 12 | 1,700 | 353 | 9.6 | 12 | 1,400 | 282 | 9.6 | 12 | 1,100 | 183 | 7.2 | 12 |
| ø 16 | 1,600 | 381 | 12.8 | 16 | 1,300 | 324 | 12.8 | 16 | 1,000 | 259 | 12.8 | 16 | 800 | 169 | 9.6 | 16 |
| ø 20 | 1,300 | 352 | 16 | 20 | 1,000 | 299 | 16 | 20 | 800 | 239 | 16 | 20 | 650 | 155 | 12 | 20 |

절입량 Depth of Cut

~ 38HRC




38HRC ~

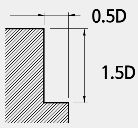



## 측면절삭 Side Cutting

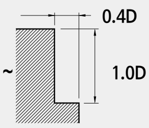
| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | | | 구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels /Gray cast iron SS / SC / FC | | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강 / 프리하든강 / 스테인레스강 Alloy Steels / Pre-hardened Steels / Stainless Steel NAK80 / KP4M / SUS304/ SUS316 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~ 200HB | | | | ~ 30HRc | | | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 4 | 5,800 | 539 | 6 | 2 | 4,800 | 458 | 6 | 2 | 4,800 | 458 | 6 | 2 | 3,200 | 351 | 4 | 1.6 |
| ø 5 | 5,800 | 318 | 7.5 | 2.5 | 4,800 | 525 | 7.5 | 2.5 | 4,800 | 525 | 7.5 | 2.5 | 2,800 | 402 | 5 | 2.0 |
| ø 6 | 4,800 | 719 | 9 | 3 | 4,200 | 611 | 9 | 3 | 4,200 | 611 | 9 | 3 | 2,400 | 467 | 6 | 2.4 |
| ø 8 | 3,700 | 863 | 12 | 4 | 3,100 | 733 | 12 | 4 | 3,100 | 733 | 12 | 4 | 1,800 | 561 | 8 | 3.2 |
| ø 10 | 3,000 | 970 | 15 | 5 | 2,500 | 825 | 15 | 5 | 2,500 | 825 | 15 | 5 | 1,500 | 631 | 10 | 4.0 |
| ø 12 | 2,400 | 848 | 18 | 6 | 2,100 | 721 | 18 | 6 | 2,100 | 721 | 18 | 6 | 1,300 | 551 | 12 | 4.8 |
| ø 16 | 1,850 | 780 | 24 | 8 | 1,600 | 663 | 24 | 8 | 1,600 | 663 | 24 | 8 | 1,000 | 507 | 16 | 6.4 |
| ø 20 | 1,500 | 719 | 30 | 10 | 1,300 | 611 | 30 | 10 | 1,300 | 611 | 30 | 10 | 750 | 467 | 20 | 8.0 |

절입량 Depth of Cut

~ 38HRC




38HRC ~




- 가능한 공구 길이 측정시 유압식 측정이 아닌 레이저식 도구 세터를 사용 하십시오.
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대 30% 이하로 줄이십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우, 진동이 발생할시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.
- 스테인레스, 내열합금강 등의 절단 가공시 수용성 절삭유가 가장 효과적 입니다.

- Use laser tool measurement instead of hydraulic measurement when measuring tool length as possible.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.
- For stainless and heat resistant alloy, water-soluble oil is the most effective.

# 2HRBE Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 공구강/금형강 Tool steels / Mold steels SCM/HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 반경 Corner Radius | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 0.1 | 0.5 | 54,000 | 430 | 0.010 | 0.010 | 48,000 | 350 | 0.006 | 0.007 | 48,000 | 280 | 0.006 | 0.007 |
| 〃 | 1 | 54,000 | 380 | 0.008 | 0.008 | 48,000 | 330 | 0.005 | 0.005 | 48,000 | 250 | 0.005 | 0.005 |
| 〃 | 1.5 | 47,000 | 320 | 0.006 | 0.006 | 47,000 | 250 | 0.004 | 0.004 | 47,000 | 200 | 0.004 | 0.004 |
| 〃 | 2 | 42,000 | 290 | 0.004 | 0.004 | 42,000 | 200 | 0.003 | 0.003 | 42,000 | 200 | 0.003 | 0.003 |
| R 0.15 | 1 | 54,000 | 640 | 0.014 | 0.015 | 48,000 | 480 | 0.010 | 0.010 | 41,000 | 370 | 0.009 | 0.010 |
| 〃 | 2 | 49,000 | 530 | 0.011 | 0.011 | 43,000 | 370 | 0.008 | 0.008 | 37,000 | 270 | 0.008 | 0.008 |
| 〃 | 3 | 43,000 | 460 | 0.009 | 0.010 | 38,000 | 320 | 0.007 | 0.006 | 32,000 | 240 | 0.006 | 0.006 |
| 〃 | 4 | 37,000 | 300 | 0.004 | 0.006 | 28,000 | 200 | 0.003 | 0.004 | 24,000 | 160 | 0.003 | 0.004 |
| R 0.2 | 1 | 54,000 | 870 | 0.023 | 0.036 | 48,000 | 660 | 0.018 | 0.024 | 37,000 | 450 | 0.015 | 0.024 |
| 〃 | 2 | 54,000 | 790 | 0.022 | 0.036 | 48,000 | 590 | 0.018 | 0.024 | 37,000 | 400 | 0.015 | 0.020 |
| 〃 | 3 | 50,000 | 660 | 0.017 | 0.018 | 41,000 | 420 | 0.012 | 0.012 | 31,000 | 280 | 0.011 | 0.012 |
| 〃 | 4 | 50,000 | 640 | 0.012 | 0.018 | 38,000 | 400 | 0.009 | 0.012 | 30,000 | 270 | 0.009 | 0.012 |
| 〃 | 5 | 37,000 | 410 | 0.009 | 0.018 | 29,000 | 330 | 0.008 | 0.012 | 26,000 | 260 | 0.007 | 0.012 |
| 〃 | 6 | 37,000 | 360 | 0.006 | 0.010 | 29,000 | 260 | 0.005 | 0.006 | 26,000 | 200 | 0.004 | 0.006 |
| 〃 | 8 | 27,000 | 200 | 0.003 | 0.006 | 27,000 | 170 | 0.003 | 0.003 | 23,000 | 150 | 0.002 | 0.003 |
| R 0.25 | 1 | 57,000 | 1,380 | 0.029 | 0.054 | 42,000 | 830 | 0.023 | 0.036 | 32,000 | 550 | 0.018 | 0.036 |
| 〃 | 2 | 57,000 | 1,250 | 0.028 | 0.054 | 42,000 | 750 | 0.022 | 0.036 | 32,000 | 500 | 0.018 | 0.036 |
| 〃 | 3 | 55,000 | 1,010 | 0.021 | 0.036 | 38,000 | 580 | 0.017 | 0.024 | 31,000 | 400 | 0.014 | 0.024 |
| 〃 | 4 | 55,000 | 1,010 | 0.021 | 0.036 | 38,000 | 580 | 0.017 | 0.024 | 31,000 | 400 | 0.014 | 0.024 |
| 〃 | 5 | 48,000 | 800 | 0.016 | 0.018 | 33,000 | 480 | 0.012 | 0.012 | 30,000 | 390 | 0.009 | 0.012 |
| 〃 | 6 | 36,000 | 610 | 0.009 | 0.018 | 28,000 | 400 | 0.008 | 0.012 | 27,000 | 330 | 0.005 | 0.012 |
| 〃 | 8 | 36,000 | 590 | 0.009 | 0.018 | 28,000 | 400 | 0.008 | 0.012 | 27,000 | 330 | 0.005 | 0.012 |
| 〃 | 10 | 36,000 | 460 | 0.009 | 0.018 | 28,000 | 400 | 0.008 | 0.012 | 27,000 | 330 | 0.005 | 0.012 |
| 〃 | 12 | 24,000 | 280 | 0.004 | 0.010 | 26,000 | 280 | 0.004 | 0.006 | 24,000 | 280 | 0.002 | 0.006 |
| R 0.3 | 1 | 57,000 | 1,670 | 0.035 | 0.144 | 37,000 | 840 | 0.027 | 0.096 | 27,000 | 540 | 0.023 | 0.096 |
| 〃 | 2 | 57,000 | 1,540 | 0.034 | 0.144 | 37,000 | 770 | 0.027 | 0.096 | 27,000 | 500 | 0.021 | 0.096 |
| 〃 | 3 | 57,000 | 1,540 | 0.034 | 0.144 | 37,000 | 770 | 0.027 | 0.096 | 27,000 | 500 | 0.021 | 0.096 |
| 〃 | 4 | 54,000 | 1,130 | 0.026 | 0.108 | 35,000 | 600 | 0.020 | 0.072 | 26,000 | 380 | 0.016 | 0.072 |
| 〃 | 5 | 46,000 | 960 | 0.019 | 0.072 | 28,000 | 460 | 0.016 | 0.048 | 26,000 | 370 | 0.012 | 0.048 |
| 〃 | 6 | 46,000 | 960 | 0.019 | 0.072 | 28,000 | 460 | 0.016 | 0.048 | 26,000 | 370 | 0.012 | 0.048 |
| 〃 | 8 | 30,000 | 570 | 0.010 | 0.054 | 24,000 | 400 | 0.009 | 0.036 | 23,000 | 320 | 0.006 | 0.036 |
| 〃 | 10 | 30,000 | 490 | 0.007 | 0.036 | 24,000 | 330 | 0.006 | 0.024 | 23,000 | 290 | 0.004 | 0.024 |
| 〃 | 12 | 30,000 | 490 | 0.007 | 0.036 | 24,000 | 330 | 0.006 | 0.024 | 23,000 | 290 | 0.004 | 0.024 |
| 〃 | 14 | 20,000 | 300 | 0.004 | 0.027 | 22,000 | 300 | 0.004 | 0.018 | 20,000 | 250 | 0.002 | 0.018 |
| R 0.35 | 2 | 56,000 | 1,800 | 0.050 | 0.162 | 35,000 | 740 | 0.039 | 0.108 | 27,000 | 500 | 0.031 | 0.108 |
| 〃 | 4 | 54,500 | 1,500 | 0.045 | 0.063 | 33,000 | 600 | 0.035 | 0.096 | 26,500 | 410 | 0.029 | 0.096 |
| 〃 | 8 | 32,000 | 800 | 0.019 | 0.072 | 12,215 | 420 | 0.020 | 0.048 | 22,500 | 355 | 0.012 | 0.048 |
| 〃 | 10 | 26,500 | 540 | 0.017 | 0.063 | 22,500 | 380 | 0.014 | 0.042 | 21,500 | 330 | 0.011 | 0.042 |
| 〃 | 12 | 23,000 | 420 | 0.017 | 0.063 | 21,500 | 380 | 0.012 | 0.032 | 21,500 | 320 | 0.010 | 0.042 |
| R 0.4 | 2 | 55,000 | 2,060 | 0.063 | 0.180 | 33,000 | 710 | 0.050 | 0.120 | 27,000 | 500 | 0.041 | 0.120 |
| 〃 | 4 | 55,000 | 1,860 | 0.063 | 0.180 | 31,000 | 600 | 0.050 | 0.120 | 27,000 | 440 | 0.041 | 0.120 |
| 〃 | 6 | 47,000 | 1,410 | 0.038 | 0.108 | 28,000 | 570 | 0.030 | 0.072 | 22,000 | 390 | 0.024 | 0.072 |
| 〃 | 8 | 34,000 | 1,040 | 0.027 | 0.090 | 21,000 | 430 | 0.021 | 0.060 | 22,000 | 390 | 0.018 | 0.060 |
| 〃 | 10 | 23,000 | 600 | 0.027 | 0.090 | 21,000 | 430 | 0.021 | 0.060 | 20,000 | 370 | 0.017 | 0.060 |
| 〃 | 12 | 16,000 | 350 | 0.027 | 0.090 | 19,000 | 430 | 0.018 | 0.040 | 20,000 | 350 | 0.016 | 0.060 |
| R 0.45 | 6 | 50,500 | 1,900 | 0.067 | 0.190 | 32,000 | 685 | 0.054 | 0.130 | 24,500 | 460 | 0.043 | 0.180 |
| R 0.5 | 2 | 46,000 | 2,000 | 0.072 | 0.360 | 32,000 | 770 | 0.057 | 0.240 | 22,000 | 480 | 0.045 | 0.240 |
| 〃 | 3 | 46,000 | 2,000 | 0.072 | 0.360 | 32,000 | 770 | 0.057 | 0.240 | 22,000 | 480 | 0.045 | 0.240 |
| 〃 | 4 | 46,000 | 2,000 | 0.071 | 0.360 | 32,000 | 770 | 0.057 | 0.240 | 22,000 | 480 | 0.045 | 0.240 |
| 〃 | 5 | 46,000 | 2,000 | 0.071 | 0.360 | 32,000 | 770 | 0.057 | 0.240 | 22,000 | 480 | 0.045 | 0.240 |
| 〃 | 6 | 39,000 | 1,500 | 0.071 | 0.180 | 26,000 | 760 | 0.055 | 0.120 | 17,600 | 480 | 0.045 | 0.120 |
| 〃 | 8 | 39,000 | 1,500 | 0.043 | 0.180 | 26,000 | 760 | 0.034 | 0.120 | 17,600 | 480 | 0.027 | 0.120 |
| 〃 | 10 | 29,000 | 1,110 | 0.028 | 0.090 | 17,600 | 530 | 0.024 | 0.060 | 16,500 | 420 | 0.018 | 0.060 |
| 〃 | 12 | 18,700 | 660 | 0.027 | 0.090 | 17,600 | 530 | 0.024 | 0.060 | 16,500 | 420 | 0.018 | 0.060 |
| 〃 | 14 | 18,700 | 640 | 0.022 | 0.090 | 15,400 | 440 | 0.018 | 0.060 | 14,300 | 360 | 0.014 | 0.060 |
| 〃 | 16 | 18,700 | 640 | 0.022 | 0.090 | 15,400 | 440 | 0.018 | 0.060 | 14,300 | 360 | 0.014 | 0.060 |
| 〃 | 18 | 18,700 | 540 | 0.017 | 0.090 | 14,300 | 440 | 0.013 | 0.060 | 13,200 | 360 | 0.009 | 0.060 |
| 〃 | 20 | 18,700 | 540 | 0.017 | 0.054 | 14,300 | 360 | 0.013 | 0.036 | 13,200 | 300 | 0.009 | 0.036 |
| 〃 | 22 | 18,700 | 540 | 0.017 | 0.054 | 14,300 | 360 | 0.013 | 0.036 | 13,200 | 300 | 0.009 | 0.036 |
| 〃 | 25 | 18,700 | 540 | 0.016 | 0.052 | 14,300 | 360 | 0.013 | 0.030 | 13,200 | 300 | 0.009 | 0.030 |
| R 0.6 | 4 | 38,000 | 2,000 | 0.085 | 0.360 | 26,000 | 770 | 0.068 | 0.240 | 18,200 | 480 | 0.054 | 0.240 |
| 〃 | 6 | 38,000 | 2,000 | 0.085 | 0.360 | 26,000 | 770 | 0.068 | 0.240 | 18,200 | 480 | 0.054 | 0.240 |
| 〃 | 8 | 32,000 | 1,490 | 0.084 | 0.360 | 21,000 | 700 | 0.067 | 0.240 | 15,100 | 440 | 0.054 | 0.240 |
| 〃 | 10 | 24,000 | 1,080 | 0.036 | 0.180 | 16,400 | 530 | 0.027 | 0.120 | 15,100 | 420 | 0.022 | 0.120 |
| 〃 | 12 | 24,000 | 1,080 | 0.036 | 0.180 | 15,300 | 530 | 0.027 | 0.120 | 14,100 | 420 | 0.022 | 0.120 |
| 〃 | 16 | 15,400 | 580 | 0.024 | 0.144 | 13,100 | 460 | 0.019 | 0.096 | 11,900 | 380 | 0.016 | 0.096 |
| 〃 | 20 | 15,400 | 580 | 0.017 | 0.090 | 12,100 | 380 | 0.013 | 0.060 | 11,000 | 320 | 0.009 | 0.060 |
| 〃 | 24 | 15,400 | 580 | 0.010 | 0.060 | 11,100 | 320 | 0.009 | 0.040 | 9,800 | 290 | 0.070 | 0.040 |

# 2HRBE Cutting Condition

• RPM : rev./min • Feed : mm/min

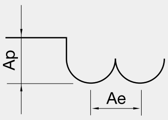
| 피삭재 Material | | 공구강/금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 반경 Corner Radius | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 0.7 | 6 | 28,000 | 1,470 | 0.099 | 0.270 | 17,600 | 680 | 0.076 | 0.180 | 13,600 | 440 | 0.063 | 0.180 |
| 〃 | 8 | 28,000 | 1,470 | 0.099 | 0.270 | 17,600 | 680 | 0.079 | 0.180 | 13,600 | 440 | 0.063 | 0.180 |
| 〃 | 12 | 19,800 | 1,080 | 0.042 | 0.270 | 13,800 | 530 | 0.033 | 0.180 | 13,600 | 420 | 0.027 | 0.180 |
| 〃 | 16 | 13,200 | 620 | 0.033 | 0.180 | 13,100 | 480 | 0.027 | 0.120 | 11,900 | 390 | 0.021 | 0.120 |
| R 0.75 | 3 | 30,000 | 2,200 | 0.171 | 0.324 | 21,000 | 1060 | 0.137 | 0.216 | 14,800 | 660 | 0.110 | 0.216 |
| 〃 | 4 | 30,000 | 2,200 | 0.171 | 0.324 | 21,000 | 1060 | 0.137 | 0.216 | 14,800 | 660 | 0.110 | 0.216 |
| 〃 | 6 | 30,000 | 1,980 | 0.147 | 0.324 | 21,000 | 940 | 0.117 | 0.216 | 14,800 | 580 | 0.090 | 0.216 |
| 〃 | 8 | 26,000 | 1,500 | 0.106 | 0.270 | 16,300 | 700 | 0.084 | 0.180 | 12,100 | 450 | 0.069 | 0.180 |
| 〃 | 10 | 26,000 | 1,500 | 0.106 | 0.270 | 16,300 | 700 | 0.084 | 0.180 | 12,100 | 450 | 0.069 | 0.180 |
| 〃 | 12 | 26,000 | 1,500 | 0.106 | 0.270 | 16,300 | 700 | 0.084 | 0.180 | 12,100 | 450 | 0.069 | 0.180 |
| 〃 | 14 | 18,700 | 1,100 | 0.045 | 0.180 | 12,600 | 530 | 0.036 | 0.120 | 12,100 | 440 | 0.027 | 0.120 |
| 〃 | 16 | 12,100 | 620 | 0.036 | 0.180 | 12,400 | 480 | 0.027 | 0.120 | 11,600 | 390 | 0.022 | 0.120 |
| 〃 | 18 | 12,100 | 620 | 0.036 | 0.180 | 12,400 | 480 | 0.027 | 0.120 | 11,600 | 390 | 0.022 | 0.120 |
| 〃 | 20 | 12,100 | 620 | 0.019 | 0.090 | 12,400 | 480 | 0.016 | 0.060 | 11,600 | 390 | 0.012 | 0.060 |
| 〃 | 22 | 12,100 | 620 | 0.019 | 0.090 | 12,400 | 480 | 0.016 | 0.060 | 11,000 | 390 | 0.012 | 0.060 |
| 〃 | 25 | 11,000 | 500 | 0.019 | 0.090 | 12,400 | 440 | 0.016 | 0.060 | 11,000 | 390 | 0.012 | 0.060 |
| 〃 | 30 | 10,700 | 450 | 0.019 | 0.090 | 10,900 | 400 | 0.016 | 0.060 | 11,000 | 390 | 0.012 | 0.060 |
| R 0.8 | 6 | 27,040 | 2,600 | 0.220 | 0.580 | 18,900 | 1200 | 0.180 | 0.390 | 1,650 | 760 | 0.150 | 0.390 |
| 〃 | 8 | 26,000 | 1,970 | 0.157 | 0.324 | 18,900 | 940 | 0.126 | 0.216 | 13,800 | 580 | 0.102 | 0.216 |
| 〃 | 12 | 25,000 | 1,490 | 0.112 | 0.180 | 15,100 | 700 | 0.090 | 0.120 | 11,500 | 440 | 0.072 | 0.120 |
| 〃 | 16 | 17,600 | 110 | 0.046 | 0.144 | 12,300 | 530 | 0.036 | 0.096 | 11,400 | 440 | 0.030 | 0.096 |
| 〃 | 20 | 11,000 | 630 | 0.036 | 0.090 | 11,500 | 480 | 0.030 | 0.060 | 10,900 | 400 | 0.024 | 0.060 |
| R 0.9 | 6 | 32,000 | 2,600 | 0.230 | 0.300 | 18,400 | 1200 | 0.185 | 0.320 | 18,400 | 738 | 0.150 | 0.320 |
| 〃 | 8 | 26,000 | 1,950 | 0.165 | 0.270 | 16,300 | 930 | 0.132 | 0.240 | 13,800 | 570 | 0.108 | 0.240 |
| 〃 | 12 | 21,000 | 1,480 | 0.120 | 0.270 | 13,800 | 700 | 0.094 | 0.180 | 10,300 | 440 | 0.077 | 0.180 |
| 〃 | 16 | 15,400 | 1,080 | 0.048 | 0.180 | 10,800 | 530 | 0.039 | 0.120 | 9,900 | 420 | 0.031 | 0.120 |
| 〃 | 20 | 10,500 | 630 | 0.039 | 0.090 | 10,200 | 480 | 0.031 | 0.060 | 9,700 | 400 | 0.025 | 0.060 |
| R 1 | 4 | 22,000 | 2,140 | 0.232 | 0.540 | 18,500 | 1260 | 0.185 | 0.360 | 13,200 | 960 | 0.150 | 0.360 |
| 〃 | 6 | 22,000 | 2,140 | 0.232 | 0.540 | 18,500 | 1260 | 0.185 | 0.360 | 13,200 | 960 | 0.150 | 0.360 |
| 〃 | 8 | 22,000 | 1,920 | 0.185 | 0.360 | 18,500 | 1120 | 0.147 | 0.240 | 13,200 | 870 | 0.120 | 0.240 |
| 〃 | 10 | 22,000 | 1,920 | 0.185 | 0.360 | 18,500 | 1120 | 0.147 | 0.240 | 13,200 | 870 | 0.120 | 0.240 |
| 〃 | 12 | 18,700 | 1,470 | 0.166 | 0.360 | 16,000 | 990 | 0.133 | 0.240 | 11,700 | 780 | 0.107 | 0.240 |
| 〃 | 14 | 18,700 | 1,470 | 0.166 | 0.360 | 16,000 | 990 | 0.133 | 0.240 | 11,700 | 780 | 0.107 | 0.240 |
| 〃 | 16 | 18,700 | 1,470 | 0.148 | 0.360 | 16,000 | 990 | 0.118 | 0.240 | 11,700 | 780 | 0.090 | 0.240 |
| 〃 | 18 | 14,300 | 1,070 | 0.093 | 0.180 | 14,700 | 580 | 0.074 | 0.120 | 11,600 | 580 | 0.061 | 0.120 |
| 〃 | 20 | 14,300 | 1,070 | 0.093 | 0.180 | 14,700 | 580 | 0.074 | 0.120 | 11,600 | 580 | 0.061 | 0.120 |
| 〃 | 22 | 9,500 | 630 | 0.074 | 0.180 | 10,600 | 450 | 0.058 | 0.120 | 10,200 | 450 | 0.045 | 0.120 |
| 〃 | 25 | 9,500 | 630 | 0.074 | 0.180 | 10,600 | 450 | 0.058 | 0.120 | 10,200 | 450 | 0.045 | 0.120 |
| 〃 | 30 | 9,500 | 530 | 0.033 | 0.090 | 10,600 | 450 | 0.026 | 0.060 | 10,200 | 380 | 0.021 | 0.060 |
| R 1.25 | 8 | 18,400 | 2,400 | 0.232 | 0.360 | 14,500 | 1400 | 0.185 | 0.240 | 9,700 | 1080 | 0.150 | 0.240 |
| 〃 | 10 | 18,400 | 2,400 | 0.232 | 0.360 | 14,500 | 1400 | 0.185 | 0.240 | 9,700 | 1080 | 0.150 | 0.240 |
| 〃 | 16 | 16,100 | 1,810 | 0.208 | 0.360 | 13,500 | 1230 | 0.166 | 0.240 | 8,400 | 980 | 0.135 | 0.240 |
| 〃 | 20 | 11,500 | 1,330 | 0.116 | 0.180 | 10,200 | 950 | 0.093 | 0.120 | 8,400 | 980 | 0.074 | 0.120 |
| 〃 | 25 | 6,900 | 770 | 0.093 | 0.180 | 8,400 | 540 | 0.074 | 0.120 | 8,400 | 560 | 0.061 | 0.120 |
| 〃 | 30 | 6,900 | 770 | 0.040 | 0.090 | 8,400 | 540 | 0.033 | 0.060 | 8,400 | 560 | 0.026 | 0.060 |
| R 1.5 | 6 | 15,000 | 2,890 | 0.278 | 0.540 | 12,900 | 1680 | 0.222 | 0.360 | 9,200 | 1300 | 0.180 | 0.360 |
| 〃 | 8 | 15,000 | 2,890 | 0.278 | 0.540 | 12,900 | 1680 | 0.222 | 0.360 | 9,200 | 1300 | 0.180 | 0.360 |
| 〃 | 10 | 15,000 | 2,600 | 0.278 | 0.540 | 12,900 | 1680 | 0.222 | 0.360 | 9,200 | 1300 | 0.180 | 0.360 |
| 〃 | 12 | 15,000 | 2,600 | 0.278 | 0.540 | 12,900 | 1510 | 0.222 | 0.360 | 9,200 | 1170 | 0.180 | 0.360 |
| 〃 | 16 | 12,700 | 1,970 | 0.029 | 0.504 | 11,300 | 1330 | 0.166 | 0.360 | 8,100 | 1040 | 0.135 | 0.360 |
| 〃 | 20 | 12,700 | 1,970 | 0.029 | 0.504 | 11,300 | 1330 | 0.166 | 0.360 | 8,100 | 1040 | 0.135 | 0.360 |
| 〃 | 25 | 10,100 | 1,450 | 0.139 | 0.270 | 8,800 | 1040 | 0.111 | 0.180 | 8,100 | 1040 | 0.090 | 0.180 |
| 〃 | 30 | 10,100 | 1,450 | 0.139 | 0.270 | 8,800 | 780 | 0.111 | 0.180 | 8,100 | 780 | 0.090 | 0.180 |
| 〃 | 35 | 6,600 | 840 | 0.073 | 0.270 | 7,900 | 620 | 0.055 | 0.180 | 7,500 | 650 | 0.045 | 0.180 |
| 〃 | 40 | 6,600 | 840 | 0.073 | 0.270 | 7,900 | 620 | 0.055 | 0.180 | 7,500 | 520 | 0.045 | 0.180 |
| 〃 | 45 | 4,500 | 500 | 0.040 | 0.270 | 6,200 | 500 | 0.035 | 0.180 | 7,000 | 450 | 0.023 | 0.180 |
| R 2 | 8 | 11,500 | 2,710 | 0.370 | 0.900 | 9,700 | 1560 | 0.297 | 0.600 | 6,800 | 1210 | 0.241 | 0.600 |
| 〃 | 10 | 11,500 | 2,710 | 0.370 | 0.900 | 9,700 | 1560 | 0.297 | 0.600 | 6,800 | 1210 | 0.241 | 0.600 |
| 〃 | 12 | 11,500 | 2,710 | 0.390 | 0.900 | 9,700 | 1560 | 0.297 | 0.600 | 6,800 | 1210 | 0.241 | 0.600 |
| 〃 | 16 | 11,500 | 2,710 | 0.390 | 0.900 | 9,700 | 1560 | 0.297 | 0.600 | 6,800 | 1210 | 0.241 | 0.600 |
| 〃 | 20 | 11,500 | 2,710 | 0.390 | 0.900 | 9,700 | 1560 | 0.297 | 0.600 | 6,800 | 1210 | 0.241 | 0.600 |
| 〃 | 25 | 10,300 | 1,850 | 0.279 | 0.540 | 8,400 | 1250 | 0.223 | 0.360 | 6,000 | 980 | 0.180 | 0.360 |
| 〃 | 30 | 10,300 | 1,850 | 0.279 | 0.540 | 8,400 | 1250 | 0.223 | 0.360 | 6,000 | 980 | 0.180 | 0.361 |
| 〃 | 35 | 7,500 | 1,360 | 0.185 | 0.540 | 6,600 | 950 | 0.148 | 0.360 | 6,000 | 700 | 0.120 | 0.360 |
| 〃 | 40 | 7,500 | 1,360 | 0.185 | 0.540 | 6,600 | 950 | 0.148 | 0.360 | 6,000 | 700 | 0.120 | 0.360 |
| 〃 | 45 | 5,000 | 780 | 0.093 | 0.360 | 5,900 | 470 | 0.074 | 0.240 | 5,600 | 490 | 0.060 | 0.240 |

# 2HRBE Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 공구강/금형강 Tool steels / Mold steels SCM/HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 반경 Corner Radius | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 2.5 | 16 | 9,600 | 2,590 | 0.406 | 0.900 | 7,800 | 1350 | 0.324 | 0.800 | 5,600 | 1050 | 0.252 | 0.800 |
| 〃 | 20 | 9,600 | 2,100 | 0.406 | 0.900 | 7,800 | 1240 | 0.324 | 0.600 | 5,600 | 950 | 0.252 | 0.600 |
| 〃 | 25 | 9,600 | 2,100 | 0.406 | 0.900 | 7,800 | 1240 | 0.324 | 0.600 | 5,600 | 950 | 0.252 | 0.600 |
| 〃 | 30 | 8,200 | 1,320 | 0.305 | 0.900 | 7,800 | 760 | 0.243 | 0.600 | 4,800 | 600 | 0.197 | 0.600 |
| 〃 | 40 | 7,000 | 830 | 0.230 | 0.900 | 7,800 | 470 | 0.200 | 0.600 | 4,300 | 380 | 0.154 | 0.600 |
| R 3 | 15 | 8,000 | 2,530 | 0.555 | 1.800 | 7,400 | 1670 | 0.443 | 1.200 | 5,200 | 1300 | 0.360 | 1.200 |
| R 4 | 25 | 9,000 | 2,400 | 0.600 | 1.500 | 7,200 | 1200 | 0.500 | 1.000 | 5,200 | 920 | 0.350 | 1.000 |
| R 5 | 30 | 7,800 | 1,300 | 0.300 | 0.900 | 6,800 | 720 | 0.230 | 0.600 | 4,600 | 570 | 0.190 | 0.570 |
| R 6 | 30 | 7,410 | 1,235 | 0.285 | 0.855 | 6,350 | 684 | 0.210 | 0.570 | 4,370 | 541 | 0.181 | 0.550 |

**절입량**
Depth of Cut




Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 ($min^{-1}$)
Vf : Feed 이송속도 (mm/min)

- HRC52 이상 고경도강 가공시 같은 직경의 같인 비율로 20% DOWN 시켜주십시오.
- 유효장이 없는 절삭조건은 같은 직경에 더 짧은 유효장 대비 같은 비율로 DOWN 해주십시오.
- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 에어브로 혹은 미스트 쿨런트를 추천하며, 동가공시 습식 쿨런트 추천 합니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 칩 제거 주의 및 가공시 발열, 발화에 주의 하십시오.

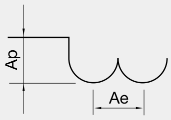
- When milling workpiece HRC over 52 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- If the effective length of your tool does not show above the table, use the shorten effevtive length of parameter and reduce the parameters in the same proportion.
- In case of long effective length, reduce the RPM and feed in same proportion.
- Air blow or oil mist is recommended for smooth chip emission, and dry milling is recommended for copper material.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- During the chip evacuation, note for heat and ignition.

# 2HCBE Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 반경 Corner Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 0.15 | 35,100 | 650 | 0.100 | 0.015 | 31,200 | 478 | 0.093 | 0.015 | 25,740 | 364 | 0.088 | 0.015 |
| R 0.2 | 35,100 | 765 | 0.200 | 0.020 | 31,200 | 582 | 0.186 | 0.020 | 25,740 | 468 | 0.176 | 0.020 |
| R 0.25 | 35,100 | 1165 | 0.300 | 0.025 | 31,200 | 915 | 0.279 | 0.025 | 25,740 | 728 | 0.264 | 0.025 |
| R 0.3 | 35,100 | 1498 | 0.350 | 0.030 | 31,200 | 1186 | 0.326 | 0.030 | 23,400 | 832 | 0.308 | 0.030 |
| R 0.35 | 31,200 | 1830 | 0.400 | 0.040 | 23,400 | 1227 | 0.372 | 0.040 | 19,500 | 962 | 0.352 | 0.040 |
| R0.4 | 30,420 | 2163 | 0.450 | 0.045 | 21,684 | 1373 | 0.419 | 0.045 | 17,706 | 1066 | 0.396 | 0.045 |
| R0.5 | 29,640 | 2371 | 0.450 | 0.050 | 19,890 | 1498 | 0.419 | 0.050 | 15,990 | 1118 | 0.396 | 0.050 |
| R0.75 | 24,960 | 2600 | 0.525 | 0.075 | 16,770 | 1622 | 0.488 | 0.075 | 13,650 | 1235 | 0.462 | 0.075 |
| R 1 | 20,280 | 2829 | 0.600 | 0.100 | 13,650 | 1747 | 0.558 | 0.100 | 11,310 | 1352 | 0.528 | 0.100 |
| R1.25 | 16,887 | 2829 | 0.700 | 0.125 | 11,310 | 1747 | 0.651 | 0.125 | 9,360 | 1352 | 0.616 | 0.125 |
| R1.5 | 13,494 | 2829 | 0.800 | 0.150 | 8,970 | 1747 | 0.744 | 0.150 | 7,410 | 1352 | 0.704 | 0.150 |
| R2 | 10,296 | 2912 | 1.000 | 0.200 | 6,864 | 1830 | 0.930 | 0.200 | 5,616 | 1404 | 0.880 | 0.200 |
| R2.5 | 9,750 | 3349 | 1.200 | 0.250 | 6,474 | 2080 | 1.116 | 0.250 | 4,992 | 1482 | 1.056 | 0.250 |
| R3 | 8,073 | 3203 | 1.500 | 0.300 | 5,382 | 1997 | 1.395 | 0.300 | 4,134 | 1456 | 1.320 | 0.300 |
| R4 | 6,084 | 2995 | 2.000 | 0.400 | 4,056 | 1851 | 1.860 | 0.400 | 3,120 | 1326 | 1.760 | 0.400 |
| R5 | 4,797 | 2829 | 2.500 | 1.000 | 3,198 | 1726 | 2.325 | 1.000 | 2,496 | 1248 | 2.200 | 1.000 |
| R6 | 4,095 | 2829 | 3.000 | 1.200 | 2,730 | 1726 | 2.790 | 1.200 | 2,067 | 1248 | 2.640 | 1.200 |
| R8 | 3,385 | 2538 | 4.000 | 1.600 | 2,028 | 1498 | 3.720 | 1.600 | 1,435 | 935 | 3.520 | 1.600 |

**절입량 Depth of Cut**




Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 ($min^{-1}$)
Vf : Feed 이송속도 (mm/min)

- HRC52 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 유효장이 없는 절삭조건은 같은 직경에 더 짧은 유효장 대비 같은 비율로 DOWN 해주십시오.
- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 에어브로 혹은 미스트 쿨런트를 추천하며, 동가공시 습식 쿨런트 추천 합니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 칩 제거 주의 및 가공시 발열, 발화에 주의 하십시오.

- When milling workpiece HRC over 52 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- If the effective length of your tool does not show above the table, use the shorten effevtive length of parameter and reduce the parameters in the same proportion.
- In case of long effective length, reduce the RPM and feed in same proportion.
- Air blow or oil mist is recommended for smooth chip emission, and dry milling is recommended for copper material.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- During the chip evacuation, note for heat and ignition.

# 2HCEE/4HCEE

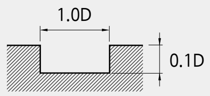
- 4HCEE는 RPM 동일, FEED만 최대 **30% Up** 적용.
- Use the same RPM and raise up the feed up to 30% for 4HCEE.

• RPM : rev./min • Feed : mm/min

## 홈절삭 Slotting

| 피삭재 Material | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.2 | 50,000 | 230 | 0.02 | 0.20 | 45,000 | 207 | 0.01 | 0.10 | 40,000 | 176 | 0.01 | 0.10 |
| ø 0.5 | 50,000 | 660 | 0.05 | 0.50 | 45,000 | 594 | 0.03 | 0.25 | 40,000 | 505 | 0.03 | 0.25 |
| ø 0.7 | 50,000 | 810 | 0.07 | 0.70 | 45,000 | 729 | 0.04 | 0.35 | 37,500 | 620 | 0.04 | 0.35 |
| ø 0.9 | 49,000 | 1,180 | 0.09 | 0.90 | 39,000 | 1062 | 0.05 | 0.45 | 27,800 | 903 | 0.05 | 0.45 |
| ø 1 | 48,000 | 1,350 | 0.10 | 1.00 | 38,000 | 1215 | 0.05 | 0.50 | 25,500 | 1033 | 0.05 | 0.50 |
| ø 1.5 | 42,000 | 1,440 | 0.15 | 1.50 | 30,000 | 1296 | 0.08 | 0.75 | 21,500 | 1102 | 0.08 | 0.75 |
| ø 2 | 33,300 | 1,530 | 0.20 | 2.00 | 26,000 | 1377 | 0.10 | 1.00 | 17,500 | 1170 | 0.10 | 1.00 |
| ø 2.5 | 26,500 | 1,530 | 0.25 | 2.50 | 22,500 | 1377 | 0.13 | 1.25 | 15,800 | 1170 | 0.13 | 1.25 |
| ø 3 | 21,800 | 1,800 | 0.30 | 3.00 | 17,300 | 1620 | 0.15 | 1.50 | 11,500 | 1377 | 0.15 | 1.50 |
| ø 4 | 16,700 | 2,160 | 0.40 | 4.00 | 13,200 | 1944 | 0.20 | 2.00 | 8,800 | 1652 | 0.20 | 2.00 |
| ø 5 | 15,700 | 2,610 | 0.50 | 5.00 | 12,500 | 2349 | 0.25 | 2.50 | 8,300 | 1997 | 0.25 | 2.50 |
| ø 6 | 13,100 | 2,700 | 0.60 | 6.00 | 10,350 | 2430 | 0.30 | 3.00 | 6,900 | 2066 | 0.30 | 3.00 |
| ø 8 | 9,880 | 2,375 | 0.80 | 8.00 | 7,800 | 2137 | 0.40 | 4.00 | 5,200 | 1817 | 0.40 | 4.00 |
| ø 10 | 7,800 | 2,050 | 1.00 | 10.00 | 6,150 | 1845 | 0.50 | 5.00 | 4,100 | 1568 | 0.50 | 5.00 |
| ø 12 | 6,650 | 1,710 | 1.20 | 12.00 | 5,250 | 1539 | 0.60 | 6.00 | 3,500 | 1308 | 0.60 | 6.00 |
| ø 16 | 5,540 | 1,670 | 1.60 | 16.00 | 4,340 | 1503 | 0.80 | 8.00 | 2,600 | 1278 | 0.80 | 8.00 |

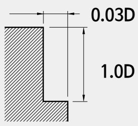
절입량 Depth of Cut

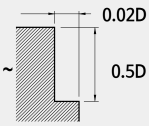



## 측면절삭 Side Cutting

| 피삭재 Material | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 48,000 | 1,260 | 1.00 | 0.03 | 38,000 | 980 | 0.50 | 0.02 | 25,500 | 610 | 0.50 | 0.02 |
| ø 2 | 33,300 | 1,440 | 2.00 | 0.06 | 26,000 | 1160 | 1.00 | 0.04 | 17,500 | 720 | 1.00 | 0.04 |
| ø 3 | 21,800 | 1,440 | 3.00 | 0.09 | 17,300 | 1160 | 1.50 | 0.06 | 11,500 | 720 | 1.50 | 0.06 |
| ø 4 | 16,700 | 1,500 | 4.00 | 0.12 | 13,200 | 1200 | 2.00 | 0.08 | 8,800 | 750 | 2.00 | 0.08 |
| ø 5 | 15,700 | 1,740 | 5.00 | 0.15 | 12,500 | 1380 | 2.50 | 0.10 | 8,300 | 850 | 2.50 | 0.10 |
| ø 6 | 13,100 | 1,620 | 6.00 | 0.18 | 10,350 | 1320 | 3.00 | 0.12 | 6,900 | 830 | 3.00 | 0.12 |
| ø 8 | 9,880 | 1,584 | 8.00 | 0.24 | 7,800 | 1230 | 4.00 | 0.16 | 5,200 | 760 | 4.00 | 0.16 |
| ø 10 | 7,800 | 1,440 | 10.00 | 0.30 | 6,150 | 1160 | 5.00 | 0.20 | 4,100 | 700 | 5.00 | 0.20 |
| ø 12 | 6,650 | 1,440 | 12.00 | 0.36 | 5,250 | 1160 | 6.00 | 0.24 | 3,500 | 700 | 6.00 | 0.24 |
| ø 16 | 5,540 | 1,200 | 16.00 | 0.39 | 4,340 | 1055 | 8.00 | 0.32 | 2,600 | 630 | 8.00 | 0.32 |

절입량 Depth of Cut

~ 40HRC



40HRC ~



- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC52 이상 고경도강 가공시 같은 직경 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭 조건표는 2날 기준이며, 4날시 회전수는 유지하고, 피드는 안정적인 속도 내에서 최대 30%까지 UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 52 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- The parameters on the table is based on 2flutes. For using 4flutes, use the same RPM and raise up the feed up to 30% in stable milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

# 3NSE/4NSE

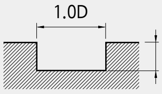
■ 4NSE는 RPM 동일, FEED만 최대 50% Up 적용.
■ Use the same RPM and raise up the feed up to 50% for 4NSE.

• RPM : rev./min • Feed : mm/min

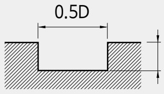
## 홈절삭 Slotting

| 피삭재 Material | 공구강/금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 13,000 | 75 | 1 | 0.03 | 9,000 | 65 | 0.50 | 0.02 | 5,700 | 41 | 0.05 | 0.50 |
| ø 1.5 | 10,000 | 75 | 2 | 0.045 | 6,000 | 65 | 0.75 | 0.03 | 4,500 | 41 | 0.08 | 0.75 |
| ø 2 | 6,400 | 188 | 2 | 0.06 | 4,800 | 162 | 1.00 | 0.04 | 3,000 | 102 | 0.10 | 1.00 |
| ø 3 | 4,200 | 375 | 3 | 0.09 | 3,400 | 324 | 1.50 | 0.06 | 2,100 | 204 | 0.15 | 1.50 |
| ø 4 | 3,400 | 413 | 4 | 0.12 | 2,700 | 356 | 2.00 | 0.08 | 1,700 | 204 | 0.20 | 2.00 |
| ø 5 | 2,900 | 563 | 5 | 0.15 | 2,300 | 486 | 2.50 | 0.10 | 1,500 | 306 | 0.25 | 2.50 |
| ø 6 | 2,500 | 788 | 6 | 0.18 | 2,000 | 680 | 3.00 | 0.12 | 1,300 | 428 | 0.30 | 3.00 |
| ø 8 | 1,900 | 813 | 8 | 0.24 | 1,500 | 702 | 4.00 | 0.16 | 1,000 | 442 | 0.40 | 4.00 |
| ø 10 | 1,600 | 750 | 10 | 0.3 | 1,300 | 648 | 5.00 | 0.20 | 800 | 408 | 0.50 | 5.00 |
| ø 12 | 1,300 | 731 | 12 | 0.36 | 1,100 | 632 | 6.00 | 0.24 | 670 | 398 | 0.60 | 6.00 |

절입량
Depth of Cut




~ 40HRC



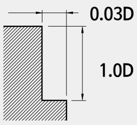

40HRC ~

## 측면절삭 Side Cutting

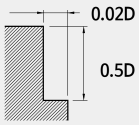
| 피삭재 Material | 공구강/금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 50HRc | | | | 50 ~ 52HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 13,000 | 75 | 1 | 0.030 | 9,000 | 65 | 0.5 | 0.02 | 5,700 | 49 | 0.50 | 0.02 |
| ø 1.5 | 10,000 | 75 | 2 | 0.045 | 6,000 | 65 | 0.75 | 0.03 | 4,500 | 49 | 0.75 | 0.03 |
| ø 2 | 6,400 | 188 | 2 | 0.060 | 4,800 | 162 | 1.00 | 0.04 | 3,000 | 122 | 1.00 | 0.04 |
| ø 3 | 4,200 | 375 | 3 | 0.090 | 3,400 | 324 | 1.50 | 0.06 | 2,100 | 245 | 1.50 | 0.06 |
| ø 4 | 3,400 | 413 | 4 | 0.120 | 2,700 | 356 | 2.00 | 0.08 | 1,700 | 269 | 2.00 | 0.08 |
| ø 5 | 2,900 | 563 | 5 | 0.150 | 2,300 | 486 | 2.50 | 0.10 | 1,500 | 367 | 2.50 | 0.10 |
| ø 6 | 2,500 | 788 | 6 | 0.180 | 2,000 | 680 | 3.00 | 0.12 | 1,300 | 514 | 3.00 | 0.12 |
| ø 8 | 1,900 | 813 | 8 | 0.240 | 1,500 | 702 | 4.00 | 0.16 | 1,000 | 530 | 4.00 | 0.16 |
| ø 10 | 1,600 | 750 | 10 | 0.300 | 1,300 | 648 | 5.00 | 0.20 | 800 | 490 | 5.00 | 0.20 |
| ø 12 | 1,300 | 731 | 12 | 0.360 | 1,100 | 632 | 6.00 | 0.24 | 670 | 477 | 6.00 | 0.24 |

절입량
Depth of Cut

~ 40HRC




40HRC ~




- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC55 이상 고경도강 가공시 같은 직경 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭 조건표는 3날 기준이며, 4날시 회전수는 유지하고, 피드는 안정적인 속도 내에서 최대 50%까지 UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 55 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- The parameters on the table is based on 3flutes. For using 4flutes, use the same RPM and raise up the feed up to 50% in stable milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

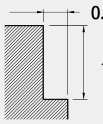
# 4HEME Cutting Condition

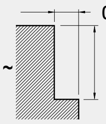
• RPM : rev./min • Feed : mm/min

측면절삭 Side Cutting

| 피삭재 Material | 공구강/금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 40,000 | 432 | 1.5 | 0.050 | 40,000 | 396 | 0.5 | 0.03 | 40,000 | 277 | 0.50 | 0.03 |
| ø 1.5 | 40,000 | 540 | 2.3 | 0.075 | 40,000 | 450 | 0.75 | 0.05 | 38,500 | 315 | 0.75 | 0.05 |
| ø 2 | 40,000 | 720 | 3.0 | 0.100 | 38,000 | 648 | 1.00 | 0.06 | 36,500 | 450 | 1.00 | 0.06 |
| ø 3 | 38,400 | 1,643 | 4.5 | 0.150 | 34,560 | 1,476 | 1.50 | 0.09 | 27,650 | 1,035 | 1.50 | 0.09 |
| ø 4 | 28,800 | 1,899 | 6.0 | 0.200 | 25,920 | 1,710 | 2.00 | 0.12 | 20,730 | 1,197 | 2.00 | 0.12 |
| ø 5 | 24,000 | 2,160 | 7.5 | 0.250 | 21,600 | 1,944 | 2.50 | 0.15 | 17,280 | 1,359 | 2.50 | 0.15 |
| ø 6 | 19,200 | 2,507 | 9.0 | 0.300 | 17,280 | 2,255 | 2.50 | 0.18 | 13,820 | 1,575 | 2.50 | 0.18 |
| ø 8 | 14,400 | 2,507 | 12.0 | 0.400 | 12,960 | 2,255 | 3.00 | 0.24 | 10,370 | 1,575 | 3.00 | 0.24 |
| ø 10 | 11,520 | 2,507 | 15.0 | 0.500 | 10,360 | 2,255 | 4.00 | 0.30 | 8,290 | 1,575 | 4.00 | 0.30 |
| ø 12 | 9,600 | 2,070 | 18.0 | 0.600 | 8,640 | 1,863 | 6.00 | 0.36 | 6,900 | 1,305 | 6.00 | 0.36 |
| ø 14 | 8,950 | 1,859 | 21.0 | 0.700 | 8,140 | 1,683 | 7.00 | 0.42 | 6,120 | 1,107 | 7.00 | 0.42 |
| ø 16 | 7,200 | 1,557 | 24.0 | 0.800 | 6,480 | 1,400 | 8.00 | 0.48 | 5,190 | 981 | 8.00 | 0.48 |

절입량 Depth of Cut

~ 40HRC



40HRC ~



- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC52 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 유효장이 길게 체결할시 회전수와 피드를 같은 비율로 DOWN 해주십시오.
- 상기 절삭조건은 참고 수치이며 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 52 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- If you clamp the endmill with long overhang of effective length, reduce the RPM and feed in the same proportion.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

# 2NCRE/4NCRE

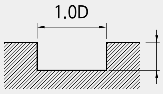
■ 4NCRE는 RPM 동일, FEED만 최대30% Up 적용.
■ Use the same RPM and raise up the feed up to 30% for 4NCRE.

• RPM : rev./min • Feed : mm/min

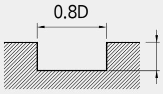
## 홈절삭 Slotting

| 피삭재 Material | 공구강/금형강 Tool steels / Mold steels SCM/HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 43,200 | 1,224 | 0.05 | 1.0 | 24,200 | 990 | 0.02 | 0.8 | 22,950 | 660 | 0.02 | 0.80 |
| ø 1.5 | 28,250 | 1,296 | 0.08 | 1.5 | 23,850 | 1,090 | 0.03 | 1.2 | 20,340 | 726 | 0.03 | 1.20 |
| ø 2 | 29,970 | 1,458 | 0.10 | 2.0 | 15,570 | 1,200 | 0.04 | 1.6 | 15,750 | 776 | 0.04 | 1.60 |
| ø 3 | 19,620 | 1,482 | 0.15 | 3.0 | 11,880 | 1,230 | 0.06 | 2.4 | 10,350 | 792 | 0.06 | 2.40 |
| ø 4 | 15,030 | 1,518 | 0.20 | 4.0 | 11,250 | 1,310 | 0.08 | 3.2 | 7,920 | 809 | 0.08 | 3.20 |
| ø 5 | 14,130 | 1,620 | 0.25 | 5.0 | 9,315 | 1,280 | 0.10 | 4.0 | 7,470 | 858 | 0.10 | 4.00 |
| ø 6 | 11,790 | 1,578 | 0.30 | 6.0 | 7,020 | 1,170 | 0.12 | 4.8 | 6,210 | 842 | 0.12 | 4.80 |
| ø 8 | 8,890 | 1,440 | 0.40 | 8.0 | 5,530 | 1,090 | 0.16 | 6.4 | 4,680 | 776 | 0.16 | 6.40 |
| ø 10 | 7,020 | 1,344 | 0.50 | 10.0 | 4,720 | 1,090 | 0.20 | 8.0 | 3,690 | 726 | 0.20 | 8.00 |
| ø 12 | 5,985 | 1,344 | 0.60 | 12.0 | 4,350 | 1,050 | 0.24 | 9.6 | 3,150 | 726 | 0.24 | 9.60 |

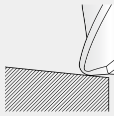
절입량
Depth of Cut



~ 40HRC



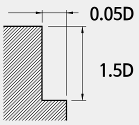
40HRC ~

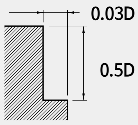

경사진면절삭
Inclined Cutting

## 측면절삭 Side Cutting

| 피삭재 Material | 공구강/금형강 Tool steels / Mold steels SCM/HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 43,200 | 870 | 1.5 | 0.050 | 34,200 | 702 | 0.5 | 0.03 | 22,950 | 470 | 0.50 | 0.03 |
| ø 1.5 | 37,080 | 980 | 2.3 | 0.075 | 29,250 | 801 | 0.75 | 0.05 | 19,350 | 550 | 0.75 | 0.05 |
| ø 2 | 29,970 | 1,280 | 3.0 | 0.100 | 23,400 | 1,035 | 1.00 | 0.06 | 15,750 | 690 | 1.00 | 0.06 |
| ø 3 | 19,620 | 1,300 | 4.5 | 0.150 | 15,570 | 1,062 | 1.50 | 0.09 | 13,500 | 700 | 1.50 | 0.09 |
| ø 4 | 15,030 | 1,330 | 6.0 | 0.200 | 11,880 | 1,080 | 2.00 | 0.12 | 7,920 | 720 | 2.00 | 0.12 |
| ø 5 | 14,130 | 1,550 | 7.5 | 0.250 | 11,250 | 1,260 | 2.50 | 0.15 | 7,470 | 840 | 2.50 | 0.15 |
| ø 6 | 11,790 | 1,440 | 9.0 | 0.300 | 9,310 | 1,170 | 2.50 | 0.18 | 6,210 | 780 | 2.50 | 0.18 |
| ø 8 | 8,890 | 1,410 | 12.0 | 0.400 | 7,020 | 1,143 | 3.00 | 0.24 | 4,680 | 760 | 3.00 | 0.24 |
| ø 10 | 7,020 | 1,280 | 15.0 | 0.500 | 5,530 | 1,035 | 4.00 | 0.30 | 3,690 | 690 | 4.00 | 0.30 |
| ø 12 | 5,980 | 1,280 | 18.0 | 0.600 | 4,720 | 1,035 | 6.00 | 0.36 | 3,150 | 690 | 6.00 | 0.36 |

절입량
Depth of Cut

~ 40HRC



40HRC ~



- 상기 절삭조건표는 2날 기준이며, 4날시 회전수는 유지하고 피드는 안정적인 속도 내에서 최대30%까지 UP 해주십시오.
- HRC52 이상인 경우 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 홈 절삭시 날경의 코너R 대비 Ae 값을 설정 하십시오.
- 상기 절삭조건은 참고 수치이며 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 피삭재와 절삭형상을 위한 적절한 쿨런트 사용과 가공시 발열, 발화에 주의 하십시오.

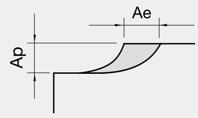
- The parameters on the table is based on 2 flutes. For using 4 flutes, use the same RPM and raise up the feed up to 30% in stable milling condition.
- When milling workpiece HRC over 52 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.
- For groove milling, set up the Ae value by considering of corner radius value.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use the adequate coolant for work material and machining geometry and note for heat and ignition.

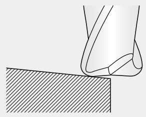
# 4RCUE Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | 반경 Corner Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | R0.2 | 40,500 | 4,361 | 0.02 | 0.40 | 37,800 | 4,858 | 0.02 | 0.30 | 31,500 | 3,207 | 0.02 | 0.30 |
| ø 1.5 | R0.5 | 36,000 | 5,607 | 0.03 | 0.60 | 36,000 | 4,984 | 0.02 | 0.45 | 27,000 | 3,302 | 0.02 | 0.45 |
| ø 2 | R0.5 | 29,700 | 6,230 | 0.04 | 0.80 | 24,300 | 5,236 | 0.03 | 0.60 | 21,600 | 3,535 | 0.03 | 0.60 |
| ø 3 | R0.5 | 19,800 | 6,853 | 0.06 | 1.20 | 16,200 | 5,607 | 0.05 | 0.90 | 14,400 | 4,007 | 0.05 | 0.90 |
| ø 4 | R0.5 | 17,100 | 8,099 | 0.08 | 1.60 | 14,400 | 6,230 | 0.06 | 1.20 | 11,700 | 4,717 | 0.06 | 1.20 |
| 〃 | R1.0 | 15,300 | 7,476 | 0.08 | 1.60 | 12,600 | 5,915 | 0.06 | 1.20 | 10,800 | 4,150 | 0.06 | 1.20 |
| ø 5 | R0.5 | 13,500 | 8,722 | 0.10 | 2.00 | 10,800 | 7,476 | 0.08 | 1.50 | 9,900 | 4,717 | 0.08 | 1.50 |
| 〃 | R1.0 | 11,700 | 8,099 | 0.10 | 2.00 | 9,900 | 6,853 | 0.08 | 1.50 | 8,640 | 4,479 | 0.08 | 1.50 |
| ø 6 | R0.5 | 11,680 | 9,555 | 0.12 | 2.40 | 9,540 | 8,099 | 0.09 | 1.80 | 8,550 | 5,660 | 0.09 | 1.80 |
| 〃 | R1.0 | 11,340 | 7,847 | 0.12 | 2.40 | 8,930 | 7,476 | 0.09 | 1.80 | 8,100 | 5,189 | 0.09 | 1.80 |
| 〃 | R1.5 | 9,900 | 8,099 | 0.12 | 2.40 | 8,100 | 6,853 | 0.09 | 1.80 | 7,200 | 4,526 | 0.09 | 1.80 |
| ø 8 | R0.5 | 7,920 | 10,249 | 0.16 | 3.20 | 7,380 | 7,882 | 0.12 | 2.40 | 6,390 | 6,132 | 0.12 | 2.40 |
| 〃 | R1.0 | 7,560 | 9,345 | 0.16 | 3.20 | 7,200 | 7,672 | 0.12 | 2.40 | 6,030 | 5,189 | 0.12 | 2.40 |
| 〃 | R2.0 | 7,380 | 8,099 | 0.16 | 3.20 | 6,300 | 6,853 | 0.12 | 2.40 | 5,400 | 4,526 | 0.12 | 2.40 |
| ø 10 | R0.5 | 6,730 | 9,310 | 0.20 | 4.00 | 5,700 | 7,882 | 0.15 | 3.00 | 4,970 | 5,152 | 0.15 | 3.00 |
| 〃 | R1.0 | 6,550 | 9,072 | 0.20 | 4.00 | 5,540 | 7,672 | 0.15 | 3.00 | 4,840 | 5,019 | 0.15 | 3.00 |
| 〃 | R2.0 | 5,850 | 8,099 | 0.20 | 4.00 | 4,950 | 6,853 | 0.15 | 3.00 | 4,320 | 4,479 | 0.15 | 3.00 |
| ø 12 | R0.5 | 6,300 | 9,345 | 0.24 | 4.80 | 4,880 | 7,351 | 0.18 | 3.60 | 4,350 | 5,009 | 0.18 | 3.60 |
| 〃 | R1.0 | 5,760 | 8,722 | 0.24 | 4.80 | 4,760 | 7,161 | 0.18 | 3.60 | 4,240 | 4,881 | 0.18 | 3.60 |
| 〃 | R2.0 | 5,400 | 7,784 | 0.24 | 4.80 | 4,640 | 6,979 | 0.18 | 3.60 | 4,130 | 4,754 | 0.18 | 3.60 |
| 〃 | R3.0 | 4,950 | 7,476 | 0.24 | 4.80 | 4,140 | 6,230 | 0.18 | 3.60 | 3,690 | 4,245 | 0.18 | 3.60 |

절입량
Depth of Cut



경사진면절삭
Inclined Cutting

## ■ Coefficients respective of tool overhang

| Type | Overhang | Revolution | Feed rate | Depth of Cut ap |
|---|---|---|---|---|
| Straight | L/D ≤ 5 | 100% | 100% | 100% |
| | L/D = 6 | 90% | 80% | 80% |
| | L/D = 7 | 80% | 70% | 70% |
| Taper neck | L/D = 6 | 100% | 100% | 100% |
| | L/D = 8 | 90% | 80% | 80% |
| | L/D ≥ 10 | 80% | 70% | 70% |

- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- 측면 절삭시 코너R 참고하여 절삭 하시기 바랍니다.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용합니다.
- 유효장 길이가 긴 경우, 위 표와같이 RPM과 FEED를 낮춰주세요.
- 절입깊이가 얕은 경우, RPM과 FEED를 증가해주세요
- 원활한 칩배출을 위하여 에어브로우나 오일 미스트를 추천합니다.

- If the effective length is long, reduce the RPM and feed maximum 30%.
- For side milling, refer to the corner radius value.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.
- If the effective length is long, refer to the table (Coefficients respective of tool overhang) and adjust the RPM and feed.
- If you use small value of Ap, raise up the RPM and feed.
- Air blow or oil mist is recommended for smooth chip emission.

# 2HRBG Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 동 Copper alloys C1100 | | | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 반경 Radius | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R0.05 | — | 54,000 | 85 | 0.004 | 0.004 | 48,000 | 75 | 0.004 | 0.004 | 48,000 | 55 | 0.002 | 0.002 |
| R0.1 | 0.5 | 54,000 | 430 | 0.010 | 0.010 | 48,000 | 350 | 0.006 | 0.007 | 48,000 | 280 | 0.006 | 0.007 |
| | 1 | 54,000 | 380 | 0.008 | 0.008 | 48,000 | 330 | 0.005 | 0.005 | 48,000 | 250 | 0.005 | 0.005 |
| | 1.5 | 47,000 | 320 | 0.006 | 0.006 | 47,000 | 250 | 0.004 | 0.004 | 47,000 | 200 | 0.004 | 0.004 |
| | 2 | 42,000 | 290 | 0.004 | 0.004 | 42,000 | 200 | 0.003 | 0.003 | 42,000 | 200 | 0.003 | 0.003 |
| R0.15 | 1.5 | 54,000 | 640 | 0.014 | 0.015 | 48,000 | 480 | 0.010 | 0.010 | 41,000 | 370 | 0.009 | 0.010 |
| | 2 | 49,000 | 530 | 0.011 | 0.011 | 43,000 | 370 | 0.008 | 0.008 | 37,000 | 270 | 0.008 | 0.008 |
| | 3 | 43,000 | 460 | 0.009 | 0.010 | 38,000 | 320 | 0.007 | 0.006 | 32,000 | 240 | 0.006 | 0.006 |
| | 4 | 37,000 | 300 | 0.004 | 0.006 | 28,000 | 200 | 0.003 | 0.004 | 24,000 | 160 | 0.003 | 0.004 |
| | 5 | 31,000 | 200 | 0.002 | 0.004 | 26,000 | 125 | 0.001 | 0.003 | 18,000 | 110 | 0.002 | 0.003 |
| R0.2 | 1 | 54,000 | 870 | 0.023 | 0.036 | 48,000 | 660 | 0.018 | 0.024 | 37,000 | 450 | 0.015 | 0.024 |
| | 2 | 54,000 | 790 | 0.022 | 0.036 | 48,000 | 590 | 0.018 | 0.024 | 37,000 | 400 | 0.015 | 0.020 |
| | 3 | 50,000 | 660 | 0.017 | 0.018 | 41,000 | 420 | 0.012 | 0.012 | 31,000 | 280 | 0.011 | 0.012 |
| | 4 | 50,000 | 640 | 0.012 | 0.018 | 38,000 | 400 | 0.009 | 0.012 | 30,000 | 270 | 0.009 | 0.012 |
| | 5 | 37,000 | 410 | 0.009 | 0.018 | 29,000 | 330 | 0.008 | 0.012 | 26,000 | 260 | 0.007 | 0.012 |
| | 6 | 37,000 | 360 | 0.006 | 0.010 | 29,000 | 260 | 0.005 | 0.006 | 26,000 | 200 | 0.004 | 0.006 |
| | 8 | 27,000 | 200 | 0.003 | 0.006 | 27,000 | 170 | 0.003 | 0.003 | 23,000 | 150 | 0.002 | 0.003 |
| | 10 | 20,000 | 110 | 0.002 | 0.004 | 25,000 | 110 | 0.002 | 0.002 | 20,000 | 110 | 0.001 | 0.002 |
| R0.25 | 1 | 57,000 | 1,380 | 0.029 | 0.054 | 42,000 | 830 | 0.023 | 0.036 | 32,000 | 550 | 0.018 | 0.036 |
| | 2 | 57,000 | 1,250 | 0.028 | 0.054 | 42,000 | 750 | 0.022 | 0.036 | 32,000 | 500 | 0.018 | 0.036 |
| | 3 | 55,000 | 1,010 | 0.021 | 0.036 | 38,000 | 580 | 0.017 | 0.024 | 31,000 | 400 | 0.014 | 0.024 |
| | 4 | 55,000 | 1,010 | 0.021 | 0.036 | 38,000 | 580 | 0.017 | 0.024 | 31,000 | 400 | 0.014 | 0.024 |
| | 5 | 48,000 | 800 | 0.016 | 0.018 | 33,000 | 480 | 0.012 | 0.012 | 30,000 | 390 | 0.009 | 0.012 |
| | 6 | 36,000 | 610 | 0.009 | 0.018 | 28,000 | 400 | 0.008 | 0.012 | 27,000 | 330 | 0.005 | 0.012 |
| | 8 | 36,000 | 590 | 0.009 | 0.018 | 28,000 | 400 | 0.008 | 0.012 | 27,000 | 330 | 0.005 | 0.012 |
| | 10 | 36,000 | 460 | 0.009 | 0.018 | 28,000 | 400 | 0.008 | 0.012 | 27,000 | 330 | 0.005 | 0.012 |
| | 12 | 24,000 | 280 | 0.004 | 0.010 | 26,000 | 280 | 0.004 | 0.006 | 24,000 | 280 | 0.002 | 0.006 |
| | 14 | 16,000 | 170 | 0.001 | 0.006 | 24,000 | 200 | 0.002 | 0.003 | 21,000 | 240 | 0.001 | 0.003 |
| R0.3 | 1 | 57,000 | 1,670 | 0.035 | 0.144 | 37,000 | 840 | 0.027 | 0.096 | 27,000 | 540 | 0.023 | 0.096 |
| | 2 | 57,000 | 1,540 | 0.034 | 0.144 | 37,000 | 770 | 0.027 | 0.096 | 27,000 | 500 | 0.021 | 0.096 |
| | 3 | 57,000 | 1,540 | 0.034 | 0.144 | 37,000 | 770 | 0.027 | 0.096 | 27,000 | 500 | 0.021 | 0.096 |
| | 4 | 54,000 | 1,130 | 0.026 | 0.108 | 35,000 | 600 | 0.020 | 0.072 | 26,000 | 380 | 0.016 | 0.072 |
| | 5 | 46,000 | 960 | 0.019 | 0.072 | 28,000 | 460 | 0.016 | 0.048 | 26,000 | 370 | 0.012 | 0.048 |
| | 6 | 46,000 | 960 | 0.019 | 0.072 | 28,000 | 460 | 0.016 | 0.048 | 26,000 | 370 | 0.012 | 0.048 |
| | 8 | 30,000 | 570 | 0.010 | 0.054 | 24,000 | 400 | 0.009 | 0.036 | 23,000 | 320 | 0.006 | 0.036 |
| | 10 | 30,000 | 490 | 0.007 | 0.036 | 24,000 | 330 | 0.006 | 0.024 | 23,000 | 290 | 0.004 | 0.024 |
| | 12 | 30,000 | 490 | 0.007 | 0.036 | 24,000 | 330 | 0.006 | 0.024 | 23,000 | 290 | 0.004 | 0.024 |
| | 14 | 20,000 | 300 | 0.004 | 0.027 | 22,000 | 300 | 0.004 | 0.018 | 20,000 | 250 | 0.002 | 0.018 |
| | 16 | 13,000 | 180 | 0.002 | 0.020 | 21,000 | 260 | 0.002 | 0.014 | 18,000 | 220 | 0.001 | 0.014 |
| R0.35 | 2 | 56,000 | 1,800 | 0.050 | 0.162 | 35,000 | 740 | 0.039 | 0.108 | 27,000 | 500 | 0.031 | 0.108 |
| | 4 | 54,500 | 1,500 | 0.045 | 0.063 | 33,000 | 600 | 0.035 | 0.062 | 26,500 | 410 | 0.029 | 0.096 |
| | 8 | 32,000 | 800 | 0.019 | 0.072 | 25,000 | 420 | 0.020 | 0.048 | 22,500 | 355 | 0.012 | 0.048 |
| | 10 | 26,500 | 540 | 0.017 | 0.063 | 22,500 | 380 | 0.014 | 0.042 | 21,500 | 330 | 0.011 | 0.042 |
| | 12 | 23,000 | 420 | 0.017 | 0.063 | 21,500 | 380 | 0.012 | 0.032 | 21,500 | 320 | 0.010 | 0.042 |
| R0.4 | 2 | 55,000 | 2,060 | 0.063 | 0.180 | 33,000 | 710 | 0.050 | 0.120 | 27,000 | 500 | 0.041 | 0.120 |
| | 4 | 55,000 | 1,860 | 0.063 | 0.180 | 31,000 | 600 | 0.050 | 0.120 | 27,000 | 440 | 0.041 | 0.120 |
| | 6 | 47,000 | 1,410 | 0.038 | 0.108 | 28,000 | 570 | 0.030 | 0.072 | 22,000 | 390 | 0.024 | 0.072 |
| | 8 | 34,000 | 1,040 | 0.027 | 0.090 | 21,000 | 430 | 0.021 | 0.060 | 22,000 | 390 | 0.018 | 0.060 |
| | 10 | 23,000 | 600 | 0.027 | 0.090 | 21,000 | 430 | 0.021 | 0.060 | 20,000 | 370 | 0.017 | 0.060 |
| | 12 | 16,000 | 350 | 0.027 | 0.090 | 19,000 | 430 | 0.018 | 0.040 | 20,000 | 350 | 0.016 | 0.060 |
| | 14 | 11,000 | 200 | 0.027 | 0.090 | 19,000 | 430 | 0.015 | 0.027 | 20,000 | 330 | 0.015 | 0.060 |
| | 16 | 7,600 | 115 | 0.027 | 0.090 | 16,000 | 430 | 0.013 | 0.018 | 20,000 | 310 | 0.014 | 0.060 |
| R0.45 | 4 | 50,500 | 1,900 | 0.067 | 0.190 | 32,000 | 685 | 0.054 | 0.130 | 24,500 | 460 | 0.043 | 0.180 |
| R0.5 | 2 | 46,000 | 2,000 | 0.072 | 0.360 | 32,000 | 770 | 0.057 | 0.240 | 22,000 | 480 | 0.045 | 0.240 |
| | 3 | 46,000 | 2,000 | 0.072 | 0.360 | 32,000 | 770 | 0.057 | 0.240 | 22,000 | 480 | 0.045 | 0.240 |
| | 4 | 46,000 | 2,000 | 0.071 | 0.360 | 32,000 | 770 | 0.057 | 0.240 | 22,000 | 480 | 0.045 | 0.240 |
| | 5 | 46,000 | 2,000 | 0.071 | 0.360 | 32,000 | 770 | 0.057 | 0.240 | 22,000 | 480 | 0.045 | 0.240 |
| | 6 | 39,000 | 1,500 | 0.071 | 0.180 | 26,000 | 760 | 0.055 | 0.120 | 17,600 | 480 | 0.035 | 0.120 |
| | 8 | 39,000 | 1,500 | 0.043 | 0.180 | 26,000 | 760 | 0.034 | 0.120 | 17,600 | 480 | 0.027 | 0.120 |
| | 10 | 29,000 | 1,110 | 0.028 | 0.090 | 17,600 | 530 | 0.024 | 0.060 | 16,500 | 420 | 0.018 | 0.060 |
| | 12 | 18,700 | 660 | 0.027 | 0.090 | 17,600 | 530 | 0.024 | 0.060 | 16,500 | 420 | 0.018 | 0.060 |
| | 14 | 18,700 | 640 | 0.022 | 0.090 | 15,400 | 440 | 0.018 | 0.060 | 14,300 | 360 | 0.014 | 0.060 |
| | 16 | 18,700 | 640 | 0.022 | 0.090 | 15,400 | 440 | 0.018 | 0.060 | 14,300 | 360 | 0.014 | 0.060 |
| | 18 | 18,700 | 540 | 0.017 | 0.090 | 14,300 | 440 | 0.013 | 0.060 | 13,200 | 360 | 0.009 | 0.060 |
| | 20 | 18,700 | 540 | 0.017 | 0.054 | 14,300 | 360 | 0.013 | 0.036 | 13,200 | 300 | 0.009 | 0.036 |
| | 22 | 18,700 | 540 | 0.017 | 0.054 | 14,300 | 360 | 0.013 | 0.036 | 13,200 | 300 | 0.009 | 0.036 |
| | 25 | 18,700 | 540 | 0.016 | 0.052 | 14,300 | 360 | 0.013 | 0.030 | 13,200 | 300 | 0.009 | 0.030 |

# 2HRBG Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 동 합금 Copper alloys C1100 | | | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 반경 Radius | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R0.6 | 4 | 38,000 | 2,000 | 0.085 | 0.360 | 26,000 | 770 | 0.068 | 0.240 | 18,200 | 480 | 0.054 | 0.240 |
| | 6 | 38,000 | 2,000 | 0.085 | 0.360 | 26,000 | 770 | 0.068 | 0.240 | 18,200 | 480 | 0.054 | 0.240 |
| | 8 | 32,000 | 1,490 | 0.084 | 0.360 | 21,000 | 700 | 0.067 | 0.240 | 15,100 | 440 | 0.054 | 0.240 |
| | 10 | 24,000 | 1,080 | 0.036 | 0.180 | 16,400 | 530 | 0.027 | 0.120 | 15,100 | 420 | 0.022 | 0.120 |
| | 12 | 24,000 | 1,080 | 0.036 | 0.180 | 15,300 | 530 | 0.027 | 0.120 | 14,100 | 420 | 0.022 | 0.120 |
| | 16 | 15,400 | 580 | 0.024 | 0.144 | 13,100 | 460 | 0.019 | 0.096 | 11,900 | 380 | 0.016 | 0.096 |
| | 20 | 15,400 | 580 | 0.017 | 0.090 | 12,100 | 380 | 0.013 | 0.060 | 11,000 | 320 | 0.009 | 0.060 |
| | 24 | 15,400 | 580 | 0.010 | 0.060 | 11,100 | 320 | 0.009 | 0.040 | 9,800 | 290 | 0.007 | 0.040 |
| R0.7 | 6 | 28,000 | 1,470 | 0.099 | 0.270 | 17,600 | 680 | 0.076 | 0.180 | 13,600 | 440 | 0.063 | 0.180 |
| | 8 | 28,000 | 1,470 | 0.099 | 0.270 | 17,600 | 680 | 0.079 | 0.180 | 13,600 | 440 | 0.063 | 0.180 |
| | 12 | 19,800 | 1,080 | 0.042 | 0.270 | 13,800 | 530 | 0.033 | 0.180 | 13,600 | 420 | 0.027 | 0.180 |
| | 16 | 13,200 | 620 | 0.033 | 0.180 | 13,100 | 480 | 0.027 | 0.120 | 11,900 | 390 | 0.021 | 0.120 |
| R0.75 | 3 | 30,000 | 2,200 | 0.171 | 0.324 | 21,000 | 1060 | 0.137 | 0.216 | 14,800 | 660 | 0.110 | 0.216 |
| | 4 | 30,000 | 2,200 | 0.171 | 0.324 | 21,000 | 1060 | 0.137 | 0.216 | 14,800 | 660 | 0.110 | 0.216 |
| | 6 | 30,000 | 1,980 | 0.147 | 0.324 | 21,000 | 940 | 0.117 | 0.216 | 14,800 | 580 | 0.090 | 0.216 |
| | 8 | 26,000 | 1,500 | 0.106 | 0.270 | 16,300 | 700 | 0.084 | 0.180 | 12,100 | 450 | 0.069 | 0.180 |
| | 10 | 26,000 | 1,500 | 0.106 | 0.270 | 16,300 | 700 | 0.084 | 0.180 | 12,100 | 450 | 0.069 | 0.180 |
| | 12 | 26,000 | 1,500 | 0.106 | 0.270 | 16,300 | 700 | 0.084 | 0.180 | 12,100 | 450 | 0.069 | 0.180 |
| | 14 | 18,700 | 1,100 | 0.045 | 0.180 | 12,600 | 530 | 0.036 | 0.120 | 12,100 | 440 | 0.027 | 0.120 |
| | 16 | 12,100 | 620 | 0.036 | 0.180 | 12,400 | 480 | 0.027 | 0.120 | 11,600 | 390 | 0.022 | 0.120 |
| | 18 | 12,100 | 620 | 0.036 | 0.180 | 12,400 | 480 | 0.027 | 0.120 | 11,600 | 390 | 0.022 | 0.120 |
| | 20 | 12,100 | 620 | 0.019 | 0.090 | 12,400 | 480 | 0.016 | 0.060 | 11,600 | 390 | 0.012 | 0.060 |
| | 22 | 12,100 | 620 | 0.019 | 0.090 | 12,400 | 480 | 0.016 | 0.060 | 11,000 | 390 | 0.012 | 0.060 |
| | 25 | 11,000 | 500 | 0.019 | 0.090 | 12,400 | 440 | 0.016 | 0.060 | 11,000 | 390 | 0.012 | 0.060 |
| | 30 | 10,700 | 450 | 0.019 | 0.090 | 10,900 | 400 | 0.016 | 0.060 | 11,000 | 390 | 0.012 | 0.060 |
| | 35 | 10,700 | 410 | 0.019 | 0.090 | 9,000 | 380 | 0.016 | 0.060 | 11,000 | 390 | 0.012 | 0.060 |
| R0.8 | 6 | 27,040 | 2,600 | 0.220 | 0.580 | 18,900 | 1200 | 0.180 | 0.390 | 16,500 | 760 | 0.150 | 0.390 |
| | 8 | 26,000 | 1,970 | 0.157 | 0.324 | 18,900 | 940 | 0.126 | 0.216 | 13,800 | 580 | 0.102 | 0.216 |
| | 12 | 25,000 | 1,490 | 0.112 | 0.180 | 15,100 | 700 | 0.090 | 0.120 | 11,500 | 440 | 0.072 | 0.120 |
| | 16 | 17,600 | 1,100 | 0.046 | 0.144 | 12,300 | 530 | 0.036 | 0.096 | 11,400 | 440 | 0.030 | 0.096 |
| | 20 | 11,000 | 630 | 0.036 | 0.090 | 11,500 | 480 | 0.030 | 0.060 | 10,900 | 400 | 0.024 | 0.060 |
| R0.9 | 6 | 32,000 | 2,600 | 0.230 | 0.210 | 18,400 | 1200 | 0.185 | 0.320 | 18,400 | 738 | 0.150 | 0.320 |
| | 8 | 26,000 | 1,950 | 0.165 | 0.270 | 16,300 | 930 | 0.132 | 0.240 | 13,800 | 570 | 0.108 | 0.240 |
| | 12 | 21,000 | 1,480 | 0.120 | 0.270 | 13,800 | 700 | 0.094 | 0.180 | 10,300 | 440 | 0.077 | 0.180 |
| | 16 | 15,400 | 1,080 | 0.048 | 0.180 | 10,800 | 530 | 0.039 | 0.120 | 9,900 | 420 | 0.031 | 0.120 |
| | 20 | 10,500 | 630 | 0.039 | 0.090 | 10,200 | 480 | 0.031 | 0.060 | 9,700 | 400 | 0.025 | 0.060 |
| R1 | 4 | 22,000 | 2,140 | 0.232 | 0.540 | 18,500 | 1260 | 0.185 | 0.360 | 13,200 | 960 | 0.150 | 0.360 |
| | 6 | 22,000 | 2,140 | 0.232 | 0.540 | 18,500 | 1260 | 0.185 | 0.360 | 13,200 | 960 | 0.150 | 0.360 |
| | 8 | 22,000 | 1,920 | 0.185 | 0.360 | 18,500 | 1120 | 0.147 | 0.240 | 13,200 | 870 | 0.120 | 0.240 |
| | 10 | 22,000 | 1,920 | 0.185 | 0.360 | 18,500 | 1120 | 0.147 | 0.240 | 13,200 | 870 | 0.120 | 0.240 |
| | 12 | 18,700 | 1,470 | 0.166 | 0.360 | 16,000 | 990 | 0.133 | 0.240 | 11,700 | 780 | 0.107 | 0.240 |
| | 14 | 18,700 | 1,470 | 0.166 | 0.360 | 16,000 | 990 | 0.133 | 0.240 | 11,700 | 780 | 0.107 | 0.240 |
| | 16 | 18,700 | 1,470 | 0.148 | 0.360 | 16,000 | 990 | 0.118 | 0.240 | 11,700 | 780 | 0.090 | 0.240 |
| | 18 | 14,300 | 1,070 | 0.093 | 0.180 | 14,700 | 580 | 0.074 | 0.120 | 11,600 | 580 | 0.061 | 0.120 |
| | 20 | 14,300 | 1,070 | 0.093 | 0.180 | 14,700 | 580 | 0.074 | 0.120 | 11,600 | 580 | 0.061 | 0.120 |
| | 22 | 9,500 | 630 | 0.074 | 0.180 | 10,600 | 450 | 0.058 | 0.120 | 10,200 | 450 | 0.045 | 0.120 |
| | 25 | 9,500 | 630 | 0.074 | 0.180 | 10,600 | 450 | 0.058 | 0.120 | 10,200 | 450 | 0.045 | 0.120 |
| | 30 | 9,500 | 530 | 0.033 | 0.090 | 10,600 | 450 | 0.026 | 0.060 | 10,200 | 380 | 0.021 | 0.060 |
| | 35 | 9,500 | 530 | 0.026 | 0.090 | 10,600 | 380 | 0.019 | 0.060 | 10,200 | 380 | 0.017 | 0.060 |
| | 40 | 9,500 | 530 | 0.026 | 0.090 | 10,600 | 380 | 0.019 | 0.060 | 10,200 | 380 | 0.017 | 0.060 |
| | 45 | 9,500 | 445 | 0.011 | 0.045 | 10,000 | 380 | 0.009 | 0.030 | 10,200 | 320 | 0.008 | 0.030 |
| R1.25 | 8 | 18,400 | 2,400 | 0.232 | 0.360 | 14,500 | 1400 | 0.185 | 0.240 | 9,700 | 1080 | 0.150 | 0.240 |
| | 10 | 18,400 | 2,400 | 0.232 | 0.360 | 14,500 | 1400 | 0.185 | 0.240 | 9,700 | 1080 | 0.150 | 0.240 |
| | 16 | 16,100 | 1,810 | 0.208 | 0.360 | 13,500 | 1230 | 0.166 | 0.240 | 8,400 | 980 | 0.135 | 0.240 |
| | 20 | 11,500 | 1,330 | 0.116 | 0.180 | 10,200 | 950 | 0.093 | 0.120 | 8,400 | 980 | 0.074 | 0.120 |
| | 25 | 6,900 | 770 | 0.093 | 0.180 | 8,400 | 540 | 0.074 | 0.120 | 8,400 | 560 | 0.061 | 0.120 |
| | 30 | 6,900 | 770 | 0.040 | 0.090 | 8,400 | 540 | 0.033 | 0.060 | 8,400 | 560 | 0.026 | 0.060 |
| | 35 | 6,900 | 770 | 0.018 | 0.050 | 8,400 | 540 | 0.015 | 0.030 | 8,400 | 560 | 0.011 | 0.030 |
| R1.5 | 6 | 15,000 | 2,890 | 0.278 | 0.540 | 12,900 | 1680 | 0.222 | 0.360 | 9,200 | 1300 | 0.180 | 0.360 |
| | 8 | 15,000 | 2,890 | 0.278 | 0.540 | 12,900 | 1680 | 0.222 | 0.360 | 9,200 | 1300 | 0.180 | 0.360 |
| | 10 | 15,000 | 2,600 | 0.278 | 0.540 | 12,900 | 1680 | 0.222 | 0.360 | 9,200 | 1300 | 0.180 | 0.360 |
| | 12 | 15,000 | 2,600 | 0.278 | 0.540 | 12,900 | 1510 | 0.222 | 0.360 | 9,200 | 1170 | 0.180 | 0.360 |
| | 16 | 12,700 | 1,970 | 0.290 | 0.504 | 11,300 | 1330 | 0.166 | 0.360 | 8,100 | 1040 | 0.135 | 0.360 |
| | 20 | 12,700 | 1,970 | 0.290 | 0.504 | 11,300 | 1330 | 0.166 | 0.360 | 8,100 | 1040 | 0.135 | 0.360 |
| | 25 | 10,100 | 1,450 | 0.139 | 0.270 | 8,800 | 1040 | 0.111 | 0.180 | 8,100 | 1040 | 0.090 | 0.180 |
| | 30 | 10,100 | 1,450 | 0.139 | 0.270 | 8,800 | 780 | 0.111 | 0.180 | 8,100 | 780 | 0.090 | 0.180 |
| | 35 | 6,600 | 840 | 0.073 | 0.270 | 7,900 | 620 | 0.055 | 0.180 | 7,500 | 650 | 0.045 | 0.180 |

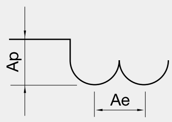
# 2HRBG Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 동 합금 Copper alloys C1100 | | | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 반경 Radius | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R1.5 | 40 | 6,600 | 840 | 0.073 | 0.270 | 7,900 | 620 | 0.055 | 0.180 | 7,500 | 520 | 0.045 | 0.180 |
| | 45 | 4,500 | 500 | 0.040 | 0.270 | 6,200 | 500 | 0.035 | 0.100 | 7,000 | 450 | 0.023 | 0.180 |
| | 50 | 4,300 | 490 | 0.040 | 0.270 | 6,200 | 500 | 0.030 | 0.090 | 7,000 | 350 | 0.023 | 0.180 |
| | 60 | 3,700 | 420 | 0.034 | 0.160 | 5,900 | 450 | 0.030 | 0.080 | 6,000 | 300 | 0.020 | 0.150 |
| R2 | 8 | 11,500 | 2,710 | 0.370 | 0.900 | 9,700 | 1560 | 0.297 | 0.600 | 6,800 | 1210 | 0.241 | 0.600 |
| | 10 | 11,500 | 2,710 | 0.370 | 0.900 | 9,700 | 1560 | 0.297 | 0.600 | 6,800 | 1210 | 0.241 | 0.600 |
| | 12 | 11,500 | 2,710 | 0.390 | 0.900 | 9,700 | 1560 | 0.297 | 0.600 | 6,800 | 1210 | 0.241 | 0.600 |
| | 16 | 11,500 | 2,710 | 0.390 | 0.900 | 9,700 | 1560 | 0.297 | 0.600 | 6,800 | 1210 | 0.241 | 0.600 |
| | 20 | 11,500 | 2,710 | 0.390 | 0.900 | 9,700 | 1560 | 0.297 | 0.600 | 6,800 | 1210 | 0.241 | 0.600 |
| | 25 | 10,300 | 1,850 | 0.279 | 0.540 | 8,400 | 1250 | 0.223 | 0.360 | 6,000 | 980 | 0.180 | 0.360 |
| | 30 | 10,300 | 1,850 | 0.279 | 0.540 | 8,400 | 1250 | 0.223 | 0.360 | 6,000 | 980 | 0.180 | 0.361 |
| | 35 | 7,500 | 1,360 | 0.185 | 0.540 | 6,600 | 950 | 0.148 | 0.360 | 6,000 | 700 | 0.120 | 0.360 |
| | 40 | 7,500 | 1,360 | 0.185 | 0.540 | 6,600 | 950 | 0.148 | 0.360 | 6,000 | 700 | 0.120 | 0.360 |
| | 45 | 5,000 | 780 | 0.093 | 0.360 | 5,900 | 470 | 0.074 | 0.240 | 5,600 | 490 | 0.060 | 0.240 |
| | 50 | 5,000 | 780 | 0.093 | 0.360 | 5,900 | 470 | 0.074 | 0.240 | 5,600 | 490 | 0.060 | 0.240 |
| | 55 | 4,500 | 640 | 0.090 | 0.330 | 5,200 | 375 | 0.068 | 0.225 | 5,400 | 370 | 0.050 | 0.251 |
| | 60 | 4,000 | 500 | 0.078 | 0.300 | 5,000 | 280 | 0.062 | 0.210 | 5,200 | 250 | 0.040 | 0.180 |
| R2.5 | 15 | 9,600 | 2,590 | 0.406 | 0.900 | 7,800 | 1350 | 0.324 | 0.800 | 5,600 | 1050 | 0.252 | 0.800 |
| | 20 | 9,600 | 2,100 | 0.406 | 0.900 | 7,800 | 1240 | 0.324 | 0.600 | 5,600 | 950 | 0.252 | 0.600 |
| | 25 | 9,600 | 2,100 | 0.406 | 0.900 | 7,800 | 1240 | 0.324 | 0.600 | 5,600 | 950 | 0.252 | 0.600 |
| | 30 | 8,200 | 1,320 | 0.305 | 0.900 | 7,800 | 760 | 0.243 | 0.600 | 4,800 | 600 | 0.197 | 0.600 |
| | 40 | 7,000 | 830 | 0.230 | 0.900 | 7,800 | 470 | 0.200 | 0.600 | 4,300 | 380 | 0.154 | 0.600 |
| | 45 | 5,000 | 520 | 0.173 | 0.900 | 6,800 | 290 | 0.165 | 0.600 | 3,900 | 240 | 0.120 | 0.600 |
| | 50 | 4,500 | 330 | 0.131 | 0.900 | 6,800 | 180 | 0.135 | 0.600 | 3,500 | 150 | 0.094 | 0.600 |
| | 60 | 4,000 | 300 | 0.099 | 0.800 | 6,800 | 110 | 0.112 | 0.600 | 3,300 | 100 | 0.074 | 0.600 |
| R3 | 15 | 8,000 | 2,530 | 0.555 | 1.800 | 7,400 | 2088 | 0.443 | 1.200 | 5,200 | 1300 | 0.360 | 1.200 |
| | 30 | 8,000 | 1,810 | 0.418 | 1.080 | 7,400 | 1875 | 0.334 | 0.720 | 4,600 | 1170 | 0.270 | 0.720 |
| R4 | 25 | 9,000 | 2,400 | 0.600 | 1.500 | 7,200 | 1500 | 0.500 | 1.000 | 5,200 | 920 | 0.350 | 1.000 |
| | 30 | 7,700 | 1,500 | 0.450 | 1.200 | 7,200 | 925 | 0.380 | 0.800 | 4,500 | 580 | 0.300 | 0.800 |
| R5 | 30 | 7,800 | 1,300 | 0.300 | 0.900 | 6,800 | 900 | 0.230 | 0.600 | 4,600 | 570 | 0.190 | 0.570 |
| | 35 | 7,125 | 1,292 | 0.176 | 0.513 | 6,800 | 860 | 0.140 | 0.340 | 5,700 | 665 | 0.110 | 0.340 |
| R6 | 30 | 7,410 | 1,235 | 0.285 | 0.855 | 6,350 | 855 | 0.210 | 0.570 | 4,370 | 541 | 0.181 | 0.550 |
| | 40 | 6,800 | 1,100 | 0.260 | 0.780 | 6,350 | 788 | 0.200 | 0.520 | 4,020 | 500 | 0.160 | 0.500 |

**절입량 Depth of Cut**

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




- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 주세요.
- 절삭조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오.
- HRC52 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛ 이내 일것.)
- 원활한 칩배출을 위하여 에어브로 혹은 미스트 쿨런트 사용을 추천하며, 동 가공시 습식 쿨런트를 추천 합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- If the effective length or overall length of your tool are not show above the table, adjust your parameter with upper or lower diameter of parameter.
- When milling workpiece HRC over 52 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or oil mist is recommended for smooth chip emission, and wet coolant milling is recommended for copper material.

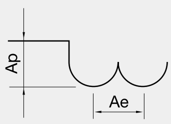
# 2HSBG/2HCBG Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 동 합금 Copper alloys C1100 | | | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 반경 Radius | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R0.05 | 0.2 | 54,000 | 360 | 0.010 | 0.050 | 43,200 | 306 | 0.009 | 0.045 | 34,560 | 245 | 0.007 | 0.036 |
| R0.075 | 0.15 | 54,000 | 456 | 0.010 | 0.030 | 43,200 | 388 | 0.009 | 0.027 | 34,560 | 310 | 0.007 | 0.022 |
| R0.1 | 0.2 | 54,000 | 516 | 0.012 | 0.008 | 43,200 | 439 | 0.011 | 0.007 | 34,560 | 351 | 0.009 | 0.006 |
| | 0.4 | 54,000 | 516 | 0.005 | 0.008 | 43,200 | 439 | 0.005 | 0.007 | 34,560 | 351 | 0.004 | 0.006 |
| R0.1.5 | 0.3 | 54,000 | 864 | 0.020 | 0.013 | 43,200 | 734 | 0.018 | 0.012 | 34,560 | 588 | 0.014 | 0.009 |
| | 0.6 | 54,000 | 864 | 0.010 | 0.013 | 43,200 | 734 | 0.009 | 0.012 | 34,560 | 588 | 0.007 | 0.009 |
| R0.2 | 0.4 | 54,000 | 1,044 | 0.028 | 0.016 | 43,200 | 887 | 0.025 | 0.014 | 34,560 | 710 | 0.020 | 0.012 |
| | 0.8 | 54,000 | 1,044 | 0.014 | 0.016 | 43,200 | 887 | 0.013 | 0.014 | 34,560 | 710 | 0.010 | 0.012 |
| R0.25 | 0.5 | 56,000 | 1,500 | 0.035 | 0.022 | 44,800 | 1,275 | 0.032 | 0.020 | 35,840 | 1,020 | 0.025 | 0.016 |
| R0.3 | 0.6 | 58,000 | 1,812 | 0.042 | 0.026 | 46,400 | 1,540 | 0.038 | 0.023 | 37,120 | 1,232 | 0.030 | 0.019 |
| R0.35 | 0.7 | 55,000 | 2,028 | 0.049 | 0.031 | 44,000 | 1,724 | 0.044 | 0.028 | 35,200 | 1,379 | 0.035 | 0.022 |
| R0.4 | 0.8 | 52,000 | 2,244 | 0.056 | 0.036 | 41,600 | 1,907 | 0.050 | 0.032 | 33,280 | 1,526 | 0.040 | 0.026 |
| | 2 | 52,000 | 2,244 | 0.033 | 0.036 | 41,600 | 1,907 | 0.015 | 0.032 | 33,280 | 1,526 | 0.012 | 0.026 |
| R0.5 | 1 | 41,000 | 1,992 | 0.063 | 0.040 | 32,800 | 1,693 | 0.057 | 0.036 | 26,240 | 1,355 | 0.045 | 0.029 |
| | 2.5 | 41,000 | 1,992 | 0.022 | 0.040 | 32,800 | 1,693 | 0.020 | 0.036 | 26,240 | 1,355 | 0.016 | 0.029 |
| R0.6 | 3 | 34,000 | 2,088 | 0.065 | 0.040 | 27,200 | 1,775 | 0.059 | 0.036 | 21,760 | 1,420 | 0.047 | 0.029 |
| R0.75 | 1.5 | 27,000 | 2,196 | 0.087 | 0.068 | 21,600 | 1,867 | 0.078 | 0.061 | 17,280 | 1,493 | 0.063 | 0.049 |
| | 4 | 27,000 | 2,196 | 0.052 | 0.068 | 21,600 | 1,867 | 0.047 | 0.061 | 17,280 | 1,493 | 0.037 | 0.049 |
| R1 | 2 | 20,000 | 2,136 | 0.112 | 0.089 | 16,000 | 1,816 | 0.101 | 0.080 | 12,800 | 1,452 | 0.081 | 0.064 |
| | 5 | 20,000 | 2,136 | 0.070 | 0.091 | 16,000 | 1,816 | 0.063 | 0.082 | 12,800 | 1,452 | 0.050 | 0.066 |
| R1.25 | 6 | 16,000 | 2,208 | 0.067 | 0.115 | 12,800 | 1,877 | 0.060 | 0.104 | 10,240 | 1,501 | 0.048 | 0.083 |
| R1.5 | 3 | 13,000 | 2,664 | 0.197 | 0.171 | 10,400 | 2,264 | 0.177 | 0.154 | 8,320 | 1,812 | 0.142 | 0.123 |
| | 8 | 13,000 | 2,664 | 0.100 | 0.171 | 10,400 | 2,264 | 0.090 | 0.154 | 8,320 | 1,812 | 0.072 | 0.123 |
| R1.75 | 8 | 11,500 | 2,580 | 0.183 | 0.190 | 9,200 | 2,193 | 0.165 | 0.171 | 7,360 | 1,754 | 0.132 | 0.136 |
| R2 | 4 | 10,000 | 2,496 | 0.266 | 0.208 | 8,000 | 2,122 | 0.239 | 0.187 | 6,400 | 1,697 | 0.192 | 0.150 |
| | 8 | 10,000 | 2,496 | 0.134 | 0.208 | 8,000 | 2,122 | 0.121 | 0.187 | 6,400 | 1,697 | 0.096 | 0.150 |
| R2.5 | 5 | 8,300 | 2,388 | 0.215 | 0.240 | 6,640 | 2,030 | 0.194 | 0.216 | 5,312 | 1,624 | 0.155 | 0.173 |
| | 8 | 8,300 | 2,388 | 0.200 | 0.240 | 6,640 | 2,030 | 0.180 | 0.216 | 5,312 | 1,624 | 0.144 | 0.173 |
| | 10 | 8,300 | 2,388 | 0.190 | 0.240 | 6,640 | 2,030 | 0.171 | 0.216 | 5,312 | 1,624 | 0.137 | 0.173 |
| R3 | 6 | 6,900 | 2,328 | 0.290 | 0.281 | 5,520 | 1,979 | 0.261 | 0.253 | 4,416 | 1,583 | 0.209 | 0.202 |
| | 10 | 6,900 | 2,328 | 0.250 | 0.281 | 5,520 | 1,979 | 0.225 | 0.253 | 4,416 | 1,583 | 0.180 | 0.202 |
| | 12 | 6,900 | 2,328 | 0.230 | 0.281 | 5,520 | 1,979 | 0.207 | 0.253 | 4,416 | 1,583 | 0.166 | 0.202 |
| R3.5 | 14 | 6,310 | 2,200 | 0.315 | 0.228 | 5,048 | 1,499 | 0.284 | 0.205 | 4,038 | 1,200 | 0.227 | 0.164 |
| R4 | 8 | 5,720 | 2,000 | 0.400 | 0.175 | 4,576 | 1,020 | 0.360 | 0.158 | 3,661 | 816 | 0.288 | 0.126 |
| | 14 | 5,720 | 2,188 | 0.400 | 0.175 | 4,576 | 1,020 | 0.360 | 0.158 | 3,661 | 816 | 0.288 | 0.126 |
| R4.5 | 16 | 5,135 | 2,125 | 0.450 | 0.165 | 4,108 | 867 | 0.405 | 0.148 | 3,286 | 694 | 0.324 | 0.118 |
| R5 | 10 | 4,550 | 2,063 | 0.500 | 0.154 | 3,640 | 714 | 0.450 | 0.139 | 2,912 | 571 | 0.360 | 0.111 |
| | 15 | 4,550 | 2,063 | 0.500 | 0.154 | 3,640 | 714 | 0.450 | 0.139 | 2,912 | 571 | 0.360 | 0.111 |
| | 18 | 4,550 | 2,063 | 0.500 | 0.154 | 3,640 | 714 | 0.450 | 0.139 | 2,912 | 571 | 0.360 | 0.111 |
| R5.5 | 20 | 4,160 | 1,950 | 0.550 | 0.157 | 3,328 | 663 | 0.495 | 0.141 | 2,662 | 530 | 0.396 | 0.113 |
| R6 | 18 | 3,770 | 1,925 | 0.600 | 0.159 | 3,016 | 612 | 0.540 | 0.143 | 2,413 | 490 | 0.432 | 0.114 |
| | 22 | 3,770 | 1,875 | 0.600 | 0.159 | 3,016 | 612 | 0.540 | 0.143 | 2,413 | 490 | 0.432 | 0.114 |
| R6.5 | 24 | 3,728 | 1,850 | 0.549 | 0.156 | 2,982 | 666 | 0.494 | 0.140 | 2,386 | 533 | 0.395 | 0.112 |
| R7 | 24 | 3,686 | 1,788 | 0.498 | 0.153 | 2,948 | 720 | 0.448 | 0.137 | 2,359 | 576 | 0.359 | 0.110 |
| R8 | 30 | 2,985 | 1,750 | 0.413 | 0.147 | 2,388 | 612 | 0.372 | 0.132 | 1,911 | 490 | 0.298 | 0.106 |
| R10 | 38 | 2,429 | 1,688 | 0.276 | 0.133 | 1,943 | 367 | 0.248 | 0.120 | 1,554 | 294 | 0.198 | 0.096 |

**절입량**
Depth of Cut

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




- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 주세요.
- 절삭조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오.
- HRC52 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송속도를 같은 비율로 줄여서 적용합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 원활한 칩 배출을 위하여 에어브로 혹은 미스트 쿨런트 사용을 추천하며, 동 가공시 습식 쿨런트를 추천 합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- If the effective length or overall length of your tool are not show above the table, adjust your parameter with upper or lower diameter of parameter.
- When milling workpiece HRC over 52 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or oil mist is recommended for smooth chip emission, and wet coolant milling is recommended for copper material.

# 2HREG Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 동 합금 Copper alloys C1100 | | | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.1 | 0.3 | 56,000 | 544 | 0.006 | 0.020 | 47,600 | 435 | 0.005 | 0.018 | 42,840 | 392 | 0.005 | 0.015 |
| 〃 | 0.5 | 50,900 | 464 | 0.005 | 0.016 | 43,265 | 371 | 0.005 | 0.014 | 38,939 | 334 | 0.004 | 0.012 |
| ø 0.2 | 0.5 | 56,000 | 544 | 0.006 | 0.020 | 47,600 | 435 | 0.005 | 0.018 | 42,840 | 392 | 0.005 | 0.015 |
| 〃 | 1 | 50,900 | 464 | 0.005 | 0.016 | 43,265 | 371 | 0.005 | 0.014 | 38,939 | 334 | 0.004 | 0.012 |
| 〃 | 2 | 48,200 | 400 | 0.003 | 0.006 | 40,970 | 320 | 0.003 | 0.005 | 36,873 | 288 | 0.002 | 0.005 |
| ø 0.3 | 1 | 60,000 | 896 | 0.009 | 0.101 | 51,000 | 717 | 0.008 | 0.091 | 45,900 | 645 | 0.007 | 0.077 |
| 〃 | 1.5 | 50,800 | 736 | 0.008 | 0.057 | 43,180 | 589 | 0.007 | 0.051 | 38,862 | 530 | 0.006 | 0.044 |
| 〃 | 2 | 41,500 | 560 | 0.006 | 0.013 | 35,275 | 448 | 0.005 | 0.012 | 31,748 | 403 | 0.005 | 0.010 |
| 〃 | 3 | 31,900 | 384 | 0.002 | 0.004 | 27,115 | 307 | 0.002 | 0.004 | 24,404 | 276 | 0.002 | 0.003 |
| 〃 | 4 | 26,200 | 272 | 0.001 | 0.003 | 22,270 | 218 | 0.001 | 0.003 | 20,043 | 196 | 0.001 | 0.002 |
| 〃 | 5 | 20,400 | 160 | 0.001 | 0.002 | 17,340 | 128 | 0.001 | 0.002 | 15,606 | 115 | 0.001 | 0.002 |
| ø 0.4 | 1 | 52,700 | 1,056 | 0.012 | 0.054 | 44,795 | 845 | 0.011 | 0.049 | 40,316 | 760 | 0.009 | 0.041 |
| 〃 | 5 | 38,500 | 608 | 0.003 | 0.003 | 32,725 | 486 | 0.003 | 0.003 | 29,453 | 438 | 0.002 | 0.002 |
| 〃 | 10 | 33,700 | 416 | 0.001 | 0.001 | 28,645 | 333 | 0.001 | 0.001 | 25,781 | 300 | 0.001 | 0.001 |
| ø 0.5 | 2 | 56,800 | 1,440 | 0.020 | 0.098 | 48,280 | 1,152 | 0.018 | 0.088 | 43,452 | 1,037 | 0.015 | 0.075 |
| 〃 | 3 | 44,200 | 1,056 | 0.009 | 0.016 | 37,570 | 845 | 0.008 | 0.014 | 33,813 | 760 | 0.007 | 0.012 |
| 〃 | 4 | 40,600 | 928 | 0.008 | 0.012 | 34,510 | 742 | 0.008 | 0.011 | 31,059 | 668 | 0.006 | 0.009 |
| 〃 | 5 | 37,000 | 800 | 0.008 | 0.008 | 31,450 | 640 | 0.007 | 0.007 | 28,305 | 576 | 0.006 | 0.006 |
| 〃 | 6 | 33,400 | 672 | 0.005 | 0.004 | 28,390 | 538 | 0.005 | 0.004 | 25,551 | 484 | 0.004 | 0.003 |
| 〃 | 8 | 29,100 | 512 | 0.002 | 0.002 | 24,735 | 410 | 0.002 | 0.002 | 22,262 | 369 | 0.002 | 0.002 |
| 〃 | 10 | 26,100 | 400 | 0.001 | 0.001 | 22,185 | 320 | 0.001 | 0.001 | 19,967 | 288 | 0.001 | 0.001 |
| 〃 | 14 | 21,500 | 192 | 0.001 | 0.001 | 18,275 | 154 | 0.001 | 0.001 | 16,448 | 138 | 0.001 | 0.001 |
| ø 0.6 | 2 | 63,600 | 1,984 | 0.025 | 0.203 | 54,060 | 1,587 | 0.023 | 0.183 | 48,654 | 1,428 | 0.019 | 0.155 |
| 〃 | 3 | 52,500 | 1,584 | 0.018 | 0.114 | 44,625 | 1,267 | 0.016 | 0.103 | 40,163 | 1,140 | 0.014 | 0.087 |
| 〃 | 4 | 41,300 | 1,184 | 0.012 | 0.025 | 35,105 | 947 | 0.011 | 0.023 | 31,595 | 852 | 0.009 | 0.019 |
| 〃 | 5 | 36,700 | 1,008 | 0.010 | 0.017 | 31,195 | 806 | 0.009 | 0.015 | 28,076 | 726 | 0.008 | 0.013 |
| 〃 | 6 | 32,100 | 832 | 0.007 | 0.008 | 27,285 | 666 | 0.006 | 0.007 | 24,557 | 599 | 0.005 | 0.006 |
| 〃 | 8 | 26,800 | 624 | 0.004 | 0.003 | 22,780 | 499 | 0.004 | 0.003 | 20,502 | 449 | 0.003 | 0.002 |
| 〃 | 10 | 23,400 | 48 | 0.002 | 0.002 | 19,890 | 38 | 0.002 | 0.002 | 17,901 | 35 | 0.002 | 0.002 |
| 〃 | 12 | 20,900 | 384 | 0.002 | 0.001 | 17,765 | 307 | 0.002 | 0.001 | 15,989 | 276 | 0.002 | 0.001 |
| 〃 | 16 | 16,200 | 160 | 0.001 | 0.001 | 13,770 | 128 | 0.001 | 0.001 | 12,393 | 115 | 0.001 | 0.001 |
| ø 0.7 | 2 | 59,800 | 2,208 | 0.030 | 0.055 | 50,830 | 1,766 | 0.027 | 0.050 | 45,747 | 1,590 | 0.023 | 0.042 |
| 〃 | 4 | 38,900 | 1,344 | 0.017 | 0.047 | 33,065 | 1,075 | 0.015 | 0.042 | 29,759 | 968 | 0.013 | 0.036 |
| 〃 | 6 | 30,200 | 960 | 0.010 | 0.014 | 25,670 | 768 | 0.009 | 0.013 | 23,103 | 691 | 0.008 | 0.011 |
| 〃 | 8 | 25,300 | 736 | 0.006 | 0.006 | 21,505 | 589 | 0.005 | 0.005 | 19,355 | 530 | 0.005 | 0.005 |
| 〃 | 10 | 22,000 | 576 | 0.004 | 0.003 | 18,700 | 461 | 0.004 | 0.003 | 16,830 | 415 | 0.003 | 0.002 |
| ø 8 | 2 | 41,200 | 1,680 | 0.033 | 0.108 | 35,020 | 1,344 | 0.030 | 0.097 | 31,518 | 1,210 | 0.025 | 0.083 |
| 〃 | 4 | 37,100 | 1,488 | 0.027 | 0.08 | 31,535 | 1,190 | 0.024 | 0.072 | 28,382 | 1,071 | 0.021 | 0.061 |
| 〃 | 6 | 28,800 | 1,088 | 0.015 | 0.024 | 24,480 | 870 | 0.014 | 0.022 | 22,032 | 783 | 0.011 | 0.018 |
| 〃 | 8 | 24,100 | 832 | 0.009 | 0.01 | 20,485 | 666 | 0.008 | 0.009 | 18,437 | 599 | 0.007 | 0.008 |
| 〃 | 10 | 21,000 | 672 | 0.006 | 0.005 | 17,850 | 538 | 0.005 | 0.005 | 16,065 | 484 | 0.005 | 0.004 |
| 〃 | 12 | 18,700 | 544 | 0.004 | 0.003 | 15,895 | 435 | 0.004 | 0.003 | 14,306 | 392 | 0.003 | 0.002 |
| 〃 | 14 | 15,600 | 368 | 0.002 | 0.001 | 13,260 | 294 | 0.002 | 0.001 | 11,934 | 265 | 0.002 | 0.001 |
| ø 0.9 | 6 | 27,600 | 1,264 | 0.019 | 0.019 | 23,460 | 1,011 | 0.017 | 0.017 | 21,114 | 910 | 0.015 | 0.015 |
| 〃 | 8 | 23,000 | 960 | 0.012 | 0.012 | 19,550 | 768 | 0.011 | 0.011 | 17,595 | 691 | 0.009 | 0.009 |
| 〃 | 10 | 20,000 | 752 | 0.008 | 0.008 | 17,000 | 602 | 0.007 | 0.007 | 15,300 | 541 | 0.006 | 0.006 |
| ø 1.0 | 2 | 37,900 | 2,144 | 0.048 | 0.263 | 30,320 | 1,822 | 0.038 | 0.210 | 27,288 | 1,640 | 0.033 | 0.179 |
| 〃 | 3 | 37,900 | 2,144 | 0.048 | 0.263 | 30,320 | 1,822 | 0.038 | 0.210 | 27,288 | 1,640 | 0.033 | 0.179 |
| 〃 | 4 | 34,100 | 1,872 | 0.040 | 0.195 | 27,280 | 1,591 | 0.032 | 0.156 | 24,552 | 1,432 | 0.027 | 0.133 |
| 〃 | 5 | 30,300 | 1,600 | 0.032 | 0.083 | 24,240 | 1,360 | 0.026 | 0.066 | 21,816 | 1,224 | 0.022 | 0.056 |
| 〃 | 6 | 26,500 | 1,360 | 0.023 | 0.058 | 21,200 | 1,156 | 0.018 | 0.046 | 19,080 | 1,040 | 0.016 | 0.039 |
| 〃 | 8 | 22,100 | 1,056 | 0.014 | 0.024 | 17,680 | 898 | 0.011 | 0.019 | 15,912 | 808 | 0.010 | 0.016 |
| 〃 | 10 | 19,200 | 848 | 0.010 | 0.013 | 15,360 | 721 | 0.008 | 0.010 | 13,824 | 649 | 0.007 | 0.009 |
| 〃 | 12 | 17,200 | 704 | 0.007 | 0.007 | 13,760 | 598 | 0.006 | 0.006 | 12,384 | 539 | 0.005 | 0.005 |
| 〃 | 14 | 15,600 | 576 | 0.005 | 0.005 | 12,480 | 490 | 0.004 | 0.004 | 11,232 | 441 | 0.003 | 0.003 |
| 〃 | 16 | 14,300 | 480 | 0.004 | 0.003 | 11,440 | 408 | 0.003 | 0.002 | 10,296 | 367 | 0.003 | 0.002 |
| 〃 | 20 | 12,500 | 320 | 0.003 | 0.001 | 10,000 | 272 | 0.002 | 0.001 | 9,000 | 245 | 0.002 | 0.001 |
| 〃 | 25 | 10,800 | 192 | 0.003 | 0.001 | 8,640 | 163 | 0.002 | 0.001 | 7,776 | 147 | 0.002 | 0.001 |
| 〃 | 30 | 9,700 | 80 | 0.002 | 0.001 | 7,760 | 68 | 0.002 | 0.001 | 6,984 | 61 | 0.001 | 0.001 |
| ø 1.2 | 4 | 28,900 | 1,888 | 0.050 | 0.189 | 23,120 | 1,605 | 0.040 | 0.151 | 20,808 | 1,444 | 0.034 | 0.129 |
| 〃 | 6 | 24,800 | 1,552 | 0.037 | 0.120 | 19,840 | 1,319 | 0.030 | 0.096 | 17,856 | 1,187 | 0.025 | 0.082 |
| 〃 | 8 | 20,700 | 1,216 | 0.024 | 0.051 | 16,560 | 1,034 | 0.019 | 0.041 | 14,904 | 930 | 0.016 | 0.035 |
| 〃 | 10 | 18,000 | 992 | 0.016 | 0.026 | 14,400 | 843 | 0.013 | 0.021 | 12,960 | 759 | 0.011 | 0.018 |
| 〃 | 12 | 16,100 | 832 | 0.011 | 0.015 | 12,880 | 707 | 0.009 | 0.012 | 11,592 | 636 | 0.007 | 0.010 |
| 〃 | 16 | 13,400 | 608 | 0.006 | 0.006 | 10,720 | 517 | 0.005 | 0.005 | 9,648 | 465 | 0.004 | 0.004 |
| 〃 | 20 | 11,700 | 448 | 0.004 | 0.003 | 9,360 | 381 | 0.003 | 0.002 | 8,424 | 343 | 0.003 | 0.002 |
| 〃 | 25 | 10,800 | 192 | 0.003 | 0.001 | 8,640 | 163 | 0.002 | 0.001 | 7,776 | 147 | 0.002 | 0.001 |
| 〃 | 30 | 9,700 | 80 | 0.002 | 0.001 | 7,760 | 68 | 0.002 | 0.001 | 6,984 | 61 | 0.001 | 0.001 |

# 2HREG Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 동 합금 Copper alloys C1100 | | | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1.4 | 6 | 23,300 | 1,712 | 0.052 | 0.222 | 18,640 | 1,455 | 0.042 | 0.178 | 16,776 | 1,310 | 0.035 | 0.151 |
| 〃 | 8 | 19,500 | 1,360 | 0.035 | 0.094 | 15,600 | 1,156 | 0.028 | 0.075 | 14,040 | 1,040 | 0.024 | 0.064 |
| 〃 | 10 | 16,900 | 1,136 | 0.025 | 0.048 | 13,520 | 966 | 0.020 | 0.038 | 12,168 | 869 | 0.017 | 0.033 |
| 〃 | 14 | 13,700 | 816 | 0.013 | 0.018 | 10,960 | 694 | 0.010 | 0.014 | 9,864 | 624 | 0.009 | 0.012 |
| 〃 | 16 | 12,600 | 720 | 0.010 | 0.012 | 10,080 | 612 | 0.008 | 0.010 | 9,072 | 551 | 0.007 | 0.008 |
| 〃 | 20 | 10,300 | 480 | 0.006 | 0.005 | 8,240 | 408 | 0.005 | 0.004 | 7,416 | 367 | 0.004 | 0.003 |
| ø 1.5 | 4 | 26,600 | 2,144 | 0.073 | 0.462 | 21,280 | 1,822 | 0.058 | 0.370 | 19,152 | 1,640 | 0.050 | 0.314 |
| 〃 | 6 | 22,800 | 1,792 | 0.057 | 0.293 | 18,240 | 1,523 | 0.046 | 0.234 | 16,416 | 1,371 | 0.039 | 0.199 |
| 〃 | 8 | 19,000 | 1,440 | 0.041 | 0.124 | 15,200 | 1,224 | 0.033 | 0.099 | 13,680 | 1,102 | 0.028 | 0.084 |
| 〃 | 10 | 16,600 | 1,200 | 0.030 | 0.063 | 13,280 | 1,020 | 0.024 | 0.050 | 11,952 | 918 | 0.020 | 0.043 |
| 〃 | 12 | 14,800 | 1,008 | 0.023 | 0.037 | 11,840 | 857 | 0.018 | 0.030 | 10,656 | 771 | 0.016 | 0.025 |
| 〃 | 14 | 13,400 | 880 | 0.017 | 0.023 | 10,720 | 748 | 0.014 | 0.018 | 9,648 | 673 | 0.012 | 0.016 |
| 〃 | 16 | 12,300 | 768 | 0.013 | 0.015 | 9,840 | 653 | 0.010 | 0.012 | 8,856 | 588 | 0.009 | 0.010 |
| 〃 | 18 | 11,500 | 672 | 0.011 | 0.011 | 9,200 | 571 | 0.009 | 0.009 | 8,280 | 514 | 0.007 | 0.007 |
| 〃 | 20 | 10,700 | 592 | 0.009 | 0.008 | 8,560 | 503 | 0.007 | 0.006 | 7,704 | 453 | 0.006 | 0.005 |
| 〃 | 25 | 9,300 | 432 | 0.005 | 0.004 | 7,440 | 367 | 0.004 | 0.003 | 6,696 | 330 | 0.003 | 0.003 |
| 〃 | 30 | 8,300 | 320 | 0.004 | 0.002 | 6,640 | 272 | 0.003 | 0.002 | 5,976 | 245 | 0.003 | 0.001 |
| ø 1.6 | 10 | 16,100 | 1,248 | 0.035 | 0.082 | 12,880 | 1,061 | 0.028 | 0.066 | 11,592 | 955 | 0.024 | 0.056 |
| 〃 | 14 | 13,000 | 928 | 0.020 | 0.030 | 10,400 | 789 | 0.016 | 0.024 | 9,360 | 710 | 0.014 | 0.020 |
| 〃 | 18 | 11,100 | 720 | 0.013 | 0.014 | 8,880 | 612 | 0.010 | 0.011 | 7,992 | 551 | 0.009 | 0.010 |
| ø 2.0 | 4 | 23,000 | 2,400 | 0.070 | 0.966 | 18,400 | 2,040 | 0.056 | 0.773 | 16,560 | 1,836 | 0.048 | 0.657 |
| 〃 | 6 | 20,300 | 2,160 | 0.064 | 0.926 | 16,240 | 1,836 | 0.051 | 0.741 | 14,616 | 1,652 | 0.044 | 0.630 |
| 〃 | 8 | 17,000 | 1,744 | 0.054 | 0.391 | 13,600 | 1,482 | 0.043 | 0.313 | 12,240 | 1,334 | 0.037 | 0.266 |
| 〃 | 10 | 14,800 | 1,472 | 0.045 | 0.200 | 11,840 | 1,251 | 0.036 | 0.160 | 10,656 | 1,126 | 0.031 | 0.136 |
| 〃 | 12 | 13,200 | 1,264 | 0.037 | 0.116 | 10,560 | 1,074 | 0.030 | 0.093 | 9,504 | 967 | 0.025 | 0.079 |
| 〃 | 14 | 12,000 | 1,120 | 0.031 | 0.073 | 9,600 | 952 | 0.025 | 0.058 | 8,640 | 857 | 0.021 | 0.050 |
| 〃 | 16 | 11,100 | 992 | 0.026 | 0.049 | 8,880 | 843 | 0.021 | 0.039 | 7,992 | 759 | 0.018 | 0.033 |
| 〃 | 18 | 10,300 | 880 | 0.022 | 0.034 | 8,240 | 748 | 0.018 | 0.027 | 7,416 | 673 | 0.015 | 0.023 |
| 〃 | 20 | 9,600 | 800 | 0.018 | 0.025 | 7,680 | 680 | 0.014 | 0.020 | 6,912 | 612 | 0.012 | 0.017 |
| 〃 | 22 | 8,700 | 672 | 0.014 | 0.018 | 6,960 | 571 | 0.011 | 0.014 | 6,264 | 514 | 0.010 | 0.012 |
| 〃 | 25 | 8,400 | 624 | 0.012 | 0.013 | 6,720 | 530 | 0.010 | 0.010 | 6,048 | 477 | 0.008 | 0.009 |
| 〃 | 30 | 7,500 | 496 | 0.008 | 0.007 | 6,000 | 422 | 0.006 | 0.006 | 5,400 | 379 | 0.005 | 0.005 |
| ø 2.5 | 8 | 15,000 | 2,144 | 0.077 | 0.954 | 12,000 | 1,822 | 0.062 | 0.763 | 10,800 | 1,640 | 0.052 | 0.649 |
| 〃 | 10 | 13,100 | 1,824 | 0.068 | 0.488 | 10,480 | 1,550 | 0.054 | 0.390 | 9,432 | 1,395 | 0.046 | 0.332 |
| 〃 | 12 | 11,800 | 1,600 | 0.060 | 0.283 | 9,440 | 1,360 | 0.048 | 0.226 | 8,496 | 1,224 | 0.041 | 0.192 |
| 〃 | 16 | 9,900 | 1,264 | 0.045 | 0.119 | 7,920 | 1,074 | 0.036 | 0.095 | 7,128 | 967 | 0.031 | 0.081 |
| 〃 | 20 | 8,700 | 1,040 | 0.033 | 0.061 | 6,960 | 884 | 0.026 | 0.049 | 6,264 | 796 | 0.022 | 0.041 |
| 〃 | 25 | 7,600 | 832 | 0.022 | 0.031 | 6,080 | 707 | 0.018 | 0.025 | 5,472 | 636 | 0.015 | 0.021 |
| 〃 | 30 | 6,800 | 688 | 0.014 | 0.018 | 5,440 | 585 | 0.011 | 0.014 | 4,896 | 526 | 0.010 | 0.012 |
| 〃 | 35 | 6,200 | 608 | 0.009 | 0.012 | 4,960 | 517 | 0.007 | 0.010 | 4,464 | 465 | 0.006 | 0.008 |
| 〃 | 40 | 5,700 | 464 | 0.005 | 0.008 | 4,560 | 394 | 0.004 | 0.006 | 4,104 | 355 | 0.003 | 0.005 |
| 〃 | 50 | 5,000 | 304 | 0.001 | 0.004 | 4,000 | 258 | 0.001 | 0.003 | 3,600 | 233 | 0.001 | 0.003 |
| ø 3 | 6 | 13,200 | 2,352 | 0.103 | 1.978 | 10,560 | 1,999 | 0.082 | 1.582 | 9,504 | 1,799 | 0.070 | 1.345 |
| 〃 | 10 | 11,600 | 2,032 | 0.092 | 1.013 | 9,280 | 1,727 | 0.074 | 0.810 | 8,352 | 1,554 | 0.063 | 0.689 |
| 〃 | 12 | 10,500 | 1,776 | 0.081 | 0.586 | 8,400 | 1,510 | 0.065 | 0.469 | 7,560 | 1,359 | 0.055 | 0.398 |
| 〃 | 16 | 8,900 | 1,440 | 0.064 | 0.247 | 7,120 | 1,224 | 0.051 | 0.198 | 6,408 | 1,102 | 0.044 | 0.168 |
| 〃 | 20 | 7,800 | 1,200 | 0.050 | 0.127 | 6,240 | 1,020 | 0.040 | 0.102 | 5,616 | 918 | 0.034 | 0.086 |
| 〃 | 25 | 6,900 | 992 | 0.036 | 0.065 | 5,520 | 843 | 0.029 | 0.052 | 4,968 | 759 | 0.024 | 0.044 |
| 〃 | 30 | 6,200 | 832 | 0.026 | 0.038 | 4,960 | 707 | 0.021 | 0.030 | 4,464 | 636 | 0.018 | 0.026 |
| 〃 | 35 | 5,700 | 704 | 0.018 | 0.024 | 4,560 | 598 | 0.014 | 0.019 | 4,104 | 539 | 0.012 | 0.016 |
| 〃 | 40 | 5,300 | 592 | 0.013 | 0.016 | 4,240 | 503 | 0.010 | 0.013 | 3,816 | 453 | 0.009 | 0.011 |
| 〃 | 45 | 5,000 | 528 | 0.008 | 0.012 | 4,000 | 449 | 0.006 | 0.010 | 3,600 | 404 | 0.005 | 0.008 |
| 〃 | 50 | 4700 | 432 | 0.006 | 0.008 | 3,760 | 367 | 0.005 | 0.006 | 3,384 | 330 | 0.004 | 0.005 |
| 〃 | 60 | 4,500 | 400 | 0.003 | 0.005 | 3,600 | 340 | 0.002 | 0.004 | 3,240 | 306 | 0.002 | 0.003 |
| ø 4 | 8 | 10,000 | 2,560 | 0.140 | 1.990 | 8,000 | 2,176 | 0.112 | 1.592 | 7,200 | 1,958 | 0.095 | 1.353 |
| 〃 | 10 | 9,200 | 2,240 | 0.120 | 1.960 | 7,360 | 1,904 | 0.096 | 1.568 | 6,624 | 1,714 | 0.082 | 1.333 |
| 〃 | 12 | 8,500 | 2,048 | 0.112 | 1.852 | 6,800 | 1,741 | 0.090 | 1.482 | 6,120 | 1,567 | 0.076 | 1.259 |
| 〃 | 16 | 7,200 | 1,680 | 0.093 | 0.781 | 5,760 | 1,428 | 0.074 | 0.625 | 5,184 | 1,285 | 0.063 | 0.531 |
| 〃 | 20 | 6,300 | 1,408 | 0.077 | 0.400 | 5,040 | 1,197 | 0.062 | 0.320 | 4,536 | 1,077 | 0.052 | 0.272 |
| 〃 | 25 | 5,600 | 1,200 | 0.061 | 0.205 | 4,480 | 1,020 | 0.049 | 0.164 | 4,032 | 918 | 0.041 | 0.139 |
| 〃 | 30 | 5,000 | 1,008 | 0.048 | 0.119 | 4,000 | 857 | 0.038 | 0.095 | 3,600 | 771 | 0.033 | 0.081 |
| 〃 | 35 | 4,600 | 864 | 0.038 | 0.075 | 3,680 | 734 | 0.030 | 0.060 | 3,312 | 661 | 0.026 | 0.051 |
| 〃 | 40 | 4,200 | 752 | 0.030 | 0.050 | 3,360 | 639 | 0.024 | 0.040 | 3,024 | 575 | 0.020 | 0.034 |
| 〃 | 45 | 3,900 | 656 | 0.023 | 0.035 | 3,120 | 558 | 0.018 | 0.028 | 2,808 | 502 | 0.016 | 0.024 |
| 〃 | 50 | 3,700 | 576 | 0.018 | 0.026 | 2,960 | 490 | 0.014 | 0.021 | 2,664 | 441 | 0.012 | 0.018 |
| 〃 | 55 | 3,500 | 512 | 0.015 | 0.020 | 2,800 | 435 | 0.012 | 0.016 | 2,520 | 392 | 0.010 | 0.014 |
| 〃 | 60 | 3,300 | 448 | 0.011 | 0.015 | 2,640 | 381 | 0.009 | 0.012 | 2,376 | 343 | 0.007 | 0.010 |

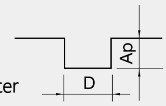
## 2HREG Cutting Condition

• RPM : rev./min • Feed : mm/min

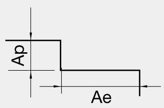
| 피삭재 Material | | 동 합금 Copper alloys C1100 | | | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | | 40 ~ 50HRc | | | | 50 ~ 52HRc | | | |
| 외경 Outside Diameter | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 5 | 16 | 6,000 | 1,824 | 0.127 | 1.907 | 4,800 | 1,550 | 0.102 | 1.526 | 4,320 | 1,395 | 0.086 | 1.297 |
| 〃 | 20 | 5,300 | 1,568 | 0.121 | 0.977 | 4,240 | 1,333 | 0.097 | 0.782 | 3,816 | 1,200 | 0.082 | 0.664 |
| 〃 | 25 | 4,600 | 1,312 | 0.109 | 0.500 | 3,680 | 1,115 | 0.087 | 0.400 | 3,312 | 1,004 | 0.074 | 0.340 |
| 〃 | 30 | 4,200 | 1,136 | 0.094 | 0.289 | 3,360 | 966 | 0.075 | 0.231 | 3,024 | 869 | 0.064 | 0.197 |
| 〃 | 35 | 3,800 | 992 | 0.077 | 0.182 | 3,040 | 843 | 0.062 | 0.146 | 2,736 | 759 | 0.052 | 0.124 |
| 〃 | 40 | 3,500 | 864 | 0.060 | 0.122 | 2,800 | 734 | 0.048 | 0.098 | 2,520 | 661 | 0.041 | 0.083 |
| 〃 | 50 | 3,100 | 688 | 0.031 | 0.063 | 2,480 | 585 | 0.025 | 0.050 | 2,232 | 526 | 0.021 | 0.043 |
| 〃 | 60 | 2,800 | 560 | 0.013 | 0.036 | 2,240 | 476 | 0.010 | 0.029 | 2,016 | 428 | 0.009 | 0.024 |
| ø 6 | 20 | 4,200 | 1,536 | 0.126 | 2.025 | 3,360 | 1,306 | 0.101 | 1.620 | 3,024 | 1,175 | 0.086 | 1.377 |
| 〃 | 30 | 3,400 | 1,168 | 0.109 | 0.600 | 2,720 | 993 | 0.087 | 0.480 | 2,448 | 894 | 0.074 | 0.408 |
| 〃 | 40 | 3,000 | 960 | 0.083 | 0.253 | 2,400 | 816 | 0.066 | 0.202 | 2,160 | 734 | 0.056 | 0.172 |
| 〃 | 50 | 2,600 | 768 | 0.054 | 0.130 | 2,080 | 653 | 0.043 | 0.104 | 1,872 | 588 | 0.037 | 0.088 |
| 〃 | 60 | 2,400 | 656 | 0.031 | 0.075 | 1,920 | 558 | 0.025 | 0.060 | 1,728 | 502 | 0.021 | 0.051 |
| ø 8 | 20 | 3,200 | 1,456 | 0.180 | 1.600 | 2,560 | 1,238 | 0.144 | 1.280 | 2,304 | 1,114 | 0.122 | 1.088 |
| 〃 | 40 | 2,600 | 960 | 0.120 | 0.200 | 2,080 | 816 | 0.096 | 0.160 | 1,872 | 734 | 0.082 | 0.136 |
| ø 10 | 25 | 2,900 | 1,424 | 0.200 | 1.760 | 2,320 | 1,210 | 0.160 | 1.408 | 2,088 | 1,089 | 0.136 | 1.197 |
| 〃 | 45 | 2,200 | 928 | 0.140 | 0.240 | 1,760 | 789 | 0.112 | 0.192 | 1,584 | 710 | 0.095 | 0.163 |
| ø 12 | 30 | 2,000 | 1,296 | 0.190 | 1.650 | 1,600 | 1,102 | 0.152 | 1.320 | 1,440 | 991 | 0.129 | 1.122 |
| 〃 | 50 | 1,950 | 912 | 0.150 | 0.250 | 1,560 | 775 | 0.120 | 0.200 | 1,404 | 698 | 0.102 | 0.170 |

**절입량** Depth of Cut

Slotting
• Ap : Axial Depth
• D : Outside Diameter




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




- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC52 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이며 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 52 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

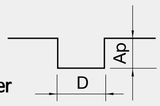
# 4HREG Cutting Condition

• RPM : rev./min • Feed : mm/min

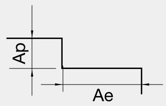
| 피삭재 Material | | 동 합금 Copper alloys C1100 | | | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.8 | 8 | 24,100 | 1,235 | 0.009 | 0.01 | 20,485 | 988 | 0.008 | 0.01 | 18,430 | 840 | 0.006 | 0.01 |
| 〃 | 12 | 18,700 | 707 | 0.004 | 0.003 | 15,895 | 566 | 0.004 | 0.003 | 14,306 | 481 | 0.003 | 0.002 |
| ø 1 | 8 | 22,100 | 1,373 | 0.014 | 0.024 | 17,680 | 1,098 | 0.011 | 0.019 | 15,912 | 934 | 0.010 | 0.016 |
| 〃 | 16 | 14,300 | 624 | 0.004 | 0.003 | 11,440 | 499 | 0.003 | 0.002 | 10,296 | 424 | 0.003 | 0.002 |
| 〃 | 25 | 10,800 | 250 | 0.003 | 0.001 | 8,640 | 200 | 0.002 | 0.001 | 7,776 | 170 | 0.002 | 0.001 |
| ø 1.5 | 8 | 19,000 | 1,872 | 0.041 | 0.124 | 15,200 | 1,498 | 0.033 | 0.099 | 13,680 | 1,273 | 0.028 | 0.084 |
| 〃 | 16 | 12,300 | 998 | 0.013 | 0.015 | 9,840 | 799 | 0.010 | 0.012 | 8,856 | 679 | 0.009 | 0.010 |
| 〃 | 25 | 9,300 | 562 | 0.005 | 0.004 | 7,440 | 449 | 0.004 | 0.003 | 6,696 | 382 | 0.003 | 0.003 |
| ø 2 | 8 | 17,000 | 2,267 | 0.054 | 0.391 | 13,600 | 1,814 | 0.043 | 0.313 | 12,240 | 1,542 | 0.037 | 0.266 |
| 〃 | 16 | 11,100 | 1,290 | 0.026 | 0.049 | 8,880 | 1,032 | 0.021 | 0.039 | 7,992 | 877 | 0.018 | 0.033 |
| 〃 | 25 | 8,400 | 811 | 0.012 | 0.013 | 6,720 | 649 | 0.010 | 0.010 | 6,048 | 552 | 0.008 | 0.009 |
| ø 2.5 | 10 | 13,100 | 2,371 | 0.068 | 0.488 | 10,480 | 1,897 | 0.054 | 0.390 | 9,432 | 1,612 | 0.046 | 0.332 |
| 〃 | 16 | 9,900 | 1,643 | 0.045 | 0.119 | 7,920 | 1,315 | 0.036 | 0.095 | 7,128 | 1,117 | 0.031 | 0.081 |
| 〃 | 30 | 6,800 | 894 | 0.014 | 0.018 | 5,440 | 716 | 0.011 | 0.014 | 4,896 | 608 | 0.010 | 0.012 |
| ø 3 | 10 | 11,600 | 2,642 | 0.092 | 1.013 | 9,280 | 2,113 | 0.074 | 0.810 | 8,352 | 1,796 | 0.063 | 0.689 |
| 〃 | 16 | 8,900 | 1,872 | 0.064 | 0.247 | 7,120 | 1,498 | 0.051 | 0.198 | 6,408 | 1,273 | 0.044 | 0.168 |
| 〃 | 25 | 6,900 | 1,290 | 0.036 | 0.065 | 5,520 | 1,032 | 0.029 | 0.052 | 4,968 | 877 | 0.024 | 0.044 |
| 〃 | 35 | 5,700 | 915 | 0.018 | 0.024 | 4,560 | 732 | 0.014 | 0.019 | 4,104 | 622 | 0.012 | 0.016 |
| ø 4 | 10 | 9,200 | 2,912 | 0.120 | 1.960 | 7,360 | 2,330 | 0.096 | 1.568 | 6,624 | 1,980 | 0.082 | 1.333 |
| 〃 | 16 | 7,200 | 2,184 | 0.093 | 0.781 | 5,760 | 1,747 | 0.074 | 0.625 | 5,184 | 1,485 | 0.063 | 0.531 |
| 〃 | 25 | 5,600 | 1,560 | 0.061 | 0.205 | 4,480 | 1,248 | 0.049 | 0.164 | 4,032 | 1,061 | 0.041 | 0.139 |
| 〃 | 40 | 4,200 | 978 | 0.030 | 0.050 | 3,360 | 782 | 0.024 | 0.040 | 3,024 | 665 | 0.020 | 0.034 |
| ø 5 | 15 | 6,000 | 2,371 | 0.127 | 1.907 | 4,800 | 1,897 | 0.102 | 1.526 | 4,320 | 1,612 | 0.086 | 1.297 |
| 〃 | 25 | 4,600 | 1,706 | 0.109 | 0.500 | 3,680 | 1,364 | 0.087 | 0.400 | 3,312 | 1,160 | 0.074 | 0.340 |
| 〃 | 40 | 3,500 | 1,123 | 0.060 | 0.122 | 2,800 | 899 | 0.048 | 0.098 | 2,520 | 764 | 0.041 | 0.083 |
| ø 6 | 20 | 4,200 | 1,997 | 0.126 | 2.025 | 3,360 | 1,597 | 0.101 | 1.620 | 3,024 | 1,358 | 0.086 | 1.377 |
| 〃 | 40 | 3,000 | 1,248 | 0.083 | 0.253 | 2,400 | 998 | 0.066 | 0.202 | 2,160 | 849 | 0.056 | 0.172 |
| ø 8 | 20 | 3,200 | 1,893 | 0.180 | 1.600 | 2,560 | 1,514 | 0.144 | 1.280 | 2,304 | 1,287 | 0.122 | 1.088 |
| 〃 | 40 | 2,600 | 1,248 | 0.120 | 0.200 | 2,080 | 998 | 0.096 | 0.160 | 1,872 | 849 | 0.082 | 0.136 |
| ø 10 | 25 | 2,900 | 1,851 | 0.200 | 1.760 | 2,320 | 1,481 | 0.160 | 1.408 | 2,088 | 1,259 | 0.136 | 1.197 |
| 〃 | 45 | 2,200 | 1,206 | 0.140 | 0.240 | 1,760 | 965 | 0.112 | 0.192 | 1,584 | 820 | 0.095 | 0.163 |
| ø 12 | 30 | 2,000 | 1,685 | 0.190 | 1.650 | 1,600 | 1,348 | 0.152 | 1.320 | 1,440 | 1,146 | 0.129 | 1.122 |
| 〃 | 50 | 1,950 | 1,186 | 0.150 | 0.250 | 1,560 | 948 | 0.120 | 0.200 | 1,404 | 806 | 0.102 | 0.170 |

**절입량 Depth of Cut**

Slotting
• Ap : Axial Depth
• D : Outside Diameter




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




- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC52 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 52 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

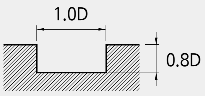
# 2HCEG/2LEMG Cutting Condition

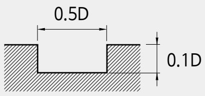
• RPM : rev./min • Feed : mm/min

## 홈절삭 Slotting

| 피삭재 Material | 동 합금 Copper alloys C1100 | | | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.1 | 50,000 | 300 | 0.01 | 0.1 | 45,000 | 240 | 0.08 | 0.05 | 40,500 | 168 | 0.08 | 0.05 |
| ø 0.2 | 50,000 | 390 | 0.02 | 0.2 | 45,000 | 312 | 0.16 | 0.10 | 40,500 | 218 | 0.16 | 0.10 |
| ø 0.3 | 50,000 | 570 | 0.03 | 0.3 | 45,000 | 456 | 0.24 | 0.15 | 40,500 | 319 | 0.24 | 0.15 |
| ø 0.4 | 50,000 | 705 | 0.04 | 0.4 | 45,000 | 564 | 0.32 | 0.20 | 40,500 | 395 | 0.32 | 0.20 |
| ø 0.5 | 50,000 | 1,110 | 0.05 | 0.5 | 45,000 | 888 | 0.40 | 0.25 | 40,500 | 622 | 0.40 | 0.25 |
| ø 0.6 | 50,000 | 1,410 | 0.06 | 0.6 | 45,000 | 1,128 | 0.48 | 0.30 | 40,500 | 790 | 0.48 | 0.30 |
| ø 0.8 | 50,000 | 1,800 | 0.08 | 0.8 | 40,000 | 1,440 | 0.64 | 0.40 | 30,000 | 1,008 | 0.64 | 0.40 |
| ø 0.9 | 49,000 | 1,965 | 0.09 | 0.9 | 39,000 | 1,572 | 0.72 | 0.45 | 27,800 | 1,100 | 0.72 | 0.45 |
| ø 1 | 48,000 | 2,250 | 0.10 | 1.0 | 38,000 | 1,800 | 0.80 | 0.50 | 25,500 | 1,260 | 0.80 | 0.50 |
| ø 2 | 33,300 | 2,550 | 0.20 | 2.0 | 26,000 | 2,040 | 1.60 | 1.00 | 17,500 | 1,428 | 1.60 | 1.00 |
| ø 3 | 21,800 | 2,550 | 0.30 | 3.0 | 17,300 | 2,040 | 2.40 | 1.50 | 11,500 | 1,428 | 2.40 | 1.50 |
| ø 4 | 16,700 | 2,640 | 0.40 | 4.0 | 13,200 | 2,112 | 3.20 | 2.00 | 8,800 | 1,478 | 3.20 | 2.00 |
| ø 5 | 15,700 | 3,000 | 0.50 | 5.0 | 12,500 | 2,400 | 4.00 | 2.50 | 8,300 | 1,680 | 4.00 | 2.50 |
| ø 6 | 13,000 | 2,850 | 0.60 | 6.0 | 10,350 | 2,280 | 4.80 | 3.00 | 6,900 | 1,596 | 4.80 | 3.00 |
| ø 8 | 9,880 | 2,790 | 0.80 | 8.0 | 7,800 | 2,232 | 6.40 | 4.00 | 5,200 | 1,562 | 6.40 | 4.00 |
| ø 10 | 7,800 | 2,550 | 1.00 | 10.0 | 6,150 | 2,040 | 8.00 | 5.00 | 4,100 | 1,428 | 8.00 | 5.00 |
| ø 12 | 6,650 | 2,550 | 1.20 | 12.0 | 5,250 | 2,040 | 9.60 | 6.00 | 3,500 | 1,428 | 9.60 | 6.00 |
| ø 16 | 5,540 | 2,340 | 1.60 | 16.0 | 4,340 | 1,872 | 12.80 | 8.00 | 2,600 | 1,310 | 12.80 | 8.00 |
| ø 18 | 5,540 | 2,340 | 1.80 | 18.0 | 4,340 | 1,872 | 14.40 | 9.00 | 2,600 | 1,310 | 14.40 | 9.00 |
| ø 20 | 4,640 | 2,160 | 2.00 | 20.0 | 4,340 | 1,728 | 16.00 | 10.00 | 2,100 | 1,210 | 16.00 | 10.00 |

절입량 Depth of Cut

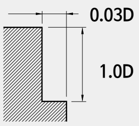
~ 40HRC


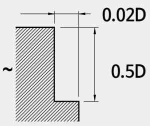

40HRC ~



## 측면절삭 Side Cutting

| 피삭재 Material | 동 Copper alloys C1100 | | | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 48,000 | 1,050 | 1 | 0.03 | 38,000 | 735 | 0.50 | 0.02 | 25,500 | 515 | 0.50 | 0.02 |
| ø 2 | 33,300 | 1,200 | 2 | 0.06 | 26,000 | 840 | 1.00 | 0.04 | 17,500 | 588 | 1.00 | 0.04 |
| ø 3 | 21,800 | 1,200 | 3 | 0.09 | 17,300 | 840 | 1.50 | 0.06 | 11,500 | 588 | 1.50 | 0.06 |
| ø 4 | 16,700 | 1,250 | 4 | 0.12 | 13,200 | 875 | 2.00 | 0.08 | 8,800 | 613 | 2.00 | 0.08 |
| ø 5 | 15,700 | 1,450 | 5 | 0.15 | 12,500 | 1,015 | 2.50 | 0.10 | 8,300 | 711 | 2.50 | 0.10 |
| ø 6 | 13,000 | 1,350 | 6 | 0.18 | 10,350 | 945 | 3.00 | 0.12 | 6,900 | 662 | 3.00 | 0.12 |
| ø 8 | 9,880 | 1,320 | 8 | 0.24 | 7,800 | 924 | 4.00 | 0.16 | 5,200 | 647 | 4.00 | 0.16 |
| ø 10 | 7,800 | 1,200 | 10 | 0.30 | 6,150 | 840 | 5.00 | 0.20 | 4,100 | 588 | 5.00 | 0.20 |
| ø 12 | 6,650 | 1,200 | 12 | 0.36 | 5,250 | 840 | 6.00 | 0.24 | 3,500 | 588 | 6.00 | 0.24 |
| ø 16 | 5,540 | 1,000 | 16 | 0.48 | 4,340 | 700 | 8.00 | 0.32 | 2,600 | 490 | 8.00 | 0.32 |
| ø 18 | 5,540 | 1,000 | 18 | 0.54 | 4,340 | 700 | 9.00 | 0.36 | 2,600 | 490 | 9.00 | 0.36 |
| ø 20 | 4,640 | 950 | 20 | 0.60 | 4,340 | 760 | 10.00 | 0.40 | 2,100 | 532 | 10.00 | 0.40 |

절입량 Depth of Cut

~ 40HRC



40HRC ~



- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 주세요.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC52 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛ 이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

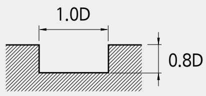
- If the effective length is long, reduce the RPM and feed in the same proportion.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 52 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

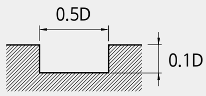
# 4HCEG/4LEMG Cutting Condition

## 홈절삭 Slotting

| 피삭재 Material | 동 합금 Copper alloys C1100 | | | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 48,000 | 2,700 | 0.10 | 1.0 | 38,000 | 2,160 | 0.80 | 0.50 | 25,500 | 1,512 | 0.80 | 0.50 |
| ø 2 | 33,300 | 3,060 | 0.20 | 2.0 | 26,000 | 2,448 | 1.60 | 1.00 | 17,500 | 1,714 | 1.60 | 1.00 |
| ø 3 | 21,800 | 3,060 | 0.30 | 3.0 | 17,300 | 2,448 | 2.40 | 1.50 | 11,500 | 1,714 | 2.40 | 1.50 |
| ø 4 | 16,700 | 3,168 | 0.40 | 4.0 | 13,200 | 2,534 | 3.20 | 2.00 | 8,800 | 1,774 | 3.20 | 2.00 |
| ø 5 | 15,700 | 3,600 | 0.50 | 5.0 | 12,500 | 2,880 | 4.00 | 2.50 | 8,300 | 2,016 | 4.00 | 2.50 |
| ø 6 | 13,000 | 3,420 | 0.60 | 6.0 | 10,350 | 2,736 | 4.80 | 3.00 | 6,900 | 1,915 | 4.80 | 3.00 |
| ø 8 | 9,880 | 3,348 | 0.80 | 8.0 | 7,800 | 2,678 | 6.40 | 4.00 | 5,200 | 1,875 | 6.40 | 4.00 |
| ø 10 | 7,800 | 3,060 | 1.00 | 10.0 | 6,150 | 2,448 | 8.00 | 5.00 | 4,100 | 1,714 | 8.00 | 5.00 |
| ø 12 | 6,650 | 3,060 | 1.20 | 12.0 | 5,250 | 2,448 | 9.60 | 6.00 | 3,500 | 1,714 | 9.60 | 6.00 |
| ø 16 | 5,540 | 2,808 | 1.60 | 16.0 | 4,340 | 2,246 | 12.80 | 8.00 | 2,600 | 1,572 | 12.80 | 8.00 |
| ø 18 | 5,540 | 2,808 | 1.80 | 18.0 | 4,340 | 2,246 | 14.40 | 9.00 | 2,600 | 1,572 | 14.40 | 9.00 |
| ø 20 | 4,640 | 2,592 | 2.00 | 20.0 | 4,340 | 2,074 | 16.00 | 10.00 | 2,100 | 1,452 | 16.00 | 10.00 |

절입량 Depth of Cut

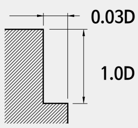
~ 40HRC 

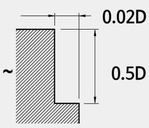

40HRC ~ 


## 측면절삭 Side Cutting

| 피삭재 Material | 동 Copper alloys C1100 | | | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 48,000 | 1,155 | 1 | 0.03 | 38,000 | 809 | 1 | 0.03 | 25,500 | 566 | 0.50 | 0.02 |
| ø 2 | 33,300 | 1,320 | 2 | 0.06 | 26,000 | 924 | 2 | 0.06 | 17,500 | 647 | 1.00 | 0.04 |
| ø 3 | 21,800 | 1,320 | 3 | 0.09 | 17,300 | 924 | 3 | 0.09 | 11,500 | 647 | 1.50 | 0.06 |
| ø 4 | 16,700 | 1,375 | 4 | 0.12 | 13,200 | 963 | 4 | 0.12 | 8,800 | 674 | 2.00 | 0.08 |
| ø 5 | 15,700 | 1,595 | 5 | 0.15 | 12,500 | 1,117 | 5 | 0.15 | 8,300 | 782 | 2.50 | 0.10 |
| ø 6 | 13,000 | 1,485 | 6 | 0.18 | 10,350 | 1,040 | 6 | 0.18 | 6,900 | 728 | 3.00 | 0.12 |
| ø 8 | 9,880 | 1,452 | 8 | 0.24 | 7,800 | 1,016 | 8 | 0.24 | 5,200 | 711 | 4.00 | 0.16 |
| ø 10 | 7,800 | 1,320 | 10 | 0.30 | 6,150 | 924 | 10 | 0.30 | 4,100 | 647 | 5.00 | 0.20 |
| ø 12 | 6,650 | 1,320 | 12 | 0.36 | 5,250 | 924 | 12 | 0.36 | 3,500 | 647 | 6.00 | 0.24 |
| ø 16 | 5,540 | 1,100 | 16 | 0.48 | 4,340 | 770 | 16 | 0.48 | 2,600 | 539 | 8.00 | 0.32 |
| ø 18 | 5,540 | 1,100 | 18 | 0.54 | 4,340 | 770 | 18 | 0.54 | 2,600 | 539 | 9.00 | 0.36 |
| ø 20 | 4,640 | 1,045 | 20 | 0.60 | 4,340 | 836 | 20 | 0.60 | 2,100 | 585 | 10.00 | 0.40 |

절입량 Depth of Cut

~ 40HRC 


40HRC ~ 


- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 주세요.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC52 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 시켜십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛ 이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- If the effective length is long, reduce the RPM and feed in the same proportion.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 52 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

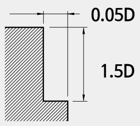
# 4HEMG Cutting Condition

• RPM : rev./min • Feed : mm/min

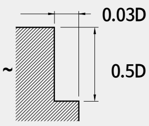
| 측면절삭 Side Cutting | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 피삭재 Material | 공구강/금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVX / SKD11 | | | |
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 40,000 | 720 | 1.5 | 0.05 | 40,000 | 660 | 1.5 | 0.05 | 40,000 | 308 | 0.5 | 0.03 |
| ø 1.5 | 40,000 | 900 | 2.25 | 0.075 | 40,000 | 750 | 2.25 | 0.075 | 38,500 | 350 | 0.75 | 0.045 |
| ø 2 | 40,000 | 1,200 | 3 | 0.1 | 38,000 | 1,080 | 3 | 0.1 | 36,500 | 504 | 1 | 0.06 |
| ø 3 | 38,400 | 2,736 | 4.5 | 0.15 | 34,560 | 2,462 | 4.5 | 0.15 | 27,648 | 1,149 | 1.5 | 0.09 |
| ø 4 | 28,800 | 3,168 | 6 | 0.2 | 25,920 | 2,851 | 6 | 0.2 | 20,736 | 1,331 | 2 | 0.12 |
| ø 5 | 24,000 | 3,600 | 7.5 | 0.25 | 21,600 | 3,240 | 7.5 | 0.25 | 17,280 | 1,512 | 2.5 | 0.15 |
| ø 6 | 19,200 | 4,176 | 9 | 0.3 | 17,280 | 3,758 | 9 | 0.3 | 13,824 | 1,754 | 3 | 0.18 |
| ø 8 | 14,400 | 4,176 | 12 | 0.4 | 12,960 | 3,758 | 12 | 0.4 | 10,368 | 1,754 | 4 | 0.24 |
| ø 10 | 11,520 | 4,176 | 15 | 0.5 | 10,368 | 3,758 | 15 | 0.5 | 8,294 | 1,754 | 5 | 0.3 |
| ø 12 | 9,600 | 3,456 | 18 | 0.6 | 8,640 | 3,110 | 18 | 0.6 | 6,912 | 1,452 | 6 | 0.36 |
| ø 16 | 7,200 | 2,592 | 24 | 0.8 | 6,480 | 2,333 | 24 | 0.8 | 5,184 | 1,089 | 8 | 0.48 |
| ø 20 | 5,760 | 2,088 | 30 | 1 | 5,184 | 1,879 | 30 | 1 | 4,147 | 877 | 10 | 0.6 |

절입량 Depth of Cut

~ 50HRC




50HRC ~




- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC52 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 유효장이길게체결할시회전수와피드를같은비율로DOWN 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를초 과하거나 버 및 적열현상이 발생할 때 스핀들속도와 이송속도를 비례하여 조정하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 52 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- If you clamp the endmill with long overhang of effective length, reduce the RPM and feed in the same proportion.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

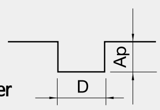
# 2CREG Cutting Condition

• RPM : rev./min • Feed : mm/min

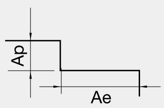
| 피삭재 Material | | 동 합금 Copper alloys C1100 | | | | 합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.2 | 1 | 50,000 | 352 | 0.016 | 0.020 | 50,000 | 264 | 0.006 | 0.020 | 34,500 | 211 | 0.004 | 0.020 |
| 〃 | 1.5 | 50,000 | 311 | 0.017 | 0.010 | 50,000 | 233 | 0.005 | 0.010 | 26,450 | 186 | 0.003 | 0.010 |
| ø 0.3 | 1 | 50,000 | 890 | 0.029 | 0.020 | 50,000 | 668 | 0.007 | 0.020 | 34,500 | 534 | 0.005 | 0.015 |
| 〃 | 3 | 50,000 | 393 | 0.029 | 0.015 | 50,000 | 295 | 0.006 | 0.015 | 24,150 | 236 | 0.003 | 0.010 |
| ø 0.4 | 1 | 47,150 | 890 | 0.047 | 0.062 | 50,000 | 668 | 0.013 | 0.070 | 39,675 | 534 | 0.011 | 0.070 |
| 〃 | 3 | 33,350 | 683 | 0.026 | 0.053 | 26,450 | 512 | 0.008 | 0.026 | 26,450 | 410 | 0.007 | 0.026 |
| ø 0.5 | 1 | 48,300 | 2,008 | 0.079 | 0.114 | 48,300 | 668 | 0.033 | 0.119 | 39,100 | 534 | 0.029 | 0.119 |
| 〃 | 3 | 31,050 | 1,118 | 0.056 | 0.088 | 31,050 | 525 | 0.022 | 0.110 | 25,415 | 420 | 0.020 | 0.110 |
| 〃 | 5 | 25,760 | 827 | 0.026 | 0.044 | 25,760 | 510 | 0.011 | 0.010 | 20,700 | 408 | 0.010 | 0.010 |
| ø 0.6 | 2 | 27,945 | 890 | 0.111 | 0.158 | 27,945 | 668 | 0.010 | 0.214 | 23,000 | 534 | 0.010 | 0.214 |
| 〃 | 6 | 16,445 | 435 | 0.035 | 0.044 | 16,445 | 326 | 0.003 | 0.010 | 13,570 | 261 | 0.003 | 0.010 |
| ø 0.8 | 4 | 17,250 | 787 | 0.129 | 0.194 | 17,020 | 590 | 0.014 | 0.114 | 14,720 | 472 | 0.015 | 0.114 |
| 〃 | 8 | 12,650 | 475 | 0.029 | 0.098 | 12,650 | 264 | 0.005 | 0.088 | 10,695 | 184 | 0.004 | 0.088 |
| ø 1 | 4 | 13,800 | 1,449 | 0.196 | 0.396 | 13,800 | 805 | 0.034 | 0.264 | 11,730 | 655 | 0.029 | 0.264 |
| 〃 | 10 | 8,625 | 559 | 0.047 | 0.308 | 8,625 | 311 | 0.013 | 0.123 | 7,475 | 264 | 0.011 | 0.123 |
| 〃 | 16 | 6,900 | 331 | 0.018 | 0.220 | 6,900 | 184 | 0.005 | 0.026 | 5,980 | 161 | 0.004 | 0.026 |
| ø 1.2 | 6 | 9,200 | 1,035 | 0.182 | 0.457 | 9,200 | 575 | 0.021 | 0.088 | 8,165 | 483 | 0.018 | 0.088 |
| 〃 | 12 | 6,670 | 662 | 0.053 | 0.396 | 6,670 | 368 | 0.010 | 0.070 | 5,980 | 299 | 0.007 | 0.070 |
| ø 1.5 | 4 | 12,880 | 1,925 | 0.293 | 0.660 | 12,880 | 1,070 | 0.059 | 0.440 | 11,730 | 920 | 0.044 | 0.440 |
| 〃 | 10 | 8,280 | 1,325 | 0.147 | 0.554 | 8,280 | 736 | 0.041 | 0.282 | 7,590 | 633 | 0.031 | 0.282 |
| 〃 | 20 | 5,865 | 725 | 0.041 | 0.352 | 6,350 | 403 | 0.006 | 0.106 | 4,160 | 345 | 0.005 | 0.106 |
| ø 2 | 6 | 12,535 | 1,801 | 0.314 | 0.836 | 12,535 | 1,001 | 0.059 | 0.792 | 11,730 | 909 | 0.042 | 0.792 |
| 〃 | 12 | 9,200 | 1,449 | 0.182 | 0.704 | 9,200 | 805 | 0.043 | 0.440 | 8,280 | 725 | 0.030 | 0.440 |
| 〃 | 20 | 6,900 | 1,139 | 0.091 | 0.651 | 6,200 | 633 | 0.023 | 0.194 | 3,520 | 564 | 0.017 | 0.194 |
| 〃 | 30 | 5,865 | 973 | 0.049 | 0.440 | 3,300 | 541 | 0.005 | 0.132 | 2,860 | 495 | 0.005 | 0.132 |
| ø 2.5 | 10 | 10,350 | 1,801 | 0.331 | 0.836 | 10,350 | 1,001 | 0.073 | 0.528 | 9,775 | 943 | 0.051 | 0.528 |
| 〃 | 30 | 6,210 | 787 | 0.067 | 0.616 | 6,210 | 437 | 0.016 | 0.176 | 5,865 | 414 | 0.011 | 0.176 |
| ø 3 | 12 | 10,350 | 2,029 | 0.381 | 0.831 | 10,350 | 1,127 | 0.103 | 0.655 | 9,775 | 874 | 0.103 | 0.616 |
| 〃 | 20 | 8,165 | 1,553 | 0.254 | 0.762 | 6,050 | 863 | 0.071 | 0.567 | 3,420 | 667 | 0.071 | 0.567 |
| 〃 | 30 | 6,900 | 1,263 | 0.137 | 0.674 | 3,300 | 702 | 0.049 | 0.371 | 2,890 | 541 | 0.049 | 0.371 |
| ø 4 | 12 | 8,740 | 1,904 | 0.401 | 1.525 | 8,740 | 1,058 | 0.117 | 1.124 | 7,360 | 920 | 0.081 | 1.124 |
| 〃 | 20 | 6,785 | 1,458 | 0.375 | 1.325 | 5,880 | 810 | 0.078 | 0.880 | 5,750 | 840 | 0.053 | 0.880 |
| 〃 | 30 | 5,750 | 752 | 0.196 | 1.210 | 2,950 | 418 | 0.041 | 0.671 | 2,540 | 656 | 0.028 | 0.671 |
| 〃 | 45 | 4,715 | 500 | 0.096 | 1.118 | 2,300 | 278 | 0.010 | 0.326 | 2,015 | 322 | 0.007 | 0.326 |
| ø 5 | 15 | 7,705 | 3,064 | 0.697 | 2.277 | 7,705 | 1,702 | 0.150 | 1.346 | 5,520 | 1,139 | 0.106 | 1.346 |
| 〃 | 30 | 5,290 | 1,470 | 0.342 | 1.760 | 2,780 | 817 | 0.075 | 1.035 | 3,795 | 541 | 0.053 | 1.035 |
| ø 6 | 20 | 5,980 | 2,194 | 0.600 | 2.194 | 5,460 | 1,219 | 0.476 | 1.356 | 3,565 | 1,035 | 0.186 | 1.356 |
| 〃 | 40 | 4,600 | 1,635 | 0.565 | 2.049 | 2,380 | 909 | 0.410 | 1.304 | 2,160 | 759 | 0.164 | 1.304 |
| ø 8 | 22 | 5,520 | 1,946 | 0.528 | 2.542 | 5,520 | 1,081 | 0.419 | 1.518 | 3,220 | 909 | 0.164 | 1.518 |
| 〃 | 40 | 4,140 | 1,449 | 0.497 | 2.277 | 2,120 | 805 | 0.361 | 1.323 | 2,080 | 667 | 0.144 | 1.323 |
| ø 10 | 24 | 4,600 | 1,656 | 0.449 | 2.887 | 4,485 | 920 | 0.356 | 1.645 | 2,760 | 771 | 0.139 | 1.645 |
| 〃 | 45 | 3,450 | 1,221 | 0.423 | 2.438 | 3,450 | 679 | 0.307 | 1.334 | 1,955 | 564 | 0.122 | 1.334 |
| ø 12 | 26 | 3,795 | 1,387 | 0.377 | 3.013 | 3,795 | 771 | 0.299 | 2.024 | 2,300 | 644 | 0.117 | 2.024 |
| 〃 | 50 | 2,875 | 1,035 | 0.355 | 2.415 | 2,875 | 575 | 0.258 | 1.403 | 1,725 | 483 | 0.103 | 1.403 |
| ø 16 | 35 | 2,990 | 1,097 | 0.302 | 2.921 | 2,990 | 610 | 0.239 | 2.162 | 1,725 | 518 | 0.094 | 2.162 |

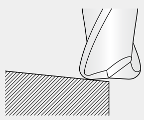
**절입량**
Depth of Cut

Slotting
• Ap : Axial Depth
• D : Outside Diameter




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



**경사진면절삭**
Inclined Cutting

• HRC52 이상인 경우 같은 직경의 같은 비율로 20% DOWN 시켜 주십시오.
• 유효장이 긴 경우에는 회전수와 이송속도를 최대 30% 이하로 줄이십시오.
• Ae 값 설정시 코너R 치수를 고려해 주십시오.
• 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
• 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.

• When milling workpiece HRC over 52 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
• If the effective length is long, reduce the RPM and feed maximum 30%.
• Consider the corner radius value when you set up the Ae value.
• For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
• For curved milling, raise up the feed up to 30% in stable milling condition.

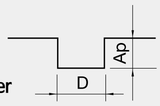
# 4CREG Cutting Condition

• RPM : rev./min • Feed : mm/min

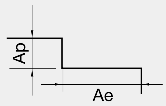
| 피삭재 Material | | 공구강/금형강 Tool steels / Mold steels SCM/HPM | | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 4 | 13,110 | 1,884 | 0.216 | 0.435 | 13,110 | 700 | 0.038 | 0.290 | 13,000 | 650 | 0.032 | 0.290 |
| 〃 | 10 | 8,194 | 727 | 0.052 | 0.339 | 8,194 | 404 | 0.014 | 0.135 | 7,101 | 343 | 0.012 | 0.135 |
| ø 1.2 | 4 | 12,500 | 1,346 | 0.200 | 0.503 | 8,740 | 950 | 0.024 | 0.097 | 12,500 | 750 | 0.019 | 0.097 |
| 〃 | 10 | 8,000 | 861 | 0.058 | 0.435 | 6,337 | 650 | 0.009 | 0.077 | 5,681 | 389 | 0.008 | 0.077 |
| ø 1.5 | 6 | 12,236 | 2,503 | 0.323 | 0.726 | 12,236 | 1,390 | 0.065 | 0.484 | 11,144 | 900 | 0.048 | 0.484 |
| 〃 | 12 | 7,866 | 1,722 | 0.161 | 0.610 | 7,866 | 957 | 0.045 | 0.310 | 7,211 | 822 | 0.034 | 0.310 |
| ø 2 | 6 | 11,908 | 2,341 | 0.345 | 0.919 | 11,908 | 1,301 | 0.065 | 0.871 | 11,144 | 1,181 | 0.046 | 0.871 |
| 〃 | 12 | 8,740 | 1,884 | 0.200 | 0.774 | 8,740 | 1,047 | 0.047 | 0.484 | 7,866 | 942 | 0.033 | 0.484 |
| ø 2.5 | 10 | 9,833 | 2,341 | 0.365 | 0.919 | 9,833 | 1,301 | 0.081 | 0.581 | 9,286 | 1,226 | 0.056 | 0.581 |
| 〃 | 20 | 5,900 | 1,023 | 0.074 | 0.677 | 5,900 | 568 | 0.017 | 0.194 | 5,572 | 538 | 0.012 | 0.194 |
| ø 3 | 10 | 9,833 | 2,637 | 0.419 | 0.914 | 9,833 | 1,465 | 0.113 | 0.720 | 9,286 | 1,136 | 0.113 | 0.678 |
| 〃 | 20 | 7,757 | 2,018 | 0.280 | 0.839 | 5,748 | 1,121 | 0.078 | 0.624 | 3,249 | 867 | 0.078 | 0.624 |
| ø 4 | 12 | 8,303 | 2,476 | 0.441 | 1.677 | 8,303 | 1,375 | 0.129 | 1.237 | 6,992 | 1,196 | 0.089 | 1.237 |
| 〃 | 20 | 6,446 | 1,895 | 0.413 | 1.457 | 5,586 | 1,053 | 0.086 | 0.968 | 5,463 | 1,091 | 0.058 | 0.968 |
| 〃 | 30 | 5,463 | 978 | 0.215 | 1.331 | 2,803 | 543 | 0.046 | 0.738 | 2,413 | 852 | 0.031 | 0.738 |
| ø 6 | 20 | 5,681 | 2,852 | 0.660 | 2.414 | 5,187 | 1,585 | 0.524 | 1.491 | 3,387 | 1,346 | 0.205 | 1.491 |
| 〃 | 40 | 4,370 | 2,126 | 0.622 | 2.254 | 2,261 | 1,181 | 0.451 | 1.435 | 2,052 | 987 | 0.180 | 1.435 |
| ø 8 | 22 | 5,244 | 2,530 | 0.581 | 2.796 | 5,244 | 1,405 | 0.461 | 1.670 | 3,059 | 1,181 | 0.180 | 1.670 |
| ø 10 | 24 | 4,370 | 2,153 | 0.494 | 3.175 | 4,261 | 1,196 | 0.392 | 1.809 | 2,622 | 1,002 | 0.153 | 1.809 |
| ø 12 | 26 | 3,605 | 1,803 | 0.415 | 3.314 | 3,605 | 1,002 | 0.329 | 2.226 | 2,185 | 837 | 0.129 | 2.226 |

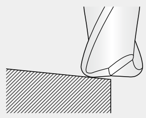
**절입량**
Depth of Cut

Slotting
• Ap : Axial Depth
• D : Outside Diameter




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



**경사진면절삭**
**Inclined Cutting**

- HRC52 이상인 경우 같은 직경의 같은 비율로 20% DOWN 시켜 주십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- Ae 값 설정시 코너R 치수를 고려해 주십시오.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.

- When milling workpiece HRC over 52 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- Consider the corner radius value when you set up the Ae value.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.

# 2NCRG/4NCRG

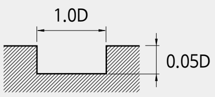
■ 4NCRG는 RPM 동일, FEED만 최대 30% Up 적용.
■ Use the same RPM and raise up the feed up to 30% for 4NCRG.

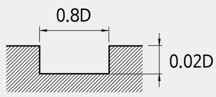
• RPM : rev./min • Feed : mm/min

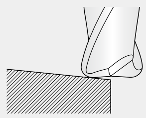
## 홈절삭 Slotting

| 피삭재 Material | 공구강/금형강 Tool steels / Mold steels | | | | 프리하든강 Prehardened Steels | | | | 고경도강 Hardened Steels | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 50HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.4 | 42,500 | 562 | 0.020 | 0.4 | 38,250 | 268 | 0.008 | 0.32 | 34,000 | 107 | 0.008 | 0.32 |
| ø 0.5 | 42,500 | 643 | 0.025 | 0.5 | 38,250 | 306 | 0.01 | 0.4 | 34,000 | 122 | 0.01 | 0.4 |
| ø 0.6 | 42,500 | 723 | 0.03 | 0.6 | 38,250 | 344 | 0.012 | 0.48 | 34,000 | 138 | 0.012 | 0.48 |
| ø 0.8 | 42,500 | 803 | 0.04 | 0.8 | 38,250 | 383 | 0.016 | 0.64 | 25,500 | 153 | 0.016 | 0.64 |
| ø 1 | 40,800 | 1,992 | 0.05 | 1 | 32,300 | 949 | 0.02 | 0.8 | 21,675 | 379 | 0.02 | 0.8 |
| ø 2 | 28,305 | 2,378 | 0.1 | 2 | 22,100 | 1,132 | 0.04 | 1.6 | 14,875 | 453 | 0.04 | 1.6 |
| ø 3 | 18,530 | 2,410 | 0.15 | 3 | 14,705 | 1,148 | 0.06 | 2.4 | 9,775 | 648 | 0.06 | 2.4 |
| ø 4 | 14,195 | 2,474 | 0.2 | 4 | 11,220 | 1,178 | 0.08 | 3.2 | 7,480 | 689 | 0.08 | 3.2 |
| ø 5 | 13,345 | 2,635 | 0.25 | 5 | 10,625 | 1,255 | 0.1 | 4 | 7,055 | 716 | 0.1 | 4 |
| ø 6 | 11,135 | 2,570 | 0.3 | 6 | 8,798 | 1,224 | 0.12 | 4.8 | 5,865 | 743 | 0.12 | 4.8 |
| ø 8 | 8,398 | 2,345 | 0.4 | 8 | 6,630 | 1,117 | 0.16 | 6.4 | 4,420 | 695 | 0.16 | 6.4 |
| ø 10 | 6,630 | 2,185 | 0.5 | 10 | 5,228 | 1,040 | 0.2 | 8 | 3,485 | 662 | 0.2 | 8 |
| ø 12 | 5,653 | 2,185 | 0.6 | 12 | 4,463 | 1,040 | 0.24 | 9.6 | 2,975 | 655 | 0.24 | 9.6 |

절입량 Depth of Cut

~ 40HRC



40HRC ~


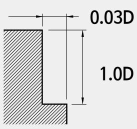



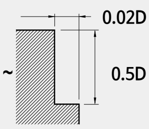
경사진면절삭 Inclined Cutting

## 측면절삭 Side Cutting

| 피삭재 Material | 공구강/금형강 Tool steels / Mold steels | | | | 프리하든강 Prehardened Steels | | | | 고경도강 Hardened Steels | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.4 | 42,500 | 236 | 0.4 | 0.01 | 38,250 | 212 | 0.2 | 0.01 | 34,000 | 127 | 0.20 | 0.01 |
| ø 0.5 | 42,500 | 261 | 0.5 | 0.015 | 38,250 | 235 | 0.25 | 0.01 | 34,000 | 141 | 0.25 | 0.01 |
| ø 0.6 | 42,500 | 263 | 0.6 | 0.018 | 38,250 | 236 | 0.30 | 0.012 | 34,000 | 142 | 0.30 | 0.012 |
| ø 0.8 | 42,500 | 427 | 0.8 | 0.024 | 34,000 | 384 | 0.40 | 0.016 | 25,500 | 231 | 0.40 | 0.016 |
| ø 1 | 40,800 | 833 | 1 | 0.03 | 32,300 | 750 | 0.50 | 0.02 | 21,675 | 450 | 0.50 | 0.02 |
| ø 2 | 28,305 | 1,224 | 2 | 0.06 | 22,100 | 1,102 | 1.00 | 0.04 | 14,875 | 661 | 1.00 | 0.04 |
| ø 3 | 18,530 | 1,250 | 3 | 0.09 | 14,705 | 1,125 | 1.50 | 0.06 | 9,775 | 675 | 1.50 | 0.06 |
| ø 4 | 14,195 | 1,275 | 4 | 0.12 | 11,220 | 1,148 | 2.00 | 0.08 | 7,480 | 689 | 2.00 | 0.08 |
| ø 5 | 13,345 | 1,479 | 5 | 0.15 | 10,625 | 1,331 | 2.50 | 0.1 | 7,055 | 799 | 2.50 | 0.1 |
| ø 6 | 11,135 | 1,377 | 6 | 0.18 | 8,798 | 1,239 | 3.00 | 0.12 | 5,865 | 744 | 3.00 | 0.12 |
| ø 8 | 8,398 | 1,346 | 8 | 0.24 | 6,630 | 1,212 | 4.00 | 0.16 | 4,420 | 727 | 4.00 | 0.16 |
| ø 10 | 6,630 | 1,224 | 10 | 0.3 | 5,228 | 1,102 | 5.00 | 0.2 | 3,485 | 661 | 5.00 | 0.2 |
| ø 12 | 5,653 | 1,200 | 12 | 0.36 | 4,463 | 1,100 | 6.00 | 0.24 | 2,975 | 635 | 6.00 | 0.24 |

절입량 Depth of Cut

~ 40HRC



40HRC ~



- HRC52 이상인 경우 같은 직경의 같은 비율로 20% DOWN 시켜 주십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 상기 절삭조건표는 2날 기준이며, 4날시 회전수는 유지하고, 피드는 안정적인 속도 내에서 최대 30%까지 UP 해주십시오.
- 홈 절삭시 날경의 코너R 대비 Ae 값을 설정 하십시오.
- 상기 절삭조건은 참고 수치이며 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 피 삭재와 절삭 형상을 위한 적절한 쿨런트 사용과 가공시 발열, 발화에 주의 하십시오.

- When milling workpiece is over HRC 52 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.
- The parameters on the table is based on 2 flutes. For using 4 flutes, use the same RPM and raise up the feed up to 30% in stable milling condition.
- For groove milling, set up the Ae value by considering of corner radius value.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use the adequate coolant for work material and machining geometry and note for heat and ignition.

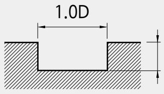
# 3&4ROUG Cutting Condition

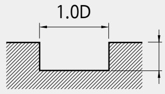
• RPM : rev./min • Feed : mm/min

## 홈절삭 Slotting

| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | | | 구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels /Gray cast iron SS / SC / FC | | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~ 200HB | | | | ~ 30HRc | | | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPMFEED | | Ap Axial Depth | Ae Radial Depth |
| ø 4 | 3,870 | 395 | 4 | 4 | 3,251 | 191 | 4 | 4 | 2,786 | 170 | 4 | 4 | 2,167 | 111 | 3.2 | 4 |
| ø 5 | 3,870 | 395 | 5 | 5 | 3,251 | 218 | 5 | 5 | 2,477 | 195 | 5 | 5 | 1,858 | 127 | 4 | 5 |
| ø 6 | 3,251 | 395 | 6 | 6 | 2,786 | 254 | 6 | 6 | 2,167 | 227 | 6 | 6 | 1,625 | 148 | 4.8 | 6 |
| ø 8 | 2,477 | 395 | 8 | 8 | 2,090 | 305 | 8 | 8 | 1,625 | 273 | 8 | 8 | 1,238 | 177 | 6.4 | 8 |
| ø 10 | 2,012 | 395 | 10 | 10 | 1,703 | 343 | 10 | 10 | 1,238 | 307 | 10 | 10 | 1,006 | 199 | 8 | 10 |
| ø 12 | 1,625 | 395 | 12 | 12 | 1,393 | 300 | 12 | 12 | 1,084 | 268 | 12 | 12 | 851 | 174 | 9.6 | 12 |
| ø 16 | 1,238 | 395 | 16 | 16 | 1,084 | 276 | 16 | 16 | 774 | 246 | 16 | 16 | 619 | 160 | 12.8 | 16 |
| ø 20 | 1,006 | 372 | 20 | 20 | 851 | 254 | 20 | 20 | 619 | 227 | 20 | 20 | 495 | 148 | 16 | 20 |

절입량 Depth of Cut

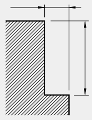
~ 38HRC


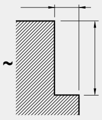

38HRC ~



## 측면절삭 Side Cutting

| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | | | 구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels /Gray cast iron SS / SC / FC | | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~ 200HB | | | | ~ 30HRc | | | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 4 | 4,300 | 439 | 6 | 2 | 3,612 | 280 | 6 | 2 | 3,096 | 194 | 6 | 2 | 2,408 | 140 | 4 | 1.2 |
| ø 5 | 4,300 | 439 | 7.5 | 2.5 | 3,612 | 290 | 7.5 | 2.5 | 2,752 | 215 | 7.5 | 2.5 | 2,064 | 161 | 5 | 1.5 |
| ø 6 | 3,612 | 439 | 9 | 3 | 3,096 | 312 | 9 | 3 | 2,408 | 237 | 9 | 3 | 1,806 | 183 | 6 | 1.8 |
| ø 8 | 2,752 | 439 | 12 | 4 | 2,322 | 355 | 12 | 4 | 1,806 | 269 | 12 | 4 | 1,376 | 204 | 8 | 2.4 |
| ø 10 | 2,236 | 439 | 15 | 5 | 1,892 | 371 | 15 | 5 | 1,376 | 280 | 15 | 5 | 1,118 | 226 | 10 | 3 |
| ø 12 | 1,806 | 439 | 18 | 6 | 1,548 | 387 | 18 | 6 | 1,204 | 290 | 18 | 6 | 946 | 231 | 12 | 3.6 |
| ø 16 | 1,376 | 439 | 24 | 8 | 1,204 | 414 | 24 | 8 | 860 | 312 | 24 | 8 | 688 | 237 | 16 | 4.8 |
| ø 20 | 1,118 | 413 | 30 | 10 | 946 | 403 | 30 | 10 | 688 | 301 | 30 | 10 | 550 | 226 | 20 | 6 |

절입량 Depth of Cut

~ 38HRC



38HRC ~



- 가능한 공구 길이 측정시 유압식 측정이 아닌 레이저식 도구 세터를 사용 하십시오.
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우, 진동이 발생할시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.
- 스테인레스, 내열합금강 등의 절단 가공시 수용성 절삭유가 가장 효과적 입니다.

- Use laser tool measurement instead of hydraulic measurement when measuring tool length as possible.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.
- For stainless and heat resistant alloy, water-soluble oil is the most effective.

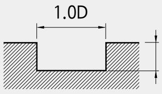
# 3&4HROUG Cutting Condition

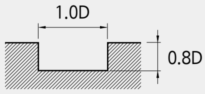
• RPM : rev./min • Feed : mm/min

## 홈절삭 Slotting

| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | | | 구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels /Gray cast iron SS / SC / FC | | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels / Stainless Steels NAK80 / KP4M / SUS304 / SUS316 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~ 200HB | | | | ~ 30HRc | | | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 4 | 4,698 | 486 | 4 | 4 | 3,888 | 243 | 4 | 4 | 3,321 | 162 | 4 | 4 | 2,592 | 122 | 3.2 | 4 |
| ø 5 | 4,698 | 486 | 5 | 5 | 3,888 | 251 | 5 | 5 | 2,997 | 186 | 5 | 5 | 2,268 | 138 | 4 | 5 |
| ø 6 | 3,888 | 486 | 6 | 6 | 3,402 | 267 | 6 | 6 | 2,592 | 203 | 6 | 6 | 1,944 | 162 | 4.8 | 6 |
| ø 8 | 2,997 | 486 | 8 | 8 | 2,511 | 307 | 8 | 8 | 1,944 | 235 | 8 | 8 | 1,458 | 178 | 6.4 | 8 |
| ø 10 | 2,430 | 486 | 10 | 10 | 2,025 | 324 | 10 | 10 | 1,458 | 243 | 10 | 10 | 1,215 | 203 | 8 | 10 |
| ø 12 | 1,944 | 486 | 12 | 12 | 1,701 | 332 | 12 | 12 | 1,296 | 251 | 12 | 12 | 1,053 | 203 | 9.6 | 12 |
| ø 16 | 1,499 | 486 | 16 | 16 | 1,296 | 356 | 16 | 16 | 972 | 267 | 16 | 16 | 810 | 203 | 12.8 | 16 |
| ø 20 | 1,215 | 446 | 20 | 20 | 1,053 | 348 | 20 | 20 | 729 | 259 | 20 | 20 | 608 | 194 | 16 | 20 |

절입량 Depth of Cut

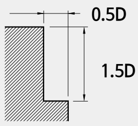
~ 38HRC 

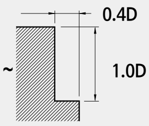

38HRC ~ 


## 측면절삭 Side Cutting

| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | | | 구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels /Gray cast iron SS / SC / FC | | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels / Stainless Steels NAK80 / KP4M / SUS304 / SUS316 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~ 200HB | | | | ~ 30HRc | | | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 4 | 5,220 | 540 | 6 | 2 | 4,320 | 270 | 6 | 2 | 3,690 | 180 | 6 | 2 | 2,880 | 135 | 4 | 1.6 |
| ø 5 | 5,220 | 540 | 7.5 | 2.5 | 4,320 | 279 | 7.5 | 2.5 | 3,330 | 207 | 7.5 | 2.5 | 2,520 | 153 | 5 | 2 |
| ø 6 | 4,320 | 540 | 9 | 3 | 3,780 | 297 | 9 | 3 | 2,880 | 225 | 9 | 3 | 2,160 | 180 | 6 | 2.4 |
| ø 8 | 3,330 | 540 | 12 | 4 | 2,790 | 342 | 12 | 4 | 2,160 | 261 | 12 | 4 | 1,620 | 198 | 8 | 3.2 |
| ø 10 | 2,700 | 540 | 15 | 5 | 2,250 | 360 | 15 | 5 | 1,620 | 270 | 15 | 5 | 1,350 | 225 | 10 | 4 |
| ø 12 | 2,160 | 540 | 18 | 6 | 1,890 | 369 | 18 | 6 | 1,440 | 279 | 18 | 6 | 1,170 | 225 | 12 | 4.8 |
| ø 16 | 1,665 | 540 | 24 | 8 | 1,440 | 396 | 24 | 8 | 1,080 | 297 | 24 | 8 | 900 | 225 | 16 | 6.4 |
| ø 20 | 1,350 | 495 | 30 | 10 | 1,170 | 387 | 30 | 10 | 810 | 288 | 30 | 10 | 675 | 216 | 20 | 8 |

절입량 Depth of Cut

~ 38HRC 


38HRC ~ 


- 가능한 공구 길이 측정시 유압식 측정이 아닌 레이저식 도구 세터를 사용 하십시오.
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우, 진동이 발생할시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.
- 스테인레스, 내열합금강 등의 절단 가공시 수용성 절삭유가 가장 효과적 입니다.

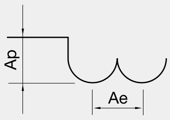
- Use laser tool measurement instead of hydraulic measurement when measuring tool length as possible.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.
- For stainless and heat resistant alloy, water-soluble oil is the most effective.

## 4VSB Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 구조용강/탄소강/회주철 Structural steel / Carbon Steels /Gray cast iron SS/SC/FC | | | | 공구강/금형강 Tool steels / Mold steels SCM/HPM | | | | 티타늄 합금강 Titanium alloy steels Ti6A | | | | 내열합금강 Heat Resistance Alloy | | | | 스테인레스강 Stainless Steels SUS304/SUS316 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ~30HRc | | | | 30 ~ 40HRc | | | | - | | | | - | | | | - | | | |
| 반경 (Radius) | RPM | FEED | Ap Axial | Ae Radial | RPM | FEED | Ap Axial | Ae Radial | RPM | FEED | Ap Axial | Ae Radial | RPM | FEED | Ap Axial | Ae Radial | RPM | FEED | Ap Axial | Ae Radial |
| 0.5R | 44,500 | 1,000 | 1.00 | 0.50 | 37,825 | 750 | 1.00 | 0.50 | 16,000 | 600 | 0.30 | 0.50 | 9,550 | 110 | 0.30 | 0.20 | 25,500 | 1,000 | 1.00 | 0.50 |
| 0.6R | 37,150 | 1,250 | 1.20 | 0.60 | 31,578 | 938 | 1.20 | 0.60 | 13,200 | 600 | 0.36 | 0.60 | 8,000 | 100 | 0.36 | 0.24 | 21,000 | 850 | 1.20 | 0.60 |
| 0.75R | 29.720 | 1,300 | 1.50 | 0.75 | 25,262 | 975 | 1.50 | 0.75 | 10,600 | 600 | 0.45 | 0.75 | 6,300 | 80 | 0.45 | 0.30 | 17,000 | 700 | 1.50 | 0.75 |
| 1R | 22.300 | 1,540 | 2.00 | 1.00 | 18,955 | 1,155 | 2.00 | 1.00 | 8,000 | 480 | 0.60 | 1.00 | 3,180 | 120 | 0.60 | 0.40 | 12,800 | 760 | 2.00 | 1.00 |
| 1.25R | 17.800 | 1,650 | 2.50 | 1.25 | 15,130 | 1,238 | 2.50 | 1.25 | 6,400 | 380 | 0.75 | 1.25 | 2,500 | 100 | 0.75 | 0.50 | 10,000 | 600 | 2.50 | 1.25 |
| 1.5R | 14.860 | 1,740 | 3.00 | 1.00 | 12,631 | 1,305 | 3.00 | 1.50 | 5,300 | 420 | 0.90 | 1.50 | 2,120 | 90 | 0.90 | 0.60 | 8,500 | 780 | 3.00 | 1.50 |
| 2R | 11,150 | 1,624 | 4.00 | 2.00 | 9,478 | 1,218 | 4.00 | 2.00 | 4,000 | 300 | 1.20 | 2.00 | 1,590 | 100 | 1.20 | 0.80 | 6,370 | 640 | 4.00 | 2.00 |
| 2.5R | 8,910 | 1,552 | 5.00 | 2.50 | 7,574 | 1,164 | 5.00 | 2.50 | 3,200 | 300 | 1.50 | 2.50 | 1,270 | 90 | 1.50 | 1.00 | 5,100 | 710 | 5.00 | 2.50 |
| 3R | 7,430 | 1,450 | 6.00 | 3.00 | 6,316 | 1,088 | 6.00 | 3.00 | 2,650 | 300 | 1.80 | 3.00 | 1,000 | 85 | 1.80 | 1.20 | 4,250 | 680 | 6.00 | 3.00 |
| 4R | 5,500 | 1,305 | 8.00 | 4.00 | 4,675 | 979 | 8.00 | 4.00 | 2,000 | 240 | 2.40 | 4.00 | 800 | 70 | 2.40 | 1.60 | 3,190 | 580 | 8.00 | 4.00 |
| 5R | 4,460 | 1,160 | 10.00 | 5.00 | 3,791 | 870 | 10.00 | 5.00 | 1,600 | 230 | 3.00 | 5.00 | 630 | 60 | 3.00 | 2.00 | 2,550 | 500 | 10.00 | 5.00 |
| 6R | 3,710 | 1,088 | 12.00 | 6.00 | 3,154 | 816 | 12.00 | 6.00 | 1,320 | 240 | 3.60 | 6.00 | 530 | 55 | 3.60 | 2.40 | 2,120 | 470 | 12.00 | 6.00 |
| 8R | 2,790 | 885 | 16.00 | 8.00 | 2,372 | 663 | 16.00 | 8.00 | 1,000 | 200 | 4.80 | 8.00 | 400 | 45 | 4.80 | 3.20 | 1,600 | 390 | 16.00 | 8.00 |
| 10R | 2,230 | 725 | 20.00 | 10.00 | 1,896 | 544 | 20.00 | 10.00 | 800 | 170 | 6.00 | 10.00 | 300 | 40 | 6.00 | 4.00 | 1,280 | 320 | 20.00 | 10.00 |
| 12.5R | 1,780 | 624 | 25.00 | 12.50 | 1,513 | 468 | 25.00 | 12.50 | 630 | 150 | 7.50 | 12.50 | 255 | 35 | 7.50 | 5.00 | 1,000 | 260 | 25.00 | 12.50 |

절입 기준 Depth of Cut




Ap : Axial Depth 축 방향의 절입 깊이(mm)
Ae : Radial Depth 반경 방향의 절입 깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전 속도 ($min^{-1}$)
Vf : Feed 이송 속도 (mm/min)

- 가공 진입시 가능 한 피삭재 밖에서 진입 하십시오.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상 , 가공 목적, 적용 기계에 따라 조건 변경 요망 합니다.
- 적용 기계의 회전속도가 부족한 경우에는 회전 속도와 이송속도를 같은 비율로 줄여서 적용합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망합니다 ( Ø 1 이하 사용시 진동 허용 관리 5㎛이내일것)
- 원활한 칩배출을 위하여 에어브로 혹은 미스트 쿨런트 사용을 추천합니다.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity(1 or less, the vibration tolerance management should be within 5㎛)
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

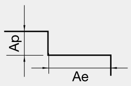
## 3&4VROU Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels /Gray cast irons SS / SC / FC | | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강/프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M | | | | 고경도강 Hardened Steels STAVAX/SKD11 | | | | 스테인레스강 Stainless Steels SUS304 / SUS316 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ~30HRc | | | | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | | - | | | |
| 외경 mm Outside Diameter | RPM | FEED | Ap Axial Depth | AE Radial Depth | RPM | FEED | Ap Axial Depth | AE Radial Depth | RPM | FEED | Ap Axial Depth | AE Radial Depth | RPM | FEED | Ap Axial Depth | AE Radial Depth | RPM | FEED | Ap Axial Depth | AE Radial Depth |
| Ø3 | 16,000 | 2,000 | 4.5 | 0.9 | 13,500 | 800 | 4.5 | 0.9 | 5,000 | 230 | 3.00 | 0.15 | 4,000 | 180 | 3.00 | 0.15 | 10,000 | 550 | 4.5 | 0.9 |
| Ø6 | 15,000 | 2,200 | 9.0 | 1.8 | 12,000 | 850 | 9.0 | 1.8 | 3,500 | 250 | 6.00 | 0.30 | 2,800 | 180 | 6.00 | 0.30 | 8,500 | 600 | 9.0 | 1.8 |
| Ø8 | 13,500 | 2,200 | 12.0 | 2.4 | 9,500 | 800 | 12.0 | 2.4 | 2,800 | 250 | 8.00 | 0.40 | 2,200 | 180 | 8.00 | 0.40 | 6,500 | 550 | 12.0 | 2.4 |
| Ø10 | 9,000 | 2,200 | 15.0 | 3.0 | 8,000 | 800 | 15.0 | 3.0 | 2,300 | 250 | 10.00 | 0.50 | 1,600 | 180 | 10.00 | 0.50 | 5,500 | 550 | 15.0 | 3.0 |
| Ø12 | 8,000 | 2,300 | 18.0 | 3.6 | 7,000 | 800 | 18.0 | 3.6 | 2,000 | 250 | 12.00 | 0.60 | 1,350 | 180 | 12.00 | 0.60 | 4,500 | 550 | 18.0 | 3.6 |
| Ø14 | 7,000 | 2,300 | 21.0 | 4.2 | 5,600 | 800 | 21.0 | 4.2 | 1,750 | 200 | 14.00 | 0.70 | 950 | 150 | 14.00 | 0.70 | 4,000 | 550 | 21.0 | 4.2 |
| Ø16 | 6,500 | 2,300 | 24.0 | 4.8 | 5,000 | 800 | 24.0 | 4.8 | 1,400 | 180 | 16.00 | 0.80 | 900 | 100 | 16.00 | 0.80 | 3,500 | 500 | 24.0 | 4.8 |
| Ø18 | 5,000 | 2,300 | 27.0 | 5.4 | 4,500 | 750 | 27.0 | 5.4 | 1,200 | 150 | 18.00 | 0.90 | 800 | 100 | 18.00 | 0.90 | 2,800 | 400 | 27.0 | 5.4 |
| Ø20 | 4,600 | 2,200 | 30.0 | 6.0 | 4,000 | 550 | 30.0 | 6.0 | 1,100 | 150 | 20.00 | 1.00 | 700 | 100 | 20.00 | 1.00 | 2,500 | 350 | 30.0 | 6.0 |

절입 기준 Depth of Cut

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




- 가공 진입시 가능 한 피삭재 밖에서 진입 하십시오.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오
- 상기 절삭 조건의 참고는 수치이므로, 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망합니다 ( Ø 1 이하 사용시 진동 허용 관리 5㎛이내일것)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공 시의 발열과 발화에 주의하십시오.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity(1 or less, the vibration tolerance management should be within 5㎛)
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

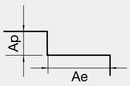
# 4VSE/4VCC/4VSC Cutting Condition

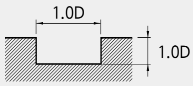
• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels /Gray cast irons SS / SC / FC | | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 티타늄 합금강 Titanium alloy steels Ti6A | | | | 내열 합금강 Heat Resistance Alloys | | | | 스테인레스강 Stainless Steels SUS304 / SUS316 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ~30HRc | | | | 30 ~ 40HRc | | | | - | | | | - | | | | - | | | |
| 외경 mm Outside Diameter | RPM | FEED | Ap Axial | Ae Radial | RPM | FEED | Ap Axial | Ae Radial | RPM | FEED | Ap Axial | Ae Radial | RPM | FEED | Ap Axial | Ae Radial | RPM | FEED | Ap Axial | Ae Radial |
| Ø1 | 41,400 | 800 | 1.50 | 0.50 | 38,000 | 690 | 1.50 | 0.50 | 22,920 | 150 | 1.00 | 0.30 | 10,800 | 100 | 1.00 | 0.20 | 31,900 | 380 | 1.50 | 0.35 |
| Ø1.2 | 34,500 | 700 | 3.00 | 0.60 | 32,000 | 600 | 1.80 | 0.60 | 19,104 | 120 | 1.20 | 0.36 | 8,951 | 80 | 1.20 | 0.24 | 26,500 | 300 | 1.80 | 0.42 |
| Ø1.5 | 27,600 | 550 | 2.25 | 0.75 | 25,600 | 450 | 2.25 | 0.75 | 15,360 | 100 | 1.50 | 0.45 | 7,155 | 65 | 1.50 | 0.30 | 21,200 | 250 | 2.25 | 0.53 |
| Ø2 | 20,700 | 400 | 3.00 | 1.00 | 19,100 | 330 | 3.00 | 1.00 | 11,460 | 80 | 2.00 | 0.60 | 5,400 | 65 | 2.00 | 0.40 | 15,600 | 200 | 3.00 | 0.70 |
| Ø2.5 | 16,500 | 330 | 3.75 | 1.25 | 15,300 | 270 | 3.75 | 1.25 | 9,120 | 70 | 2.50 | 0.75 | 4,293 | 50 | 2.50 | 0.50 | 12,800 | 150 | 3.75 | 0.88 |
| Ø3 | 13,800 | 330 | 4.50 | 1.50 | 12,740 | 240 | 4.50 | 1.50 | 7,644 | 100 | 3.00 | 0.90 | 3,578 | 50 | 3.00 | 0.60 | 10,600 | 210 | 4.50 | 1.05 |
| Ø4 | 10,350 | 410 | 6.00 | 2.00 | 9,560 | 405 | 6.00 | 2.00 | 5,736 | 160 | 4.00 | 1.20 | 2,700 | 40 | 4.00 | 0.80 | 8,000 | 150 | 6.00 | 1.40 |
| Ø5 | 8,280 | 430 | 7.50 | 2.50 | 7,600 | 450 | 7.50 | 2.50 | 4,584 | 230 | 5.00 | 1.50 | 2,160 | 60 | 5.00 | 1.00 | 6,380 | 250 | 7.50 | 1.75 |
| Ø6 | 6,900 | 550 | 9.00 | 3.00 | 6,400 | 450 | 9.00 | 3.00 | 3,840 | 250 | 6.00 | 1.80 | 1,782 | 116 | 6.00 | 1.20 | 5,300 | 420 | 9.00 | 2.10 |
| Ø8 | 5,180 | 600 | 12.00 | 4.00 | 4,780 | 420 | 12.00 | 4.00 | 2,868 | 320 | 8.00 | 2.40 | 1,350 | 116 | 8.00 | 1.60 | 4,000 | 180 | 12.00 | 2.80 |
| Ø10 | 4,140 | 780 | 15.00 | 5.00 | 4,140 | 600 | 15.00 | 5.00 | 2,400 | 380 | 10.00 | 3.00 | 1,080 | 131 | 10.00 | 2.00 | 3,180 | 510 | 15.00 | 3.50 |
| Ø12 | 3,450 | 800 | 18.00 | 6.00 | 3,440 | 600 | 18.00 | 6.00 | 1,920 | 400 | 12.00 | 3.60 | 891 | 145 | 12.00 | 2.40 | 2,650 | 530 | 18.00 | 4.20 |
| Ø16 | 2,600 | 700 | 24.00 | 8.00 | 2,600 | 600 | 24.00 | 8.00 | 1,440 | 350 | 16.00 | 4.80 | 675 | 131 | 16.00 | 3.20 | 2,000 | 400 | 24.00 | 5.60 |
| Ø20 | 2,000 | 700 | 30.00 | 10.00 | 2,000 | 540 | 30.00 | 10.00 | 1,200 | 320 | 20.00 | 6.00 | 540 | 116 | 20.00 | 4.00 | 1,600 | 320 | 30.00 | 7.00 |

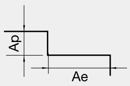
절입 기준 Depth of Cut

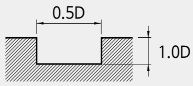
Side Milling
• Ap : Axial Depth
• Ae : Radial Depth

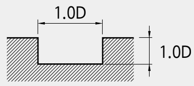



Side Milling
• Ap : Axial Depth
• Ae : Radial Depth




- 가공 진입시 가능 한 피삭재 밖에서 진입 하십시오.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상 , 가공 목적, 적용 기계에 따라 조건 변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망합니다 ( Ø 1 이하 사용시 진동 허용 관리 5㎛이내일것)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의하십시오.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- The edge the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity(1 or less, the vibration tolerance management should be within 5㎛)
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

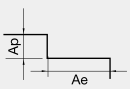
# 6VSE/6VSC Cutting Condition

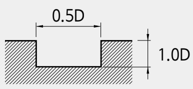
• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels /Gray cast irons SS / SC / FC | | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 티타늄 합금강 Titanium alloy steels Ti6A | | | | 내열 합금강 Heat Resistance Alloys | | | | 스테인레스강 Stainless Steels SUS304 / SUS316 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ~30HRc | | | | 30 ~ 40HRc | | | | - | | | | - | | | | - | | | |
| 외경 mm Outside Diameter | RPM | FEED | Ap Axial Depth | AE Radial Depth | RPM | FEED | Ap Axial Depth | AE Radial Depth | RPM | FEED | Ap Axial Depth | AE Radial Depth | RPM | FEED | Ap Axial Depth | AE Radial Depth | RPM | FEED | Ap Axial Depth | AE Radial Depth |
| Ø3 | 21,000 | 5,200 | 6.0 | 0.20 | 18,500 | 2,000 | 6.0 | 0.20 | 7,400 | 900 | 4.5 | 0.2 | 2,860 | 280 | 4.5 | 0.2 | 5,600 | 1,350 | 6.0 | 0.20 |
| Ø4 | 18,000 | 5,750 | 8.0 | 0.20 | 16,000 | 2,410 | 8.0 | 0.20 | 6,850 | 930 | 6.0 | 0.2 | 2,100 | 300 | 6.0 | 0.2 | 5,950 | 1,650 | 8.0 | 0.20 |
| Ø5 | 15,200 | 6,100 | 10.0 | 0.30 | 13,500 | 2,850 | 10.0 | 0.30 | 6,100 | 1,050 | 7.5 | 0.3 | 1,850 | 360 | 7.5 | 0.3 | 6,300 | 1,800 | 10.0 | 0.30 |
| Ø6 | 14,500 | 6,300 | 12.0 | 0.30 | 12,000 | 3,100 | 12.0 | 0.30 | 5,800 | 1,150 | 9.0 | 0.3 | 1,700 | 385 | 9.0 | 0.3 | 6,800 | 2,000 | 12.0 | 0.30 |
| Ø8 | 12,000 | 8,150 | 14.0 | 0.40 | 8,500 | 3,900 | 14.0 | 0.40 | 4,350 | 1,350 | 10.5 | 0.4 | 1,450 | 420 | 10.5 | 0.4 | 5,400 | 2,300 | 14.0 | 0.40 |
| Ø10 | 9,500 | 7,950 | 20.0 | 0.50 | 7,250 | 4,100 | 20.0 | 0.50 | 3,400 | 1,500 | 15.0 | 0.5 | 1,000 | 460 | 15.0 | 0.5 | 4,850 | 2,400 | 20.0 | 0.50 |
| Ø12 | 8,200 | 7,800 | 24.0 | 0.60 | 5,900 | 4,250 | 24.0 | 0.60 | 2,850 | 1,650 | 18.0 | 0.6 | 900 | 490 | 18.0 | 0.6 | 3,900 | 2,600 | 24.0 | 0.60 |
| Ø16 | 6,200 | 6,800 | 32.0 | 0.80 | 4,250 | 3,950 | 32.0 | 0.80 | 2,450 | 1,350 | 24.0 | 0.8 | 750 | 400 | 24.0 | 0.8 | 2,800 | 2,000 | 32.0 | 0.80 |
| Ø20 | 4,850 | 6,650 | 40.0 | 1.00 | 3,650 | 3,650 | 40.0 | 1.00 | 1,950 | 1,200 | 30.0 | 1.0 | 580 | 360 | 30.0 | 1.0 | 2,650 | 1,700 | 40.0 | 1.00 |

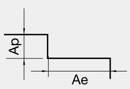
절입 기준 Depth of Cut

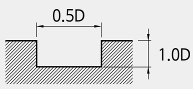
Side Milling
• Ap : Axial Depth
• Ae : Radial Depth

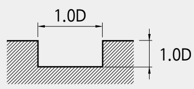



Side Milling
• Ap : Axial Depth
• Ae : Radial Depth



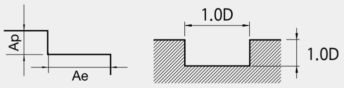
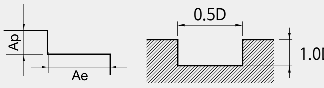
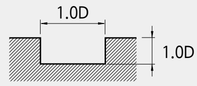




- 가공 진입시 가능 한 피삭재 밖에서 진입 하십시오.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상 , 가공 목적, 적용 기계에 따라 조건 변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망합니다 ( Ø 1 이하 사용시 진동 허용 관리 5㎛이내일것)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의하십시오.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- The edge the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity(1 or less, the vibration tolerance management should be within 5㎛)
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

# 5VCC Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels /Gray cast irons SS / SC / FC | | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 티타늄 합금강 Titanium alloy steels Ti6A | | | | 내열 합금강 Heat Resistance Alloys | | | | 스테인레스강 Stainless Steels SUS304 / SUS316 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ~30HRc | | | | 30 ~ 40HRc | | | | - | | | | - | | | | - | | | |
| 외경 mm Outside Diameter | RPM | FEED | Ap Axial Depth | AE Radial Depth | RPM | FEED | Ap Axial Depth | AE Radial Depth | RPM | FEED | Ap Axial Depth | AE Radial Depth | RPM | FEED | Ap Axial Depth | AE Radial Depth | RPM | FEED | Ap Axial Depth | AE Radial Depth |
| Ø6 | 12,000 | 3,025 | 9.0 | 0.3 | 8,000 | 2,020 | 9.0 | 3.0 | 5,180 | 525 | 6.00 | 1.80 | 1,890 | 186 | 6.00 | 1.20 | 5,930 | 1,600 | 9.0 | 2.10 |
| Ø8 | 9,000 | 3,300 | 12.0 | 0.4 | 5,900 | 2,300 | 12.0 | 4.0 | 3,800 | 670 | 8.00 | 2.40 | 1,430 | 186 | 8.00 | 1.60 | 4,480 | 1,820 | 12.0 | 2.80 |
| Ø10 | 7,200 | 4,290 | 15.0 | 0.5 | 5,100 | 2,700 | 15.0 | 5.0 | 3,240 | 800 | 10.00 | 3.00 | 1,145 | 209 | 10.00 | 2.00 | 3,560 | 1,940 | 15.0 | 3.50 |
| Ø12 | 6,000 | 4,400 | 18.0 | 0.6 | 4,300 | 2,700 | 18.0 | 6.0 | 2,590 | 840 | 12.00 | 3.60 | 945 | 230 | 12.00 | 2.40 | 2,970 | 2,000 | 18.0 | 4.20 |
| Ø14 | 8,300 | 4,150 | 21.0 | 0.7 | 3,840 | 2,700 | 21.0 | 7.0 | 2,300 | 790 | 14.00 | 4.20 | 820 | 220 | 14.00 | 2.80 | 2,540 | 1,780 | 21.0 | 4.90 |
| Ø16 | 4,500 | 3,850 | 24.0 | 0.8 | 3,250 | 2,700 | 24.0 | 8.0 | 1,900 | 735 | 16.00 | 4.80 | 715 | 210 | 16.00 | 3.20 | 2,240 | 1,520 | 24.0 | 5.60 |
| Ø18 | 3,950 | 3,850 | 27.0 | 0.9 | 2,860 | 2,560 | 27.0 | 9.0 | 1,750 | 700 | 18.00 | 5.40 | 630 | 195 | 18.00 | 3.60 | 2,010 | 1,350 | 27.0 | 6.30 |
| Ø20 | 3,480 | 3,850 | 30.0 | 1.0 | 2,500 | 2,430 | 30.0 | 10.0 | 1,620 | 670 | 20.00 | 6.00 | 570 | 185 | 20.00 | 4.00 | 1,800 | 1,220 | 30.0 | 7.00 |
| 절입 기준 Depth of Cut | Side Milling • Ap : Axial Depth • Ae : Radial Depth  | | | | | | | | Side Milling • Ap : Axial Depth • Ae : Radial Depth  | | | | | | | |  | | | |





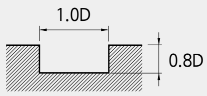


- 가공 진입시 가능 한 피삭재 밖에서 진입 하십시오.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오
- 날 경의 코너C 대비 Ae 값을 설정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상 , 가공 목적, 적용 기계에 따라 조건 변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망합니다 ( Ø 1 이하 사용시 진동 허용 관리 5㎛이내일것)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공 시의 발열과 발화에 주의하십시오.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- Set ae figure considering Corner C figure of diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity(1 or less, the vibration tolerance management should be within 5㎛)
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

# 4SLE Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M 40~45HRC | | | | 스테인레스강 / 티타늄 합금강 Stainless Steels / Titanium alloy steels SUS304 / SUS316 / Ti6A | | | | 내열합금강 Heat Resistance Alloys | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 40 ~ 45HRc | | | | - | | | | - | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 3 | 13,270 | 740 | 2.4 | 3.0 | 5,840 | 260 | 2.4 | 3.0 | 3,185 | 115 | 2.4 | 3.0 |
| ø 4 | 9,950 | 710 | 3.2 | 4.0 | 4,380 | 245 | 3.2 | 4.0 | 2,390 | 115 | 3.2 | 4.0 |
| ø 6 | 6,630 | 720 | 4.8 | 6.0 | 2,920 | 245 | 4.8 | 6.0 | 1,590 | 115 | 4.8 | 6.0 |
| ø 8 | 4,970 | 800 | 6.4 | 8.0 | 2,190 | 245 | 6.4 | 8.0 | 1,190 | 115 | 6.4 | 8.0 |
| ø 10 | 3,980 | 800 | 8.0 | 10.0 | 1,750 | 245 | 8.0 | 10.0 | 955 | 115 | 8.0 | 10.0 |
| ø 12 | 3,320 | 800 | 9.6 | 12.0 | 1,460 | 245 | 9.6 | 12.0 | 796 | 115 | 9.6 | 12.0 |
| ø 16 | 2,490 | 800 | 12.8 | 16.0 | 1,095 | 245 | 12.8 | 16.0 | 597 | 115 | 12.8 | 16.0 |
| ø 20 | 1,990 | 800 | 16.0 | 20.0 | 880 | 245 | 16.0 | 20.0 | 480 | 115 | 16.0 | 20.0 |
| 절입량 Depth of Cut |  | | | | | | | | | | | |

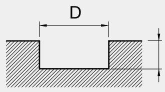
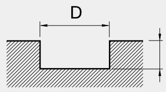
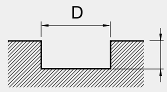


- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP & DOWN 하여 설정 하십시오.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- If the effective length is long, reduce the RPM and feed in the same proportion.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

## 7SUC Cutting Condition

• RPM : rev./min • Feed : mm/min

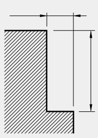
| 피삭재<br>Material | 합금강 / 프리하든강<br>Alloy Steels / Pre-hardened Steels<br>NAK80 / KP4M 40~45HRC | | | | 스테인레스강 / 티타늄 합금강<br>Stainless Steels / Titanium alloy steels<br>SUS304 / SUS316 / Ti6A | | | | 내열합금강<br>Heat Resistance Alloys | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 40 ~ 45HRc | | | | - | | | | - | | | |
| 외경<br>Outside Diameter | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth |
| ø 6 | 4,070 | 925 | 6 | 6 | 4,070 | 550 | 3 | 6 | 1,430 | 200 | 1.2 | 6 |
| ø 8 | 3,080 | 838 | 8 | 8 | 3,080 | 488 | 4 | 8 | 1,100 | 163 | 1.6 | 8 |
| ø 10 | 2,420 | 663 | 10 | 10 | 2,420 | 438 | 5 | 10 | 880 | 163 | 2 | 10 |
| ø 12 | 2,090 | 663 | 12 | 12 | 2,090 | 375 | 6 | 12 | 726 | 138 | 2.4 | 12 |
| ø 16 | 1,540 | 488 | 16 | 16 | 1,540 | 350 | 8 | 16 | 550 | 100 | 3.2 | 16 |
| ø 20 | 1,210 | 438 | 20 | 20 | 1,210 | 325 | 10 | 20 | 440 | 75 | 4 | 20 |
| 절입량<br>Depth of Cut |   ≦1D (MAX. 12mm) | | | |   ≦0.5D | | | |   ≦0.2D | | | |

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- If the effective length is long, reduce the RPM and feed in the same proportion.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

## 5&6TROE Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재<br>Material | 합금강 / 프리하든강<br>Alloy Steels / Pre-hardened Steels<br>NAK80 / KP4M | | | | 스테인레스강 / 티타늄 합금강<br>Stainless Steels / Titanium alloy steels<br>SUS304 / SUS316 / Ti6A | | | | 내열합금강<br>Heat Resistance Alloys | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 40 ~ 45HRc | | | | - | | | | - | | | |
| 외경<br>Outside Diameter | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth |
| ø 6 | 3,700 | 450 | 6 | 0.3 | 3,200 | 380 | 6 | 0.3 | 1,100 | 65 | 6 | 0.3 |
| ø 8 | 2,800 | 400 | 8 | 0.4 | 2,350 | 420 | 8 | 0.4 | 950 | 60 | 8 | 0.4 |
| ø 10 | 2,250 | 325 | 10 | 0.5 | 1,990 | 350 | 10 | 0.5 | 750 | 60 | 10 | 0.5 |
| ø 12 | 1,990 | 300 | 12 | 0.6 | 1,550 | 270 | 12 | 0.6 | 600 | 55 | 12 | 0.6 |
| ø 16 | 1,550 | 250 | 16 | 0.8 | 1,250 | 250 | 16 | 0.8 | 500 | 50 | 16 | 0.8 |
| ø 20 | 1,200 | 180 | 20 | 1 | 900 | 150 | 20 | 1 | 350 | 50 | 20 | 1 |
| 절입량<br>Depth of Cut |  ≦0.05D ≦1D | | | | | | | | | | | |

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

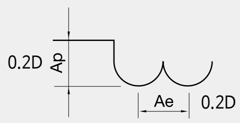
- If the effective length is long, reduce the RPM and feed in the same proportion.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

# 2GBE Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 흑연 Graphite | | | |
|---|---|---|---|---|---|
| 반경 Radius | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 0.25 | 5 | 25,000 | 320 | 0.10 | 0.10 |
| R 0.5 | 10 | 21,850 | 380 | 0.20 | 0.20 |
| 〃 | 20 | 19,665 | 342 | 0.18 | 0.18 |
| 〃 | 30 | 18,682 | 325 | 0.15 | 0.15 |
| R 0.75 | 10 | 21,850 | 646 | 0.30 | 0.30 |
| 〃 | 20 | 19,665 | 630 | 0.27 | 0.27 |
| 〃 | 30 | 18,682 | 580 | 0.23 | 0.23 |
| R 1 | 15 | 19,950 | 760 | 0.40 | 0.40 |
| 〃 | 20 | 17,955 | 684 | 0.36 | 0.36 |
| 〃 | 30 | 16,160 | 616 | 0.32 | 0.32 |
| 〃 | 40 | 13,736 | 523 | 0.26 | 0.26 |
| 〃 | 50 | 10,988 | 419 | 0.21 | 0.21 |
| R 1.5 | 20 | 17,575 | 1,378 | 0.60 | 0.60 |
| 〃 | 30 | 15,818 | 1,240 | 0.54 | 0.54 |
| 〃 | 40 | 14,236 | 1,116 | 0.49 | 0.49 |
| 〃 | 50 | 12,100 | 948 | 0.44 | 0.44 |
| R 2 | 20 | 15,200 | 1,995 | 0.80 | 0.80 |
| 〃 | 35 | 13,680 | 1,796 | 0.72 | 0.72 |
| 〃 | 45 | 12,312 | 1,616 | 0.61 | 0.61 |
| R 2.5 | 25 | 14,725 | 2,423 | 1.00 | 1.00 |
| 〃 | 50 | 11,780 | 1,938 | 0.80 | 0.80 |
| R 3 | 25 | 14,250 | 2,803 | 1.20 | 1.20 |
| R 4 | 30 | 12,350 | 2,850 | 1.60 | 1.60 |
| R 5 | - | 10,925 | 2,898 | 2.00 | 2.00 |
| R 6 | - | 9,975 | 2,993 | 2.40 | 2.40 |
| R 8 | - | 7,600 | 2,375 | 3.20 | 3.20 |
| R 10 | - | 6,175 | 1,900 | 4.00 | 4.00 |

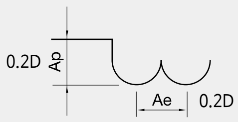
절입량 Depth of Cut




- 유효장이 긴 경우에는 회전수와 이송속도를 최대20% 이하로 줄이십시오.
- 절삭 조건표에 없는 유효장은 같은 직경과 비례하여 DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우, 진동이 발생할시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.

- In case of long effective length, reduce the RPM and feed by 20% or less.
- If the effective length of your tool does not show above the table, use the shorten effevtive length of parameter and reduce the parameters in the same proportion.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.

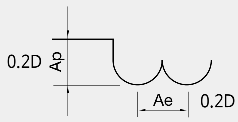
# 2TGB Cutting Condition

| 피삭재 Material | | 흑연 Graphite | | | | |
|---|---|---|---|---|---|---|
| 반경 Radius | 유효장 Effective Length | Angle θ | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 0.5 | 20 | 0°30 | 18,000 | 300 | 0.20 | 0.20 |
| 〃 | 30 | 0°30 | 17,100 | 285 | 0.18 | 0.18 |
| 〃 | 40 | 0°30 | 16,245 | 271 | 0.16 | 0.16 |
| 〃 | 25 | 1° | 16,740 | 279 | 0.20 | 0.20 |
| 〃 | 35 | 1° | 15,903 | 265 | 0.18 | 0.18 |
| 〃 | 50 | 1° | 15,108 | 252 | 0.16 | 0.16 |
| R 0.75 | 30 | 0°30 | 17,000 | 320 | 0.30 | 0.30 |
| 〃 | 40 | 0°30 | 16,150 | 304 | 0.28 | 0.28 |
| 〃 | 50 | 0°30 | 15,343 | 289 | 0.26 | 0.26 |
| 〃 | 30 | 1° | 15,300 | 288 | 0.30 | 0.30 |
| 〃 | 50 | 1° | 14,229 | 268 | 0.28 | 0.28 |
| 〃 | 60 | 1° | 13,233 | 249 | 0.26 | 0.26 |
| R 1 | 40 | 0°30 | 16,500 | 600 | 0.40 | 0.40 |
| 〃 | 50 | 0°30 | 14,850 | 540 | 0.36 | 0.36 |
| 〃 | 70 | 0°30 | 13,365 | 486 | 0.32 | 0.32 |
| 〃 | 60 | 1° | 12,029 | 437 | 0.36 | 0.36 |
| 〃 | 90 | 1° | 10,224 | 372 | 0.32 | 0.32 |
| R 2 | 70 | 0°30 | 13,500 | 1,600 | 0.80 | 0.80 |
| 〃 | 80 | 1° | 12,825 | 1,520 | 0.76 | 0.76 |
| R 3 | 100 | 0°30 | 11,000 | 2,200 | 1.20 | 1.20 |
| 〃 | 100 | 1° | 10,780 | 2,156 | 1.20 | 1.20 |
| R 5 | 83 | 0°30 | 9,600 | 2,250 | 2.00 | 2.00 |
| R 6 | 110 | 0°30 | 7,500 | 2,300 | 2.40 | 2.40 |
| 절입량 Depth of Cut | |  | | | | |



# 3TBD

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 흑연 Graphite | | | | |
|---|---|---|---|---|---|---|
| 반경 Radius | 유효장 Effective Length | Angle θ | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 0.5 | 20 | 0°30 | 18,900 | 360 | 0.20 | 0.20 |
| 〃 | 30 | 0°30 | 17,955 | 342 | 0.18 | 0.18 |
| 〃 | 40 | 0°30 | 17,057 | 325 | 0.16 | 0.16 |
| 〃 | 25 | 1° | 17,577 | 335 | 0.20 | 0.20 |
| 〃 | 35 | 1° | 16,698 | 318 | 0.18 | 0.18 |
| 〃 | 50 | 1° | 15,863 | 302 | 0.16 | 0.16 |
| R 0.75 | 30 | 0°30 | 17,850 | 384 | 0.30 | 0.30 |
| 〃 | 40 | 0°30 | 16,958 | 365 | 0.28 | 0.28 |
| 〃 | 50 | 0°30 | 16,110 | 347 | 0.26 | 0.26 |
| 〃 | 40 | 1° | 16,065 | 346 | 0.30 | 0.30 |
| 〃 | 50 | 1° | 14,940 | 321 | 0.28 | 0.28 |
| 〃 | 60 | 1° | 13,895 | 299 | 0.26 | 0.26 |
| R 1 | 40 | 0°30 | 17,325 | 720 | 0.40 | 0.40 |
| 〃 | 50 | 0°30 | 15,593 | 648 | 0.36 | 0.36 |
| 〃 | 60 | 0°30 | 14,702 | 559 | 0.32 | 0.32 |
| 〃 | 50 | 1° | 14,524 | 588 | 0.36 | 0.36 |
| 〃 | 60 | 1° | 12,630 | 525 | 0.32 | 0.32 |
| 〃 | 70 | 1° | 11,367 | 472 | 0.19 | 0.19 |
| R 2 | 80 | 0°30 | 13,466 | 1,824 | 0.80 | 0.80 |
| 〃 | 100 | 1° | 12,120 | 1,642 | 0.76 | 0.76 |
| 절입량 Depth of Cut | |  | | | | |



- 유효장이 긴 경우에는 회전수와 이송속도를 최대20% 이하로 줄이십시오.
- 절삭조건표에 없는 유효장은 같은 직경과 비례하여 DOWN 시켜주십시오.
- 절삭조건에 없는 각도는 같은 직경에 이전 각도와 비례하여 사용 하십시오.
- 이송속도 및 축 방향의 절입 깊이는 리브창과 테이퍼각에 따라 고려하시고, 절삭 상황에 맞추어 조정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우, 진동이 발생할시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.

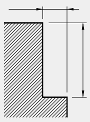
- In case of long effective length, reduce the RPM and feed by 20% or less.
- If the effective length of your tool does not show above the table, use the shorten effevtive length of parameter and reduce the parameters in the same proportion.
- If there is no parameter for the angle of your tool, refer to the previous angle, and adjust compare to it.
- Adjust the value of the feed and Ap based on the effective length and taper angle, and adjust the milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.

# 2GEM/4GEM/6GEM Cutting Condition

• RPM : rev./min • Feed : mm/min

| | 2GEM | | | | 4GEM | | | | 6GEM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 피삭재 Material | 흑연 Graphite | | | | 흑연 Graphite | | | | 흑연 Graphite | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 36,000 | 700 | 1.00 | 0.10 | - | - | - | - | - | - | - | - |
| ø 2 | 28,000 | 700 | 2.00 | 0.20 | - | - | - | - | - | - | - | - |
| ø 3 | 18,000 | 800 | 3.00 | 0.30 | 18,000 | 1,600 | 3.00 | 0.30 | - | - | - | - |
| ø 4 | 16,000 | 1,000 | 4.00 | 0.40 | 16,000 | 2,000 | 4.00 | 0.40 | - | - | - | - |
| ø 5 | 15,000 | 1,200 | 5.00 | 0.50 | 15,000 | 2,400 | 5.00 | 0.50 | - | - | - | - |
| ø 6 | 12,000 | 1,300 | 6.00 | 0.60 | 12,000 | 2,600 | 6.00 | 0.60 | 23,400 | 2,880 | 6.00 | 0.60 |
| ø 8 | 10,000 | 1,500 | 8.00 | 0.80 | 10,000 | 3,000 | 8.00 | 0.80 | 19,500 | 3,900 | 8.00 | 0.80 |
| ø 10 | 8,000 | 1,400 | 10.00 | 1.00 | 8,000 | 2,800 | 10.00 | 1.00 | 15,600 | 4,800 | 10.00 | 1.00 |
| ø 12 | 6,500 | 1,400 | 12.00 | 1.20 | 6,500 | 2,800 | 12.00 | 1.20 | 12,675 | 4,800 | 12.00 | 1.20 |
| ø 16 | 5,800 | 1,300 | 16.00 | 1.60 | 5,800 | 2,600 | 16.00 | 1.60 | 11,310 | 5,400 | 16.00 | 1.60 |
| ø 20 | 5,000 | 1,200 | 20.00 | 2.00 | 5,000 | 2,400 | 20.00 | 2.00 | 9,750 | 5,400 | 20.00 | 2.00 |

절입량
Depth of Cut




- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 주세요.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 흑연 가공시 에어브로를 추천 합니다.

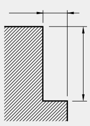
- If the effective length is long, reduce the RPM and feed in the same proportion.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contac measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- For graphite milling, air blow method is recommended.

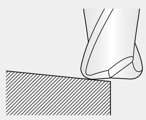
# 2DCR/4DCR Cutting Condition

• RPM : rev./min • Feed : mm/min

| | 2DCR | | | | 4DCR | | | |
|---|---|---|---|---|---|---|---|---|
| 피삭재 Material | 흑연 Graphite | | | | 흑연 Graphite | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.2 | 40,000 | 100 | 0.06 | 0.06 | - | - | - | - |
| ø 0.4 | 40,000 | 230 | 0.12 | 0.12 | - | - | - | - |
| ø 0.5 | 40,000 | 300 | 0.15 | 0.15 | - | - | - | - |
| ø 0.6 | 40,000 | 400 | 0.18 | 0.18 | - | - | - | - |
| ø 0.8 | 40,000 | 630 | 0.24 | 0.24 | - | - | - | - |
| ø 1 | 35,000 | 800 | 0.30 | 0.30 | - | - | - | - |
| ø 2 | 25,000 | 920 | 0.60 | 0.60 | 25,000 | 1,840 | 0.60 | 0.60 |
| ø 3 | 16,500 | 920 | 0.90 | 0.90 | 16,500 | 1,840 | 0.90 | 0.90 |
| ø 4 | 15,000 | 1,300 | 1.20 | 1.20 | 15,000 | 2,600 | 1.2 | 1.2 |
| ø 5 | 14,000 | 1,600 | 1.50 | 1.50 | - | - | - | - |
| ø 6 | 11,000 | 1,700 | 1.80 | 1.80 | 11,000 | 3,390 | 1.8 | 1.8 |
| ø 8 | - | - | - | - | 8,000 | 2,030 | 2.4 | 2.4 |
| ø 10 | - | - | - | - | 6,500 | 1,700 | 3.0 | 3.0 |
| ø 12 | - | - | - | - | 5,500 | 1,700 | 3.6 | 3.6 |
| ø 16 | - | - | - | - | 5,500 | 1,500 | 4.8 | 4.8 |

절입량
Depth of Cut



경사진면절삭
Inclined Cutting

- 유효장이 긴 경우에는 회전수와 이송속도를 최대20% 이하로 줄이십시오.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 50%까지 UP 해주십시오.
- 홈 절삭시 날경의 코너R 대비 Ae 값을 설정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 적절한 쿨런트 사용과 가공시 발열, 발화에 주의 하십시오.

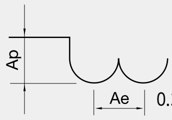
- If the effective length is long, reduce the RPM and feed in the same proportion.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 50% in stable milling condition.
- For groove milling, set up the Ae value by considering of corner radius value.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use the adequate coolant for work material and machining geometry and note for heat and ignition.

## 2DBE/3DBE/4DBE Cutting Condition

• RPM : rev./min • Feed : mm/min

| | 2DBE | | | | 3DBE | | | | 4DBE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 피삭재 Material | 흑연 Graphite | | | | 흑연 Graphite | | | | 흑연 Graphite | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 16,000 | 400 | 0.20 | 0.20 | 16,000 | 480 | 0.20 | 0.20 | 16,000 | 700 | 0.20 | 0.20 |
| ø 2 | 16,000 | 800 | 0.40 | 0.40 | 16,000 | 960 | 0.40 | 0.40 | 16,000 | 1,200 | 0.40 | 0.40 |
| ø 3 | 16,000 | 1,450 | 0.60 | 0.60 | 16,000 | 1,740 | 0.60 | 0.60 | 16,000 | 2,000 | 0.60 | 0.60 |
| ø 4 | 16,000 | 2,100 | 0.80 | 0.80 | 16,000 | 2,520 | 0.80 | 0.80 | 16,000 | 3,100 | 0.80 | 0.80 |
| ø 5 | 15,500 | 2,550 | 1.00 | 1.00 | 15,500 | 3,060 | 1.00 | 1.00 | 15,000 | 3,800 | 1.00 | 1.00 |
| ø 6 | 15,000 | 2,950 | 1.20 | 1.20 | 15,000 | 3,540 | 1.20 | 1.20 | 15,000 | 4,400 | 1.20 | 1.20 |
| ø 8 | 13,000 | 3,000 | 1.60 | 1.60 | 13,000 | 3,600 | 1.60 | 1.60 | 13,000 | 4,500 | 1.60 | 1.60 |
| ø 10 | 11,500 | 3,000 | 2.00 | 2.00 | 12,000 | 3,600 | 2.00 | 2.00 | 12,000 | 4,600 | 2.00 | 2.00 |
| ø 12 | 10,700 | 3,200 | 2.40 | 2.40 | 10,000 | 3,840 | 2.40 | 2.40 | 10,000 | 4,700 | 2.40 | 2.40 |

절입량 Depth of Cut




- 유효장이 긴 경우에는 회전수와 이송속도를 최대20% 이하로 줄이십시오.
- 절삭 조건표에 없는 유효장은 같은 직경과 비례하여 DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공형상, 가공목적, 적용기계에 따라 조건변경 요망합니다.
- 공작기계와 가공물의 강성이 없는 경우 진동이 발생할 시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용합니다.

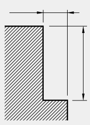
- If the effective length is long, reduce the RPM and feed maximum 20%.
- If the effective length of your tool does not show above the table, use the shorten effevtive length of parameter and reduce the parameters in the same proportion.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.

## 2DEM/3DEM/4&6DEM Cutting Condition

• RPM : rev./min • Feed : mm/min

| | 2DEM | | | | 4DEM | | | | 6DEM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 피삭재 Material | 흑연 Graphite | | | | 흑연 Graphite | | | | 흑연 Graphite | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.2 | 40,000 | 100 | 0.3 | 0.02 | - | - | - | - | - | - | - | - |
| ø 0.4 | 40,000 | 200 | 0.6 | 0.04 | - | - | - | - | - | - | - | - |
| ø 0.6 | 40,000 | 350 | 0.9 | 0.06 | - | - | - | - | - | - | - | - |
| ø 0.8 | 40,000 | 550 | 1.2 | 0.08 | - | - | - | - | - | - | - | - |
| ø 1 | 40,000 | 700 | 1.5 | 0.10 | - | - | - | - | - | - | - | - |
| ø 2 | 25,000 | 800 | 3.0 | 0.20 | - | - | - | - | - | - | - | - |
| ø 3 | 16,500 | 800 | 4.5 | 0.30 | 16,500 | 1,600 | 4.5 | 0.3 | - | - | - | - |
| ø 4 | 15,000 | 1,200 | 6.0 | 0.40 | 15,000 | 2,400 | 6.0 | 0.4 | - | - | - | - |
| ø 5 | 14,000 | 1,400 | 7.5 | 0.50 | 14,000 | 2,800 | 7.5 | 0.5 | - | - | - | - |
| ø 6 | 11,000 | 1,500 | 9.0 | 0.60 | 11,000 | 3,000 | 9.0 | 0.6 | 21,450 | 6,200 | 9 | 0.6 |
| ø 8 | 8,000 | 1,800 | 12.0 | 0.80 | 8,000 | 3,600 | 12.0 | 0.8 | 15,600 | 7,400 | 12 | 0.8 |
| ø 10 | 6,500 | 1,200 | 15.0 | 1.00 | 6,500 | 3,000 | 15.0 | 1.0 | 12,675 | 6,200 | 15 | 1.0 |
| ø 12 | 5,500 | 1,500 | 18.0 | 1.20 | 5,500 | 3,000 | 18.0 | 1.2 | 10,725 | 6,200 | 18 | 1.2 |
| ø 16 | 5,500 | 1,300 | 24.0 | 1.60 | - | - | - | - | 10,725 | 5,300 | 24 | 1.6 |

절입량 Depth of Cut

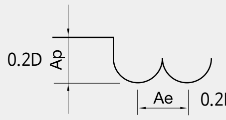



- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 주세요.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 흑연 가공시 에어브로를 추천 합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- For graphite milling, air blow method is recommended.

## 2CPB Cutting Condition

• RPM : rev./min • Feed : mm/min

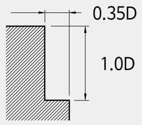
| 피삭재 Material | CFRP | | | | GFRP | | | |
|---|---|---|---|---|---|---|---|---|
| 반경 Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 0.25 | 28,000 | 273 | 0.05 | 0.05 | 13,720 | 112 | 0.05 | 0.05 |
| R 0.3 | 25,760 | 315 | 0.06 | 0.06 | 12,622 | 129 | 0.06 | 0.06 |
| R 0.4 | 18,816 | 399 | 0.08 | 0.08 | 9,220 | 164 | 0.08 | 0.08 |
| R 0.5 | 17,920 | 420 | 0.1 | 0.1 | 8,781 | 172 | 0.1 | 0.1 |
| R 1 | 17,920 | 840 | 0.2 | 0.2 | 8,781 | 344 | 0.2 | 0.2 |
| R 2 | 17,920 | 2,205 | 0.4 | 0.4 | 8,781 | 904 | 0.4 | 0.4 |
| R 3 | 16,800 | 3,098 | 0.6 | 0.6 | 8,232 | 1,270 | 0.6 | 0.6 |
| R 4 | 14,560 | 3,150 | 0.8 | 0.8 | 7,134 | 1,292 | 0.8 | 0.8 |
| R 5 | 12,880 | 3,360 | 1 | 1 | 6,311 | 1,378 | 1 | 1 |
| R 6 | 11,200 | 3,308 | 1.2 | 1.2 | 5,488 | 1,356 | 1.2 | 1.2 |
| 절입량 Depth of Cut |   | | | | | | | |

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 최대 20% 이하로 줄이십시오.
- 유효장에 따라 같은 직경에 비례하여 회전수와 이송속도를 DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공형상, 가공목적, 적용기계에 따라 조건변경 요망합니다.
- 공작기계와 가공물의 강성이 없는 경우, 진동이 발생할 시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- If the effective length of your tool does not show above the table, use the shorten effevtive length of parameter and reduce the parameters in the same proportion.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.

## 8 ~12CPE Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | CFRP | | | | GFRP | | | |
|---|---|---|---|---|---|---|---|---|
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 6 | 8,400 | 840 | 6 | 2.1 | 4116 | 378 | 6 | 2.1 |
| ø 8 | 6,200 | 860 | 8 | 2.8 | 3038 | 387 | 8 | 2.8 |
| ø 10 | 5,100 | 780 | 10 | 3.5 | 2499 | 351 | 10 | 3.5 |
| ø 12 | 4,150 | 750 | 12 | 4.2 | 2034 | 338 | 12 | 4.2 |
| 절입량 Depth of Cut |   | | | | | | | |

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 최대 20% 이하로 줄이십시오.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 조건은 8날 기준이며 날 수가 증가시 같은 직경에 비례하여 회전수와 이송속도를 UP 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- In case of long effective length, reduce the RPM and feed by 20% or less.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Above the value of the table is based on 8 flutes. If you use more than 8 flutes of endmill, raise up the RPM and Feed in a same proportion compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

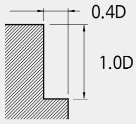
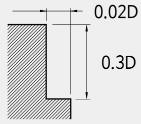
## 3CPR R-TAC Coating

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | CFRP | | | |
|---|---|---|---|---|
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 6 | 8,000 | 600 | 6 | 2.4 |
| ø 8 | 6,000 | 600 | 8 | 3.2 |
| ø 10 | 4,800 | 540 | 10 | 4.0 |
| ø 12 | 4,000 | 540 | 12 | 4.8 |

## 4&6CPR DIA Coating

• RPM : rev./min • Feed : mm/min

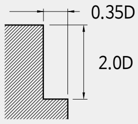
| | 4CPR | | | | | | | | 6CPR | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 피삭재 Material | CFRP | | | | GFRP | | | | CFRP | | | | GFRP | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 6 | 7,900 | 1,100 | 6 | 2.4 | 4,200 | 430 | 6 | 2.4 | 10,500 | 1,950 | 1.8 | 0.12 | 5,300 | 740 | 1.8 | 0.12 |
| ø 8 | 5,960 | 1,600 | 8 | 3.2 | 3,200 | 590 | 8 | 3.2 | 7,970 | 2,950 | 2.4 | 0.16 | 3,900 | 950 | 2.4 | 0.16 |
| ø 10 | 4,750 | 1,500 | 10 | 4.0 | 2,550 | 560 | 10 | 4.0 | 6,350 | 2,930 | 3 | 0.20 | 3,120 | 850 | 3 | 0.20 |
| ø 12 | 3,950 | 2,060 | 12 | 4.8 | 2,120 | 725 | 12 | 4.8 | 5,300 | 3,900 | 3.6 | 0.24 | 2,600 | 1,050 | 3.6 | 0.24 |
| 절입량 Depth of Cut |   | | | | | | | |   | | | | | | | |

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 최대 20% 이하로 줄이십시오.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- In case of long effective length, reduce the RPM and feed by 20% or less.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

## 6 ~16CPO Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | CFRP | | | | GFRP | | | |
|---|---|---|---|---|---|---|---|---|
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 4 | 15,900 | 1,400 | 8 | 1.4 | 15,900 | 1,400 | 8 | 1.4 |
| ø 5 | 13,000 | 1,900 | 10 | 1.8 | 13,000 | 1,900 | 10 | 1.8 |
| ø 6 | 10,600 | 2,200 | 12 | 2.1 | 10,600 | 2,200 | 12 | 2.1 |
| ø 8 | 7,950 | 2,600 | 16 | 2.8 | 7,950 | 2,600 | 16 | 2.8 |
| ø 10 | 6300 | 3050 | 20 | 3.5 | 6300 | 3050 | 20 | 3.5 |
| ø 12 | 5300 | 3300 | 24 | 4.2 | 5300 | 3300 | 24 | 4.2 |
| 절입량 Depth of Cut |   | | | | | | | |

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 최대 20% 이하로 줄이십시오.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 조건은 8날 기준이며 날 수가 증가시 같은 직경에 비례하여 회전수와 이송속도를 UP 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송속도를 비례하여 조정하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- In case of long effective length, reduce the RPM and feed by 20% or less.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Above the value of the table is based on 8 flutes. If you use more than 8 flutes of endmill, raise up the RPM and Feed in a same proportion compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

## 2DDCA Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | CFRP | | | |
|---|---|---|---|---|
| 외경 Outside Diameter | RPM | FEED | V/C | Fz |
| ø 2 | 15,900 | 960 | 100 ~ 150 | 0.03 ~ 0.07 |
| ø 2.5 | 12,700 | 760 | 〃 | 〃 |
| ø 3 | 10,600 | 630 | 〃 | 〃 |
| ø 4 | 7,960 | 480 | 〃 | 〃 |
| ø 5 | 6,370 | 380 | 〃 | 〃 |
| ø 6 | 5,300 | 320 | 〃 | 〃 |
| ø 8 | 3,980 | 240 | 〃 | 〃 |
| ø 9 | 3,540 | 210 | 〃 | 〃 |
| ø 10 | 3,180 | 190 | 〃 | 〃 |
| ø 11 | 2,890 | 175 | 〃 | 〃 |
| ø 12 | 2,650 | 160 | 〃 | 〃 |

- 상기조건은V/C 100 , Fz 0.03 기준이며, 실가공시가공목적, 적용기계에따라조건변경요망합니다.
- 조건표가 기계의 최대 스핀들속도를 초과할 시 스핀들속도와 이송속도를 비례하여 조정하십시오.
- 에어브로, 절삭유, 오일미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의하십시오.

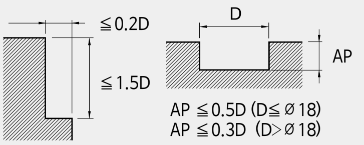
- Above the parameters are based on V/C 100 with Fz 0.03. Actual machining can be changed depending on your machining purpose and condition of your machine.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

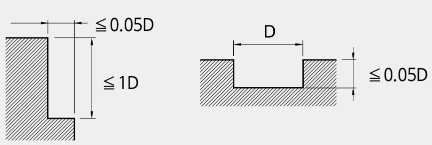
## 3SUE Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 스테인레스강 / 티타늄 합금강 Stainless Steel / Titanium alloy steels SUS304 / SUS316 / Ti6A | | | | 고경도강 STAVAX / SKD11 | | | | 내열합금강 Heat Resistance Alloys | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | 45 ~ 55HRc | | | | | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.8 | 6,400 | 80 | 1.2 | 0.16 | 7,800 | 210 | 0.8 | 0.04 | 2,000 | 20 | 0.8 | 0.04 |
| ø 1 | 5,600 | 90 | 1.5 | 0.20 | 7,000 | 210 | 1.0 | 0.05 | 1,700 | 30 | 1.0 | 0.05 |
| ø 2 | 4,800 | 100 | 3.0 | 0.40 | 5,800 | 238 | 1.5 | 0.08 | 1,400 | 40 | 1.5 | 0.08 |
| ø 3 | 4,000 | 120 | 4.5 | 0.60 | 4,400 | 315 | 2.5 | 0.13 | 1,400 | 50 | 2.5 | 0.13 |
| ø 4 | 3,300 | 180 | 6.0 | 0.80 | 3,600 | 490 | 3.0 | 0.15 | 1,200 | 70 | 3.0 | 0.15 |
| ø 5 | 2,700 | 220 | 7.5 | 1.00 | 3,000 | 630 | 4.0 | 0.20 | 1,000 | 90 | 4.0 | 0.20 |
| ø 6 | 2,400 | 230 | 9.0 | 1.20 | 2,800 | 630 | 5.0 | 0.25 | 900 | 90 | 5.0 | 0.25 |
| ø 8 | 1,800 | 250 | 12.0 | 1.50 | 2,000 | 700 | 7.0 | 0.35 | 720 | 80 | 7.0 | 0.35 |
| ø 10 | 1,400 | 250 | 14.0 | 1.80 | 1,800 | 770 | 9.0 | 0.45 | 600 | 80 | 9.0 | 0.45 |
| ø 12 | 1,200 | 200 | 17.0 | 2.00 | 1,400 | 630 | 10.0 | 0.50 | 500 | 70 | 10.0 | 0.50 |
| ø 16 | 900 | 150 | 23.0 | 2.50 | 1,100 | 420 | 15.0 | 0.75 | 360 | 60 | 15.0 | 0.75 |

절입량 Depth of Cut




- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

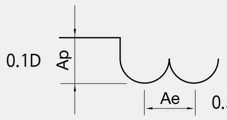
- If the effective length is long, reduce the RPM and feed in the same proportion.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

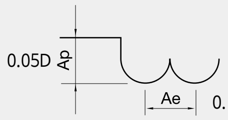
## 3SURB Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 스테인레스강 Stainless Steel SUS304 / SUS316 | | | | 고경도강 Hardened steels STAVAX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | | | | | 45 ~ 55HRc | | | |
| 반경 Corner Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R0.5 | 42000 | 500 | 0.10 | 0.30 | 25000 | 220 | 0.10 | 0.30 | 9000 | 130 | 0.050 | 0.10 |
| R0.75 | 38000 | 520 | 0.15 | 0.45 | 17000 | 250 | 0.15 | 0.45 | 7600 | 185 | 0.075 | 0.15 |
| R1 | 24000 | 550 | 0.20 | 0.60 | 12700 | 300 | 0.20 | 0.60 | 6400 | 225 | 0.100 | 0.20 |
| R1.5 | 16000 | 600 | 0.30 | 0.90 | 8500 | 310 | 0.30 | 0.90 | 5460 | 272 | 0.150 | 0.30 |
| R2 | 12000 | 530 | 0.40 | 1.20 | 6400 | 290 | 0.40 | 1.20 | 4160 | 208 | 0.200 | 0.40 |
| R3 | 8000 | 350 | 0.60 | 1.80 | 4200 | 240 | 0.60 | 1.80 | 2730 | 168 | 0.300 | 0.60 |
| R4 | 5900 | 270 | 0.80 | 2.40 | 3190 | 240 | 0.80 | 2.40 | 2080 | 152 | 0.400 | 0.80 |
| R5 | 4700 | 200 | 1.00 | 3.00 | 2550 | 230 | 1.00 | 3.00 | 1690 | 144 | 0.500 | 1.00 |
| R6 | 4000 | 180 | 1.20 | 3.60 | 2100 | 230 | 1.20 | 3.60 | 1430 | 100 | 0.600 | 1.20 |

절입량
Depth of Cut



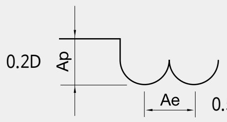



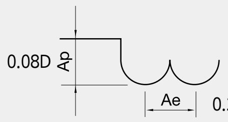

## 4SUB Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 스테인레스강 Stainless Steel SUS304 / SUS316 | | | | 고경도강 Hardened steels STAVAX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | | | | | 45 ~ 55HRc | | | |
| 반경 Corner Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R1.5 | 13,860 | 707 | 0.3 | 0.9 | 9,600 | 387 | 0.3 | 0.9 | 5040 | 376 | 0.15 | 0.3 |
| R2 | 10,560 | 619 | 0.4 | 1.2 | 7,200 | 354 | 0.4 | 1.2 | 3840 | 287 | 0.2 | 0.4 |
| R2.5 | 8,382 | 575 | 0.5 | 1.5 | 5,760 | 309 | 0.5 | 1.5 | 3000 | 276 | 0.25 | 0.5 |
| R3 | 6,996 | 464 | 0.6 | 1.8 | 4,800 | 287 | 0.6 | 1.8 | 2520 | 232 | 0.3 | 0.6 |
| R4 | 5,280 | 420 | 0.8 | 2.4 | 3,600 | 287 | 0.8 | 2.4 | 1920 | 210 | 0.4 | 0.8 |
| R5 | 4,224 | 398 | 1.0 | 3.0 | 2,880 | 276 | 1.0 | 3.0 | 1560 | 199 | 0.5 | 1.0 |
| R6 | 3,498 | 398 | 1.2 | 3.6 | 2,400 | 276 | 1.2 | 3.6 | 1320 | 166 | 0.6 | 1.2 |

절입량
Depth of Cut



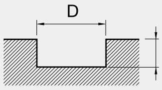
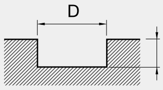
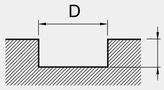




- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오.
- HRC55 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송속도를 같은 비율로 줄여서 적용합니다.
- 원활한 칩배출을 위하여 에어브로 혹은 미스트 쿨런트 사용을 추천 합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- When milling workpiece, HRC over 55 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, reduce the RPM and feed in the same proportion.
- Air blow or oil mist is recommended for smooth chip emission.

# 4SURE Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 스테인레스강 / 티타늄 합금강 Stainless Steel / Titanium alloy steels SUS304 / SUS316 / Ti6A | | | | 내열합금강 Heat Resistance Alloys | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 40 ~ 45HRc | | | | | | | | | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 18000 | 750 | 1 | 1 | 18000 | 232 | 0.5 | 1 | 6000 | 80 | 0.2 | 1 |
| ø 2 | 11740 | 820 | 2 | 2 | 10920 | 232 | 1 | 2 | 4990 | 112 | 0.4 | 2 |
| ø 3 | 8390 | 900 | 3 | 3 | 8270 | 352 | 1.5 | 3 | 4370 | 160 | 0.6 | 3 |
| ø 4 | 6150 | 800 | 4 | 4 | 6240 | 400 | 2 | 4 | 3330 | 184 | 0.8 | 4 |
| ø 5 | 5370 | 750 | 5 | 5 | 4990 | 416 | 2.5 | 5 | 2600 | 208 | 1 | 5 |
| ø 6 | 4480 | 600 | 6 | 6 | 4130 | 416 | 3 | 6 | 2180 | 208 | 1.2 | 6 |
| ø 8 | 3350 | 580 | 8 | 8 | 3120 | 392 | 4 | 8 | 1660 | 208 | 1.6 | 8 |
| ø 10 | 2680 | 560 | 10 | 10 | 2500 | 320 | 5 | 10 | 1350 | 176 | 2 | 10 |
| ø 12 | 2240 | 530 | 12 | 12 | 2100 | 320 | 6 | 12 | 1140 | 144 | 2.4 | 12 |
| ø 16 | 1680 | 500 | 16 | 16 | 1560 | 232 | 8 | 16 | 830 | 112 | 3.2 | 16 |
| ø 20 | 1340 | 500 | 20 | 20 | 1250 | 208 | 10 | 20 | 620 | 80 | 4 | 20 |
| 절입량 Depth of Cut |  D ≦1D (MAX. 12mm) | | | |  D ≦0.5D | | | |  D ≦0.2D | | | |

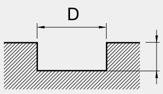
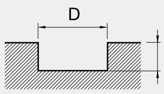
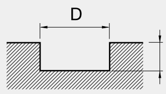
- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- If the effective length is long, reduce the RPM and feed in the same proportion.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

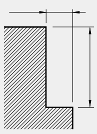
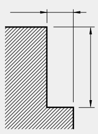
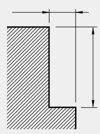
# 4SUE/4SUC/4SUV Cutting Condition

• RPM : rev./min • Feed : mm/min

## 홈절삭 Slotting

| 피삭재<br>Material | 합금강 / 프리하든강<br>Alloy Steels / Pre-hardened Steels<br>NAK80 / KP4M | | | | 스테인레스강 / 티타늄 합금강<br>Stainless Steel / Titanium alloy steels<br>SUS304 / SUS316 / Ti6A | | | | 내열합금강<br>Heat Resistance Alloys | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 40 ~ 45HRc | | | | | | | | | | | |
| 외경<br>Outside Diameter | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth |
| ø 2 | 10,000 | 400 | 2 | 2 | 9,600 | 310 | 1 | 2 | 3,200 | 80 | 0.4 | 2 |
| ø 3 | 6,900 | 410 | 3 | 3 | 7,400 | 380 | 1.5 | 3 | 2,700 | 110 | 0.6 | 3 |
| ø 4 | 5,600 | 490 | 4 | 4 | 5,600 | 400 | 2 | 4 | 2,000 | 120 | 0.8 | 4 |
| ø 5 | 4,500 | 630 | 5 | 5 | 4,500 | 410 | 2.5 | 5 | 1,600 | 130 | 1 | 5 |
| ø 6 | 3,700 | 740 | 6 | 6 | 3,700 | 440 | 3 | 6 | 1,300 | 160 | 1.2 | 6 |
| ø 7 | 3,200 | 700 | 7 | 7 | 3,200 | 410 | 3.5 | 7 | 1,100 | 140 | 1.4 | 7 |
| ø 8 | 2,800 | 670 | 8 | 8 | 2,800 | 390 | 4 | 8 | 1,000 | 130 | 1.6 | 8 |
| ø 9 | 2,500 | 600 | 9 | 9 | 2,500 | 350 | 4.5 | 9 | 900 | 130 | 1.8 | 9 |
| ø 10 | 2,200 | 530 | 10 | 10 | 2,200 | 350 | 5 | 10 | 800 | 130 | 2 | 10 |
| ø 11 | 2,000 | 530 | 11 | 11 | 2,000 | 320 | 5.5 | 11 | 720 | 120 | 2.2 | 11 |
| ø 12 | 1,900 | 530 | 12 | 12 | 1,900 | 300 | 6 | 12 | 660 | 110 | 2.4 | 12 |
| ø 16 | 1,400 | 390 | 16 | 16 | 1,400 | 280 | 8 | 16 | 500 | 80 | 3.2 | 16 |
| ø 20 | 1,100 | 350 | 20 | 20 | 1,100 | 260 | 10 | 20 | 400 | 60 | 4 | 20 |
| 절입량<br>Depth of Cut |  D ≦1D (MAX. 12mm) | | | |  D ≦0.5D | | | |  D ≦0.2D | | | |

## 측면절삭 Side Cutting

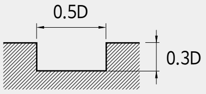
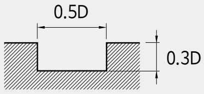
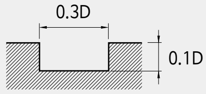
| 피삭재<br>Material | 합금강 / 프리하든강<br>Alloy Steels / Pre-hardened Steels<br>NAK80 / KP4M | | | | 스테인레스강 / 티타늄 합금강<br>Stainless Steel / Titanium alloy steels<br>SUS304 / SUS316 / Ti6A | | | | 내열합금강<br>Heat Resistance Alloys | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 40 ~ 45HRc | | | | | | | | | | | |
| 외경<br>Outside Diameter | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth | RPM | FEED | Ap<br>Axial Depth | Ae<br>Radial Depth |
| ø 2 | 21,000 | 825 | 3 | 0.4 | 14,000 | 420 | 3 | 0.2 | 4,800 | 130 | 3 | 0.1 |
| ø 3 | 15,000 | 938 | 4.5 | 0.6 | 10,600 | 638 | 4.5 | 0.3 | 4,200 | 200 | 4.5 | 0.15 |
| ø 4 | 11,000 | 1,050 | 6 | 0.8 | 8,000 | 720 | 6 | 0.4 | 3,200 | 220 | 6 | 0.2 |
| ø 5 | 9,600 | 1,425 | 7.5 | 1 | 6,400 | 750 | 7.5 | 0.5 | 2,500 | 250 | 7.5 | 0.25 |
| ø 6 | 8,000 | 1,650 | 9 | 1.2 | 5,300 | 750 | 9 | 0.6 | 2,100 | 250 | 9 | 0.3 |
| ø 7 | 6,800 | 1,425 | 10.5 | 1.4 | 4,500 | 750 | 10.5 | 0.7 | 1,800 | 260 | 10.5 | 0.35 |
| ø 8 | 6,000 | 1,200 | 12 | 1.6 | 4,000 | 720 | 12 | 0.8 | 1,600 | 260 | 12 | 0.4 |
| ø 9 | 5,300 | 1,110 | 13.5 | 1.8 | 3,500 | 630 | 13.5 | 0.9 | 1,400 | 220 | 13.5 | 0.45 |
| ø 10 | 4,800 | 1,080 | 15 | 2 | 3,200 | 578 | 15 | 1 | 1,300 | 210 | 15 | 0.5 |
| ø 11 | 4,400 | 1,013 | 16.5 | 2.2 | 2,900 | 570 | 16.5 | 1.1 | 1,200 | 190 | 16.5 | 0.55 |
| ø 12 | 4,000 | 938 | 18 | 2.4 | 2,700 | 570 | 18 | 1.2 | 1,100 | 180 | 18 | 0.6 |
| ø 16 | 3,000 | 855 | 24 | 3.2 | 2,000 | 420 | 24 | 1.6 | 800 | 130 | 24 | 0.8 |
| ø 20 | 2,400 | 645 | 30 | 4 | 1,600 | 383 | 30 | 2 | 600 | 100 | 30 | 1 |
| 절입량<br>Depth of Cut |  ≦0.2D ≦1.5D | | | |  ≦0.1D ≦1.5D | | | |  ≦0.05D ≦1.5D | | | |

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의하십시오

- If the effective length is long, reduce the RPM and feed in the same proportion.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

## 4SUCR Cutting Condition

• RPM : rev./min • Feed : mm/min

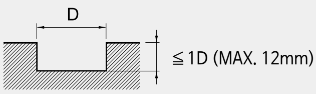
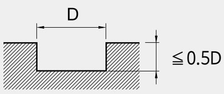
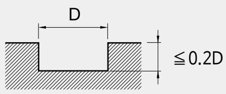
| 피삭재 Material | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 스테인레스강 / 티타늄 합금강 Stainless Steel / Titanium alloy steels SUS304 / SUS316 / Ti6A | | | | 내열합금강 Heat Resistance Alloys | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 40 ~ 45HRc | | | | | | | | | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 13,210 | 357 | 0.3 | 0.5 | 10,836 | 339 | 0.3 | 0.5 | 5,820 | 78 | 0.1 | 0.3 |
| ø 2 | 11,270 | 518 | 0.6 | 1.0 | 9,391 | 339 | 0.6 | 1.0 | 4,840 | 109 | 0.2 | 0.6 |
| ø 3 | 8,054 | 588 | 0.9 | 1.5 | 7,112 | 515 | 0.9 | 1.5 | 4,239 | 155 | 0.3 | 0.9 |
| ø 4 | 5,904 | 657 | 1.2 | 2.0 | 5,366 | 585 | 1.2 | 2.0 | 3,230 | 178 | 0.4 | 1.2 |
| ø 5 | 5,155 | 887 | 1.5 | 2.5 | 4,291 | 608 | 1.5 | 2.5 | 2,522 | 202 | 0.5 | 1.5 |
| ø 6 | 4,301 | 1037 | 1.8 | 3.0 | 3,552 | 608 | 1.8 | 3.0 | 2,115 | 202 | 0.6 | 1.8 |
| ø 8 | 3,216 | 749 | 2.4 | 4.0 | 2,683 | 573 | 2.4 | 4.0 | 1,610 | 202 | 0.8 | 2.4 |
| ø 10 | 2,573 | 657 | 3.0 | 5.0 | 2,150 | 468 | 3.0 | 5.0 | 1,310 | 171 | 1.0 | 3.0 |
| ø 12 | 2,150 | 576 | 3.6 | 6.0 | 1,806 | 468 | 3.6 | 6.0 | 1,106 | 140 | 1.2 | 3.6 |
| ø 16 | 1,613 | 541 | 4.8 | 8.0 | 1,342 | 339 | 4.8 | 8.0 | 805 | 109 | 1.6 | 4.8 |
| ø 20 | 1,286 | 404 | 6.0 | 10.0 | 1,075 | 304 | 6.0 | 10.0 | 601 | 78 | 2.0 | 6.0 |
| 절입량 Depth of Cut |  | | | |  | | | |  | | | |

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오.
- 날 경의 코너R 대비Ae 값을 설정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- If the effective length is long, reduce the RPM and feed in the same proportion.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- Consider the corner radius value when you set up the Ae value.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

## 4LSUC Cutting Condition

• RPM : rev./min • Feed : mm/min

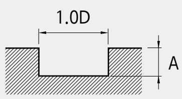
| 피삭재 Material | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 스테인레스강 / 티타늄 합금강 Stainless Steel / Titanium alloy steels SUS304 / SUS316 / Ti6A | | | | 내열합금강 Heat Resistance Alloys | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 40 ~ 45HRc | | | | | | | | | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 14,300 | 380 | 0.5 | 1 | 9,600 | 310 | 0.5 | 1 | 4,770 | 80 | 0.2 | 1 |
| ø 2 | 8,500 | 400 | 1.0 | 2 | 9,600 | 310 | 1.0 | 2 | 3,000 | 100 | 0.4 | 2 |
| ø 3 | 6,900 | 410 | 1.5 | 3 | 7,400 | 380 | 1.5 | 3 | 2,700 | 110 | 0.6 | 3 |
| ø 4 | 5,600 | 490 | 2.0 | 4 | 5,600 | 400 | 2.0 | 4 | 2,000 | 120 | 0.8 | 4 |
| ø 5 | 4,500 | 630 | 2.5 | 5 | 4,500 | 410 | 2.5 | 5 | 1,600 | 130 | 1.0 | 5 |
| ø 6 | 3,700 | 740 | 3.0 | 6 | 3,700 | 440 | 3.0 | 6 | 1,300 | 160 | 1.2 | 6 |
| ø 7 | 3,200 | 700 | 3.5 | 7 | 3,200 | 410 | 3.5 | 7 | 1,100 | 140 | 1.4 | 7 |
| ø 8 | 2,800 | 670 | 4.0 | 8 | 2,800 | 390 | 4.0 | 8 | 1,000 | 130 | 1.6 | 8 |
| ø 10 | 2,200 | 530 | 5.0 | 10 | 2,200 | 350 | 5.0 | 10 | 800 | 130 | 2.0 | 10 |
| ø 11 | 2,000 | 530 | 5.5 | 11 | 2,000 | 320 | 5.5 | 11 | 720 | 120 | 2.2 | 11 |
| ø 12 | 1,900 | 530 | 6.0 | 12 | 1,900 | 300 | 6.0 | 12 | 660 | 110 | 2.4 | 12 |
| ø 16 | 1,400 | 390 | 8.0 | 16 | 1,400 | 280 | 8.0 | 16 | 500 | 80 | 3.2 | 16 |
| ø 20 | 1,100 | 350 | 10.0 | 20 | 1,100 | 260 | 10.0 | 20 | 400 | 60 | 4.0 | 20 |
| 절입량 Depth of Cut |  | | | |  | | | |  | | | |

## 3&4&5SUR Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 스테인레스강/ 티탄합금 Stainless Steels / Titanium Alloy Steels | | | |
|---|---|---|---|---|
| | SUS304 / SUS 316 / Ti6A | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 3 | 5,000 | 380 | 0.9 | 3 |
| ø 4 | 4,800 | 350 | 1.2 | 4 |
| ø 5 | 4,700 | 350 | 1.5 | 5 |
| ø 6 | 4,400 | 340 | 1.5 | 6 |
| ø 7 | 3,800 | 340 | 1.75 | 7 |
| ø 8 | 3,300 | 340 | 2 | 8 |
| ø 9 | 3,000 | 340 | 2.25 | 9 |
| ø 10 | 2,700 | 330 | 2.5 | 10 |
| ø 12 | 2,200 | 330 | 1.8 | 12 |
| ø 14 | 2,000 | 310 | 2.1 | 14 |
| ø 16 | 1,750 | 300 | 2.4 | 16 |
| ø 20 | 1,300 | 210 | 2 | 20 |

절입량
Depth of Cut




A : Ø3 ~ 5 = 0.3 x D
Ø6 ~ 10 = 0.25 x D
Ø12 ~ 16 = 0.15 x D
Ø18 ~ 20 = 0.1 x D

- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우 진동이 발생할시 조건표에 회전 속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.
- 스테인레스, 내열합금강 등의 절단 가공시 수용성 절삭유가 가장 효과적입니다.

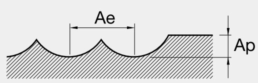
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.
- For parting off stainless or hear resistant alloy, using water-soluble oil is the most effective way.

## 2COB Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 동합금 Copper Alloys C1100 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 반경 Corner Radius | α≤15˚ | | | | α>15˚ | | | |
| | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 0.5 | 40,000 | 5,200 | 0.06 | 0.1 | 40,000 | 3,200 | 0.06 | 0.1 |
| R 0.75 | 40,000 | 6,240 | 0.09 | 0.15 | 40,000 | 4,000 | 0.09 | 0.15 |
| R 1 | 40,000 | 6,240 | 0.11 | 0.2 | 39,000 | 4,700 | 0.11 | 0.2 |
| R 1.5 | 40,000 | 7,800 | 0.12 | 0.3 | 30,000 | 4,500 | 0.12 | 0.3 |
| R 2 | 40,000 | 7,800 | 0.13 | 0.4 | 27,000 | 4,300 | 0.13 | 0.4 |
| R 2.5 | 32,000 | 7,150 | 0.15 | 0.5 | 20,000 | 3,600 | 0.15 | 0.5 |
| R 3 | 25,000 | 5,850 | 0.2 | 0.6 | 16,000 | 2,900 | 0.2 | 0.6 |
| R 4 | 21,000 | 5,460 | 0.25 | 0.8 | 13,000 | 2,600 | 0.25 | 0.8 |
| R 5 | 16,000 | 4,160 | 0.3 | 1 | 10,000 | 2,000 | 0.3 | 1 |
| R 6 | 13,000 | 3,380 | 0.5 | 1.2 | 8,000 | 1,700 | 0.5 | 1.2 |
| R 8 | 9,000 | 2,340 | 0.5 | 1.6 | 6,000 | 1,300 | 0.5 | 1.6 |

절입량
Depth of Cut

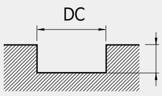
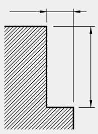



- α란 가공면의 경사각입니다.
- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 원활한 칩배출을 위하여 수용성 절삭유제의 사용을 추천합니다.
- 적용 기계의 회전속도가 부족한 경우에는 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.

- α value represents a slope of workpiece.
- If the effective length is long, reduce the RPM and feed in the same proportion.
- Using Water-soluble oil is recommended for smooth chip emission.
- If the parameters exceed the maximum RPM and feed of your machine, reduce the RPM and feed in the same proportion.

# 2COR/3COR Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | | 홈절삭 Slotting | | | | 측면절삭 Side Cutting | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 동/ 동합금 C1100 Copper / Copper Alloys | | | | 동/ 동합금 C1100 Copper / Copper Alloys | | | |
| 외경 Outside Diameter | 반경 Corner Radius | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ap Radial Depth | RPM | FEED | Ap Axial Depth | Ap Radial Depth |
| ø 1 | R0.1, R0.2 | 3 | 45,000 | 2,500 | 0.036 | 1 | 45,000 | 4,500 | 0.036 | 0.2 |
| 〃 | 〃 | 6 | 40,000 | 2,000 | 0.03 | 1 | 40,000 | 3,000 | 0.03 | 0.2 |
| 〃 | 〃 | 10 | 35,000 | 1,600 | 0.025 | 1 | 35,000 | 2,000 | 0.025 | 0.2 |
| ø 1.5 | R0.1, R0.2 | 5 | 23,000 | 1,800 | 0.08 | 1.5 | 50,000 | 6,000 | 0.08 | 0.3 |
| 〃 | 〃 | 8 | 26,000 | 1,600 | 0.06 | 1.5 | 45,000 | 5,500 | 0.06 | 0.3 |
| 〃 | 〃 | 12 | 30,000 | 1,500 | 0.05 | 1.5 | 40,000 | 4,500 | 0.04 | 0.3 |
| ø 2 | R0.1, R0.2 | 6 | 35,000 | 1,800 | 0.14 | 2 | 45,000 | 5,000 | 0.12 | 0.8 |
| 〃 | 〃 | 10 | 30,000 | 1,600 | 0.12 | 2 | 40,000 | 4,700 | 0.1 | 0.6 |
| 〃 | 〃 | 14 | 30,000 | 1,200 | 0.08 | 2 | 30,000 | 3,800 | 0.06 | 0.4 |
| ø 3 | R0.2, R0.3 | 10 | 30,000 | 2,200 | 0.14 | 3 | 40,000 | 6,500 | 0.12 | 1 |
| 〃 | 〃 | 16 | 20,000 | 2,000 | 0.12 | 3 | 35,000 | 6,000 | 0.1 | 0.6 |
| 〃 | 〃 | 20 | 20,000 | 2,000 | 0.12 | 3 | 35,000 | 6,000 | 0.1 | 0.6 |
| 〃 | R0.5 | 10 | 20,000 | 2,600 | 0.14 | 3 | 38,000 | 10,000 | 0.12 | 0.8 |
| 〃 | 〃 | 16 | 20,000 | 2,200 | 0.12 | 3 | 35,000 | 8,000 | 0.1 | 0.6 |
| 〃 | 〃 | 20 | 20,000 | 2,200 | 0.12 | 3 | 35,000 | 8,000 | 0.1 | 0.6 |
| ø 4 | R0.2, R0.3 | 12 | 20,000 | 2,600 | 0.5 | 4 | 40,000 | 8,000 | 0.18 | 0.12 |
| 〃 | 〃 | 16 | 15,000 | 2,400 | 0.3 | 4 | 32,000 | 5,000 | 0.16 | 0.1 |
| 〃 | 〃 | 20 | 15,000 | 2,000 | 0.25 | 4 | 32,000 | 5,000 | 0.15 | 0.8 |
| 〃 | R0.5 | 12 | 20,000 | 2,400 | 0.5 | 4 | 35,000 | 10,000 | 0.3 | 0.1 |
| 〃 | 〃 | 16 | 15,000 | 2,200 | 0.25 | 4 | 32,000 | 7,000 | 0.15 | 0.8 |
| 〃 | 〃 | 20 | 15,000 | 2,200 | 0.25 | 4 | 32,000 | 7,000 | 0.15 | 0.8 |
| ø 6 | R0.3, R0.5 | 20 | 10,000 | 1,400 | 0.6 | 6 | 20,000 | 5,200 | 0.25 | 1.2 |
| 〃 | 〃 | 30 | 10,000 | 1,200 | 0.4 | 6 | 20,000 | 5,000 | 0.25 | 1.2 |
| 〃 | R10 | 20 | 10,000 | 1,800 | 0.6 | 6 | 20,000 | 9,000 | 0.25 | 1.2 |
| 〃 | 〃 | 30 | 10,000 | 1,500 | 0.4 | 6 | 20,000 | 7,000 | 0.25 | 1.2 |
| ø 8 | R0.3, R0.5 | 25 | 8,000 | 1,000 | 0.3 | 8 | 15,000 | 5,000 | 0.3 | 1.5 |
| 〃 | R1 | 25 | 8,000 | 1,300 | 0.3 | 8 | 15,000 | 10,000 | 0.3 | 1.5 |
| ø 10 | R0.5 | 30 | 7,000 | 1,300 | 0.3 | 10 | 13,000 | 7,000 | 0.2 | 1.5 |
| 〃 | R1.0 | 30 | 7,000 | 1,500 | 0.3 | 10 | 13,000 | 12,000 | 0.2 | 1.5 |
| ø 12 | R0.5 | 35 | 6,000 | 1,100 | 0.2 | 12 | 10,000 | 9,000 | 0.15 | 2 |
| 〃 | R1.0 | 35 | 6,000 | 1,300 | 0.2 | 12 | 10,000 | 15,000 | 0.15 | 2 |
| 절입량 Depth of Cut | | |   | | | |   | | | |

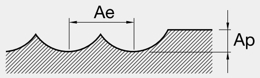
- 절삭 시 코너R 부분을 참고하여 절삭하시기 바랍니다.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대 20% 이하로 줄이십시오.
- 위 절삭 조건은 2날 절삭 조건이며, 3날 가공 시 회전수는 유지하고, 피드는 안정적인 속도내에서 최대 20%까지 UP 해주십시.
- 홈 절삭 시 날 경의 코너R 대비 Ae값을 설정 하십시오.

- Please refer to the corner R when cutting.
- If the effective length is long, reduce the rotation speed and feed rate by up to 20%.
- The above cutting conditions are for 2-flute cutting. For 3-flute cutting, maintain the rotation speed and increase the feed by up to 20% within a stable speed range.
- When cutting grooves, set the Ae value relative to the corner R of the tool's edge.

## 2DRB Cutting Condition

• RPM : rev./min • Feed : mm/min

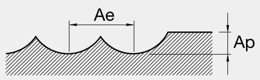
| 피삭재 Material | 알루미늄 합금 Aluminum Alloy Expanding Material AL7075 | | | | 알루미늄 합금 주물 / 다이캐스팅 Aluminum Alloys Casting / Die Casting AC4B / Si13% | | | | 탄소섬유 / 동합금 Magnesium Alloy / Copper Allloy / CFRP AZ91 / AZ80A / C1100 | | 동합금 Copper Allloy C1100 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 일반가공 Regular Milling | | 고속가공 High Speed Milling | | 일반가공 Regular Milling | | 고속가공 High Speed Milling | | 일반가공 Regular Milling | | 고속가공 High Speed Milling | |
| 반경 Radius | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| R0.1 | 32,000 | 220 | 45,000 | 290 | 32,000 | 220 | 45,000 | 290 | 32,000 | 220 | 45,000 | 290 |
| R0.3 | 32,000 | 480 | 45,000 | 660 | 32,000 | 480 | 45,000 | 660 | 32,000 | 480 | 45,000 | 660 |
| R0.5 | 28,800 | 760 | 45,000 | 1,100 | 28,800 | 760 | 45,000 | 1,100 | 28,800 | 760 | 45,000 | 1,100 |
| R0.8 | 28,800 | 850 | 45,000 | 1,400 | 28,800 | 850 | 45,000 | 1,400 | 25,200 | 850 | 35,900 | 1,300 |
| R1 | 28,600 | 1,400 | 45,000 | 2,000 | 28,600 | 1,400 | 43,000 | 1,900 | 21,500 | 1,000 | 35,900 | 1,600 |
| R1.5 | 19,100 | 1,400 | 45,000 | 3,000 | 19,100 | 1,400 | 28,600 | 1,900 | 14,300 | 1,000 | 23,900 | 1,600 |
| R2 | 14,300 | 1,400 | 35,900 | 3,200 | 14,300 | 1,400 | 21,400 | 1,900 | 10,700 | 1,000 | 17,900 | 1,600 |
| R3 | 9,500 | 1,400 | 23,900 | 3,200 | 9,500 | 1,400 | 14,300 | 1,900 | 7,200 | 1,000 | 12,000 | 1,600 |
| R4 | 7,200 | 1,800 | 17,600 | 4,100 | 7,200 | 1,800 | 10,700 | 2,400 | 5,400 | 1,300 | 8,900 | 2,000 |
| R5 | 5,700 | 1,600 | 14,000 | 3,600 | 5,700 | 1,600 | 8,600 | 2,200 | 4,300 | 1,200 | 7,200 | 1,800 |
| R6 | 4,800 | 1,500 | 11,700 | 3,400 | 4,800 | 1,500 | 7,200 | 2,000 | 3,600 | 1,100 | 5,900 | 1,700 |
| 절입량 Depth of Cut | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae |
| | 0.1D | 0.2D | 0.05D | 0.1D | 0.1D | 0.2D | 0.05D | 0.1D | 0.1D | 0.2D | 0.02D | 0.05D |




## 2DLB Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 알루미늄 합금 Aluminum Alloy Expanding Material AL7075 | | | | 알루미늄 합금 주물 / 다이캐스팅 Aluminum Alloys Casting / Die Casting AC4B / Si13% | | | | 탄소섬유 / 동합금 Magnesium Alloy / Copper Allloy / CFRP AZ91 / AZ80A / C1100 | | 동합금 Copper Allloy C1100 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 일반가공 Regular Milling | | 고속가공 High Speed Milling | | 일반가공 Regular Milling | | 고속가공 High Speed Milling | | 일반가공 Regular Milling | | 고속가공 High Speed Milling | |
| 반경 Radius | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| R0.3 | 28,800 | 350 | 40,000 | 490 | 28,800 | 350 | 36,100 | 480 | 28,800 | 350 | 31,600 | 420 |
| R0.5 | 23,400 | 720 | 31,500 | 950 | 23,400 | 720 | 25,200 | 900 | 23,400 | 720 | 20,700 | 800 |
| R0.8 | 23,400 | 760 | 35,900 | 1,120 | 23,400 | 760 | 25,200 | 1,000 | 22,500 | 720 | 20,700 | 800 |
| R1 | 22,500 | 950 | 31,500 | 1,260 | 22,500 | 950 | 25,200 | 1,100 | 17,100 | 720 | 20,700 | 800 |
| R1.5 | 15,300 | 950 | 20,700 | 1,260 | 15,300 | 950 | 16,700 | 1,100 | 11,300 | 720 | 13,500 | 800 |
| R2 | 11,300 | 950 | 15,800 | 1,260 | 11,300 | 950 | 12,600 | 1,100 | 8,600 | 720 | 10,400 | 800 |
| R3 | 9,000 | 950 | 13,200 | 1,260 | 9,000 | 950 | 12,600 | 1,100 | 5,900 | 720 | 8,900 | 800 |
| R4 | 6,400 | 1,150 | 11,600 | 1,260 | 6,400 | 1,150 | 9,800 | 1,000 | 4,800 | 880 | 6,400 | 950 |
| R5 | 5,200 | 1,050 | 9,400 | 1,120 | 5,200 | 1,050 | 7,800 | 860 | 3,900 | 760 | 5,300 | 880 |
| R6 | 4,100 | 1,000 | 6,700 | 950 | 4,100 | 1,000 | 5,400 | 520 | 3,000 | 740 | 4,600 | 840 |
| 절입량 Depth of Cut | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae |
| | 0.1D | 0.2D | 0.05D | 0.1D | 0.1D | 0.2D | 0.05D | 0.1D | 0.1D | 0.2D | 0.02D | 0.05D |




- 상기 절삭조건은 참고 수치이므로 실가공시 가공형상, 가공목적, 적용기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들속도와 이송속도를 비례하여 조정하십시오.
- 에어브로 혹은 미스트 쿨런트를 추천합니다.

- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolant is recommended.

# 2DRE/3DRE Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 알루미늄 합금<br>Aluminum Alloy Expanding Material<br>AL7075 | | | | 알루미늄 합금 주물 / 다이캐스팅<br>Aluminum Alloys Casting / Die Casting<br>AC4B / Si13% | | | | 탄소섬유 / 동합금<br>Magnesium Alloy / Copper Allloy / CFRP<br>AZ91 / AZ80A / C1100 | | 동합금<br>Copper Allloy<br>C1100 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 일반가공<br>Regular Milling | | 고속가공<br>High Speed Milling | | 일반가공<br>Regular Milling | | 고속가공<br>High Speed Milling | | 일반가공<br>Regular Milling | | 고속가공<br>High Speed Milling | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| ø 0.5 | 28,800 | 160 | 45,000 | 500 | 28,800 | 160 | 45,000 | 450 | 28,800 | 140 | 45,000 | 410 |
| ø 0.6 | 28,800 | 180 | 45,000 | 590 | 28,800 | 180 | 45,000 | 540 | 28,800 | 160 | 45,000 | 500 |
| ø 0.8 | 28,800 | 200 | 45,000 | 770 | 28,800 | 200 | 45,000 | 720 | 26,100 | 180 | 45,000 | 590 |
| ø 1 | 28,800 | 200 | 45,000 | 900 | 28,800 | 200 | 45,000 | 960 | 20,700 | 200 | 37,800 | 630 |
| ø 1.2 | 28,800 | 210 | 45,000 | 1,100 | 28,800 | 210 | 45,000 | 1,000 | 17,100 | 200 | 32,400 | 630 |
| ø 1.5 | 28,800 | 250 | 45,000 | 1,400 | 28,800 | 250 | 45,000 | 1,100 | 14,000 | 200 | 26,600 | 630 |
| ø 2 | 28,800 | 400 | 45,000 | 1,800 | 28,800 | 380 | 45,000 | 1,100 | 13,000 | 200 | 25,200 | 680 |
| ø 2.5 | 22,500 | 540 | 43,200 | 1,900 | 22,500 | 540 | 27,900 | 1,100 | 8,600 | 230 | 18,000 | 680 |
| ø 3 | 18,900 | 630 | 36,000 | 1,900 | 18,900 | 630 | 23,400 | 1,100 | 7,200 | 230 | 15,300 | 680 |
| ø 4 | 14,000 | 650 | 29,700 | 2,000 | 14,000 | 650 | 18,000 | 1,200 | 5,400 | 250 | 12,600 | 720 |
| ø 5 | 11,300 | 680 | 27,900 | 2,500 | 11,300 | 680 | 17,280 | 1,500 | 4,300 | 270 | 11,300 | 860 |
| ø 6 | 9,500 | 750 | 23,400 | 2,500 | 9,500 | 750 | 14,310 | 1,500 | 3,600 | 280 | 9,500 | 900 |
| ø 8 | 7,200 | 800 | 17,550 | 2,600 | 7,200 | 800 | 10,800 | 1,600 | 2,600 | 270 | 7,100 | 900 |
| ø 10 | 5,700 | 900 | 13,950 | 2,900 | 5,700 | 900 | 8,640 | 1,700 | 2,100 | 330 | 5,700 | 1,000 |
| ø 12 | 4,800 | 950 | 11,700 | 2,900 | 4,800 | 950 | 7,200 | 1,700 | 1,800 | 350 | 4,800 | 1,000 |
| 측면절삭<br>Side Cutting | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae |
| | 1.5D | 0.1D | 1D | 0.1D | 1.5D | 0.1D | 1D | 0.1D | 1.5D | 0.1D | 1D | 0.05D |
| 홈절삭<br>Slotting | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae |
| | 0.5D | 0.8D | 0.15D | 0.8D | 0.5D | 0.8D | 0.15D | 0.8D | 0.5D | 0.8D | 0.1D | 0.8D |

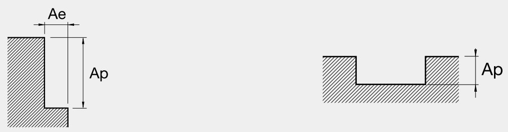
절입량
Depth of Cut


# 2DLE Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 알루미늄합금재<br>Aluminum Alloy Expanding Material<br>A7075 | | | | 알루미늄합금주물 / 다이캐스팅<br>Aluminum Alloys Casting / Die Casting<br>AC4B / Si13% | | | | 탄소섬유 / 동합금<br>Magnesium Alloy / Copper Allloy / CFRP<br>AZ91 / AZ80A / C1100 | | 동합금<br>Copper Allloy<br>C1100 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 일반가공<br>Regular Milling | | 고속가공<br>High Speed Milling | | 일반가공<br>Regular Milling | | 고속가공<br>High Speed Milling | | 일반가공<br>Regular Milling | | 고속가공<br>High Speed Milling | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| ø 0.1 | 32,000 | 35 | 45,000 | 120 | 32,000 | 35 | 45,000 | 120 | 32,000 | 35 | 45,000 | 100 |
| ø 0.3 | 32,000 | 60 | 45,000 | 300 | 32,000 | 60 | 45,000 | 300 | 32,000 | 60 | 45,000 | 210 |
| ø 0.5 | 28,800 | 90 | 45,000 | 500 | 28,800 | 90 | 45,000 | 500 | 28,800 | 90 | 45,000 | 390 |
| ø 0.8 | 28,800 | 120 | 45,000 | 700 | 28,800 | 130 | 45,000 | 700 | 23,000 | 110 | 45,000 | 500 |
| ø 1 | 28,800 | 170 | 45,000 | 900 | 28,800 | 170 | 45,000 | 900 | 20,700 | 125 | 37,800 | 630 |
| ø 1.5 | 28,800 | 230 | 40,500 | 1,100 | 28,800 | 230 | 40,500 | 1,100 | 14,000 | 130 | 26,700 | 630 |
| ø 2 | 23,000 | 270 | 30,600 | 1,100 | 23,000 | 270 | 30,600 | 1,100 | 10,400 | 135 | 21,600 | 675 |
| ø 3 | 15,300 | 460 | 20,700 | 1,100 | 15,300 | 460 | 20,700 | 1,100 | 7,200 | 200 | 15,300 | 675 |
| ø 4 | 11,300 | 470 | 15,300 | 1,100 | 11,300 | 470 | 15,300 | 1,100 | 5,400 | 210 | 11,700 | 675 |
| ø 5 | 9,000 | 490 | 12,200 | 1,100 | 9,000 | 490 | 12,200 | 1,100 | 4,300 | 225 | 9,000 | 675 |
| ø 6 | 7,700 | 540 | 10,000 | 1,100 | 7,700 | 540 | 10,000 | 1,100 | 3,600 | 225 | 7,200 | 675 |
| ø 8 | 6,000 | 600 | 8,200 | 1,200 | 6,000 | 600 | 8,200 | 1,200 | 2,600 | 300 | 5,900 | 720 |
| ø 10 | 4,500 | 650 | 6,000 | 1,400 | 4,500 | 650 | 6,000 | 1,400 | 2,100 | 300 | 4,300 | 800 |
| ø 12 | 3,100 | 690 | 4,500 | 1,500 | 3,100 | 690 | 4,500 | 1,500 | 1,600 | 320 | 3,200 | 850 |
| 측면절삭<br>Side Cutting | Ap | Ae | Ap | Ap | Ap | Ap | Ap | Ae | Ap | Ae | Ap | Ae |
| | 1.2D | 0.1D | 1D | 0.1D | 1.2D | 0.1D | 1D | 0.1D | 1D | 0.1D | 1D | 0.05D |
| 홈절삭<br>Slotting | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae |
| | 0.3D | 0.8D | 0.15D | 0.8D | 0.3D | 0.8D | 0.15D | 0.8D | 0.3D | 0.8D | 0.1D | 0.8D |

절입량
Depth of Cut

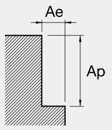
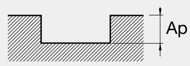



- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolant is recommended and note for chip emission, heat, or ignition.

# 2DLC Cutting Condition

• RPM : rev./min • Feed : mm/min

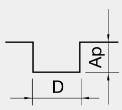
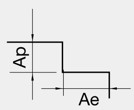
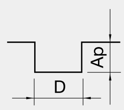
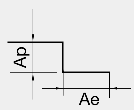
| 피삭재 Material | 알루미늄 합금 Aluminum Alloy Expanding Material AL7075 | | | | 알루미늄 합금 주물 / 다이캐스팅 Aluminum Alloys Casting / Die Casting AC4B / Si13% | | | | 탄소섬유 / 동합금 Magnesium Alloy / Copper Allloy / CFRP AZ91 / AZ80A / C1100 | | 동합금 Copper Allloy C1100 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 일반가공 Regular Milling | | 고속가공 High Speed Milling | | 일반가공 Regular Milling | | 고속가공 High Speed Milling | | 일반가공 Regular Milling | | 고속가공 High Speed Milling | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| ø 1 | 37,500 | 220 | 50,000 | 1,170 | 37,400 | 220 | 50,000 | 1,170 | 27,000 | 160 | 49,000 | 820 |
| ø 1.5 | 37,500 | 300 | 50,000 | 1,430 | 37,400 | 300 | 50,000 | 1,430 | 18,000 | 170 | 34,700 | 820 |
| ø 2 | 30,000 | 350 | 40,000 | 1,430 | 30,000 | 350 | 40,000 | 1,430 | 13,500 | 180 | 28,000 | 880 |
| ø 3 | 20,000 | 600 | 27,000 | 1,430 | 20,000 | 600 | 27,000 | 1,430 | 9,400 | 260 | 20,000 | 880 |
| ø 4 | 15,000 | 610 | 20,000 | 1,430 | 14,700 | 610 | 20,000 | 1,430 | 7,000 | 270 | 15,200 | 880 |
| ø 6 | 10,000 | 700 | 13,000 | 1,430 | 10,000 | 700 | 13,000 | 1,430 | 4,700 | 290 | 9,400 | 880 |
| ø 8 | 7,800 | 780 | 11,000 | 1,560 | 7,800 | 780 | 10,700 | 1,560 | 3,400 | 390 | 7,700 | 940 |
| ø 10 | 5,900 | 850 | 7,800 | 1,820 | 5,900 | 850 | 7,800 | 1,820 | 2,700 | 390 | 5,600 | 1,000 |
| ø 12 | 4,000 | 900 | 5,900 | 1,950 | 4,000 | 900 | 5,900 | 1,950 | 2,100 | 410 | 4,200 | 1,100 |
| 측면절삭 Side Cutting | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae |
| | 1.2D | 0.1D | 1D | 0.1D | 1.2D | 0.1D | 1D | 0.1D | 1D | 0.1D | 1D | 0.05D |
| 홈절삭 Slotting | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae | Ap | Ae |
| | 0.3D | 0.8D | 0.15D | 0.8D | 0.3D | 0.8D | 0.15D | 0.8D | 0.3D | 0.8D | 0.1D | 0.8D |
| 절입량 Depth of Cut |   | | | |   | | | | | | | |

• 유효장이 긴 경우에는 회전수와 이송속도를 최대 20% 이하로 줄이십시오.
• 측면 절삭시 코너R 부분을 참고하여 절삭하시기 바랍니다.
• 홈 절삭시 날경의 코너R 대비 Ae 값을 설정 하십시오.
• 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
• 에어브로 혹은 미스트 쿨런트를 추천하며 칩 제거 주의 및 가공시 발열, 발화에 주의 하십시오.

• In case of long effective length, reduce the RPM and feed by 20% or less.
• Refer to the corner radius value for side milling
• Consider the corner radius value when you set up the Ae value.
• Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
• Air blow or mist coolant is recommended and note for chip emission, heat, or ignition.

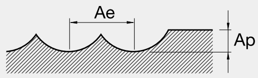
# 3ALR/3ALE

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 알루미늄합금 Aluminum Alloys etc AL7075 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 3ALR Type | | | | 3ALE Type | | | |
| 외경 Outside Diameter | RPM | FEED | | | RPM | FEED | | |
| | | 수직 Vertical | 홈절삭 Soltting | 측면절삭 Side Milling | | 수직 Vertical | 홈절삭 Soltting | 측면절삭 Side Milling |
| ø 1 | 35,000 | 150 | 585 | 715 | 32,000 | 130 | 501 | 605 |
| ø 2 | 30,000 | 225 | 1,170 | 1,398 | 25,500 | 190 | 995 | 1,170 |
| ø 3 | 21,600 | 225 | 1,300 | 1,560 | 18,400 | 190 | 1,100 | 1,300 |
| ø 4 | 16,200 | 300 | 1,300 | 1,560 | 14,000 | 255 | 1,100 | 1,300 |
| ø 5 | 13,000 | 300 | 1,300 | 1,560 | 11,000 | 255 | 1,100 | 1,300 |
| ø 6 | 10,800 | 300 | 1,300 | 1,560 | 9,200 | 255 | 1,100 | 1,300 |
| ø 8 | 8,100 | 300 | 1,300 | 1,560 | 7,000 | 255 | 1,100 | 1,300 |
| ø 10 | 6,480 | 250 | 1,300 | 1,560 | 5,500 | 210 | 1,100 | 1,300 |
| ø 12 | 5,400 | 200 | 1,300 | 1,560 | 4,400 | 170 | 1,100 | 1,300 |
| ø 16 | - | - | - | - | 3,200 | 130 | 995 | 1,235 |
| ø 20 | - | - | - | - | 2,000 | 85 | 884 | 1,105 |
| Milling Amount (mm) | | Ap=0.75D | Ap=0.75D | Ap=0.75D/ Ae=0.3D | | Ap=0.75D | Ap=0.75D | Ap=0.75D/ Ae=0.3D |
| 절입량 Depth of Cut | | |   |   | | |   |   |

## 2ALB Cutting Condition

• RPM : rev./min • Feed : mm/min

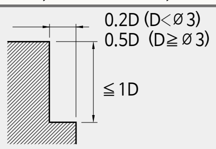
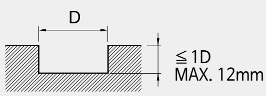
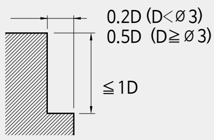
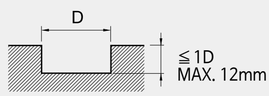
| 피삭재 Material | 알루미늄 합금 Aluminum Alloys AL7075 | | | | 동합금 Copper Alloys C1100 | | | |
|---|---|---|---|---|---|---|---|---|
| 반경 Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| 0.25R | 40,000 | 700 | 0.01 | 0.025 | 34,000 | 2,000 | 0.015 | 0.05 |
| 0.3R | 40,000 | 800 | 0.012 | 0.03 | 34,000 | 2,300 | 0.018 | 0.06 |
| 0.4R | 40,000 | 1,050 | 0.016 | 0.04 | 34,000 | 2,580 | 0.024 | 0.08 |
| 0.5R | 40,000 | 1,200 | 0.02 | 0.05 | 34,000 | 2,880 | 0.03 | 0.1 |
| 0.6R | 40,000 | 1,650 | 0.024 | 0.06 | 34,000 | 3,250 | 0.036 | 0.12 |
| 0.75R | 40,000 | 1,950 | 0.03 | 0.075 | 34,000 | 3,600 | 0.045 | 0.15 |
| 1R | 40,000 | 2,170 | 0.04 | 0.1 | 33,150 | 4,230 | 0.06 | 0.2 |
| 1.25R | 37,000 | 2,250 | 0.05 | 0.125 | 28,500 | 4,100 | 0.075 | 0.25 |
| 1.5R | 33,125 | 2,300 | 0.06 | 0.15 | 25,500 | 4,050 | 0.09 | 0.3 |
| 2R | 23,125 | 2,450 | 0.08 | 0.2 | 22,950 | 3,870 | 0.12 | 0.4 |
| 2.5R | 19,125 | 2,500 | 0.1 | 0.25 | 17,000 | 3,240 | 0.15 | 0.5 |
| 3R | 16,250 | 2,500 | 0.12 | 0.3 | 31,600 | 2,610 | 0.18 | 0.6 |
| 4R | 11,875 | 2,500 | 0.16 | 0.4 | 11,050 | 2,340 | 0.24 | 0.8 |
| 5R | 10,000 | 2,200 | 0.2 | 0.5 | 8,500 | 2,200 | 0.3 | 1 |
| 6R | 8,125 | 2,170 | 0.24 | 0.6 | 6,800 | 2,050 | 0.36 | 1.2 |
| 8R | 7,500 | 2,000 | 0.32 | 0.8 | 5,100 | 2,000 | 0.48 | 1.6 |
| 절입량 Depth of Cut |   | | | | | | | |

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 원활한 칩배출을 위하여 수용성 절삭유제의 사용을 추천합니다.
- 적용 기계의 회전속도가 부족한 경우에는 회전 속도와 이송속도를 같은 비율로 줄여서 적용합니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 용망합니다. (Ø1 이하 사용시 진동 허용 관리 5㎛ 이내일것)
- 원활한 칩배출을 위하여 에어브로 혹은 미스트 쿨런트 사용을 추천하며, 동 가공시 습식 쿨런트를 추천합니다.

- If the effective length is long, lower RPM and FEED at the same ratio.
- We recommend using a soluble cutting fluid for smooth chip evacuation.
- If the rotation speed of the applied machine is insufficient, reduce the rotation speed and feed rate at the same ratio.
- The above cutting conditions are numerical values, so they may need to be adjusted depending on the actual machining shape, machining purpose, and applied machine.
- Please use a rigid and low-vibration machine (vibration tolerance within 5μm for Ø1 or below).
- For smooth chip evacuation, we recommend using air blow or mist coolant, and for non-ferrous materials, we recommend using wet coolant during machining

## 2ALE Cutting Condition

• RPM : rev./min • Feed : mm/min

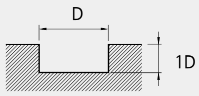
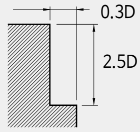
| 피삭재 Material | 알루미늄합금 Aluminum Alloys AL7075 | | | | 알루미늄 합금 주물 Aluminum Alloys AC4B | | | |
|---|---|---|---|---|---|---|---|---|
| | 측면가공 Side Milling | | 홈가공 Soltting | | 측면가공 Side Milling | | 홈가공 Soltting | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| ø 1 | 34,000 | 500 | 34,000 | 400 | 34,000 | 400 | 34,000 | 300 |
| ø 2 | 34,000 | 950 | 32,300 | 720 | 32,300 | 720 | 27,200 | 470 |
| ø 3 | 27,200 | 1,200 | 21,300 | 800 | 21,300 | 800 | 18,000 | 510 |
| ø 4 | 20,400 | 1,300 | 16,000 | 850 | 16,000 | 850 | 14,000 | 550 |
| ø 5 | 16,200 | 1,400 | 13,000 | 850 | 13,000 | 850 | 11,000 | 600 |
| ø 6 | 13,600 | 1,600 | 11,000 | 940 | 11,000 | 940 | 9,400 | 640 |
| ø 8 | 10,200 | 1,600 | 8,000 | 1,000 | 8,000 | 1,000 | 6,800 | 680 |
| ø 10 | 8,100 | 1,600 | 6,500 | 1,000 | 6,500 | 1,000 | 5,400 | 680 |
| ø 12 | 6,800 | 1,600 | 5,400 | 1,000 | 5,400 | 1,000 | 4,500 | 680 |
| ø 16 | 5,100 | 1,600 | 4,100 | 1,000 | 4,100 | 1,000 | 3,400 | 610 |
| ø 20 | 4,100 | 1,300 | 3,200 | 850 | 3,200 | 850 | 2,700 | 560 |
| 절입량 Depth of Cut |   | |   | |   | |   | |

- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

## 3FALE Cutting Condition

• RPM : rev./min • Feed : mm/min

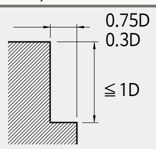
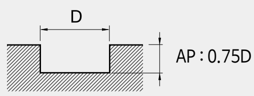
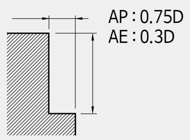
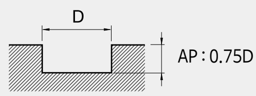
| | 홈절삭 Slotting | | | | 측면절삭 Side Cutting | | | |
|---|---|---|---|---|---|---|---|---|
| 피삭재 Material | 알루미늄 합금 Aluminum Alloys AL7075 | | | | 알루미늄 합금 Aluminum Alloys AL7075 | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 6 | 8,000 | 1,000 | 6 | 6 | 8,000 | 1,200 | 15 | 1.8 |
| ø 8 | 6,000 | 1,000 | 8 | 8 | 6,000 | 1,200 | 20 | 2.4 |
| ø 10 | 4,800 | 1,000 | 10 | 10 | 4,800 | 1,200 | 25 | 3 |
| ø 12 | 4,000 | 1,000 | 12 | 12 | 4,000 | 1,200 | 30 | 3.6 |
| ø 16 | 3,000 | 1,000 | 16 | 16 | 3,000 | 1,200 | 40 | 4.8 |
| 절입량 Depth of Cut |  | | | |  | | | |

- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대 20% 이하로 줄이십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우 진동이 발생할시 조건표에 회전 속도와 이송 속도를 같은 비율로 줄여서 적용 합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- In case of long effective length, reduce the RPM and feed by 20% or less.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.

## 4ALE Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 알루미늄 합금 Aluminum Alloys AL7075 | | | | 알루미늄 합금 주물 aluminum alloy casting AC4B | | | |
|---|---|---|---|---|---|---|---|---|
| | 측면가공 Side Milling | | 홈가공 Soltting | | 측면가공 Side Milling | | 홈가공 Soltting | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| ø3 | 12,800 | 975 | 12,880 | 825 | 5,796 | 439 | 5,796 | 330 |
| ø4 | 9,800 | 975 | 9,800 | 825 | 4,410 | 439 | 4,410 | 330 |
| ø5 | 7,700 | 975 | 7,700 | 825 | 3,465 | 439 | 3,465 | 330 |
| ø6 | 6,440 | 975 | 6,440 | 825 | 2,898 | 439 | 2,898 | 330 |
| ø8 | 4,900 | 975 | 4,900 | 825 | 2,205 | 439 | 2,205 | 330 |
| ø10 | 3,850 | 975 | 3,850 | 825 | 1,733 | 439 | 1,733 | 330 |
| ø12 | 3,080 | 975 | 3,080 | 825 | 1,386 | 439 | 1,386 | 330 |
| ø16 | 2,240 | 926 | 2,240 | 746 | 1,008 | 417 | 1,008 | 298 |
| ø20 | 1,400 | 829 | 1,400 | 663 | 630 | 373 | 630 | 265 |
| 절입량 Depth of Cut |  | |  | |  | |  | |

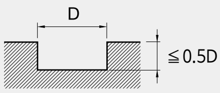
- 높은 이송속도로 절삭 시 절삭날의 배출되는 칩의 융착되어, 안정적인 절삭조건을 먼저 확인해 해주십시오.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정하십시오.
- 상기 절삭조건은 참고 수치이므로  실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며,  칩을 잘 제거하고 가공시 발열과 발화에 주의하십시오.
- 측면가공 후 좋지않은 표면의 세로결이 생긴다면 홀더의 클램핑과 콜렛의 체결을 확인해주십시오.
- When cutting at a high feed rate, check the stability of the cutting conditions first, as chip adhesion may occur on the cutting edge.
- The cutting edge is precisely ground. To prevent breakage, try to measure without contacting the edge if possible.
- The above cutting conditions are numerical values, so they may need to be adjusted depending on the actual machining shape, machining purpose, and applied machine.
- We recommend using air blow, cutting oil, or oil mist coolant to remove chips effectively and pay attention to heat generation and ignition during machining.
- If vertical lines appear on the surface after side milling, check the clamping of the holder and the fastening of the collet.

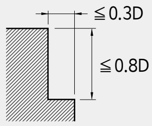
## 3ALC Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 홈절삭 Slotting<br>알루미늄 합금 Aluminum Alloys AL7075 | | | | 측면절삭 Side Cutting<br>알루미늄 합금 Aluminum Alloys AL7075 | | | |
|---|---|---|---|---|---|---|---|---|
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 6 | 10,000 | 3,300 | 3 | 6 | 10,000 | 4,200 | 4.8 | 1.8 |
| ø 8 | 9,000 | 2,700 | 4 | 8 | 9,000 | 3,750 | 6.4 | 2.4 |
| ø 10 | 7,500 | 2,000 | 5 | 10 | 7,500 | 3,000 | 8 | 3 |
| ø 12 | 6,500 | 1,600 | 6 | 12 | 6,500 | 2,700 | 9.6 | 3.6 |
| ø 16 | 5,000 | 1,600 | 8 | 16 | 5,000 | 2,700 | 12.8 | 4.8 |
| ø 20 | 4,000 | 1,500 | 10 | 20 | 4,000 | 2,500 | 16 | 6 |

절입량 Depth of Cut




- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 최대 20% 이하로 줄이십시오.
- 측면 절삭시 코너R 부분을 참고하여 절삭 하시기 바랍니다.
- 홈 절삭시 날경의 코너R 대비 Ae 값을 설정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시의 발열과 발화에 주의하십시오

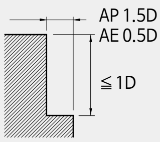
- In case of long effective length, reduce the RPM and feed by 20% or less.
- Refer to the corner radius value for side milling.
- Consider the corner radius value when you set up the Ae value.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

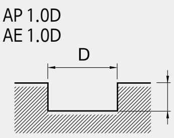
## 3ALCB Cutting Condition

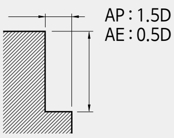
• RPM : rev./min • Feed : mm/min

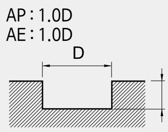
| 피삭재 Material | 알루미늄합금 Aluminum Alloys A7075 | | | | 알루미늄 합금 주물 Aluminum Alloys AC4B | | | | 비철금속 Non-ferrous | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 측면가공 Side Milling | | 홈가공 Soltting | | 측면가공 Side Milling | | 홈가공 Soltting | | 측면가공 Side Milling | | 홈가공 Soltting | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| Ø3 | 40,300 | 3,600 | 37,000 | 2,200 | 26,500 | 1,600 | 15,900 | 1,200 | 47,700 | 5,700 | 40,000 | 3,600 |
| Ø4 | 30,250 | 4,080 | 27,800 | 2,500 | 19,900 | 2,400 | 12,000 | 1,450 | 35,820 | 6,450 | 30,000 | 4,000 |
| Ø5 | 25,500 | 5,080 | 22,300 | 2,780 | 15,900 | 2,800 | 9,550 | 1,720 | 28,600 | 6,880 | 24,200 | 4,350 |
| Ø6 | 21,200 | 5,700 | 18,500 | 2,900 | 13,270 | 2,900 | 7,960 | 1,790 | 23,800 | 7,100 | 20,170 | 4,800 |
| Ø8 | 15,900 | 6,200 | 14,000 | 3,700 | 9,950 | 2,300 | 5,970 | 2,150 | 17,900 | 7,500 | 15,100 | 5,450 |
| Ø10 | 12,800 | 5,700 | 11,200 | 4,000 | 7,960 | 2,150 | 4,770 | 2,290 | 14,300 | 8,100 | 12,100 | 5,800 |
| Ø12 | 10,600 | 5,400 | 9,250 | 3,600 | 6,630 | 2,980 | 3,980 | 2,000 | 12,000 | 7,500 | 10,080 | 6,050 |
| Ø16 | 8,560 | 4,700 | 7,000 | 3,100 | 4,970 | 2,680 | 3,000 | 1,700 | 8,950 | 6,780 | 7,560 | 5,200 |
| Ø20 | 6,850 | 4,100 | 5,570 | 2,800 | 3,980 | 2,300 | 2,400 | 1,450 | 7,170 | 5,800 | 6,050 | 4,550 |

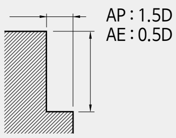
절입량 Depth of Cut

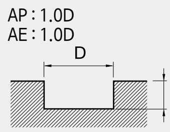


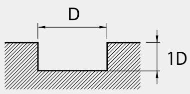
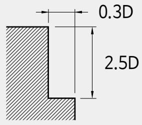




- 가공 진입시 가능 한 피삭재 밖에서 진입 하십시오
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 적용 기계의 회전속도가 부족한 경우에는 회전 속도와 이송속도를 같은 비율로 줄여서 적용합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망합니다. (Ø1 이하 사용시 진동 허용 관리 5㎛이내일것.)
- 원활한 칩배출을 위하여 수용성 쿨런트 사용을 추천합니다.

- During tool entry, try to enter from outside the workpiece as much as possible.
- For diameters and effective lengths without specific cutting conditions, set them proportionally UP&DOWN to similar diameters and effective lengths.
- The above cutting conditions are numerical values, so they may need to be adjusted depending on the actual machining shape, machining purpose, and applied machine.
- If the rotation speed of the applied machine is insufficient, reduce the rotation speed and feed rate at the same ratio.
- Please use a rigid and low-vibration machine (vibration tolerance within 5㎛ for Ø1 or below).
- We recommend using a soluble coolant for smooth chip evacuation.

## 3ARE/3ARC Cutting Condition

• RPM : rev./min • Feed : mm/min

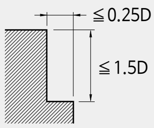
| 피삭재 Material | 동 Copper alloys C1100 | | | | | | 알루미늄 합금 Aluminum alloys AL7075 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 홈절삭 Slotting | | 측면절삭 Side Cutting | | | | 홈절삭 Slotting | | 측면절삭 Side Cutting | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | Ap Axial Depth | Ae Radial Depth |
| ø 6 | 4,200 | 1,500 | 6 | 6 | 15 | 1.8 | 8,000 | 1,800 | 6 | 6 | 15 | 1.8 |
| ø 8 | 3,200 | 1,500 | 8 | 8 | 20 | 2.4 | 6,000 | 1,800 | 8 | 8 | 20 | 2.4 |
| ø 10 | 2,600 | 1,500 | 10 | 10 | 25 | 3 | 4,800 | 1,800 | 10 | 10 | 25 | 3 |
| ø 12 | 2,100 | 1,500 | 12 | 12 | 30 | 3.6 | 4,000 | 1,800 | 12 | 12 | 30 | 3.6 |
| ø 16 | 1,600 | 1,500 | 16 | 16 | 40 | 4.8 | 3,000 | 1,800 | 16 | 16 | 40 | 4.8 |
| ø 20 | 1,300 | 1,500 | 20 | 20 | 50 | 6 | 2,400 | 1,800 | 20 | 20 | 50 | 6 |
| 절입량 Depth of Cut |   | | | | | |   | | | | | |

- 가공진입시가능한피삭재밖에서진입하십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대 20% 이하로 줄이십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망합니다.
- 공작기계와 가공물의 강성이 없는 경우 진동이 발생할시 조건표에 회전 속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- In case of long effective length, reduce the RPM and feed by 20% or less.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.

## 3ARO Cutting Condition

• RPM : rev./min • Feed : mm/min

| | 측면절삭 Side Cutting | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 피삭재 Material | 알루미늄 합금 Aluminum Alloys AL7075 | | | | 알루미늄 합금 주물 Aluminum Alloys AC4B | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 4 | 22,500 | 4,200 | 6 | 1 | 16,000 | 1,800 | 6 | 1 |
| ø 5 | 20,250 | 4,900 | 7.5 | 1.25 | 14,400 | 2,000 | 7.5 | 1.25 |
| ø 6 | 18,225 | 5,500 | 9 | 1.5 | 11,700 | 2,100 | 9 | 1.5 |
| ø 8 | 13,500 | 5,400 | 12 | 2 | 9,000 | 2,200 | 12 | 2 |
| ø 10 | 10,800 | 5,200 | 15 | 2.5 | 7,200 | 2,100 | 15 | 2.5 |
| ø 12 | 8,775 | 4,800 | 18 | 3 | 5,900 | 1,900 | 18 | 3 |
| ø 16 | 6,750 | 4,600 | 24 | 4 | 4,500 | 1,800 | 24 | 4 |
| ø 20 | 5,400 | 4,300 | 30 | 5 | 3,600 | 1,700 | 30 | 5 |
| 절입량 Depth of Cut |   | | | | | | | |

- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대 20% 이하로 줄이십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우 진동이 발생할시 조건표에 회전 속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.

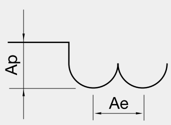
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- In case of long effective length, reduce the RPM and feed by 20% or less.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.

# 3TBIC Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | | 55~ 62HRc | | | |
| 반경 Radius | 유효장 Effective Length | 각도 Taper Angle | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 0.5 | 12 | 1° | 38,000 | 1,375 | 0.110 | 0.16 | 35,000 | 880 | 0.080 | 0.13 | 25,000 | 440 | 0.050 | 0.08 |
| 〃 | 20 | 1° | 38,000 | 1,375 | 0.060 | 0.09 | 35,000 | 880 | 0.050 | 0.07 | 25,000 | 440 | 0.030 | 0.05 |
| 〃 | 15 | 2° | 38,000 | 1,375 | 0.090 | 0.14 | 35,000 | 880 | 0.070 | 0.11 | 25,000 | 440 | 0.050 | 0.07 |
| 〃 | 20 | 2° | 38,000 | 1,375 | 0.060 | 0.09 | 35,000 | 880 | 0.050 | 0.07 | 25,000 | 440 | 0.030 | 0.05 |
| 〃 | 15 | 3° | 38,000 | 1,375 | 0.090 | 0.14 | 35,000 | 880 | 0.070 | 0.11 | 25,000 | 440 | 0.050 | 0.07 |
| 〃 | 20 | 3° | 38,000 | 1,375 | 0.060 | 0.09 | 35,000 | 880 | 0.050 | 0.07 | 25,000 | 440 | 0.030 | 0.05 |
| 〃 | 20 | 4° | 38,000 | 1,375 | 0.070 | 0.1 | 35,000 | 880 | 0.060 | 0.08 | 25,000 | 440 | 0.030 | 0.05 |
| 〃 | 20 | 5° | 38,000 | 1,375 | 0.080 | 0.11 | 35,000 | 880 | 0.060 | 0.09 | 25,000 | 440 | 0.040 | 0.06 |
| 〃 | 20 | 7° | 38,000 | 1,375 | 0.080 | 0.11 | 35,000 | 880 | 0.060 | 0.09 | 25,000 | 440 | 0.040 | 0.06 |
| R 1 | 12 | 1° | 35,000 | 1,540 | 0.400 | 0.27 | 30,000 | 990 | 0.140 | 0.22 | 15,000 | 550 | 0.090 | 0.14 |
| 〃 | 20 | 1° | 35,000 | 1,540 | 0.180 | 0.21 | 30,000 | 990 | 0.110 | 0.17 | 15,000 | 550 | 0.070 | 0.11 |
| 〃 | 15 | 2° | 35,000 | 1,540 | 0.400 | 0.24 | 30,000 | 990 | 0.130 | 0.19 | 15,000 | 550 | 0.080 | 0.12 |
| 〃 | 20 | 2° | 35,000 | 1,540 | 0.160 | 0.21 | 30,000 | 990 | 0.110 | 0.17 | 15,000 | 550 | 0.070 | 0.11 |
| 〃 | 15 | 3° | 35,000 | 1,540 | 0.400 | 0.24 | 30,000 | 990 | 0.130 | 0.19 | 15,000 | 550 | 0.080 | 0.12 |
| 〃 | 20 | 3° | 35,000 | 1,540 | 0.300 | 0.21 | 30,000 | 990 | 0.110 | 0.17 | 15,000 | 550 | 0.070 | 0.11 |
| 〃 | 30 | 3° | 35,000 | 1,540 | 0.160 | 0.2 | 30,000 | 990 | 0.12 | 0.18 | 15,000 | 550 | 0.08 | 0.12 |
| 〃 | 20 | 4° | 35,000 | 1,540 | 0.400 | 0.21 | 30,000 | 990 | 0.110 | 0.17 | 15,000 | 550 | 0.070 | 0.11 |
| 〃 | 20 | 5° | 35,000 | 1,540 | 0.15 | 0.22 | 30,000 | 990 | 0.12 | 0.18 | 15,000 | 550 | 0.08 | 0.12 |
| 〃 | 30 | 5° | 35,000 | 1,540 | 0.13 | 0.2 | 30,000 | 990 | 0.11 | 0.18 | 15,000 | 550 | 0.07 | 0.12 |
| 〃 | 29 | 6° | 35,000 | 1,540 | 0.14 | 0.2 | 30,000 | 990 | 0.1 | 0.18 | 15,000 | 550 | 0.07 | 0.12 |
| 〃 | 25 | 7° | 35,000 | 1,540 | 0.15 | 0.25 | 30,000 | 990 | 0.12 | 0.18 | 15,000 | 550 | 0.07 | 0.11 |
| R 2 | 20 | 1° | 24,000 | 1,925 | 0.23 | 0.34 | 20,000 | 1,375 | 0.18 | 0.27 | 12,000 | 825 | 0.11 | 0.17 |
| 〃 | 20 | 2° | 24,000 | 1,925 | 0.23 | 0.34 | 20,000 | 1,375 | 0.18 | 0.27 | 12,000 | 825 | 0.11 | 0.17 |
| 〃 | 21 | 3° | 24,000 | 1,925 | 0.23 | 0.34 | 20,000 | 1,375 | 0.18 | 0.27 | 12,000 | 825 | 0.11 | 0.17 |
| 〃 | 20 | 4° | 24,000 | 1,925 | 0.23 | 0.34 | 20,000 | 1,375 | 0.18 | 0.27 | 12,000 | 825 | 0.11 | 0.17 |
| 〃 | 20 | 5° | 24,000 | 1,925 | 0.24 | 0.37 | 20,000 | 1,375 | 0.19 | 0.29 | 12,000 | 825 | 0.12 | 0.18 |
| 〃 | 20 | 6° | 24,000 | 1,925 | 0.22 | 0.32 | 20,000 | 1,375 | 0.17 | 0.25 | 12,000 | 825 | 0.1 | 0.16 |
| 〃 | 18 | 7° | 24,000 | 1,925 | 0.23 | 0.34 | 20,000 | 1,375 | 0.18 | 0.27 | 12,000 | 825 | 0.11 | 0.17 |
| R 3 | 32 | 1° | 16,000 | 1,925 | 0.23 | 0.41 | 13,500 | 1,375 | 0.23 | 0.35 | 8,000 | 825 | 0.14 | 0.21 |
| 〃 | 30 | 2° | 16,000 | 1,925 | 0.25 | 0.42 | 13,500 | 1,375 | 0.23 | 0.35 | 8,000 | 825 | 0.14 | 0.21 |
| 〃 | 22 | 3° | 16,000 | 1,925 | 0.3 | 0.45 | 13,500 | 1,375 | 0.24 | 0.36 | 8,000 | 825 | 0.15 | 0.23 |
| 〃 | 40 | 3° | 16,000 | 1,925 | 0.2 | 0.4 | 13,500 | 1,375 | 0.2 | 0.35 | 8,000 | 825 | 0.13 | 0.19 |
| 〃 | 25 | 4° | 16,000 | 1,925 | 0.22 | 0.43 | 13,500 | 1,375 | 0.22 | 0.36 | 8,000 | 825 | 0.14 | 0.2 |
| 〃 | 21 | 5° | 16,000 | 1,925 | 0.25 | 0.45 | 13,500 | 1,375 | 0.23 | 0.36 | 8,000 | 825 | 0.14 | 0.23 |
| 〃 | 21 | 6° | 16,000 | 1,925 | 0.25 | 0.45 | 13,500 | 1,375 | 0.23 | 0.36 | 8,000 | 825 | 0.14 | 0.23 |
| 〃 | 19 | 7° | 16,000 | 1,925 | 0.21 | 0.43 | 13,500 | 1,375 | 0.25 | 0.36 | 8,000 | 825 | 0.15 | 0.25 |

**절입량**
Depth of Cut




Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 ($min^{-1}$)
Vf : Feed 이송속도 (mm/min)

- 절삭 조건에 없는 각도는 같은 직경에 이전 각도와 비례하여 사용 하십시오.
- 이송속도 및 축 방향의 절입 깊이는 테이퍼각에 따라 고려하시고, 절삭 상황에 맞추어 조정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 절삭 양이 작은 경우, Feed를 최대 20% 까지 UP 시켜 주십시오.
- 칩 제거 주의 및 가공시 발열, 발화에 주의 하십시오.

- If there is no parameter for the angle of your tool, refer to the previous angle, and adjust compare to it.
- Consider the RPM and feed based on the taper angle and adjust it with milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If you want to increase metal removal rates, raise up the feed up to 20%.
- During the chip evacuation, note for heat and ignition.

# 4&6CTDB

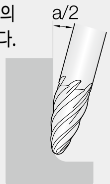
■ 6CTDB는 RPM 동일, FEED만 최대 **30% Up** 적용.
■ Use the same RPM and raise up the feed up to 30% for 6CTDB.

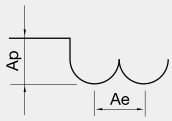
• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 흑연 Graphite | | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | |
|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | | 30 ~ 40HRc | | | |
| 반경 Radius | a/2 | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 0.5 | 10 | 35,000 | 4,200 | 0.22 | 0.3 | 42,000 | 1,950 | 0.09 | 0.05 |
| R 0.75 | 10 | 33,000 | 5,250 | 0.27 | 0.3 | 39,000 | 2,860 | 0.10 | 0.05 |
| R 1 | 10 | 32,000 | 6,300 | 0.32 | 0.6 | 38,500 | 3,510 | 0.20 | 0.10 |
| R 1 | 15 | 25,000 | 6,000 | 1.18 | 0.6 | 30,000 | 2,730 | 0.20 | 0.10 |
| R 1.5 | 10 | 25,000 | 6,000 | 0.39 | 0.8 | 30,000 | 3,120 | 0.30 | 0.10 |
| R 2 | 10 | 16,000 | 4,500 | 0.45 | 1.1 | 20,000 | 2,275 | 0.40 | 0.10 |
| R 2 | 30 | 14,500 | 3,700 | 1.18 | 1.1 | 18,000 | 1,950 | 0.40 | 0.10 |
| R 3 | 10 | 12,000 | 4,250 | 0.49 | 1.4 | 14,000 | 2,210 | 0.60 | 0.10 |
| R 3 | 20 | 10,500 | 4,000 | 1.18 | 1.4 | 13,200 | 2,015 | 0.60 | 0.10 |
| R 4 | 5 | 9,500 | 4,100 | 0.45 | 1.6 | 11,000 | 2,080 | 0.80 | 0.10 |
| R 4 | 10 | 8,000 | 3,850 | 0.45 | 1.6 | 10,000 | 1,950 | 0.80 | 0.10 |

**절입량** Depth of Cut

a/2 각도만큼의
절삭을권장합니다.



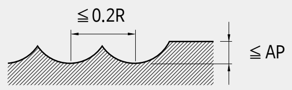
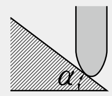

Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 ($min^{-1}$)
Vf : Feed 이송속도 (mm/min)

- 절삭 조건표는 4날 기준이며, 6날시에는 회전수는 유지하고, 피드는 안정적인 속도 내에서 최대30%까지 UP 해주십시오.
- 절삭 조건에 없는 각도는 같은 직경에 이전 각도와 비례하여 사용 하십시오.
- 이송속도 및 축 방향의 절입 깊이는 테이퍼각에 따라 고려하시고, 절삭 상황에 맞추어 조정 하십시오.
- 5축 가공시 유효장 부분을 확인 하여 주십시오.
- 절삭양이 작은 경우, Feed를 최대 20% 까지 UP 시켜 주십시오.
- 칩 제거 주의 및 가공시 발열, 발화에 주의 하십시오.

- The parameters on the table is based on 4 flutes. For using 6 flutes, use the same RPM and raise up the feed up to 30% in stable milling condition.
- If there is no parameter for the angle of your tool, refer to the previous angle, and adjust compare to it.
- Consider the RPM and feed based on the taper angle and adjust it with milling condition.
- For 5-axis milling, check the length of the effective length before milling.
- If you want to increase metal removal rates, raise up the feed up to 20%.
- During the chip evacuation, note for heat and ignition.

# 2CTB Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 40 ~ 45HRC | | | | | | 45~ 55HRC | | | | | |
| 반경 Radius | α≦15˚ | | α>15˚ | | Ap Axial Depth | Ae Radial Depth | α≦15˚ | | α>15˚ | | Ap Axial Depth | Ae Radial Depth |
| | RPM | FEED | RPM | FEED | | | RPM | FEED | RPM | FEED | | |
| R0.5 | 40,000 | 2,800 | 40,000 | 1,600 | 0.06 | 0.1 | 40,000 | 2,800 | 40,000 | 1,500 | 0.05 | 0.1 |
| R0.75 | 40,000 | 3,250 | 40,000 | 2,000 | 0.09 | 0.15 | 40,000 | 3,250 | 32,000 | 1,600 | 0.08 | 0.15 |
| R1 | 40,000 | 3,250 | 39,000 | 2,350 | 0.11 | 0.2 | 40,000 | 3,250 | 31,000 | 1,750 | 0.11 | 0.2 |
| R1.25 | 40,000 | 3,500 | 30,000 | 2,250 | 0.12 | 0.25 | 36,000 | 3,250 | 26,000 | 1,750 | 0.12 | 0.25 |
| R1.5 | 40,000 | 3,750 | 27,000 | 2,150 | 0.13 | 0.3 | 32,000 | 3,000 | 22,000 | 1,700 | 0.13 | 0.3 |
| R2 | 32,000 | 3,750 | 20,000 | 1,800 | 0.15 | 0.4 | 25,000 | 3,000 | 16,000 | 1,350 | 0.15 | 0.4 |
| R2.5 | 25,000 | 3,000 | 16,000 | 1,450 | 0.2 | 0.5 | 20,000 | 2,700 | 13,000 | 1,150 | 0.2 | 0.5 |
| R3 | 21,000 | 2,900 | 13,000 | 1,300 | 0.25 | 0.6 | 17,000 | 2,350 | 10,000 | 1,000 | 0.25 | 0.6 |
| R4 | 16,000 | 2,250 | 10,000 | 1,000 | 0.3 | 0.8 | 13,000 | 1,800 | 8,000 | 750 | 0.3 | 0.8 |
| R5 | 13,000 | 1,800 | 8,000 | 850 | 0.5 | 1 | 10,000 | 1,450 | 6,400 | 600 | 0.5 | 1 |
| R6 | 9,000 | 1,250 | 6,000 | 650 | 0.5 | 1.2 | 7,200 | 1,000 | 4,800 | 500 | 0.5 | 1.2 |
| 절입량 Depth of Cut |   | | | | | | | | | |   | |

- α 란 가공면의 경사각입니다.
- 이송속도 및 축 방향의 절입 깊이는 테이퍼각에 따라 고려하시고, 절삭 상황에 맞추어 조정하십시오.
- 에어브로 혹은 미스트 쿨런트를 추천합니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 칩 제거 주의 및 가공시 발열, 발화에 주의 하십시오.

- α value represents the inclined angle.
- Consider the RPM and feed based on the taper angle and adjust it with milling condition.
- Air blow or mist coolant is recommended.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- During the chip evacuation, note for heat and ignition.

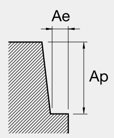
# 2CTE Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steels HP / SM | | 구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels /Gray cast irons SS / SC / FC | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | 합금강 / 프리하든강 / 스테인레스강 Alloy Steels / Pre-hardened Steels / Stainless Steels NAK80 / KP4M / SUS304/ SUS316 | | 고경도강 Hardened Steels STAVAX / SKD11 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~200HB | | ~ 30HRc | | 30 ~ 40HRc | | 38 ~ 45HRc | | 45 ~ 55HRc | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| ø 1 | 15,500 | 155 | 15,500 | 130 | 13,000 | 90 | 12,000 | 90 | 10,500 | 40 |
| ø 1.5 | 10,500 | 155 | 10,500 | 130 | 8,900 | 90 | 8,250 | 90 | 7,000 | 40 |
| ø 2 | 7,950 | 155 | 7,950 | 130 | 6,650 | 90 | 6,200 | 90 | 5,250 | 40 |
| ø 2.5 | 6,200 | 145 | 6,200 | 125 | 5,300 | 90 | 4,950 | 90 | 4,200 | 40 |
| ø 3 | 5,150 | 145 | 5,150 | 125 | 4,450 | 90 | 4,100 | 90 | 3,500 | 40 |
| ø 4 | 3,850 | 145 | 3,850 | 125 | 3,300 | 90 | 3,100 | 85 | 2,600 | 40 |
| ø 5 | 3,100 | 145 | 3,100 | 125 | 2,650 | 90 | 2,450 | 85 | 2,100 | 40 |
| ø 6 | 2,600 | 145 | 2,600 | 125 | 2,200 | 90 | 2,050 | 85 | 1,750 | 40 |
| ø 8 | 1,950 | 145 | 1,950 | 125 | 1,650 | 90 | 1,550 | 85 | 1,300 | 40 |
| ø 10 | 1,550 | 145 | 1,550 | 120 | 1,300 | 90 | 1,200 | 85 | 1,050 | 40 |

절입량 Depth of Cut

| Ap | Ae |
|---|---|
| 2.5D | 0.02D |



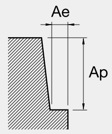
## 4CTE

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steels HP / SM | | 구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels /Gray cast irons SS / SC / FC | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | 합금강 / 프리하든강 / 스테인레스강 Alloy Steels / Pre-hardened Steels / Stainless Steels NAK80 / KP4M / SUS304/ SUS316 | | 고경도강 Hardened Steels STAVAX / SKD11 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~200HB | | ~ 30HRc | | 30 ~ 40HRc | | 38 ~ 45HRc | | 45 ~ 55HRc | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| ø 3 | 5,300 | 225 | 4,450 | 225 | 4,450 | 180 | 4,100 | 130 | 3,500 | 130 |
| ø 4 | 3,950 | 245 | 3,300 | 245 | 3,300 | 195 | 3,100 | 150 | 2,600 | 150 |
| ø 5 | 3,150 | 275 | 2,650 | 275 | 2,650 | 225 | 2,450 | 160 | 2,100 | 160 |
| ø 6 | 2,200 | 275 | 2,200 | 275 | 2,200 | 225 | 2,050 | 175 | 1,750 | 175 |
| ø 8 | 1,950 | 270 | 1,650 | 270 | 1,650 | 225 | 1,550 | 190 | 1,300 | 190 |
| ø 10 | 1,550 | 270 | 1,300 | 270 | 1,300 | 225 | 1,200 | 180 | 1,050 | 180 |

절입량
Depth of Cut

| Ap | Ae |
|---|---|
| 2.5D | 0.02D |




- 절입기준은 2CTE, 4CTE 동일 합니다.
- 이송속도 및 축 방향의 절입 깊이는 테이퍼각에 따라 고려하시고, 절삭 상황에 맞추어 조정 하십시오.
- 가급적 열박음 척을 사용하여 주십시오.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

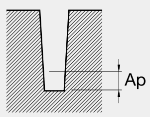
- 2CTE and 4CTE type can be used the same depth of cut.
- Consider the RPM and feed based on the taper angle and adjust it with milling condition.
- Using shrink-fit chuck is recommeded.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

## 4RTE Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels /Gray cast irons SS / SC / FC | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | 합금강 / 프리하든강 / 스테인레스강 Alloy Steels / Pre-hardened Steels / Stainless Steels NAK80 / KP4M / SUS304/ SUS316 | | | 고경도강 Hardened Steels STAVAX / SKD11 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~ 30HRc | | | 30HRc ~ 40HRc | | | 38HRc ~ 45HRc | | | 45HRc ~ 55HRc | | |
| 외경 Outside Diameter | RPM | FEED | Ap | RPM | FEED | Ap | RPM | FEED | Ap | RPM | FEED | Ap |
| ø 0.5 | 31,500 | 565 | 0.01~0.025 | 31,500 | 475 | 0.01~0.025 | 31,500 | 440 | 0.01~0.025 | 19,000 | 250 | 0.005~0.01 |
| ø 0.6 | 31,500 | 680 | 0.012~0.03 | 29,500 | 530 | 0.012~0.03 | 26,500 | 445 | 0.012~0.03 | 15,500 | 260 | 0.006~0.012 |
| ø 0.7 | 27,000 | 680 | 0.014~0.035 | 25,000 | 530 | 0.014~0.035 | 22,500 | 445 | 0.014~0.035 | 13,500 | 260 | 0.007~0.014 |
| ø 0.8 | 23,500 | 680 | 0.016~0.04 | 22,000 | 630 | 0.016~0.04 | 19,500 | 445 | 0.016~0.04 | 11,500 | 260 | 0.008~0.016 |
| ø 0.9 | 21,000 | 680 | 0.018~0.045 | 19,500 | 530 | 0.018~0.045 | 17,500 | 445 | 0.018~0.045 | 10,500 | 260 | 0.009~0.018 |
| ø 1 | 19,000 | 680 | 0.02~0.05 | 17,500 | 530 | 0.02~0.05 | 15,500 | 445 | 0.02~0.05 | 9,500 | 260 | 0.01~0.02 |
| ø 1.2 | 15,500 | 680 | 0.024~0.06 | 14,500 | 530 | 0.024~0.06 | 13,000 | 445 | 0.024~0.06 | 7,950 | 260 | 0.012~0.024 |
| ø 1.5 | 12,500 | 680 | 0.03~0.075 | 11,500 | 530 | 0.03~0.075 | 10,500 | 445 | 0.03~0.075 | 6,350 | 260 | 0.015~0.03 |
| ø 2 | 9,500 | 680 | 0.04~0.1 | 8,900 | 530 | 0.04~0.1 | 7,950 | 445 | 0.04~0.1 | 4,750 | 260 | 0.02~0.04 |
| ø 2.5 | 7,600 | 680 | 0.05~0.125 | 7,100 | 530 | 0.05~0.125 | 7,950 | 445 | 0.04~0.1 | 4,750 | 260 | 0.02~0.04 |

절입량
Depth of Cut




- 날 깊이를 얻기 위해서는, 순차적으로 하나씩 목부길이를 맞추는 것이 가장 효과적 입니다.
- 이송속도 및 축 방향의 절입 깊이는 테이퍼각에 따라 고려하시고, 절삭 상황에 맞추어 조정 하십시오.
- 코너 작업시에는 피드값을 50% 줄여 주십시오.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- Consider the RPM and feed based on the taper angle and adjust it with milling condition.
- Reduce the feed by 50% for corner milling.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

# 2CRC Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | 구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels /Gray cast irons SS / SC / FC | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | |
|---|---|---|---|---|---|---|
| 경도 Hardness | -200HB | | ~30HRc | | 30~ 40HRc | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED |
| ø 1.9 | 7,400 | 410 | 8,500 | 340 | 10,000 | 270 |
| ø 2.9 | 6,600 | 365 | 7,800 | 300 | 9,230 | 240 |
| ø 3.9 | 5,800 | 320 | 7,300 | 270 | 8,500 | 210 |
| ø 4.9 | 5,250 | 300 | 6,500 | 240 | 7,560 | 190 |
| ø 5.9 | 4,600 | 260 | 5,700 | 220 | 6,750 | 170 |

- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- R 게이지를 통해 절삭 후 측정 바랍니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- Measure after cutting through the R gauge.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.

# 4CRC

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | 구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels /Gray cast irons SS / SC / FC | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | |
|---|---|---|---|---|---|---|
| 경도 Hardness | -200HB | | ~30HRc | | 30~ 40HRc | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED |
| ø 1.9 | 5,940 | 630 | 6,800 | 520 | 8,000 | 420 |
| ø 2.9 | 5,280 | 560 | 6,000 | 470 | 7,100 | 370 |
| ø 3.9 | 4,700 | 500 | 5,400 | 420 | 6,300 | 330 |
| ø 4.9 | 4,200 | 450 | 4,830 | 370 | 5,600 | 300 |
| ø 5.9 | 3,700 | 410 | 4,250 | 330 | 5,000 | 270 |

- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- R 게이지를 통해 절삭 후 측정 바랍니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- Measure after cutting through the R gauge.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.

# 1HTE

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 알루미늄 합금 Aluminum AL7075 | | 플라스틱 Plastic | | ABS수지 / 아크릴 ABS resin Acrylic | |
|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED |
| ø1.2 | 21,300 | 470 | 12,000 | 300 | 30,000 | 2,000 |
| ø2 | 15,500 | 600 | 7,000 | 300 | 30,000 | 2,200 |
| ø3 | 13,580 | 660 | 4,800 | 250 | 25,000 | 2,400 |
| ø4 | 10,160 | 690 | 3,600 | 200 | 20,000 | 2,200 |
| ø5 | 8,170 | 700 | 2,400 | 120 | 13,500 | 2,300 |
| ø8 | 5,130 | 640 | 2,050 | 120 | 10,000 | 2,400 |
| ø10 | 4,085 | 600 | 1,600 | 120 | 8,000 | 2,400 |
| ø12 | 3,420 | 560 | 1,350 | 120 | 7,000 | 2,200 |
| ø16 | 3,040 | 550 | 950 | 120 | 5,600 | 2,200 |

- 절삭날의 칩 융착을 주의하십시오.
- 피삭재에 진입 시 공구의 칩 뭉침을 확인해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례 적으로 조정하십시오.

- Please be mindful of chip adhesion on the cutting edge.
- When entering the cutting material, please check for chip buildup on the tool.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

# 1CHA

• RPM : rev./min • Feed : mm/min

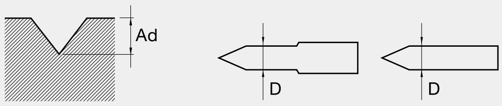
| 피삭재 Material | 알루미늄 합금 Aluminum AL7075 | | 플라스틱 Plastic | | ABS수지 / 아크릴 ABS resin Acrylic | |
|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED |
| ø0.9 | 37,000 | 230 | 14,500 | 300 | 25,000 | 220 |
| ø1.2 | 34,000 | 230 | 11,000 | 320 | 24,000 | 230 |
| ø2 | 20,700 | 230 | 8,500 | 350 | 12,000 | 230 |
| ø3 | 13,800 | 230 | 6,800 | 380 | 8,000 | 230 |
| ø4 | 10,350 | 250 | 6,200 | 380 | 6,000 | 230 |
| ø6 | 6,900 | 250 | 5,900 | 400 | 4,000 | 240 |
| ø8 | 5,150 | 250 | 5,000 | 400 | 3,000 | 240 |
| ø10 | 4,140 | 250 | 4,000 | 400 | 3,000 | 250 |
| ø12 | 3,450 | 250 | 3,300 | 420 | 2,000 | 250 |
| ø16 | 2,588 | 250 | 2,500 | 420 | 1,400 | 250 |

- 가공 진입 시 가능한 피삭재 밖에서 진입 하십시오.
- 상기 절삭 조건의 참고는 수치이므로, 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 에어브로 혹은 수용성 절삭유 또는 유성 절삭유를 추천합니다.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

# 1STE/2STE/4STE

• RPM : rev./min • Feed : mm/min

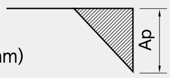
| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | 구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels /Gray cast irons SS / SC / FC | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | |
|---|---|---|---|---|---|---|
| 경도 Hardness | -200HB | | ~30HRc | | 30~ 40HRc | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED |
| ø 2 | 5,500 | 85 | 4,000 | 75 | 3,000 | 50 |
| ø 3 | 4,000 | 70 | 3,000 | 55 | 2,000 | 40 |
| ø 4 | 3,000 | 60 | 2,500 | 45 | 1,800 | 35 |
| ø 5 | 2,500 | 50 | 2,000 | 40 | 1,500 | 30 |
| ø 6 | 2,000 | 45 | 1,600 | 35 | 1,200 | 25 |
| ø 7 | 1,800 | 40 | 1,300 | 30 | 1,150 | 25 |
| ø 8 | 1,500 | 35 | 1,250 | 30 | 900 | 23 |
| ø 9 | 1,350 | 35 | 1,100 | 30 | 850 | 20 |
| ø 10 | 1,200 | 35 | 900 | 25 | 800 | 20 |
| ø 11 | 1,100 | 35 | 850 | 25 | 750 | 20 |
| ø 12 | 1,000 | 30 | 800 | 25 | 600 | 15 |
| 절입량 Depth of Cut | Ad : 0.05D이하   | | | | | |

• 상기 조건은 2날 기준이며 날수의 변경시 같은 직경에 비례하여 회전수와 이송속도를 UP/DOWN 시켜주십시오.
• 조각 가공시 엔드밀의 날 끝을 확인해 주십시오.
• 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.

• The parameters on the table is based on 2 flutes. To change the number of flutes, refer to the same diameter of other parameters and then adjust it.
• For engrave machining, check the edge of the flutes.
• Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.

# 2CHA/3CHA Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | 구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels /Gray cast irons SS / SC / FC | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | |
|---|---|---|---|---|---|---|
| 경도 Hardness | ~200HB | | ~30HRc | | 30~ 40HRc | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED |
| ø 3 | 4,200 | 70 | 3,000 | 55 | 2,500 | 40 |
| ø 4 | 3,000 | 60 | 2,500 | 45 | 1,800 | 35 |
| ø 6 | 2,000 | 40 | 1,500 | 35 | 1,200 | 25 |
| ø 8 | 1,500 | 35 | 1,200 | 30 | 900 | 25 |
| ø 10 | 1,200 | 35 | 1,000 | 25 | 900 | 20 |
| ø 12 | 1,000 | 30 | 850 | 25 | 600 | 20 |
| 절입량 Depth of Cut | Ap : 0.1d<br>Ap : Axial Depth<br>축방향의절입깊이(mm)   | | | | | |

• 상기 조건은 2날 기준이며 날 수의 변경시 같은 직경에 비례하여 회전수와 이송속도를 UP/DOWN 시켜주십시오.
• 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
• 에어브로 혹은 수용성 절삭유 또는 유성 절삭유를 추천합니다.

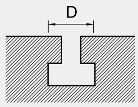
• The parameters on the table is based on 2 flutes. To change the number of flutes, refer to the same diameter of other parameters and then adjust it.
• Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
• Air blow, water-soluble oil, or oil mist is recommended.

# 4TES/4TRS/3TRC/4&6TDA/3&4THC/4&6TAC

■ 3TRC는RPM 동일, FEED만최대 **30% Down** 적용.
■ Use the same RPM and reduce the feed by 30% for 3TRC.

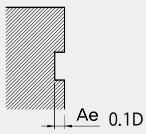
| 홈절삭 Slotting | | | | | | |
|---|---|---|---|---|---|---|
| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | 구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels /Gray cast irons SS / SC / FC | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | |
| 경도 Hardness | -200HB | | ~30HRc | | 30~ 40HRc | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED |
| ø 1.5 | 3,050 | 117 | 1,890 | 77 | 1,530 | 59 |
| ø 2 | 2,850 | 110 | 1,790 | 72 | 1,440 | 55 |
| ø 2.5 | 2,680 | 99 | 1,700 | 66 | 1,350 | 50 |
| ø 3 | 2,500 | 92 | 1,610 | 60 | 1,260 | 45 |
| ø 4 | 2,150 | 81 | 1,430 | 54 | 1,080 | 41 |
| ø 5 | 1,800 | 70 | 1,200 | 47 | 900 | 35 |
| ø 6 | 1,430 | 59 | 950 | 39 | 720 | 30 |
| ø 8 | 1,070 | 44 | 720 | 30 | 540 | 22 |
| ø 10 | 860 | 35 | 580 | 23 | 430 | 17 |
| ø 12 | 720 | 30 | 480 | 20 | 360 | 14 |

절입량
Depth of Cut




| 측면절삭 Side Cutting | | | | | | |
|---|---|---|---|---|---|---|
| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | 구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels /Gray cast irons SS / SC / FC | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | |
| 경도 Hardness | -200HB | | ~30HRc | | 30~ 40HRc | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED |
| ø 1.5 | 3,050 | 162 | 1,890 | 94 | 1,530 | 76 |
| ø 2 | 2,850 | 149 | 1,790 | 88 | 1,440 | 70 |
| ø 2.5 | 2,680 | 135 | 1,700 | 83 | 1,350 | 65 |
| ø 3 | 2,500 | 122 | 1,610 | 79 | 1,260 | 59 |
| ø 4 | 2,150 | 108 | 1,430 | 72 | 1,080 | 54 |
| ø 5 | 1,800 | 95 | 1,200 | 65 | 900 | 49 |
| ø 6 | 1,430 | 86 | 950 | 58 | 720 | 43 |
| ø 8 | 1,070 | 64 | 720 | 43 | 540 | 32 |
| ø 10 | 860 | 52 | 580 | 34 | 430 | 26 |
| ø 12 | 720 | 43 | 480 | 29 | 360 | 22 |

절입량
Depth of Cut

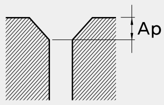



- 공구 진입시 피삭재 밖에서 진입하십시오. • 상기 절삭 조건은 4날 기준이며, 3TRC의 경우 회전수는 유지하고 Feed를 30% 줄여서 사용하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 측면절삭 시 떨림이 발생한 경우 절삭조건의 Feed를 줄여주십시오.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- The parameters on the table is based on 4 flutes. For using 3TRC , use the same RPM and reduce the feed by 30%.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- If a vibration is occurred while side milling, reduce the feed.

# 2CEN Cutting Condition

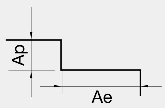
• RPM : rev./min • Feed : mm/min

| 피삭재<br>Material | 일반구조강 / 쾌삭강<br>Mild steels / Free cutting steel<br>HP / SM | | | 구조용강 / 탄소강 / 회주철<br>Structural steel / Carbon Steels /Gray cast iron<br>SS / SC / FC | | | 공구강 / 금형강<br>Tool steels / Mold steels<br>SCM / HPM | | | 알루미늄 합금<br>Aluminum Alloys<br>AL7075 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | -200HB | | | ~30HRc | | | 30~ 40HRc | | | | | |
| 외경 Outside Diameter | RPM | FEED | Ap<br>Axial Depth | RPM | FEED | Ap<br>Axial Depth | RPM | FEED | Ap<br>Axial Depth | RPM | FEED | Ap<br>Axial Depth |
| ø 2 | 1,400 | 100 | 2 | 800 | 50 | 2 | 650 | 40 | 1 | 4,800 | 280 | 2 |
| ø 3 | 1,400 | 100 | 3 | 800 | 50 | 3 | 650 | 40 | 1.5 | 4,800 | 280 | 3 |
| ø 4 | 1,280 | 100 | 4 | 690 | 50 | 4 | 580 | 40 | 2 | 4,200 | 280 | 4 |
| ø 5 | 1,300 | 100 | 5 | 640 | 50 | 5 | 520 | 40 | 2.5 | 3,300 | 280 | 5 |
| ø 6 | 1,150 | 100 | 6 | 600 | 50 | 6 | 480 | 40 | 3 | 2,900 | 280 | 6 |
| ø 8 | 1,000 | 100 | 8 | 530 | 50 | 8 | 420 | 40 | 4 | 2,600 | 280 | 8 |
| ø 10 | 850 | 90 | 10 | 490 | 40 | 10 | 390 | 30 | 5 | 2,400 | 260 | 10 |
| ø 12 | 720 | 90 | 12 | 410 | 40 | 12 | 310 | 30 | 6 | 1,900 | 260 | 12 |
| ø 14 | 610 | 90 | 14 | 340 | 40 | 14 | 270 | 30 | 7 | 1,700 | 240 | 14 |
| ø 16 | 550 | 90 | 16 | 310 | 40 | 16 | 250 | 30 | 8 | 1,500 | 230 | 16 |
| 절입량<br>Depth of Cut |  | | | | | | | | | | | |



# 2CENE / 2CCMC

• RPM : rev./min • Feed : mm/min

| 피삭재<br>Material | 일반구조강 / 쾌삭강<br>Mild steels / Free cutting steel<br>HP / SM | | | | 구조용강 / 탄소강 / 회주철<br>Structural steel / Carbon Steels<br>/Gray cast iron<br>SS / SC / FC | | | | 공구강 / 금형강<br>Tool steels / Mold steels<br>SCM / HPM | | | | 동합금<br>Copper alloys<br>C1100 | | | | 알루미늄<br>Aluminum<br>AL7075 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | -200HB | | | | ~30HRc | | | | 30~ 40HRc | | | | | | | | | | | |
| 외경<br>Outside Diameter | RPM | FEED | Ap | Ae | RPM | FEED | Ap | Ae | RPM | FEED | Ap | Ae | RPM | FEED | Ap | Ae | RPM | FEED | Ap | Ae |
| ø 1 | 28,000 | 230 | 1.5 | 0.05 | 24,500 | 180 | 1.5 | 0.05 | 17,500 | 120 | 1.5 | 0.05 | 23,000 | 150 | 1.5 | 0.1 | 50,000 | 400 | 1.5 | 0.2 |
| ø 1.5 | 18,700 | 340 | 2.0 | 0.10 | 16,300 | 180 | 2.0 | 0.10 | 11,700 | 120 | 2.0 | 0.10 | 13,000 | 150 | 2.0 | 0.3 | 40,900 | 400 | 2.0 | 0.3 |
| ø 2 | 14,000 | 360 | 2.5 | 0.15 | 12,300 | 220 | 2.5 | 0.15 | 8,800 | 170 | 2.5 | 0.15 | 11,500 | 150 | 2.5 | 0.4 | 31,800 | 400 | 2.5 | 0.4 |
| ø 3 | 9,300 | 390 | 4.0 | 0.30 | 8,200 | 240 | 4.0 | 0.30 | 5,800 | 170 | 4.0 | 0.30 | 8,000 | 200 | 4.0 | 0.6 | 21,200 | 400 | 4.0 | 0.6 |
| ø 4 | 7,000 | 390 | 5.0 | 0.40 | 6,100 | 240 | 5.0 | 0.40 | 4,400 | 180 | 5.0 | 0.40 | 6,000 | 200 | 5.0 | 0.8 | 15,900 | 500 | 5.0 | 0.8 |
| ø 5 | 5,600 | 470 | 6.0 | 0.50 | 4,900 | 260 | 6.0 | 0.50 | 3,500 | 200 | 6.0 | 0.50 | 5,000 | 200 | 6.0 | 1 | 12,700 | 500 | 6.0 | 1 |
| ø 6 | 4,700 | 480 | 8.0 | 0.60 | 4,100 | 270 | 8.0 | 0.60 | 2,900 | 200 | 8.0 | 0.60 | 4,000 | 200 | 8.0 | 1.2 | 10,600 | 500 | 8.0 | 1.2 |
| ø 8 | 3,500 | 470 | 10.0 | 1.00 | 3,100 | 270 | 10.0 | 1.00 | 2,200 | 200 | 10.0 | 1.00 | 3,000 | 200 | 10.0 | 1.6 | 8,000 | 600 | 10.0 | 1.6 |
| ø 10 | 2,800 | 480 | 12.0 | 1.20 | 2,500 | 280 | 12.0 | 1.20 | 1,800 | 200 | 12.0 | 1.20 | 2,400 | 200 | 12.0 | 2 | 6,400 | 600 | 12.0 | 2 |
| ø 12 | 2,300 | 470 | 15.0 | 1.50 | 2,000 | 260 | 15.0 | 1.50 | 1,500 | 200 | 15.0 | 1.50 | 2,000 | 200 | 15.0 | 2.4 | 5,300 | 700 | 15.0 | 2.4 |
| 절입량<br>Depth of Cut | Side Milling<br>• Ap : Axial Depth<br>• Ae : Radial Depth  | | | | | | | | | | | | | | | | | | | |



• 2CENE는 홈 절삭이 불가능하며, 2CCMC는 홈 절삭을 추천하지 않습니다.
• 상기 절삭 조건은 측면 절삭조건 입니다.
• 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
• 에어브로 혹은 수용성 절삭유 또는 유성 절삭유를 추천합니다.

• Grooving with 2CENE is not possible and 2CCMC is also not recommeded.
• Above parameters are for side milling.
• Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
• If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
• If a vibration is occurred while side milling, reduce the feed.

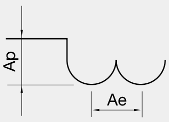
# 2MRB/3MRB

■ 3MRB는 RPM과 FEED를 **10% Up** 적용.
■ raise up the RPM and feed by 10% for 3MRB.

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | | 알루미늄합금 Aluminum Alloys AL7075 | | | | 플라스틱 Plastic | | | |
|---|---|---|---|---|---|---|---|---|---|
| 반경 Corner Radius | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ap Radial Depth | RPM | FEED | Ap Axial Depth | Ap Radial Depth |
| R 0.1 | 1 | 35,000 | 420 | 0.003 | 0.03 | 35,000 | 1,000 | 0.05 | 0.03 |
| R 0.15 | 2 | 35,000 | 490 | 0.004 | 0.04 | 35,000 | 1,050 | 0.06 | 0.04 |
| R 0.2 | 3 | 35,000 | 560 | 0.005 | 0.06 | 35,000 | 1,100 | 0.07 | 0.06 |
| R 0.25 | 4 | 35,000 | 700 | 0.006 | 0.07 | 28,000 | 1,200 | 0.08 | 0.07 |
| 〃 | 10 | 27,300 | 504 | 0.004 | 0.05 | 21,840 | 864 | 0.06 | 0.04 |
| R 0.3 | 4 | 35,000 | 910 | 0.007 | 0.09 | 24,000 | 1,200 | 0.1 | 0.09 |
| 〃 | 10 | 27,300 | 655 | 0.005 | 0.07 | 18,720 | 864 | 0.07 | 0.05 |
| R 0.4 | 4 | 26,000 | 940 | 0.008 | 0.12 | 18,000 | 900 | 0.13 | 0.12 |
| 〃 | 10 | 19,500 | 658 | 0.006 | 0.1 | 13,500 | 576 | 0.11 | 0.1 |
| R 0.5 | 6 | 21,000 | 970 | 0.008 | 0.15 | 14,000 | 700 | 0.17 | 0.15 |
| 〃 | 16 | 14,700 | 631 | 0.006 | 0.1 | 9,800 | 455 | 0.1 | 0.09 |
| R 0.6 | 6 | 18,000 | 1,010 | 0.009 | 0.18 | 12,000 | 600 | 0.2 | 0.18 |
| 〃 | 16 | 12,780 | 616 | 0.007 | 0.11 | 8,520 | 366 | 0.13 | 0.12 |
| R 0.7 | 6 | 15,000 | 1,020 | 0.01 | 0.21 | 10,000 | 500 | 0.23 | 0.21 |
| 〃 | 16 | 10,800 | 622 | 0.008 | 0.16 | 7,200 | 305 | 0.17 | 0.15 |
| R 0.75 | 6 | 14,000 | 1,010 | 0.012 | 0.24 | 9,500 | 480 | 0.25 | 0.24 |
| 〃 | 16 | 10,220 | 636 | 0.01 | 0.19 | 6,935 | 302 | 0.19 | 0.17 |
| 〃 | 25 | 8,483 | 477 | 0.008 | 0.14 | 5,756 | 227 | 0.13 | 0.11 |
| R 1 | 8 | 11,000 | 1,100 | 0.18 | 0.35 | 7,000 | 350 | 0.4 | 0.35 |
| 〃 | 20 | 8,140 | 704 | 0.16 | 0.3 | 5,180 | 224 | 0.35 | 0.33 |
| 〃 | 30 | 6,919 | 528 | 0.14 | 0.25 | 4,403 | 168 | 0.3 | 0.28 |
| R 1.5 | 8 | 6,900 | 760 | 0.2 | 0.5 | 4,800 | 240 | 0.5 | 0.5 |
| 〃 | 20 | 5,313 | 486 | 0.18 | 0.45 | 4,080 | 151 | 0.45 | 0.45 |
| 〃 | 30 | 4,516 | 365 | 0.16 | 0.4 | 3,142 | 113 | 0.4 | 0.4 |
| R 2 | 16 | 5,200 | 690 | 0.25 | 0.65 | 3,600 | 180 | 0.6 | 0.65 |
| 〃 | 25 | 4,056 | 449 | 0.22 | 0.6 | 3,060 | 113 | 0.56 | 0.61 |
| 〃 | 35 | 3,488 | 336 | 0.2 | 0.55 | 2,356 | 85 | 0.54 | 0.57 |
| R 2.5 | 16 | 4,200 | 590 | 0.3 | 0.8 | 2,900 | 150 | 0.8 | 0.85 |
| 〃 | 25 | 3,234 | 401 | 0.27 | 0.75 | 2,233 | 102 | 0.76 | 0.81 |
| 〃 | 35 | 2,652 | 309 | 0.24 | 0.7 | 1,831 | 79 | 0.72 | 0.75 |
| R 3 | 25 | 3,500 | 550 | 0.35 | 0.9 | 2,400 | 120 | 1 | 1.2 |
| 〃 | 35 | 2,940 | 468 | 0.33 | 0.8 | 2,016 | 102 | 0.95 | 1.1 |
| 〃 | 50 | 2,323 | 355 | 0.3 | 0.7 | 1,593 | 78 | 0.9 | 1 |
| R 4 | - | 3,300 | 520 | 0.4 | 1.2 | 2,065 | 130 | 1.3 | 1.6 |
| R 5 | - | 2,850 | 500 | 0.5 | 1.5 | 1,615 | 125 | 1.6 | 2 |
| R 6 | - | 2,650 | 470 | 0.6 | 1.8 | 1,350 | 125 | 2 | 2.4 |
| R 7 | - | 2,500 | 450 | 0.8 | 2.4 | 1,000 | 120 | 2.5 | 3.2 |

**절입량**
Depth of Cut




Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 ($min^{-1}$)
Vf : Feed 이송속도 (mm/min)

- 상기 절삭조건은 2날 기준이며, 3날 가공시 회전수와 Feed를 10% UP 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 적용 기계의 회전속도가 부족한 경우에는 회전 속도와 이송속도를 같은 비율로 줄여서 적용 합니다.

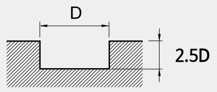
- The parameters on the table is based on 2 flutes. For using 3 flutes, increase RPM and feed by 10% in stable milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.

## 1MBE

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | ABS 수지 / 아크릴 ABS resin / Acrylic | | | 알루미늄합금 Aluminum Alloys AL7075 | | |
|---|---|---|---|---|---|---|
| 외경 Outside Diameter | RPM | FEED | Ap (Axial Depth) | RPM | FEED | Ap (Axial Depth) |
| R0.5 | 41,600 | 2,200 | 2.5 | 29,900 | 1,430 | 2.5 |
| R1 | 41,600 | 2,420 | 5 | 29,900 | 1,650 | 5 |
| R1.5 | 32,500 | 2,640 | 7.5 | 23,400 | 1,870 | 7.5 |
| R2 | 26,000 | 2,640 | 10 | 19,500 | 1,980 | 10 |
| R2.5 | 19,500 | 2,420 | 12.5 | 15,600 | 1,980 | 12.5 |
| R3 | 17,550 | 2,530 | 15 | 13,000 | 1,980 | 15 |
| R4 | 17,000 | 2,640 | 20 | 12,500 | 2,090 | 20 |
| R5 | 16,000 | 2,640 | 25 | 12,000 | 2,200 | 25 |
| R6 | 14,000 | 2,420 | 30 | 10,000 | 2,090 | 30 |
| R8 | 13,000 | 2,350 | 40 | 8,700 | 2,000 | 40 |

절입량
Depth of Cut




- 절삭날의 칩 융착을 주의하십시오.
- 최대한 공구 진입 시 피삭재 밖에서 진입하십시오
- 상기 절살조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.

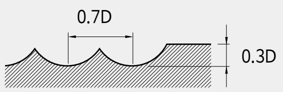
- Please be mindful of chip adhesion on the cutting edge.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

## 2MLB

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | ABS 수지 / 아크릴 ABS resin / Acrylic | | | |
|---|---|---|---|---|
| 반경 Radius | RPM | FEED | Ap Axial Depth | Ap Radial Depth |
| R 0.1 | 37,000 | 50 | 0.06 | 0.14 |
| R 0.2 | 37,000 | 100 | 0.12 | 0.28 |
| R 0.3 | 37,000 | 140 | 0.18 | 0.42 |
| R 0.4 | 37,000 | 190 | 0.24 | 0.56 |
| R 0.5 | 32,000 | 210 | 0.30 | 0.7 |
| R 1 | 16,000 | 210 | 0.60 | 1.4 |
| R 1.5 | 11,000 | 210 | 0.90 | 2.1 |
| R 2 | 8,200 | 210 | 1.20 | 2.8 |
| R 2.5 | 6,000 | 250 | 1.50 | 3.5 |
| R 3 | 5,500 | 250 | 1.80 | 4.2 |
| R 4 | 4,100 | 280 | 2.40 | 5.6 |
| R 5 | 3,200 | 280 | 3.00 | 7.0 |
| R 6 | 2,700 | 330 | 3.60 | 8.4 |
| R 8 | 2,200 | 330 | 4.80 | 11.2 |

절입량
Depth of Cut




- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 상기 절사조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용기계에 따라 조건변경 요망 합니다.
- 적용 기계의 회전속도가 부족한 경우에는 회전 속도와 이송속도를 같은 비율로 줄여서 적용합니다.

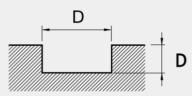
- If the effective length is long, reduce the RPM and feed in the same proportion.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.

## 2MLE

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | ABS 수지 / 아크릴 ABS resin / Acrylic | | | |
|---|---|---|---|---|
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ap Radial Depth |
| ø 0.2 | 50,000 | 100 | 0.2 | 0.2 |
| ø 0.4 | 50,000 | 200 | 0.4 | 0.4 |
| ø 0.5 | 50,000 | 240 | 0.5 | 0.5 |
| ø 0.6 | 40,000 | 240 | 0.6 | 0.6 |
| ø 0.8 | 30,000 | 240 | 0.8 | 0.8 |
| ø 1 | 24,000 | 240 | 1 | 1 |
| ø 2 | 12,000 | 240 | 2 | 2 |
| ø 3 | 8,000 | 240 | 3 | 3 |
| ø 4 | 6,000 | 240 | 4 | 4 |
| ø 5 | 4,800 | 240 | 5 | 5 |
| ø 6 | 4,000 | 260 | 6 | 6 |
| ø 8 | 3,000 | 260 | 8 | 8 |
| ø 10 | 3,000 | 260 | 10 | 10 |
| ø 12 | 2,000 | 260 | 12 | 12 |
| ø 16 | 1,400 | 260 | 16 | 16 |

절입량
Depth of Cut




- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정하십시오.
- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 상기 절사조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송속도를 같은 비율로 줄여서 적용합니다.

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- If the effective length is long, reduce the RPM and feed in the same proportion.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.

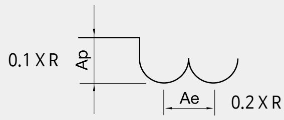
## 2MBE / 3MBE

- 3MBE는 RPM과FEED를 **10% Up** 적용.
- Raise up the RPM and feed by 10% for 3MBE.

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | | | 구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels /Gray cast iron SS / SC / FC | | | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | -200HB | | | | ~30HRc | | | | 30~ 40HRc | | | |
| 반경 Corner Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 0.2 | 36,000 | 630 | 0.02 | 0.04 | 34,200 | 520 | 0.02 | 0.04 | 33,174 | 400 | 0.02 | 0.04 |
| R 0.3 | 24,300 | 630 | 0.03 | 0.06 | 23,085 | 520 | 0.03 | 0.06 | 22,392 | 400 | 0.03 | 0.06 |
| R 0.4 | 21,000 | 630 | 0.04 | 0.08 | 19,950 | 520 | 0.04 | 0.08 | 19,352 | 400 | 0.04 | 0.08 |
| R 0.5 | 12,000 | 630 | 0.05 | 0.10 | 12,300 | 520 | 0.1 | 0.10 | 10,179 | 400 | 0.05 | 0.10 |
| R 1 | 11,400 | 630 | 0.10 | 0.20 | 10,000 | 520 | 0.1 | 0.20 | 8,700 | 400 | 0.10 | 0.20 |
| R 1.5 | 7,700 | 630 | 0.15 | 0.30 | 6,700 | 520 | 0.2 | 0.30 | 5,800 | 400 | 0.15 | 0.30 |
| R 2 | 5,800 | 630 | 0.20 | 0.40 | 5,000 | 520 | 0.2 | 0.40 | 4,300 | 400 | 0.20 | 0.40 |
| R 3 | 3,800 | 630 | 0.30 | 0.60 | 3,300 | 520 | 0.3 | 0.60 | 2,900 | 400 | 0.30 | 0.60 |
| R 4 | 2,900 | 630 | 0.40 | 0.80 | 2,500 | 520 | 0.4 | 0.80 | 2,200 | 400 | 0.40 | 0.80 |
| R 5 | 2,300 | 630 | 0.50 | 1.00 | 2,000 | 520 | 0.5 | 1.00 | 1,700 | 400 | 0.50 | 1.00 |
| R 6 | 1,900 | 630 | 0.60 | 1.20 | 1,700 | 520 | 0.6 | 1.20 | 1,400 | 400 | 0.60 | 1.20 |

절입량
Depth of Cut




- 상기 절삭 조건은 2날 기준이며 3날 가공시 회전수와 Feed를 10% UP 시켜주십시오.
- R0.5 이하 제품은 절삭조건의 Feed 보다낮게 시작하여 점차 올려 주십시오.
- 상기 절사조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 적용 기계의 회전속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용합니다.

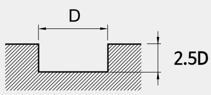
- The parameters on the table is based on 2 flutes. For using 3 flutes, increase RPM and feed by 10% in stable milling condition.
- Below 0.5mm of front diameter tool, set up the lower RPM
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.

## 1MEM / 1REM

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | ABS 수지 / 아크릴 ABS resin / Acrylic | | | 구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels /Gray cast iron SS / SC / FC | | |
|---|---|---|---|---|---|---|
| 외경 Outside Diameter | RPM | FEED | Ap (Axial Depth) | RPM | FEED | Ap (Axial Depth) |
| ø 1 | 32,000 | 2,000 | 2.5 | 23,000 | 1,300 | 2.5 |
| ø 2 | 32,000 | 2,200 | 5 | 23,000 | 1,500 | 5 |
| ø 3 | 25,000 | 2,400 | 7.5 | 18,000 | 1,700 | 7.5 |
| ø 4 | 20,000 | 2,400 | 10 | 15,000 | 1,800 | 10 |
| ø 5 | 15,000 | 2,200 | 12.5 | 12,000 | 1,800 | 12.5 |
| ø 6 | 13,500 | 2,300 | 15 | 10,000 | 1,800 | 15 |
| ø 8 | 10,000 | 2,400 | 20 | 7,800 | 1,900 | 20 |
| ø 10 | 8,000 | 2,400 | 25 | 6,000 | 2,000 | 25 |
| ø 12 | 7,000 | 2,200 | 30 | 5,000 | 1,900 | 30 |

절입량
Depth of Cut




- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오
- 공구 진입시 피삭재 밖에서 진입 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

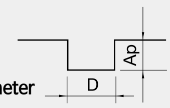
# 2MRE

• RPM : rev./min • Feed : mm/min

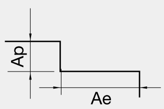
| 피삭재 Material | | ABS / MC Nylon | | | | Acrylic / Polyaetal | | | | Polycabonate | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 외경 Outside Diameter | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 0.5 | 2 | 7,800 | 150 | 0.20 | 0.005 | 19,500 | 150 | 0.20 | 0.005 | 11,700 | 150 | 0.20 | 0.005 |
| 〃 | 4 | 7,800 | 150 | 0.20 | 0.003 | 19,500 | 150 | 0.20 | 0.003 | 11,700 | 150 | 0.20 | 0.003 |
| 〃 | 6 | 7,800 | 150 | 0.20 | 0.001 | 19,500 | 150 | 0.20 | 0.001 | 11,700 | 150 | 0.20 | 0.001 |
| ø 0.6 | 4 | 7,800 | 170 | 0.20 | 0.005 | 18,720 | 150 | 0.20 | 0.005 | 11,440 | 270 | 0.20 | 0.005 |
| 〃 | 6 | 7,800 | 170 | 0.20 | 0.003 | 18,720 | 150 | 0.20 | 0.003 | 11,440 | 270 | 0.20 | 0.003 |
| ø 0.7 | 4 | 7,800 | 190 | 0.20 | 0.01 | 17,940 | 150 | 0.20 | 0.01 | 11,180 | 390 | 0.20 | 0.01 |
| 〃 | 6 | 7,800 | 190 | 0.20 | 0.008 | 17,940 | 150 | 0.20 | 0.008 | 11,180 | 390 | 0.20 | 0.008 |
| ø 0.8 | 6 | 7,800 | 210 | 0.20 | 0.008 | 17,160 | 150 | 0.20 | 0.008 | 10,920 | 500 | 0.20 | 0.008 |
| 〃 | 8 | 7,800 | 210 | 0.20 | 0.005 | 16,770 | 140 | 0.20 | 0.005 | 10,660 | 480 | 0.20 | 0.005 |
| ø 0.9 | 6 | 7,800 | 230 | 0.20 | 0.08 | 16,380 | 150 | 0.20 | 0.08 | 10,660 | 650 | 0.20 | 0.08 |
| 〃 | 10 | 7,800 | 230 | 0.20 | 0.03 | 15,340 | 130 | 0.20 | 0.03 | 10,140 | 500 | 0.20 | 0.03 |
| ø 1 | 6 | 7,800 | 250 | 0.30 | 0.05 | 15,600 | 150 | 0.30 | 0.05 | 10,400 | 750 | 0.30 | 0.05 |
| 〃 | 8 | 7,800 | 250 | 0.30 | 0.05 | 14,950 | 135 | 0.30 | 0.05 | 10,010 | 700 | 0.30 | 0.05 |
| 〃 | 10 | 7,800 | 250 | 0.30 | 0.03 | 14,300 | 120 | 0.30 | 0.03 | 9,750 | 600 | 0.30 | 0.03 |
| 〃 | 12 | 7,800 | 250 | 0.30 | 0.03 | 13,520 | 110 | 0.30 | 0.03 | 9,360 | 550 | 0.30 | 0.03 |
| 〃 | 16 | 7,800 | 250 | 0.30 | 0.02 | 12,090 | 80 | 0.30 | 0.02 | 8,710 | 415 | 0.30 | 0.02 |
| 〃 | 20 | 7,800 | 250 | 0.30 | 0.01 | 10,400 | 45 | 0.30 | 0.01 | 7,800 | 250 | 0.30 | 0.01 |
| ø 1.2 | 6 | 7,800 | 305 | 0.40 | 0.05 | 15,210 | 165 | 0.40 | 0.05 | 10,400 | 750 | 0.40 | 0.05 |
| 〃 | 8 | 7,800 | 305 | 0.40 | 0.05 | 14,560 | 150 | 0.40 | 0.05 | 10,010 | 700 | 0.40 | 0.05 |
| 〃 | 10 | 7,800 | 300 | 0.40 | 0.03 | 13,910 | 140 | 0.40 | 0.03 | 9,750 | 650 | 0.40 | 0.03 |
| 〃 | 12 | 7,800 | 300 | 0.40 | 0.03 | 13,260 | 125 | 0.40 | 0.03 | 9,360 | 600 | 0.40 | 0.03 |
| ø 1.4 | 6 | 7,800 | 360 | 0.40 | 0.05 | 14,742 | 180 | 0.40 | 0.05 | 10,400 | 800 | 0.40 | 0.05 |
| 〃 | 10 | 7,800 | 350 | 0.40 | 0.03 | 13,910 | 155 | 0.40 | 0.03 | 10,010 | 700 | 0.40 | 0.03 |
| 〃 | 16 | 7,800 | 340 | 0.40 | 0.01 | 12,740 | 115 | 0.40 | 0.01 | 9,360 | 500 | 0.40 | 0.01 |
| ø 1.5 | 6 | 7,930 | 390 | 0.50 | 0.05 | 14,560 | 190 | 0.50 | 0.05 | 10,400 | 800 | 0.50 | 0.05 |
| 〃 | 10 | 7,800 | 380 | 0.50 | 0.05 | 13,260 | 165 | 0.50 | 0.05 | 9,750 | 700 | 0.50 | 0.05 |
| 〃 | 14 | 7,800 | 365 | 0.50 | 0.03 | 12,480 | 135 | 0.50 | 0.03 | 9,100 | 550 | 0.50 | 0.03 |
| 〃 | 16 | 7,800 | 365 | 0.50 | 0.03 | 11,440 | 125 | 0.50 | 0.03 | 8,710 | 500 | 0.50 | 0.03 |
| 〃 | 20 | 7,670 | 350 | 0.50 | 0.02 | 9,880 | 90 | 0.50 | 0.02 | 7,930 | 375 | 0.50 | 0.02 |
| ø 1.6 | 6 | 7,930 | 415 | 0.80 | 0.05 | 14,300 | 195 | 0.80 | 0.05 | 10,400 | 800 | 0.80 | 0.05 |
| ø 2 | 8 | 7,930 | 500 | 1.00 | 0.10 | 13,130 | 220 | 1.00 | 0.10 | 10,270 | 850 | 1.00 | 0.10 |
| 〃 | 10 | 7,800 | 490 | 1.00 | 0.10 | 12,740 | 210 | 1.00 | 0.10 | 10,010 | 800 | 1.00 | 0.10 |
| 〃 | 12 | 7,800 | 485 | 1.00 | 0.08 | 12,350 | 200 | 1.00 | 0.08 | 9,750 | 800 | 1.00 | 0.08 |
| 〃 | 14 | 7,670 | 475 | 1.00 | 0.08 | 11,830 | 190 | 1.00 | 0.08 | 9,490 | 750 | 1.00 | 0.08 |
| 〃 | 16 | 7,670 | 465 | 1.00 | 0.05 | 11,440 | 180 | 1.00 | 0.05 | 9,230 | 700 | 1.00 | 0.05 |
| 〃 | 18 | 7,540 | 460 | 1.00 | 0.05 | 11,050 | 170 | 1.00 | 0.05 | 8,970 | 650 | 1.00 | 0.05 |
| 〃 | 20 | 7,410 | 445 | 1.00 | 0.03 | 10,400 | 150 | 1.00 | 0.03 | 8,450 | 600 | 1.00 | 0.03 |
| 〃 | 25 | 7,280 | 425 | 1.00 | 0.03 | 9,360 | 125 | 1.00 | 0.03 | 7,800 | 550 | 1.00 | 0.03 |
| 〃 | 30 | 7,020 | 400 | 1.00 | 0.02 | 8,060 | 95 | 1.00 | 0.02 | 7,020 | 425 | 1.00 | 0.02 |
| ø 2.5 | 12 | 7,800 | 650 | 1.20 | 0.20 | 11,180 | 240 | 1.20 | 0.20 | 9,620 | 800 | 1.20 | 0.20 |
| 〃 | 20 | 7,410 | 550 | 1.00 | 0.10 | 8,840 | 175 | 1.00 | 0.10 | 8,060 | 650 | 1.00 | 0.10 |
| ø 3 | 8 | 8,060 | 800 | 1.50 | 0.30 | 11,310 | 305 | 1.50 | 0.30 | 10,400 | 950 | 1.50 | 0.30 |
| 〃 | 12 | 7,800 | 750 | 1.50 | 0.25 | 10,400 | 280 | 1.50 | 0.25 | 9,750 | 900 | 1.50 | 0.25 |
| 〃 | 16 | 7,540 | 700 | 1.50 | 0.20 | 9,490 | 255 | 1.50 | 0.20 | 9,100 | 850 | 1.50 | 0.20 |
| 〃 | 20 | 7,280 | 650 | 1.50 | 0.20 | 8,320 | 220 | 1.50 | 0.20 | 8,190 | 900 | 1.50 | 0.20 |
| 〃 | 25 | 7.020 | 600 | 1.50 | 0.15 | 7,150 | 185 | 1.50 | 0.15 | 7,280 | 700 | 1.50 | 0.15 |
| 〃 | 30 | 6,760 | 550 | 1.50 | 0.10 | 5,850 | 145 | 1.50 | 0.10 | 6,240 | 600 | 1.50 | 0.10 |
| 〃 | 40 | 6,240 | 480 | 1.50 | 0.10 | 3,510 | 80 | 1.50 | 0.10 | 4,550 | 420 | 1.50 | 0.10 |
| ø 4 | 12 | 6,500 | 700 | 2.00 | 0.35 | 9,100 | 260 | 2.00 | 0.35 | 7,540 | 750 | 2.00 | 0.35 |
| 〃 | 16 | 6,370 | 700 | 2.00 | 0.30 | 8,450 | 240 | 2.00 | 0.30 | 7,150 | 700 | 2.00 | 0.30 |
| 〃 | 18 | 6,240 | 700 | 2.00 | 0.30 | 8,190 | 235 | 2.00 | 0.30 | 7,020 | 700 | 2.00 | 0.30 |
| 〃 | 20 | 6,240 | 700 | 2.00 | 0.30 | 7,800 | 220 | 2.00 | 0.30 | 6,630 | 650 | 2.00 | 0.30 |
| 〃 | 25 | 6,110 | 650 | 2.00 | 0.25 | 7,280 | 205 | 2.00 | 0.25 | 6,670 | 650 | 2.00 | 0.25 |
| 〃 | 30 | 5,850 | 650 | 2.00 | 0.20 | 6,110 | 170 | 2.00 | 0.20 | 5,720 | 550 | 2.00 | 0.20 |
| 〃 | 35 | 5,590 | 650 | 2.00 | 0.20 | 5,460 | 150 | 2.00 | 0.20 | 5,330 | 550 | 2.00 | 0.20 |
| 〃 | 40 | 5,460 | 650 | 2.00 | 0.10 | 4,680 | 125 | 2.00 | 0.10 | 4,680 | 480 | 2.00 | 0.10 |
| 〃 | 50 | 5,070 | 600 | 2.00 | 0.10 | 3,120 | 80 | 2.00 | 0.10 | 3,770 | 390 | 2.00 | 0.10 |
| ø 5 | 16 | 4,420 | 600 | 2.50 | 0.50 | 7,540 | 235 | 2.50 | 0.50 | 5,200 | 600 | 2.50 | 0.50 |
| 〃 | 35 | 4,160 | 550 | 2.50 | 0.30 | 5,070 | 130 | 2.50 | 0.30 | 3,770 | 455 | 2.50 | 0.30 |
| ø 6 | 35 | 3,120 | 480 | 3.00 | 0.40 | 3,380 | 120 | 3.00 | 0.40 | 2,470 | 380 | 3.00 | 0.40 |
| 〃 | 50 | 2,860 | 445 | 3.00 | 0.30 | 2,470 | 85 | 3.00 | 0.30 | 2,210 | 335 | 3.00 | 0.30 |
| 〃 | 60 | 2,600 | 400 | 3.00 | 0.20 | 13,00 | 45 | 3.00 | 0.20 | 1,950 | 300 | 3.00 | 0.20 |

**절입량**
Depth of Cut

Slotting
• Ap : Axial Depth
• D : Outside Diameter




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



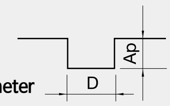
# 3MRE

• RPM : rev./min • Feed : mm/min

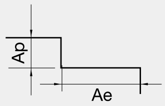
| 피삭재 Material | | ABS / MC Nylon | | | | Acrylic / Polyaetal | | | | Polycabonate | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 외경 Outside Diameter | 유효장 Effective Length | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 10 | 8,268 | 280 | 0.30 | 0.03 | 14,056 | 132 | 0.30 | 0.03 | 10,725 | 784 | 0.30 | 0.03 |
| 〃 | 15 | 8,268 | 280 | 0.30 | 0.02 | 12,126 | 86 | 0.30 | 0.02 | 9,568 | 560 | 0.30 | 0.02 |
| 〃 | 20 | 8,268 | 280 | 0.30 | 0.01 | 10,473 | 52 | 0.30 | 0.01 | 8,775 | 420 | 0.30 | 0.01 |
| ø 1.5 | 10 | 8,268 | 426 | 0.50 | 0.05 | 14,056 | 185 | 0.50 | 0.05 | 10,335 | 784 | 0.50 | 0.05 |
| 〃 | 15 | 8,268 | 409 | 0.50 | 0.03 | 12,126 | 140 | 0.50 | 0.03 | 9,233 | 560 | 0.50 | 0.03 |
| 〃 | 20 | 8,130 | 392 | 0.50 | 0.02 | 10,473 | 101 | 0.50 | 0.02 | 8,406 | 420 | 0.50 | 0.02 |
| ø 2 | 10 | 8,229 | 550 | 1.00 | 0.10 | 13,441 | 236 | 1.00 | 0.10 | 10,561 | 898 | 1.00 | 0.10 |
| 〃 | 15 | 8,092 | 522 | 1.00 | 0.05 | 12,069 | 202 | 1.00 | 0.05 | 9,738 | 785 | 1.00 | 0.05 |
| 〃 | 20 | 7,818 | 499 | 1.00 | 0.03 | 10,972 | 168 | 1.00 | 0.03 | 8,915 | 673 | 1.00 | 0.03 |
| 〃 | 25 | 7,680 | 477 | 1.00 | 0.03 | 9,875 | 140 | 1.00 | 0.03 | 8,229 | 617 | 1.00 | 0.03 |
| ø 3 | 20 | 7,622 | 733 | 1.50 | 0.20 | 8,711 | 248 | 1.50 | 0.20 | 8,575 | 1,015 | 1.50 | 0.20 |
| 〃 | 30 | 7,078 | 620 | 1.50 | 0.10 | 6,125 | 164 | 1.50 | 0.10 | 6,533 | 677 | 1.50 | 0.10 |
| ø 4 | 20 | 6,533 | 790 | 2.00 | 0.30 | 8,167 | 248 | 2.00 | 0.30 | 6,942 | 733 | 2.00 | 0.30 |
| 〃 | 30 | 6,125 | 733 | 2.00 | 0.20 | 6,397 | 192 | 2.00 | 0.20 | 5,989 | 620 | 2.00 | 0.20 |
| ø 6 | 30 | 4,141 | 612 | 3.00 | 0.40 | 4,486 | 153 | 3.00 | 0.40 | 3,279 | 484 | 3.00 | 0.40 |
| 〃 | 40 | 3,629 | 547 | 3.00 | 0.30 | 3,134 | 104 | 3.00 | 0.30 | 2,804 | 412 | 3.00 | 0.30 |
| ø 8 | 40 | 3,338 | 514 | 4.00 | 0.50 | 2,883 | 98 | 4.00 | 0.50 | 2,580 | 387 | 4.00 | 0.50 |
| 〃 | 50 | 2,571 | 432 | 4.00 | 0.40 | 2,220 | 82 | 4.00 | 0.40 | 1,986 | 325 | 4.00 | 0.40 |
| ø 10 | 50 | 2,262 | 401 | 5.00 | 0.60 | 1,954 | 77 | 5.00 | 0.60 | 1,748 | 302 | 5.00 | 0.60 |
| 〃 | 60 | 1,697 | 169 | 5.00 | 0.50 | 1,465 | 32 | 5.00 | 0.50 | 1,311 | 127 | 5.00 | 0.50 |
| ø 12 | 60 | 1,442 | 153 | 6.00 | 0.60 | 1,245 | 29 | 6.00 | 0.60 | 1,114 | 116 | 6.00 | 0.60 |

**절입량** Depth of Cut

Slotting
• **Ap : Axial Depth**
• **D : Outside Diameter**




Side Milling
• **Ap : Axial Depth**
• **Ae : Radial Depth**




- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망합니다 (Ø1 이하 사용시 진동 허용 관리 5㎛이내 일것.)

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).

# 2MEM

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | | | 구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels /Gray cast iron SS / SC / FC | | | | 알루미늄 합금 Aluminum alloys AL7075 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | -200HB | | | | ~30HRc | | | | | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 12,900 | 125 | 0.15 | 0.07 | 11,400 | 90 | 0.15 | 0.07 | 43,000 | 510 | 0.15 | 0.07 |
| ø 1.5 | 8,600 | 125 | 0.75 | 0.11 | 7,700 | 90 | 0.75 | 0.11 | 29,000 | 580 | 0.75 | 0.11 |
| ø 2 | 6,500 | 125 | 1.00 | 0.14 | 5,800 | 110 | 1.00 | 0.14 | 22,000 | 650 | 1.00 | 0.14 |
| ø 2.5 | 5,100 | 150 | 1.25 | 0.18 | 4,600 | 110 | 1.25 | 0.18 | 17,200 | 680 | 1.25 | 0.18 |
| ø 3 | 4,300 | 170 | 1.50 | 0.45 | 3,800 | 120 | 1.50 | 0.45 | 14,300 | 720 | 1.50 | 0.45 |
| ø 4 | 3,200 | 200 | 3.00 | 0.60 | 2,900 | 120 | 3.00 | 0.60 | 10,700 | 750 | 3.00 | 0.60 |
| ø 5 | 2,600 | 210 | 3.75 | 0.75 | 2,300 | 135 | 3.75 | 0.75 | 8,600 | 775 | 3.75 | 0.75 |
| ø 6 | 2,200 | 220 | 4.50 | 0.90 | 1,900 | 150 | 4.50 | 0.90 | 7,200 | 790 | 4.50 | 0.90 |
| ø 8 | 1,600 | 200 | 6.00 | 1.20 | 1,400 | 145 | 6.00 | 1.20 | 5,400 | 700 | 6.00 | 1.20 |
| ø 10 | 1,300 | 180 | 7.50 | 1.50 | 1,200 | 145 | 7.50 | 1.50 | 4,300 | 650 | 7.50 | 1.50 |
| ø 12 | 1,100 | 170 | 9.00 | 1.80 | 1,000 | 135 | 9.00 | 1.80 | 3,600 | 610 | 9.00 | 1.80 |

# 3MEM

• RPM : rev./min • Feed : mm/min

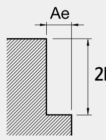
| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | | | 구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels /Gray cast iron SS / SC / FC | | | | 알루미늄 합금 Aluminum alloys AL7075 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | -200HB | | | | ~30HRc | | | | | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 13,674 | 141 | 0.15 | 0.07 | 12,084 | 101 | 0.15 | 0.07 | 45,580 | 566 | 0.15 | 0.07 |
| ø 1.5 | 9,116 | 141 | 0.75 | 0.11 | 8,162 | 101 | 0.75 | 0.11 | 30,740 | 644 | 0.75 | 0.11 |
| ø 2 | 6,890 | 141 | 1.00 | 0.14 | 6,148 | 123 | 1.00 | 0.14 | 23,320 | 722 | 1.00 | 0.14 |
| ø 2.5 | 5,406 | 170 | 1.25 | 0.18 | 4,876 | 123 | 1.25 | 0.18 | 18,232 | 769 | 1.25 | 0.18 |
| ø 3 | 4,558 | 192 | 1.50 | 0.45 | 4,028 | 134 | 1.50 | 0.45 | 15,158 | 799 | 1.50 | 0.45 |
| ø 4 | 3,392 | 226 | 3.00 | 0.60 | 3,074 | 134 | 3.00 | 0.60 | 11,342 | 833 | 3.00 | 0.60 |
| ø 6 | 2,332 | 249 | 4.50 | 0.90 | 2,014 | 168 | 4.50 | 0.90 | 7,632 | 877 | 4.50 | 0.90 |

# 4MEM

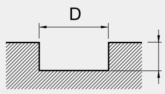
• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | | | 구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels /Gray cast iron SS / SC / FC | | | | 알루미늄 합금 Aluminum alloys AL7075 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | -200HB | | | | ~30HRc | | | | | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 1 | 14,084 | 153 | 0.15 | 1.00 | 12,483 | 107 | 0.15 | 1.00 | 46,583 | 594 | 0.15 | 1.00 |
| ø 1.5 | 9,389 | 153 | 0.75 | 1.50 | 8,431 | 107 | 0.75 | 1.50 | 31,416 | 676 | 0.75 | 1.50 |
| ø 2 | 7,097 | 153 | 1.00 | 2.00 | 6,351 | 131 | 1.00 | 2.00 | 23,833 | 758 | 1.00 | 2.00 |
| ø 2.5 | 5,568 | 183 | 1.25 | 2.50 | 5,037 | 131 | 1.25 | 2.50 | 18,633 | 808 | 1.25 | 2.50 |
| ø 3 | 4,695 | 207 | 1.50 | 3.00 | 4,161 | 142 | 1.50 | 3.00 | 15,491 | 839 | 1.50 | 3.00 |
| ø 4 | 3,494 | 244 | 3.00 | 4.00 | 3,175 | 142 | 3.00 | 4.00 | 11,592 | 874 | 3.00 | 4.00 |
| ø 6 | 2,402 | 268 | 4.50 | 6.00 | 2,080 | 178 | 4.50 | 6.00 | 7,800 | 921 | 4.50 | 6.00 |
| ø 8 | 2,509 | 258 | 6.00 | 8.00 | 1,957 | 156 | 6.00 | 8.00 | 6,006 | 889 | 6.00 | 8.00 |
| ø 10 | 1,720 | 234 | 7.50 | 10.00 | 1,342 | 133 | 7.50 | 10.00 | 4,625 | 826 | 7.50 | 10.00 |
| ø 12 | 1,279 | 210 | 9.00 | 12.00 | 998 | 116 | 9.00 | 12.00 | 3,561 | 744 | 9.00 | 12.00 |

**절입량**
Depth of Cut




Ae
ø 1 ~ 2.9 = 0.07D
ø 3 ~ = 0.15D




Ap
ø 1 ~ 1.2 = 0.15D
ø 1.5 ~ 3.5 = 0.5D
ø 4 ~ = 0.75D

- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오
- 공구 진입시 피삭재 밖에서 진입 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.

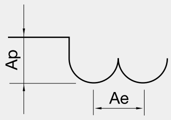
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

# 2HHINB/2JJINB Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM 30 ~40HRC | | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M 40~45HRC | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 반경 Corner Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 5 | 7320 | 2635 | 0.25 | 1.0 | 6700 | 2196 | 0.50 | 1.0 | 5400 | 1910 | 0.50 | 0.50 |
| R 5.5 | 6660 | 2428 | 0.28 | 1.1 | 6000 | 2024 | 0.55 | 1.1 | 4900 | 1760 | 0.55 | 0.55 |
| R 6 | 6100 | 2185 | 0.30 | 1.2 | 5570 | 1821 | 0.60 | 1.2 | 4500 | 1584 | 0.60 | 0.60 |
| R 6.5 | 5630 | 2015 | 0.33 | 1.3 | 5150 | 1679 | 0.65 | 1.3 | 4160 | 1461 | 0.65 | 0.65 |
| R 8 | 4580 | 1639 | 0.40 | 1.6 | 4180 | 1366 | 0.80 | 1.6 | 3380 | 1188 | 0.80 | 0.80 |
| R 8.5 | 4300 | 1542 | 0.43 | 1.7 | 3900 | 1285 | 0.85 | 1.7 | 3180 | 1118 | 0.85 | 0.85 |
| R 10 | 3660 | 1311 | 0.50 | 2.0 | 3340 | 1093 | 1.00 | 2.0 | 2700 | 950 | 1.00 | 1.00 |
| R 10.5 | 3500 | 1250 | 0.53 | 2.1 | 3180 | 1042 | 1.05 | 2.1 | 2580 | 906 | 1.05 | 1.05 |
| R 12.5 | 2930 | 1056 | 0.63 | 2.5 | 2670 | 880 | 1.25 | 2.5 | 2170 | 765 | 1.25 | 1.25 |
| R 13 | 2800 | 1007 | 0.65 | 2.6 | 2600 | 839 | 1.30 | 2.6 | 2080 | 730 | 1.30 | 1.30 |
| R 15 | 2440 | 874 | 0.75 | 3.0 | 2230 | 728 | 1.50 | 3.0 | 1800 | 633 | 1.50 | 1.50 |

**절입량** Depth of Cut




Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 $(min^{-1})$
Vf : Feed 이송속도 (mm/min)

- 유효장이 긴 경우에는 회전수와 이송속도를 최대 20% 이하로 줄이십시오.
- 인서트 체결 및 볼트의 조임을 확인 후 가공 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우 진동이 발생할시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- In case of long effective length, reduce the RPM and feed by 20% or less.
- After the heat the shrink-fit, check the clamping and bolt status, and then use.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

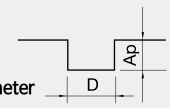
# 2HHINC/2JJINC Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM 30 ~40HRC | | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M 40~45HRC | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 10 | 9550 | 950 | 0.25 | 2.0 | 8900 | 890 | 0.50 | 2.0 | 7000 | 700 | 0.50 | 1.0 |
| ø 11 | 8690 | 870 | 0.28 | 2.2 | 8100 | 810 | 0.55 | 2.2 | 6370 | 640 | 0.55 | 1.1 |
| ø 12 | 7960 | 800 | 0.30 | 2.4 | 7430 | 740 | 0.60 | 2.4 | 5840 | 580 | 0.60 | 1.2 |
| ø 13 | 7350 | 730 | 0.33 | 2.6 | 6860 | 690 | 0.65 | 2.6 | 5390 | 540 | 0.65 | 1.3 |
| ø 16 | 5970 | 600 | 0.40 | 3.2 | 5570 | 550 | 0.80 | 3.2 | 4380 | 440 | 0.80 | 1.6 |
| ø 17 | 5620 | 560 | 0.43 | 3.4 | 5240 | 520 | 0.85 | 3.4 | 4120 | 410 | 0.85 | 1.7 |
| ø 20 | 4780 | 480 | 0.50 | 4.0 | 4460 | 450 | 1.00 | 4.0 | 3500 | 350 | 1.00 | 2.0 |
| ø 21 | 4550 | 450 | 0.53 | 4.2 | 4250 | 425 | 1.05 | 4.2 | 3340 | 330 | 1.05 | 2.1 |
| ø 25 | 3800 | 380 | 0.63 | 5.0 | 3670 | 350 | 1.25 | 5.0 | 2800 | 280 | 1.25 | 2.5 |
| ø 26 | 3670 | 360 | 0.65 | 5.2 | 3400 | 340 | 1.30 | 5.2 | 2700 | 270 | 1.30 | 2.6 |
| ø 30 | 3200 | 320 | 0.75 | 6.0 | 2980 | 290 | 1.50 | 6.0 | 2330 | 230 | 1.50 | 3.0 |

**절입량** Depth of Cut

Slotting
- Ap : Axial Depth
- D : Outside Diameter




- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 인서트 체결 및 볼트의 조임을 확인 후 가공 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

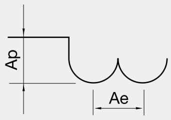
- If the effective length is long, reduce the RPM and feed in the same proportion.
- After the heat the shrink-fit, check the clamping and bolt status, and then use.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

## 2GINB Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 반경 Corner Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 5 | 6,220 | 2,500 | 0.1 | 0.5 | 5,700 | 1,700 | 0.1 | 0.3 | 4,590 | 1,840 | 0.05 | 0.3 |
| R 5.5 | 5,660 | 2,260 | 0.1 | 0.5 | 5,100 | 1,530 | 0.1 | 0.3 | 4,160 | 1,700 | 0.06 | 0.3 |
| R 6 | 5,180 | 2,070 | 0.1 | 0.5 | 4,740 | 1,420 | 0.1 | 0.3 | 3,800 | 1,530 | 0.06 | 0.3 |
| R 6.5 | 4,800 | 1,900 | 0.1 | 0.5 | 4,380 | 1,320 | 0.1 | 0.3 | 3,530 | 1,400 | 0.07 | 0.3 |
| R 8 | 3,900 | 1,530 | 0.2 | 0.5 | 3,550 | 1,060 | 0.1 | 0.3 | 2,870 | 1,150 | 0.08 | 0.3 |
| R 8.5 | 3,660 | 1,460 | 0.2 | 0.5 | 3,300 | 1,000 | 0.1 | 0.3 | 2,700 | 1,080 | 0.09 | 0.3 |
| R 10 | 3,120 | 1,240 | 0.2 | 0.5 | 2,840 | 850 | 0.1 | 0.3 | 2,300 | 920 | 0.10 | 0.3 |
| R 10.5 | 3,000 | 1,180 | 0.2 | 0.5 | 2,700 | 800 | 0.1 | 0.3 | 2,200 | 880 | 0.11 | 0.3 |
| R 12.5 | 2,500 | 990 | 0.3 | 0.5 | 2,270 | 680 | 0.1 | 0.3 | 1,830 | 740 | 0.13 | 0.3 |
| R 13 | 2,380 | 960 | 0.3 | 0.5 | 2,210 | 650 | 0.1 | 0.3 | 1,760 | 700 | 0.13 | 0.3 |
| R 15 | 2,080 | 850 | 0.3 | 0.5 | 1,990 | 600 | 0.2 | 0.3 | 1,530 | 610 | 0.15 | 0.3 |

절입량 Depth of Cut




Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 (min⁻¹)
Vf : Feed 이송속도 (mm/min)

- 유효장이 긴 경우에는 회전수와 이송속도를 최대 20% 이하로 줄이십시오.
- 인서트 체결 및 볼트의 조임을 확인 후 가공 하십시오.
- 상기 절삭조건은 참고 수치이므로, 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우 진동이 발생할시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- In case of long effective length, reduce the RPM and feed by 20% or less.
- After the heat the shrink-fit, check the clamping and bolt status, and then use.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

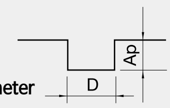
## 2GINC Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 10 | 8.200 | 807 | 0.3 | 2.0 | 7.560 | 756 | 0.1 | 1.0 | 5,950 | 595 | 0.125 | 1.0 |
| ø 11 | 7.400 | 739 | 0.3 | 2.2 | 6.900 | 688 | 0.1 | 1.1 | 5,410 | 544 | 0.138 | 1.1 |
| ø 12 | 6.770 | 680 | 0.3 | 2.4 | 6.320 | 629 | 0.2 | 1.2 | 4,960 | 493 | 0.150 | 1.2 |
| ø 13 | 6.250 | 620 | 0.3 | 2.6 | 5.830 | 586 | 0.2 | 1.3 | 4,580 | 459 | 0.163 | 1.3 |
| ø 16 | 5.070 | 510 | 0.4 | 3.2 | 4.740 | 467 | 0.2 | 1.6 | 3,720 | 374 | 0.200 | 1.6 |
| ø 17 | 4.780 | 476 | 0.4 | 3.4 | 4.450 | 442 | 0.2 | 1.7 | 3,500 | 348 | 0.213 | 1.7 |
| ø 20 | 4.060 | 408 | 0.5 | 4.0 | 3.790 | 382 | 0.3 | 2.0 | 2,970 | 297 | 0.250 | 2.0 |
| ø 21 | 3.870 | 382 | 0.5 | 4.2 | 3.610 | 361 | 0.3 | 2.1 | 2,840 | 280 | 0.263 | 2.1 |
| ø 25 | 3.230 | 323 | 0.6 | 5.0 | 3.120 | 287 | 0.3 | 2.5 | 2,380 | 238 | 0.313 | 2.5 |
| ø 26 | 3.120 | 306 | 0.7 | 5.2 | 2.890 | 289 | 0.3 | 2.6 | 2,300 | 229 | 0.325 | 2.6 |
| ø 30 | 2.720 | 272 | 0.8 | 6.0 | 2.530 | 246 | 0.4 | 3.0 | 1,980 | 195 | 0.375 | 3.0 |

절입량 Depth of Cut

Slotting
- Ap : Axial Depth
- D : Outside Diameter




- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 인서트 체결 및 볼트의 조임을 확인 후 가공 하십시오.
- 상기 절삭조건은 참고 수치이므로, 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생 시 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

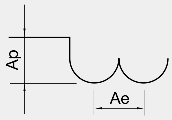
- If the effective length is long, reduce the RPM and feed in the same proportion.
- After the heat the shrink-fit, check the clamping and bolt status, and then use.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

## 2DINB

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 흑연 Graphite | | | |
|---|---|---|---|---|
| 반경 Radius | RPM | FEED | Ap Axial Depth | Ap Radial Depth |
| R 5 | 12740 | 4200 | 0.250 | 1.0 |
| R 5.5 | 11580 | 3892 | 0.275 | 1.1 |
| R 6 | 10600 | 3570 | 0.300 | 1.2 |
| R 6.5 | 9800 | 3290 | 0.325 | 1.3 |
| R 8 | 7960 | 3800 | 0.400 | 1.6 |
| R 8.5 | 7490 | 3600 | 0.850 | 1.7 |
| R 10 | 6370 | 3060 | 1.000 | 2.0 |
| R 10.5 | 6000 | 2900 | 1.050 | 2.1 |
| R 12.5 | 5100 | 2440 | 1.250 | 2.5 |
| R 13 | 4900 | 2360 | 1.300 | 2.6 |
| R 15 | 4250 | 2000 | 1.500 | 3.0 |

절입량 Depth of Cut




Ap : Axial Depth
Ae : Radial Depth
D : Outside Diameter
n : Speed (min $^{-1}$)
Vf : Feed (mm/min)

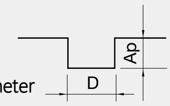
## 2DINC

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 흑연 Graphite | | | |
|---|---|---|---|---|
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ap Radial Depth |
| ø 10 | 16560 | 2822 | 0.250 | 3.0 |
| ø 11 | 15000 | 1862 | 0.275 | 3.3 |
| ø 12 | 13780 | 1708 | 0.300 | 3.6 |
| ø 13 | 12740 | 1582 | 0.325 | 3.9 |
| ø 16 | 10350 | 1820 | 0.400 | 4.8 |
| ø 17 | 9740 | 1720 | 0.850 | 5.1 |
| ø 20 | 8280 | 1460 | 1.000 | 6.0 |
| ø 21 | 7800 | 1400 | 1.050 | 6.3 |
| ø 25 | 6630 | 1180 | 1.250 | 7.5 |
| ø 26 | 6370 | 1140 | 1.300 | 7.8 |
| ø 30 | 5520 | 1920 | 1.500 | 9.0 |

절입량 Depth of Cut

Slotting
• Ap : Axial Depth
• D : Outside Diameter




• 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
• 인서트 체결 및 볼트의 조임을 확인 후 가공 하십시오.
• 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
• 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생 시 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
• 흑연 가공 에어브로를 추천합니다.

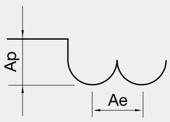
• If the effective length is long, reduce the RPM and feed in the same proportion.
• After the heat the shrink-fit, check the clamping and bolt status, and then use.
• Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
• If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
• Air blow is recommended for graphite milling.

## 4SFJB Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 반경 Corner Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 5 | 6370 | 2380 | 0.3 | 1.0 | 4750 | 1700 | 0.13 | 0.8 | 3100 | 620 | 0.13 | 0.8 |
| R 5.5 | 5800 | 2125 | 0.3 | 1.1 | 4300 | 1550 | 0.14 | 0.8 | 2840 | 570 | 0.14 | 0.8 |
| R 6 | 5300 | 1980 | 0.3 | 1.2 | 3950 | 1420 | 0.15 | 0.9 | 2600 | 520 | 0.15 | 0.9 |
| R 6.5 | 4900 | 1836 | 0.3 | 1.3 | 3650 | 1300 | 0.16 | 1.0 | 2400 | 480 | 0.16 | 1.0 |
| R 8 | 4000 | 1487 | 0.5 | 1.8 | 3000 | 1070 | 0.23 | 1.4 | 1950 | 390 | 0.23 | 1.4 |
| R 8.5 | 3750 | 1402 | 0.5 | 1.9 | 2800 | 1000 | 0.24 | 1.4 | 1800 | 370 | 0.24 | 1.4 |
| R 10 | 3180 | 1190 | 0.5 | 2.0 | 2370 | 850 | 0.25 | 1.5 | 1560 | 300 | 0.25 | 1.5 |
| R 10.5 | 3000 | 1130 | 0.5 | 2.1 | 2260 | 800 | 0.26 | 1.6 | 1500 | 300 | 0.26 | 1.6 |

절입량 Depth of Cut




Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 (min $^{-1}$)
Vf : Feed 이송속도 (mm/min)

• 유효장이 긴 경우에는 회전수와 이송속도를 최대 20% 이하로 줄이십시오.
• 열박음 후 완전히 밀착되었는지 확인 후 가공 하십시오.
• 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
• 공작기계와 가공물의 강성이 없는 경우 진동이 발생할시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
• 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

• In case of long effective length, reduce the RPM and feed by 20% or less.
• After the heat the shrink-fit, check the clamping and bolt status, and then use.
• Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
• In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
• Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

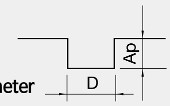
• RPM : rev./min • Feed : mm/min

## 홈절삭 Slotting

| 피삭재 Material | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Axial Depth | RPM | FEED | Ap Axial Depth | Ae Axial Depth | RPM | FEED | Ap Axial Depth | Ae Axial Depth |
| ø 10 | 1600 | 320 | 2.0 | 10 | 1440 | 288 | 1.0 | 10 | 800 | 130 | 1.0 | 8.0 |
| ø 11 | 1450 | 290 | 2.2 | 11 | 1305 | 261 | 1.1 | 11 | 725 | 120 | 1.1 | 8.8 |
| ø 12 | 1330 | 265 | 2.4 | 12 | 1197 | 239 | 1.2 | 12 | 660 | 100 | 1.2 | 9.6 |
| ø 13 | 1225 | 245 | 2.6 | 13 | 1103 | 221 | 1.3 | 13 | 610 | 100 | 1.3 | 10.4 |
| ø 16 | 1000 | 200 | 3.2 | 16 | 900 | 180 | 1.6 | 16 | 500 | 80 | 1.6 | 12.8 |
| ø 17 | 940 | 190 | 3.4 | 17 | 846 | 171 | 1.7 | 17 | 470 | 75 | 1.7 | 13.6 |
| ø 20 | 800 | 160 | 4.0 | 20 | 720 | 144 | 2.0 | 20 | 400 | 65 | 2.0 | 16.0 |
| ø 21 | 760 | 150 | 4.2 | 21 | 684 | 135 | 2.1 | 21 | 380 | 60 | 2.1 | 16.8 |

절입량
Depth of Cut

Slotting
• Ap : Axial Depth
• D : Outside Diameter

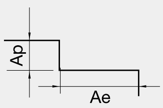



## 측면절삭 Side Cutting

| 피삭재 Material | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | | | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | | | 고경도강 Hardened Steels STAVAX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 10 | 2050 | 500 | 5.0 | 1.0 | 2050 | 480 | 5.0 | 0.5 | 800 | 130 | 3.0 | 0.5 |
| ø 11 | 1880 | 450 | 5.5 | 1.1 | 1880 | 420 | 5.5 | 0.6 | 730 | 120 | 3.3 | 0.6 |
| ø 12 | 1720 | 410 | 6.0 | 1.2 | 1720 | 380 | 6.0 | 0.6 | 660 | 100 | 3.6 | 0.6 |
| ø 13 | 1600 | 380 | 6.5 | 1.3 | 1600 | 350 | 6.5 | 0.7 | 610 | 100 | 3.9 | 0.7 |
| ø 16 | 1300 | 310 | 8.0 | 1.6 | 1300 | 300 | 8.0 | 0.8 | 500 | 80 | 4.8 | 0.8 |
| ø 17 | 1220 | 300 | 8.5 | 1.7 | 1220 | 285 | 8.5 | 0.9 | 470 | 75 | 5.1 | 0.9 |
| ø 20 | 1000 | 250 | 10.0 | 2.0 | 1000 | 240 | 10.0 | 1.0 | 400 | 65 | 6.0 | 1.0 |
| ø 21 | 980 | 230 | 10.5 | 2.1 | 980 | 220 | 10.5 | 1.1 | 380 | 60 | 6.3 | 1.1 |

절입량
Depth of Cut

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

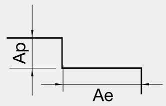



- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 열박음 후 완전히 밀착되었는지 확인 후 가공 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생 시 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- If the effective length is long, reduce the RPM and feed in the same proportion.
- After the heat the shrink-fit, check the clamping and bolt status, and then use.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

# 6~12SFJC Cutting Condition

• RPM : rev./min • Feed : mm/min

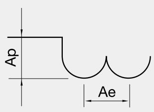
| 피삭재 Material | 측면절삭 Side Cutting<br>공구강 / 금형강<br>Tool steels / Mold steels<br>SCM / HPM | | | | 합금강 / 프리하든강<br>Alloy Steels / Pre-hardened Steels<br>NAK80 / KP4M | | | | 고경도강<br>Hardened Steels<br>STAVAX / SKD11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 30 ~ 40HRc | | | | 40 ~ 45HRc | | | | 45 ~ 55HRc | | | |
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 10 | 3075 | 1150 | 5.0 | 1.0 | 3075 | 1104 | 3.0 | 0.5 | 1200 | 299 | 3.0 | 0.5 |
| ø 11 | 2820 | 1035 | 5.5 | 1.1 | 2820 | 966 | 3.3 | 0.6 | 1095 | 276 | 3.3 | 0.6 |
| ø 12 | 2580 | 943 | 6.0 | 1.2 | 2580 | 874 | 3.6 | 0.6 | 990 | 230 | 3.6 | 0.6 |
| ø 13 | 2400 | 874 | 6.5 | 1.3 | 2400 | 805 | 3.9 | 0.7 | 915 | 230 | 3.9 | 0.7 |
| ø 16 | 1950 | 713 | 8.0 | 1.6 | 1950 | 690 | 4.8 | 0.8 | 750 | 184 | 4.8 | 0.8 |
| ø 17 | 1830 | 690 | 8.5 | 1.7 | 1830 | 656 | 5.1 | 0.9 | 705 | 173 | 5.1 | 0.9 |
| ø 20 | 1500 | 575 | 10.0 | 2.0 | 1500 | 552 | 6.0 | 1.0 | 600 | 150 | 6.0 | 1.0 |
| ø 21 | 1470 | 529 | 10.5 | 2.1 | 1470 | 506 | 6.3 | 1.1 | 570 | 138 | 6.3 | 1.1 |
| 절입량 Depth of Cut | Side Milling<br>• Ap : Axial Depth<br>• Ae : Radial Depth  | | | | | | | | | | | |



- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 열박음 후 완전히 밀착되었는지 확인 후 가공 하십시오.
- 상기 절삭 조건은 6날 기준이며 날 수 증가시 안정적인 속도 내에서 FEED를 UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생 시 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

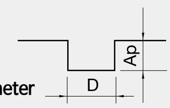
- If the effective length is long, reduce the RPM and feed in the same proportion.
- After the heat the shrink-fit, check the clamping and bolt status, and then use.
- Above the table value is based on 6 flutes. If you use more than 6 flutes of endmill, raise up the feed in stable milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

## 4SFDB

| 피삭재 Material | 흑연 Graphite | | | |
|---|---|---|---|---|
| 반경 Corner Radius | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| R 5 | 9550 | 3965 | 0.250 | 1.0 |
| R 5.5 | 8700 | 3640 | 0.275 | 1.1 |
| R 6 | 7960 | 3315 | 0.300 | 1.2 |
| R 6.5 | 7350 | 3055 | 0.325 | 1.3 |
| R 8 | 5970 | 2470 | 0.400 | 1.6 |
| R 8.5 | 5620 | 2340 | 0.850 | 1.7 |
| R 10 | 4780 | 1989 | 1.000 | 2.0 |
| R 10.5 | 4550 | 1898 | 1.050 | 2.1 |
| 절입량 Depth of Cut |  Ap : Axial Depth<br>Ae : Radial Depth<br>D : Outside Diameter<br>n : Speed ($min^{-1}$)<br>Vf : Feed (mm/min) | | | |

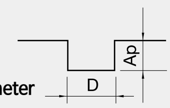


## 4SFDC

| 피삭재 Material | 흑연 Graphite | | | |
|---|---|---|---|---|
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 10 | 5100 | 4000 | 0.250 | 3.0 |
| ø 11 | 4630 | 3700 | 0.275 | 3.3 |
| ø 12 | 4250 | 3400 | 0.300 | 3.6 |
| ø 13 | 3920 | 3125 | 0.325 | 3.9 |
| ø 16 | 3180 | 2550 | 0.400 | 4.8 |
| ø 17 | 3000 | 2400 | 0.850 | 5.1 |
| ø 20 | 2550 | 2000 | 1.000 | 6.0 |
| ø 21 | 2430 | 1950 | 1.050 | 6.3 |
| 절입량 Depth of Cut | Slotting<br>• Ap : Axial Depth<br>• D : Outside Diameter  | | | |



## 6~12SFDC

| 피삭재 Material | 흑연 Graphite | | | |
|---|---|---|---|---|
| 외경 Outside Diameter | RPM | FEED | Ap Axial Depth | Ae Radial Depth |
| ø 10 | 5100 | 4840 | 0.250 | 3.0 |
| ø 11 | 4630 | 4477 | 0.275 | 3.3 |
| ø 12 | 4250 | 4114 | 0.300 | 3.6 |
| ø 13 | 3920 | 3781 | 0.325 | 3.9 |
| ø 16 | 3180 | 3086 | 0.400 | 4.8 |
| ø 17 | 3000 | 2904 | 0.850 | 5.1 |
| ø 20 | 2550 | 2420 | 1.000 | 6.0 |
| ø 21 | 2430 | 2360 | 1.050 | 6.3 |
| 절입량 Depth of Cut | Slotting<br>• Ap : Axial Depth<br>• D : Outside Diameter  | | | |



• RPM : rev./min • Feed : mm/min

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 열박음 후 완전히 밀착되었는지 확인 후 가공 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생 시 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 흑연 가공 에어브로를 추천합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- After the heat the shrink-fit, check the clamping and bolt status, and then use.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow is recommended for graphite milling.

# PCD End Mill Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | VC m/mim | FEED RATE (fz) | | | |
|---|---|---|---|---|---|
| | | 2 ~ 3mm | 4 ~ 6mm | 7 ~ 11mm | 12 ~ 20mm |
| AL-alloy Si 〈1% | 150 ~ 6,000 | 0.007 ~ 0.05 | 0.02 ~ 0.150 | 0.02 ~ 0.20 | 0.04 ~ 0.3 |
| AL-alloy Si 〈12% | 150 ~ 4,000 | 0.007 ~ 0.05 | 0.02 ~ 0.150 | 0.02 ~ 0.20 | 0.04 ~ 0.3 |
| AL-alloy Si 〉12% | 150 ~ 2,000 | 0.007 ~ 0.05 | 0.02 ~ 0.150 | 0.02 ~ 0.20 | 0.04 ~ 0.3 |
| Magnesium alloy | 150 ~ 6,000 | 0.007 ~ 0.05 | 0.02 ~ 0.150 | 0.02 ~ 0.20 | 0.04 ~ 0.3 |
| Cooper alloy | 150 ~ 5,000 | 0.007 ~ 0.05 | 0.02 ~ 0.150 | 0.02 ~ 0.20 | 0.04 ~ 0.3 |
| Brass ally | 150 ~ 5,001 | 0.007 ~ 0.05 | 0.02 ~ 0.150 | 0.02 ~ 0.20 | 0.04 ~ 0.3 |
| GFRP | 150 ~ 3,000 | 0.007 ~ 0.05 | 0.02 ~ 0.150 | 0.02 ~ 0.20 | 0.04 ~ 0.3 |
| CFRP | 150 ~ 4,000 | 0.007 ~ 0.05 | 0.02 ~ 0.150 | 0.02 ~ 0.20 | 0.04 ~ 0.3 |
| Graphite | 150 ~ 3,000 | 0.007 ~ 0.05 | 0.02 ~ 0.150 | 0.02 ~ 0.20 | 0.04 ~ 0.3 |

# 2SPO Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM | | 구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels /Gray cast irons SS / SC / FC | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | |
|---|---|---|---|---|---|---|
| 경도 Hardness | ~200HB | | ~30HRc | | 30~ 40HRc | |
| 외경 Outside Diameter | RPM | FEED | RPM | FEED | RPM | FEED |
| ø 1 | 23,800 | 500 | 20,000 | 400 | 19.100 | 380 |
| ø 2 | 12,000 | 700 | 10,350 | 400 | 9.550 | 380 |
| ø 3 | 8,000 | 800 | 6,900 | 550 | 6.400 | 510 |
| ø 4 | 5,900 | 800 | 5,200 | 620 | 4.800 | 570 |
| ø 6 | 3,980 | 700 | 3,450 | 550 | 3.180 | 510 |
| ø 8 | 3,000 | 600 | 2,600 | 520 | 2.400 | 480 |
| ø 10 | 2,400 | 580 | 2,070 | 500 | 2.000 | 460 |
| ø 12 | 2,000 | 560 | 1,720 | 480 | 1.600 | 450 |
| ø 16 | 1,500 | 500 | 1,300 | 400 | 1.200 | 380 |

- 진동이 적고 강성이 좋은 공작기계 사용요망합니다 (Ø1 이하 사용시 진동 허용 관리 3㎛이내 일것.)
- 가급적 열박음 척을 추천합니다.
- 상기 절삭 조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 3㎛).
- Using shrink-fit chuck is recommeded.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

# 2STD Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM | | 구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC | | 공구강/금형강 Tool steels / Mold steels SCM/HPM | | 덕타일 주철 Ductile cast irons FCD | | 스텐레스강 Stainless Steels SUS304/SUS316 | | 알루미늄 합금 Aluminum alloys AL7075 | | 인코넬 inconel | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도Hardness | ~200HB | | ~30HRc | | 30 ~ 40HRc | | | | | | | | | |
| 직경 Diameter | 절삭속도 V/C | 이송량 f | 절삭속도 V/C | 이송량 f | 절삭속도 V/C | 이송량 f | 절삭속도 V/C | 이송량 f | 절삭속도 V/C | 이송량 f | 절삭속도 V/C | 이송량 f | 절삭속도 V/C | 이송량 f |
| ø 3.4 | 60 ~100 | 0.1 ~ 0.2 | 60 ~100 | 0.1 ~ 0.2 | 20 ~ 60 | 0.05 ~ 0.1 | 40 ~ 70 | 0.07 ~ 0.2 | 20 ~ 60 | 0.05 ~ 0.2 | 80 ~ 120 | 0.1 ~ 0.2 | 10 ~ 30 | 0.05 ~ 0.15 |
| ø 4.3 | 60 ~100 | 0.1 ~ 0.2 | 60 ~100 | 0.1 ~ 0.2 | 20 ~ 60 | 0.05 ~ 0.1 | 40 ~ 70 | 0.07 ~ 0.2 | 20 ~ 60 | 0.05 ~ 0.2 | 80 ~ 120 | 0.1 ~ 0.2 | 10 ~ 30 | 0.05 ~ 0.15 |
| ø 5.1 | 60 ~100 | 0.1 ~ 0.2 | 60 ~100 | 0.1 ~ 0.2 | 20 ~ 60 | 0.05 ~ 0.1 | 40 ~ 70 | 0.07 ~ 0.2 | 20 ~ 60 | 0.05 ~ 0.2 | 80 ~ 120 | 0.1 ~ 0.2 | 10 ~ 30 | 0.05 ~ 0.15 |
| ø 6.9 | 60 ~100 | 0.15 ~ 0.3 | 60 ~100 | 0.15 ~ 0.3 | 20 ~ 60 | 0.08 ~ 0.2 | 40 ~ 70 | 0.1 ~ 0.2 | 20 ~ 60 | 0.1 ~ 0.2 | 80 ~ 120 | 0.15 ~ 0.2 | 10 ~ 30 | 0.05 ~ 0.15 |
| ø 8.6 | 60 ~100 | 0.15 ~ 0.3 | 60 ~100 | 0.15 ~ 0.3 | 20 ~ 60 | 0.08 ~ 0.2 | 40 ~ 70 | 0.1 ~ 0.2 | 20 ~ 60 | 0.1 ~ 0.2 | 80 ~ 120 | 0.15 ~ 0.2 | 10 ~ 30 | 0.05 ~ 0.15 |
| ø 10.3 | 60 ~100 | 0.2 ~ 0.4 | 60 ~100 | 0.2 ~ 0.4 | 20 ~ 60 | 0.1 ~ 0.2 | 40 ~ 70 | 0.2 ~ 0.4 | 20 ~ 60 | 0.15 ~ 0.3 | 80 ~ 120 | 0.2 ~ 0.4 | 10 ~ 30 | 0.1 ~ 0.2 |

- 상기 알루미늄 절삭조건은 A7075계열의 기준으로 작성 된 절삭조건으로 그 외에 알루미늄 계열의 드릴링 시 당사 연구소에 문의 바랍니다. (대표번호 02)808-2745 -연구소)
- 진동이 적고 강성이 좋은 공작기계 사용요망합니다 (Ø1 이하 사용시 진동 허용 관리 3㎛이내 일것.)
- 가급적 열박음 척을 추천합니다.
- 상기 절삭 조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- The above aluminum cutting conditions are based on the A7075 series, so please inquire with our staff for drilling conditions for other aluminum series.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 3㎛).
- Using shrink-fit chuck is recommeded.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

## 2DED Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 알루미늄 합금 Aluminum alloys AL7075 | | ABS수지/아크릴 ABS resin / Acrylic | |
|---|---|---|---|---|
| 직경 Diameter | RPM | 이송량 (f) | RPM | 이송량 (f) |
| ø 0.1 ~ 0.3 | 25,000 | 0.001 ~ 0.003 | 22,000 | 0.001 ~ 0.003 |
| ø 0.3 ~ 0.5 | 20,000 | 0.005 ~ 0.02 | 22,000 | 0.005 ~ 0.01 |
| ø 0.5 ~ 0.8 | 18,000 | 0.01 ~ 0.03 | 15,000 | 0.01 ~ 0.03 |
| ø 0.8 ~ 1 | 15,000 | 0.02 ~ 0.04 | 13,000 | 0.02 ~ 0.05 |
| ø 1~1.5 | 12,000 | 0.03 ~ 0.05 | 8,000 | 0.02 ~ 0.05 |
| ø 1.5 ~ 2 | 9,000 | 0.03 ~ 0.05 | 6,000 | 0.02 ~ 0.05 |
| ø 2 ~ 3 | 7,000 | 0.03 ~ 0.05 | 4,500 | 0.05 |
| ø 3 ~ 4 | 3,500 | 0.03 ~ 0.05 | 3,200 | 0.05 |
| ø 4 ~ 5 | 2,800 | 0.03 ~ 0.05 | 2,500 | 0.05 |
| ø 5 ~ 6 | 2,200 | 0.03 ~ 0.05 | 2,000 | 0.05 |

- 상기 알루미늄 절삭조건은 A7075계열의 기준으로 작성 된 절삭조건으로 그 외에 알루미늄 계열의 드릴링 시 당사 연구소에 문의 바랍니다. (대표번호 02)808-2745 -연구소)
- 진동이 적고 강성이 좋은 공작기계 사용요망합니다 (Ø1 이하 사용시 진동 허용 관리 3㎛이내 일것.)
- 가급적 열박음 척을 추천합니다.
- 상기 절삭 조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- The above aluminum cutting conditions are based on the A7075 series, so please inquire with our staff for drilling conditions for other aluminum series.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 3㎛).
- Using shrink-fit chuck is recommeded.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

## 2MID Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM | | 구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC | | 알루미늄 합금 Aluminum alloys AL7075 | | 동 Copper C1100 | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~ 200HB | | ~30HRc | | - | | - | |
| 외경 Outside Diameter | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED |
| ø0.5 | 25,500 | 510 | 19,100 | 380 | 35,000 | 700 | 28,000 | 350 |
| ø1 | 191,00 | 840 | 13,000 | 360 | 28,600 | 1,720 | 22,880 | 860 |
| ø1.5 | 138,00 | 760 | 7,430 | 330 | 21,200 | 1,520 | 16,960 | 760 |
| ø2 | 9,500 | 630 | 6,000 | 330 | 19,400 | 1,160 | 15,520 | 580 |
| ø2.5 | 8,900 | 780 | 5,730 | 370 | 15,300 | 1,840 | 12,240 | 920 |
| ø3 | 8,500 | 840 | 5,900 | 450 | 13,000 | 1,250 | 10,400 | 625 |

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망합니다.(Ø1 이하 사용 시 진동 허용 관리 3㎛이내일것)
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Please use a machine with low vibration and good rigidity (for Ø1 or below, keep vibration tolerance within 3$\mu$m).
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

## 4DUBE(Standard length) Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM | | 구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC | | 공구강/금형강 Tool steels / Mold steels SCM/HPM | | 덕타일 주철 Ductile cast irons FCD | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~ 200HB | | ~ 30 HRc | | 30~40HRc | | - | |
| 외경 Outside Diameter | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED |
| ø6 | 3,600 | 920 | 3,400 | 575 | 2,550 | 600 | 2,550 | 580 |
| ø8 | 2,720 | 770 | 2,800 | 610 | 1,780 | 460 | 1,870 | 485 |
| ø10 | 2,150 | 660 | 2,120 | 610 | 1,440 | 415 | 1,530 | 435 |
| ø12 | 1,870 | 630 | 1,780 | 550 | 1,190 | 370 | 1,275 | 400 |

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 절삭하는 피삭재의 따라 구멍깊이 최대 5xDc 이상의 드릴링 시 peck(Q) 절입량을 변경하십시오.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Please adjust the peck (Q) feed rate when drilling with a cutting tool that has a depth of cut (Dc) exceeding 5 times the diameter.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

## 3DUBEH Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | 고경도강 Hardened Steels STAVX / SKD11 | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51 | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | 40~45HRc | | 45~55HRc | | 55~62HRc | | 62~65HRc | |
| 외경 Outside Diameter | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED |
| ø3 | 3,820 | 232 | 2,636 | 127 | 1,910 | 86 | 1452 | 67 |
| ø4 | 2,900 | 235 | 1,943 | 130 | 1,450 | 72 | 1088 | 55 |
| ø5 | 2,400 | 211 | 1,584 | 119 | 1,200 | 66 | 900 | 46 |
| ø6 | 1,910 | 195 | 1,320 | 108 | 1,000 | 60 | 730 | 36 |
| ø8 | 1,440 | 150 | 965 | 90 | 720 | 45 | 540 | 27 |
| ø10 | 1,177 | 120 | 783 | 72 | 580 | 36 | 435 | 22 |
| ø12 | 998 | 105 | 653 | 60 | 480 | 30 | 360 | 18 |
| ø16 | 720 | 75 | 486 | 45 | 360 | 23 | 270 | 14 |

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 상기 절삭 조건은 3Dc이하 조건입니다.
- 3Dc 초과로 절삭 시 스텝 가공을 실시 하십시오. 하지만 절삭 조건에 따라 칩 배출이 나빠질 수 있습니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- The cutting conditions above are 3Dc or less.
- When cutting more than 3Dc, perform step processing. However, depending on the cutting conditions, chip emissions can get worse.
- Please adjust the peck (Q) feed rate when drilling with a cutting tool that has a depth of cut (Dc) exceeding 5 times the diameter.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

## 2DUBES(3XD) Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 구조용강/탄소강/회주철 Structural steels / Carbon Steels / Gray cast irons SS / SC / FC | | 공구강/금형강 Tool Steels / Pre-hardened Steels SCM / HPM | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | 고경도강 Hardened Steels STAVX / SKD11 | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~30HRc | | 30~40HRc | | 40~45HRc | | 45~55HRc | |
| 외경 Outside Diameter | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED |
| ø1 | 15,900 | 440 | 11,000 | 360 | 9,450 | 310 | 8,900 | 200 |
| ø2 | 7,900 | 520 | 6,000 | 390 | 5,000 | 220 | 4,500 | 200 |
| ø3 | 6,900 | 770 | 5,900 | 450 | 4,300 | 250 | 4,000 | 230 |
| ø4 | 5,170 | 850 | 4,500 | 450 | 3,200 | 280 | 3,000 | 250 |
| ø5 | 4,140 | 820 | 3,450 | 570 | 3,000 | 360 | 2,450 | 310 |
| ø6 | 3,450 | 840 | 3,000 | 570 | 3,000 | 330 | 2,010 | 310 |
| ø8 | 2,580 | 860 | 2,100 | 440 | 1,700 | 280 | 1,520 | 260 |
| ø10 | 2,070 | 680 | 1,700 | 400 | 1,300 | 220 | 1,210 | 220 |
| ø12 | 1,730 | 560 | 1,400 | 350 | 1,050 | 200 | 1,000 | 200 |
| ø16 | 1,300 | 440 | 1,150 | 340 | 800 | 170 | 750 | 170 |
| ø20 | 1,030 | 390 | 950 | 340 | 650 | 170 | 600 | 170 |

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

## 2DUBES(5XD) Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 구조용강/탄소강/회주철 Structural steels / Carbon Steels / Gray cast irons SS / SC / FC | | 공구강/금형강 Tool Steels / Pre-hardened Steels SCM / HPM | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | 고경도강 Hardened Steels STAVX / SKD11 | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~ 30HRc | | 30 ~ 40HRc | | 40 ~ 45HRc | | 45~55HRc | |
| 외경 Outside Diameter | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED |
| 1mm | 15,900 | 400 | 11,000 | 330 | 9,450 | 280 | 8,900 | 180 |
| 2mm | 7,900 | 470 | 6,000 | 350 | 5,000 | 200 | 4,500 | 180 |
| 3mm | 6,900 | 700 | 5,900 | 410 | 4,300 | 230 | 4,000 | 210 |
| 4mm | 5,170 | 770 | 4,500 | 410 | 3,200 | 250 | 3,000 | 230 |
| 5mm | 4,140 | 745 | 3,450 | 520 | 3,000 | 330 | 2,450 | 280 |
| 6mm | 3,450 | 760 | 3,000 | 520 | 3,000 | 300 | 2,010 | 280 |
| 8mm | 2,580 | 780 | 2,100 | 400 | 1,700 | 250 | 1,520 | 240 |
| 10mm | 2,070 | 620 | 1,700 | 360 | 1,300 | 200 | 1,210 | 200 |
| 12mm | 1,730 | 510 | 1,400 | 320 | 1,050 | 180 | 1,000 | 180 |
| 16mm | 1,300 | 400 | 1,150 | 310 | 800 | 150 | 750 | 150 |
| 20mm | 1,030 | 350 | 950 | 310 | 650 | 150 | 600 | 150 |

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 절삭하는 피삭재의 따라 구멍깊이 최대 5xDc 이상의 드릴링 시 peck(Q) 절입량을 변경하십시오.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Please adjust the peck (Q) feed rate when drilling with a cutting tool that has a depth of cut (Dc) exceeding 5 times the diameter.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

## 2DUBE(Short length) Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM | | 구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC | | 공구강/금형강 Tool steels / Mold steels SCM/HPM | | 덕타일 주철 Ductile cast irons FCD | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~ 200HB | | ~ 30HRc | | 30~40HRc | | - | |
| 외경 Outside Diameter | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED |
| ø1 | 19,100 | 840 | 19,200 | 430 | 13,000 | 360 | 11,500 | 385 |
| ø2 | 9,500 | 630 | 9,700 | 430 | 6,000 | 330 | 6,100 | 330 |
| ø3 | 8,500 | 840 | 8,200 | 360 | 5,900 | 450 | 5,950 | 460 |
| ø4 | 6,400 | 770 | 6,500 | 430 | 4,500 | 450 | 4,400 | 440 |
| ø5 | 5,000 | 940 | 5,200 | 680 | 3,450 | 550 | 3,500 | 560 |
| ø6 | 4,250 | 880 | 4,500 | 600 | 4,000 | 550 | 3,000 | 560 |
| ø8 | 3,200 | 740 | 3,300 | 580 | 2,100 | 440 | 2,200 | 460 |
| ø10 | 2,550 | 640 | 2,500 | 580 | 1,700 | 400 | 1,800 | 420 |
| ø12 | 2,200 | 600 | 2,100 | 530 | 1,400 | 350 | 1,500 | 390 |

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

## 2DUBE(Standard length) Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM | | 구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC | | 공구강/금형강 Tool steels / Mold steels SCM/HPM | | 덕타일 주철 Ductile cast irons FCD | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~ 200HB | | ~ 30HRc | | 30~40HRc | | - | |
| 외경 Outside Diameter | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED |
| ø1 | 19,100 | 760 | 19,200 | 390 | 13,000 | 330 | 11,500 | 350 |
| ø2 | 9,500 | 570 | 9,700 | 390 | 6,000 | 300 | 6,100 | 300 |
| ø3 | 8,500 | 760 | 8,200 | 330 | 5,900 | 410 | 5,950 | 420 |
| ø4 | 6,400 | 700 | 6,500 | 390 | 4,500 | 410 | 4,400 | 400 |
| ø5 | 5,000 | 850 | 5,200 | 620 | 3,450 | 520 | 3,500 | 510 |
| ø6 | 4,250 | 800 | 4,500 | 550 | 4,000 | 500 | 3,000 | 510 |
| ø8 | 3,200 | 670 | 3,300 | 530 | 2,100 | 400 | 2,200 | 420 |
| ø10 | 2,550 | 850 | 2,500 | 530 | 1,700 | 360 | 1,800 | 380 |
| ø12 | 2,200 | 550 | 2,100 | 480 | 1,400 | 320 | 1,500 | 350 |
| ø16 | 1,600 | 530 | 1,600 | 430 | 1,150 | 310 | 1,100 | 300 |
| ø20 | 1,300 | 450 | 1,300 | 430 | 950 | 310 | 900 | 300 |

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 절삭하는 피삭재의 따라 구멍깊이 최대 5xDc 이상의 드릴링 시 peck(Q) 절입량을 변경하십시오.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Please adjust the peck (Q) feed rate when drilling with a cutting tool that has a depth of cut (Dc) exceeding 5 times the diameter.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

## 2DUBEV(3XD) Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM | | 구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC | | 공구강/금형강 Tool steels / Mold steels SCM/HPM | | 덕타일 주철 Ductile cast irons FCD | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~ 200HB | | ~ 30HRc | | 30~40HRc | | - | |
| 외경 Outside Diameter | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED |
| ø1 | 19,100 | 840 | 19,200 | 430 | 13,000 | 360 | 11,500 | 385 |
| ø2 | 9,500 | 630 | 9,700 | 430 | 6,000 | 330 | 6,100 | 330 |
| ø3 | 8,500 | 840 | 8,200 | 360 | 5,900 | 450 | 5,950 | 460 |
| ø4 | 6,400 | 770 | 6,500 | 430 | 4,500 | 450 | 4,400 | 440 |
| ø5 | 5,000 | 940 | 5,200 | 680 | 3,450 | 550 | 3,500 | 560 |
| ø6 | 4,250 | 880 | 4,500 | 600 | 4,000 | 550 | 3,000 | 560 |
| ø8 | 3,200 | 740 | 3,300 | 580 | 2,100 | 440 | 2,200 | 460 |
| ø10 | 2,550 | 640 | 2,500 | 580 | 1,700 | 400 | 1,800 | 420 |
| ø12 | 2,200 | 600 | 2,100 | 530 | 1,400 | 350 | 1,500 | 390 |
| ø16 | 1,600 | 580 | 1,600 | 470 | 1,150 | 340 | 1,100 | 330 |
| ø20 | 1,300 | 500 | 1,300 | 470 | 950 | 340 | 900 | 330 |

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

## 2DUBEV(5XD) Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM | | 구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC | | 공구강/금형강 Tool steels / Mold steels SCM/HPM | | 덕타일 주철 Ductile cast irons FCD | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~ 200HB | | ~ 30HRc | | 30~40HRc | | - | |
| 외경 Outside Diameter | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED |
| ø1 | 19,100 | 760 | 19,200 | 390 | 13,000 | 330 | 11,500 | 350 |
| ø2 | 9,500 | 570 | 9,700 | 390 | 6,000 | 300 | 6,100 | 300 |
| ø3 | 8,500 | 760 | 8,200 | 330 | 5,900 | 410 | 5,950 | 420 |
| ø4 | 6,400 | 700 | 6,500 | 390 | 4,500 | 410 | 4,400 | 400 |
| ø5 | 5,000 | 850 | 5,200 | 620 | 3,450 | 500 | 3,500 | 510 |
| ø6 | 4,250 | 800 | 4,500 | 550 | 4,000 | 500 | 3,000 | 510 |
| ø8 | 3,200 | 670 | 3,300 | 530 | 2,100 | 400 | 2,200 | 420 |
| ø10 | 2,550 | 580 | 2,500 | 530 | 1,700 | 360 | 1,800 | 380 |
| ø12 | 2,200 | 550 | 2,100 | 480 | 1,400 | 320 | 1,500 | 350 |
| ø16 | 1,600 | 430 | 1,600 | 530 | 1,150 | 310 | 1,100 | 300 |
| ø20 | 1,300 | 450 | 1,300 | 430 | 950 | 310 | 900 | 300 |

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 절삭하는 피삭재의 따라 구멍깊이 최대 5xDc 이상의 드릴링 시 peck(Q) 절입량을 변경하십시오.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Please adjust the peck (Q) feed rate when drilling with a cutting tool that has a depth of cut (Dc) exceeding 5 times the diameter.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

## 2DUBEW(3XD) Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM | | 구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC | | 덕타일 주철 Ductile cast irons FCD | | 스테인레스강 Stainless Steels SUS304/SUS316 | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~200HB | | ~30HRc | | - | | - | |
| 외경 Outside Diameter | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED |
| ø1 | 19,000 | 530 | 13,200 | 430 | 13,200 | 460 | 19,150 | 830 |
| ø2 | 9,480 | 620 | 7,200 | 460 | 7,010 | 400 | 9,550 | 630 |
| ø3 | 8,280 | 920 | 7,080 | 540 | 6,840 | 550 | 8,400 | 830 |
| ø4 | 6,200 | 1010 | 5,400 | 540 | 5,060 | 550 | 6,350 | 770 |
| ø5 | 4,970 | 980 | 4,140 | 690 | 4,025 | 670 | 5,100 | 715 |
| ø6 | 4,140 | 1000 | 3,600 | 690 | 3,450 | 670 | 4,200 | 660 |
| ø8 | 3,100 | 1030 | 2,520 | 530 | 2,530 | 550 | 3,200 | 740 |
| ø10 | 2,500 | 830 | 2,040 | 470 | 2,070 | 500 | 2,550 | 700 |
| ø12 | 2,100 | 670 | 1,680 | 420 | 1,725 | 460 | 2,100 | 580 |
| ø16 | 1,560 | 530 | 1,380 | 410 | 1,265 | 400 | 1,600 | 510 |
| ø20 | 1,240 | 460 | 1,140 | 410 | 1,035 | 400 | 1,250 | 480 |

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- Peck(Q) drilling 간격은 외부 쿨런트 타입 0.2Dc~0.5Dc, 내부 쿨런트 타입 0.2Dc~1.5Dc를 권장합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- For peck (Q) drilling, we recommend intervals of 0.2Dc to 0.5Dc for external coolant types and 0.2Dc to 1.5Dc for internal coolant types.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

## 2DUBEW(5XD) Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM | | 구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC | | 덕타일 주철 Ductile cast irons FCD | | 스테인레스강 Stainless Steels SUS304/SUS316 | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | ~200HB | | ~30HRc | | - | | - | |
| 외경 Outside Diameter | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED |
| ø1 | 19,000 | 480 | 13,200 | 390 | 13,200 | 420 | 19,150 | 750 |
| ø2 | 9,480 | 560 | 7,200 | 420 | 7,010 | 360 | 9,550 | 570 |
| ø3 | 8,280 | 840 | 7,080 | 490 | 6,840 | 500 | 8,400 | 750 |
| ø4 | 6,200 | 920 | 5,400 | 490 | 5,060 | 500 | 6,350 | 700 |
| ø5 | 4,970 | 890 | 4,140 | 625 | 4,025 | 610 | 5,100 | 650 |
| ø6 | 4,140 | 910 | 3,600 | 625 | 3,450 | 610 | 4,200 | 600 |
| ø8 | 3,100 | 940 | 2,520 | 480 | 2,530 | 500 | 3,200 | 670 |
| ø10 | 2,500 | 750 | 2,040 | 430 | 2,070 | 455 | 2,550 | 640 |
| ø12 | 2,100 | 610 | 1,680 | 380 | 1,725 | 420 | 2,100 | 525 |
| ø16 | 1,560 | 480 | 1,380 | 370 | 1,265 | 360 | 1,600 | 460 |
| ø20 | 1,240 | 420 | 1,140 | 370 | 1,035 | 360 | 1,250 | 440 |

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 절삭하는 피삭재의 따라 구멍깊이 최대 5xDc 이상의 드릴링 시 peck(Q) 절입량을 변경하십시오.
- Peck(Q) drilling 간격은 외부 쿨런트 타입 0.2Dc~0.5Dc, 내부 쿨런트 타입 0.2Dc~1.5Dc를 권장합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Please adjust the peck (Q) feed rate when drilling with a cutting tool that has a depth of cut (Dc) exceeding 5 times the diameter.
- For peck (Q) drilling, we recommend intervals of 0.2Dc to 0.5Dc for external coolant types and 0.2Dc to 1.5Dc for internal coolant types.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

## 2DUBEN(3XD) Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 알루미늄 합금 주물 Aluminum alloy castings AC48 | | 알루미늄 합금 Aluminum alloy AL7075 | | ABS수지/아크릴 ABS resin / Acrylic | |
|---|---|---|---|---|---|---|
| 외경 Outside Diameter | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED |
| ø1 | 28,600 | 1,720 | 25,740 | 1,540 | 10,500 | 210 |
| ø2 | 19,400 | 1,160 | 17,460 | 1,050 | 7,000 | 210 |
| ø3 | 13,000 | 1,250 | 11,700 | 1,120 | 5,250 | 260 |
| ø4 | 9,650 | 1,160 | 8,685 | 1,040 | 3,850 | 190 |
| ø5 | 7,800 | 1,120 | 7,020 | 1,010 | 2,850 | 140 |
| ø6 | 6,500 | 840 | 5,850 | 760 | 2,250 | 110 |
| ø8 | 4,850 | 870 | 4,365 | 790 | 1,800 | 90 |
| ø10 | 3,900 | 800 | 3,510 | 720 | 1,450 | 70 |
| ø12 | 3,200 | 770 | 2,880 | 700 | 1,200 | 60 |
| ø13 | 3,000 | 800 | 2,700 | 710 | 1,100 | 55 |

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 절삭하는 피삭재의 따라 구멍깊이 최대 5xDc 이상의 드릴링 시 peck(Q) 절입량을 변경하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망합니다.(Ø1 이하 사용 시 진동 허용 관리 3㎛이내일것)
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Please adjust the peck (Q) feed rate when drilling with a cutting tool that has a depth of cut (Dc) exceeding 5 times the diameter.
- Please use a machine with low vibration and good rigidity (for Ø1 or below, keep vibration tolerance within 3$\mu$m).
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

## 2DUBEN(5XD) Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 알루미늄 합금 주물 Aluminum alloy castings AC48 | | 알루미늄 합금 Aluminum alloy AL7075 | | ABS수지/아크릴 ABS resin / Acrylic | |
|---|---|---|---|---|---|---|
| 외경 Outside Diameter | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED |
| ø1 | 28,600 | 1,430 | 25,740 | 1,290 | 10,500 | 168 |
| ø2 | 19,400 | 970 | 17,460 | 870 | 7,000 | 168 |
| ø3 | 13,000 | 1,040 | 11,700 | 940 | 5,250 | 208 |
| ø4 | 9,650 | 970 | 8,685 | 870 | 3,850 | 152 |
| ø5 | 7,800 | 940 | 7,020 | 850 | 2,850 | 112 |
| ø6 | 6,500 | 700 | 5,850 | 630 | 2,250 | 88 |
| ø8 | 4,850 | 730 | 4,365 | 660 | 1,800 | 72 |
| ø10 | 3,900 | 660 | 3,510 | 600 | 1,450 | 56 |
| ø12 | 3,200 | 640 | 2,880 | 580 | 1,200 | 48 |
| ø13 | 3,000 | 660 | 2,700 | 600 | 1,100 | 44 |


- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 절삭하는 피삭재의 따라 구멍깊이 최대 5xDc 이상의 드릴링 시 peck(Q) 절입량을 변경하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망합니다.(Ø1 이하 사용 시 진동 허용 관리 3㎛이내일것)
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Please adjust the peck (Q) feed rate when drilling with a cutting tool that has a depth of cut (Dc) exceeding 5 times the diameter.
- Please use a machine with low vibration and good rigidity (for Ø1 or below, keep vibration tolerance within 3$\mu$m).
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

# 2FDR Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM | | 구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC | | 공구강/금형강 Tool Steels / Mold steels SCM/HPM | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80/KP4M | | 덕타일 주철 Ductile cast irons FCD | | 스테인레스강 Stainless Steels SUS304/SUS316 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도Hardness | ~200HB | | ~30HRc | | 30 ~ 40HRc | | 40 ~ 45HRc | | - | | - | |
| 외경 Diameter | 회전수 RPM | 이송속도 FEED | 회전수 RPM | 이송속도 FEED | 회전수 RPM | 이송속도 FEED | 회전수 RPM | 이송속도 FEED | 회전수 RPM | 이송속도 FEED | 회전수 RPM | 이송속도 FEED |
| ø 0.2 | 33000 | 35 | 29500 | 40 | 16500 | 25 | 14000 | 15 | 29500 | 30 | 16200 | 15 |
| ø 0.3 | 31500 | 55 | 25000 | 40 | 15500 | 30 | 12500 | 15 | 26500 | 35 | 15300 | 15 |
| ø 0.4 | 27500 | 75 | 23800 | 50 | 14500 | 35 | 11500 | 20 | 23200 | 40 | 14500 | 20 |
| ø 0.5 | 25800 | 85 | 22000 | 60 | 13200 | 40 | 11000 | 25 | 21500 | 45 | 13200 | 20 |
| ø 0.6 | 24600 | 115 | 20500 | 85 | 12000 | 55 | 10000 | 25 | 20000 | 60 | 12000 | 25 |
| ø 0.7 | 22500 | 135 | 19500 | 115 | 11000 | 70 | 9000 | 30 | 18500 | 90 | 11500 | 30 |
| ø 0.8 | 21000 | 180 | 18000 | 150 | 10500 | 80 | 8000 | 35 | 17000 | 120 | 10000 | 35 |
| ø 0.9 | 20500 | 240 | 16800 | 190 | 9500 | 95 | 7500 | 35 | 16000 | 145 | 9850 | 40 |
| ø 1 | 19500 | 300 | 16000 | 230 | 9450 | 110 | 6800 | 35 | 15700 | 180 | 9600 | 50 |
| ø 2 | 12000 | 340 | 10000 | 290 | 5800 | 150 | 4100 | 60 | 10000 | 230 | - | - |
| ø 3 | 8000 | 410 | 7100 | 330 | 3800 | 165 | 2700 | 70 | 7100 | 280 | - | - |
| ø 4 | 6100 | 425 | 5200 | 380 | 2700 | 170 | 2100 | 80 | 5250 | 300 | - | - |
| ø 5 | 4900 | 425 | 4200 | 280 | 2350 | 175 | 1650 | 80 | 4250 | 300 | - | - |
| ø 6 | 4150 | 425 | 3550 | 330 | 1800 | 175 | 1350 | 80 | 3550 | 300 | - | - |
| ø 8 | 3100 | 430 | 2700 | 350 | 1500 | 175 | 1000 | 80 | 2700 | 300 | - | - |
| ø 10 | 2600 | 430 | 2200 | 360 | 1100 | 175 | 850 | 80 | 2000 | 300 | - | - |
| ø 12 | 2100 | 430 | 1750 | 360 | 950 | 175 | 630 | 80 | 1800 | 310 | - | - |
| ø 18 | 1600 | 430 | 1400 | 360 | 750 | 175 | 520 | 80 | 1350 | 310 | - | - |
| ø 20 | 1250 | 430 | 1100 | 360 | 600 | 175 | 430 | 80 | 1000 | 310 | - | - |

- 절삭 조건표 참조는 수용성 절삭유 사용이 전제입니다. 절삭유를 사용하지 않을시, 회전과 속도를 20% 줄여 사용하십시오.
- 절삭하는 피삭재에 따라 드릴링의 최종깊이가 직경대비 2배 이상 시 펙 드릴링 방식을 권장합니다.
- 경사 드릴 가공시, 경사진 각도에 따라(절삭 조건을) 조절하십시오. 경사각이 30도 이하일 때, 피드를 50% 낮추십시오.
  경사각이 30도 이상일 때, 회전을 70% 이하, 피드를30% 이하로 줄이십시오.
- 측면 가공용으로는 사용하지 마십시오.
- 절삭 조건을 기계 강성이나 클램프 상태에 따라 조절하십시오.

- Use the water soluble cutting oil. In case if you do not use water soluble cutting oil, reduce the RPM and the feed by 20%.
- When the final depth of drilling exceeds twice the diameter relative to the cutting material, we recommend using peck drilling method.
- For stainless drilling, we recommend that the tool diameter is 1.9mm or less.
- If you use for inclined angle as slope drilling, reduce the feed by 50% for inclined angle less than 30˚, and reduce below 70% of the RPM and 30% of the feed for inclined angle over 30˚.
- Do not use for side milling.
- Change cutting conditions depending on work variables; rigidity of machine, work clamp or material shape.

# 2FDRL Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM | | 구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC | | 공구강/금형강 Tool Steels / Mold steels SCM/HPM | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80/KP4M | | 덕타일 주철 FCD | |
|---|---|---|---|---|---|---|---|---|---|---|
| 경도Hardness | ~200HB | | ~30HRc | | 30 ~ 40HRc | | 40 ~ 45HRc | | - | |
| 외경 Diameter | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송속도 FEED | 회전수 RPM | 이송 속도 FEED |
| ø 3 | 11000 | 800 | 9500 | 580 | 7500 | 320 | 5000 | 220 | 9300 | 400 |
| ø 4 | 8000 | 800 | 7200 | 580 | 5600 | 320 | 4100 | 220 | 7300 | 400 |
| ø 5 | 6500 | 800 | 5550 | 580 | 4500 | 320 | 3300 | 220 | 6000 | 400 |
| ø 6 | 5500 | 810 | 4800 | 590 | 3550 | 320 | 2700 | 220 | 5000 | 400 |
| ø 8 | 4100 | 810 | 3600 | 590 | 2850 | 320 | 2000 | 220 | 3800 | 400 |
| ø 10 | 3300 | 810 | 3000 | 590 | 2350 | 320 | 1650 | 220 | 3000 | 410 |
| ø 12 | 2750 | 820 | 2450 | 600 | 2000 | 320 | 1480 | 220 | 2480 | 410 |
| ø 16 | 2100 | 820 | 1800 | 600 | 1550 | 330 | 1000 | 220 | 1850 | 410 |
| ø 20 | 1650 | 820 | 1550 | 600 | 1250 | 330 | 850 | 220 | 1550 | 410 |

- 절삭 조건표 참조는 수용성 절삭유 사용이 전제입니다. 절삭유를 사용하지 않을 시, 회전과 이송속도를 20% 줄여 사용하십시오.
- 절삭하는 피삭재에 따라 드릴링의 최종깊이가 직경대비 2배 이상 시 펙 드릴링 방식을 권장합니다.
- 측면 가공용으로는 사용하지 마십시오.
- 절삭 조건을 기계 강성이나 클램프 상태에 따라 조절하십시오.

- Use the water soluble cutting oil. In case if you do not use water soluble cutting oil, reduce the RPM and the feed by 20%.
- When the final depth of drilling exceeds twice the diameter relative to the cutting material, we recommend using peck drilling method.
- Do not use for stainless material. We recommend using 2FDRW or 2FDRLW for stainless material.
- Do not use for side milling.
- Change cutting conditions depending on work variables; rigidity of machine, work clamp or material shape.

# 2FDRW Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM | | 구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC | | 공구강/금형강 Tool Steels / Mold steels SCM/HPM | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80/KP4M | | 덕타일 주철 Ductile cast irons FCD | | 스테인레스강 Stainless Steels SUS304/SUS316 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도Hardness | ~200HB | | ~30HRc | | 30 ~ 40HRc | | 40 ~ 45HRc | | - | | - | |
| 외경 Diameter | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED |
| Ø3 | 12500 | 900 | 10000 | 600 | 7500 | 300 | 6500 | 270 | 10000 | 450 | 10000 | 600 |
| Ø4 | 9500 | 930 | 8000 | 620 | 5500 | 300 | 4800 | 270 | 8000 | 450 | 8000 | 600 |
| Ø5 | 7500 | 930 | 6500 | 620 | 4500 | 300 | 3800 | 270 | 6300 | 460 | 6300 | 620 |
| Ø6 | 6500 | 950 | 5400 | 630 | 3700 | 330 | 3200 | 280 | 5400 | 470 | 5500 | 620 |
| Ø8 | 4800 | 950 | 4000 | 630 | 2900 | 330 | 2500 | 280 | 4000 | 470 | 4000 | 620 |
| Ø10 | 3800 | 950 | 3300 | 630 | 2450 | 330 | 2000 | 280 | 3200 | 470 | 3300 | 620 |
| Ø12 | 3300 | 950 | 2800 | 630 | 2000 | 330 | 1600 | 280 | 2800 | 470 | 2900 | 620 |
| Ø16 | 2500 | 950 | 2000 | 630 | 1500 | 330 | 1300 | 280 | 2000 | 470 | 2000 | 620 |

- 절삭 조건표 참조는 수용성 절삭유 사용이 전제입니다. 절삭유를 사용하지 않을 시, 회전과 속도를 20% 줄여 사용하십시오.
- 드릴 깊이는 3xDc를 넘기지 마십시오. 칩 배출 상태가 좋지 않을 경우, 펙드릴링 방식을 사용하십시오.
- 펙드릴 간격은 0.1Dc ~ 0.5Dc 사이를 권장합니다.
- 측면 가공용으로는 사용하지 마십시오.
- 절삭 조건을 기계 강성이나 클램프 상태에 따라 조절하십시오.

- Use the water soluble cutting oil. In case if you do not use water soluble cutting oil, reduce the RPM and the feed by 20%.
- Do not over the drilling depth of 3 x Dc. If the state of chip emission is not good enough, use peck drilling method.
- For the stainless material, use peck drilling method.
- Peck drill interval is recommended between 0.1 Dc to 0.5 Dc.
- Side milling is not possible.
- Change cutting conditions depending on work variables; rigidity of machine, work clamp or material shape.

# 2FDRLW Cutting Condition

• RPM : rev./min • Feed : mm/min

| 피삭재 Material | 일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM | | 구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC | | 공구강/금형강 Tool Steels / Mold steels SCM/HPM | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80/KP4M | | 덕타일 주철 Ductile cast irons FCD | | 스테인레스강 Stainless Steels SUS304/SUS316 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 경도Hardness | ~200HB | | ~30HRc | | 30 ~ 40HRc | | 40 ~ 45HRc | | - | | - | |
| 외경 Diameter | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED | 회전수 RPM | 이송 속도 FEED |
| Ø3 | 15000 | 1250 | 10000 | 600 | 7300 | 300 | 6500 | 270 | 10000 | 460 | 10000 | 600 |
| Ø4 | 11000 | 1300 | 8000 | 600 | 5500 | 300 | 4800 | 270 | 8000 | 460 | 8000 | 620 |
| Ø5 | 9000 | 1300 | 6400 | 600 | 4500 | 300 | 3800 | 270 | 6500 | 460 | 6500 | 620 |
| Ø6 | 7500 | 1350 | 5300 | 630 | 3700 | 320 | 3200 | 280 | 5300 | 480 | 5300 | 630 |
| Ø8 | 5600 | 1350 | 4000 | 630 | 2800 | 320 | 2500 | 280 | 4000 | 480 | 4000 | 630 |
| Ø10 | 4500 | 1350 | 3200 | 630 | 2300 | 320 | 2000 | 280 | 3200 | 480 | 3300 | 630 |
| Ø12 | 3700 | 1350 | 2800 | 630 | 2000 | 320 | 1700 | 280 | 2900 | 480 | 2800 | 630 |
| Ø16 | 2850 | 1350 | 2100 | 630 | 1500 | 320 | 1300 | 280 | 2100 | 480 | 2100 | 630 |

- 절삭 조건표 참조는 수용성 절삭유 사용이 전제입니다. 절삭유를 사용하지 않을 시, 회전과 속도를 20% 줄여 사용하십시오.
- 드릴 깊이는 5xDc를 넘기지 마십시오. 칩 배출 상태가 좋지 않을 경우, 펙드릴링 방식을 사용하십시오.
- 펙드릴 간격은 0.1Dc ~ 0.5Dc 사이를 권장합니다.
- 측면 가공용으로는 사용하지 마십시오.
- 절삭 조건을 기계 강성이나 클램프 상태에 따라 조절하십시오.

- Use the water soluble cutting oil. In case if you do not use water soluble cutting oil, reduce the RPM and the feed by 20%.
- Do not over the drilling depth of 5 x Dc. If the state of chip emission is not good enough, use peck drilling method.
- For the stainless material, use peck drilling method.
- Peck drill interval is recommended between 0.1 Dc to 0.5 Dc.
- Side milling is not possible.
- Change cutting conditions depending on work variables; rigidity of machine, work clamp or material shape.

# 추천 절삭조건표 Recommended Cutting Conditions

## 4ETM(R)

| 피삭재 Work Material | 알루미늄 합금 Aluminum alloys AL7075 | | 스테인레스강 Stainless steels SUS304 / SUS316 | | 구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC | | 합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80/KP4M | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | ~30HRc | | 40 ~ 45HRc | |
| TAP | V/C | FZ | V/C | FZ | V/C | FZ | V/C | FZ |
| M3 | | 0.02 ~ 0.03 | | 0.01 ~ 0.015 | | 0.01 ~ 0.015 | | 0.005 ~ 0.01 |
| M4 | | 0.02 ~ 0.03 | | 0.01 ~ 0.015 | | 0.01 ~ 0.015 | | 0.005 ~ 0.01 |
| M5 | | 0.02 ~ 0.03 | | 0.01 ~ 0.015 | | 0.01 ~ 0.015 | | 0.005 ~ 0.01 |
| M6 | 120~250 | 0.03 ~ 0.04 | 70 ~ 80 | 0.015 ~ 0.02 | 60 ~ 70 | 0.015 ~ 0.02 | 45 ~ 55 | 0.01 ~ 0.015 |
| M8 | | 0.03 ~ 0.04 | | 0.015 ~ 0.02 | | 0.015 ~ 0.02 | | 0.01 ~ 0.015 |
| M10 | | 0.04 ~ 0.05 | | 0.015 ~ 0.02 | | 0.015 ~ 0.02 | | 0.015 ~ 0.02 |
| M12 | | 0.04 ~ 0.05 | | 0.015 ~ 0.02 | | 0.015 ~ 0.02 | | 0.015 ~ 0.02 |
| M16~M23 | | 0.05 ~ 0.07 | | 0.025 ~ 0.03 | | 0.025 ~ 0.03 | | 0.015 ~ 0.02 |

## 2DTM

| 피삭재 Work Material | 알루미늄 합금 Aluminum alloys AL7075 | | 비철금속 Non-ferrous metal | |
|---|---|---|---|---|
| TAP | V/C | FZ | V/C | FZ |
| M3 | | 0.03 ~ 0.04 | | 0.03 ~ 0.04 |
| M4 | | 0.03 ~ 0.04 | | 0.03 ~ 0.04 |
| M5 | | 0.03 ~ 0.04 | | 0.03 ~ 0.04 |
| M6 | 200~250 | 0.04 ~ 0.05 | 250~300 | 0.04 ~ 0.05 |
| M8 | | 0.04 ~ 0.05 | | 0.04 ~ 0.05 |
| M10 | | 0.05 ~ 0.06 | | 0.05 ~ 0.06 |
| M12 | | 0.06 ~ 0.07 | | 0.06 ~ 0.07 |
| M16 | | 0.06 ~ 0.07 | | 0.06 ~ 0.07 |

## 4IMTM

| 피삭재 Work Material | 티타늄 합금 Titanium Alloys | |
|---|---|---|
| TAP | V/C | FZ |
| M0.8 ~ M1 | | 0.005 ~ 0.01 |
| M1 ~ M2 | 20 ~ 60 | 0.005 ~ 0.01 |
| M 2.5 | | 0.005 ~ 0.01 |
| M 2.6 | | 0.005 ~ 0.01 |

## 4TRTM(S)

| 피삭재 Work Material | 스테인레스강 Stainless steels SUS304 / SUS316 | | 일반구조강 / 쾌삭강 Mild Steels / Free cutting steels HP / SM | | 구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC | | 공구강 / 금형강 Tool steels / Mold steels SCM / HPM | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | ~ 200HB | | ~ 30HRc | | 30 ~ 40HRc | |
| TAP | V/C | FZ | V/C | FZ | V/C | FZ | V/C | FZ |
| Tr8, Tr9 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 |
| Tr10, Tr11 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 |
| Tr12, Tr14 | | 0.03 ~ 0.04 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| Tr12 | 70 ~ 80 | 0.03 ~ 0.04 | 60 ~ 70 | 0.03 ~ 0.04 | 50 ~ 60 | 0.02 ~ 0.03 | 40 ~ 50 | 0.02 ~ 0.03 |
| Tr14, Tr22 | | 0.03 ~ 0.04 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| Tr16, Tr18, Tr20 | | 0.03 ~ 0.04 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| Tr22, Tr24, Tr26 | | 0.03 ~ 0.04 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| | | | | | | | | |

- 파지력이 좋은 열박음 척 사용을 추천 합니다.
- 떨림방지를 위한 부등분할 설계로, 공구 진입 시 f1 (mm/tooth) 기준으로 나사가공 이송대비 50% 수준으로 낮춰 주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 절삭시 내,외부 급유형 쿨런트 사용을 추천합니다.

- Using shrink-fit chuck with great holding power is recommeded.
- When the tool approaches the work material, reduce the feed by 50%.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Internal and external coolants are recommended for milling.

# 추천 절삭조건표 Recommended Cutting Conditions

## 4MTM

| 피삭재 Work Material | 알루미늄 합금 Aluminum alloys AL7075 | | 스테인레스강 Stainless steels SUS304 / SUS316 | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | 40 ~ 45HRc | | 55 ~ 62HRc | |
| TAP | V/C | FZ | V/C | FZ | V/C | FZ | V/C | FZ |
| M1 | 120 ~ 250 | 0.03 ~ 0.04 | 70 ~ 85 | 0.01 ~ 0.02 | 50 ~ 60 | 0.01 ~ 0.02 | 40 ~ 50 | 0.008 ~ 0.01 |
| M2 | | 0.03 ~ 0.04 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 | | 0.008 ~ 0.01 |
| M3 | | 0.03 ~ 0.04 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 |
| M4 | | 0.04 ~ 0.05 | | 0.02 ~ 0.03 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 |
| M6 | | 0.04 ~ 0.05 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| M8 | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| M10 | | 0.06 ~ 0.07 | | 0.05 ~ 0.06 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| M12 | | 0.06 ~ 0.07 | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.03 ~ 0.04 |

## 4BSP(T)

| 피삭재 Work Material | 알루미늄 합금 Aluminum alloys AL7075 | | 스테인레스강 Stainless steels SUS304 / SUS316 | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | 40 ~ 45HRc | | 55 ~ 58HRc | |
| TAP | V/C | FZ | V/C | FZ | V/C | FZ | V/C | FZ |
| 1/16/28C | 120 ~ 250 | 0.04 ~ 0.05 | 70 ~ 85 | 0.02 ~ 0.03 | 50 ~ 60 | 0.02 ~ 0.03 | 40 ~ 50 | 0.02 ~ 0.03 |
| 1/4/19C | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| 1/2/14C | | 0.06 ~ 0.07 | | 0.05 ~ 0.06 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| 1"/11C | | 0.06 ~ 0.07 | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.03 ~ 0.04 |

## 4HBSP

| 피삭재 Work Material | 알루미늄 합금 Aluminum alloys AL7075 | | 스테인레스강 Stainless steels SUS304 / SUS316 | | 구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | ~ 30 HRc | | 40 ~ 45HRc | |
| TAP | V/C | FZ | V/C | FZ | V/C | FZ | V/C | FZ |
| 1/16/28C | 120 ~ 150 | 0.03 ~ 0.04 | 70 ~ 85 | 0.02 ~ 0.03 | 50 ~ 65 | 0.01 ~ 0.02 | 40 ~ 50 | 0.01 ~ 0.02 |
| 1/4/19C | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 |
| 1/2/14C | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| 1"/11C | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |

- 파지력이 좋은  열박음 척 사용을 추천 합니다.
- 떨림방지를 위한 부등분할 설계로, 공구 진입 시 f1 (mm/tooth) 기준으로 나사가공 이송대비 50% 수준으로 낮춰 주십시오.
- 상기 절삭조건은 참고 수치이므로, 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 절삭시 내,외부 급유형 쿨런트 사용을 추천합니다.

- Using shrink-fit chuck with great holding power is recommeded.
- When the tool approaches the work material, reduce the feed by 50%.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Internal and external coolants are recommended for milling.

# 추천 절삭조건표 Recommended Cutting Conditions

## 4STM

| 피삭재 Work Material | 알루미늄 합금 Aluminum alloys AL7075 | | 스테인레스강 Stainless steels SUS304 / SUS316 | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | 40 ~ 45HRc | | 55 ~ 62HRc | |
| TAP | V/C | FZ | V/C | FZ | V/C | FZ | V/C | FZ |
| M1 ~ m3 | 120 ~ 250 | 0.03 ~ 0.04 | 70 ~ 85 | 0.01 ~ 0.02 | 50 ~ 60 | 0.01 ~ 0.02 | 40 ~ 50 | 0.008 ~ 0.01 |
| M4 | | 0.03 ~ 0.04 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 | | 0.008 ~ 0.01 |
| M5 | | 0.03 ~ 0.04 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 |
| M6 | | 0.04 ~ 0.05 | | 0.02 ~ 0.03 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 |
| M8 | | 0.04 ~ 0.05 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| M10 | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| M12 | | 0.06 ~ 0.07 | | 0.05 ~ 0.06 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| M16 ~ M20 | | 0.06 ~ 0.07 | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.03 ~ 0.04 |

## 4HTM/4LTM

| 피삭재 Work Material | 알루미늄 합금 Aluminum alloys AL7075 | | 스테인레스강 Stainless steels SUS304 / SUS316 | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | ~ 30HRC | | 40 ~ 45HRC | |
| TAP | V/C | FZ | V/C | FZ | V/C | FZ | V/C | FZ |
| M3 | 120 ~ 150 | 0.02 ~ 0.03 | 70 ~ 85 | 0.01 ~ 0.02 | 50 ~ 65 | 0.01 ~ 0.02 | 40 ~ 50 | 0.008 ~ 0.01 |
| M4 | | 0.02 ~ 0.03 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 | | 0.008 ~ 0.01 |
| M5 | | 0.02 ~ 0.03 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 |
| M6 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 |
| M8 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.01 ~ 0.02 | | 0.02 ~ 0.03 |
| M10 | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| M12 | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| M16 ~ M20 | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |

## 4NKTM

| 피삭재 Work Material | 알루미늄 합금 Aluminum alloys AL7075 | | 스테인레스강 Stainless steels SUS304 / SUS316 | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | 40 ~ 45HRc | | 55 ~ 62HRc | |
| TAP | V/C | FZ | V/C | FZ | V/C | FZ | V/C | FZ |
| M3 | 120 ~ 150 | 0.03 ~ 0.04 | 70 ~ 85 | 0.01 ~ 0.02 | 50 ~ 65 | 0.01 ~ 0.02 | 40 ~ 55 | 0.008 ~ 0.01 |
| M4 | | 0.03 ~ 0.04 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 | | 0.008 ~ 0.01 |
| M5 | | 0.03 ~ 0.04 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 |
| M6 | | 0.04 ~ 0.05 | | 0.02 ~ 0.03 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 |
| M8 | | 0.04 ~ 0.05 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| M10 | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| M12 | | 0.06 ~ 0.07 | | 0.05 ~ 0.06 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| M16 | | 0.06 ~ 0.07 | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.03 ~ 0.04 |
| M20 | | 0.06 ~ 0.07 | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.03 ~ 0.04 |

# 추천 절삭조건표 Recommended Cutting Conditions

## 4BSTM

| 피삭재 Work Material | 알루미늄 합금 Aluminum alloys AL7075 | | 스테인레스강 Stainless steels SUS304 / SUS316 | | 구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | ~30HRc | | 40~45HRc | |
| TAP | V/C | FZ | V/C | FZ | V/C | FZ | V/C | FZ |
| 1/16.28C BSPT | 120 ~ 150 | 0.03 ~ 0.04 | 70 ~ 85 | 0.02 ~ 0.03 | 50 ~ 65 | 0.01 ~ 0.02 | 40 ~ 50 | 0.01 ~ 0.02 |
| 1/8/28C BSPT | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 |
| 1/4 .19C BSPT | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| 3/8.19C BSPT | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| 1/2(3/4).14C BSPT | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| 1".11C BSPT | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |

## 4NPTS

| 피삭재 Work Material | 알루미늄 합금 Aluminum alloys AL7075 | | 스테인레스강 Stainless steels SUS304 / SUS316 | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | | 열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61 | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | 40 ~ 45HRc | | 55 ~ 62HRc | |
| TAP | V/C | FZ | V/C | FZ | V/C | FZ | V/C | FZ |
| 1/16/27C | 120 ~ 250 | 0.04 ~ 0.05 | 70 ~ 85 | 0.02 ~ 0.03 | 50 ~ 60 | 0.02 ~ 0.03 | 40 ~ 50 | 0.02 ~ 0.03 |
| 1/4/18C | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| 1/2/14C | | 0.06 ~ 0.07 | | 0.05 ~ 0.06 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| 1"/11.5C | | 0.06 ~ 0.07 | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.03 ~ 0.04 |

## 4NPTM

| 피삭재 Work Material | 알루미늄 합금 Aluminum alloys AL7075 | | 스테인레스강 Stainless steels SUS304 / SUS316 | | 구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC | | 합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M | |
|---|---|---|---|---|---|---|---|---|
| 경도 Hardness | | | | | ~30HRc | | 40 ~ 45HRc | |
| TAP | V/C | FZ | V/C | FZ | V/C | FZ | V/C | FZ |
| 1/16.27C NPT | 120 ~ 150 | 0.03 ~ 0.04 | 70 ~ 85 | 0.02 ~ 0.03 | 50 ~ 85 | 0.01 ~ 0.02 | 40 ~ 50 | 0.01 ~ 0.02 |
| 1/8/27C NPT | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.01 ~ 0.02 | | 0.01 ~ 0.02 |
| 1/4.18C NPT | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| 3/8.18C NPT | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |
| 1/2(3/4),14C NPT | | 0.05 ~ 0.06 | | 0.03 ~ 0.04 | | 0.02 ~ 0.03 | | 0.02 ~ 0.03 |

### 절삭조건 계산공식

**회전수(N) : N=1000xV/πxD**

V : 절삭속도
π : 3.14(원주율)
D : 공구직경

분당이송 : F=fxZxN

f : 회전당 이송
z : 날 수
N : 회전 수

- 절삭하는 피삭재에 따라 절입 횟수를 변경하십시오. (열처리 강 나사 가공 시 3회 이상의 절입을 권장합니다.)
- 나사플러그 게이지 측정 후 경 보정값을 수정하십시오.
- 긴 유효장 타입의 제품을 사용 시 나사가공 이송속도를 줄여주십시오.
- 가급적 열박음 척을 추천 합니다.
- 공구 진입 시 이송 f(mm/tooth)을 나사가공 이송 대비 30% 수준으로 낮춰주십시오.
- 상기 절삭조건은 참고 수치입니다. 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망합니다.

- Change the number of feeds according to the workpiece material.
  (Three or more feeds are recommended for thread milling of hardened steel.)
- Modify the diameter correction value after measuring the gauge of screw plug.
- When using the tool with long effective length, please reduce the speed of threading feed.
  Shrink fit chuck is recommended.
- During the approach of the tool to the workpiece, please reduce the feed F value (mm/tooth) to 30% of the feed for threading.
- The above cutting condition is just for reference.
- You may modify depending on the processing shape, purpose of processing, and the machine you use.

# 엔드밀 재연삭 가격 안내

## 초경 Ball & Radius 엔드밀

• 부등분할 : ×1.1 • C작업시 : ×0.9

| 날경 | | 6이하 | 10이하 | 12이하 | 16이하 | 20이하 | 25이하 |
|---|---|---|---|---|---|---|---|
| 무코팅 | 2날 | 6,100 | 6,600 | 7,700 | 9,900 | 13,200 | 16,500 |
| | 3, 4, 6날 | 8,300 | 9,400 | 11,000 | 12,100 | 16,500 | 22,000 |
| TISIN코팅 | 2날 | 8,300 | 9,500 | 10,900 | 13,400 | 19,100 | 20,900 |
| | 3, 4, 6날 | 10,300 | 12,500 | 13,400 | 15,200 | 23,800 | 26,400 |

## 초경 엔드밀 절단& 밑날

• 부등분할 : ×1.1 • 라핑시 : ×1.1

| 날경 | | 6이하 | 10이하 | 12이하 | 16이하 | 20이하 | 25이하 |
|---|---|---|---|---|---|---|---|
| 무코팅 | 2날 | 4,200 | 4,800 | 6,400 | 8,500 | 10,700 | 13,900 |
| | 3, 4, 6날 | 5,300 | 5,900 | 7,500 | 10,700 | 12,300 | 17,100 |
| TISIN코팅 | 2날 | 4,800 | 5,200 | 7,100 | 10,100 | 12,400 | 15,200 |
| | 3, 4, 6날 | 5,800 | 6,300 | 8,500 | 12,400 | 13,800 | 18,200 |

## 초경 다이아 절단& 밑날

| 날경 | 6이하 | 12이하 | 16이하 | 20이하 |
|---|---|---|---|---|
| 2날 | 14,800 | 16,600 | 19,250 | 22,200 |
| 3, 4, 6날 | 16,600 | 18,600 | 24,250 | 27,750 |

## 초경 Taper 엔드밀 외경연삭

• 30도 미만 제작수리 : ×2
• 30도 이상 제작수리 : ×1.5

| 생크경 (∅) | 6이하 | 8이하 | 10이하 | 12이하 | 16이하 | 20이하 | 25이하 |
|---|---|---|---|---|---|---|---|
| 2˚미만 | 13,300 | 14,800 | 16,300 | 17,700 | 22,200 | 29,600 | 37,000 |
| 2˚이상 | 13,300 | 14,800 | 17,700 | 20,700 | 26,600 | 35,500 | 41,500 |
| 30˚이상 | 8,800 | 10,300 | 11,800 | 13,300 | 16,300 | 22,200 | 28,100 |

## HSS Taper 엔드밀

• Long : ×1.5 • 제작수리 : ×2 • 역 : ×2

| 생크경 (∅) | 16이하 | 20이하 | 25이하 | 32이하 | 35이하 |
|---|---|---|---|---|---|
| 2˚미만 | 10,300 | 11,800 | 13,300 | 17,700 | 22,200 |
| 2˚이상 | 11,800 | 14,800 | 17,700 | 22,200 | 26,600 |
| 30˚이상 | 8,800 | 10,300 | 11,800 | 14,800 | 17,700 |

## 초경 엔드밀 외경연삭

• Long : ×1.2 • EX.Long : ×1.5

| 날경 | 6이하 | 12이하 | 16이하 | 20이하 | 25이하 | 30이하 |
|---|---|---|---|---|---|---|
| 2날 | 5,900 | 7,400 | 10,300 | 14,800 | 22,200 | 31,100 |
| 4날 | 7,400 | 8,800 | 11,800 | 17,700 | 26,600 | 37,000 |

• 골수리(홈연삭) : X2

## HSS 엔드밀 외경연삭

• Long : ×1.5 • EX.Long : ×2

| 날경 | 20이하 | 30이하 | 40이하 | 50이하 |
|---|---|---|---|---|
| 2날 | 4,400 | 5,900 | 10,300 | 17,700 |
| 4날 | 5,900 | 7,400 | 11,800 | 22,200 |

• 골수리(홈연삭) : X1.5

## 초경 High Helix 엔드밀 외경연삭

• Long : ×1.2 • EX.Long : ×1.5

| 날경 | 6이하 | 12이하 | 16이하 | 20이하 | 25이하 | 32이하 |
|---|---|---|---|---|---|---|
| 6날 | 14,800 | 17,700 | 22,200 | 26,600 | 41,500 | 48,900 |

• 골수리(홈연삭) : X2

## HSS Roughing 엔드밀

• Long : ×1.5 • EX.Long : ×2

| 날경 | 20이하 | 30이하 | 40이하 | 50이하 |
|---|---|---|---|---|
| - | 5,900 | 7,400 | 10,300 | 13,300 |

## 날붙이(BG) 초경 엔드밀 외경연삭

• Long : ×1.5 • EX.Long : ×2

| 날경 | 20이하 | 30이하 | 40이하 | 50이하 |
|---|---|---|---|---|
| 2날 | 7,400 | 11,800 | 14,800 | 22,200 |
| 4날 | 8,800 | 13,300 | 17,700 | 29,600 |

• 골수리(홈연삭) : X2

## 초경 드릴 재연마

오일홀 타입 ×1.8

| 날경 | | 6이하 | 10이하 | 12이하 | 16이하 | 20이하 |
|---|---|---|---|---|---|---|
| 무코팅 | 2날 | 5,500 | 6,000 | 7,000 | 9,000 | 12,000 |
| TIALN코팅 | 2날 | 7,500 | 8,500 | 10,000 | 12,000 | 17,000 |

## 초경 엔드밀 TISIN 코팅 가격

• Long : ×1.5 (전장 150L 이상)

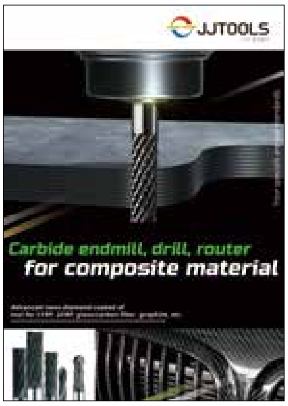
| 날경 | 6이하 | 8이하 | 10이하 | 12이하 | 16이하 | 20이하 | 25이하 | 32이하 |
|---|---|---|---|---|---|---|---|---|
| - | 2,100 | 2,600 | 3,500 | 4,700 | 8,800 | 10,500 | 15,200 | 21,100 |

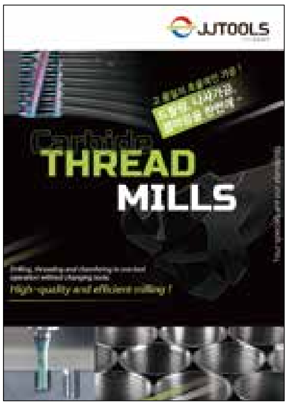
## 초경 엔드밀 JJ 코팅 가격

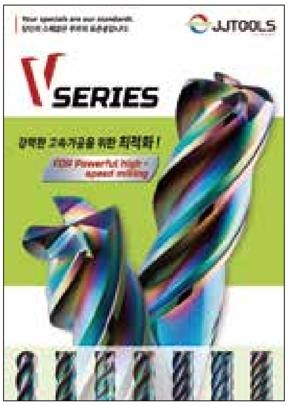
• Long : ×1.5 (전장 150L 이상)

| 날경 | 6이하 | 8이하 | 10이하 | 12이하 | 16이하 | 20이하 | 25이하 | 32이하 |
|---|---|---|---|---|---|---|---|---|
| - | 2,500 | 3,100 | 4,200 | 5,600 | 10,500 | 12,700 | 18,300 | 25,400 |

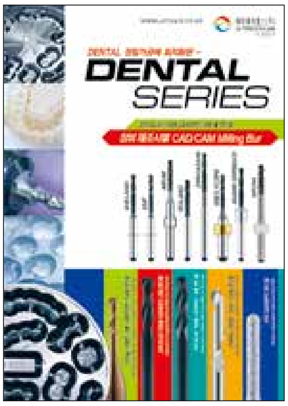
Designed by JJTOOLS | 2025 / 09

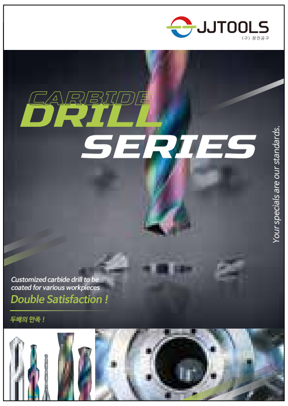








# Where Variety Meets Precision.

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- 공구가 사용중 파손되어 상해의 위험이 있으므로 보호안경 등 안전장비를 착용하고 사용해 주십시오
- 공구의 목적 외에 다른 용도로 사용하거나 전용장비가 아닌 장비에 장착하지 마시고 임의로 연삭, 변경하지 마십시오
- 제품 날부분의 손상을 방지하기 위해 가능한 비접촉 측정을 권고합니다.
- 공구의 체결이 정확히 되었는지 확인한 후 사용해 주십시오.
- 사용시 고열로 인한 스파크가 발생할 수 있습니다.
- 화재나 폭발 등 위험 인자를 제거하고 사용하십시오
- 제품 사용 전과 후에도 공구와 가공물의 치수를 반드시 확인해 주십시오
- 공구가 마모되거나 손상된 경우 사용을 중지해 주십시오
- 비정상적인 진동, 소음이 발생할 경우 시스템을 중지하고 진동, 소음의 원인을 확인하여 제거 하십시오.

## Precautions When Using Tools

- Wear safety equipment such as protective eyewear to prevent the risk of injury in case the tool breaks during use.
- Do not use the tool for purposes other than its intended use, or install it on equipment that is not designed for it. Do not grind or modify it arbitrarily.
- To prevent damage to the cutting edge, it is recommended to use non-contact measurements whenever possible.
- Ensure proper attachment of the tool before use.
- Sparks may be generated due to high heat during use.
- Eliminate potential fire or explosion hazards before using.
- Before and after use, always check the dimensions of the tool and the workpiece.
- Discontinue use if the tool is worn or damaged.
- If abnormal vibration or noise occurs, stop the system and identify and eliminate the cause of the vibration or noise.

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