CARBIDE END MILL

GENERAL CATALOG

초경 엔드밀 종합 카탈로그 Vol.3

주식회사 유엠
UM CO., LTD.

World-Class Quality Products

(주)유엠은 초경 엔드밀 전문 제조업체로서
세계 최고 수준의 고정밀, 고품질 제품을 생산하고 있으며,
글로벌 품질 경쟁력을 인정받고 있습니다.

UM Co., Ltd. is a manufacturer specializing in carbide end mills.
We are producing world-class high-precision, high-quality products,
It is recognized for its global quality competitiveness.

- **최고의 성능**
  Top Performance
- **최고의 품질**
  High Quality
- **최고의 효율**
  Best Efficiency
- **독창적인 제조공법**
  Unique Process

“공구, 그 이상의 **가치** 창조”

“Creating **Value** Beyond Tools”

소경 규격의 최강자!

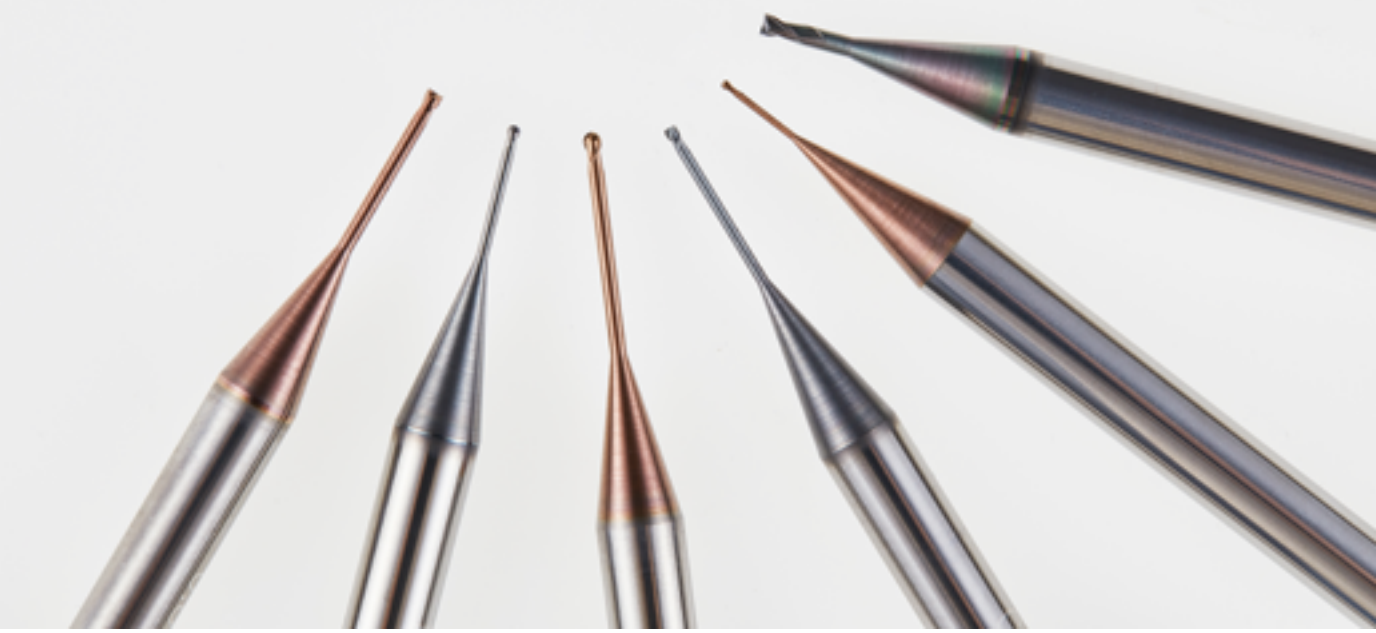
Extremely Strong in small Diameter

최고 수준의 **정밀도**를 자랑하는 유엠의 다양한 소경 제품을 경험해 보십시오.
Experience UM's various small-diameter products boasting the highest level of precision

여러분의 제품 품질을 **업그레이드** 시킬 수 있는 **최적화된 라인업**
Optimized lineup to upgrade your product quality

"공구, 그 이상의 **가치** 창조"
"Creating **Value** Beyond Tools"

Various Products
lineup!



HY-MAX 시리즈

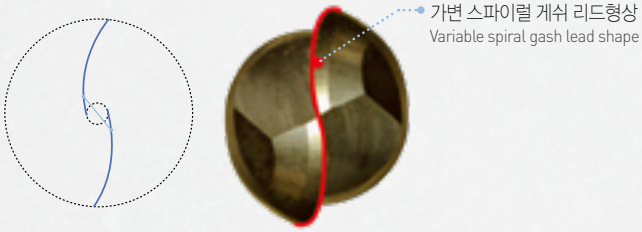
- TiSiN기반의 다층 코팅 초경엔드밀 입니다.
- 이 코팅은 산화와 마모 및 열전달로 부터 절삭날의 날 끝을 보호하도록 설계되었습니다.
- HY-MAX 시리즈는 낮은 윤활과 건식조건에서 단단하고 질긴 재료의 고속가공용으로 개발되었습니다.

HY-MAX Series

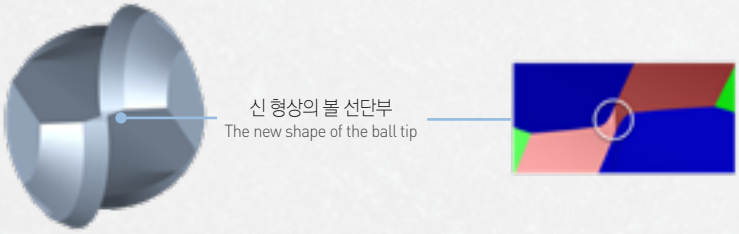
- The TiSiN based multi-layer coated carbide end mill
- This coating is designed to protect the cutting edge from heat transfer, oxidation and abrasion.
- HY-MAX series was developed for high speed machining of the hardest and toughest materials under low lubrication and dry conditions.

HY-MAX Series BALL

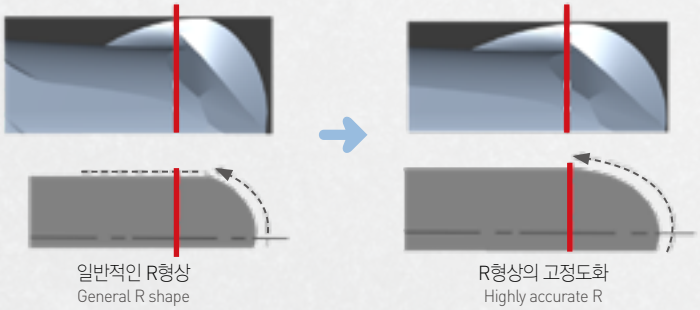
1 가공시 발생하는 진동을 억제하는 가변 스파이럴 게쉬 리드 형상을 적용하여 고품질의 가공면을 실현했습니다.
High-quality machining surface is realized by applying a variable spiral gash lead shape that suppresses vibration



2 절삭부하를 낮추고 치핑을 억제하는 신 형상의 볼 선단부
The new shape of the ball tip lowers the cutting load and suppresses chipping

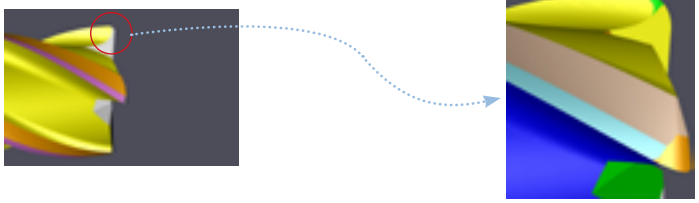


3 볼 Tip에서 외주날까지 플랭크면의 연결부위가 고정도인 R형상
High-precision R shape on the flank face from R tip to peripheral cutting edge



HY-MAX Series RADIUS

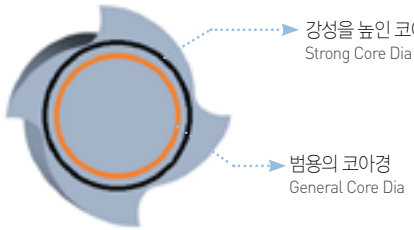
1 코너R 3차원 설계
Corner R 3D design



3D 설계로 고정밀 R정도를 구현하고, 절삭성을 향상시키며 황삭가공에서도 코너 R의 치핑을 방지

3D design realizes high precision R accuracy, improves machinability and prevents chipping of corner R even in roughing

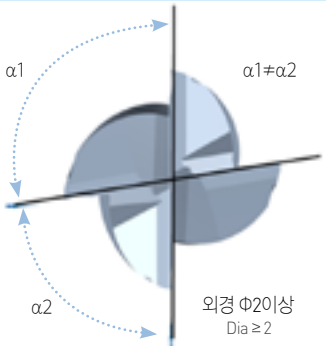
2 고속, 고경도에 적합한 코아경 적용으로 공구의 강성을 높임
Increased tool rigidity by applying a core dia suitable for high speed and hardened steel machining



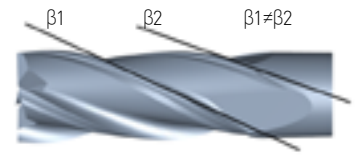
HY-MAX series RADIUS / SQUARE

1 멀티헬릭스, 부등분할의 설계로 가공시 발생하는 진동을 억제하고 고능률 가공을 실현합니다 (4날 타입)
Unequal spacing of teeth and Multi Helix suppresses vibration and realizes high efficiency machining (4-Flute Type)

부등분할 Unequal Spacing Teeth

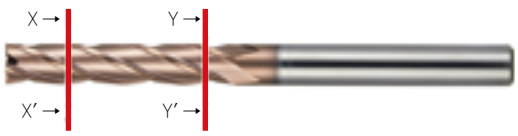


멀티헬릭스 Multi Helix



외경 Φ20이상
Dia ≥ 2

2 긴 날장 타입의 스퀘어 엔드밀에 코어 테이퍼를 적용하여 공구강성을 높여 고효율 가공을 실현 (4날 Type)
High rigidity geometry with a strong core at the end part realized high efficient machining (4-Flute Type)



깊은 홈
우수한 칩 배출성
Improved chip removal ability
(X-X')

얕은 홈
높은 강성
Shallow Flute
High rigidity
(Y-Y')

WIDE-MAX 시리즈

- 진동제어 AlCrN-Based 코팅 초경엔드밀
- AlCrN-base층에 Si층을 더하여 내마모성이 우수한 고경도를 나타냅니다.
- 공구 모재와의 밀착성이 우수한 내열 코팅 입니다.
- 열 충격 안정성이 향상되어 습식 및 건식가공에서 모두 공구 수명이 길어졌습니다.
- 용착이 발생하기 쉬운 플라스틱 사출금형 등과 같은 절삭 재료에 대해 우수한 절삭 수명을 보여줍니다.

WIDE-MAX Series

- Anti-Vibration AlCrN-Based coated carbide end mill.
- Add Si to the AlCrN-based layer to indicate a high hardness with good wear resistance.
- A heat-resistant coating with good adhesion to the tool base material.
- Improved thermal shock stability results in longer tool life for both wet and dry cutting.
- Excellent cutting life for cutting materials such as plastic injection molds, which are prone to tool seizure.

WIDE-MAX Series BALL

1 가공시 발생하는 진동을 억제하는 가변 스파이럴 게쉬 리드 형상을 적용하여 고품질의 가공면을 실현했습니다.
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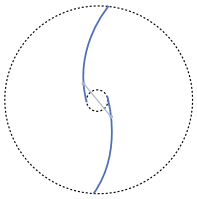
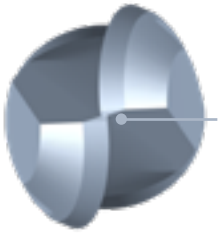
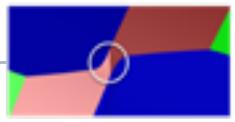


가변 스파이럴 게쉬 리드형상
Variable spiral gash lead shape

2 절삭부하를 낮추고 치핑을 억제하는 신 형상의 볼 선단부
The new shape of the ball tip lowers the cutting load and suppresses chipping



신 형상의 볼 선단부
The new shape of the ball tip



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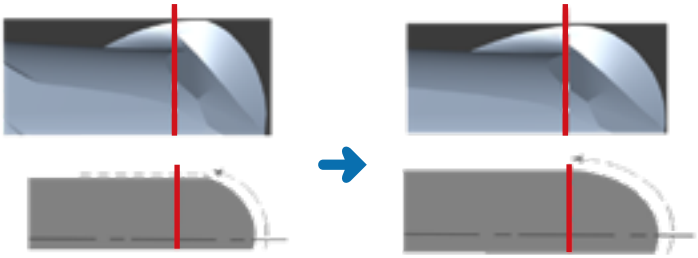


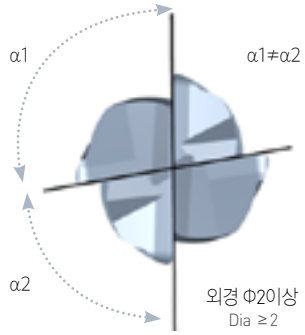
일반적인 R형상
General R shape

R형상의 고정도화
Highly accurate R

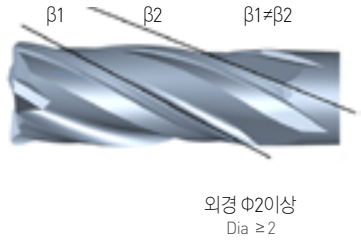
WIDE-MAX Series RADIUS / SQUARE

1 멀티헬릭스, 부등분할의 설계로 가공시 발생하는 진동을 억제하고 고능률 가공을 실현합니다. (4날 타입)
Unequal spacing of teeth and Multi Helix suppresses vibration and realizes high efficiency machining. (4-Flute Type)

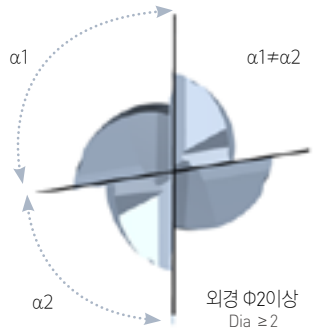
부등분할 Unequal Spacing Teeth



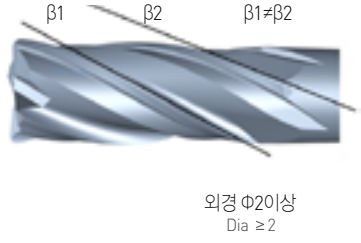
멀티헬릭스 Multi Helix



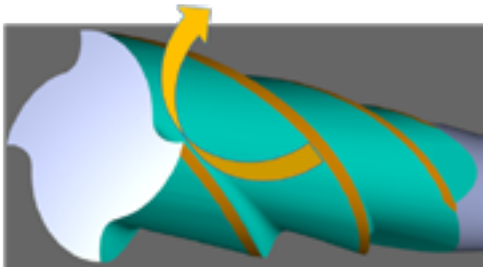
부등분할 Unequal Spacing Teeth



멀티헬릭스 Multi Helix



2 새로운 홈 형상 적용으로 강성이 향상되고, 칩 배출도 우수합니다.
The rigidity is also improved by applying the new flute form geometry, and the chip evacuation is excellent



CO-MAX 시리즈

- 동전극용 DLC코팅 초경엔드밀
- 동전극 가공시 장수명 및 고품질 실현
- 높은 경도와 낮은 마찰계수를 제공합니다.
- 동합금 또는 비철금속에 우수한 가공면을 제공합니다.
- 예리하면서 정도가 높은 인선부 채택
- 우수한 볼 R 정도

CO-MAX Series

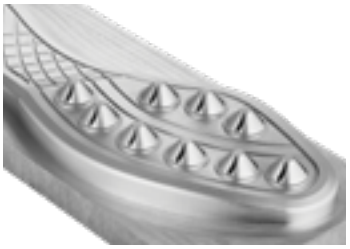
- DLC coated carbide end mill for copper electrode.
- Realization of long life and high quality in copper electrode machining.
- High hardness and low coefficient of friction.
- Excellent machining surface for copper alloys or non-ferrous metals.
- High accuracy cutting edge with sharpness.
- Superior ball R precision.

1 우수한 가공면 정도!
Excellent cutting surface accuracy

2 정밀한 공구 외경관리!
Precise diameter management

3 버 억제 및 고정도 가공 실현!
Burr suppression and High precision

4 엔지니어링 플라스틱, 알루미늄 등 다양한 비철금속에도 적용!
Applicable to various non-ferrous metals such as engineering plastics and aluminum



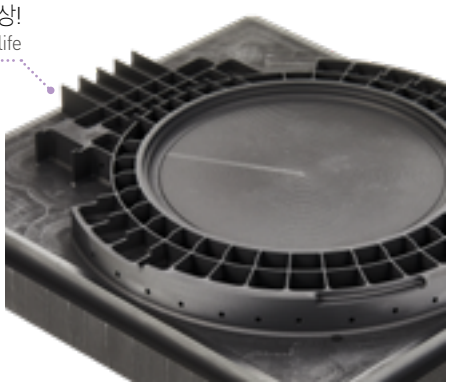
DIA-MAX 시리즈

- 순수한 다이아몬드 특성을 가지고 있는 다결정 다이아몬드 코팅입니다.
- 흑연 및 비철금속 가공시 장수명 및 고품질 실현.
- 결정구조 큐빅 SP^3.

DIA-MAX Series

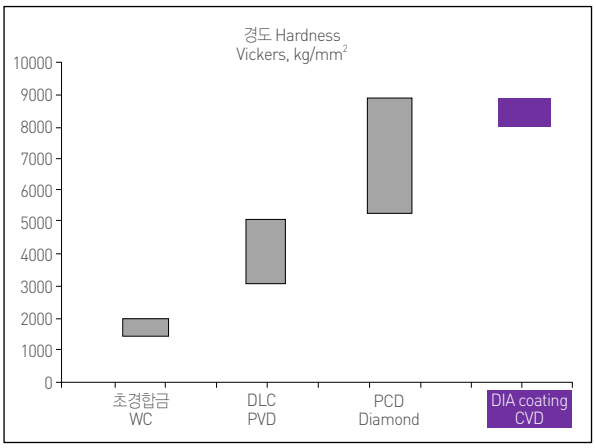
- A polycrystalline diamond coating that has the characteristics of pure diamond.
- Realization of long life when processing graphite and non-ferrous metals.
- Crystal structure Cubic SP^3.

1 고정도 가공과 우수한 공구수명 향상!
High precision machining and excellent long tool life

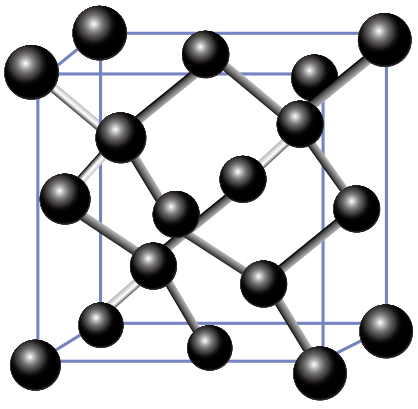


2 전체 날 길이의 균일한 치수 정밀도 실현!
Uniform dimensional accuracy over the entire length

3 최적화 된 코팅 밀착력!
Optimized coating adhesion



Diamond Coating 경도 비교표
Diamond Coating Hardness Comparision Table



다이아몬드 결정구조 cubic SP^3
Diamond Crystal structure Cubic SP^3

코팅의 특징 Features of Coating

대표 시리즈 Main Series	코팅 Coating	색상 Color	경도(HV) Hardness (HV)	적용 온도 (°C) Service temp (°C)	마찰계수 (vs.STEEL) Friction vs. steel	마찰계수 (vs.S45C) Friction vs. S45C	코팅막 두께 (μm) Coating Thickness (μm)	권장분야 Recommended Parts
HY-MAX	TiSiN	구리색 Copper	3,500~3,600 (HV0.05)	1100°C	0.4	0.8	0.5~3.5	주철, 프리하든강, 열처리강(~60HRC) Cast Iron, Pre-hardened Steels, Hardened Steels(~60HRC)
WIDE-MAX	AlCrN Based	회색 Grey	3,400 (HV0.02)	1080°C	0.4	0.5	0.5~3.5	연강에서 고경도강(~52HRC), 탄소강, 스테인레스강 Mild Steel to Hardened Steel(~52HRC), Carbon Steel, SUS(INOX)
CO-MAX	DLC / PVD	무지개색-검정 Rainbow-Black	5,000~6,000 (HV0.05)	500°C	< 0.1		0.3~1	동, 알루미늄 합금, 복합재료, 엔지니어링 플라스틱 Copper, Aluminum Alloy, Composite Material, Engineering Plastic
DIA-MAX	DIAMOND CVD	진한회색 Dark Grey	9,000~10,000 (HV0.05)	600°C	< 0.1		5~10	흑연, 동, 복합재료, 강화플라스틱 Graphite, Copper, Composite Material, Reinforced Plastic

TiSiN

- 결정질 TiN매트릭스에 비정질 Si3N4 로 둘러싸여진 nano-composite의 다층구조 코팅입니다.
- 이 코팅은 산화와 마모 및 열전달로 부터 절삭날의 날 끝을 보호하도록 설계되었습니다.
- 이 코팅은 절삭날 끝의 온도가 1100°C까지 가능하도록 설계되었습니다.
- TiSiN기반의 다층 코팅은 낮은 윤활과 건식조건에서 가장 단단한 재료의 고속가공용으로 개발되었습니다.

- A multi-layer coating with a nano-composite outer layer with Si3N4 nano-crystallites in a crystalline TiN matrix.
- This coating is designed to protect the cutting edge from heat transfer, oxidation and abrasion.
- This coating is designed to allow a cutting edge temperature of up to 1100°C.
- The TiSiN based multi-layer coating was developed for high speed machining of the hardest and toughest materials under low lubrication and dry conditions.

AlCrN-Based

- AlCrN-base층에 Si층을 더하여 내마모성이 우수한 고경도를 나타냅니다.
- 공구 모재와의 밀착성이 우수한 내열 코팅 입니다.
- 열 충격 안정성이 향상되어 습식 및 건식가공에서 모두 공구 수명이 길어졌습니다.
- AlCrN-Based 코팅은 용착이 발생하기 쉬운 플라스틱 사출금형 등과 같은 절삭 재료에 대해 우수한 절삭 수명을 보여줍니다.

- Add Si to the AlCrN-based layer to indicate a high hardness with good wear resistance.
- A heat-resistant coating with good adhesion to the tool base material.
- Improved thermal shock stability results in longer tool life for both wet and dry cutting.
- The AlCrN-Based coating shows the excellent cutting life for cutting materials such as plastic molds, etc. where tool deposition often occurs.

DLC

- 수소를 포함하지 않은 DLC 코팅입니다.
- 얇고 매우 단단한 코팅으로써 절삭날 끝의 예리함을 최대한으로 유지하도록 설계되었습니다.
- 매우 낮은 마찰계수는 광범위한 점착성 소재를 가공하는 데 있어서 탁월한 성능을 나타냅니다.

- Non-hydrogenated DLC Coating
- The thin, extremely hard coating is designed to maintain maximum cutting edge sharpness.
- The very low coefficient of friction shows excellent performance in machining a wide range of adhesive materials.

DIAMOND

- 순수한 다이아몬드 특성을 가지고 있는 다결정 다이아몬드 코팅입니다.
- 다이아몬드 코팅의 높은 열 전도성은 빠르게 열을 방출합니다. 이는 탄소와 유리섬유 강화 플라스틱 같은 온도에 민감한 재료를 가공 시 속도를 높일 수 있습니다.
- 매우 낮은 마찰계수는 광범위한 점착성 소재를 가공하는 데 있어서 탁월한 성능을 나타냅니다.
- 또한 높은 인장강도와 압축강도를 가집니다.

- A polycrystalline diamond coating that has the characteristics of pure diamond.
- The diamond coating's high heat conductivity makes for fast heat dissipation. When processing temperature-sensitive materials such as carbon and glass-fiber reinforced plastics, and allows higher processing speed during machining.
- The very low coefficient of friction shows excellent performance in machining a wide range of adhesive materials.
- It also has the highest tensile and compressive strength

아이콘의 설명 Meaning of icons

공구재질 Tool Materials

- CARBIDE ULTRA — 초미립자 초경합금 / ULTRA Micro Grain Carbide
- CARBIDE MG — 미립자 초경합금 / Micro Grain Carbide
- CARBIDE Fine — 초경합금 / Fine Grain Carbide

비틀림각 Helix Angle

- 0° Helix — 0°
- 30° Helix — 30°
- 45° Helix — 45°
- Multi Helix — Multi

코팅 Coating

- TiSiN — TiSiN 코팅 / TiSiN Coating
- AlCrN Based — AlCrN Based 코팅 / AlCrN Base Coating
- DLC PVD — DLC 코팅 / DLC Coating
- DIA CVD — DIAMOND 코팅 / DIAMOND Coating

공차 Tolerance

- R — 볼R공차 / Tolerance of Ball Radius
- CR — 코너반경 공차 / Tolerance of Corner Radius
- D — 외경공차 / Tolerance of Diameter
- Shank — 생크공차 / Tolerance of Shank Dia

날수 Number of Flutes

- 2 — 2날 / 2 Flute
- 3 — 3날 / 3 Flute
- 4 — 4날 / 4 Flute

가공 용도 Application

- 3D — 곡면 가공 / 3D Milling
- Slot — 홈 가공 / Slot Milling
- Side — 측면가공 / Side Milling
- Face — 평면가공 / Face Milling
- Plunge — 플런지가공 / Plunge
- C — C면취가공 / C Chamfering

주요 제품 모델 명칭 설명 Main Product Model Naming Guide

모델명 Model	약칭 Abbreviation	R(리브), 테이퍼(T), 테이퍼넥(TN) R(Rib), Taper(T), Taper Neck(TN)	분류 Type	길이유형 Length Type	날수 Flutes	헬릭스 각도 Helix Angle	인선경 / 선단경 Dia / Front Dia	코너R Corner R	각도 Angle	유효장 Effective Length	날장 Length of cut	전장 Overall Length	생크경 Shank Dia
HMRB230-03020-060-S06	HM (HY-MAX)	R (Rib)	B (Ball)		2	30	030 (Dia 3)			20		060 (60L)	S06 (Shank6)
HMB230-10018-100-S10	HM		B (Ball)		2	30	100 (Dia 10)				18	100 (100L)	S10 (Shank10)
HMRR230-060R05-20-060-S06	HM	R (Rib)	R (Radius)		2	30	060 (Dia 6)	R05 (R0.5)		20		060 (60L)	S06 (Shank6)
HMR230-100R10-100-S10	HM		R (Radius)		2	30	100 (Dia 10)	R10 (R1)				100 (100L)	S10 (Shank10)
HMRR430-060R05-20-060-S06	HM	R (Rib)	R (Radius)		4	30	060 (Dia 6)	R05 (R0.5)		20		060 (60L)	S06 (Shank6)
HMR430-100R10-100-S10	HM		R (Radius)		4	30	100 (Dia 10)	R10 (R1)				100 (100L)	S10 (Shank10)
HMRE230-03020-060-S06	HM	R (Rib)	E (Square)		2	30	030 (Dia 3)			20		060 (60L)	S06 (Shank6)
HME230-10025-070-S10	HM		E (Square)		2	30	100 (Dia 10)				25	070 (70L)	S10 (Shank10)
HMRE430-03020-060-S06	HM	R (Rib)	E (Square)		4	30	030 (Dia 3)			20		060 (60L)	S06 (Shank6)
HME430-10025-070-S10	HM		E (Square)		4	30	100 (Dia 10)				25	070 (70L)	S10 (Shank10)
HMEL430-06020-070-S06	HM		E (Square)	L (Long Flute)	4	30	060 (Dia 6)				20	070 (70L)	S06 (Shank6)
HMCHC200-000T450-050-S04	HM		CHC (Chamfer Cutter)		2	00	000 (Front Dia 0)		T450 (45°)			050 (50L)	S04 (Shank4)
WMRB230-03020-060-S06	WM (WIDE-MAX)	R (Rib)	B (Ball)		2	30	030 (Dia 3)			20		060 (60L)	S06 (Shank6)
WMB230-10018-100-S10	WM		B (Ball)		2	30	100 (Dia 10)				18	100 (100L)	S10 (Shank10)
WMRR430-060R05-20-060-S06	WM	R (Rib)	R (Radius)		4	30	060 (Dia 6)	R05 (R0.5)		20		060 (60L)	S06 (Shank6)
WMR430-100R10-100-S10	WM		R (Radius)		4	30	100 (Dia 10)	R10 (R1)				100 (100L)	S10 (Shank10)
CMRB230-03020-060-S06	CM (CO-MAX)	R (Rib)	B (Ball)		2	30	030 (Dia 3)			20		060 (60L)	S06 (Shank6)
CMRR230-060R05-20-060-S06	CM	R (Rib)	R (Radius)		2	30	060 (Dia 6)	R05 (R0.5)		20		060 (60L)	S06 (Shank6)
CMRE230-03020-060-S06	CM	R (Rib)	E (Square)		2	30	030 (Dia 3)			20		060 (60L)	S06 (Shank6)
CME230-10025-070-S10	CM		E (Square)		2	30	100 (Dia 10)				25	070 (70L)	S10 (Shank10)
ALE345-10025-070-S10	AL (Aluminium)		E (Square)		3	45	100 (Dia 10)				25	070 (70L)	S10 (Shank10)
DMRB230-03030-100-S04	DM (DIA-MAX)	R (Rib)	B (Ball)		2	30	030 (Dia 3)			30		100 (100L)	S04 (Shank4)
DMRR430-060R05-30-105-S06	DM	R (Rib)	R (Radius)		4	30	060 (Dia 6)	R05 (R0.5)		30		105 (105L)	S06 (Shank6)
DMRE230-03030-080-S04	DM	R (Rib)	E (Square)		2	30	030 (Dia 3)			30		080 (80L)	S04 (Shank4)
DME430-06020-070-S06	DM		E (Square)		4	30	060 (Dia 6)				20	070 (70L)	S06 (Shank6)
DMRE430-06030-105-S06	DM	R (Rib)	E (Square)		4	30	060 (Dia 6)			30		105 (105L)	S06 (Shank6)

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HY-MAX

WIDE-MAX

CO-MAX

ALU-MAX

DIA MAX

FORMED TOOL

CARBIDE END MILL

GENERAL CATALOG

초경 엔드밀 종합 카탈로그 Vol.3

주식회사 유엠
UM CO., LTD.

초경엔드밀 시리즈별 색인 Carbide End Mill Series Index

사양 Specification						P
사진 Photo	분류 Type	헬릭스 각 Helix Angle	모델 Model	사이즈 Size	페이지 Page	탄소강 Carbon Steels S45C/S50C ~800 N/mm²

HY-MAX End Mill Series

볼엔드밀 Ball End Mill						
	리브 볼 엔드밀 2날 Rib Ball End Mill 2-Flute	30°	HMRB230	0.1~12	22p	○
	볼 엔드밀 2날 Ball End Mill 2-Flute	30°	HMB230	0.3~16	26p	○
래디우스 엔드밀 Radius End Mill						
	리브 래디우스 엔드밀 2날 Rib Radius End Mill 2-Flute	30°	HMRR230	0.2~12	28p	○
	래디우스 엔드밀 2날 Radius End Mill 2-Flute	30°	HMR230	0.2~12	34p	○
	리브 래디우스 엔드밀 4날 Rib Radius End Mill 4-Flute	30°/Multi	HMRR430	0.6~12	37p	○
	래디우스 엔드밀 4날 Radius End Mill 4-Flute	30°/Multi	HMR430	0.6~12	42p	○
스퀘어 엔드밀 Square End Mill						
	리브 스퀘어 엔드밀 2날 Rib Square End Mill 2-Flute	30°	HMRE230	0.1~12	45p	○
	스퀘어 엔드밀 2날 Square End Mill 2-Flute	30°	HME230	0.1~12	48p	○
	리브 스퀘어 엔드밀 4날 Rib Square End Mill 4-Flute	30°/Multi	HMRE430	1~12	49p	○
	스퀘어 엔드밀 4날 Square End Mill 4-Flute	30°/Multi	HME430	1~16	51p	○
	긴 날장 스퀘어 엔드밀 4날 Long Length Square End Mill 4-Flute	30°/Multi	HMEL430	6~16	52p	○

적용 피삭재 (◎는 최적 ○는 가능) **Applicable Work Material** (◎Most Suitable ○ Applicable)

피삭재 Work Material									
		H			M	S	N		
합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄 합금 Aluminum Alloys	흑연 Graphite
SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
피삭재 Work Material									
◎	◎	◎	◎	○	○	○	○		
◎	◎	◎	◎	○	○	○	○		
피삭재 Work Material									
◎	◎	◎	○		○	○	○		
◎	◎	◎	○		○	○	○		
◎	◎	◎	◎	○	○	○	○		
◎	◎	◎	◎	○	○	○	○		
피삭재 Work Material									
◎	◎	○			○	○	○		
◎	◎	○			○	○	○		
◎	◎	◎			○	○	○		
◎	◎	◎			○	○	○		
◎	◎	○							

초경엔드밀 시리즈별 색인 Carbide End Mill Series Index

사양 Specification						P
사진 Photo	분류 Type	헬릭스 각 Helix Angle	모델 Model	사이즈 Size	페이지 Page	탄소강 Carbon Steels S45C/S50C ~800 N/mm²

WIDE-MAX End Mill Series

볼엔드밀 Ball End Mill						
	리브 볼 엔드밀 2날 Rib Ball End Mill 2-Flute	30°	WMRB230	0.1~6	53p	◎
	볼 엔드밀 2날 Ball End Mill 2-Flute	30°	WMB230	0.3~16	56p	◎
래디우스 엔드밀 Radius End Mill						
	리브 래디우스 엔드밀 4날 Rib Radius End Mill 4-Flute	30°/Multi	WMRR430	1~12	58p	◎
	래디우스 엔드밀 4날 Radius End Mill 4-Flute	30°/Multi	WMR430	1~12	63p	◎
스퀘어 엔드밀 Square End Mill						
	리브 스퀘어 엔드밀 4날 Rib Square End Mill 4-Flute	30°/Multi	WMRE430	1~12	66p	◎
	스퀘어 엔드밀 4날 Square End Mill 4-Flute	30°/Multi	WME430	1~16	68p	◎

CO-MAX End Mill Series

볼엔드밀 Ball End Mill						
	리브 볼 엔드밀 2날 Rib Ball End Mill 2-Flute	30°	CMRB230	0.1~6	69p	
래디우스 엔드밀 Radius End Mill						
	리브 래디우스 엔드밀 2날 Rib Radius End Mill 2-Flute	30°	CMRR230	0.2~12	71p	
스퀘어 엔드밀 Square End Mill						
	리브 스퀘어 엔드밀 2날 Rib Square End Mill 2-Flute	30°	CMRE230	0.1~4	74p	
	스퀘어 엔드밀 2날 Square End Mill 2-Flute	30°	CME230	0.1/1~12	76p	

적용 피삭재 (◎는 최적 ○는 가능) **Applicable Work Material** (◎Most Suitable ○ Applicable)

피삭재 Work Material									
		H			M	S	N		
합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄 합금 Aluminum Alloys	흑연 Graphite
SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
피삭재 Work Material									
◎	◎	○			◎	○	○	○	
◎	◎	○			◎	○	○	○	
피삭재 Work Material									
◎	◎	○			◎	○	○	○	
◎	◎	○			◎	○	○	○	
피삭재 Work Material									
◎	◎	○			◎	○	○	○	
◎	◎	○			◎	○	○	○	
피삭재 Work Material									
							◎	◎	○
피삭재 Work Material									
							◎	◎	○
피삭재 Work Material									
							◎	○	○
							◎	○	○

초경엔드밀 시리즈별 색인 Carbide End Mill Series Index

사양 Specification						
사진 Photo	분류 Type	헬릭스 각 Helix Angle	모델 Model	사이즈 Size	페이지 Page	P 탄소강 Carbon Steels S45C/S50C ~800 N/mm²

ALU-MAX End Mill Series

스퀘어 엔드밀 Square End Mill						
	스퀘어 엔드밀 3날 Square End Mill 3-Flute	45°	ALE345	1~16	77p	

DIA-MAX End Mill Series

볼엔드밀 Ball End Mill						
	리브 볼 엔드밀 2날 Rib Ball End Mill 2-Flute	30°	DMRB230	0.2~12	78p	
래디우스 엔드밀 Radius End Mill						
	리브 래디우스 엔드밀 4날 Rib Radius End Mill 4-Flute	30°	DMRR430	2~12	80p	
스퀘어 엔드밀 Square End Mill						
	리브 스퀘어 엔드밀 2날 Rib Square End Mill 2-Flute	30°	DMRE230	0.2~4	81p	
	리브 스퀘어 엔드밀 4날 Rib Square End Mill 4-Flute	30°	DMRE430	6~12	83p	
	스퀘어 엔드밀 4날 Square End Mill 4-Flute	30°	DME430	1~12	84p	

Formed Tool Series

C면취 C-Chamfer						
	면취 커터 2날 Chamfer Cutter 2-Flute	0°	CHC200	0	85p	◎
	면취 커터 2날 Chamfer Cutter 2-Flute	0°	HMCHC200	0	85p	◎

적용 피삭재 (◎는 최적 ○는 가능) **Applicable Work Material** (◎Most Suitable ○ Applicable)

피삭재 Work Material									
		H			M	S	N		
합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄 합금 Aluminum Alloys	흑연 Graphite
SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
							○	◎	

피삭재 Work Material									
							○		◎

피삭재 Work Material									
							○		◎

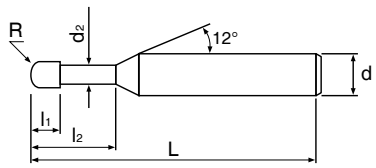
피삭재 Work Material									
							○		◎
							○		◎
							○		◎

피삭재 Work Material									
◎	◎	○			○	○	○	○	○
◎	◎	○			○	○	○	○	○

HMRB230

HY-MAX 리브 볼 엔드밀 2날 헬릭스30°

HY-MAX Rib Ball End Mill 2-Flute Helix30°



*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

CARBIDE ULTRA | TiSiN | 2 | 30° Helix | R ±0.005 (R < 3) | R ±0.01 (R≥3) | D 0/-0.008 (D < 6) | D 0/-0.015 (D≥6) | Shank h5 | 3D

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
○	◎	◎	◎	◎	○	○	○	○		

단위(mm)/Unit(mm)

모델번호 Model No.	볼반경 Radius of Ball Nose	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	R	l_2	l_1	d_2	L	d	
HMRB230-001003-045-S04	R0.05	0.3	0.1	0.085	45	4	
HMRB230-001005-045-S04	R0.05	0.5	0.1	0.085	45	4	
HMRB230-0015005-045-S04	R0.075	0.5	0.15	0.13	45	4	
HMRB230-001501-045-S04	R0.075	1	0.15	0.13	45	4	
HMRB230-002005-045-S04	R0.1	0.5	0.2	0.18	45	4	
HMRB230-00201-045-S04	R0.1	1	0.2	0.18	45	4	
HMRB230-002015-045-S04	R0.1	1.5	0.2	0.18	45	4	
HMRB230-00202-045-S04	R0.1	2	0.2	0.18	45	4	
HMRB230-003005-045-S04	R0.15	0.5	0.3	0.27	45	4	
HMRB230-00301-045-S04	R0.15	1	0.3	0.27	45	4	
HMRB230-003015-045-S04	R0.15	1.5	0.3	0.27	45	4	
HMRB230-00302-045-S04	R0.15	2	0.3	0.27	45	4	
HMRB230-00303-045-S04	R0.15	3	0.3	0.27	45	4	
HMRB230-00401-045-S04	R0.2	1	0.4	0.37	45	4	
HMRB230-004015-045-S04	R0.2	1.5	0.4	0.37	45	4	
HMRB230-00402-045-S04	R0.2	2	0.4	0.37	45	4	
HMRB230-00403-045-S04	R0.2	3	0.4	0.37	45	4	
HMRB230-00404-045-S04	R0.2	4	0.4	0.37	45	4	
HMRB230-00405-045-S04	R0.2	5	0.4	0.37	45	4	
HMRB230-00406-045-S04	R0.2	6	0.4	0.37	45	4	
HMRB230-00501-045-S04	R0.25	1	0.5	0.46	45	4	
HMRB230-00502-045-S04	R0.25	2	0.5	0.46	45	4	
HMRB230-00503-045-S04	R0.25	3	0.5	0.46	45	4	
HMRB230-00504-045-S04	R0.25	4	0.5	0.46	45	4	
HMRB230-00505-045-S04	R0.25	5	0.5	0.46	45	4	
HMRB230-00506-045-S04	R0.25	6	0.5	0.46	45	4	

HMRB230

모델번호 Model No.	볼반경 Radius of Ball Nose	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	R	l_2	l_1	d_2	L	d	
HMRB230-00508-045-S04	R0.25	8	0.5	0.46	45	4	
HMRB230-00510-045-S04	R0.25	10	0.5	0.46	45	4	
HMRB230-00601-045-S04	R0.3	1	0.6	0.56	45	4	
HMRB230-00602-045-S04	R0.3	2	0.6	0.56	45	4	
HMRB230-00603-045-S04	R0.3	3	0.6	0.56	45	4	
HMRB230-00604-045-S04	R0.3	4	0.6	0.56	45	4	
HMRB230-00605-045-S04	R0.3	5	0.6	0.56	45	4	
HMRB230-00606-045-S04	R0.3	6	0.6	0.56	45	4	
NEW HMRB230-00607-045-S04	R0.3	7	0.6	0.56	45	4	
HMRB230-00608-045-S04	R0.3	8	0.6	0.56	45	4	
HMRB230-00610-045-S04	R0.3	10	0.6	0.56	45	4	
HMRB230-00612-045-S04	R0.3	12	0.6	0.56	45	4	
HMRB230-00702-045-S04	R0.35	2	0.7	0.66	45	4	
NEW HMRB230-00703-045-S04	R0.35	3	0.7	0.66	45	4	
HMRB230-00704-045-S04	R0.35	4	0.7	0.66	45	4	
NEW HMRB230-00705-045-S04	R0.35	5	0.7	0.66	45	4	
HMRB230-00706-045-S04	R0.35	6	0.7	0.66	45	4	
NEW HMRB230-00707-045-S04	R0.35	7	0.7	0.66	45	4	
HMRB230-00708-045-S04	R0.35	8	0.7	0.66	45	4	
HMRB230-00802-045-S04	R0.4	2	0.8	0.76	45	4	
HMRB230-00803-045-S04	R0.4	3	0.8	0.76	45	4	
HMRB230-00804-045-S04	R0.4	4	0.8	0.76	45	4	
HMRB230-00805-045-S04	R0.4	5	0.8	0.76	45	4	
HMRB230-00806-045-S04	R0.4	6	0.8	0.76	45	4	
NEW HMRB230-00807-045-S04	R0.4	7	0.8	0.76	45	4	
HMRB230-00808-045-S04	R0.4	8	0.8	0.76	45	4	
HMRB230-00810-045-S04	R0.4	10	0.8	0.76	45	4	
HMRB230-00812-045-S04	R0.4	12	0.8	0.76	45	4	
NEW HMRB230-01002-045-S04	R0.5	2	1	0.96	45	4	
HMRB230-010025-050-S06	R0.5	2.5	1	0.96	50	6	
HMRB230-01003-045-S04	R0.5	3	1	0.96	45	4	
HMRB230-01004-045-S04	R0.5	4	1	0.96	45	4	
NEW HMRB230-01004-050-S06	R0.5	4	1	0.96	50	6	
HMRB230-01005-045-S04	R0.5	5	1	0.96	45	4	
HMRB230-01006-045-S04	R0.5	6	1	0.96	45	4	
NEW HMRB230-01006-050-S06	R0.5	6	1	0.96	50	6	
HMRB230-01008-045-S04	R0.5	8	1	0.96	45	4	
NEW HMRB230-01008-050-S06	R0.5	8	1	0.96	50	6	
HMRB230-01010-045-S04	R0.5	10	1	0.96	45	4	
NEW HMRB230-01010-050-S06	R0.5	10	1	0.96	50	6	
HMRB230-01012-045-S04	R0.5	12	1	0.96	45	4	
HMRB230-01014-050-S04	R0.5	14	1	0.96	50	4	
HMRB230-01016-050-S04	R0.5	16	1	0.96	50	4	
HMRB230-01020-060-S04	R0.5	20	1	0.96	60	4	
HMRB230-01025-070-S04	R0.5	25	1	0.96	70	4	
HMRB230-01204-045-S04	R0.6	4	1.2	1.15	45	4	
HMRB230-01206-045-S04	R0.6	6	1.2	1.15	45	4	
HMRB230-01208-045-S04	R0.6	8	1.2	1.15	45	4	

HMRB230

모델번호 Model No.	볼반경 Radius of Ball Nose	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	R	l_2	l_1	d_2	L	d	
HMRB230-01210-045-S04	R0.6	10	1.2	1.15	45	4	
HMRB230-01212-045-S04	R0.6	12	1.2	1.15	45	4	
HMRB230-01214-050-S04	R0.6	14	1.2	1.15	50	4	
HMRB230-01216-050-S04	R0.6	16	1.2	1.15	50	4	
HMRB230-01220-060-S04	R0.6	20	1.2	1.15	60	4	
HMRB230-01504-045-S04	R0.75	4	1.5	1.45	45	4	
HMRB230-01504-050-S06	R0.75	4	1.5	1.45	50	6	
HMRB230-01506-045-S04	R0.75	6	1.5	1.45	45	4	
NEW HMRB230-01506-050-S06	R0.75	6	1.5	1.45	50	6	
HMRB230-01508-045-S04	R0.75	8	1.5	1.45	45	4	
NEW HMRB230-01508-050-S06	R0.75	8	1.5	1.45	50	6	
HMRB230-01510-045-S04	R0.75	10	1.5	1.45	45	4	
NEW HMRB230-01510-050-S06	R0.75	10	1.5	1.45	50	6	
HMRB230-01512-045-S04	R0.75	12	1.5	1.45	45	4	
NEW HMRB230-01512-050-S06	R0.75	12	1.5	1.45	50	6	
HMRB230-01514-050-S04	R0.75	14	1.5	1.45	50	4	
HMRB230-01516-050-S04	R0.75	16	1.5	1.45	50	4	
HMRB230-01520-060-S04	R0.75	20	1.5	1.45	60	4	
HMRB230-02004-045-S04	R1	4	2	1.9	45	4	
HMRB230-02006-045-S04	R1	6	2	1.9	45	4	
HMRB230-02006-050-S06	R1	6	2	1.9	50	6	
HMRB230-02008-045-S04	R1	8	2	1.9	45	4	
NEW HMRB230-02008-050-S06	R1	8	2	1.9	50	6	
HMRB230-02010-045-S04	R1	10	2	1.9	45	4	
NEW HMRB230-02010-050-S06	R1	10	2	1.9	50	6	
HMRB230-02012-045-S04	R1	12	2	1.9	45	4	
NEW HMRB230-02012-050-S06	R1	12	2	1.9	50	6	
HMRB230-02014-050-S04	R1	14	2	1.9	50	4	
HMRB230-02016-050-S04	R1	16	2	1.9	50	4	
HMRB230-02020-060-S04	R1	20	2	1.9	60	4	
HMRB230-02025-070-S04	R1	25	2	1.9	70	4	
HMRB230-02030-070-S04	R1	30	2	1.9	70	4	
HMRB230-02035-080-S04	R1	35	2	1.9	80	4	
HMRB230-02040-080-S04	R1	40	2	1.9	80	4	
HMRB230-02506-045-S04	R1.25	6	2.5	2.35	45	4	
HMRB230-02508-045-S04	R1.25	8	2.5	2.35	45	4	
HMRB230-02510-045-S04	R1.25	10	2.5	2.35	45	4	
HMRB230-02512-045-S04	R1.25	12	2.5	2.35	45	4	
HMRB230-02516-050-S04	R1.25	16	2.5	2.35	50	4	
HMRB230-02520-060-S04	R1.25	20	2.5	2.35	60	4	
HMRB230-02525-070-S04	R1.25	25	2.5	2.35	70	4	
HMRB230-03008-050-S06	R1.5	8	3	2.85	50	6	
HMRB230-03010-050-S06	R1.5	10	3	2.85	50	6	
HMRB230-03012-050-S06	R1.5	12	3	2.85	50	6	
HMRB230-03014-060-S06	R1.5	14	3	2.85	60	6	
HMRB230-03016-060-S06	R1.5	16	3	2.85	60	6	
HMRB230-03020-060-S06	R1.5	20	3	2.85	60	6	
HMRB230-03025-070-S06	R1.5	25	3	2.85	70	6	

HMRB230

모델번호 Model No.	볼반경 Radius of Ball Nose	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	R	l_2	l_1	d_2	L	d	
HMRB230-03030-070-S06	R1.5	30	3	2.85	70	6	
HMRB230-03035-080-S06	R1.5	35	3	2.85	80	6	
HMRB230-03040-080-S06	R1.5	40	3	2.85	80	6	
HMRB230-04010-050-S06	R2	10	4	3.85	50	6	
HMRB230-04012-050-S06	R2	12	4	3.85	50	6	
HMRB230-04016-060-S06	R2	16	4	3.85	60	6	
HMRB230-04020-060-S06	R2	20	4	3.85	60	6	
HMRB230-04025-070-S06	R2	25	4	3.85	70	6	
HMRB230-04030-070-S06	R2	30	4	3.85	70	6	
HMRB230-04035-080-S06	R2	35	4	3.85	80	6	
HMRB230-04040-080-S06	R2	40	4	3.85	80	6	
HMRB230-05012-050-S06	R2.5	12	5	4.8	50	6	
NEW HMRB230-05016-060-S06	R2.5	16	5	4.8	60	6	
HMRB230-05020-060-S06	R2.5	20	5	4.8	60	6	
HMRB230-05030-070-S06	R2.5	30	5	4.8	70	6	
HMRB230-06015-060-S06	R3	15	7	5.7	60	6	
HMRB230-06020-060-S06	R3	20	7	5.7	60	6	
HMRB230-06025-070-S06	R3	25	7	5.7	70	6	
HMRB230-06030-080-S06	R3	30	7	5.7	80	6	
HMRB230-08020-060-S08	R4	20	10	7.7	60	8	
NEW HMRB230-08040-100-S08	R4	40	10	7.7	100	8	
HMRB230-10025-070-S10	R5	25	12	9.7	70	10	
NEW HMRB230-10050-100-S10	R5	50	12	9.7	100	10	
HMRB230-12030-080-S12	R6	30	14	11.7	80	12	
NEW HMRB230-12060-110-S12	R6	60	14	11.7	110	12	

NOTE

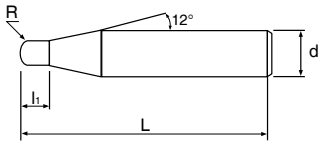
생크 테이퍼 각도는 약12도 입니다. 정확한 값이 아니므로 피삭재와 간섭의 염려가 있을 경우에는 반드시 확인해 주십시오.

The shank taper angle is about 12°. This angle is not an exact value and to avoid contact with the workpiece, we recommend the user check the precise value of this angle.

HMB230

HY-MAX 볼 엔드밀 2날 헬릭스30°

HY-MAX Ball End Mill 2-Flute Helix30°



*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

CARBIDE ULTRA | TiSiN | 2 | 30° Helix | R ±0.005 (R < 3) | R ±0.01 (R≥3) | D 0/-0.008 (D < 6) | D 0/-0.015 (D≥6) | Shank h5 | 3D

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
○	◎	◎	◎	◎	○	○	○	○		

단위(mm)/Unit(mm)

모델번호 Model No.	볼반경 Radius of Ball Nose	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	R	l_1	L	d	
NEW HMB230-003003-040-S04	R0.15	0.3	40	4	
NEW HMB230-004004-040-S04	R0.2	0.4	40	4	
NEW HMB230-005005-040-S04	R0.25	0.5	40	4	
NEW HMB230-006006-040-S04	R0.3	0.6	40	4	
NEW HMB230-008008-040-S04	R0.4	0.8	40	4	
HMB230-01002-050-S04	R0.5	2	50	4	
HMB230-01002-050-S06	R0.5	2	50	6	
HMB230-01503-050-S04	R0.75	3	50	4	
HMB230-01503-050-S06	R0.75	3	50	6	
HMB230-02004-050-S04	R1	4	50	4	
HMB230-02004-050-S06	R1	4	50	6	
HMB230-02505-050-S04	R1.25	5	50	4	
HMB230-02505-050-S06	R1.25	5	50	6	
HMB230-03006-050-S03	R1.5	6	50	3	
HMB230-03006-050-S04	R1.5	6	50	4	
NEW HMB230-03005-050-S06	R1.5	5	50	6	
HMB230-03006-060-S06	R1.5	6	60	6	
HMB230-03507-060-S06	R1.75	7	60	6	
HMB230-04008-050-S04	R2	8	50	4	
HMB230-04008-060-S04	R2	8	60	4	
HMB230-04008-080-S04	R2	8	80	4	
HMB230-04007-050-S06	R2	7	50	6	
HMB230-04008-070-S06	R2	8	70	6	
HMB230-05008-060-S06	R2.5	8	60	6	
HMB230-05010-090-S06	R2.5	10	90	6	
HMB230-06010-060-S06	R3	10	60	6	
NEW HMB230-06010-075-S06	R3	10	75	6	

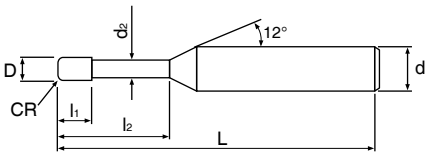
HMB230

모델번호 Model No.	볼반경 Radius of Ball Nose	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	R	l_1	L	d	
HMB230-06012-090-S06	R3	12	90	6	
HMB230-07014-100-S08	R3.5	14	100	8	
HMB230-08012-060-S08	R4	12	60	8	
HMB230-08013-080-S08	R4	13	80	8	
HMB230-08014-100-S08	R4	14	100	8	
HMB230-10016-070-S10	R5	16	70	10	
HMB230-10018-100-S10	R5	18	100	10	
HMB230-10018-130-S10	R5	18	130	10	
HMB230-12018-080-S12	R6	18	80	12	
HMB230-12022-100-S12	R6	22	100	12	
HMB230-12022-130-S12	R6	22	130	12	
HMB230-12022-150-S12	R6	22	150	12	
HMB230-16030-130-S16	R8	30	130	16	

HMRR230

HY-MAX 리브 래디우스 엔드밀 2날 헬릭스30°

HY-MAX Rib Radius End Mill 2-Flute Helix30°



* 적용 피삭재 (Applicable Work Material)
  ◎ : 최적 (Most Suitable)
  ○ : 가능 (Applicable)

CARBIDE ULTRA | TiSiN | 2 | 30° Helix | CR ±0.005 (R < 0.5) | CR ±0.01 (R≥0.5) | D 0/-0.008 (D < 6) | D 0/-0.015 (D≥6) | Shank h5 | Slot | Side | Face

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
○	◎	◎	◎	○		○	○	○		

단위(mm)/Unit(mm)

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
NEW HMRR230-002R002-005-045-S04	0.2	0.02	0.5	0.2	0.18	45	4	
NEW HMRR230-002R002-01-045-S04	0.2	0.02	1	0.2	0.18	45	4	
NEW HMRR230-002R005-005-045-S04	0.2	0.05	0.5	0.2	0.18	45	4	
NEW HMRR230-002R005-01-045-S04	0.2	0.05	1	0.2	0.18	45	4	
HMRR230-003R005-01-045-S04	0.3	0.05	1	0.3	0.27	45	4	
HMRR230-003R005-015-045-S04	0.3	0.05	1.5	0.3	0.27	45	4	
HMRR230-003R005-02-045-S04	0.3	0.05	2	0.3	0.27	45	4	
HMRR230-004R005-01-045-S04	0.4	0.05	1	0.4	0.37	45	4	
HMRR230-004R005-02-045-S04	0.4	0.05	2	0.4	0.37	45	4	
HMRR230-004R005-03-045-S04	0.4	0.05	3	0.4	0.37	45	4	
HMRR230-004R005-04-045-S04	0.4	0.05	4	0.4	0.37	45	4	
NEW HMRR230-004R01-01-045-S04	0.4	0.1	1	0.4	0.37	45	4	
NEW HMRR230-004R01-02-045-S04	0.4	0.1	2	0.4	0.37	45	4	
NEW HMRR230-004R01-03-045-S04	0.4	0.1	3	0.4	0.37	45	4	
NEW HMRR230-004R01-04-045-S04	0.4	0.1	4	0.4	0.37	45	4	
HMRR230-005R005-01-045-S04	0.5	0.05	1	0.5	0.46	45	4	
HMRR230-005R005-02-045-S04	0.5	0.05	2	0.5	0.46	45	4	
HMRR230-005R005-03-045-S04	0.5	0.05	3	0.5	0.46	45	4	
HMRR230-005R005-04-045-S04	0.5	0.05	4	0.5	0.46	45	4	
HMRR230-005R005-05-045-S04	0.5	0.05	5	0.5	0.46	45	4	
HMRR230-005R005-06-045-S04	0.5	0.05	6	0.5	0.46	45	4	
HMRR230-005R01-01-045-S04	0.5	0.1	1	0.5	0.46	45	4	
HMRR230-005R01-02-045-S04	0.5	0.1	2	0.5	0.46	45	4	
HMRR230-005R01-03-045-S04	0.5	0.1	3	0.5	0.46	45	4	
HMRR230-005R01-04-045-S04	0.5	0.1	4	0.5	0.46	45	4	
HMRR230-005R01-05-045-S04	0.5	0.1	5	0.5	0.46	45	4	
HMRR230-005R01-06-045-S04	0.5	0.1	6	0.5	0.46	45	4	

HMRR230

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
HMRR230-006R005-01-045-S04	0.6	0.05	1	0.6	0.56	45	4	
HMRR230-006R005-02-045-S04	0.6	0.05	2	0.6	0.56	45	4	
NEW HMRR230-006R005-03-045-S04	0.6	0.05	3	0.6	0.56	45	4	
HMRR230-006R005-04-045-S04	0.6	0.05	4	0.6	0.56	45	4	
HMRR230-006R005-06-045-S04	0.6	0.05	6	0.6	0.56	45	4	
HMRR230-006R005-08-045-S04	0.6	0.05	8	0.6	0.56	45	4	
HMRR230-006R01-01-045-S04	0.6	0.1	1	0.6	0.56	45	4	
HMRR230-006R01-02-045-S04	0.6	0.1	2	0.6	0.56	45	4	
NEW HMRR230-006R01-03-045-S04	0.6	0.1	3	0.6	0.56	45	4	
HMRR230-006R01-04-045-S04	0.6	0.1	4	0.6	0.56	45	4	
HMRR230-006R01-06-045-S04	0.6	0.1	6	0.6	0.56	45	4	
HMRR230-006R01-08-045-S04	0.6	0.1	8	0.6	0.56	45	4	
HMRR230-007R01-02-045-S04	0.7	0.1	2	0.7	0.66	45	4	
HMRR230-007R01-04-045-S04	0.7	0.1	4	0.7	0.66	45	4	
HMRR230-007R01-06-045-S04	0.7	0.1	6	0.7	0.66	45	4	
HMRR230-007R01-08-045-S04	0.7	0.1	8	0.7	0.66	45	4	
HMRR230-008R005-02-045-S04	0.8	0.05	2	0.8	0.76	45	4	
HMRR230-008R005-04-045-S04	0.8	0.05	4	0.8	0.76	45	4	
HMRR230-008R005-06-045-S04	0.8	0.05	6	0.8	0.76	45	4	
HMRR230-008R005-08-045-S04	0.8	0.05	8	0.8	0.76	45	4	
HMRR230-008R005-10-045-S04	0.8	0.05	10	0.8	0.76	45	4	
HMRR230-008R01-02-045-S04	0.8	0.1	2	0.8	0.76	45	4	
HMRR230-008R01-04-045-S04	0.8	0.1	4	0.8	0.76	45	4	
HMRR230-008R01-06-045-S04	0.8	0.1	6	0.8	0.76	45	4	
HMRR230-008R01-08-045-S04	0.8	0.1	8	0.8	0.76	45	4	
HMRR230-008R01-10-045-S04	0.8	0.1	10	0.8	0.76	45	4	
HMRR230-008R02-02-045-S04	0.8	0.2	2	0.8	0.76	45	4	
HMRR230-008R02-04-045-S04	0.8	0.2	4	0.8	0.76	45	4	
HMRR230-008R02-06-045-S04	0.8	0.2	6	0.8	0.76	45	4	
HMRR230-008R02-08-045-S04	0.8	0.2	8	0.8	0.76	45	4	
HMRR230-008R02-10-045-S04	0.8	0.2	10	0.8	0.76	45	4	
HMRR230-010R005-025-045-S04	1	0.05	2.5	1.5	0.96	45	4	
HMRR230-010R005-04-045-S04	1	0.05	4	1.5	0.96	45	4	
HMRR230-010R005-06-045-S04	1	0.05	6	1.5	0.96	45	4	
HMRR230-010R005-08-045-S04	1	0.05	8	1.5	0.96	45	4	
HMRR230-010R005-10-045-S04	1	0.05	10	1.5	0.96	45	4	
HMRR230-010R005-12-045-S04	1	0.05	12	1.5	0.96	45	4	
HMRR230-010R005-14-050-S04	1	0.05	14	1.5	0.96	50	4	
HMRR230-010R005-16-050-S04	1	0.05	16	1.5	0.96	50	4	
HMRR230-010R01-025-045-S04	1	0.1	2.5	1.5	0.96	45	4	
HMRR230-010R01-04-045-S04	1	0.1	4	1.5	0.96	45	4	
HMRR230-010R01-06-045-S04	1	0.1	6	1.5	0.96	45	4	
HMRR230-010R01-08-045-S04	1	0.1	8	1.5	0.96	45	4	
HMRR230-010R01-10-045-S04	1	0.1	10	1.5	0.96	45	4	
HMRR230-010R01-12-045-S04	1	0.1	12	1.5	0.96	45	4	
HMRR230-010R01-14-050-S04	1	0.1	14	1.5	0.96	50	4	
HMRR230-010R01-16-050-S04	1	0.1	16	1.5	0.96	50	4	
HMRR230-010R02-025-045-S04	1	0.2	2.5	1.5	0.96	45	4	

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모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
HMRR230-010R02-04-045-S04	1	0.2	4	1.5	0.96	45	4	
HMRR230-010R02-06-045-S04	1	0.2	6	1.5	0.96	45	4	
HMRR230-010R02-08-045-S04	1	0.2	8	1.5	0.96	45	4	
HMRR230-010R02-10-045-S04	1	0.2	10	1.5	0.96	45	4	
HMRR230-010R02-12-045-S04	1	0.2	12	1.5	0.96	45	4	
HMRR230-010R02-14-050-S04	1	0.2	14	1.5	0.96	50	4	
HMRR230-010R02-16-050-S04	1	0.2	16	1.5	0.96	50	4	
HMRR230-010R03-025-045-S04	1	0.3	2.5	1.5	0.96	45	4	
HMRR230-010R03-04-045-S04	1	0.3	4	1.5	0.96	45	4	
HMRR230-010R03-06-045-S04	1	0.3	6	1.5	0.96	45	4	
HMRR230-010R03-08-045-S04	1	0.3	8	1.5	0.96	45	4	
HMRR230-010R03-10-045-S04	1	0.3	10	1.5	0.96	45	4	
HMRR230-010R03-12-045-S04	1	0.3	12	1.5	0.96	45	4	
HMRR230-010R03-14-050-S04	1	0.3	14	1.5	0.96	50	4	
HMRR230-010R03-16-050-S04	1	0.3	16	1.5	0.96	50	4	
HMRR230-012R01-04-045-S04	1.2	0.1	4	1.8	1.15	45	4	
HMRR230-012R01-06-045-S04	1.2	0.1	6	1.8	1.15	45	4	
HMRR230-012R01-08-045-S04	1.2	0.1	8	1.8	1.15	45	4	
HMRR230-012R01-10-045-S04	1.2	0.1	10	1.8	1.15	45	4	
HMRR230-012R01-12-045-S04	1.2	0.1	12	1.8	1.15	45	4	
HMRR230-012R01-14-050-S04	1.2	0.1	14	1.8	1.15	50	4	
HMRR230-012R01-16-050-S04	1.2	0.1	16	1.8	1.15	50	4	
HMRR230-012R02-04-045-S04	1.2	0.2	4	1.8	1.15	45	4	
HMRR230-012R02-06-045-S04	1.2	0.2	6	1.8	1.15	45	4	
HMRR230-012R02-08-045-S04	1.2	0.2	8	1.8	1.15	45	4	
HMRR230-012R02-10-045-S04	1.2	0.2	10	1.8	1.15	45	4	
HMRR230-012R02-12-045-S04	1.2	0.2	12	1.8	1.15	45	4	
HMRR230-012R02-14-050-S04	1.2	0.2	14	1.8	1.15	50	4	
HMRR230-012R02-16-050-S04	1.2	0.2	16	1.8	1.15	50	4	
NEW HMRR230-012R03-04-045-S04	1.2	0.3	4	1.8	1.15	45	4	
NEW HMRR230-012R03-06-045-S04	1.2	0.3	6	1.8	1.15	45	4	
NEW HMRR230-012R03-08-045-S04	1.2	0.3	8	1.8	1.15	45	4	
NEW HMRR230-012R03-10-045-S04	1.2	0.3	10	1.8	1.15	45	4	
NEW HMRR230-012R03-12-045-S04	1.2	0.3	12	1.8	1.15	45	4	
NEW HMRR230-012R03-14-050-S04	1.2	0.3	14	1.8	1.15	50	4	
NEW HMRR230-012R03-16-050-S04	1.2	0.3	16	1.8	1.15	50	4	
HMRR230-015R01-04-045-S04	1.5	0.1	4	2.3	1.45	45	4	
HMRR230-015R01-06-045-S04	1.5	0.1	6	2.3	1.45	45	4	
HMRR230-015R01-08-045-S04	1.5	0.1	8	2.3	1.45	45	4	
HMRR230-015R01-10-045-S04	1.5	0.1	10	2.3	1.45	45	4	
HMRR230-015R01-12-045-S04	1.5	0.1	12	2.3	1.45	45	4	
HMRR230-015R01-14-050-S04	1.5	0.1	14	2.3	1.45	50	4	
HMRR230-015R01-16-050-S04	1.5	0.1	16	2.3	1.45	50	4	
HMRR230-015R01-20-060-S04	1.5	0.1	20	2.3	1.45	60	4	
HMRR230-015R02-04-045-S04	1.5	0.2	4	2.3	1.45	45	4	
HMRR230-015R02-06-045-S04	1.5	0.2	6	2.3	1.45	45	4	
HMRR230-015R02-08-045-S04	1.5	0.2	8	2.3	1.45	45	4	
HMRR230-015R02-10-045-S04	1.5	0.2	10	2.3	1.45	45	4	

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모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
HMRR230-015R02-12-045-S04	1.5	0.2	12	2.3	1.45	45	4	
HMRR230-015R02-14-050-S04	1.5	0.2	14	2.3	1.45	50	4	
HMRR230-015R02-16-050-S04	1.5	0.2	16	2.3	1.45	50	4	
HMRR230-015R02-20-060-S04	1.5	0.2	20	2.3	1.45	60	4	
HMRR230-015R03-04-045-S04	1.5	0.3	4	2.3	1.45	45	4	
HMRR230-015R03-06-045-S04	1.5	0.3	6	2.3	1.45	45	4	
HMRR230-015R03-08-045-S04	1.5	0.3	8	2.3	1.45	45	4	
HMRR230-015R03-10-045-S04	1.5	0.3	10	2.3	1.45	45	4	
HMRR230-015R03-12-045-S04	1.5	0.3	12	2.3	1.45	45	4	
HMRR230-015R03-14-050-S04	1.5	0.3	14	2.3	1.45	50	4	
HMRR230-015R03-16-050-S04	1.5	0.3	16	2.3	1.45	50	4	
HMRR230-015R03-20-060-S04	1.5	0.3	20	2.3	1.45	60	4	
HMRR230-015R05-04-045-S04	1.5	0.5	4	2.3	1.45	45	4	
HMRR230-015R05-06-045-S04	1.5	0.5	6	2.3	1.45	45	4	
HMRR230-015R05-08-045-S04	1.5	0.5	8	2.3	1.45	45	4	
HMRR230-015R05-10-045-S04	1.5	0.5	10	2.3	1.45	45	4	
HMRR230-015R05-12-045-S04	1.5	0.5	12	2.3	1.45	45	4	
HMRR230-015R05-14-050-S04	1.5	0.5	14	2.3	1.45	50	4	
HMRR230-015R05-16-050-S04	1.5	0.5	16	2.3	1.45	50	4	
HMRR230-015R05-20-060-S04	1.5	0.5	20	2.3	1.45	60	4	
HMRR230-020R01-06-045-S04	2	0.1	6	3	1.9	45	4	
HMRR230-020R01-08-045-S04	2	0.1	8	3	1.9	45	4	
HMRR230-020R01-10-045-S04	2	0.1	10	3	1.9	45	4	
HMRR230-020R01-12-045-S04	2	0.1	12	3	1.9	45	4	
HMRR230-020R01-14-050-S04	2	0.1	14	3	1.9	50	4	
HMRR230-020R01-16-050-S04	2	0.1	16	3	1.9	50	4	
HMRR230-020R01-20-060-S04	2	0.1	20	3	1.9	60	4	
HMRR230-020R02-06-045-S04	2	0.2	6	3	1.9	45	4	
HMRR230-020R02-08-045-S04	2	0.2	8	3	1.9	45	4	
HMRR230-020R02-10-045-S04	2	0.2	10	3	1.9	45	4	
HMRR230-020R02-12-045-S04	2	0.2	12	3	1.9	45	4	
HMRR230-020R02-14-050-S04	2	0.2	14	3	1.9	50	4	
HMRR230-020R02-16-050-S04	2	0.2	16	3	1.9	50	4	
HMRR230-020R02-20-060-S04	2	0.2	20	3	1.9	60	4	
HMRR230-020R03-06-045-S04	2	0.3	6	3	1.9	45	4	
HMRR230-020R03-08-045-S04	2	0.3	8	3	1.9	45	4	
HMRR230-020R03-10-045-S04	2	0.3	10	3	1.9	45	4	
HMRR230-020R03-12-045-S04	2	0.3	12	3	1.9	45	4	
HMRR230-020R03-14-050-S04	2	0.3	14	3	1.9	50	4	
HMRR230-020R03-16-050-S04	2	0.3	16	3	1.9	50	4	
HMRR230-020R03-20-060-S04	2	0.3	20	3	1.9	60	4	
HMRR230-020R05-06-045-S04	2	0.5	6	3	1.9	45	4	
HMRR230-020R05-08-045-S04	2	0.5	8	3	1.9	45	4	
HMRR230-020R05-10-045-S04	2	0.5	10	3	1.9	45	4	
HMRR230-020R05-12-045-S04	2	0.5	12	3	1.9	45	4	
HMRR230-020R05-14-050-S04	2	0.5	14	3	1.9	50	4	
HMRR230-020R05-16-050-S04	2	0.5	16	3	1.9	50	4	
HMRR230-020R05-20-060-S04	2	0.5	20	3	1.9	60	4	

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모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
HMRR230-025R02-10-045-S04	2.5	0.2	10	4	2.35	45	4	
HMRR230-025R02-16-050-S04	2.5	0.2	16	4	2.35	50	4	
HMRR230-025R02-20-060-S04	2.5	0.2	20	4	2.35	60	4	
HMRR230-025R05-10-045-S04	2.5	0.5	10	4	2.35	45	4	
HMRR230-025R05-16-050-S04	2.5	0.5	16	4	2.35	50	4	
HMRR230-025R05-20-060-S04	2.5	0.5	20	4	2.35	60	4	
HMRR230-030R02-10-050-S06	3	0.2	10	4.5	2.85	50	6	
HMRR230-030R02-12-050-S06	3	0.2	12	4.5	2.85	50	6	
HMRR230-030R02-16-060-S06	3	0.2	16	4.5	2.85	60	6	
HMRR230-030R02-20-060-S06	3	0.2	20	4.5	2.85	60	6	
HMRR230-030R02-25-070-S06	3	0.2	25	4.5	2.85	70	6	
HMRR230-030R02-30-070-S06	3	0.2	30	4.5	2.85	70	6	
HMRR230-030R02-35-080-S06	3	0.2	35	4.5	2.85	80	6	
HMRR230-030R03-10-050-S06	3	0.3	10	4.5	2.85	50	6	
HMRR230-030R03-12-050-S06	3	0.3	12	4.5	2.85	50	6	
HMRR230-030R03-16-060-S06	3	0.3	16	4.5	2.85	60	6	
HMRR230-030R03-20-060-S06	3	0.3	20	4.5	2.85	60	6	
HMRR230-030R03-25-070-S06	3	0.3	25	4.5	2.85	70	6	
HMRR230-030R03-30-070-S06	3	0.3	30	4.5	2.85	70	6	
HMRR230-030R03-35-080-S06	3	0.3	35	4.5	2.85	80	6	
HMRR230-030R05-10-050-S06	3	0.5	10	4.5	2.85	50	6	
HMRR230-030R05-12-050-S06	3	0.5	12	4.5	2.85	50	6	
HMRR230-030R05-16-060-S06	3	0.5	16	4.5	2.85	60	6	
HMRR230-030R05-20-060-S06	3	0.5	20	4.5	2.85	60	6	
HMRR230-030R05-25-070-S06	3	0.5	25	4.5	2.85	70	6	
HMRR230-030R05-30-070-S06	3	0.5	30	4.5	2.85	70	6	
HMRR230-030R05-35-080-S06	3	0.5	35	4.5	2.85	80	6	
HMRR230-030R10-10-050-S06	3	1	10	4.5	2.85	50	6	
HMRR230-030R10-12-050-S06	3	1	12	4.5	2.85	50	6	
HMRR230-030R10-16-060-S06	3	1	16	4.5	2.85	60	6	
HMRR230-030R10-20-060-S06	3	1	20	4.5	2.85	60	6	
HMRR230-030R10-25-070-S06	3	1	25	4.5	2.85	70	6	
HMRR230-030R10-30-070-S06	3	1	30	4.5	2.85	70	6	
HMRR230-030R10-35-080-S06	3	1	35	4.5	2.85	80	6	
HMRR230-040R02-12-050-S06	4	0.2	12	6	3.85	50	6	
HMRR230-040R02-16-060-S06	4	0.2	16	6	3.85	60	6	
HMRR230-040R02-20-060-S06	4	0.2	20	6	3.85	60	6	
HMRR230-040R02-25-070-S06	4	0.2	25	6	3.85	70	6	
HMRR230-040R02-30-070-S06	4	0.2	30	6	3.85	70	6	
HMRR230-040R02-35-080-S06	4	0.2	35	6	3.85	80	6	
HMRR230-040R03-12-050-S06	4	0.3	12	6	3.85	50	6	
HMRR230-040R03-16-060-S06	4	0.3	16	6	3.85	60	6	
HMRR230-040R03-20-060-S06	4	0.3	20	6	3.85	60	6	
HMRR230-040R03-25-070-S06	4	0.3	25	6	3.85	70	6	
HMRR230-040R03-30-070-S06	4	0.3	30	6	3.85	70	6	
HMRR230-040R03-35-080-S06	4	0.3	35	6	3.85	80	6	
HMRR230-040R05-12-050-S06	4	0.5	12	6	3.85	50	6	
HMRR230-040R05-16-060-S06	4	0.5	16	6	3.85	60	6	

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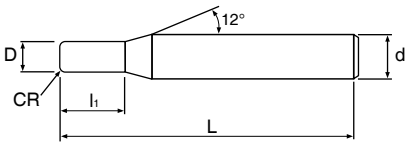
모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
HMRR230-040R05-20-060-S06	4	0.5	20	6	3.85	60	6	
HMRR230-040R05-25-070-S06	4	0.5	25	6	3.85	70	6	
HMRR230-040R05-30-070-S06	4	0.5	30	6	3.85	70	6	
HMRR230-040R05-35-080-S06	4	0.5	35	6	3.85	80	6	
HMRR230-040R10-12-050-S06	4	1	12	6	3.85	50	6	
HMRR230-040R10-16-060-S06	4	1	16	6	3.85	60	6	
HMRR230-040R10-20-060-S06	4	1	20	6	3.85	60	6	
HMRR230-040R10-25-070-S06	4	1	25	6	3.85	70	6	
HMRR230-040R10-30-070-S06	4	1	30	6	3.85	70	6	
HMRR230-040R10-35-080-S06	4	1	35	6	3.85	80	6	
HMRR230-050R02-20-060-S06	5	0.2	20	7.5	4.8	60	6	
HMRR230-050R03-20-060-S06	5	0.3	20	7.5	4.8	60	6	
HMRR230-050R05-20-060-S06	5	0.5	20	7.5	4.8	60	6	
HMRR230-050R10-20-060-S06	5	1	20	7.5	4.8	60	6	
HMRR230-060R02-20-060-S06	6	0.2	20	9	5.7	60	6	
HMRR230-060R02-30-090-S06	6	0.2	30	9	5.7	90	6	
HMRR230-060R03-20-060-S06	6	0.3	20	9	5.7	60	6	
HMRR230-060R03-30-090-S06	6	0.3	30	9	5.7	90	6	
HMRR230-060R05-20-060-S06	6	0.5	20	9	5.7	60	6	
HMRR230-060R05-30-090-S06	6	0.5	30	9	5.7	90	6	
HMRR230-060R10-20-060-S06	6	1	20	9	5.7	60	6	
HMRR230-060R10-30-090-S06	6	1	30	9	5.7	90	6	
NEW HMRR230-080R02-24-065-S08	8	0.2	24	12	7.7	65	8	
NEW HMRR230-080R02-40-090-S08	8	0.2	40	12	7.7	90	8	
HMRR230-080R03-24-065-S08	8	0.3	24	12	7.7	65	8	
HMRR230-080R03-40-090-S08	8	0.3	40	12	7.7	90	8	
HMRR230-080R05-24-065-S08	8	0.5	24	12	7.7	65	8	
HMRR230-080R05-40-090-S08	8	0.5	40	12	7.7	90	8	
HMRR230-080R10-24-065-S08	8	1	24	12	7.7	65	8	
HMRR230-080R10-40-090-S08	8	1	40	12	7.7	90	8	
NEW HMRR230-100R02-30-070-S10	10	0.2	30	15	9.7	70	10	
NEW HMRR230-100R02-50-100-S10	10	0.2	50	15	9.7	100	10	
HMRR230-100R03-30-070-S10	10	0.3	30	15	9.7	70	10	
HMRR230-100R03-50-100-S10	10	0.3	50	15	9.7	100	10	
HMRR230-100R05-30-070-S10	10	0.5	30	15	9.7	70	10	
HMRR230-100R05-50-100-S10	10	0.5	50	15	9.7	100	10	
HMRR230-100R10-30-070-S10	10	1	30	15	9.7	70	10	
HMRR230-100R10-50-100-S10	10	1	50	15	9.7	100	10	
NEW HMRR230-120R02-30-080-S12	12	0.2	30	18	11.7	80	12	
NEW HMRR230-120R02-55-100-S12	12	0.2	55	18	11.7	100	12	
HMRR230-120R05-30-080-S12	12	0.5	30	18	11.7	80	12	
HMRR230-120R05-55-100-S12	12	0.5	55	18	11.7	100	12	
HMRR230-120R10-30-080-S12	12	1	30	18	11.7	80	12	
HMRR230-120R10-55-100-S12	12	1	55	18	11.7	100	12	

HMR230

HY-MAX 래디우스 엔드밀 2날 헬릭스30°

HY-MAX Radius End Mill 2-Flute Helix30°



* 적용 피삭재 (Applicable Work Material)

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

R < 0.5 R≥0.5 D < 6 D≥6

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
○	◎	◎	◎	○		○	○	○		

단위(mm)/Unit(mm)

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_1	L	d	
NEW HMR230-002R002-045-S04	0.2	0.02	0.4	45	4	
NEW HMR230-002R005-045-S04	0.2	0.05	0.4	45	4	
NEW HMR230-003R005-045-S04	0.3	0.05	0.6	45	4	
NEW HMR230-003R01-045-S04	0.3	0.1	0.6	45	4	
NEW HMR230-004R005-045-S04	0.4	0.05	0.8	45	4	
NEW HMR230-004R01-045-S04	0.4	0.1	0.8	45	4	
NEW HMR230-005R005-045-S04	0.5	0.05	1	45	4	
NEW HMR230-005R01-045-S04	0.5	0.1	1	45	4	
NEW HMR230-006R005-045-S04	0.6	0.05	1.2	45	4	
NEW HMR230-006R01-045-S04	0.6	0.1	1.2	45	4	
NEW HMR230-006R02-045-S04	0.6	0.2	1.2	45	4	
NEW HMR230-007R005-045-S04	0.7	0.05	1.4	45	4	
NEW HMR230-007R01-045-S04	0.7	0.1	1.4	45	4	
NEW HMR230-007R02-045-S04	0.7	0.2	1.4	45	4	
NEW HMR230-008R005-045-S04	0.8	0.05	1.6	45	4	
NEW HMR230-008R01-045-S04	0.8	0.1	1.6	45	4	
NEW HMR230-008R02-045-S04	0.8	0.2	1.6	45	4	
HMR230-010R005-045-S04	1	0.05	2.5	45	4	
HMR230-010R01-045-S04	1	0.1	2.5	45	4	
HMR230-010R02-045-S04	1	0.2	2.5	45	4	
HMR230-010R03-045-S04	1	0.3	2.5	45	4	
HMR230-012R01-045-S04	1.2	0.1	3	45	4	
HMR230-012R02-045-S04	1.2	0.2	3	45	4	
HMR230-012R03-045-S04	1.2	0.3	3	45	4	
HMR230-015R01-045-S04	1.5	0.1	4	45	4	
HMR230-015R02-045-S04	1.5	0.2	4	45	4	
HMR230-015R03-045-S04	1.5	0.3	4	45	4	

HMR230

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_1	L	d	
HMR230-015R05-045-S04	1.5	0.5	4	45	4	
HMR230-020R01-045-S04	2	0.1	6	45	4	
HMR230-020R02-045-S04	2	0.2	6	45	4	
HMR230-020R03-045-S04	2	0.3	6	45	4	
HMR230-020R05-045-S04	2	0.5	6	45	4	
HMR230-025R01-045-S04	2.5	0.1	7	45	4	
HMR230-025R02-045-S04	2.5	0.2	7	45	4	
HMR230-025R03-045-S04	2.5	0.3	7	45	4	
HMR230-025R05-045-S04	2.5	0.5	7	45	4	
HMR230-030R01-060-S06	3	0.1	8	60	6	
HMR230-030R02-060-S06	3	0.2	8	60	6	
HMR230-030R03-060-S06	3	0.3	8	60	6	
HMR230-030R05-060-S06	3	0.5	8	60	6	
HMR230-030R10-060-S06	3	1	8	60	6	
NEW HMR230-040R01-050-S04	4	0.1	10	50	4	
NEW HMR230-040R02-050-S04	4	0.2	10	50	4	
NEW HMR230-040R03-050-S04	4	0.3	10	50	4	
NEW HMR230-040R05-050-S04	4	0.5	10	50	4	
NEW HMR230-040R10-050-S04	4	1	10	50	4	
HMR230-040R01-070-S06	4	0.1	10	70	6	
HMR230-040R02-070-S06	4	0.2	10	70	6	
HMR230-040R03-070-S06	4	0.3	10	70	6	
HMR230-040R05-070-S06	4	0.5	10	70	6	
HMR230-040R10-070-S06	4	1	10	70	6	
HMR230-050R02-070-S06	5	0.2	10	70	6	
HMR230-050R03-070-S06	5	0.3	10	70	6	
HMR230-050R05-070-S06	5	0.5	10	70	6	
HMR230-050R10-070-S06	5	1	10	70	6	
NEW HMR230-060R02-060-S06	6	0.2	12	60	6	
HMR230-060R02-090-S06	6	0.2	12	90	6	
NEW HMR230-060R03-060-S06	6	0.3	12	60	6	
HMR230-060R03-090-S06	6	0.3	12	90	6	
NEW HMR230-060R05-060-S06	6	0.5	12	60	6	
HMR230-060R05-090-S06	6	0.5	12	90	6	
NEW HMR230-060R10-060-S06	6	1	12	60	6	
HMR230-060R10-090-S06	6	1	12	90	6	
NEW HMR230-080R02-060-S08	8	0.2	16	60	8	
HMR230-080R02-090-S08	8	0.2	16	90	8	
NEW HMR230-080R03-060-S08	8	0.3	16	60	8	
HMR230-080R03-090-S08	8	0.3	16	90	8	
NEW HMR230-080R05-060-S08	8	0.5	16	60	8	
HMR230-080R05-090-S08	8	0.5	16	90	8	
NEW HMR230-080R10-060-S08	8	1	16	60	8	
HMR230-080R10-090-S08	8	1	16	90	8	
NEW HMR230-100R02-070-S10	10	0.2	20	70	10	
NEW HMR230-100R02-100-S10	10	0.2	20	100	10	
NEW HMR230-100R03-070-S10	10	0.3	20	70	10	
HMR230-100R03-100-S10	10	0.3	20	100	10	

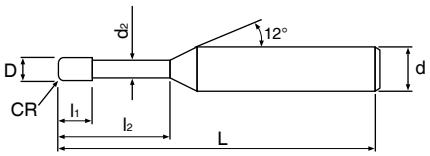
HMR230

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_1	L	d	
HMR230-100R03-130-S10	10	0.3	20	130	10	
NEW HMR230-100R05-070-S10	10	0.5	20	70	10	
HMR230-100R05-100-S10	10	0.5	20	100	10	
HMR230-100R05-130-S10	10	0.5	20	130	10	
NEW HMR230-100R10-070-S10	10	1	20	70	10	
HMR230-100R10-100-S10	10	1	20	100	10	
HMR230-100R10-130-S10	10	1	20	130	10	
NEW HMR230-120R02-080-S12	12	0.2	24	80	12	
NEW HMR230-120R02-100-S12	12	0.2	24	100	12	
NEW HMR230-120R05-080-S12	12	0.5	24	80	12	
HMR230-120R05-100-S12	12	0.5	24	100	12	
HMR230-120R05-130-S12	12	0.5	24	130	12	
NEW HMR230-120R10-080-S12	12	1	24	80	12	
HMR230-120R10-100-S12	12	1	24	100	12	
HMR230-120R10-130-S12	12	1	24	130	12	

HMRR430

HY-MAX 리브 래디우스 엔드밀 4날 헬릭스30°

HY-MAX Rib Radius End Mill 4-Flute Helix30°



*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
○	◎	◎	◎	◎	○	○	○	○		

단위(mm)/Unit(mm)

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
NEW HMRR430-006R005-02-045-S04	0.6	0.05	2	0.6	0.56	45	4	
NEW HMRR430-006R005-03-045-S04	0.6	0.05	3	0.6	0.56	45	4	
NEW HMRR430-006R005-04-045-S04	0.6	0.05	4	0.6	0.56	45	4	
NEW HMRR430-006R005-06-045-S04	0.6	0.05	6	0.6	0.56	45	4	
NEW HMRR430-006R01-02-045-S04	0.6	0.1	2	0.6	0.56	45	4	
NEW HMRR430-006R01-03-045-S04	0.6	0.1	3	0.6	0.56	45	4	
NEW HMRR430-006R01-04-045-S04	0.6	0.1	4	0.6	0.56	45	4	
NEW HMRR430-006R01-06-045-S04	0.6	0.1	6	0.6	0.56	45	4	
NEW HMRR430-008R005-02-045-S04	0.8	0.05	2	0.8	0.76	45	4	
NEW HMRR430-008R005-04-045-S04	0.8	0.05	4	0.8	0.76	45	4	
NEW HMRR430-008R005-06-045-S04	0.8	0.05	6	0.8	0.76	45	4	
NEW HMRR430-008R005-08-045-S04	0.8	0.05	8	0.8	0.76	45	4	
NEW HMRR430-008R01-02-045-S04	0.8	0.1	2	0.8	0.76	45	4	
NEW HMRR430-008R01-04-045-S04	0.8	0.1	4	0.8	0.76	45	4	
NEW HMRR430-008R01-06-045-S04	0.8	0.1	6	0.8	0.76	45	4	
NEW HMRR430-008R01-08-045-S04	0.8	0.1	8	0.8	0.76	45	4	
NEW HMRR430-008R02-02-045-S04	0.8	0.2	2	0.8	0.76	45	4	
NEW HMRR430-008R02-04-045-S04	0.8	0.2	4	0.8	0.76	45	4	
NEW HMRR430-008R02-06-045-S04	0.8	0.2	6	0.8	0.76	45	4	
NEW HMRR430-008R02-08-045-S04	0.8	0.2	8	0.8	0.76	45	4	
HMRR430-010R005-025-045-S04	1	0.05	2.5	1.5	0.96	45	4	
HMRR430-010R005-04-045-S04	1	0.05	4	1.5	0.96	45	4	
HMRR430-010R005-06-045-S04	1	0.05	6	1.5	0.96	45	4	
HMRR430-010R005-08-045-S04	1	0.05	8	1.5	0.96	45	4	
HMRR430-010R005-10-045-S04	1	0.05	10	1.5	0.96	45	4	
HMRR430-010R005-12-045-S04	1	0.05	12	1.5	0.96	45	4	
HMRR430-010R01-025-045-S04	1	0.1	2.5	1.5	0.96	45	4	

HMRR430

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
HMRR430-010R01-04-045-S04	1	0.1	4	1.5	0.96	45	4	
HMRR430-010R01-06-045-S04	1	0.1	6	1.5	0.96	45	4	
HMRR430-010R01-08-045-S04	1	0.1	8	1.5	0.96	45	4	
HMRR430-010R01-10-045-S04	1	0.1	10	1.5	0.96	45	4	
HMRR430-010R01-12-045-S04	1	0.1	12	1.5	0.96	45	4	
HMRR430-010R02-025-045-S04	1	0.2	2.5	1.5	0.96	45	4	
HMRR430-010R02-04-045-S04	1	0.2	4	1.5	0.96	45	4	
HMRR430-010R02-06-045-S04	1	0.2	6	1.5	0.96	45	4	
HMRR430-010R02-08-045-S04	1	0.2	8	1.5	0.96	45	4	
HMRR430-010R02-10-045-S04	1	0.2	10	1.5	0.96	45	4	
HMRR430-010R02-12-045-S04	1	0.2	12	1.5	0.96	45	4	
HMRR430-010R03-025-045-S04	1	0.3	2.5	1.5	0.96	45	4	
HMRR430-010R03-04-045-S04	1	0.3	4	1.5	0.96	45	4	
HMRR430-010R03-06-045-S04	1	0.3	6	1.5	0.96	45	4	
HMRR430-010R03-08-045-S04	1	0.3	8	1.5	0.96	45	4	
HMRR430-010R03-10-045-S04	1	0.3	10	1.5	0.96	45	4	
HMRR430-010R03-12-045-S04	1	0.3	12	1.5	0.96	45	4	
HMRR430-015R01-04-045-S04	1.5	0.1	4	2.3	1.45	45	4	
HMRR430-015R01-06-045-S04	1.5	0.1	6	2.3	1.45	45	4	
HMRR430-015R01-08-045-S04	1.5	0.1	8	2.3	1.45	45	4	
HMRR430-015R01-10-045-S04	1.5	0.1	10	2.3	1.45	45	4	
HMRR430-015R01-12-045-S04	1.5	0.1	12	2.3	1.45	45	4	
HMRR430-015R01-14-050-S04	1.5	0.1	14	2.3	1.45	50	4	
HMRR430-015R01-16-050-S04	1.5	0.1	16	2.3	1.45	50	4	
HMRR430-015R01-20-060-S04	1.5	0.1	20	2.3	1.45	60	4	
HMRR430-015R02-04-045-S04	1.5	0.2	4	2.3	1.45	45	4	
HMRR430-015R02-06-045-S04	1.5	0.2	6	2.3	1.45	45	4	
HMRR430-015R02-08-045-S04	1.5	0.2	8	2.3	1.45	45	4	
HMRR430-015R02-10-045-S04	1.5	0.2	10	2.3	1.45	45	4	
HMRR430-015R02-12-045-S04	1.5	0.2	12	2.3	1.45	45	4	
HMRR430-015R02-14-050-S04	1.5	0.2	14	2.3	1.45	50	4	
HMRR430-015R02-16-050-S04	1.5	0.2	16	2.3	1.45	50	4	
HMRR430-015R02-20-060-S04	1.5	0.2	20	2.3	1.45	60	4	
HMRR430-015R03-04-045-S04	1.5	0.3	4	2.3	1.45	45	4	
HMRR430-015R03-06-045-S04	1.5	0.3	6	2.3	1.45	45	4	
HMRR430-015R03-08-045-S04	1.5	0.3	8	2.3	1.45	45	4	
HMRR430-015R03-10-045-S04	1.5	0.3	10	2.3	1.45	45	4	
HMRR430-015R03-12-045-S04	1.5	0.3	12	2.3	1.45	45	4	
HMRR430-015R03-14-050-S04	1.5	0.3	14	2.3	1.45	50	4	
HMRR430-015R03-16-050-S04	1.5	0.3	16	2.3	1.45	50	4	
HMRR430-015R03-20-060-S04	1.5	0.3	20	2.3	1.45	60	4	
HMRR430-015R05-04-045-S04	1.5	0.5	4	2.3	1.45	45	4	
HMRR430-015R05-06-045-S04	1.5	0.5	6	2.3	1.45	45	4	
HMRR430-015R05-08-045-S04	1.5	0.5	8	2.3	1.45	45	4	
HMRR430-015R05-10-045-S04	1.5	0.5	10	2.3	1.45	45	4	
HMRR430-015R05-12-045-S04	1.5	0.5	12	2.3	1.45	45	4	
HMRR430-015R05-14-050-S04	1.5	0.5	14	2.3	1.45	50	4	
HMRR430-015R05-16-050-S04	1.5	0.5	16	2.3	1.45	50	4	

HMRR430

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
HMRR430-015R05-20-060-S04	1.5	0.5	20	2.3	1.45	60	4	
HMRR430-020R01-06-045-S04	2	0.1	6	3	1.9	45	4	
HMRR430-020R01-08-045-S04	2	0.1	8	3	1.9	45	4	
HMRR430-020R01-10-045-S04	2	0.1	10	3	1.9	45	4	
HMRR430-020R01-12-045-S04	2	0.1	12	3	1.9	45	4	
HMRR430-020R01-14-050-S04	2	0.1	14	3	1.9	50	4	
HMRR430-020R01-16-050-S04	2	0.1	16	3	1.9	50	4	
HMRR430-020R01-20-060-S04	2	0.1	20	3	1.9	60	4	
HMRR430-020R02-06-045-S04	2	0.2	6	3	1.9	45	4	
HMRR430-020R02-08-045-S04	2	0.2	8	3	1.9	45	4	
HMRR430-020R02-10-045-S04	2	0.2	10	3	1.9	45	4	
HMRR430-020R02-12-045-S04	2	0.2	12	3	1.9	45	4	
HMRR430-020R02-14-050-S04	2	0.2	14	3	1.9	50	4	
HMRR430-020R02-16-050-S04	2	0.2	16	3	1.9	50	4	
HMRR430-020R02-20-060-S04	2	0.2	20	3	1.9	60	4	
HMRR430-020R03-06-045-S04	2	0.3	6	3	1.9	45	4	
HMRR430-020R03-08-045-S04	2	0.3	8	3	1.9	45	4	
HMRR430-020R03-10-045-S04	2	0.3	10	3	1.9	45	4	
HMRR430-020R03-12-045-S04	2	0.3	12	3	1.9	45	4	
HMRR430-020R03-14-050-S04	2	0.3	14	3	1.9	50	4	
HMRR430-020R03-16-050-S04	2	0.3	16	3	1.9	50	4	
HMRR430-020R03-20-060-S04	2	0.3	20	3	1.9	60	4	
HMRR430-020R05-06-045-S04	2	0.5	6	3	1.9	45	4	
HMRR430-020R05-08-045-S04	2	0.5	8	3	1.9	45	4	
HMRR430-020R05-10-045-S04	2	0.5	10	3	1.9	45	4	
HMRR430-020R05-12-045-S04	2	0.5	12	3	1.9	45	4	
HMRR430-020R05-14-050-S04	2	0.5	14	3	1.9	50	4	
HMRR430-020R05-16-050-S04	2	0.5	16	3	1.9	50	4	
HMRR430-020R05-20-060-S04	2	0.5	20	3	1.9	60	4	
HMRR430-025R02-10-045-S04	2.5	0.2	10	4	2.35	45	4	
HMRR430-025R02-16-050-S04	2.5	0.2	16	4	2.35	50	4	
HMRR430-025R02-20-060-S04	2.5	0.2	20	4	2.35	60	4	
HMRR430-025R05-10-045-S04	2.5	0.5	10	4	2.35	45	4	
HMRR430-025R05-16-050-S04	2.5	0.5	16	4	2.35	50	4	
HMRR430-025R05-20-060-S04	2.5	0.5	20	4	2.35	60	4	
HMRR430-030R01-10-050-S06	3	0.1	10	4.5	2.85	50	6	
HMRR430-030R01-12-050-S06	3	0.1	12	4.5	2.85	50	6	
HMRR430-030R01-16-060-S06	3	0.1	16	4.5	2.85	60	6	
HMRR430-030R01-20-060-S06	3	0.1	20	4.5	2.85	60	6	
HMRR430-030R01-25-070-S06	3	0.1	25	4.5	2.85	70	6	
HMRR430-030R01-30-070-S06	3	0.1	30	4.5	2.85	70	6	
HMRR430-030R01-35-080-S06	3	0.1	35	4.5	2.85	80	6	
HMRR430-030R02-10-050-S06	3	0.2	10	4.5	2.85	50	6	
HMRR430-030R02-12-050-S06	3	0.2	12	4.5	2.85	50	6	
HMRR430-030R02-16-060-S06	3	0.2	16	4.5	2.85	60	6	
HMRR430-030R02-20-060-S06	3	0.2	20	4.5	2.85	60	6	
HMRR430-030R02-25-070-S06	3	0.2	25	4.5	2.85	70	6	
HMRR430-030R02-30-070-S06	3	0.2	30	4.5	2.85	70	6	

HMRR430

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
HMRR430-030R02-35-080-S06	3	0.2	35	4.5	2.85	80	6	
HMRR430-030R03-10-050-S06	3	0.3	10	4.5	2.85	50	6	
HMRR430-030R03-12-050-S06	3	0.3	12	4.5	2.85	50	6	
HMRR430-030R03-16-060-S06	3	0.3	16	4.5	2.85	60	6	
HMRR430-030R03-20-060-S06	3	0.3	20	4.5	2.85	60	6	
HMRR430-030R03-25-070-S06	3	0.3	25	4.5	2.85	70	6	
HMRR430-030R03-30-070-S06	3	0.3	30	4.5	2.85	70	6	
HMRR430-030R03-35-080-S06	3	0.3	35	4.5	2.85	80	6	
HMRR430-030R05-10-050-S06	3	0.5	10	4.5	2.85	50	6	
HMRR430-030R05-12-050-S06	3	0.5	12	4.5	2.85	50	6	
HMRR430-030R05-16-060-S06	3	0.5	16	4.5	2.85	60	6	
HMRR430-030R05-20-060-S06	3	0.5	20	4.5	2.85	60	6	
HMRR430-030R05-25-070-S06	3	0.5	25	4.5	2.85	70	6	
HMRR430-030R05-30-070-S06	3	0.5	30	4.5	2.85	70	6	
HMRR430-030R05-35-080-S06	3	0.5	35	4.5	2.85	80	6	
HMRR430-030R10-10-050-S06	3	1	10	4.5	2.85	50	6	
HMRR430-030R10-12-050-S06	3	1	12	4.5	2.85	50	6	
HMRR430-030R10-16-060-S06	3	1	16	4.5	2.85	60	6	
HMRR430-030R10-20-060-S06	3	1	20	4.5	2.85	60	6	
HMRR430-030R10-25-070-S06	3	1	25	4.5	2.85	70	6	
HMRR430-030R10-30-070-S06	3	1	30	4.5	2.85	70	6	
HMRR430-030R10-35-080-S06	3	1	35	4.5	2.85	80	6	
HMRR430-040R01-12-050-S06	4	0.1	12	6	3.85	50	6	
HMRR430-040R01-16-060-S06	4	0.1	16	6	3.85	60	6	
HMRR430-040R01-20-060-S06	4	0.1	20	6	3.85	60	6	
HMRR430-040R01-25-070-S06	4	0.1	25	6	3.85	70	6	
HMRR430-040R01-30-070-S06	4	0.1	30	6	3.85	70	6	
HMRR430-040R01-35-080-S06	4	0.1	35	6	3.85	80	6	
HMRR430-040R02-12-050-S06	4	0.2	12	6	3.85	50	6	
HMRR430-040R02-16-060-S06	4	0.2	16	6	3.85	60	6	
HMRR430-040R02-20-060-S06	4	0.2	20	6	3.85	60	6	
HMRR430-040R02-25-070-S06	4	0.2	25	6	3.85	70	6	
HMRR430-040R02-30-070-S06	4	0.2	30	6	3.85	70	6	
HMRR430-040R02-35-080-S06	4	0.2	35	6	3.85	80	6	
HMRR430-040R03-12-050-S06	4	0.3	12	6	3.85	50	6	
HMRR430-040R03-16-060-S06	4	0.3	16	6	3.85	60	6	
HMRR430-040R03-20-060-S06	4	0.3	20	6	3.85	60	6	
HMRR430-040R03-25-070-S06	4	0.3	25	6	3.85	70	6	
HMRR430-040R03-30-070-S06	4	0.3	30	6	3.85	70	6	
HMRR430-040R03-35-080-S06	4	0.3	35	6	3.85	80	6	
HMRR430-040R05-12-050-S06	4	0.5	12	6	3.85	50	6	
HMRR430-040R05-16-060-S06	4	0.5	16	6	3.85	60	6	
HMRR430-040R05-20-060-S06	4	0.5	20	6	3.85	60	6	
HMRR430-040R05-25-070-S06	4	0.5	25	6	3.85	70	6	
HMRR430-040R05-30-070-S06	4	0.5	30	6	3.85	70	6	
HMRR430-040R05-35-080-S06	4	0.5	35	6	3.85	80	6	
HMRR430-040R10-12-050-S06	4	1	12	6	3.85	50	6	
HMRR430-040R10-16-060-S06	4	1	16	6	3.85	60	6	

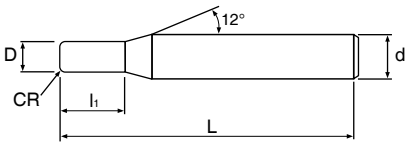
HMRR430

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
HMRR430-040R10-20-060-S06	4	1	20	6	3.85	60	6	
HMRR430-040R10-25-070-S06	4	1	25	6	3.85	70	6	
HMRR430-040R10-30-070-S06	4	1	30	6	3.85	70	6	
HMRR430-040R10-35-080-S06	4	1	35	6	3.85	80	6	
HMRR430-050R02-20-060-S06	5	0.2	20	7.5	4.8	60	6	
HMRR430-050R03-20-060-S06	5	0.3	20	7.5	4.8	60	6	
HMRR430-050R05-20-060-S06	5	0.5	20	7.5	4.8	60	6	
HMRR430-050R10-20-060-S06	5	1	20	7.5	4.8	60	6	
HMRR430-060R02-20-060-S06	6	0.2	20	9	5.7	60	6	
HMRR430-060R02-30-090-S06	6	0.2	30	9	5.7	90	6	
HMRR430-060R03-20-060-S06	6	0.3	20	9	5.7	60	6	
HMRR430-060R03-30-090-S06	6	0.3	30	9	5.7	90	6	
HMRR430-060R05-20-060-S06	6	0.5	20	9	5.7	60	6	
HMRR430-060R05-30-090-S06	6	0.5	30	9	5.7	90	6	
HMRR430-060R10-20-060-S06	6	1	20	9	5.7	60	6	
HMRR430-060R10-30-090-S06	6	1	30	9	5.7	90	6	
NEW HMRR430-080R02-24-065-S08	8	0.2	24	12	7.7	65	8	
NEW HMRR430-080R02-40-090-S08	8	0.2	40	12	7.7	90	8	
HMRR430-080R03-24-065-S08	8	0.3	24	12	7.7	65	8	
HMRR430-080R03-40-090-S08	8	0.3	40	12	7.7	90	8	
HMRR430-080R05-24-065-S08	8	0.5	24	12	7.7	65	8	
HMRR430-080R05-40-090-S08	8	0.5	40	12	7.7	90	8	
HMRR430-080R10-24-065-S08	8	1	24	12	7.7	65	8	
HMRR430-080R10-40-090-S08	8	1	40	12	7.7	90	8	
HMRR430-080R20-24-065-S08	8	2	24	12	7.7	65	8	
HMRR430-080R20-40-090-S08	8	2	40	12	7.7	90	8	
NEW HMRR430-100R02-30-070-S10	10	0.2	30	15	9.7	70	10	
NEW HMRR430-100R02-50-100-S10	10	0.2	50	15	9.7	100	10	
HMRR430-100R03-30-070-S10	10	0.3	30	15	9.7	70	10	
HMRR430-100R03-50-100-S10	10	0.3	50	15	9.7	100	10	
HMRR430-100R05-30-070-S10	10	0.5	30	15	9.7	70	10	
HMRR430-100R05-50-100-S10	10	0.5	50	15	9.7	100	10	
HMRR430-100R10-30-070-S10	10	1	30	15	9.7	70	10	
HMRR430-100R10-50-100-S10	10	1	50	15	9.7	100	10	
HMRR430-100R20-30-070-S10	10	2	30	15	9.7	70	10	
HMRR430-100R20-50-100-S10	10	2	50	15	9.7	100	10	
NEW HMRR430-120R02-30-080-S12	12	0.2	30	18	11.7	80	12	
NEW HMRR430-120R02-55-100-S12	12	0.2	55	18	11.7	100	12	
NEW HMRR430-120R02-60-150-S12	12	0.2	60	18	11.7	150	12	
HMRR430-120R05-30-080-S12	12	0.5	30	18	11.7	80	12	
HMRR430-120R05-55-100-S12	12	0.5	55	18	11.7	100	12	
HMRR430-120R05-60-150-S12	12	0.5	60	18	11.7	150	12	
HMRR430-120R10-30-080-S12	12	1	30	18	11.7	80	12	
HMRR430-120R10-55-100-S12	12	1	55	18	11.7	100	12	
HMRR430-120R10-60-150-S12	12	1	60	18	11.7	150	12	
HMRR430-120R20-30-080-S12	12	2	30	18	11.7	80	12	
HMRR430-120R20-55-100-S12	12	2	55	18	11.7	100	12	
HMRR430-120R20-60-150-S12	12	2	60	18	11.7	150	12	

HMR430

HY-MAX 래디우스 엔드밀 4날 헬릭스30°

HY-MAX Radius End Mill 4-Flute Helix30°



Slot Side Face

CARBIDE ULTRA | TiSiN | 4 | 30° Helix | Multi Helix | CR ±0.005 | CR ±0.01 | D 0/-0.008 | D 0/-0.015 | Shank h5

D ≥2 | R < 0.5 | R≥0.5 | D < 6 | D≥6 | h5

*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
○	◎	◎	◎	◎	○	○	○	○		

단위(mm)/Unit(mm)

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_1	L	d	
NEW HMR430-006R005-045-S04	0.6	0.05	1.2	45	4	
NEW HMR430-006R01-045-S04	0.6	0.1	1.2	45	4	
NEW HMR430-008R005-045-S04	0.8	0.05	1.6	45	4	
NEW HMR430-008R01-045-S04	0.8	0.1	1.6	45	4	
NEW HMR430-008R02-045-S04	0.8	0.2	1.6	45	4	
HMR430-010R005-045-S04	1	0.05	2.5	45	4	
HMR430-010R01-045-S04	1	0.1	2.5	45	4	
HMR430-010R02-045-S04	1	0.2	2.5	45	4	
HMR430-010R03-045-S04	1	0.3	2.5	45	4	
HMR430-015R01-045-S04	1.5	0.1	4	45	4	
HMR430-015R02-045-S04	1.5	0.2	4	45	4	
HMR430-015R03-045-S04	1.5	0.3	4	45	4	
HMR430-015R05-045-S04	1.5	0.5	4	45	4	
HMR430-020R01-045-S04	2	0.1	6	45	4	
HMR430-020R02-045-S04	2	0.2	6	45	4	
HMR430-020R03-045-S04	2	0.3	6	45	4	
HMR430-020R05-045-S04	2	0.5	6	45	4	
HMR430-025R01-045-S04	2.5	0.1	7	45	4	
HMR430-025R02-045-S04	2.5	0.2	7	45	4	
HMR430-025R03-045-S04	2.5	0.3	7	45	4	
HMR430-025R05-045-S04	2.5	0.5	7	45	4	
NEW HMR430-030R01-050-S03	3	0.1	8	50	3	
HMR430-030R01-060-S06	3	0.1	8	60	6	
NEW HMR430-030R02-050-S03	3	0.2	8	50	3	
HMR430-030R02-060-S06	3	0.2	8	60	6	
NEW HMR430-030R03-050-S03	3	0.3	8	50	3	
HMR430-030R03-060-S06	3	0.3	8	60	6	
NEW HMR430-030R05-050-S03	3	0.5	8	50	3	

HMR430

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_1	L	d	
HMR430-030R05-060-S06	3	0.5	8	60	6	
NEW HMR430-030R10-050-S03	3	1	8	50	3	
HMR430-030R10-060-S06	3	1	8	60	6	
NEW HMR430-040R01-050-S04	4	0.1	10	50	4	
HMR430-040R01-080-S04	4	0.1	10	80	4	
HMR430-040R01-050-S06	4	0.1	10	50	6	
HMR430-040R01-070-S06	4	0.1	10	70	6	
NEW HMR430-040R02-050-S04	4	0.2	10	50	4	
HMR430-040R02-080-S04	4	0.2	10	80	4	
HMR430-040R02-050-S06	4	0.2	10	50	6	
HMR430-040R02-070-S06	4	0.2	10	70	6	
NEW HMR430-040R03-050-S04	4	0.3	10	50	4	
HMR430-040R03-080-S04	4	0.3	10	80	4	
HMR430-040R03-050-S06	4	0.3	10	50	6	
HMR430-040R03-070-S06	4	0.3	10	70	6	
NEW HMR430-040R05-050-S04	4	0.5	10	50	4	
HMR430-040R05-080-S04	4	0.5	10	80	4	
HMR430-040R05-050-S06	4	0.5	10	50	6	
HMR430-040R05-070-S06	4	0.5	10	70	6	
NEW HMR430-040R10-050-S04	4	1	10	50	4	
HMR430-040R10-080-S04	4	1	10	80	4	
HMR430-040R10-050-S06	4	1	10	50	6	
HMR430-040R10-070-S06	4	1	10	70	6	
HMR430-050R02-070-S06	5	0.2	10	70	6	
HMR430-050R03-070-S06	5	0.3	10	70	6	
HMR430-050R05-070-S06	5	0.5	10	70	6	
HMR430-050R10-070-S06	5	1	10	70	6	
HMR430-060R02-060-S06	6	0.2	12	60	6	
NEW HMR430-060R02-075-S06	6	0.2	12	75	6	
HMR430-060R02-090-S06	6	0.2	12	90	6	
HMR430-060R03-060-S06	6	0.3	12	60	6	
NEW HMR430-060R03-075-S06	6	0.3	12	75	6	
HMR430-060R03-090-S06	6	0.3	12	90	6	
HMR430-060R05-060-S06	6	0.5	12	60	6	
NEW HMR430-060R05-075-S06	6	0.5	12	75	6	
HMR430-060R05-090-S06	6	0.5	12	90	6	
HMR430-060R10-060-S06	6	1	12	60	6	
NEW HMR430-060R10-075-S06	6	1	12	75	6	
HMR430-060R10-090-S06	6	1	12	90	6	
NEW HMR430-060R15-060-S06	6	1.5	12	60	6	
NEW HMR430-060R15-075-S06	6	1.5	12	75	6	
NEW HMR430-060R15-090-S06	6	1.5	12	90	6	
HMR430-080R02-060-S08	8	0.2	16	60	8	
NEW HMR430-080R02-075-S08	8	0.2	16	75	8	
HMR430-080R02-090-S08	8	0.2	16	90	8	
HMR430-080R03-060-S08	8	0.3	16	60	8	
NEW HMR430-080R03-075-S08	8	0.3	16	75	8	
HMR430-080R03-090-S08	8	0.3	16	90	8	
HMR430-080R05-060-S08	8	0.5	16	60	8	

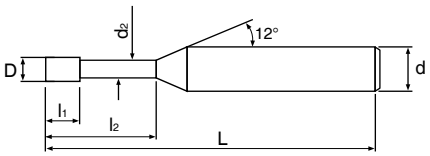
HMR430

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_1	L	d	
NEW HMR430-080R05-075-S08	8	0.5	16	75	8	
HMR430-080R05-090-S08	8	0.5	16	90	8	
HMR430-080R10-060-S08	8	1	16	60	8	
NEW HMR430-080R10-075-S08	8	1	16	75	8	
HMR430-080R10-090-S08	8	1	16	90	8	
HMR430-080R20-060-S08	8	2	16	60	8	
NEW HMR430-080R20-075-S08	8	2	16	75	8	
HMR430-080R20-090-S08	8	2	16	90	8	
NEW HMR430-100R02-070-S10	10	0.2	20	70	10	
NEW HMR430-100R02-100-S10	10	0.2	20	100	10	
NEW HMR430-100R02-130-S10	10	0.2	20	130	10	
HMR430-100R03-070-S10	10	0.3	20	70	10	
HMR430-100R03-100-S10	10	0.3	20	100	10	
HMR430-100R03-130-S10	10	0.3	20	130	10	
HMR430-100R05-070-S10	10	0.5	20	70	10	
HMR430-100R05-100-S10	10	0.5	20	100	10	
HMR430-100R05-130-S10	10	0.5	20	130	10	
HMR430-100R10-070-S10	10	1	20	70	10	
HMR430-100R10-100-S10	10	1	20	100	10	
HMR430-100R10-130-S10	10	1	20	130	10	
HMR430-100R20-070-S10	10	2	20	70	10	
HMR430-100R20-100-S10	10	2	20	100	10	
HMR430-100R20-130-S10	10	2	20	130	10	
NEW HMR430-120R02-080-S12	12	0.2	24	80	12	
NEW HMR430-120R02-100-S12	12	0.2	24	100	12	
NEW HMR430-120R02-130-S12	12	0.2	24	130	12	
HMR430-120R05-080-S12	12	0.5	24	80	12	
HMR430-120R05-100-S12	12	0.5	24	100	12	
NEW HMR430-120R05-110-S12	12	0.5	24	110	12	
HMR430-120R05-130-S12	12	0.5	24	130	12	
HMR430-120R10-080-S12	12	1	24	80	12	
HMR430-120R10-100-S12	12	1	24	100	12	
NEW HMR430-120R10-110-S12	12	1	24	110	12	
HMR430-120R10-130-S12	12	1	24	130	12	
HMR430-120R20-080-S12	12	2	24	80	12	
HMR430-120R20-100-S12	12	2	24	100	12	
HMR430-120R20-130-S12	12	2	24	130	12	

HMRE230

HY-MAX 리브 스퀘어 엔드밀 2날 헬릭스30°

HY-MAX Rib Square End Mill 2-Flute Helix30°



*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
○	◎	◎	○			○	○	○		

단위(mm)/Unit(mm)

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	l_2	l_1	d_2	L	d	
HMRE230-001005-045-S04	0.1	0.5	0.1	0.085	45	4	
HMRE230-0015005-045-S04	0.15	0.5	0.15	0.13	45	4	
HMRE230-001501-045-S04	0.15	1	0.15	0.13	45	4	
HMRE230-002005-045-S04	0.2	0.5	0.2	0.18	45	4	
HMRE230-00201-045-S04	0.2	1	0.2	0.18	45	4	
HMRE230-002015-045-S04	0.2	1.5	0.2	0.18	45	4	
HMRE230-00202-045-S04	0.2	2	0.2	0.18	45	4	
HMRE230-00301-045-S04	0.3	1	0.3	0.27	45	4	
HMRE230-003015-045-S04	0.3	1.5	0.3	0.27	45	4	
HMRE230-00302-045-S04	0.3	2	0.3	0.27	45	4	
HMRE230-00303-045-S04	0.3	3	0.3	0.27	45	4	
HMRE230-00401-045-S04	0.4	1	0.4	0.37	45	4	
HMRE230-00402-045-S04	0.4	2	0.4	0.37	45	4	
HMRE230-00403-045-S04	0.4	3	0.4	0.37	45	4	
HMRE230-00404-045-S04	0.4	4	0.4	0.37	45	4	
HMRE230-00405-045-S04	0.4	5	0.4	0.37	45	4	
HMRE230-00406-045-S04	0.4	6	0.4	0.37	45	4	
HMRE230-00502-045-S04	0.5	2	0.5	0.46	45	4	
HMRE230-00503-045-S04	0.5	3	0.5	0.46	45	4	
HMRE230-00504-045-S04	0.5	4	0.5	0.46	45	4	
HMRE230-00505-045-S04	0.5	5	0.5	0.46	45	4	
HMRE230-00506-045-S04	0.5	6	0.5	0.46	45	4	
HMRE230-00508-045-S04	0.5	8	0.5	0.46	45	4	
HMRE230-00510-045-S04	0.5	10	0.5	0.46	45	4	
HMRE230-00602-045-S04	0.6	2	0.6	0.56	45	4	
HMRE230-00603-045-S04	0.6	3	0.6	0.56	45	4	
HMRE230-00604-045-S04	0.6	4	0.6	0.56	45	4	

HMRE230

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	l_2	l_1	d_2	L	d	
HMRE230-00605-045-S04	0.6	5	0.6	0.56	45	4	
HMRE230-00606-045-S04	0.6	6	0.6	0.56	45	4	
HMRE230-00608-045-S04	0.6	8	0.6	0.56	45	4	
HMRE230-00610-045-S04	0.6	10	0.6	0.56	45	4	
HMRE230-00612-045-S04	0.6	12	0.6	0.56	45	4	
HMRE230-00702-045-S04	0.7	2	0.7	0.66	45	4	
HMRE230-00704-045-S04	0.7	4	0.7	0.66	45	4	
HMRE230-00706-045-S04	0.7	6	0.7	0.66	45	4	
HMRE230-00802-045-S04	0.8	2	0.8	0.76	45	4	
HMRE230-00803-045-S04	0.8	3	0.8	0.76	45	4	
HMRE230-00804-045-S04	0.8	4	0.8	0.76	45	4	
HMRE230-00805-045-S04	0.8	5	0.8	0.76	45	4	
HMRE230-00806-045-S04	0.8	6	0.8	0.76	45	4	
HMRE230-00808-045-S04	0.8	8	0.8	0.76	45	4	
HMRE230-00810-045-S04	0.8	10	0.8	0.76	45	4	
HMRE230-00812-045-S04	0.8	12	0.8	0.76	45	4	
HMRE230-01003-045-S04	1	3	1.5	0.96	45	4	
HMRE230-01004-045-S04	1	4	1.5	0.96	45	4	
HMRE230-01005-045-S04	1	5	1.5	0.96	45	4	
HMRE230-01006-045-S04	1	6	1.5	0.96	45	4	
HMRE230-01008-045-S04	1	8	1.5	0.96	45	4	
HMRE230-01010-045-S04	1	10	1.5	0.96	45	4	
HMRE230-01012-045-S04	1	12	1.5	0.96	45	4	
HMRE230-01014-050-S04	1	14	1.5	0.96	50	4	
HMRE230-01016-050-S04	1	16	1.5	0.96	50	4	
HMRE230-01020-060-S04	1	20	1.5	0.96	60	4	
HMRE230-01025-070-S04	1	25	1.5	0.96	70	4	
HMRE230-01204-045-S04	1.2	4	1.8	1.15	45	4	
HMRE230-01206-045-S04	1.2	6	1.8	1.15	45	4	
HMRE230-01208-045-S04	1.2	8	1.8	1.15	45	4	
HMRE230-01210-045-S04	1.2	10	1.8	1.15	45	4	
HMRE230-01212-045-S04	1.2	12	1.8	1.15	45	4	
HMRE230-01214-050-S04	1.2	14	1.8	1.15	50	4	
HMRE230-01216-050-S04	1.2	16	1.8	1.15	50	4	
HMRE230-01504-045-S04	1.5	4	2.3	1.45	45	4	
HMRE230-01506-045-S04	1.5	6	2.3	1.45	45	4	
HMRE230-01508-045-S04	1.5	8	2.3	1.45	45	4	
HMRE230-01510-045-S04	1.5	10	2.3	1.45	45	4	
HMRE230-01512-045-S04	1.5	12	2.3	1.45	45	4	
HMRE230-01514-050-S04	1.5	14	2.3	1.45	50	4	
HMRE230-01516-050-S04	1.5	16	2.3	1.45	50	4	
HMRE230-01520-060-S04	1.5	20	2.3	1.45	60	4	
HMRE230-02006-045-S04	2	6	3	1.9	45	4	
HMRE230-02008-045-S04	2	8	3	1.9	45	4	
HMRE230-02010-045-S04	2	10	3	1.9	45	4	
HMRE230-02012-045-S04	2	12	3	1.9	45	4	
HMRE230-02014-050-S04	2	14	3	1.9	50	4	
HMRE230-02016-050-S04	2	16	3	1.9	50	4	

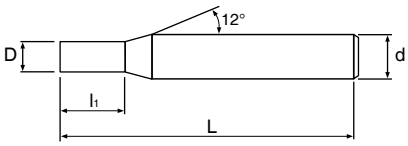
HMRE230

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	l_2	l_1	d_2	L	d	
HMRE230-02020-060-S04	2	20	3	1.9	60	4	
HMRE230-03010-050-S06	3	10	4.5	2.85	50	6	
HMRE230-03012-050-S06	3	12	4.5	2.85	50	6	
HMRE230-03014-060-S06	3	14	4.5	2.85	60	6	
HMRE230-03016-060-S06	3	16	4.5	2.85	60	6	
HMRE230-03020-060-S06	3	20	4.5	2.85	60	6	
HMRE230-03025-070-S06	3	25	4.5	2.85	70	6	
HMRE230-03030-070-S06	3	30	4.5	2.85	70	6	
HMRE230-04012-050-S06	4	12	6	3.85	50	6	
HMRE230-04016-060-S06	4	16	6	3.85	60	6	
HMRE230-04020-060-S06	4	20	6	3.85	60	6	
HMRE230-04025-070-S06	4	25	6	3.85	70	6	
HMRE230-04030-070-S06	4	30	6	3.85	70	6	
HMRE230-06020-060-S06	6	20	9	5.7	60	6	
HMRE230-06030-090-S06	6	30	9	5.7	90	6	
HMRE230-08040-090-S08	8	40	12	7.7	90	8	
HMRE230-10050-100-S10	10	50	15	9.7	100	10	
HMRE230-12055-100-S12	12	55	18	11.7	100	12	

HME230

HY-MAX 스퀘어 엔드밀 2날 헬릭스30°

HY-MAX Square End Mill 2-Flute Helix30°



*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
○	◎	◎	○			○	○	○		

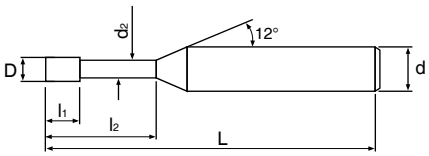
단위(mm)/Unit(mm)

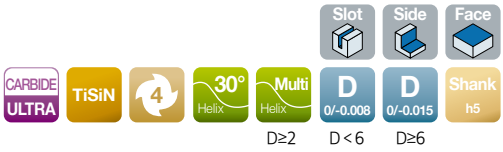
모델번호 Model No.	인선직경 Dia of Mill	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	l_1	L	d	
HME230-0010015-040-S04	0.1	0.15	40	4	
HME230-0015002-040-S04	0.15	0.2	40	4	
HME230-002004-040-S04	0.2	0.4	40	4	
HME230-003006-040-S04	0.3	0.6	40	4	
HME230-004008-040-S04	0.4	0.8	40	4	
HME230-00501-040-S04	0.5	1	40	4	
HME230-006012-040-S04	0.6	1.2	40	4	
HME230-007014-040-S04	0.7	1.4	40	4	
HME230-008016-040-S04	0.8	1.6	40	4	
HME230-010025-045-S04	1	2.5	45	4	
HME230-01203-045-S04	1.2	3	45	4	
HME230-01504-045-S04	1.5	4	45	4	
HME230-02006-045-S04	2	6	45	4	
HME230-02508-045-S04	2.5	8	45	4	
NEW HME230-03008-050-S04	3	8	50	4	
HME230-03008-050-S06	3	8	50	6	
NEW HME230-04010-050-S04	4	10	50	4	
HME230-04010-050-S06	4	10	50	6	
HME230-05015-060-S06	5	15	60	6	
HME230-06015-060-S06	6	15	60	6	
HME230-07020-065-S08	7	20	65	8	
HME230-08020-065-S08	8	20	65	8	
HME230-10025-070-S10	10	25	70	10	
HME230-12030-080-S12	12	30	80	12	
HME230-16040-100-S16	16	40	100	16	

HMRE430

HY-MAX 리브 스퀘어 엔드밀 4날 헬릭스30°

HY-MAX Rib Square End Mill 4-Flute Helix30°





*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
○	◎	◎	◎			○	○	○		

단위(mm)/Unit(mm)

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	l_2	l_1	d_2	L	d	
HMRE430-01004-045-S04	1	4	1.5	0.96	45	4	
HMRE430-01006-045-S04	1	6	1.5	0.96	45	4	
HMRE430-01008-045-S04	1	8	1.5	0.96	45	4	
HMRE430-01010-045-S04	1	10	1.5	0.96	45	4	
HMRE430-01012-045-S04	1	12	1.5	0.96	45	4	
HMRE430-01504-045-S04	1.5	4	2.3	1.45	45	4	
HMRE430-01506-045-S04	1.5	6	2.3	1.45	45	4	
HMRE430-01508-045-S04	1.5	8	2.3	1.45	45	4	
HMRE430-01510-045-S04	1.5	10	2.3	1.45	45	4	
HMRE430-01512-045-S04	1.5	12	2.3	1.45	45	4	
HMRE430-02006-045-S04	2	6	3	1.9	45	4	
HMRE430-02008-045-S04	2	8	3	1.9	45	4	
HMRE430-02010-045-S04	2	10	3	1.9	45	4	
HMRE430-02012-045-S04	2	12	3	1.9	45	4	
HMRE430-02016-050-S04	2	16	3	1.9	50	4	
HMRE430-03010-050-S06	3	10	4.5	2.85	50	6	
HMRE430-03012-050-S06	3	12	4.5	2.85	50	6	
HMRE430-03016-060-S06	3	16	4.5	2.85	60	6	
HMRE430-03020-060-S06	3	20	4.5	2.85	60	6	
HMRE430-03025-070-S06	3	25	4.5	2.85	70	6	
HMRE430-04020-080-S04	4	20	6	3.85	80	4	
HMRE430-04012-050-S06	4	12	6	3.85	50	6	
HMRE430-04016-060-S06	4	16	6	3.85	60	6	
HMRE430-04020-060-S06	4	20	6	3.85	60	6	
HMRE430-04025-070-S06	4	25	6	3.85	70	6	
HMRE430-04030-070-S06	4	30	6	3.85	70	6	
HMRE430-06020-060-S06	6	20	9	5.7	60	6	

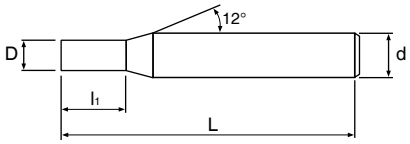
HMRE430

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	l_2	l_1	d_2	L	d	
HMRE430-06030-090-S06	6	30	9	5.7	90	6	
HMRE430-08040-090-S08	8	40	12	7.7	90	8	
HMRE430-10050-100-S10	10	50	15	9.7	100	10	
HMRE430-12055-100-S12	12	55	18	11.7	100	12	
HMRE430-12060-150-S12	12	60	18	11.7	150	12	

HME430

HY-MAX 스퀘어 엔드밀 4날 헬릭스30°

HY-MAX Square End Mill 4-Flute Helix30°



Side Face

CARBIDE ULTRA | TiSiN | 4 | 30° Helix | Multi Helix | D 0/-0.008 | D 0/-0.015 | Shank h5

D≥2 D<6 D≥6

*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
○	◎	◎	◎			○	○	○		

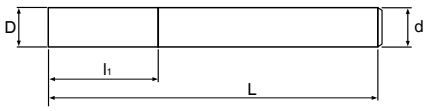
단위(mm)/Unit(mm)

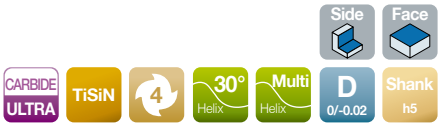
모델번호 Model No.	인선직경 Dia of Mill	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	l_1	L	d	
HME430-010025-050-S04	1	2.5	50	4	
HME430-010025-050-S06	1	2.5	50	6	
HME430-01504-050-S04	1.5	4	50	4	
HME430-01504-050-S06	1.5	4	50	6	
HME430-02006-050-S04	2	6	50	4	
HME430-02006-050-S06	2	6	50	6	
HME430-02508-050-S04	2.5	8	50	4	
HME430-02508-050-S06	2.5	8	50	6	
HME430-03008-050-S03	3	8	50	3	
HME430-03008-050-S04	3	8	50	4	
HME430-03008-050-S06	3	8	50	6	
HME430-04010-050-S04	4	10	50	4	
HME430-04010-050-S06	4	10	50	6	
HME430-05015-060-S06	5	15	60	6	
HME430-06015-060-S06	6	15	60	6	
NEW HME430-06015-075-S06	6	15	75	6	
HME430-07020-065-S08	7	20	65	8	
HME430-08020-065-S08	8	20	65	8	
HME430-10025-070-S10	10	25	70	10	
HME430-11030-080-S12	11	30	80	12	
HME430-12030-080-S12	12	30	80	12	
HME430-16040-100-S16	16	40	100	16	

HMEL430

HY-MAX 긴 날장 스퀘어 엔드밀 4날 헬릭스30°

HY-MAX Long Length Square End Mill 4-Flute Helix30°





D≥6

*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
○	◎	◎	○							

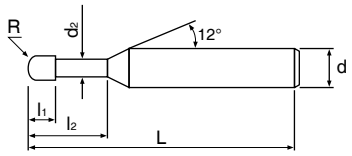
단위(mm)/Unit(mm)

모델번호 Model No.	인선직경 Dia of Mill	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	l1	L	d	
HMEL430-06020-070-S06	6	20	70	6	
HMEL430-08030-080-S08	8	30	80	8	
HMEL430-08040-090-S08	8	40	90	8	
HMEL430-10040-100-S10	10	40	100	10	
HMEL430-10050-120-S10	10	50	120	10	
HMEL430-12040-100-S12	12	40	100	12	
HMEL430-12050-120-S12	12	50	120	12	
HMEL430-12060-130-S12	12	60	130	12	
HMEL430-12070-150-S12	12	70	150	12	
HMEL430-16060-130-S16	16	60	130	16	
HMEL430-16080-160-S16	16	80	160	16	

WMRB230 NEW

WIDE-MAX 리브 볼 엔드밀 2날 헬릭스30°

WIDE-MAX Rib Ball End Mill 2-Flute Helix30°



R < 3 R≥3 D < 6 D≥6

*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
◎	◎	◎	○			◎	○	○	○	

단위(mm)/Unit(mm)

모델번호 Model No.	볼반경 Radius of Ball Nose	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	R	l_2	l_1	d_2	L	d	
WMRB230-001003-045-S04	R0.05	0.3	0.1	0.085	45	4	
WMRB230-001005-045-S04	R0.05	0.5	0.1	0.085	45	4	
WMRB230-0015005-045-S04	R0.075	0.5	0.15	0.13	45	4	
WMRB230-001501-045-S04	R0.075	1	0.15	0.13	45	4	
WMRB230-002005-045-S04	R0.1	0.5	0.2	0.18	45	4	
WMRB230-00201-045-S04	R0.1	1	0.2	0.18	45	4	
WMRB230-002015-045-S04	R0.1	1.5	0.2	0.18	45	4	
WMRB230-00202-045-S04	R0.1	2	0.2	0.18	45	4	
WMRB230-003005-045-S04	R0.15	0.5	0.3	0.27	45	4	
WMRB230-00301-045-S04	R0.15	1	0.3	0.27	45	4	
WMRB230-003015-045-S04	R0.15	1.5	0.3	0.27	45	4	
WMRB230-00302-045-S04	R0.15	2	0.3	0.27	45	4	
WMRB230-00303-045-S04	R0.15	3	0.3	0.27	45	4	
WMRB230-00401-045-S04	R0.2	1	0.4	0.37	45	4	
WMRB230-004015-045-S04	R0.2	1.5	0.4	0.37	45	4	
WMRB230-00402-045-S04	R0.2	2	0.4	0.37	45	4	
WMRB230-00403-045-S04	R0.2	3	0.4	0.37	45	4	
WMRB230-00404-045-S04	R0.2	4	0.4	0.37	45	4	
WMRB230-00405-045-S04	R0.2	5	0.4	0.37	45	4	
WMRB230-00406-045-S04	R0.2	6	0.4	0.37	45	4	
WMRB230-00501-045-S04	R0.25	1	0.5	0.46	45	4	
WMRB230-00502-045-S04	R0.25	2	0.5	0.46	45	4	
WMRB230-00503-045-S04	R0.25	3	0.5	0.46	45	4	
WMRB230-00504-045-S04	R0.25	4	0.5	0.46	45	4	
WMRB230-00505-045-S04	R0.25	5	0.5	0.46	45	4	
WMRB230-00506-045-S04	R0.25	6	0.5	0.46	45	4	
WMRB230-00508-045-S04	R0.25	8	0.5	0.46	45	4	
WMRB230-00510-045-S04	R0.25	10	0.5	0.46	45	4	

WMRB230

모델번호 Model No.	볼반경 Radius of Ball Nose	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	R	l_2	l_1	d_2	L	d	
WMRB230-00601-045-S04	R0.3	1	0.6	0.56	45	4	
WMRB230-00602-045-S04	R0.3	2	0.6	0.56	45	4	
WMRB230-00603-045-S04	R0.3	3	0.6	0.56	45	4	
WMRB230-00604-045-S04	R0.3	4	0.6	0.56	45	4	
WMRB230-00605-045-S04	R0.3	5	0.6	0.56	45	4	
WMRB230-00606-045-S04	R0.3	6	0.6	0.56	45	4	
WMRB230-00607-045-S04	R0.3	7	0.6	0.56	45	4	
WMRB230-00608-045-S04	R0.3	8	0.6	0.56	45	4	
WMRB230-00610-045-S04	R0.3	10	0.6	0.56	45	4	
WMRB230-00612-045-S04	R0.3	12	0.6	0.56	45	4	
WMRB230-00702-045-S04	R0.35	2	0.7	0.66	45	4	
WMRB230-00703-045-S04	R0.35	3	0.7	0.66	45	4	
WMRB230-00704-045-S04	R0.35	4	0.7	0.66	45	4	
WMRB230-00705-045-S04	R0.35	5	0.7	0.66	45	4	
WMRB230-00706-045-S04	R0.35	6	0.7	0.66	45	4	
WMRB230-00707-045-S04	R0.35	7	0.7	0.66	45	4	
WMRB230-00708-045-S04	R0.35	8	0.7	0.66	45	4	
WMRB230-00802-045-S04	R0.4	2	0.8	0.76	45	4	
WMRB230-00803-045-S04	R0.4	3	0.8	0.76	45	4	
WMRB230-00804-045-S04	R0.4	4	0.8	0.76	45	4	
WMRB230-00805-045-S04	R0.4	5	0.8	0.76	45	4	
WMRB230-00806-045-S04	R0.4	6	0.8	0.76	45	4	
WMRB230-00807-045-S04	R0.4	7	0.8	0.76	45	4	
WMRB230-00808-045-S04	R0.4	8	0.8	0.76	45	4	
WMRB230-00810-045-S04	R0.4	10	0.8	0.76	45	4	
WMRB230-00812-045-S04	R0.4	12	0.8	0.76	45	4	
WMRB230-01003-045-S04	R0.5	3	1	0.96	45	4	
WMRB230-01004-045-S04	R0.5	4	1	0.96	45	4	
WMRB230-01005-045-S04	R0.5	5	1	0.96	45	4	
WMRB230-01006-045-S04	R0.5	6	1	0.96	45	4	
WMRB230-01008-045-S04	R0.5	8	1	0.96	45	4	
WMRB230-01010-045-S04	R0.5	10	1	0.96	45	4	
WMRB230-01012-045-S04	R0.5	12	1	0.96	45	4	
WMRB230-01014-050-S04	R0.5	14	1	0.96	50	4	
WMRB230-01016-050-S04	R0.5	16	1	0.96	50	4	
WMRB230-01020-060-S04	R0.5	20	1	0.96	60	4	
WMRB230-01025-070-S04	R0.5	25	1	0.96	70	4	
WMRB230-01204-045-S04	R0.6	4	1.2	1.15	45	4	
WMRB230-01206-045-S04	R0.6	6	1.2	1.15	45	4	
WMRB230-01208-045-S04	R0.6	8	1.2	1.15	45	4	
WMRB230-01210-045-S04	R0.6	10	1.2	1.15	45	4	
WMRB230-01212-045-S04	R0.6	12	1.2	1.15	45	4	
WMRB230-01214-050-S04	R0.6	14	1.2	1.15	50	4	
WMRB230-01216-050-S04	R0.6	16	1.2	1.15	50	4	
WMRB230-01220-060-S04	R0.6	20	1.2	1.15	60	4	
WMRB230-01504-045-S04	R0.75	4	1.5	1.45	45	4	
WMRB230-01506-045-S04	R0.75	6	1.5	1.45	45	4	
WMRB230-01508-045-S04	R0.75	8	1.5	1.45	45	4	
WMRB230-01510-045-S04	R0.75	10	1.5	1.45	45	4	

모델번호 Model No.	볼반경 Radius of Ball Nose	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	R	l_2	l_1	d_2	L	d	
WMRB230-01512-045-S04	R0.75	12	1.5	1.45	45	4	
WMRB230-01514-050-S04	R0.75	14	1.5	1.45	50	4	
WMRB230-01516-050-S04	R0.75	16	1.5	1.45	50	4	
WMRB230-01520-060-S04	R0.75	20	1.5	1.45	60	4	
WMRB230-02004-045-S04	R1	4	2	1.9	45	4	
WMRB230-02006-045-S04	R1	6	2	1.9	45	4	
WMRB230-02008-045-S04	R1	8	2	1.9	45	4	
WMRB230-02010-045-S04	R1	10	2	1.9	45	4	
WMRB230-02012-045-S04	R1	12	2	1.9	45	4	
WMRB230-02014-050-S04	R1	14	2	1.9	50	4	
WMRB230-02016-050-S04	R1	16	2	1.9	50	4	
WMRB230-02020-060-S04	R1	20	2	1.9	60	4	
WMRB230-02025-070-S04	R1	25	2	1.9	70	4	
WMRB230-02030-070-S04	R1	30	2	1.9	70	4	
WMRB230-02035-080-S04	R1	35	2	1.9	80	4	
WMRB230-02040-080-S04	R1	40	2	1.9	80	4	
WMRB230-02506-045-S04	R1.25	6	2.5	2.35	45	4	
WMRB230-02508-045-S04	R1.25	8	2.5	2.35	45	4	
WMRB230-02510-045-S04	R1.25	10	2.5	2.35	45	4	
WMRB230-02512-045-S04	R1.25	12	2.5	2.35	45	4	
WMRB230-02516-050-S04	R1.25	16	2.5	2.35	50	4	
WMRB230-02520-060-S04	R1.25	20	2.5	2.35	60	4	
WMRB230-02525-070-S04	R1.25	25	2.5	2.35	70	4	
WMRB230-03008-050-S06	R1.5	8	3	2.85	50	6	
WMRB230-03010-050-S06	R1.5	10	3	2.85	50	6	
WMRB230-03012-050-S06	R1.5	12	3	2.85	50	6	
WMRB230-03014-060-S06	R1.5	14	3	2.85	60	6	
WMRB230-03016-060-S06	R1.5	16	3	2.85	60	6	
WMRB230-03020-060-S06	R1.5	20	3	2.85	60	6	
WMRB230-03025-070-S06	R1.5	25	3	2.85	70	6	
WMRB230-03030-070-S06	R1.5	30	3	2.85	70	6	
WMRB230-03035-080-S06	R1.5	35	3	2.85	80	6	
WMRB230-03040-080-S06	R1.5	40	3	2.85	80	6	
WMRB230-04010-050-S06	R2	10	4	3.85	50	6	
WMRB230-04012-050-S06	R2	12	4	3.85	50	6	
WMRB230-04016-060-S06	R2	16	4	3.85	60	6	
WMRB230-04020-060-S06	R2	20	4	3.85	60	6	
WMRB230-04025-070-S06	R2	25	4	3.85	70	6	
WMRB230-04030-070-S06	R2	30	4	3.85	70	6	
WMRB230-04035-080-S06	R2	35	4	3.85	80	6	
WMRB230-04040-080-S06	R2	40	4	3.85	80	6	
WMRB230-05020-060-S06	R2.5	20	5	4.8	60	6	
WMRB230-05030-070-S06	R2.5	30	5	4.8	70	6	
WMRB230-06020-060-S06	R3	20	7	5.7	60	6	
WMRB230-06025-070-S06	R3	25	7	5.7	70	6	
WMRB230-06030-080-S06	R3	30	7	5.7	80	6	

NOTE

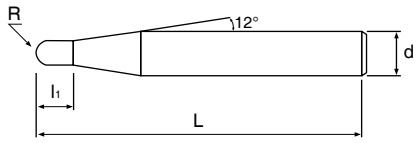
생크 테이퍼 각도는 약12도 입니다. 정확한 값이 아니므로 피삭재와 간섭의 염려가 있을 경우에는 반드시 확인해 주십시오.

The shank taper angle is about 12°. This angle is not an exact value and to avoid contact with the workpiece, we recommend the user check the precise value of this angle.

WMB230 NEW

WIDE-MAX 볼 엔드밀 2날 헬릭스30°

WIDE-MAX Ball End Mill 2-Flute Helix30°



R < 3 | R ≥ 3 | D < 6 | D ≥ 6

*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
◎	◎	◎	○			◎	○	○	○	

단위(mm)/Unit(mm)

모델번호 Model No.	볼반경 Radius of Ball Nose	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	R	l_1	L	d	
WMB230-003003-040-S04	R0.15	0.3	40	4	
WMB230-004004-040-S04	R0.2	0.4	40	4	
WMB230-005005-040-S04	R0.25	0.5	40	4	
WMB230-006006-040-S04	R0.3	0.6	40	4	
WMB230-008008-040-S04	R0.4	0.8	40	4	
WMB230-01002-050-S04	R0.5	2	50	4	
WMB230-01002-050-S06	R0.5	2	50	6	
WMB230-01503-050-S04	R0.75	3	50	4	
WMB230-01503-050-S06	R0.75	3	50	6	
WMB230-02004-050-S04	R1	4	50	4	
WMB230-02004-050-S06	R1	4	50	6	
WMB230-02505-050-S04	R1.25	5	50	4	
WMB230-02505-050-S06	R1.25	5	50	6	
WMB230-03006-050-S03	R1.5	6	50	3	
WMB230-03006-050-S04	R1.5	6	50	4	
WMB230-03005-050-S06	R1.5	5	50	6	
WMB230-03006-060-S06	R1.5	6	60	6	
WMB230-04008-050-S04	R2	8	50	4	
WMB230-04008-060-S04	R2	8	60	4	
WMB230-04008-080-S04	R2	8	80	4	
WMB230-04007-050-S06	R2	7	50	6	
WMB230-04008-070-S06	R2	8	70	6	
WMB230-05010-075-S06	R2.5	10	75	6	
WMB230-06010-060-S06	R3	10	60	6	
WMB230-06010-075-S06	R3	10	75	6	
WMB230-06012-090-S06	R3	12	90	6	
WMB230-08012-060-S08	R4	12	60	8	
WMB230-08013-080-S08	R4	13	80	8	

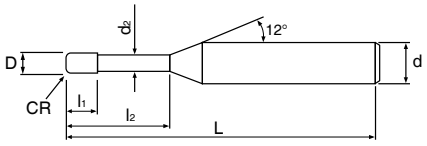
WMB230

모델번호 Model No.	볼반경 Radius of Ball Nose	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	R	l_1	L	d	
WMB230-08014-100-S08	R4	14	100	8	
WMB230-10016-080-S10	R5	16	80	10	
WMB230-10018-100-S10	R5	18	100	10	
WMB230-10018-130-S10	R5	18	130	10	
WMB230-12018-090-S12	R6	18	90	12	
WMB230-12022-110-S12	R6	22	110	12	
WMB230-12022-130-S12	R6	22	130	12	
WMB230-12022-150-S12	R6	22	150	12	
WMB230-16030-130-S16	R8	30	130	16	

WMRR430 NEW

WIDE-MAX 리브 래디우스 엔드밀 4날 헬릭스30°

WIDE-MAX Rib Radius End Mill 4-Flute Helix30°



* 적용 피삭재 (Applicable Work Material)

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
◎	◎	◎	○			◎	○	○	○	

단위(mm)/Unit(mm)

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
WMRR430-010R005-025-045-S04	1	0.05	2.5	1.5	0.96	45	4	
WMRR430-010R005-04-045-S04	1	0.05	4	1.5	0.96	45	4	
WMRR430-010R005-06-045-S04	1	0.05	6	1.5	0.96	45	4	
WMRR430-010R005-08-045-S04	1	0.05	8	1.5	0.96	45	4	
WMRR430-010R005-10-045-S04	1	0.05	10	1.5	0.96	45	4	
WMRR430-010R005-12-045-S04	1	0.05	12	1.5	0.96	45	4	
WMRR430-010R01-025-045-S04	1	0.1	2.5	1.5	0.96	45	4	
WMRR430-010R01-04-045-S04	1	0.1	4	1.5	0.96	45	4	
WMRR430-010R01-06-045-S04	1	0.1	6	1.5	0.96	45	4	
WMRR430-010R01-08-045-S04	1	0.1	8	1.5	0.96	45	4	
WMRR430-010R01-10-045-S04	1	0.1	10	1.5	0.96	45	4	
WMRR430-010R01-12-045-S04	1	0.1	12	1.5	0.96	45	4	
WMRR430-010R02-025-045-S04	1	0.2	2.5	1.5	0.96	45	4	
WMRR430-010R02-04-045-S04	1	0.2	4	1.5	0.96	45	4	
WMRR430-010R02-06-045-S04	1	0.2	6	1.5	0.96	45	4	
WMRR430-010R02-08-045-S04	1	0.2	8	1.5	0.96	45	4	
WMRR430-010R02-10-045-S04	1	0.2	10	1.5	0.96	45	4	
WMRR430-010R02-12-045-S04	1	0.2	12	1.5	0.96	45	4	
WMRR430-010R03-025-045-S04	1	0.3	2.5	1.5	0.96	45	4	
WMRR430-010R03-04-045-S04	1	0.3	4	1.5	0.96	45	4	
WMRR430-010R03-06-045-S04	1	0.3	6	1.5	0.96	45	4	
WMRR430-010R03-08-045-S04	1	0.3	8	1.5	0.96	45	4	
WMRR430-010R03-10-045-S04	1	0.3	10	1.5	0.96	45	4	
WMRR430-010R03-12-045-S04	1	0.3	12	1.5	0.96	45	4	
WMRR430-015R01-04-045-S04	1.5	0.1	4	2.3	1.45	45	4	
WMRR430-015R01-06-045-S04	1.5	0.1	6	2.3	1.45	45	4	
WMRR430-015R01-08-045-S04	1.5	0.1	8	2.3	1.45	45	4	
WMRR430-015R01-10-045-S04	1.5	0.1	10	2.3	1.45	45	4	

WMRR430

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
WMRR430-015R01-12-045-S04	1.5	0.1	12	2.3	1.45	45	4	
WMRR430-015R01-14-050-S04	1.5	0.1	14	2.3	1.45	50	4	
WMRR430-015R01-16-050-S04	1.5	0.1	16	2.3	1.45	50	4	
WMRR430-015R01-20-060-S04	1.5	0.1	20	2.3	1.45	60	4	
WMRR430-015R02-04-045-S04	1.5	0.2	4	2.3	1.45	45	4	
WMRR430-015R02-06-045-S04	1.5	0.2	6	2.3	1.45	45	4	
WMRR430-015R02-08-045-S04	1.5	0.2	8	2.3	1.45	45	4	
WMRR430-015R02-10-045-S04	1.5	0.2	10	2.3	1.45	45	4	
WMRR430-015R02-12-045-S04	1.5	0.2	12	2.3	1.45	45	4	
WMRR430-015R02-14-050-S04	1.5	0.2	14	2.3	1.45	50	4	
WMRR430-015R02-16-050-S04	1.5	0.2	16	2.3	1.45	50	4	
WMRR430-015R02-20-060-S04	1.5	0.2	20	2.3	1.45	60	4	
WMRR430-015R03-04-045-S04	1.5	0.3	4	2.3	1.45	45	4	
WMRR430-015R03-06-045-S04	1.5	0.3	6	2.3	1.45	45	4	
WMRR430-015R03-08-045-S04	1.5	0.3	8	2.3	1.45	45	4	
WMRR430-015R03-10-045-S04	1.5	0.3	10	2.3	1.45	45	4	
WMRR430-015R03-12-045-S04	1.5	0.3	12	2.3	1.45	45	4	
WMRR430-015R03-14-050-S04	1.5	0.3	14	2.3	1.45	50	4	
WMRR430-015R03-16-050-S04	1.5	0.3	16	2.3	1.45	50	4	
WMRR430-015R03-20-060-S04	1.5	0.3	20	2.3	1.45	60	4	
WMRR430-015R05-04-045-S04	1.5	0.5	4	2.3	1.45	45	4	
WMRR430-015R05-06-045-S04	1.5	0.5	6	2.3	1.45	45	4	
WMRR430-015R05-08-045-S04	1.5	0.5	8	2.3	1.45	45	4	
WMRR430-015R05-10-045-S04	1.5	0.5	10	2.3	1.45	45	4	
WMRR430-015R05-12-045-S04	1.5	0.5	12	2.3	1.45	45	4	
WMRR430-015R05-14-050-S04	1.5	0.5	14	2.3	1.45	50	4	
WMRR430-015R05-16-050-S04	1.5	0.5	16	2.3	1.45	50	4	
WMRR430-015R05-20-060-S04	1.5	0.5	20	2.3	1.45	60	4	
WMRR430-020R01-06-045-S04	2	0.1	6	3	1.9	45	4	
WMRR430-020R01-08-045-S04	2	0.1	8	3	1.9	45	4	
WMRR430-020R01-10-045-S04	2	0.1	10	3	1.9	45	4	
WMRR430-020R01-12-045-S04	2	0.1	12	3	1.9	45	4	
WMRR430-020R01-14-050-S04	2	0.1	14	3	1.9	50	4	
WMRR430-020R01-16-050-S04	2	0.1	16	3	1.9	50	4	
WMRR430-020R01-20-060-S04	2	0.1	20	3	1.9	60	4	
WMRR430-020R02-06-045-S04	2	0.2	6	3	1.9	45	4	
WMRR430-020R02-08-045-S04	2	0.2	8	3	1.9	45	4	
WMRR430-020R02-10-045-S04	2	0.2	10	3	1.9	45	4	
WMRR430-020R02-12-045-S04	2	0.2	12	3	1.9	45	4	
WMRR430-020R02-14-050-S04	2	0.2	14	3	1.9	50	4	
WMRR430-020R02-16-050-S04	2	0.2	16	3	1.9	50	4	
WMRR430-020R02-20-060-S04	2	0.2	20	3	1.9	60	4	
WMRR430-020R03-06-045-S04	2	0.3	6	3	1.9	45	4	
WMRR430-020R03-08-045-S04	2	0.3	8	3	1.9	45	4	
WMRR430-020R03-10-045-S04	2	0.3	10	3	1.9	45	4	
WMRR430-020R03-12-045-S04	2	0.3	12	3	1.9	45	4	
WMRR430-020R03-14-050-S04	2	0.3	14	3	1.9	50	4	
WMRR430-020R03-16-050-S04	2	0.3	16	3	1.9	50	4	

WMRR430

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
WMRR430-020R03-20-060-S04	2	0.3	20	3	1.9	60	4	
WMRR430-020R05-06-045-S04	2	0.5	6	3	1.9	45	4	
WMRR430-020R05-08-045-S04	2	0.5	8	3	1.9	45	4	
WMRR430-020R05-10-045-S04	2	0.5	10	3	1.9	45	4	
WMRR430-020R05-12-045-S04	2	0.5	12	3	1.9	45	4	
WMRR430-020R05-14-050-S04	2	0.5	14	3	1.9	50	4	
WMRR430-020R05-16-050-S04	2	0.5	16	3	1.9	50	4	
WMRR430-020R05-20-060-S04	2	0.5	20	3	1.9	60	4	
WMRR430-025R02-10-045-S04	2.5	0.2	10	4	2.35	45	4	
WMRR430-025R02-16-050-S04	2.5	0.2	16	4	2.35	50	4	
WMRR430-025R02-20-060-S04	2.5	0.2	20	4	2.35	60	4	
WMRR430-025R05-10-045-S04	2.5	0.5	10	4	2.35	45	4	
WMRR430-025R05-16-050-S04	2.5	0.5	16	4	2.35	50	4	
WMRR430-025R05-20-060-S04	2.5	0.5	20	4	2.35	60	4	
WMRR430-030R01-10-050-S06	3	0.1	10	4.5	2.85	50	6	
WMRR430-030R01-12-050-S06	3	0.1	12	4.5	2.85	50	6	
WMRR430-030R01-16-060-S06	3	0.1	16	4.5	2.85	60	6	
WMRR430-030R01-20-060-S06	3	0.1	20	4.5	2.85	60	6	
WMRR430-030R01-25-070-S06	3	0.1	25	4.5	2.85	70	6	
WMRR430-030R01-30-070-S06	3	0.1	30	4.5	2.85	70	6	
WMRR430-030R01-35-080-S06	3	0.1	35	4.5	2.85	80	6	
WMRR430-030R02-10-050-S06	3	0.2	10	4.5	2.85	50	6	
WMRR430-030R02-12-050-S06	3	0.2	12	4.5	2.85	50	6	
WMRR430-030R02-16-060-S06	3	0.2	16	4.5	2.85	60	6	
WMRR430-030R02-20-060-S06	3	0.2	20	4.5	2.85	60	6	
WMRR430-030R02-25-070-S06	3	0.2	25	4.5	2.85	70	6	
WMRR430-030R02-30-070-S06	3	0.2	30	4.5	2.85	70	6	
WMRR430-030R02-35-080-S06	3	0.2	35	4.5	2.85	80	6	
WMRR430-030R03-10-050-S06	3	0.3	10	4.5	2.85	50	6	
WMRR430-030R03-12-050-S06	3	0.3	12	4.5	2.85	50	6	
WMRR430-030R03-16-060-S06	3	0.3	16	4.5	2.85	60	6	
WMRR430-030R03-20-060-S06	3	0.3	20	4.5	2.85	60	6	
WMRR430-030R03-25-070-S06	3	0.3	25	4.5	2.85	70	6	
WMRR430-030R03-30-070-S06	3	0.3	30	4.5	2.85	70	6	
WMRR430-030R03-35-080-S06	3	0.3	35	4.5	2.85	80	6	
WMRR430-030R05-10-050-S06	3	0.5	10	4.5	2.85	50	6	
WMRR430-030R05-12-050-S06	3	0.5	12	4.5	2.85	50	6	
WMRR430-030R05-16-060-S06	3	0.5	16	4.5	2.85	60	6	
WMRR430-030R05-20-060-S06	3	0.5	20	4.5	2.85	60	6	
WMRR430-030R05-25-070-S06	3	0.5	25	4.5	2.85	70	6	
WMRR430-030R05-30-070-S06	3	0.5	30	4.5	2.85	70	6	
WMRR430-030R05-35-080-S06	3	0.5	35	4.5	2.85	80	6	
WMRR430-030R10-10-050-S06	3	1	10	4.5	2.85	50	6	
WMRR430-030R10-12-050-S06	3	1	12	4.5	2.85	50	6	
WMRR430-030R10-16-060-S06	3	1	16	4.5	2.85	60	6	
WMRR430-030R10-20-060-S06	3	1	20	4.5	2.85	60	6	
WMRR430-030R10-25-070-S06	3	1	25	4.5	2.85	70	6	
WMRR430-030R10-30-070-S06	3	1	30	4.5	2.85	70	6	

WMRR430

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
WMRR430-030R10-35-080-S06	3	1	35	4.5	2.85	80	6	
WMRR430-040R01-12-050-S06	4	0.1	12	6	3.85	50	6	
WMRR430-040R01-16-060-S06	4	0.1	16	6	3.85	60	6	
WMRR430-040R01-20-060-S06	4	0.1	20	6	3.85	60	6	
WMRR430-040R01-25-070-S06	4	0.1	25	6	3.85	70	6	
WMRR430-040R01-30-070-S06	4	0.1	30	6	3.85	70	6	
WMRR430-040R01-35-080-S06	4	0.1	35	6	3.85	80	6	
WMRR430-040R02-12-050-S06	4	0.2	12	6	3.85	50	6	
WMRR430-040R02-16-060-S06	4	0.2	16	6	3.85	60	6	
WMRR430-040R02-20-060-S06	4	0.2	20	6	3.85	60	6	
WMRR430-040R02-25-070-S06	4	0.2	25	6	3.85	70	6	
WMRR430-040R02-30-070-S06	4	0.2	30	6	3.85	70	6	
WMRR430-040R02-35-080-S06	4	0.2	35	6	3.85	80	6	
WMRR430-040R03-12-050-S06	4	0.3	12	6	3.85	50	6	
WMRR430-040R03-16-060-S06	4	0.3	16	6	3.85	60	6	
WMRR430-040R03-20-060-S06	4	0.3	20	6	3.85	60	6	
WMRR430-040R03-25-070-S06	4	0.3	25	6	3.85	70	6	
WMRR430-040R03-30-070-S06	4	0.3	30	6	3.85	70	6	
WMRR430-040R03-35-080-S06	4	0.3	35	6	3.85	80	6	
WMRR430-040R05-12-050-S06	4	0.5	12	6	3.85	50	6	
WMRR430-040R05-16-060-S06	4	0.5	16	6	3.85	60	6	
WMRR430-040R05-20-060-S06	4	0.5	20	6	3.85	60	6	
WMRR430-040R05-25-070-S06	4	0.5	25	6	3.85	70	6	
WMRR430-040R05-30-070-S06	4	0.5	30	6	3.85	70	6	
WMRR430-040R05-35-080-S06	4	0.5	35	6	3.85	80	6	
WMRR430-040R10-12-050-S06	4	1	12	6	3.85	50	6	
WMRR430-040R10-16-060-S06	4	1	16	6	3.85	60	6	
WMRR430-040R10-20-060-S06	4	1	20	6	3.85	60	6	
WMRR430-040R10-25-070-S06	4	1	25	6	3.85	70	6	
WMRR430-040R10-30-070-S06	4	1	30	6	3.85	70	6	
WMRR430-040R10-35-080-S06	4	1	35	6	3.85	80	6	
WMRR430-050R02-20-060-S06	5	0.2	20	7.5	4.8	60	6	
WMRR430-050R03-20-060-S06	5	0.3	20	7.5	4.8	60	6	
WMRR430-050R05-20-060-S06	5	0.5	20	7.5	4.8	60	6	
WMRR430-050R10-20-060-S06	5	1	20	7.5	4.8	60	6	
WMRR430-060R02-20-060-S06	6	0.2	20	9	5.7	60	6	
WMRR430-060R02-30-090-S06	6	0.2	30	9	5.7	90	6	
WMRR430-060R03-20-060-S06	6	0.3	20	9	5.7	60	6	
WMRR430-060R03-30-090-S06	6	0.3	30	9	5.7	90	6	
WMRR430-060R05-20-060-S06	6	0.5	20	9	5.7	60	6	
WMRR430-060R05-30-090-S06	6	0.5	30	9	5.7	90	6	
WMRR430-060R10-20-060-S06	6	1	20	9	5.7	60	6	
WMRR430-060R10-30-090-S06	6	1	30	9	5.7	90	6	
WMRR430-080R02-24-065-S08	8	0.2	24	12	7.7	65	8	
WMRR430-080R02-40-090-S08	8	0.2	40	12	7.7	90	8	
WMRR430-080R03-24-065-S08	8	0.3	24	12	7.7	65	8	
WMRR430-080R03-40-090-S08	8	0.3	40	12	7.7	90	8	
WMRR430-080R05-24-065-S08	8	0.5	24	12	7.7	65	8	

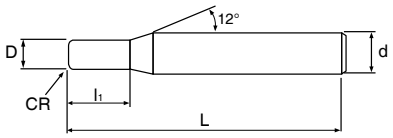
WMRR430

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
WMRR430-080R05-40-090-S08	8	0.5	40	12	7.7	90	8	
WMRR430-080R10-24-065-S08	8	1	24	12	7.7	65	8	
WMRR430-080R10-40-090-S08	8	1	40	12	7.7	90	8	
WMRR430-080R20-24-065-S08	8	2	24	12	7.7	65	8	
WMRR430-080R20-40-090-S08	8	2	40	12	7.7	90	8	
WMRR430-100R02-30-070-S10	10	0.2	30	15	9.7	70	10	
WMRR430-100R02-50-100-S10	10	0.2	50	15	9.7	100	10	
WMRR430-100R03-30-070-S10	10	0.3	30	15	9.7	70	10	
WMRR430-100R03-50-100-S10	10	0.3	50	15	9.7	100	10	
WMRR430-100R05-30-070-S10	10	0.5	30	15	9.7	70	10	
WMRR430-100R05-50-100-S10	10	0.5	50	15	9.7	100	10	
WMRR430-100R10-30-070-S10	10	1	30	15	9.7	70	10	
WMRR430-100R10-50-100-S10	10	1	50	15	9.7	100	10	
WMRR430-100R20-30-070-S10	10	2	30	15	9.7	70	10	
WMRR430-100R20-50-100-S10	10	2	50	15	9.7	100	10	
WMRR430-120R02-30-080-S12	12	0.2	30	18	11.7	80	12	
WMRR430-120R02-55-110-S12	12	0.2	55	18	11.7	110	12	
WMRR430-120R02-60-150-S12	12	0.2	60	18	11.7	150	12	
WMRR430-120R05-30-080-S12	12	0.5	30	18	11.7	80	12	
WMRR430-120R05-55-110-S12	12	0.5	55	18	11.7	110	12	
WMRR430-120R05-60-150-S12	12	0.5	60	18	11.7	150	12	
WMRR430-120R10-30-080-S12	12	1	30	18	11.7	80	12	
WMRR430-120R10-55-110-S12	12	1	55	18	11.7	110	12	
WMRR430-120R10-60-150-S12	12	1	60	18	11.7	150	12	
WMRR430-120R20-30-080-S12	12	2	30	18	11.7	80	12	
WMRR430-120R20-55-110-S12	12	2	55	18	11.7	110	12	
WMRR430-120R20-60-150-S12	12	2	60	18	11.7	150	12	

WMR430 NEW

WIDE-MAX 래디우스 엔드밀 4날 헬릭스30°

WIDE-MAX Radius End Mill 4-Flute Helix30°



*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
◎	◎	◎	○			◎	○	○	○	

단위(mm)/Unit(mm)

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_1	L	d	
WMR430-010R005-045-S04	1	0.05	2.5	45	4	
WMR430-010R01-045-S04	1	0.1	2.5	45	4	
WMR430-010R02-045-S04	1	0.2	2.5	45	4	
WMR430-010R03-045-S04	1	0.3	2.5	45	4	
WMR430-015R01-045-S04	1.5	0.1	4	45	4	
WMR430-015R02-045-S04	1.5	0.2	4	45	4	
WMR430-015R03-045-S04	1.5	0.3	4	45	4	
WMR430-015R05-045-S04	1.5	0.5	4	45	4	
WMR430-020R01-045-S04	2	0.1	6	45	4	
WMR430-020R02-045-S04	2	0.2	6	45	4	
WMR430-020R03-045-S04	2	0.3	6	45	4	
WMR430-020R05-045-S04	2	0.5	6	45	4	
WMR430-025R01-045-S04	2.5	0.1	7	45	4	
WMR430-025R02-045-S04	2.5	0.2	7	45	4	
WMR430-025R03-045-S04	2.5	0.3	7	45	4	
WMR430-025R05-045-S04	2.5	0.5	7	45	4	
WMR430-030R01-050-S03	3	0.1	8	50	3	
WMR430-030R01-060-S06	3	0.1	8	60	6	
WMR430-030R02-050-S03	3	0.2	8	50	3	
WMR430-030R02-060-S06	3	0.2	8	60	6	
WMR430-030R03-050-S03	3	0.3	8	50	3	
WMR430-030R03-060-S06	3	0.3	8	60	6	
WMR430-030R05-050-S03	3	0.5	8	50	3	
WMR430-030R05-060-S06	3	0.5	8	60	6	
WMR430-030R10-050-S03	3	1	8	50	3	
WMR430-030R10-060-S06	3	1	8	60	6	
WMR430-040R01-050-S04	4	0.1	10	50	4	

WMR430

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_1	L	d	
WMR430-040R01-080-S04	4	0.1	10	80	4	
WMR430-040R01-050-S06	4	0.1	10	50	6	
WMR430-040R01-070-S06	4	0.1	10	70	6	
WMR430-040R02-050-S04	4	0.2	10	50	4	
WMR430-040R02-080-S04	4	0.2	10	80	4	
WMR430-040R02-050-S06	4	0.2	10	50	6	
WMR430-040R02-070-S06	4	0.2	10	70	6	
WMR430-040R03-050-S04	4	0.3	10	50	4	
WMR430-040R03-080-S04	4	0.3	10	80	4	
WMR430-040R03-050-S06	4	0.3	10	50	6	
WMR430-040R03-070-S06	4	0.3	10	70	6	
WMR430-040R05-050-S04	4	0.5	10	50	4	
WMR430-040R05-080-S04	4	0.5	10	80	4	
WMR430-040R05-050-S06	4	0.5	10	50	6	
WMR430-040R05-070-S06	4	0.5	10	70	6	
WMR430-040R10-050-S04	4	1	10	50	4	
WMR430-040R10-080-S04	4	1	10	80	4	
WMR430-040R10-050-S06	4	1	10	50	6	
WMR430-040R10-070-S06	4	1	10	70	6	
WMR430-050R02-070-S06	5	0.2	10	70	6	
WMR430-050R03-070-S06	5	0.3	10	70	6	
WMR430-050R05-070-S06	5	0.5	10	70	6	
WMR430-050R10-070-S06	5	1	10	70	6	
WMR430-060R02-060-S06	6	0.2	12	60	6	
WMR430-060R02-075-S06	6	0.2	12	75	6	
WMR430-060R02-090-S06	6	0.2	12	90	6	
WMR430-060R03-060-S06	6	0.3	12	60	6	
WMR430-060R03-075-S06	6	0.3	12	75	6	
WMR430-060R03-090-S06	6	0.3	12	90	6	
WMR430-060R05-060-S06	6	0.5	12	60	6	
WMR430-060R05-075-S06	6	0.5	12	75	6	
WMR430-060R05-090-S06	6	0.5	12	90	6	
WMR430-060R10-060-S06	6	1	12	60	6	
WMR430-060R10-075-S06	6	1	12	75	6	
WMR430-060R10-090-S06	6	1	12	90	6	
WMR430-060R15-060-S06	6	1.5	12	60	6	
WMR430-060R15-075-S06	6	1.5	12	75	6	
WMR430-060R15-090-S06	6	1.5	12	90	6	
WMR430-080R02-060-S08	8	0.2	16	60	8	
WMR430-080R02-075-S08	8	0.2	16	75	8	
WMR430-080R02-090-S08	8	0.2	16	90	8	
WMR430-080R03-060-S08	8	0.3	16	60	8	
WMR430-080R03-075-S08	8	0.3	16	75	8	
WMR430-080R03-090-S08	8	0.3	16	90	8	
WMR430-080R05-060-S08	8	0.5	16	60	8	
WMR430-080R05-075-S08	8	0.5	16	75	8	
WMR430-080R05-090-S08	8	0.5	16	90	8	
WMR430-080R10-060-S08	8	1	16	60	8	

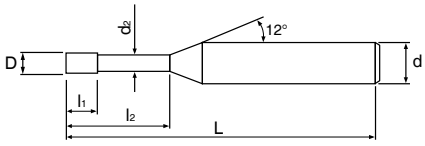
WMR430

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_1	L	d	
WMR430-080R10-075-S08	8	1	16	75	8	
WMR430-080R10-090-S08	8	1	16	90	8	
WMR430-080R20-060-S08	8	2	16	60	8	
WMR430-080R20-075-S08	8	2	16	75	8	
WMR430-080R20-090-S08	8	2	16	90	8	
WMR430-100R02-070-S10	10	0.2	20	70	10	
WMR430-100R02-100-S10	10	0.2	20	100	10	
WMR430-100R03-070-S10	10	0.3	20	70	10	
WMR430-100R03-100-S10	10	0.3	20	100	10	
WMR430-100R05-070-S10	10	0.5	20	70	10	
WMR430-100R05-100-S10	10	0.5	20	100	10	
WMR430-100R10-070-S10	10	1	20	70	10	
WMR430-100R10-100-S10	10	1	20	100	10	
WMR430-100R20-070-S10	10	2	20	70	10	
WMR430-100R20-100-S10	10	2	20	100	10	
WMR430-120R02-080-S12	12	0.2	24	80	12	
WMR430-120R02-110-S12	12	0.2	24	110	12	
WMR430-120R02-130-S12	12	0.2	24	130	12	
WMR430-120R05-080-S12	12	0.5	24	80	12	
WMR430-120R05-110-S12	12	0.5	24	110	12	
WMR430-120R05-130-S12	12	0.5	24	130	12	
WMR430-120R10-080-S12	12	1	24	80	12	
WMR430-120R10-110-S12	12	1	24	110	12	
WMR430-120R10-130-S12	12	1	24	130	12	
WMR430-120R20-080-S12	12	2	24	80	12	
WMR430-120R20-110-S12	12	2	24	110	12	
WMR430-120R20-130-S12	12	2	24	130	12	

WMRE430 NEW

WIDE-MAX 리브 스퀘어 엔드밀 4날 헬릭스30°

WIDE-MAX Rib Square End Mill 4-Flute Helix30°



* 적용 피삭재 (Applicable Work Material)
◎ : 최적 (Most Suitable)
○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
◎	◎	◎	○			◎	○	○	○	

단위(mm)/Unit(mm)

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	l_2	l_1	d_2	L	d	
WMRE430-01004-045-S04	1	4	1.5	0.96	45	4	
WMRE430-01006-045-S04	1	6	1.5	0.96	45	4	
WMRE430-01008-045-S04	1	8	1.5	0.96	45	4	
WMRE430-01010-045-S04	1	10	1.5	0.96	45	4	
WMRE430-01012-045-S04	1	12	1.5	0.96	45	4	
WMRE430-01504-045-S04	1.5	4	2.3	1.45	45	4	
WMRE430-01506-045-S04	1.5	6	2.3	1.45	45	4	
WMRE430-01508-045-S04	1.5	8	2.3	1.45	45	4	
WMRE430-01510-045-S04	1.5	10	2.3	1.45	45	4	
WMRE430-01512-045-S04	1.5	12	2.3	1.45	45	4	
WMRE430-02006-045-S04	2	6	3	1.9	45	4	
WMRE430-02008-045-S04	2	8	3	1.9	45	4	
WMRE430-02010-045-S04	2	10	3	1.9	45	4	
WMRE430-02012-045-S04	2	12	3	1.9	45	4	
WMRE430-02016-050-S04	2	16	3	1.9	50	4	
WMRE430-03010-050-S06	3	10	4.5	2.85	50	6	
WMRE430-03012-050-S06	3	12	4.5	2.85	50	6	
WMRE430-03016-060-S06	3	16	4.5	2.85	60	6	
WMRE430-03020-060-S06	3	20	4.5	2.85	60	6	
WMRE430-03025-070-S06	3	25	4.5	2.85	70	6	
WMRE430-04020-080-S04	4	20	6	3.85	80	4	
WMRE430-04012-050-S06	4	12	6	3.85	50	6	
WMRE430-04016-060-S06	4	16	6	3.85	60	6	
WMRE430-04020-060-S06	4	20	6	3.85	60	6	
WMRE430-04025-070-S06	4	25	6	3.85	70	6	
WMRE430-04030-070-S06	4	30	6	3.85	70	6	
WMRE430-06020-060-S06	6	20	9	5.7	60	6	
WMRE430-06030-090-S06	6	30	9	5.7	90	6	

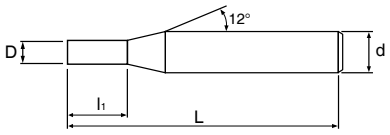
WMRE430

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	**l_2**	**l_1**	**d_2**	**L**	**d**	
WMRE430-08040-090-S08	**8**	**40**	12	7.7	90	8	
WMRE430-10050-100-S10	**10**	**50**	15	9.7	100	10	
WMRE430-12055-110-S12	**12**	**55**	18	11.7	110	12	
WMRE430-12060-150-S12	**12**	**60**	18	11.7	150	12	

WME430 NEW

WIDE-MAX 스퀘어 엔드밀 4날 헬릭스30°

WIDE-MAX Square End Mill 4-Flute Helix30°



Side Face

CARBIDE ULTRA | AlCrN Based | 4 | 30° Helix | Multi Helix | D 0/-0.008 | D 0/-0.015 | Shank h5

D≥2 D<6 D≥6

*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)
○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
◎	◎	◎	○			◎	○	○	○	

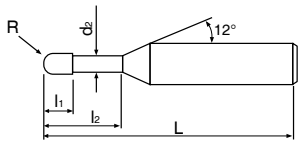
단위(mm)/Unit(mm)

모델번호 Model No.	인선직경 Dia of Mill	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	l_1	L	d	
WME430-010025-050-S04	1	2.5	50	4	
WME430-010025-050-S06	1	2.5	50	6	
WME430-01504-050-S04	1.5	4	50	4	
WME430-01504-050-S06	1.5	4	50	6	
WME430-02006-050-S04	2	6	50	4	
WME430-02006-050-S06	2	6	50	6	
WME430-02508-050-S04	2.5	8	50	4	
WME430-02508-050-S06	2.5	8	50	6	
WME430-03008-050-S03	3	8	50	3	
WME430-03008-050-S04	3	8	50	4	
WME430-03008-050-S06	3	8	50	6	
WME430-04010-050-S04	4	10	50	4	
WME430-04010-050-S06	4	10	50	6	
WME430-05015-060-S06	5	15	60	6	
WME430-06015-060-S06	6	15	60	6	
WME430-06015-075-S06	6	15	75	6	
WME430-07020-065-S08	7	20	65	8	
WME430-08020-065-S08	8	20	65	8	
WME430-10025-070-S10	10	25	70	10	
WME430-11030-080-S12	11	30	80	12	
WME430-12030-080-S12	12	30	80	12	
WME430-16040-100-S16	16	40	100	16	

CMRB230

CO-MAX 리브 볼 엔드밀 2날 헬릭스30°

CO-MAX Rib Ball End Mill 2-Flute Helix30°



* 적용 피삭재 (Applicable Work Material)

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

R < 3 R≥3 D≤2 2 < D < 6 D≥6

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
								◎	◎	○

단위(mm)/Unit(mm)

모델번호 Model No.	볼반경 Radius of Ball Nose	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	R	l_2	l_1	d_2	L	d	
CMRB230-001003-045-S04	R0.05	0.3	0.1	0.085	45	4	
CMRB230-001005-045-S04	R0.05	0.5	0.1	0.085	45	4	
CMRB230-00101-045-S04	R0.05	1	0.1	0.085	45	4	
CMRB230-00201-045-S04	R0.1	1	0.2	0.18	45	4	
CMRB230-002015-045-S04	R0.1	1.5	0.2	0.18	45	4	
CMRB230-00202-045-S04	R0.1	2	0.2	0.18	45	4	
CMRB230-00301-045-S04	R0.15	1	0.3	0.27	45	4	
CMRB230-003015-045-S04	R0.15	1.5	0.3	0.27	45	4	
CMRB230-00302-045-S04	R0.15	2	0.3	0.27	45	4	
CMRB230-00303-045-S04	R0.15	3	0.3	0.27	45	4	
CMRB230-00401-045-S04	R0.2	1	0.4	0.37	45	4	
CMRB230-00402-045-S04	R0.2	2	0.4	0.37	45	4	
CMRB230-00403-045-S04	R0.2	3	0.4	0.37	45	4	
CMRB230-00404-045-S04	R0.2	4	0.4	0.37	45	4	
CMRB230-00405-045-S04	R0.2	5	0.4	0.37	45	4	
CMRB230-00406-045-S04	R0.2	6	0.4	0.37	45	4	
CMRB230-00502-045-S04	R0.25	2	0.5	0.46	45	4	
CMRB230-00503-045-S04	R0.25	3	0.5	0.46	45	4	
CMRB230-00504-045-S04	R0.25	4	0.5	0.46	45	4	
CMRB230-00505-045-S04	R0.25	5	0.5	0.46	45	4	
CMRB230-00506-045-S04	R0.25	6	0.5	0.46	45	4	
CMRB230-00508-045-S04	R0.25	8	0.5	0.46	45	4	
CMRB230-00510-045-S04	R0.25	10	0.5	0.46	45	4	
CMRB230-00602-045-S04	R0.3	2	0.6	0.56	45	4	
NEW CMRB230-00603-045-S04	R0.3	3	0.6	0.56	45	4	
CMRB230-00604-045-S04	R0.3	4	0.6	0.56	45	4	
CMRB230-00606-045-S04	R0.3	6	0.6	0.56	45	4	

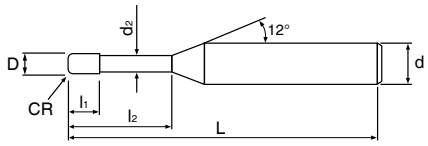
CMRB230

모델번호 Model No.	볼반경 Radius of Ball Nose	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	R	l_2	l_1	d_2	L	d	
CMRB230-00608-045-S04	R0.3	8	0.6	0.56	45	4	
CMRB230-00610-045-S04	R0.3	10	0.6	0.56	45	4	
CMRB230-00612-045-S04	R0.3	12	0.6	0.56	45	4	
CMRB230-00802-045-S04	R0.4	2	0.8	0.76	45	4	
CMRB230-00804-045-S04	R0.4	4	0.8	0.76	45	4	
CMRB230-00806-045-S04	R0.4	6	0.8	0.76	45	4	
CMRB230-00808-045-S04	R0.4	8	0.8	0.76	45	4	
CMRB230-00810-045-S04	R0.4	10	0.8	0.76	45	4	
CMRB230-00812-045-S04	R0.4	12	0.8	0.76	45	4	
CMRB230-01004-045-S04	R0.5	4	1	0.96	45	4	
CMRB230-01006-045-S04	R0.5	6	1	0.96	45	4	
CMRB230-01008-045-S04	R0.5	8	1	0.96	45	4	
CMRB230-01010-045-S04	R0.5	10	1	0.96	45	4	
CMRB230-01012-045-S04	R0.5	12	1	0.96	45	4	
CMRB230-01014-050-S04	R0.5	14	1	0.96	50	4	
CMRB230-01016-050-S04	R0.5	16	1	0.96	50	4	
CMRB230-01506-045-S04	R0.75	6	1.5	1.45	45	4	
CMRB230-01508-045-S04	R0.75	8	1.5	1.45	45	4	
CMRB230-01510-045-S04	R0.75	10	1.5	1.45	45	4	
CMRB230-01512-045-S04	R0.75	12	1.5	1.45	45	4	
CMRB230-01514-050-S04	R0.75	14	1.5	1.45	50	4	
CMRB230-01516-050-S04	R0.75	16	1.5	1.45	50	4	
CMRB230-01520-060-S04	R0.75	20	1.5	1.45	60	4	
CMRB230-02006-045-S04	R1	6	2	1.9	45	4	
CMRB230-02008-045-S04	R1	8	2	1.9	45	4	
CMRB230-02010-045-S04	R1	10	2	1.9	45	4	
CMRB230-02012-045-S04	R1	12	2	1.9	45	4	
CMRB230-02014-050-S04	R1	14	2	1.9	50	4	
CMRB230-02016-050-S04	R1	16	2	1.9	50	4	
CMRB230-02020-060-S04	R1	20	2	1.9	60	4	
CMRB230-03012-050-S06	R1.5	12	3	2.85	50	6	
CMRB230-03014-060-S06	R1.5	14	3	2.85	60	6	
CMRB230-03016-060-S06	R1.5	16	3	2.85	60	6	
CMRB230-03020-060-S06	R1.5	20	3	2.85	60	6	
CMRB230-03025-070-S06	R1.5	25	3	2.85	70	6	
CMRB230-03030-070-S06	R1.5	30	3	2.85	70	6	
CMRB230-04016-060-S06	R2	16	4	3.85	60	6	
CMRB230-04020-060-S06	R2	20	4	3.85	60	6	
CMRB230-04025-070-S06	R2	25	4	3.85	70	6	
CMRB230-04030-070-S06	R2	30	4	3.85	70	6	
CMRB230-06020-060-S06	R3	20	7	5.7	60	6	
CMRB230-06030-080-S06	R3	30	7	5.7	80	6	

CMRR230

CO-MAX 리브 래디우스 엔드밀 2날 헬릭스30°

CO-MAX Rib Radius End Mill 2-Flute Helix30°



Slot Side Face

CARBIDE ULTRA | DLC PVD | 2 | 30° Helix | R ±0.005 | R ±0.01 | D 0/-0.008 | D 0/-0.01 | D 0/-0.02 | Shank h5

R < 0.5 R≥0.5 D≤2 2 < D < 6 D≥6

* 적용 피삭재 (Applicable Work Material)

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
								◎	◎	○

단위(mm)/Unit(mm)

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
NEW CMRR230-002R002-01-045-S04	0.2	0.02	1	0.2	0.18	45	4	
NEW CMRR230-002R002-015-045-S04	0.2	0.02	1.5	0.2	0.18	45	4	
NEW CMRR230-002R005-01-045-S04	0.2	0.05	1	0.2	0.18	45	4	
NEW CMRR230-002R005-015-045-S04	0.2	0.05	1.5	0.2	0.18	45	4	
CMRR230-003R005-015-045-S04	0.3	0.05	1.5	0.3	0.27	45	4	
CMRR230-003R005-02-045-S04	0.3	0.05	2	0.3	0.27	45	4	
CMRR230-003R005-03-045-S04	0.3	0.05	3	0.3	0.27	45	4	
CMRR230-004R005-02-045-S04	0.4	0.05	2	0.4	0.37	45	4	
CMRR230-004R005-03-045-S04	0.4	0.05	3	0.4	0.37	45	4	
CMRR230-004R005-04-045-S04	0.4	0.05	4	0.4	0.37	45	4	
CMRR230-005R005-02-045-S04	0.5	0.05	2	0.5	0.46	45	4	
CMRR230-005R005-03-045-S04	0.5	0.05	3	0.5	0.46	45	4	
CMRR230-005R005-04-045-S04	0.5	0.05	4	0.5	0.46	45	4	
CMRR230-005R005-05-045-S04	0.5	0.05	5	0.5	0.46	45	4	
CMRR230-005R005-06-045-S04	0.5	0.05	6	0.5	0.46	45	4	
NEW CMRR230-005R01-02-045-S04	0.5	0.1	2	0.5	0.46	45	4	
NEW CMRR230-005R01-03-045-S04	0.5	0.1	3	0.5	0.46	45	4	
NEW CMRR230-005R01-04-045-S04	0.5	0.1	4	0.5	0.46	45	4	
NEW CMRR230-005R01-05-045-S04	0.5	0.1	5	0.5	0.46	45	4	
NEW CMRR230-005R01-06-045-S04	0.5	0.1	6	0.5	0.46	45	4	
CMRR230-006R005-02-045-S04	0.6	0.05	2	0.6	0.56	45	4	
CMRR230-006R005-04-045-S04	0.6	0.05	4	0.6	0.56	45	4	
CMRR230-006R005-06-045-S04	0.6	0.05	6	0.6	0.56	45	4	
CMRR230-006R005-08-045-S04	0.6	0.05	8	0.6	0.56	45	4	
NEW CMRR230-006R01-02-045-S04	0.6	0.1	2	0.6	0.56	45	4	
NEW CMRR230-006R01-04-045-S04	0.6	0.1	4	0.6	0.56	45	4	
NEW CMRR230-006R01-06-045-S04	0.6	0.1	6	0.6	0.56	45	4	

CMRR230

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
NEW CMRR230-006R01-08-045-S04	0.6	0.1	8	0.6	0.56	45	4	
CMRR230-008R01-04-045-S04	0.8	0.1	4	0.8	0.76	45	4	
CMRR230-008R01-06-045-S04	0.8	0.1	6	0.8	0.76	45	4	
CMRR230-008R01-08-045-S04	0.8	0.1	8	0.8	0.76	45	4	
CMRR230-010R01-04-045-S04	1	0.1	4	1.5	0.96	45	4	
CMRR230-010R01-06-045-S04	1	0.1	6	1.5	0.96	45	4	
CMRR230-010R01-08-045-S04	1	0.1	8	1.5	0.96	45	4	
CMRR230-010R01-10-045-S04	1	0.1	10	1.5	0.96	45	4	
CMRR230-010R01-12-045-S04	1	0.1	12	1.5	0.96	45	4	
CMRR230-010R02-04-045-S04	1	0.2	4	1.5	0.96	45	4	
CMRR230-010R02-06-045-S04	1	0.2	6	1.5	0.96	45	4	
CMRR230-010R02-08-045-S04	1	0.2	8	1.5	0.96	45	4	
CMRR230-010R02-10-045-S04	1	0.2	10	1.5	0.96	45	4	
CMRR230-010R02-12-045-S04	1	0.2	12	1.5	0.96	45	4	
CMRR230-015R01-06-045-S04	1.5	0.1	6	2.3	1.45	45	4	
CMRR230-015R01-08-045-S04	1.5	0.1	8	2.3	1.45	45	4	
CMRR230-015R01-10-045-S04	1.5	0.1	10	2.3	1.45	45	4	
CMRR230-015R01-12-045-S04	1.5	0.1	12	2.3	1.45	45	4	
CMRR230-015R02-06-045-S04	1.5	0.2	6	2.3	1.45	45	4	
CMRR230-015R02-08-045-S04	1.5	0.2	8	2.3	1.45	45	4	
CMRR230-015R02-10-045-S04	1.5	0.2	10	2.3	1.45	45	4	
CMRR230-015R02-12-045-S04	1.5	0.2	12	2.3	1.45	45	4	
CMRR230-020R02-08-045-S04	2	0.2	8	3	1.9	45	4	
CMRR230-020R02-10-045-S04	2	0.2	10	3	1.9	45	4	
CMRR230-020R02-12-045-S04	2	0.2	12	3	1.9	45	4	
CMRR230-020R02-14-050-S04	2	0.2	14	3	1.9	50	4	
CMRR230-020R02-16-050-S04	2	0.2	16	3	1.9	50	4	
CMRR230-020R03-08-045-S04	2	0.3	8	3	1.9	45	4	
CMRR230-020R03-10-045-S04	2	0.3	10	3	1.9	45	4	
CMRR230-020R03-12-045-S04	2	0.3	12	3	1.9	45	4	
CMRR230-020R03-14-050-S04	2	0.3	14	3	1.9	50	4	
CMRR230-020R03-16-050-S04	2	0.3	16	3	1.9	50	4	
CMRR230-020R05-08-045-S04	2	0.5	8	3	1.9	45	4	
CMRR230-020R05-10-045-S04	2	0.5	10	3	1.9	45	4	
CMRR230-020R05-12-045-S04	2	0.5	12	3	1.9	45	4	
CMRR230-020R05-14-050-S04	2	0.5	14	3	1.9	50	4	
CMRR230-020R05-16-050-S04	2	0.5	16	3	1.9	50	4	
CMRR230-030R02-12-050-S06	3	0.2	12	4.5	2.85	50	6	
CMRR230-030R02-16-060-S06	3	0.2	16	4.5	2.85	60	6	
CMRR230-030R02-20-060-S06	3	0.2	20	4.5	2.85	60	6	
CMRR230-030R03-12-050-S06	3	0.3	12	4.5	2.85	50	6	
CMRR230-030R03-16-060-S06	3	0.3	16	4.5	2.85	60	6	
CMRR230-030R03-20-060-S06	3	0.3	20	4.5	2.85	60	6	
CMRR230-030R05-12-050-S06	3	0.5	12	4.5	2.85	50	6	
CMRR230-030R05-16-060-S06	3	0.5	16	4.5	2.85	60	6	
CMRR230-030R05-20-060-S06	3	0.5	20	4.5	2.85	60	6	
CMRR230-040R02-16-060-S06	4	0.2	16	6	3.85	60	6	
CMRR230-040R02-20-060-S06	4	0.2	20	6	3.85	60	6	

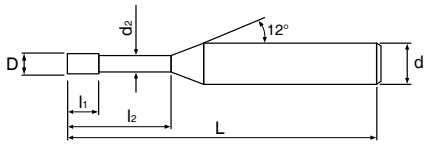
CMRR230

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
CMRR230-040R02-25-070-S06	4	0.2	25	6	3.85	70	6	
CMRR230-040R03-16-060-S06	4	0.3	16	6	3.85	60	6	
CMRR230-040R03-20-060-S06	4	0.3	20	6	3.85	60	6	
CMRR230-040R03-25-070-S06	4	0.3	25	6	3.85	70	6	
CMRR230-040R05-16-060-S06	4	0.5	16	6	3.85	60	6	
CMRR230-040R05-20-060-S06	4	0.5	20	6	3.85	60	6	
CMRR230-040R05-25-070-S06	4	0.5	25	6	3.85	70	6	
CMRR230-060R03-20-060-S06	6	0.3	20	9	5.7	60	6	
CMRR230-060R05-20-060-S06	6	0.5	20	9	5.7	60	6	
CMRR230-060R10-20-060-S06	6	1	20	9	5.7	60	6	
CMRR230-080R05-24-065-S08	8	0.5	24	12	7.7	65	8	
CMRR230-080R10-24-065-S08	8	1	24	12	7.7	65	8	
CMRR230-100R05-30-070-S10	10	0.5	30	15	9.7	70	10	
CMRR230-100R10-30-070-S10	10	1	30	15	9.7	70	10	
CMRR230-120R05-30-080-S12	12	0.5	30	18	11.7	80	12	
CMRR230-120R10-30-080-S12	12	1	30	18	11.7	80	12	

CMRE230

CO-MAX 리브 스퀘어 엔드밀 2날 헬릭스30°

CO-MAX Rib Square End Mill 2-Flute Helix30°



* 적용 피삭재 (Applicable Work Material)
◎ : 최적 (Most Suitable)
○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
								◎	○	○

단위(mm)/Unit(mm)

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Diameter	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	l_2	l_1	d_2	L	d	
CMRE230-001005-045-S04	0.1	0.5	0.1	0.085	45	4	
CMRE230-0015005-045-S04	0.15	0.5	0.15	0.13	45	4	
CMRE230-001501-045-S04	0.15	1	0.15	0.13	45	4	
CMRE230-00201-045-S04	0.2	1	0.2	0.18	45	4	
CMRE230-002015-045-S04	0.2	1.5	0.2	0.18	45	4	
CMRE230-00202-045-S04	0.2	2	0.2	0.18	45	4	
CMRE230-00301-045-S04	0.3	1	0.3	0.27	45	4	
CMRE230-003015-045-S04	0.3	1.5	0.3	0.27	45	4	
CMRE230-00302-045-S04	0.3	2	0.3	0.27	45	4	
CMRE230-00303-045-S04	0.3	3	0.3	0.27	45	4	
CMRE230-00402-045-S04	0.4	2	0.4	0.37	45	4	
CMRE230-00403-045-S04	0.4	3	0.4	0.37	45	4	
CMRE230-00404-045-S04	0.4	4	0.4	0.37	45	4	
CMRE230-00502-045-S04	0.5	2	0.5	0.46	45	4	
CMRE230-00503-045-S04	0.5	3	0.5	0.46	45	4	
CMRE230-00504-045-S04	0.5	4	0.5	0.46	45	4	
CMRE230-00506-045-S04	0.5	6	0.5	0.46	45	4	
CMRE230-00602-045-S04	0.6	2	0.6	0.56	45	4	
CMRE230-00603-045-S04	0.6	3	0.6	0.56	45	4	
CMRE230-00604-045-S04	0.6	4	0.6	0.56	45	4	
CMRE230-00606-045-S04	0.6	6	0.6	0.56	45	4	
CMRE230-00608-045-S04	0.6	8	0.6	0.56	45	4	
CMRE230-00802-045-S04	0.8	2	0.8	0.76	45	4	
CMRE230-00804-045-S04	0.8	4	0.8	0.76	45	4	
CMRE230-00806-045-S04	0.8	6	0.8	0.76	45	4	
CMRE230-00808-045-S04	0.8	8	0.8	0.76	45	4	
CMRE230-01004-045-S04	1	4	1.5	0.96	45	4	

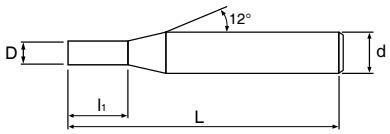
CMRE230

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Diameter	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	l_2	l_1	d_2	L	d	
CMRE230-01006-045-S04	1	6	1.5	0.96	45	4	
CMRE230-01008-045-S04	1	8	1.5	0.96	45	4	
CMRE230-01010-045-S04	1	10	1.5	0.96	45	4	
CMRE230-01012-045-S04	1	12	1.5	0.96	45	4	
CMRE230-01506-045-S04	1.5	6	2.3	1.45	45	4	
CMRE230-01508-045-S04	1.5	8	2.3	1.45	45	4	
CMRE230-01510-045-S04	1.5	10	2.3	1.45	45	4	
CMRE230-01512-045-S04	1.5	12	2.3	1.45	45	4	
CMRE230-02006-045-S04	2	6	3	1.9	45	4	
CMRE230-02008-045-S04	2	8	3	1.9	45	4	
CMRE230-02010-045-S04	2	10	3	1.9	45	4	
CMRE230-02012-045-S04	2	12	3	1.9	45	4	
CMRE230-02016-050-S04	2	16	3	1.9	50	4	
CMRE230-02020-060-S04	2	20	3	1.9	60	4	
CMRE230-03012-050-S06	3	12	4.5	2.85	50	6	
CMRE230-03016-060-S06	3	16	4.5	2.85	60	6	
CMRE230-03020-060-S06	3	20	4.5	2.85	60	6	
CMRE230-03025-070-S06	3	25	4.5	2.85	70	6	
CMRE230-03030-070-S06	3	30	4.5	2.85	70	6	
CMRE230-04012-050-S06	4	12	6	3.85	50	6	
CMRE230-04016-060-S06	4	16	6	3.85	60	6	
CMRE230-04020-060-S06	4	20	6	3.85	60	6	
CMRE230-04025-070-S06	4	25	6	3.85	70	6	
CMRE230-04030-070-S06	4	30	6	3.85	70	6	

CME230

CO-MAX 스퀘어 엔드밀 2날 헬릭스30°

CO-MAX Square End Mill 2-Flute Helix30°



* 적용 피삭재 (Applicable Work Material)

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
								◎	○	○

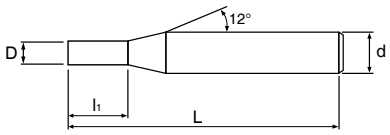
단위(mm)/Unit(mm)

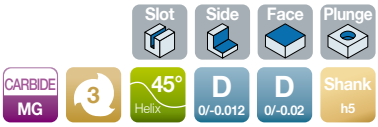
모델번호 Model No.	인선직경 Dia of Mill	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	l_1	L	d	
CME230-0010015-040-S04	0.1	0.15	40	4	
CME230-010025-045-S04	1	2.5	45	4	
NEW CME230-01004-045-S04	1	4	45	4	
NEW CME230-01504-045-S04	1.5	4	45	4	
CME230-02006-045-S04	2	6	45	4	
NEW CME230-02008-045-S04	2	8	45	4	
CME230-03010-050-S06	3	10	50	6	
NEW CME230-04012-050-S06	4	12	50	6	
CME230-06015-060-S06	6	15	60	6	
CME230-08020-065-S08	8	20	65	8	
CME230-10025-070-S10	10	25	70	10	
CME230-12030-080-S12	12	30	80	12	

ALE345

ALU-MAX 3날 스퀘어 엔드밀 헬릭스45°

ALU-MAX Square End Mill 3-Flute Helix45°





*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
								○	◎	

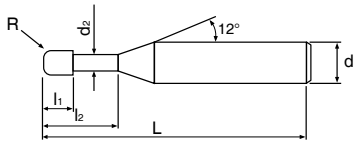
단위(mm)/Unit(mm)

모델번호 Model No.	인선직경 Dia of Mill	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	l_1	L	d	
ALE345-010025-050-S06	1	2.5	50	6	
ALE345-01504-050-S06	1.5	4	50	6	
ALE345-02006-050-S06	2	6	50	6	
ALE345-02508-050-S06	2.5	8	50	6	
ALE345-03009-050-S06	3	9	50	6	
ALE345-04012-050-S06	4	12	50	6	
ALE345-05015-060-S06	5	15	60	6	
ALE345-06015-060-S06	6	15	60	6	
ALE345-08020-065-S08	8	20	65	8	
ALE345-10025-070-S10	10	25	70	10	
ALE345-12030-080-S12	12	30	80	12	
ALE345-16040-100-S16	16	40	100	16	

DMRB230

DIA-MAX 리브 볼 엔드밀 2날 헬릭스30°

DIA-MAX Rib Ball End Mill 2-Flute Helix30°



D<1 D≥1

*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
								○		◎

단위(mm)/Unit(mm)

모델번호 Model No.	볼반경 Radius of Ball Nose	유효장 Effective Length	날장 Length of Cut	목부경 Neck Diameter	전장 Overall Length	생크경 Shank Dia	비고 Remark
	R	l_2	l_1	d_2	L	d	
DMRB230-00201-045-S04	R0.1	1	0.2	0.17	45	4	
DMRB230-003015-045-S04	R0.15	1.5	0.3	0.25	45	4	
DMRB230-00302-045-S04	R0.15	2	0.3	0.25	45	4	
DMRB230-00303-045-S04	R0.15	3	0.3	0.25	45	4	
DMRB230-00402-045-S04	R0.2	2	0.4	0.35	45	4	
DMRB230-00403-045-S04	R0.2	3	0.4	0.35	45	4	
DMRB230-00404-045-S04	R0.2	4	0.4	0.35	45	4	
DMRB230-00502-045-S04	R0.25	2	1	0.45	45	4	
DMRB230-00504-045-S04	R0.25	4	1	0.45	45	4	
DMRB230-00506-045-S04	R0.25	6	1	0.45	45	4	
DMRB230-00508-045-S04	R0.25	8	1	0.45	45	4	
DMRB230-00602-045-S04	R0.3	2	1.2	0.55	45	4	
DMRB230-00604-045-S04	R0.3	4	1.2	0.55	45	4	
DMRB230-00606-045-S04	R0.3	6	1.2	0.55	45	4	
DMRB230-00608-045-S04	R0.3	8	1.2	0.55	45	4	
DMRB230-00610-060-S04	R0.3	10	1.2	0.55	60	4	
DMRB230-00612-060-S04	R0.3	12	1.2	0.55	60	4	
DMRB230-00615-060-S04	R0.3	15	1.2	0.55	60	4	
DMRB230-00620-060-S04	R0.3	20	1.2	0.55	60	4	
DMRB230-00804-045-S04	R0.4	4	1.6	0.75	45	4	
DMRB230-00806-045-S04	R0.4	6	1.6	0.75	45	4	
DMRB230-00808-045-S04	R0.4	8	1.6	0.75	45	4	
DMRB230-00810-060-S04	R0.4	10	1.6	0.75	60	4	
DMRB230-00815-060-S04	R0.4	15	1.6	0.75	60	4	
DMRB230-00820-060-S04	R0.4	20	1.6	0.75	60	4	
DMRB230-01004-050-S04	R0.5	4	2	0.95	50	4	
DMRB230-01006-050-S04	R0.5	6	2	0.95	50	4	
DMRB230-01008-050-S04	R0.5	8	2	0.95	50	4	

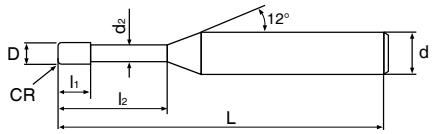
DMRB230

모델번호 Model No.	볼반경 Radius of Ball Nose	유효장 Effective Length	날장 Length of Cut	목부경 Neck Diameter	전장 Overall Length	생크경 Shank Dia	비고 Remark
	R	l_2	l_1	d_2	L	d	
DMRB230-01010-060-S04	R0.5	10	2	0.95	60	4	
DMRB230-01012-060-S04	R0.5	12	2	0.95	60	4	
DMRB230-01016-060-S04	R0.5	16	2	0.95	60	4	
DMRB230-01020-060-S04	R0.5	20	2	0.95	60	4	
DMRB230-01025-080-S04	R0.5	25	2	0.95	80	4	
DMRB230-01030-080-S04	R0.5	30	2	0.95	80	4	
DMRB230-01035-080-S04	R0.5	35	2	0.95	80	4	
DMRB230-01040-080-S04	R0.5	40	2	0.95	80	4	
DMRB230-01506-050-S04	R0.75	6	3	1.45	50	4	
DMRB230-01508-050-S04	R0.75	8	3	1.45	50	4	
DMRB230-01510-050-S04	R0.75	10	3	1.45	50	4	
DMRB230-01512-050-S04	R0.75	12	3	1.45	50	4	
DMRB230-01516-080-S04	R0.75	16	3	1.45	80	4	
DMRB230-01520-080-S04	R0.75	20	3	1.45	80	4	
DMRB230-01525-080-S04	R0.75	25	3	1.45	80	4	
DMRB230-01530-080-S04	R0.75	30	3	1.45	80	4	
DMRB230-02006-050-S04	R1	6	4	1.9	50	4	
DMRB230-02010-050-S04	R1	10	4	1.9	50	4	
DMRB230-02012-050-S04	R1	12	4	1.9	50	4	
DMRB230-02016-050-S04	R1	16	4	1.9	50	4	
DMRB230-02016-080-S04	R1	16	4	1.9	80	4	
DMRB230-02020-080-S04	R1	20	4	1.9	80	4	
DMRB230-02025-080-S04	R1	25	4	1.9	80	4	
DMRB230-02030-080-S04	R1	30	4	1.9	80	4	
DMRB230-02035-080-S04	R1	35	4	1.9	80	4	
DMRB230-02040-100-S04	R1	40	4	1.9	100	4	
DMRB230-02050-100-S04	R1	50	4	1.9	100	4	
DMRB230-03012-060-S04	R1.5	12	6	2.7	60	4	
DMRB230-03016-060-S04	R1.5	16	6	2.7	60	4	
DMRB230-03020-060-S04	R1.5	20	6	2.7	60	4	
DMRB230-03020-100-S04	R1.5	20	6	2.7	100	4	
DMRB230-03030-100-S04	R1.5	30	6	2.7	100	4	
DMRB230-03040-100-S04	R1.5	40	6	2.7	100	4	
DMRB230-03050-100-S04	R1.5	50	6	2.7	100	4	
DMRB230-04020-060-S04	R2	20	12	3.7	60	4	
DMRB230-04030-080-S04	R2	30	12	3.7	80	4	
DMRB230-04040-100-S04	R2	40	12	3.7	100	4	
DMRB230-04040-130-S04	R2	40	12	3.7	130	4	
DMRB230-06025-080-S06	R3	25	15	5.7	80	6	
DMRB230-06040-105-S06	R3	40	15	5.7	105	6	
DMRB230-06050-150-S06	R3	50	15	5.7	150	6	
DMRB230-08030-080-S08	R4	30	20	7.7	80	8	
DMRB230-08040-105-S08	R4	40	20	7.7	105	8	
DMRB230-08050-150-S08	R4	50	20	7.7	150	8	
DMRB230-10050-105-S10	R5	50	22	9.7	105	10	
DMRB230-10060-160-S10	R5	60	22	9.7	160	10	
DMRB230-12055-105-S12	R6	55	25	11.7	105	12	
DMRB230-12060-160-S12	R6	60	25	11.7	160	12	

DMRR430

DIA-MAX 리브 래디우스 엔드밀 4날 헬릭스30°

DIA-MAX Rib Radius End Mill 4-Flute Helix30°



*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
								○		◎

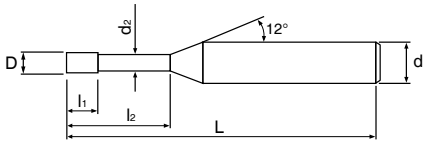
단위(mm)/Unit(mm)

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Corner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	CR	l_2	l_1	d_2	L	d	
DMRR430-020R02-12-080-S04	2	0.2	12	4	1.9	80	4	
DMRR430-020R02-16-080-S04	2	0.2	16	4	1.9	80	4	
DMRR430-020R02-20-080-S04	2	0.2	20	4	1.9	80	4	
DMRR430-020R02-25-080-S04	2	0.2	25	4	1.9	80	4	
DMRR430-020R02-30-080-S04	2	0.2	30	4	1.9	80	4	
DMRR430-030R02-20-080-S04	3	0.2	20	6	2.7	80	4	
DMRR430-030R02-30-080-S04	3	0.2	30	6	2.7	80	4	
DMRR430-030R02-40-080-S04	3	0.2	40	6	2.7	80	4	
DMRR430-030R05-20-080-S04	3	0.5	20	6	2.7	80	4	
DMRR430-030R05-30-080-S04	3	0.5	30	6	2.7	80	4	
DMRR430-030R05-40-080-S04	3	0.5	40	6	2.7	80	4	
DMRR430-040R02-30-100-S04	4	0.2	30	8	3.7	100	4	
DMRR430-040R05-30-100-S04	4	0.5	30	8	3.7	100	4	
DMRR430-060R05-30-105-S06	6	0.5	30	12	5.7	105	6	
DMRR430-060R10-30-105-S06	6	1	30	12	5.7	105	6	
DMRR430-080R05-40-105-S08	8	0.5	40	16	7.7	105	8	
DMRR430-080R10-40-105-S08	8	1	40	16	7.7	105	8	
DMRR430-100R05-50-105-S10	10	0.5	50	20	9.7	105	10	
DMRR430-100R05-60-160-S10	10	0.5	60	20	9.7	160	10	
DMRR430-100R10-50-105-S10	10	1	50	20	9.7	105	10	
DMRR430-100R10-60-160-S10	10	1	60	20	9.7	160	10	
DMRR430-120R05-55-105-S12	12	0.5	55	24	11.7	105	12	
DMRR430-120R05-60-160-S12	12	0.5	60	24	11.7	160	12	
DMRR430-120R10-55-105-S12	12	1	55	24	11.7	105	12	
DMRR430-120R10-60-160-S12	12	1	60	24	11.7	160	12	

DMRE230

DIA-MAX 리브 스퀘어 엔드밀 2날 헬릭스30°

DIA-MAX Rib Square End Mill 2-Flute Helix30°



*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
								○		◎

단위(mm)/Unit(mm)

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	l_2	l_1	d_2	L	d	
DMRE230-00201-045-S04	0.2	1	0.2	0.17	45	4	
DMRE230-002015-045-S04	0.2	1.5	0.2	0.17	45	4	
DMRE230-003015-045-S04	0.3	1.5	0.3	0.25	45	4	
DMRE230-00302-045-S04	0.3	2	0.3	0.25	45	4	
DMRE230-00303-045-S04	0.3	3	0.3	0.25	45	4	
DMRE230-00402-045-S04	0.4	2	0.4	0.35	45	4	
DMRE230-00403-045-S04	0.4	3	0.4	0.35	45	4	
DMRE230-00404-045-S04	0.4	4	0.4	0.35	45	4	
DMRE230-00502-045-S04	0.5	2	1	0.45	45	4	
DMRE230-00504-045-S04	0.5	4	1	0.45	45	4	
DMRE230-00506-045-S04	0.5	6	1	0.45	45	4	
DMRE230-00602-045-S04	0.6	2	1.2	0.55	45	4	
DMRE230-00604-045-S04	0.6	4	1.2	0.55	45	4	
DMRE230-00606-045-S04	0.6	6	1.2	0.55	45	4	
DMRE230-00804-045-S04	0.8	4	1.6	0.75	45	4	
DMRE230-00806-045-S04	0.8	6	1.6	0.75	45	4	
DMRE230-00808-045-S04	0.8	8	1.6	0.75	45	4	
DMRE230-01004-050-S04	1	4	2	0.95	50	4	
DMRE230-01006-050-S04	1	6	2	0.95	50	4	
DMRE230-01008-050-S04	1	8	2	0.95	50	4	
DMRE230-01010-050-S04	1	10	2	0.95	50	4	
DMRE230-01012-050-S04	1	12	2	0.95	50	4	
DMRE230-01016-050-S04	1	16	2	0.95	50	4	
DMRE230-01506-050-S04	1.5	6	3	1.45	50	4	
DMRE230-01508-050-S04	1.5	8	3	1.45	50	4	
DMRE230-01510-050-S04	1.5	10	3	1.45	50	4	
DMRE230-01512-050-S04	1.5	12	3	1.45	50	4	

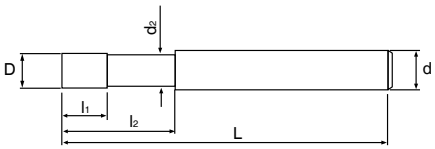
DMRE230

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	l_2	l_1	d_2	L	d	
DMRE230-01516-050-S04	1.5	16	3	1.45	50	4	
DMRE230-02006-050-S04	2	6	4	1.9	50	4	
DMRE230-02010-050-S04	2	10	4	1.9	50	4	
DMRE230-02012-050-S04	2	12	4	1.9	50	4	
DMRE230-02016-050-S04	2	16	4	1.9	50	4	
DMRE230-02020-080-S04	2	20	4	1.9	80	4	
DMRE230-02025-080-S04	2	25	4	1.9	80	4	
DMRE230-02030-080-S04	2	30	4	1.9	80	4	
DMRE230-03012-060-S04	3	12	4.5	2.7	60	4	
DMRE230-03020-080-S04	3	20	6	2.7	80	4	
DMRE230-03030-080-S04	3	30	6	2.7	80	4	
DMRE230-03040-080-S04	3	40	6	2.7	80	4	
DMRE230-04012-060-S04	4	12	6	3.7	60	4	
DMRE230-04030-080-S04	4	30	8	3.7	80	4	

DMRE430

DIA-MAX 리브 스퀘어 엔드밀 4날 헬릭스30°

DIA-MAX Rib Square End Mill 4-Flute Helix30°



D≥6

*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
								○		◎

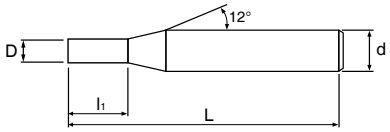
단위(mm)/Unit(mm)

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	l_2	l_1	d_2	L	d	
DMRE430-06030-105-S06	6	30	20	5.7	105	6	
DMRE430-08040-105-S08	8	40	24	7.7	105	8	
DMRE430-10050-105-S10	10	50	25	9.7	105	10	
DMRE430-12055-105-S12	12	55	25	11.7	105	12	

DME430

DIA-MAX 스퀘어 엔드밀 4날 헬릭스30°

DIA-MAX Square End Mill 4-Flute Helix30°



D≥1

*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
								○		◎

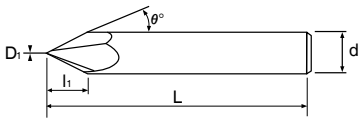
단위(mm)/Unit(mm)

모델번호 Model No.	인선직경 Dia of Mill	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
	D	l_1	L	d	
DME430-01003-050-S04	1	3	50	4	
DME430-01504-050-S04	1.5	4	50	4	
DME430-02006-050-S04	2	6	50	4	
DME430-03012-060-S06	3	12	60	6	
DME430-04016-060-S06	4	16	60	6	
DME430-05020-070-S06	5	20	70	6	
DME430-06020-070-S06	6	20	70	6	
DME430-08024-070-S08	8	24	70	8	
DME430-10025-080-S10	10	25	80	10	
DME430-12025-080-S12	12	25	80	12	

CHC200 NEW

면취 커터 2날 헬릭스0°

Chamfer Cutter 2-Flute Helix 0°



*** 적용 피삭재 (Applicable Work Material)**

◎ : 최적 (Most Suitable)

○ : 가능 (Applicable)

피삭재 Work Material

P			H			M	S	N		
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Pre-Hardened Steels	열처리강 Hardened Steels			스테인레스강 Stainless Steels	내열합금강 Heat-resistant alloys	동 Copper	알루미늄합금 Aluminum Alloys	흑연 Graphite
S45C/S50C ~800 N/mm²	SCM ~35HRC	NAK/HPM ~45HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~62HRC					
◎	◎	◎	○			○	○	○	○	○

단위(mm)/Unit(mm)

모델번호 Model No.		선단경 Front Dia	각도(편각) Taper Angle on Side	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia	비고 Remark
비코팅 Uncoated	코팅 Coated	D_1	θ	l_1	L	d	
CHC200-000T300-050-S04	HMCHC200-000T300-050-S04	0	30°	3.4	50	4	
CHC200-000T450-050-S04	HMCHC200-000T450-050-S04	0	45°	2	50	4	
CHC200-000T600-050-S04	HMCHC200-000T600-050-S04	0	60°	1.15	50	4	
CHC200-000T300-060-S06	HMCHC200-000T300-060-S06	0	30°	5.1	60	6	
CHC200-000T450-060-S06	HMCHC200-000T450-060-S06	0	45°	3	60	6	
CHC200-000T600-060-S06	HMCHC200-000T600-060-S06	0	60°	1.73	60	6	
CHC200-000T450-065-S08	HMCHC200-000T450-065-S08	0	45°	4	65	8	
CHC200-000T450-070-S10	HMCHC200-000T450-070-S10	0	45°	5	70	10	
CHC200-000T450-075-S12	HMCHC200-000T450-075-S12	0	45°	6	75	12	
CHC200-000T450-110-S12	HMCHC200-000T450-110-S12	0	45°	6	110	12	

CUTTING CONDITIONS

Milling Conditions List

HY-MAX

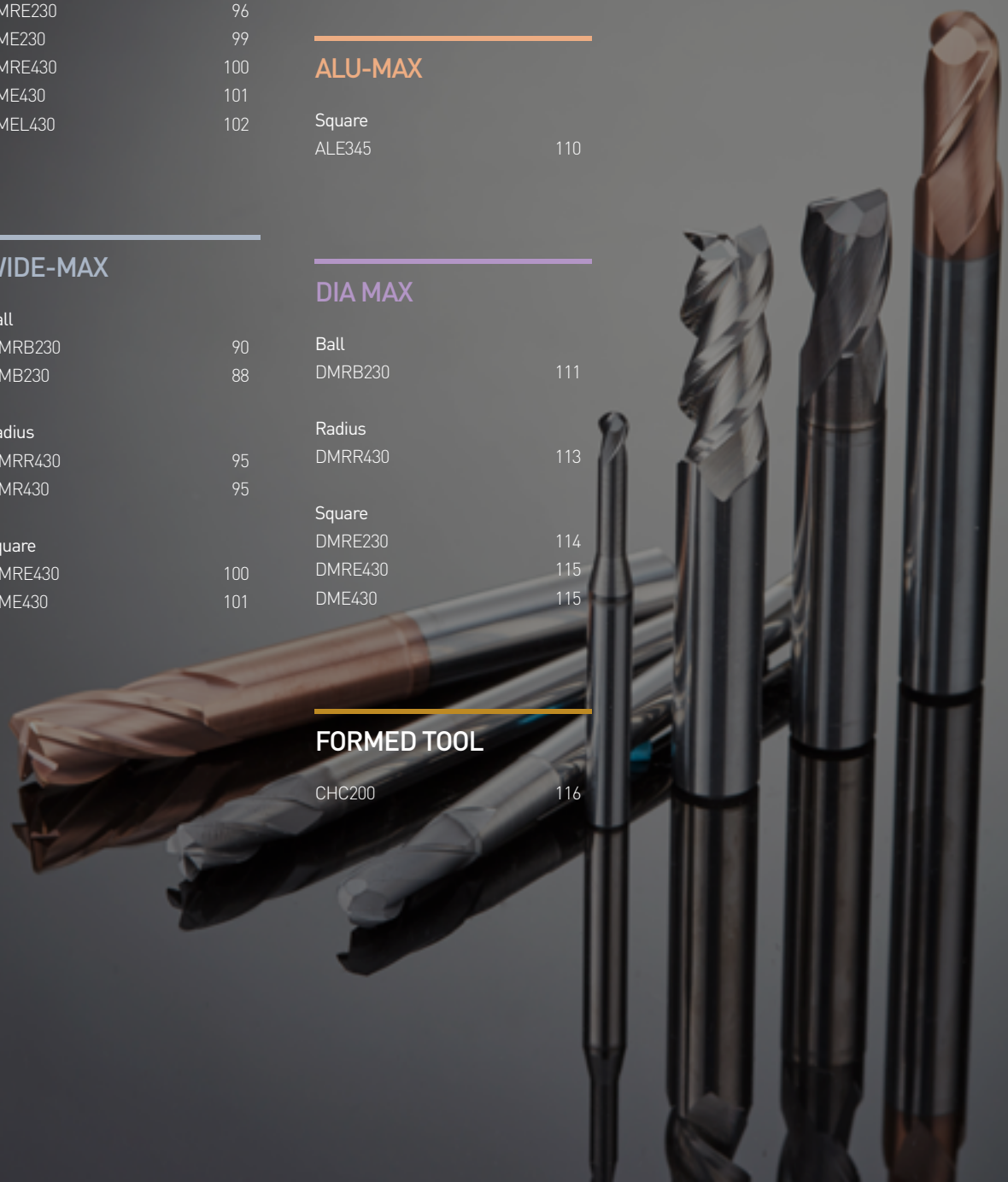
WIDE-MAX

CO-MAX

ALU-MAX

DIA MAX

FORMED TOOL



HMB230, WMB230 황삭 일반절삭 조건 참고 자료

HMB230, WMB230 Rough General Cutting Conditions Reference Table

WIDE-MAX Series

HY-MAX Series

피삭재 Work Material	탄소강, 합금강, 주철 Carbon Steel, Alloy Steel, Cast Iron S50C, SCM, FC250				프리하든강 Prehardened Steel NAK, HPM				열처리강 Hardened Steel SKD61, STAVAX				열처리강 Hardened Steel SKD11			
	~1000 N/mm²				35~45 HRC				45~55 HRC				55~60 HRC			
볼반경 Radius	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut a_p(mm)	Depth of Cut a_e(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut a_p(mm)	Depth of Cut a_e(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut a_p(mm)	Depth of Cut a_e(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut a_p(mm)	Depth of Cut a_e(mm)
R0.5	20,000	700	0.05	0.20	20,000	650	0.05	0.20	20,000	550	0.04	0.15	19,000	450	0.03	0.10
R0.75	20,000	1,200	0.07	0.30	20,000	1,050	0.07	0.30	18,000	650	0.06	0.23	15,000	500	0.04	0.15
R1	20,000	1,350	0.10	0.40	20,000	1,150	0.10	0.40	16,000	750	0.08	0.30	13,000	550	0.06	0.20
R1.5	16,000	1,600	0.15	0.60	16,000	1,450	0.15	0.60	11,000	800	0.12	0.45	8,500	550	0.09	0.30
R2	12,000	1,650	0.20	0.80	12,000	1,450	0.20	0.80	8,000	800	0.16	0.60	6,500	600	0.12	0.40
R2.5	10,000	1,550	0.25	1.00	10,000	1,450	0.25	1.00	6,500	800	0.20	0.75	5,000	600	0.15	0.50
R3	8,000	1,700	0.30	1.20	8,000	1,450	0.30	1.20	5,500	800	0.24	0.90	4,500	600	0.18	0.60
R4	6,000	1,800	0.40	1.60	6,000	1,500	0.40	1.60	4,000	850	0.32	1.20	3,500	600	0.24	0.80
R5	5,000	1,700	0.50	2.00	5,000	1,500	0.50	2.00	3,500	800	0.40	1.50	2,500	550	0.30	1.00
R6	4,500	1,600	0.60	2.40	4,000	1,350	0.60	2.40	3,000	750	0.48	1.80	2,100	500	0.36	1.20
R8	3,300	1,300	0.80	3.20	3,000	1,100	0.80	3.20	2,000	600	0.64	2.40	1,600	450	0.48	1.60

HMB230, WMB230 황삭 고속절삭 조건 참고 자료

HMB230, WMB230 Rough High Speed Cutting Conditions Reference Table

WIDE-MAX Series

HY-MAX Series

피삭재 Work Material	탄소강, 합금강, 주철 Carbon Steel, Alloy Steel, Cast Iron S50C, SCM, FC250				프리하든강 Prehardened Steel NAK, HPM				열처리강 Hardened Steel SKD61, STAVAX				열처리강 Hardened Steel SKD11			
	~1000 N/mm²				35~45 HRC				45~55 HRC				55~60 HRC			
볼반경 Radius	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut a_p(mm)	Depth of Cut a_e(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut a_p(mm)	Depth of Cut a_e(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut a_p(mm)	Depth of Cut a_e(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut a_p(mm)	Depth of Cut a_e(mm)
R0.5	40,000	1,500	0.05	0.15	40,000	1,300	0.05	0.15	40,000	1,200	0.04	0.10	40,000	1,000	0.03	0.10
R0.75	40,000	2,200	0.07	0.23	40,000	2,100	0.07	0.23	40,000	1,700	0.06	0.15	38,000	1,200	0.05	0.15
R1	40,000	2,800	0.10	0.30	40,000	2,700	0.10	0.30	38,000	2,000	0.08	0.20	29,000	1,400	0.06	0.20
R1.5	32,000	3,200	0.15	0.45	32,000	2,800	0.15	0.45	25,000	2,100	0.12	0.30	19,000	1,450	0.09	0.30
R2	24,000	3,300	0.20	0.60	24,000	2,900	0.20	0.60	19,000	2,200	0.16	0.40	14,000	1,500	0.12	0.40
R2.5	20,000	3,300	0.25	0.75	20,000	2,900	0.25	0.75	16,000	2,200	0.20	0.50	12,000	1,500	0.15	0.50
R3	16,000	3,300	0.30	0.90	16,000	3,000	0.30	0.90	13,000	2,300	0.24	0.60	9,500	1,500	0.18	0.60
R4	14,000	3,600	0.40	1.20	14,000	3,000	0.40	1.20	11,000	2,300	0.32	0.80	7,500	1,500	0.24	0.80
R5	12,000	3,600	0.50	1.50	12,000	3,000	0.50	1.50	8,500	2,100	0.40	1.00	6,000	1,400	0.30	1.00
R6	8,000	3,000	0.60	1.80	8,000	2,600	0.60	1.80	6,500	1,900	0.48	1.20	4,600	1,200	0.36	1.20
R8	6,000	2,500	0.80	2.40	6,000	2,200	0.80	2.40	4,500	1,500	0.64	1.60	3,500	950	0.48	1.60

HMB230, WMB230 정삭 일반절삭 조건 참고 자료

HMB230, WMB230 Finish General Cutting Conditions Reference Table

WIDE-MAX Series

HY-MAX Series

피삭재 Work Material	탄소강, 합금강, 주철 Carbon Steel, Alloy Steel, Cast Iron S50C, SCM, FC250				프리하든강 Prehardened Steel NAK, HPM				열처리강 Hardened Steel SKD61, STAVAX				열처리강 Hardened Steel SKD11			
	~1000 N/mm²				35~45 HRC				45~55 HRC				55~60 HRC			
볼반경 Radius	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Depth of Cut ae(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Depth of Cut ae(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Depth of Cut ae(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Depth of Cut ae(mm)
R0.5	20,000	700	0.03	0.03	20,000	650	0.03	0.02	20,000	550	0.03	0.02	19,000	450	0.02	0.02
R0.75	20,000	1,200	0.05	0.04	20,000	1,050	0.05	0.03	18,000	650	0.03	0.03	15,000	500	0.02	0.03
R1	20,000	1,350	0.05	0.05	20,000	1,150	0.05	0.04	16,000	750	0.03	0.04	13,000	550	0.02	0.04
R1.5	16,000	1,600	0.08	0.08	16,000	1,450	0.06	0.06	11,000	800	0.05	0.06	8,500	550	0.05	0.06
R2	12,000	1,650	0.10	0.10	12,000	1,450	0.08	0.08	8,000	800	0.05	0.08	6,500	600	0.05	0.08
R2.5	10,000	1,550	0.10	0.13	10,000	1,450	0.10	0.10	6,500	800	0.05	0.10	5,000	600	0.05	0.10
R3	8,000	1,700	0.15	0.15	8,000	1,450	0.10	0.10	5,500	800	0.10	0.10	4,500	600	0.10	0.10
R4	6,000	1,800	0.20	0.20	6,000	1,500	0.15	0.15	4,000	850	0.10	0.15	3,500	600	0.10	0.15
R5	5,000	1,700	0.20	0.25	5,000	1,500	0.15	0.20	3,500	800	0.10	0.20	2,500	550	0.10	0.20
R6	4,500	1,600	0.20	0.30	4,000	1,350	0.15	0.24	3,000	750	0.10	0.24	2,100	500	0.10	0.24

HMB230, WMB230 정삭 고속절삭 조건 참고 자료

HMB230, WMB230 Finish High Speed Cutting Conditions Reference Table

WIDE-MAX Series

HY-MAX Series

피삭재 Work Material	탄소강, 합금강, 주철 Carbon Steel, Alloy Steel, Cast Iron S50C, SCM, FC250				프리하든강 Prehardened Steel NAK, HPM				열처리강 Hardened Steel SKD61, STAVAX				열처리강 Hardened Steel SKD11			
	~1000 N/mm²				35~45 HRC				45~55 HRC				55~60 HRC			
볼반경 Radius	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Depth of Cut ae(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Depth of Cut ae(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Depth of Cut ae(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Depth of Cut ae(mm)
R0.5	40,000	3,800	0.03	0.03	40,000	3,500	0.03	0.02	40,000	3,000	0.03	0.02	40,000	2,000	0.02	0.02
R0.75	38,000	3,800	0.05	0.04	38,000	3,500	0.05	0.03	38,000	3,000	0.03	0.03	38,000	2,000	0.02	0.03
R1	32,000	3,800	0.05	0.05	32,000	3,500	0.05	0.04	32,000	3,100	0.03	0.04	32,000	2,600	0.02	0.04
R1.5	26,000	3,500	0.08	0.08	26,000	3,300	0.06	0.06	24,000	2,800	0.05	0.06	21,000	2,300	0.05	0.06
R2	22,000	3,700	0.10	0.10	22,000	3,400	0.08	0.08	20,000	2,900	0.05	0.08	17,000	2,300	0.05	0.08
R2.5	20,000	3,600	0.10	0.13	20,000	3,400	0.10	0.10	17,000	2,700	0.05	0.10	14,000	2,100	0.05	0.10
R3	16,000	3,500	0.15	0.15	16,000	3,200	0.10	0.10	13,000	2,600	0.10	0.10	11,000	2,000	0.10	0.10
R4	14,000	3,000	0.20	0.20	13,000	2,700	0.15	0.15	10,000	2,100	0.10	0.15	8,000	1,600	0.10	0.15
R5	10,000	2,600	0.20	0.25	10,000	2,500	0.15	0.20	8,000	1,900	0.10	0.20	6,000	1,350	0.10	0.20
R6	8,000	2,100	0.20	0.30	8,000	2,000	0.15	0.24	6,500	1,550	0.10	0.24	5,000	1,150	0.10	0.24

NOTE

1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. ap는 축방향의 절입량을 표시합니다. ae는 반경방향의 절입량을 표시합니다.
3. 피삭재와 가공형상에 따라 적절한 절삭유를 사용해 주십시오.
4. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.
2. ap(mm) : Axial Depth of Cut / ae(mm) : Radial Depth of Cut
3. Use the appropriate coolant for the workpiece and machining shape.
4. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

HMRB230과 WMRB230 절삭조건 참고 자료

HMRB230, WMRB230 Cutting Conditions Reference Table

WIDE-MAX Series

HY-MAX Series

피삭재 Work Material		탄소강, 합금강, 주철 Carbon Steel, Alloy Steel, Cast Iron S50C, SCM, FC250			프리하든강 Prehardened Steel NAK, HPM			열처리강 Hardened Steel SKD61, STAVAX			열처리강 Hardened Steel SKD11		
		~1000 N/mm²			35~45 HRC			45~55 HRC			55~60 HRC		
볼반경 Radius	유효장 Effective Length	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)
R0.05	0.3	50,000	110	0.003	50,000	90	0.002	50,000	50	0.002			
	0.5	50,000	90	0.002	50,000	70	0.002	50,000	30	0.001			
	1	50,000	60	0.001	50,000	30	0.001						
R0.075	0.5	50,000	250	0.005	50,000	220	0.004	46,000	160	0.003			
	1	50,000	210	0.002	50,000	180	0.002	41,000	110	0.001			
R0.1	0.5	50,000	340	0.008	50,000	310	0.007	45,000	260	0.006	42,000	190	0.003
	1	50,000	340	0.007	50,000	310	0.006	45,000	250	0.005	42,000	170	0.002
	1.5	48,000	290	0.005	45,000	240	0.005	40,000	180	0.004	38,000	120	0.001
	2	38,000	220	0.005	38,000	200	0.004	37,000	130	0.003			
R0.15	0.5	50,000	500	0.013	50,000	450	0.011	45,000	370	0.009	42,000	330	0.006
	1	50,000	490	0.011	50,000	440	0.010	45,000	360	0.008	42,000	320	0.005
	1.5	50,000	480	0.009	50,000	430	0.008	45,000	350	0.007	42,000	310	0.003
	2	48,000	400	0.006	45,000	360	0.006	40,000	290	0.005	36,000	250	0.002
	3	38,000	280	0.005	38,000	260	0.004	37,000	180	0.003			
R0.2	1	43,000	500	0.023	40,000	450	0.020	36,000	350	0.016	33,000	310	0.010
	2	43,000	490	0.018	40,000	440	0.016	36,000	340	0.013	33,000	300	0.007
	3	38,000	400	0.008	36,000	360	0.007	32,000	300	0.006	30,000	270	0.003
	4	38,000	390	0.004	36,000	340	0.003	32,000	280	0.003	30,000	250	0.001
	5	33,000	280	0.002	32,000	260	0.002	31,000	170	0.001	28,000	130	0.001
	6	30,000	210	0.001	30,000	190	0.001	29,000	120	0.001			
R0.25	1	36,000	700	0.027	34,000	600	0.024	30,000	550	0.020	28,000	450	0.015
	2	36,000	700	0.023	34,000	600	0.020	30,000	550	0.016	28,000	450	0.012
	3	32,000	600	0.018	30,000	500	0.016	27,000	450	0.013	26,000	350	0.009
	4	32,000	580	0.014	30,000	480	0.012	27,000	400	0.010	26,000	300	0.007
	5	30,000	400	0.009	30,000	380	0.008	27,000	250	0.007	26,000	170	0.003
	6	28,000	300	0.005	28,000	280	0.004	26,000	180	0.003	24,000	120	0.002
	8	22,000	160	0.003	22,000	150	0.002	21,000	110	0.002			
R0.3	2	36,000	1,100	0.027	34,000	900	0.024	30,000	700	0.020	28,000	550	0.016
	3	36,000	1,100	0.027	34,000	900	0.024	30,000	700	0.020	28,000	550	0.013
	4	32,000	900	0.018	30,000	750	0.016	27,000	600	0.013	25,000	450	0.010
	5	30,000	700	0.014	30,000	640	0.012	27,000	500	0.010	25,000	310	0.008
	6	26,000	600	0.009	26,000	570	0.008	25,000	380	0.007	22,000	260	0.005
	8	20,000	320	0.005	20,000	300	0.004	19,000	200	0.003	17,000	140	0.002
	10	20,000	200	0.003	20,000	190	0.002	19,000	120	0.002			
R0.4	2	36,000	1,300	0.054	34,000	1,100	0.048	30,000	900	0.039	28,000	750	0.030
	3	36,000	1,300	0.050	34,000	1,100	0.044	30,000	850	0.036	28,000	700	0.030
	4	36,000	1,250	0.041	34,000	1,150	0.036	30,000	800	0.029	28,000	650	0.023
	5	32,000	1,050	0.032	30,000	900	0.028	27,000	700	0.023	25,500	600	0.020
	6	32,000	1,000	0.023	30,000	850	0.020	27,000	600	0.016	25,500	500	0.015
	8	25,000	600	0.014	25,000	570	0.012	25,000	450	0.010	22,000	310	0.007
	10	19,000	350	0.006	18,000	330	0.006	17,000	220	0.005	17,000	180	0.003
	12	17,000	250	0.005	17,000	230	0.004	16,000	160	0.003			

피삭재 Work Material		탄소강, 합금강, 주철 Carbon Steel, Alloy Steel, Cast Iron S50C, SCM, FC250			프리하든강 Prehardened Steel NAK, HPM			열처리강 Hardened Steel SKD61, STAVAX			열처리강 Hardened Steel SKD11		
		~1000 N/mm²			35~45 HRC			45~55 HRC			55~60 HRC		
볼반경 Radius	유효장 Effective Length	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)
R0.5	3	32,000	1,600	0.072	30,000	1,350	0.064	27,000	1,100	0.052	25,000	950	0.048
	4	32,000	1,600	0.054	30,000	1,350	0.048	27,000	1,100	0.039	25,000	950	0.036
	5	32,000	1,600	0.045	30,000	1,350	0.040	27,000	1,100	0.033	25,000	950	0.030
	6	30,000	1,300	0.036	28,000	1,100	0.032	24,000	950	0.026	23,000	800	0.023
	8	29,000	1,250	0.027	27,000	1,050	0.024	24,000	900	0.020	23,000	750	0.015
	10	28,000	1,200	0.018	26,000	1,000	0.016	23,000	850	0.013	22,000	700	0.010
	12	20,000	800	0.009	20,000	750	0.008	19,000	600	0.007	17,000	450	0.005
	14	18,000	600	0.007	18,000	570	0.006	17,000	430	0.005	15,000	300	0.004
	16	16,000	420	0.005	16,000	400	0.005	15,000	300	0.004	13,000	200	0.003
	20	13,000	300	0.004	13,000	270	0.003	12,000	170	0.003			
R0.6	4	27,000	1,400	0.063	26,000	1,200	0.056	23,000	1,000	0.046	21,000	850	0.042
	6	26,000	1,300	0.045	25,000	1,100	0.040	22,000	950	0.033	20,000	770	0.030
	8	26,000	1,250	0.036	25,000	1,050	0.032	22,000	900	0.026	20,000	700	0.022
	10	25,000	1,200	0.027	24,000	1,000	0.024	21,000	850	0.020	19,000	630	0.016
	12	22,000	950	0.023	20,000	800	0.020	17,000	650	0.016	14,000	450	0.012
	14	18,000	650	0.018	16,000	600	0.016	15,000	450	0.013	13,000	310	0.010
	16	16,000	450	0.011	15,000	420	0.010	14,000	300	0.008	12,000	200	0.006
	20	14,000	330	0.005	13,000	300	0.005	12,000	180	0.004	10,000	130	0.003
R0.75	4	25,000	1,700	0.081	24,000	1,500	0.072	21,000	1,100	0.059	19,000	950	0.054
	6	25,000	1,700	0.072	24,000	1,500	0.064	21,000	1,100	0.052	19,000	950	0.048
	8	23,000	1,400	0.054	22,000	1,200	0.048	18,000	950	0.039	17,000	800	0.036
	10	23,000	1,350	0.045	22,000	1,150	0.040	18,000	900	0.033	17,000	750	0.030
	12	23,000	1,300	0.045	22,000	1,100	0.040	18,000	850	0.033	17,000	700	0.026
	14	20,000	1,100	0.036	19,000	950	0.032	16,000	750	0.026	15,000	600	0.020
	16	16,000	800	0.018	14,000	750	0.016	13,000	550	0.013	10,000	350	0.010
	20	13,000	350	0.014	12,000	340	0.012	11,000	250	0.010	9,000	150	0.007
R1	6	19,000	1,900	0.144	17,500	1,500	0.128	15,500	1,200	0.104	15,000	1,050	0.096
	8	19,000	1,900	0.135	17,500	1,500	0.120	15,500	1,200	0.098	15,000	1,000	0.090
	10	19,000	1,500	0.126	17,500	1,300	0.112	15,500	1,150	0.091	15,000	950	0.084
	12	17,000	1,340	0.108	16,000	1,150	0.096	14,000	1,000	0.078	13,500	850	0.072
	14	17,000	1,340	0.072	16,000	1,100	0.064	14,000	950	0.052	13,000	800	0.048
	16	17,000	1,220	0.072	16,000	1,050	0.064	14,000	900	0.050	13,000	750	0.045
	20	17,000	1,220	0.045	16,000	1,000	0.040	14,000	850	0.033	13,000	700	0.030
	25	15,000	1,020	0.032	14,000	850	0.028	12,500	700	0.023	12,000	650	0.020
	30	15,000	1,020	0.014	14,000	800	0.012	12,000	650	0.010	11,000	600	0.009
	40	11,000	720	0.009	10,500	550	0.008	9,500	500	0.007	8,500	400	0.006
R1.25	6	16,500	2,000	0.180	15,500	1,600	0.160	13,500	1,300	0.130	13,000	1,100	0.120
	8	16,500	2,000	0.162	15,500	1,600	0.144	13,500	1,300	0.117	13,000	1,100	0.108
	10	16,500	2,000	0.153	15,500	1,600	0.136	13,500	1,300	0.111	13,000	1,100	0.100
	12	15,000	1,600	0.126	14,000	1,350	0.112	12,500	1,100	0.091	11,500	900	0.084
	16	15,000	1,600	0.090	14,000	1,350	0.080	12,500	1,100	0.065	11,500	900	0.060
	20	15,000	1,550	0.072	14,000	1,300	0.064	12,500	1,050	0.052	11,500	850	0.048

피삭재 Work Material		탄소강, 합금강, 주철 Carbon Steel, Alloy Steel, Cast Iron S50C, SCM, FC250			프리하든강 Prehardened Steel NAK, HPM			열처리강 Hardened Steel SKD61, STAVAX			열처리강 Hardened Steel SKD11		
		~1000 N/mm²			35~45 HRC			45~55 HRC			55~60 HRC		
볼반경 Radius	유효장 Effective Length	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)
R1.5	10	14,500	2,100	0.180	13,500	1,800	0.160	12,000	1,500	0.130	11,000	1,300	0.120
	12	14,500	2,100	0.180	13,500	1,800	0.160	12,000	1,500	0.130	11,000	1,300	0.120
	14	14,500	2,050	0.180	13,500	1,700	0.160	12,000	1,400	0.130	11,000	1,250	0.120
	16	14,500	2,000	0.180	13,500	1,600	0.160	12,000	1,350	0.130	11,000	1,200	0.120
	20	13,000	1,750	0.108	12,500	1,500	0.096	11,000	1,200	0.078	10,000	1,050	0.070
	25	13,000	1,700	0.072	12,500	1,450	0.064	11,000	1,150	0.052	10,000	1,000	0.048
	30	13,000	1,650	0.063	12,500	1,400	0.056	11,000	1,100	0.046	10,000	950	0.040
	40	11,500	1,350	0.045	10,500	1,100	0.040	9,500	900	0.033	8,500	800	0.030
R2	12	10,500	2,000	0.270	9,500	1,700	0.240	8,500	1,400	0.195	8,000	1,200	0.180
	16	10,500	2,000	0.270	9,500	1,700	0.240	8,500	1,400	0.195	8,000	1,200	0.180
	20	10,500	2,000	0.225	9,500	1,700	0.200	8,500	1,400	0.163	8,000	1,200	0.150
	25	9,500	1,500	0.180	9,000	1,400	0.160	8,000	1,100	0.130	7,500	1,000	0.120
	30	9,500	1,500	0.135	9,000	1,400	0.120	8,000	1,100	0.098	7,500	1,000	0.090
	40	9,500	1,500	0.090	9,000	1,400	0.080	8,000	1,100	0.065	7,500	1,000	0.060
R3	20	8,000	2,000	0.405	7,500	1,650	0.360	6,700	1,500	0.293	6,000	1,100	0.270
	25	8,000	2,000	0.360	7,000	1,400	0.320	6,000	1,200	0.260	5,600	1,000	0.240
	30	7,500	1,700	0.315	7,000	1,400	0.280	6,000	1,200	0.228	5,600	1,000	0.210

NOTE

1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. ap는 축방향의 절입량을 표시합니다.
3. 홈 절삭시, 조건표의 ap를 70%이하로 설정해 주십시오.
4. 피삭재와 가공형상에 따라 적절한 절삭유를 사용해 주십시오.
5. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.
2. ap(mm) : Axial Depth of Cut
3. For slotting, set ap in the condition table to 70% or less.
4. Use the appropriate coolant for the workpiece and machining shape.
5. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

HMRR230, HMR230 절삭조건 참고 자료

HMRR230, HMR230 Cutting Conditions Reference Table

피삭재 Work Material		프리하든강 Prehardened Steel NAK, HPM			열처리강 Hardened Steel SKD61, STAVAX		
		35~45 HRC			45~55 HRC		
날경 Dia	유효장 Effective Length	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)
0.2	0.5	30,000	200	0.010	30,000	150	0.004
	1	30,000	150	0.006	30,000	100	0.003
0.3	1	30,000	200	0.015	30,000	150	0.004
	1.5	30,000	150	0.012	30,000	130	0.003
	2	30,000	100	0.008	30,000	100	0.003
0.4	1	30,000	350	0.017	30,000	250	0.006
	2	30,000	300	0.014	30,000	200	0.005
	3	30,000	250	0.010	30,000	180	0.004
	4	30,000	200	0.007	30,000	140	0.003

피삭재 Work Material		프리하든강 Prehardened Steel NAK, HPM			열처리강 Hardened Steel SKD61, STAVAX		
		35~45 HRC			45~55 HRC		
날경 Dia	유효장 Effective Length	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)
0.5	1	30,000	500	0.020	24,000	350	0.009
	2	30,000	480	0.017	24,000	330	0.008
	3	30,000	400	0.013	24,000	270	0.006
	4	25,000	270	0.010	20,000	200	0.004
	5	25,000	250	0.007	20,000	180	0.003
	6	25,000	200	0.005	20,000	150	0.002
0.6	2	30,000	600	0.028	25,000	400	0.018
	4	25,000	400	0.019	20,000	250	0.013
	6	20,000	250	0.011	16,000	150	0.007
	8	18,000	180	0.008	14,000	100	0.005
0.7	2	30,000	650	0.030	25,000	450	0.020
	4	25,000	600	0.023	20,000	400	0.017
	6	20,000	450	0.017	16,000	250	0.009
	8	18,000	140	0.008	14,000	100	0.003
0.8	2	30,000	1,100	0.040	25,000	700	0.020
	4	25,000	1,000	0.028	20,000	600	0.017
	6	20,000	700	0.019	16,000	400	0.014
	8	18,000	400	0.014	14,000	250	0.008
	10	18,000	250	0.007	14,000	150	0.005
1	2.5	25,000	1,600	0.060	20,000	900	0.050
	4	25,000	1,400	0.050	20,000	800	0.040
	6	20,000	1,000	0.040	16,000	600	0.020
	8	18,000	700	0.030	14,000	450	0.020
	10	16,000	600	0.020	13,000	350	0.010
	12	14,000	350	0.020	12,000	250	0.008
	14	12,000	300	0.010	10,000	200	0.005
	16	12,000	250	0.010	10,000	150	0.005
1.2	4	22,000	1,500	0.050	18,000	800	0.030
	6	20,000	1,300	0.050	17,000	700	0.030
	8	18,000	1,100	0.040	15,000	600	0.020
	10	16,000	900	0.030	13,000	500	0.020
	12	14,000	700	0.020	11,000	400	0.015
	14	12,000	350	0.010	10,000	200	0.010
	16	12,000	300	0.010	10,000	180	0.008
1.5	4	22,000	1,600	0.090	18,000	1,000	0.050
	6	20,000	1,400	0.080	16,000	850	0.040
	8	18,000	1,200	0.070	15,000	700	0.040
	10	16,000	1,000	0.060	13,000	550	0.030
	12	14,000	800	0.050	11,000	450	0.030
	14	12,000	700	0.040	10,000	400	0.020
	16	12,000	600	0.030	10,000	350	0.015
	20	10,000	300	0.020	8,000	200	0.005
2	6	16,000	2,100	0.120	14,000	900	0.050
	8	16,000	2,000	0.110	13,000	800	0.050
	10	16,000	1,800	0.100	13,000	750	0.040
	12	14,000	1,500	0.090	11,000	600	0.040
	16	12,000	1,200	0.070	10,000	500	0.030
	20	10,000	800	0.050	8,000	350	0.020

피삭재 Work Material		프리하든강 Prehardened Steel NAK, HPM			열처리강 Hardened Steel SKD61, STAVAX		
		35~45 HRC			45~55 HRC		
날경 Dia	유효장 Effective Length	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)
2.5	10	15,000	1,800	0.130	12,000	900	0.070
	16	12,000	1,200	0.080	9,000	550	0.050
	20	10,000	1,000	0.070	8,000	450	0.050
3	12	13,000	1,800	0.150	10,000	950	0.080
	16	12,000	1,500	0.120	9,000	800	0.070
	20	11,000	1,200	0.100	8,000	600	0.060
	25	10,000	1,000	0.080	7,500	500	0.050
	30	9,000	800	0.060	6,500	400	0.030
	35	8,000	500	0.030	5,500	300	0.010
4	12	10,000	2,300	0.200	9,000	1,000	0.100
	16	8,000	2,000	0.160	7,000	800	0.090
	20	7,000	1,700	0.140	6,000	750	0.080
	25	7,000	1,500	0.120	5,500	700	0.070
	30	6,000	900	0.080	4,500	500	0.040
	35	5,000	500	0.050	4,000	400	0.020
6	20	12,000	1,300	0.100	12,000	1,100	0.090
	30	11,000	1,100	0.090	11,000	900	0.070
8	24	12,000	1,300	0.100	12,000	1,100	0.090
	40	11,000	1,100	0.090	11,000	900	0.070
10	30	12,000	1,400	0.100	12,000	1,200	0.090
	50	11,000	1,200	0.090	11,000	1,000	0.070
12	30	10,000	1,600	0.100	10,000	1,400	0.090
	55	9,000	1,400	0.090	9,000	1,200	0.070

NOTE

1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. ap는 축방향의 절입량을 표시합니다. ae는 반경방향의 절입량을 표시합니다.
3. ae의 설정은 [날경-(2x코너R값)] x 20~40% 범위로 권장합니다.
4. 홈 절삭시, 조건표의 ap와 피드를 50%이하로 설정해 주십시오.
5. 피삭재와 가공형상에 따라 적절한 절삭유를 사용해 주십시오.
6. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.
2. ap(mm) : Axial Depth of Cut / ae(mm) : Radial Depth of Cut
3. We recommend setting ae in the range of [Dia-(2xCorner R value)] x 20~40%
4. For slotting, set ap and Feed in the condition table to 50% or less.
5. Use the appropriate coolant for the workpiece and machining shape.
6. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

HMRR430, HMR430, WMRR430, WMR430 절삭조건 참고 자료

HMRR430, HMR430, WMRR430, WMR430 Cutting Conditions Reference Table

WIDE-MAX Series

HY-MAX Series

피삭재 Work Material		프리하든강 Prehardened Steel NAK, HPM			열처리강 Hardened Steel SKD61, STAVAX			열처리강 Hardened Steel SKD11		
		35~45 HRC			45~55 HRC			55~60 HRC		
날경 Dia	유효장 Effective Length	Spindle Speed (min¹)	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min¹)	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min¹)	Feed (mm/min)	Depth of Cut ap(mm)
0.6	2	30,000	1,200	0.030	25,000	1,000	0.020	23,000	800	0.010
	4	25,000	900	0.020	23,000	800	0.015	20,000	600	0.007
	6	23,000	600	0.010	20,000	400	0.008	18,000	300	0.005
0.8	2	28,000	2,000	0.040	25,000	1,600	0.030	23,000	1,400	0.020
	4	28,000	1,800	0.030	25,000	1,400	0.020	23,000	1,200	0.010
	6	23,000	1,400	0.020	20,000	1,100	0.010	18,000	900	0.007
1	2.5	25,000	2,100	0.050	20,000	1,900	0.040	16,000	1,000	0.020
	4	23,000	1,800	0.040	18,000	1,500	0.030	14,000	900	0.010
	6	18,000	1,400	0.020	14,000	1,100	0.010	10,000	800	0.007
	8	16,000	1,200	0.020	12,000	950	0.010	8,000	650	0.005
	10	14,000	1,000	0.010	10,000	800	0.007	6,000	500	0.005
	12	12,000	800	0.007	8,000	650	0.005	5,000	400	0.003
1.5	4	25,000	2,000	0.050	20,000	1,600	0.040	15,000	1,100	0.030
	6	20,000	1,600	0.040	18,000	1,400	0.030	14,000	1,000	0.020
	8	18,000	1,200	0.040	14,000	1,200	0.030	10,000	750	0.010
	10	16,000	1,100	0.030	13,000	1,000	0.020	9,000	700	0.007
	12	14,000	1,000	0.030	12,000	850	0.020	8,000	630	0.007
	14	12,000	900	0.020	10,000	800	0.010	7,000	550	0.005
	16	12,000	850	0.020	9,500	700	0.010	6,500	500	0.005
	20	8,500	550	0.010	7,000	400	0.070	5,500	300	0.005
2	6	18,000	1,800	0.060	15,000	1,500	0.050	12,000	1,100	0.030
	8	16,000	1,600	0.050	12,000	1,200	0.040	10,000	950	0.020
	10	14,000	1,400	0.040	12,000	1,100	0.030	9,500	850	0.010
	12	12,000	1,200	0.040	10,000	1,000	0.030	8,000	800	0.010
	16	10,000	1,000	0.030	9,000	800	0.020	7,500	650	0.007
	20	9,000	750	0.020	8,500	700	0.010	6,000	500	0.005
2.5	10	14,000	1,600	0.070	10,000	1,400	0.050	8,000	900	0.030
	16	10,000	1,200	0.050	8,000	1,100	0.020	6,000	700	0.010
	20	8,500	1,100	0.050	7,500	950	0.020	5,000	650	0.010
3	10	18,000	2,200	0.100	13,000	1,800	0.070	10,000	1,200	0.050
	12	12,000	1,600	0.080	10,000	1,400	0.060	8,000	1,000	0.040
	16	10,000	1,400	0.070	8,500	1,200	0.050	7,000	800	0.030
	20	9,000	1,400	0.070	7,500	1,200	0.040	6,000	800	0.020
	25	8,000	1,200	0.060	7,000	1,000	0.030	5,000	700	0.010
	30	7,000	1,200	0.030	6,500	1,000	0.020	4,500	600	0.007
4	12	12,000	2,000	0.100	10,000	1,500	0.060	8,500	1,100	0.050
	16	10,000	1,800	0.100	8,000	1,400	0.060	6,000	900	0.050
	20	9,000	1,500	0.080	7,000	1,300	0.050	5,500	850	0.030
	25	6,500	1,400	0.080	5,500	1,200	0.050	4,500	750	0.030
	30	5,000	1,000	0.050	4,000	800	0.020	4,000	600	0.010
	35	4,500	900	0.030	3,800	750	0.010	3,200	500	0.007

피삭재 Work Material		프리하든강 Prehardened Steel NAK, HPM			열처리강 Hardened Steel SKD61, STAVAX			열처리강 Hardened Steel SKD11		
		35~45 HRC			45~55 HRC			55~60 HRC		
날경 Dia	유효장 Effective Length	Spindle Speed (min¹)	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min¹)	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min¹)	Feed (mm/min)	Depth of Cut ap(mm)
5	20	7,000	1,800	0.100	6,000	1,600	0.070	5,000	1,100	0.050
6	20	7,000	1,800	0.120	6,000	1,400	0.098	5,500	1,000	0.090
	30	6,000	1,500	0.080	5,500	1,200	0.065	5,000	900	0.050
8	24	6,000	2,300	0.150	5,800	2,200	0.100	5,000	2,200	0.050
	40	5,000	1,900	0.100	4,800	1,800	0.050	4,000	1,700	0.030
10	30	5,600	2,700	0.150	5,200	2,400	0.100	4,000	2,200	0.050
	50	4,600	2,200	0.100	4,200	1,900	0.050	3,000	1,600	0.030
12	30	4,500	2,500	0.200	4,000	1,800	0.150	3,000	1,400	0.050
	55	3,500	1,900	0.150	3,000	1,400	0.100	2,000	850	0.030

NOTE

1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. ap는 축방향의 절입량을 표시합니다. ae는 반경방향의 절입량을 표시합니다.
3. ae의 설정은 [날경-(2x코너R값)] x 20~40% 범위로 권장합니다.
4. 홈 절삭시, 조건표의 ap와 피드를 50%이하로 설정해 주십시오.
5. 피삭재와 가공형상에 따라 적절한 절삭유를 사용해 주십시오.
6. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.
2. ap(mm) : Axial Depth of Cut / ae(mm) : Radial Depth of Cut
3. We recommend setting ae in the range of [Dia-(2xCorner R value)] x 20~40%
4. For slotting, set ap and Feed in the condition table to 50% or less.
5. Use the appropriate coolant for the workpiece and machining shape.
6. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

HMRE230 절삭조건 참고 자료

HMRE230 Cutting Conditions Reference Table

피삭재 Work Material		탄소강,합금강,주철 Carbon Steel, Alloy Steel, Cast Iron S50C, SCM, FC250			프리하든강 Prehardened Steel NAK, HPM			열처리강 Hardened Steel SKD61, STAVAX		
		~1000 N/mm²			35~45 HRC			45~52 HRC		
날경 Dia	유효장 Effective Length	Spindle Speed (min¹)	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min¹)	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min¹)	Feed (mm/min)	Depth of Cut ap(mm)
0.1	0.5	40,000	130	0.003	40,000	110	0.003	40,000	90	0.002
0.15	0.5	40,000	170	0.004	40,000	150	0.003	40,000	120	0.003
	1	40,000	130	0.002	40,000	110	0.002	40,000	90	0.002
0.2	0.5	40,000	340	0.008	36,000	240	0.007	32,000	170	0.005
	1	40,000	310	0.006	36,000	210	0.005	32,000	140	0.004
	1.5	36,000	160	0.005	34,000	140	0.004	30,000	120	0.003
	2	32,000	120	0.003	30,000	100	0.003	27,000	60	0.002
0.3	1	36,000	380	0.016	34,000	260	0.013	30,000	210	0.010
	1.5	36,000	380	0.015	34,000	260	0.012	30,000	210	0.008
	2	30,000	290	0.010	30,000	230	0.008	27,000	170	0.005
	3	30,000	270	0.006	30,000	210	0.005	27,000	150	0.003
0.4	1	28,000	540	0.024	27,000	380	0.020	24,000	280	0.015
	2	28,000	540	0.020	27,000	380	0.016	24,000	280	0.013
	3	26,000	400	0.013	25,000	310	0.010	22,000	230	0.008
	4	26,000	380	0.008	25,000	290	0.007	22,000	210	0.005
	5	23,000	270	0.008	22,000	200	0.007	19,000	160	0.005
	6	23,000	260	0.005	22,000	190	0.004	19,000	150	0.003

피삭재 Work Material		탄소강,합금강,주철 Carbon Steel, Alloy Steel, Cast Iron S50C, SCM, FC250			프리하든강 Prehardened Steel NAK, HPM			열처리강 Hardened Steel SKD61, STAVAX		
		35~45 HRC			35~45 HRC			45~52 HRC		
날경 Dia	유효장 Effective Length	Spindle Speed (min¹)	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min¹)	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min¹)	Feed (mm/min)	Depth of Cut ap(mm)
0.5	2	28,000	550	0.024	27,000	440	0.020	24,000	290	0.015
	3	26,000	410	0.016	25,000	360	0.013	22,000	240	0.010
	4	26,000	410	0.014	25,000	320	0.012	22,000	230	0.009
	5	26,000	390	0.010	25,000	300	0.008	22,000	210	0.007
	6	23,000	320	0.008	22,000	210	0.007	19,000	170	0.005
	8	23,000	270	0.004	22,000	170	0.003	19,000	140	0.003
	10	20,000	210	0.002	19,000	120	0.002	17,000	100	0.002
0.6	2	28,000	790	0.032	27,000	560	0.026	24,000	420	0.018
	3	26,000	670	0.028	24,000	500	0.023	21,000	370	0.016
	4	26,000	670	0.019	24,000	500	0.016	21,000	370	0.012
	5	26,000	590	0.016	24,000	440	0.013	21,000	330	0.010
	6	26,000	590	0.012	24,000	440	0.010	21,000	330	0.008
	8	23,000	460	0.010	21,000	280	0.008	19,000	250	0.006
	10	23,000	430	0.006	21,000	250	0.005	19,000	220	0.003
0.7	2	28,000	790	0.048	27,000	560	0.039	24,000	420	0.025
	4	26,000	590	0.032	24,000	440	0.026	21,000	330	0.018
	6	26,000	580	0.014	24,000	430	0.012	21,000	320	0.009
0.8	2	28,000	790	0.064	27,000	630	0.052	24,000	470	0.035
	3	26,000	730	0.048	24,000	560	0.039	21,000	410	0.030
	4	26,000	730	0.040	24,000	560	0.033	21,000	410	0.024
	5	26,000	590	0.032	24,000	560	0.026	21,000	410	0.017
	6	26,000	590	0.024	24,000	560	0.020	21,000	410	0.012
	8	26,000	590	0.016	24,000	440	0.013	21,000	330	0.008
	10	23,000	400	0.012	21,000	240	0.010	19,000	210	0.006
	12	23,000	370	0.008	21,000	210	0.007	19,000	180	0.003
1	3	26,000	1,100	0.056	24,000	910	0.046	21,000	680	0.035
	4	26,000	1,100	0.052	24,000	910	0.042	21,000	680	0.032
	5	26,000	1,100	0.040	24,000	910	0.033	21,000	680	0.025
	6	23,000	890	0.032	22,000	770	0.026	19,000	560	0.020
	8	23,000	890	0.028	22,000	770	0.023	19,000	560	0.018
	10	23,000	800	0.020	22,000	690	0.016	19,000	450	0.013
	12	20,000	600	0.016	19,000	390	0.013	17,000	340	0.010
	14	20,000	600	0.014	19,000	390	0.011	17,000	340	0.009
	16	20,000	510	0.009	19,000	370	0.007	17,000	290	0.006
	20	18,000	420	0.005	17,000	260	0.004	15,000	200	0.003
1.2	4	23,000	970	0.064	22,000	760	0.052	19,000	500	0.040
	6	23,000	970	0.056	22,000	760	0.046	19,000	500	0.035
	8	20,000	770	0.036	19,000	660	0.029	17,000	450	0.023
	10	20,000	770	0.024	19,000	660	0.020	17,000	450	0.015
	12	20,000	620	0.024	19,000	530	0.020	17,000	400	0.015
	14	18,000	530	0.020	17,000	460	0.016	15,000	340	0.013
	16	18,000	520	0.016	17,000	450	0.013	15,000	330	0.010
1.5	4	20,000	940	0.008	19,000	660	0.007	17,000	500	0.005
	6	20,000	940	0.008	19,000	660	0.007	17,000	500	0.005
	8	18,000	770	0.048	17,000	590	0.039	15,000	440	0.030
	10	18,000	700	0.048	17,000	570	0.039	15,000	430	0.030
	12	18,000	700	0.048	17,000	570	0.039	15,000	400	0.030
	14	18,000	690	0.030	17,000	560	0.025	15,000	390	0.019
	16	16,000	540	0.028	15,000	340	0.023	13,000	300	0.018
	20	16,000	480	0.024	15,000	300	0.020	13,000	260	0.015

피삭재 Work Material		탄소강,합금강,주철 Carbon Steel, Alloy Steel, Cast Iron S50C, SCM, FC250			프리하든강 Prehardened Steel NAK, HPM			열처리강 Hardened Steel SKD61, STAVAX		
		35~45 HRC			35~45 HRC			45~52 HRC		
날경 Dia	유효장 Effective Length	Spindle Speed (min¹)	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min¹)	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min¹)	Feed (mm/min)	Depth of Cut ap(mm)
2	6	15,000	850	0.128	14,000	640	0.104	12,500	490	0.080
	8	15,000	850	0.112	14,000	640	0.091	12,500	490	0.070
	10	15,000	850	0.112	14,000	640	0.091	12,500	490	0.070
	12	13,500	770	0.072	13,000	590	0.059	11,000	430	0.045
	14	13,500	750	0.064	13,000	570	0.052	11,000	410	0.040
	16	13,500	700	0.064	13,000	540	0.052	11,000	390	0.040
	20	13,500	620	0.040	13,000	480	0.033	11,000	340	0.025
3	10	12,000	940	0.176	11,000	640	0.143	10,000	490	0.110
	12	12,000	940	0.160	11,000	640	0.130	10,000	490	0.100
	16	10,500	750	0.104	10,000	580	0.085	9,000	440	0.065
	20	10,500	710	0.096	10,000	570	0.078	9,000	430	0.060
	25	10,500	700	0.064	10,000	560	0.052	9,000	420	0.040
	30	10,500	600	0.056	10,000	550	0.046	9,000	410	0.035
4	12	8,500	1,300	0.280	8,000	1,200	0.228	7,000	800	0.175
	16	8,500	1,300	0.224	8,000	1,200	0.182	7,000	800	0.140
	20	7,500	1,100	0.200	7,000	1,000	0.163	6,500	740	0.125
	25	7,500	1,000	0.128	7,000	920	0.104	6,500	730	0.080
	30	7,500	950	0.120	7,000	850	0.098	6,500	660	0.075
	35	7,000	850	0.080	6,500	750	0.065	6,000	550	0.050
6	20	6,000	1,100	0.360	5,500	870	0.293	5,000	600	0.225
	30	5,000	800	0.350	4,200	700	0.290	4,200	590	0.200
8	40	3,800	450	0.350	3,200	540	0.290	3,200	450	0.200
10	50	3,000	360	0.350	2,500	400	0.290	2,500	350	0.200
12	55	2,500	300	0.350	2,100	340	0.290	2,100	300	0.200

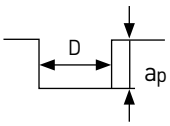
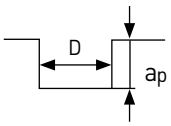
NOTE

1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. ap는 축방향의 절입량을 표시합니다.
3. 피삭재와 가공형상에 따라 적절한 절삭유를 사용해 주십시오.
4. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.
2. ap(mm) : Axial Depth of Cut
3. Use the appropriate coolant for the workpiece and machining shape.
4. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

HME230 절삭조건 참고 자료

HME230 Cutting Conditions Reference Table

피삭재 Work Material	탄소강, 합금강, 주철 Carbon Steel, Alloy Steel, Cast Iron S50C, SCM, FC250		프리하든강 Prehardened Steel NAK, HPM		열처리강 Hardened Steel SKD61, STAVAX	
	~1000 N/mm²		35~45 HRC		45~52 HRC	
날경 Dia	Spindle Speed (min^{-1})	Feed (mm/min)	Spindle Speed (min^{-1})	Feed (mm/min)	Spindle Speed (min^{-1})	Feed (mm/min)
0.1	40,000	20	40,000	16	40,000	12
0.2	32,000	90	32,000	35	32,000	30
0.3	32,000	109	32,000	55	23,000	30
0.4	32,000	122	27,000	59	17,500	30
0.5	29,500	124	22,000	60	14,000	30
0.6	24,500	125	18,500	60	11,500	30
0.8	18,500	125	13,500	65	8,700	30
1	14,500	125	11,000	65	7,000	30
1.5	10,500	125	8,000	65	5,000	40
2	8,400	125	6,300	69	4,000	41
2.5	7,800	125	6,000	72	3,600	43
3	6,400	150	4,500	76	2,750	45
4	5,000	180	3,500	90	2,200	50
5	4,300	235	3,000	98	1,900	55
6	3,600	235	2,500	100	1,550	55
8	2,700	235	1,900	100	1,150	50
10	2,100	225	1,500	95	950	50
12	1,800	225	1,250	95	800	45
16	1,400	190	960	85	600	35
절입량 Depth of Cut (mm) (D=날경/Dia)	홈(Slotting)  ap ϕ0.1~0.45=0.05D ϕ0.5~1.45=0.1D ϕ1.5~3.9=0.3D ϕ4~16=0.5D				홈(Slotting)  ap ϕ0.1~0.9=0.02D ϕ1~16=0.05D	

NOTE

1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. ap는 축방향의 절입량을 표시합니다.
3. 피삭재와 가공형상에 따라 적절한 절삭유를 사용해 주십시오.
4. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.
2. ap(mm) : Axial Depth of Cut
3. Use the appropriate coolant for the workpiece and machining shape.
4. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

HMRE430, WMRE430 절삭조건 참고 자료

HMRE430, WMRE430 Cutting Conditions Reference Table

WIDE-MAX Series

HY-MAX Series

피삭재 Work Material		탄소강, 합금강, 주철 Carbon Steel, Alloy Steel, Cast Iron S50C, SCM, FC250			프리하든강 Prehardened Steel NAK, HPM			열처리강 Hardened Steel SKD61, STAVAX		
		~1000 N/mm²			35~45 HRC			45~55 HRC		
날경 Dia	유효장 Effective Length	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut a_p(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut a_p(mm)	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut a_p(mm)
1	4	25,000	1,600	0.040	22,000	1,000	0.030	18,000	750	0.020
	6	20,000	1,200	0.030	18,000	750	0.020	14,000	500	0.015
	8	18,000	1,050	0.020	16,000	600	0.015	12,000	400	0.010
	10	16,000	900	0.015	14,000	500	0.010	10,000	320	0.010
	12	14,000	750	0.010	12,000	400	0.010	8,000	200	0.010
1.5	6	20,000	1,800	0.080	16,000	1,100	0.060	16,000	900	0.040
	8	18,000	1,500	0.070	14,000	900	0.050	14,000	750	0.030
	10	16,000	1,300	0.060	13,000	700	0.040	12,000	600	0.030
	12	14,000	1,050	0.050	12,000	600	0.030	10,000	500	0.020
2	6	16,000	2,100	0.120	14,000	1,400	0.100	12,000	1,100	0.060
	8	16,000	2,000	0.110	14,000	1,300	0.090	12,000	1,000	0.050
	10	16,000	1,800	0.100	14,000	1,200	0.080	12,000	900	0.050
	12	14,000	1,500	0.080	13,000	1,100	0.070	11,000	800	0.040
	16	12,000	1,200	0.070	11,000	850	0.050	10,000	650	0.030
3	10	11,000	2,100	0.150	10,000	1,400	0.120	9,000	1,200	0.090
	12	11,000	2,000	0.150	10,000	1,350	0.120	9,000	1,150	0.080
	16	10,000	1,500	0.120	9,000	1,000	0.080	8,000	850	0.070
	20	9,000	1,200	0.100	8,000	750	0.070	7,000	600	0.060
	25	8,000	1,050	0.080	7,000	650	0.060	6,000	500	0.050
4	12	8,000	2,200	0.300	7,000	1,500	0.250	6,000	1,250	0.150
	16	8,000	2,100	0.250	7,000	1,400	0.200	6,000	1,150	0.100
	20	8,000	2,000	0.200	7,000	1,250	0.150	6,000	1,000	0.080
	25	7,000	1,700	0.150	6,000	1,050	0.100	5,000	800	0.070
	30	7,000	1,500	0.120	6,000	950	0.080	5,000	750	0.050
6	20	8,000	1,900	0.250	6,500	1,500	0.150	4,500	1,300	0.070
	30	5,000	1,150	0.250	4,200	1,050	0.150	4,200	900	0.070
8	40	3,200	720	0.250	3,000	630	0.150	2,900	580	0.070
10	50	2,800	760	0.250	2,600	620	0.150	2,500	560	0.070
12	55	2,500	700	0.250	2,100	500	0.150	2,100	470	0.070

NOTE

1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. 절입량의 a_p는 축방향의 절입량을 표시합니다.
3. 회전수와 테이블이송은 같은 비율로 조정해 주십시요.
4. 상기 절삭조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계용량, 작업환경에 따라 조건을 조정해서 가공하시기 바랍니다.

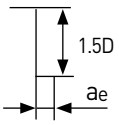
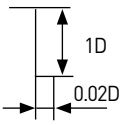
1. Use a rigid and precise machine and holder.
2. a_p(mm) : Axial Depth of Cut
3. Adjust both Spindle speed and Feed rate by the same proportion.
4. The above conditions are only for reference. In actual machining conditions adjust these parameters according to the milling shape, machine capability and the operation environment.

HME430, WME430 절삭조건 참고 자료

HME430, WME430 Cutting Conditions Reference Table

WIDE-MAX Series

HY-MAX Series

피삭재 Work Material	탄소강, 합금강, 주철 Carbon Steel, Alloy Steel, Cast Iron S50C, SCM, FC250		프리하든강 Prehardened Steel NAK, HPM		열처리강 Hardened Steel SKD61, STAVAX	
	~1000 N/mm²		35~45 HRC		45~55 HRC	
날경 Dia	Spindle Speed (min^{-1})	Feed (mm/min)	Spindle Speed (min^{-1})	Feed (mm/min)	Spindle Speed (min^{-1})	Feed (mm/min)
1	20,000	312	14,000	147	9,500	114
1.5	12,000	288	8,500	136	6,500	130
2	10,000	320	7,000	140	5,000	160
3	7,000	420	5,000	160	3,200	192
4	5,000	480	4,000	192	2,500	230
5	4,000	496	3,000	192	2,000	256
6	3,500	546	2,500	200	1,600	243
8	2,700	497	2,000	200	1,200	240
10	2,100	462	1,500	210	1,000	240
12	1,700	428	1,200	197	800	224
16	1,300	416	1,000	176	600	192
절입량 Depth of Cut (mm) (D=날경/Dia)	측면(Side)  ae ϕ1~2=0.05D ϕ3~16=0.1D				측면(Side) 	

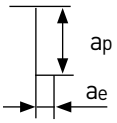
NOTE

1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. a_e는 반경방향의 절입량을 표시합니다.
3. 피삭재와 가공형상에 따라 적절한 절삭유를 사용해 주십시오.
4. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.
2. a_e(mm) : Radial Depth of Cut
3. Use the appropriate coolant for the workpiece and machining shape.
4. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

HMEL430 절삭조건 참고 자료

HMEL430 Cutting Conditions Reference Table

피삭재 Work Material	탄소강, 합금강, 주철 Carbon Steel, Alloy Steel, Cast Iron S50C, SCM, FC250		프리하든강 Prehardened Steel NAK, HPM		열처리강 Hardened Steel SKD61, STAVAX	
	~1000 N/mm²		35~45 HRC		45~52 HRC	
날경 Dia	Spindle Speed (min^{-1})	Feed (mm/min)	Spindle Speed (min^{-1})	Feed (mm/min)	Spindle Speed (min^{-1})	Feed (mm/min)
6	2,100	150	1,450	80	1,300	70
8	1,550	150	1,100	80	990	70
10	1,250	150	890	80	790	70
12	1,050	150	740	80	660	70
절입량 Depth of Cut (mm) (D=날경/Dia)	측면(Side Milling)  ap=4D~6D ae=0.01D					

NOTE

1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. a_p는 축방향의 절입량을 표시합니다. a_e는 반경방향의 절입량을 표시합니다.
3. 피삭재와 가공형상에 따라 적절한 절삭유를 사용해 주십시오.
4. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.
2. a_p(mm) : Axial Depth of Cut / a_e(mm) : Radial Depth of Cut
3. Use the appropriate coolant for the workpiece and machining shape.
4. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

CMRB230 절삭조건 참고 자료

CMRB230 Cutting Conditions Reference Table

피삭재 Work Material		동 Copper		
볼반경 Radius	유효장 Effective Length	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)
R0.05	0.3	40,000	220	0.003
	0.5	40,000	170	0.002
	1	40,000	100	0.002
R0.1	1	40,000	320	0.012
	1.5	40,000	300	0.008
	2	40,000	200	0.007
R0.15	1	40,000	480	0.018
	1.5	40,000	480	0.013
	2	40,000	430	0.010
	3	40,000	400	0.007
R0.2	1	40,000	550	0.044
	2	40,000	550	0.031
	3	40,000	440	0.012
	4	40,000	400	0.006
	5	40,000	300	0.004
	6	30,000	220	0.002
R0.25	2	40,000	800	0.039
	3	35,000	630	0.033
	4	35,000	630	0.022
	5	35,000	630	0.020
	6	30,000	510	0.008
	8	30,000	510	0.004
	10	24,000	240	0.002
R0.3	2	40,000	1,200	0.046
	4	35,000	990	0.026
	6	35,000	940	0.017
	8	30,000	760	0.009
	10	24,000	430	0.006
	12	20,000	280	0.003
R0.4	2	40,000	1,440	0.088
	4	40,000	1,440	0.062
	6	35,000	1,130	0.035
	8	30,000	970	0.022
	10	24,000	520	0.011
	12	20,000	360	0.004

피삭재 Work Material		동 Copper		
볼반경 Radius	유효장 Effective Length	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut a_p(mm)
R0.5	4	35,000	1,750	0.077
	6	30,000	1,350	0.044
	8	30,000	1,350	0.044
	10	30,000	1,350	0.028
	12	20,000	850	0.014
	14	20,000	720	0.011
	16	20,000	560	0.009
R0.75	6	30,000	1,980	0.110
	8	28,000	1,660	0.066
	10	28,000	1,660	0.066
	12	20,000	1,180	0.066
	14	18,000	1,010	0.055
	16	18,000	1,010	0.021
	20	16,000	890	0.019
R1	6	25,000	2,250	0.220
	8	25,000	2,250	0.154
	10	25,000	2,000	0.154
	12	18,000	1,440	0.088
	14	16,000	1,280	0.088
	16	16,000	1,150	0.088
	20	14,000	1,000	0.055
R1.5	12	18,000	2,700	0.231
	14	18,000	2,700	0.231
	16	18,000	2,430	0.231
	20	16,000	2,160	0.132
	25	16,000	2,160	0.088
	30	14,000	1,890	0.088
R2	16	14,000	2,800	0.308
	20	14,000	2,800	0.308
	25	12,000	2,160	0.176
	30	12,000	2,160	0.176
R3	20	12,000	3,120	0.550
	30	10,000	2,400	0.440

NOTE

1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. a_p는 축방향의 절입량을 표시합니다.
3. 동 텅스텐(W70%-Cu30%) 절삭가공시, 절삭조건 참고수치의 회전수 와 피드를 약10% 낮추어 가공해 주십시오.
4. 피삭재와 가공형상에 따라 적절한 절삭유를 사용해 주십시오.
5. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.
2. a_p(mm) : Axial Depth of Cut
3. When cutting Copper Tungsten(W70%-Cu30%), reduce the cutting speed and feed rate by 10% for the reference value
4. Use the appropriate coolant for the workpiece and machining shape.
5. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

CMRR230 절삭조건 참고 자료

CMRR230 Cutting Conditions Reference Table

피삭재 Work Material		동 Copper		
날경 Dia	유효장 Effective Length	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)
0.2	1	40,000	300	0.010
	1.5	35,000	180	0.005
0.3	1	40,000	500	0.020
	1.5	40,000	460	0.019
	2	40,000	400	0.014
0.4	1	40,000	560	0.030
	2	35,000	490	0.019
	3	30,000	360	0.017
	4	30,000	360	0.010
0.5	2	30,000	660	0.028
	3	30,000	660	0.020
	4	30,000	660	0.020
	5	25,000	550	0.013
	6	25,000	500	0.010
0.6	2	30,000	840	0.034
	4	30,000	720	0.023
	6	25,000	500	0.014
	8	20,000	360	0.012
0.8	4	30,000	780	0.038
	6	25,000	600	0.023
	8	22,000	528	0.018
1	4	30,000	1,260	0.046
	6	25,000	950	0.029
	8	22,000	830	0.029
	10	20,000	760	0.018
	12	18,000	610	0.018
1.5	6	24,000	1,100	0.048
	8	22,000	1,010	0.043
	10	20,000	920	0.043
	12	17,000	780	0.043
2	8	22,000	1,710	0.084
	10	17,000	1,220	0.072
	12	17,000	1,190	0.048
	14	16,000	1,120	0.048
	16	16,000	1,120	0.048
3	12	17,000	1,660	0.084
	16	17,000	1,660	0.060
	20	14,000	1,370	0.060

피삭재 Work Material		동 Copper		
날경 Dia	유효장 Effective Length	**Spindle Speed** (min^{-1})	**Feed** (mm/min)	**Depth of Cut** a_p(mm)
4	16	12,000	2,000	0.156
	20	12,000	2,000	0.132
	25	12,000	2,000	0.120
6	20	12,000	3,000	0.200
8	24	12,000	3,500	0.300
10	30	10,500	3,500	0.400
12	30	8,500	4,000	0.400

NOTE

1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. a_p는 축방향의 절입량을 표시합니다.
3. 동 텅스텐(W70%-Cu30%) 절삭가공시, 절삭조건 참고수치의 회전수 와 피드를 약10% 낮추어 가공해 주십시오.
4. 피삭재와 가공형상에 따라 적절한 절삭유를 사용해 주십시오.
5. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.
2. a_p(mm) : Axial Depth of Cut
3. When cutting Copper Tungsten(W70%-Cu30%), reduce the cutting speed and feed rate by 10% for the reference value
4. Use the appropriate coolant for the workpiece and machining shape.
5. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

CMRE230 절삭조건 참고 자료

CMRE230 Cutting Conditions Reference Table

피삭재 Work Material		동 Copper		
날경 Dia	유효장 Effective Length	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut ap(mm)
0.1	0.5	40,000	280	0.004
0.15	0.5	40,000	320	0.006
	1	40,000	250	0.004
0.2	1	40,000	390	0.013
	1.5	40,000	360	0.007
	2	40,000	320	0.005
0.3	1	40,000	450	0.025
	1.5	40,000	450	0.020
	2	40,000	410	0.014
	3	35,000	360	0.010
0.4	2	35,000	690	0.030
	3	35,000	560	0.019
	4	30,000	480	0.012
0.5	2	35,000	690	0.040
	3	35,000	560	0.024
	4	30,000	480	0.020
	6	25,000	350	0.016
0.6	2	35,000	990	0.050
	3	30,000	770	0.042
	4	30,000	770	0.029
	6	25,000	570	0.018
	8	20,000	380	0.018
0.8	2	35,000	990	0.090
	4	30,000	850	0.060
	6	25,000	570	0.038
	8	22,000	500	0.024
1	4	30,000	1,270	0.070
	6	25,000	1,020	0.042
	8	22,000	850	0.042
	10	20,000	770	0.026
	12	18,000	540	0.026
1.5	6	24,000	1,020	0.130
	8	22,000	950	0.072
	10	20,000	860	0.072
	12	17,000	660	0.072

피삭재 Work Material		동 Copper		
날경 Dia	유효장 Effective Length	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut a_p(mm)
2	6	20,000	1,260	0.240
	8	20,000	1,260	0.168
	10	20,000	1,260	0.168
	12	17,000	970	0.096
	16	15,000	770	0.096
	20	12,000	580	0.060
3	12	15,000	1,180	0.250
	16	14,000	1,000	0.144
	20	12,000	770	0.144
	25	10,000	640	0.096
	30	8,500	480	0.096
4	12	12,000	2,160	0.480
	16	12,000	2,160	0.336
	20	11,000	1,980	0.336
	25	8,500	1,370	0.192
	30	8,500	1,370	0.192

NOTE

1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. a_p는 축방향의 절입량을 표시합니다.
3. 동 텅스텐(W70%-Cu30%) 절삭가공시, 절삭조건 참고수치의 회전수 와 피드를 약10% 낮추어 가공해 주십시오.
4. 피삭재와 가공형상에 따라 적절한 절삭유를 사용해 주십시오.
5. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.
2. a_p(mm) : Axial Depth of Cut
3. When cutting Copper Tungsten(W70%-Cu30%), reduce the cutting speed and feed rate by 10% for the reference value
4. Use the appropriate coolant for the workpiece and machining shape.
5. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

CME230 절삭조건 참고 자료

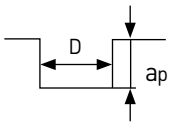
CME230 Cutting Conditions Reference Table

피삭재 Work Material	동 COPPER				
날경 × 날장 Dia × Length of Cut	Spindle Speed (min^{-1})	홈가공 Slotting		측면가공 Side Milling	
		Feed (mm/min)	Depth of Cut a_p(mm)	Feed (mm/min)	Depth of Cut a_p(mm)
0.1×0.15	40,000	25	0.005	60	0.150
1×2.5	22,500	100	0.3	260	1.5
1×4	16,000			150	4.0
2×6	9,500	80	1.0	180	6.0
2×8	8,000			160	8.0
3×10	6,500	85	1.5	180	9.0
4×12	5,000	100	2.0	220	12.0
6×15	3,200	125	3.0	280	15.0
8×20	2,400	125	4.0	280	20.0
10×25	2,000	125	5.0	280	25.0
12×30	1,600	125	6.0	280	30.0

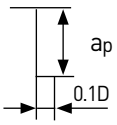
절입량
Depth of Cut
(mm)

(D=날경/Dia)

홈(Slotting)



측면(Side Milling)



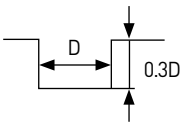
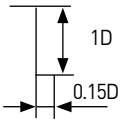
NOTE

1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. a_p는 축방향의 절입량을 표시합니다.
3. 동 텅스텐(W70%-Cu30%) 절삭가공시, 절삭조건 참고수치의 회전수 와 피드를 약10% 낮추어 가공해 주십시오.
4. 피삭재와 가공형상에 따라 적절한 절삭유를 사용해 주십시오.
5. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.
2. a_p(mm) : Axial Depth of Cut
3. When cutting Copper Tungsten(W70%-Cu30%), reduce the cutting speed and feed rate by 10% for the reference value
4. Use the appropriate coolant for the workpiece and machining shape.
5. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

ALE345 절삭조건 참고 자료

ALE345 Cutting Conditions Reference Table

피삭재 Work Material	알루미늄 합금 A5052 Aluminum Alloy A5052		
날경 Dia	**Spindle Speed** (min^{-1})	홈가공 Slotting **Feed** (mm/min)	측면가공 Side Milling **Feed** (mm/min)
1	10,000	300	800
1.5	10,000	500	1,100
2	10,000	700	1,500
3	10,000	1,000	2,200
4	10,000	1,300	2,400
5	10,000	1,600	2,900
6	10,000	2,000	3,200
8	8,000	2,200	3,700
10	6,500	2,200	3,700
12	5,500	2,200	3,700
절입량 Depth of Cut (mm) (D=날경/Dia)	홈(Slotting)  	측면(Side Milling)  	

NOTE

1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. 알루미늄 가공에는 수용성 절삭유 사용을 권장합니다.
3. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.
2. We recommend using water soluble coolant for aluminum machining.
3. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

DMRB230 절삭조건 참고 자료

DMRB230 Cutting Conditions Reference Table

피삭재 Work Material		흑연 Graphite		
볼반경 Radius	유효장 Effective Length	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut a_p(mm)
R0.1		20,000~40,000	200~300	0.020
R0.15		20,000~40,000	200~450	0.030
R0.2		20,000~40,000	450~950	0.040
R0.25		20,000~40,000	400~950	0.050
R0.3	6	20,000~40,000	450~950	0.060
	10	20,000~32,000	400~650	0.050
	15	10,000~15,000	150~200	0.030
	20	7,000~9,000	90~130	0.020
R0.4	6	20,000~40,000	500~1,000	0.070
	10	20,000~40,000	450~700	0.060
	15	10,000~15,000	200~250	0.040
	20	7,000~9,000	100~140	0.030
R0.5	4	20,000~40,000	600~1,200	0.100
	6	20,000~40,000	550~1,100	0.100
	10	20,000~32,000	550~950	0.100
	16	18,000~23,000	400~500	0.080
	20	12,000~18,000	200~300	0.070
	30	5,000~8,000	90~140	0.040
	40	5,000~7,000	80~120	0.030
R0.75	6	20,000~40,000	900~1,800	0.150
	10	20,000~38,000	850~1,600	0.150
	16	20,000~30,000	850~1,300	0.150
	20	18,000~22,000	650~750	0.150
	30	9,000~12,000	250~300	0.100
R1	6	20,000~40,000	1,400~2,800	0.200
	10	20,000~40,000	1,300~2,500	0.200
	16	18,000~27,000	1,300~1,800	0.200
	20	18,000~23,000	1,100~1,500	0.200
	30	12,000~16,000	600~850	0.200
	40	4,000~6,000	200~350	0.150
	50	4,000~6,000	200~300	0.100
R1.5	16	15,000~20,000	1,600~2,000	0.400
	20	15,000~20,000	1,500~2,000	0.300
	30	15,000~20,000	1,100~1,600	0.300
	40	9,000~12,000	700~1,000	0.200
	50	4,000~7,500	300~500	0.150
R2	20	14,000~20,000	2,000~3,000	0.400
	40	9,000~12,000	1,300~1,700	0.400

피삭재 Work Material		흑연 Graphite		
볼반경 Radius	유효장 Effective Length	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut a_p(mm)
R3	25	9,000~20,000	2,000~4,500	0.600
	40	6,000~10,000	1,300~2,200	0.500
	50	5,000~9,000	1,050~2,000	0.400
R4	40	7,000~16,000	1,800~3,500	0.800
R5	50	6,000~12,000	1,400~3,000	1.000
R6	55	5,000~10,000	1,100~2,500	1.200

NOTE

1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. a_p는 축방향의 절입량을 표시합니다.
3. 흑연 가공에는 건식가공을 권장합니다.
4. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.
2. a_p(mm) : Axial Depth of Cut
3. Air blow cooling is recommended for graphite machining.
4. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

DMRR430 절삭조건 참고 자료

DMRR430 Cutting Conditions Reference Table

피삭재 Work Material		흑연 Graphite			
날경 Dia	유효장 Effective Length	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut a_p(mm)	Depth of Cut a_e(mm)
2×R0.2	12	12,000~16,000	1,500~2,000	0.20	1.20
	16	9,000~12,000	1,100~1,500	0.20	1.20
	20	8,000~11,000	1,000~1,300	0.18	1.00
	30	7,000~9,000	800~1,000	0.15	1.00
3×R0.2	20	8,000~12,000	1,300~1,800	0.20	1.80
	40	4,000~7,000	700~1,100	0.15	1.60
3×R0.5	20	8,000~12,000	1,300~1,800	0.20	1.30
	40	4,000~7,000	700~1,100	0.15	1.20
4×R0.2	30	9,000~13,000	2,300~3,500	0.35	2.80
4×R0.5	30	9,000~13,000	2,300~3,500	0.35	2.40
6×R0.5	30	7,000~12,000	2,500~4,000	1.50	4.00
6×R1	30	7,000~12,000	2,500~4,000	1.50	3.20
8×R0.5	40	7,000~10,000	2,500~4,000	2.00	5.60
8×R1	40	7,000~10,000	2,500~4,000	2.00	4.80
10×R0.5	50	4,000~8,000	1,500~3,000	2.50	7.20
10×R1	50	4,000~8,000	1,500~3,000	2.50	6.40
12×R0.5	55	3,000~6,000	1,100~2,500	3.00	9.00
12×R1	55	3,000~6,000	1,100~2,500	3.00	8.00

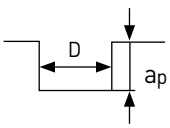
NOTE

1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. a_p는 축축방향의 절입량을 표시합니다. a_e는 반경방향의 절입량을 표시합니다.
3. 흑연 가공에는 건식가공을 권장합니다.
4. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.
2. a_p(mm) : Axial Depth of Cut / a_e(mm) : Radial Depth of Cut
3. Air blow cooling is recommended for graphite machining.
4. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

DMRE230 절삭조건 참고 자료

DMRE230 Cutting Conditions Reference Table

피삭재 Work Material		흑연 Graphite		
날경 Dia	유효장 Effective Length	Spindle Speed (min^{-1})	Feed (mm/min)	Depth of Cut a_p(mm)
0.2	1	40,000	160	<0.1D
0.3	1.5	40,000	240	<0.1D
0.4	3	30,000	240	<0.1D
0.5	4	30,000	300	<0.15D
0.6	4	30,000	360	<0.15D
0.8	6	25,000	400	<0.15D
1	6	16,000	420	<0.15D
	8	16,000	380	<0.15D
	10	16,000	320	<0.15D
	12	16,000	320	<0.15D
	16	12,000	240	<0.1D
	20	10,000	200	<0.1D
1.5	8	16,000	450	<0.15D
	10	16,000	420	<0.15D
	12	16,000	420	<0.15D
	16	12,000	320	<0.1D
2	10	16,000	480	<0.15D
	12	16,000	480	<0.15D
	16	12,000	360	<0.1D
	20	10,000	300	<0.1D
3	20	10,000	400	<0.5D
	30	9,000	360	<0.5D
4	30	9,000	540	<0.5D
절입량 Depth of Cut (mm) (D=날경/Dia)	홈(Slotting) 			

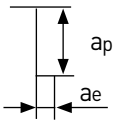
NOTE

1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. a_p는 축방향의 절입량을 표시합니다.
3. 흑연 가공에는 건식가공을 권장합니다.
4. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.
2. a_p(mm) : Axial Depth of Cut
3. Air blow cooling is recommended for graphite machining.
4. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

DME430, DMRE430 절삭조건 참고 자료

DME430, DMRE430 Cutting Conditions Reference Table

피삭재 Work Material	흑연 Graphite			
날경 Dia	**Spindle Speed** (min[1])	**Feed** (mm/min)	Depth of Cut ap(mm)	**Depth of Cut** ae(mm)
1	30,000	1,200	1D	0.05D
1.5	25,000	1,200	1D	0.05D
2	22,000	1,500	1D	0.05D
3	20,000	2,200	1.5D	0.05D
4	18,000	2,300	1.5D	0.05D
5	13,000	2,600	1.5D	0.05D
6	12,000	3,000	1.5D	0.05D
8	10,000	2,800	1.5D	0.05D
10	8,500	2,500	2D	0.05D
12	7,200	2,200	2D	0.05D
절입량 Depth of Cut (mm) (D=날경/Dia)	측면(Side Milling)  			

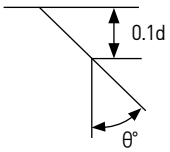
NOTE

1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. a_p는 축축방향의 절입량을 표시합니다. a_e는 반경방향의 절입량을 표시합니다.
3. 흑연 가공에는 건식가공을 권장합니다.
4. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.
2. a_p(mm) : Axial Depth of Cut / a_e(mm) : Radial Depth of Cut
3. Air blow cooling is recommended for graphite machining.
4. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

CHC200, HMCHC200 절삭조건 참고 자료

CHC200, HMCHC200 Cutting Conditions Reference Table

피삭재 Work Material	탄소강,합금강,주철 Carbon Steel, Alloy Steel, Cast Iron S50C, SCM, FC250		프리하든강 Prehardened Steel NAK, HPM	
	~1000 N/mm²		35~45 HRC	
생크경 Shank Dia	Spindle Speed (min^{-1})	Feed (mm/min)	Spindle Speed (min^{-1})	Feed (mm/min)
4	2,000~4,000	46~69	1,200~2,400	27~42
6	1,300~2,700	34~50	800~1,600	20~31
8	1,000~2,000	30~43	600~1,200	19~30
10	800~1,600	28~39	600~1,200	15~23
12	700~1,300	26~37	400~800	14~22
절입량 Depth of Cut (mm)				

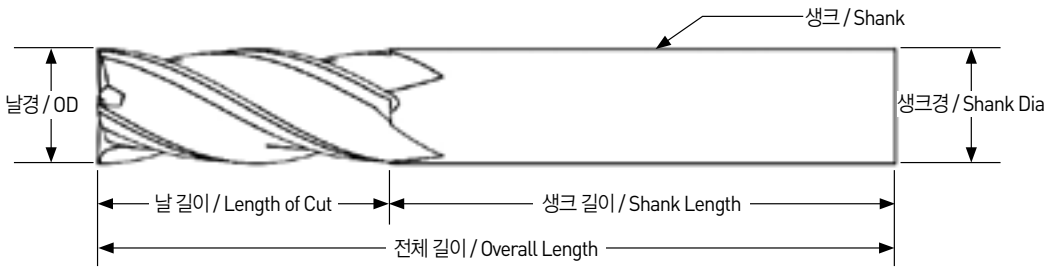
NOTE

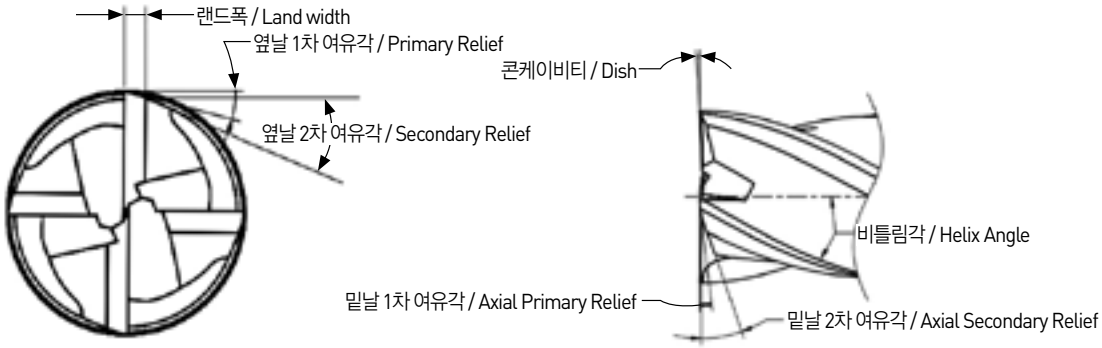
1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
2. 피삭재와 가공형상에 따라 적절한 절삭유를 사용해 주십시오.
3. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.
2. Use the appropriate coolant for the workpiece and machining shape.
3. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

TECHNICAL INFORMATION

엔드밀 각 부위의 명칭 Terminology for each part of the end mill





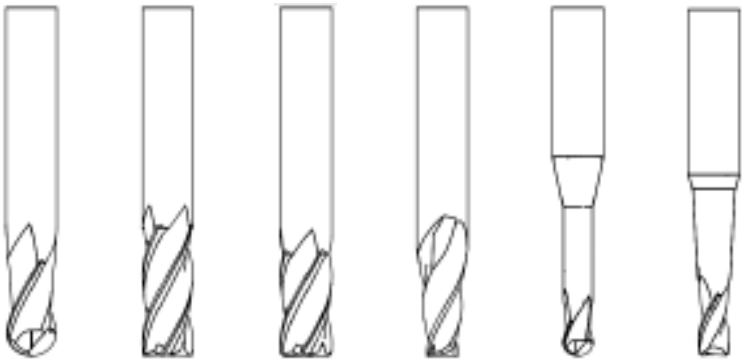
엔드밀 날수 Number of flutes

2날
2 Flutes

3날
3 Flutes

4날
4 Flutes

엔드밀의 형상 End mill shape



볼형
Ball

스퀘어형
Square

코너 R형
Radius

테이퍼형
Taper

리브타입형
Rib

넥테이퍼형
Neck Taper

절삭 조건 계산식 Calculation of milling conditions

절삭속도 (Vc) Cutting Speed	=	$\frac{\pi \times D \times n}{1{,}000}$
회전수 (n) Spindle Speed	=	$Vc \div \pi \div D \times 1{,}000$
테이블이송 (Vf) Feed	=	$n \times fz \times Z$
한날당이송 (fz) Feed per tooth	=	$\frac{Vf}{n \times Z}$

Vc = 절삭속도 (m/min)
Cutting Speed

π = 3.14 (원주율)
The circular constant

D = 날경 (mm)
Diameter

n = 회전수 (min^{-1})
Spindle speed

Vf = 테이블이송 (mm/min)
Feed

fz = 한날당이송 (mm/tooth)
Feed per tooth

Z = 날수
Number of flutes

절삭 조건 사용 요령 Using the milling conditions

- 가공할 피삭재의 종류 또는 그 피삭재 경도에 대한 절삭속도(Vc)값을 결정한다.
- 사용 공구의 외경을 알고 있기에 계산식에 따라 회전수와 이송을 구한다.
- 축방향(ap)과 반경방향(ae)의 가공 절입량을 결정한다,
- 기계 스핀들이 밀링조건 기준표 값보다 작을경우, 이송속도를 동일한 속도로 감소시킨다.

- Decide the cutting speed(Vc) on the type of workpiece or its hardness,
- Knowing the diameter of the tool, we can set spindle speed(n) and Feed(Vf).
- Set the Axial(ap) and Radial(ae) depth of cut.
- If the machine spindle is less than value of milling conditions reference table, reduce the feed rate to the same rate.

경도 환산표 Hardness conversion table

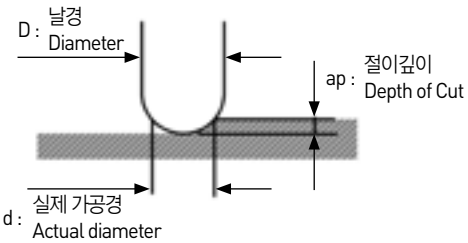
로크웰경도 C 스케일 (HRC)	비커스경도 (HV)	브리넬경도 10mm구 하중 3000Kgf표준구 (HB)	로크웰경도 A 스케일 (HRA)	쇼어경도 (HS)	인장강도 (근사치) N/mm^2
Rockwell Hardness C Scale 150kg Brale (HRC)	Diamond Pyramid Hardness Number Vickers (HV)	Brinell Hardness Standard 10mm Ball 3000Kgf (HB)	Rockwell Hardness A Scale 60kg Brale (HRA)	Shore Scleroscope Hardness Number (HS)	Approx Tensile Strength N/mm^2
80.5	1900		93.1		
79.2	1800		92.6		
77.9	1700		91.9		
76.6	1600		91.3		
75.3	1500		90.5		
74.6	1450		90.1		
74.0	1400		89.6		
73.4	1350		89.1		
72.7	1300		88.7		
72.1	1250		88.3		
71.5	1200		87.9		
70.9	1150		87.5		
70.8	1100		87.1		
69.6	1050		86.6		
68.9	1000		86.2		
68.0	940		85.6	97	
67.5	920		85.3	96	
67.0	900		85.0	95	
66.4	880		84.7	93	
65.9	860		84.4	92	
65.3	840		84.1	91	
64.7	820		83.8	90	
64.0	800		83.4	88	
63.3	780		83.0	87	
62.5	760		82.6	86	
61.8	740		82.2	84	
61.0	720		81.8	83	
60.1	700		81.3	81	
59.7	690		81.1		
59.2	680		80.8	80	
58.8	670		80.6		
58.3	660		80.3	79	
57.8	650		80.0		
57.3	640		79.8	77	
56.8	630		79.5		
56.3	620		79.2	75	
55.7	610		78.6		
55.2	600		78.9	74	
54.7	590		78.4		2055
54.1	580		78.0	72	2020
53.6	570		77.8		1985
53.0	560		77.4	71	1950
52.3	550	(505)	77.0		1905
51.7	540	(496)	76.7	69	1860
51.1	530	(488)	76.4		1825
50.5	520	(480)	76.1	67	1795
49.8	510	(473)	75.7		1750
49.1	500	(465)	75.3	66	1750
48.4	490	(456)	74.9		1660
47.7	480	448	74.5	64	1620

로크웰경도 C 스케일 (HRC)	비커스경도 (HV)	브리넬경도 10mm구 하중 3000Kgf표준구 (HB)	로크웰경도 A 스케일 (HRA)	쇼어경도 (HS)	인장강도 (근사치) N/mm^2
Rockwell Hardness C Scale 150kg Brale (HRC)	Diamond Pyramid Hardness Number Vickers (HV)	Brinell Hardness Standard 10mm Ball 3000Kgf (HB)	Rockwell Hardness A Scale 60kg Brale (HRA)	Shore Scleroscope Hardness Number (HS)	Approx Tensile Strength N/mm^2
46.9	470	442	74.1		1570
46.1	460	433	73.6	62	1530
45.3	450	425	73.3		1495
44.5	440	415	72.8	59	1460
43.6	430	405	72.3		1410
42.7	420	397	71.8	57	1370
41.8	410	388	71.4		1330
40.8	400	379	70.8	55	1290
39.8	390	369	70.3		1240
38.8	380	360	69.8	52	1205
37.7	370	350	69.2		1170
36.6	360	341	68.7	50	1130
35.5	350	331	68.1		1095
34.4	340	322	67.6	47	1070
33.3	330	313	67.0		1035
32.2	320	303	66.4	45	1005
31.0	310	294	65.8		980
29.8	300	284	65.2	42	950
29.2	295	280	64.8		935
28.5	290	275	64.5	41	915
27.8	285	270	64.2		905
27.1	280	265	63.8	40	890
26.4	275	261	63.5		875
25.6	270	256	63.1	38	855
24.8	265	252	62.7		840
24.0	260	247	62.4	37	825
23.1	255	243	62.0		805
22.2	250	238	61.6	36	795
21.3	245	233	61.2		780
20.3	240	228	60.7	34	765
(18.0)	230	219		33	730
(15.7)	220	209		32	695
(13.4)	210	200		30	670
(11.0)	200	190		29	635
(8.5)	190	181		28	605
(6.0)	180	171		26	580
(3.0)	170	162		25	545
(0.0)	160	152		24	515
	150	143		22	490
	140	133		21	455
	130	124		20	425
	120	114			390
	110	105			
	100	95			
	95	90			
	90	86			
	85	81			

볼 엔드밀의 가공시 실제 가공경 Actual Diameter of Ball End Mill

볼 반경 R	외경 D	절입깊이 ap(mm) Depth of Cut ap(mm)															
Radius R	Dia D	0.01	0.02	0.03	0.04	0.05	0.08	0.1	0.15	0.2	0.3	0.4	0.5	0.8	1	2	3
0.1	0.2	0.087	0.12	0.143	0.16	0.173	0.196	0.2									
0.2	0.4	0.125	0.174	0.211	0.24	0.265	0.32	0.35	0.39	0.4							
0.3	0.6	0.154	0.215	0.262	0.299	0.332	0.41	0.45	0.52	0.57	0.6						
0.4	0.8	0.178	0.25	0.304	0.349	0.387	0.48	0.53	0.62	0.69	0.77	0.8					
0.5	1	0.199	0.28	0.341	0.392	0.436	0.54	0.6	0.71	0.8	0.92	0.98	1				
1	2	0.282	0.398	0.486	0.56	0.624	0.78	0.87	1.05	1.2	1.43	1.6	1.73	1.96	2		
1.5	3	0.346	0.488	0.597	0.688	0.768	0.97	1.08	1.31	1.5	1.8	2.04	2.24	2.65	2.83		
2	4	0.399	0.564	0.69	0.796	0.889	1.12	1.25	1.52	1.74	2.11	2.4	2.65	3.2	3.46	4	
3	6	0.489	0.692	0.846	0.977	1.091	1.38	1.54	1.87	2.15	2.62	2.99	3.32	4.08	4.47	5.66	6
4	8	0.565	0.799	0.978	1.129	1.261	1.59	1.78	2.17	2.5	3.04	3.49	3.87	4.8	5.29	6.93	7.75
5	10	0.632	0.894	1.094	1.262	1.411	1.78	1.99	2.43	2.8	3.41	3.92	4.36	5.43	6	8	9.17
6	12	0.693	0.979	1.198	1.383	1.546	1.95	2.18	2.67	3.07	3.75	4.31	4.8	5.99	6.63	8.94	10.39

볼 엔드밀 가공시 실제 가공경의 계산식 Calculation of Actual Diameter



$$d = 2\sqrt{ap(D - ap)}$$

- 따라서, 볼 엔드밀의 끝부분만을 사용할 때에는, 절삭 조건에서 공구경 D값을 좀 더 작게 설정할 필요가 있습니다.

- When cutting work by using only a ball end cutting part of a ball end mill, set D to a smaller value according to the milling condition.

WIDE-MAX와 타사품의 공구 마모량과 가공면 조도 비교

Comparison of tool wear and surface finish of WIDE-MAX and competitor

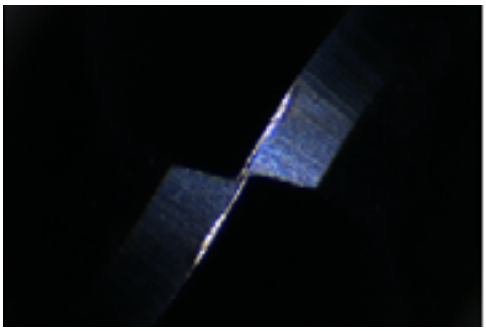
◆ 피삭재 : SKD61 (열처리강/HRC50)
◆ 가공 아이템 : 테스트 샘플
(피삭재 사이즈 59.8 × 34.6 × 39.7)
◆ 사용공구 : WIDE-MAX (WMRB230 R1 × 8)

• Work Material : SKD61 (Hardened steel / HRC50)
• Cutting Item : Test Sample
(Work Size 59.8 × 34.6 × 39.7)
• Tool : WIDE-MAX (WMRB230 R1 × 8)

사용공구 Tool	R1 × 8	절입깊이apxae(mm) Depth of cut	0.03 × 0.04
회전수(min^{1}) Spindle speed	15,000	절삭유 Coolant	비수용성 절삭유 Oil
이송(mm/min) Feed	1,200	가공시간 Cutting time	1시간 1hr

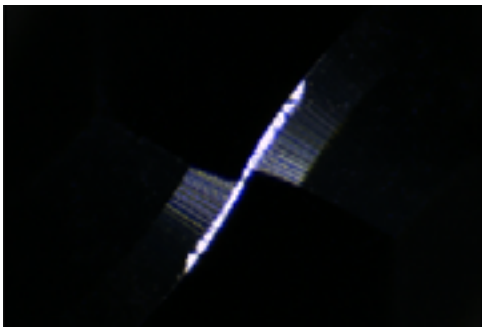
공구 마모 비교 Comparison of tool wear

◆ WIDE-MAX Rib Ball
Model : WMRB230-02008



마모량(Tool wear) 0.017mm

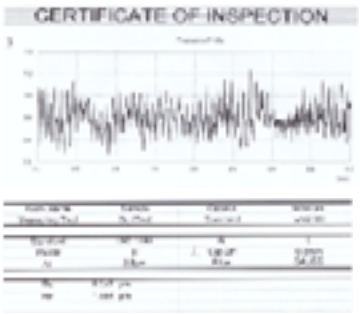
◆ 타사 엔드밀 Competitor tool



마모량(Tool wear) 0.03mm

가공면 비교 Comparison of cutting surface

◆ WIDE-MAX Rib Ball
Model : WMRB230-02008



면조도(Surface rougness) Ra0.243㎛

◆ 타사 엔드밀 Competitor tool

면조도(Surface rougness) Ra0.656㎛

Comment

WIDE-MAX 볼은 동일한 가공조건에서 타사공구 대비 탁월한 가공면을 보여 주었습니다.
WIDE-MAX BALL showed superior machining surface compared to other tools under the same machining conditions.

SUS304 가공 후 공구 마모량과 가공면 조도 비교

Comparison of tool wear and cutting surface roughness after machining SUS304

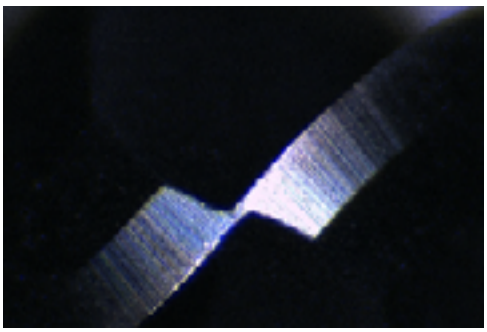
◆ 피삭재 : SUS304
◆ 사용공구 : WIDE-MAX (WMRB230 R1 × 12)
HY-MAX (HMRB230 R1 × 12)

• Work Material : SUS304
• Tool : WIDE-MAX (WMRB230 R1 × 12)
HY-MAX (HMRB230 R1 × 12)

사용공구 Tool	R1 × 12	절입깊이apxae(mm) Depth of cut	0.06 × 0.04
회전수(min^{-1}) Spindle speed	17,000	절삭유 Coolant	비수용성 절삭유 Oil
이송(mm/min) Feed	1,300	가공시간 Cutting time	1시간 40분 1hr 40min

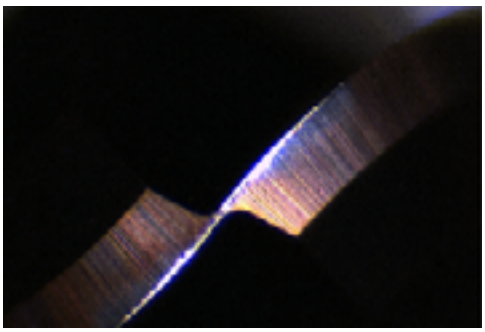
공구 마모 비교 Comparison of tool wear

◆ WIDE-MAX Rib Ball
Model : WMRB230-02012



마모량(Tool wear) 0.01mm

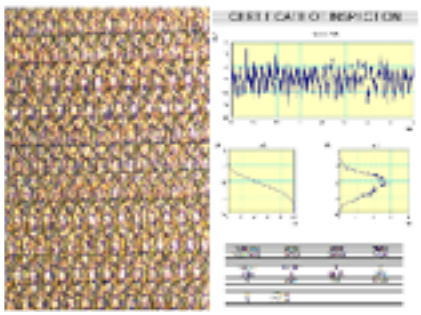
◆ HY-MAX Rib Ball
Model : HMRB230-02012



마모량(Tool wear) 0.021mm

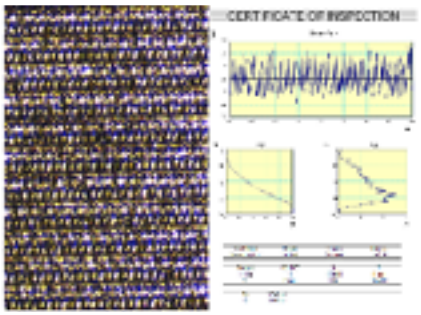
가공면 비교 Comparison of cutting surface

◆ WIDE-MAX Rib Ball
Model : WMRB230-02012



면조도(Surface rougness) Ra0.110㎛

◆ HY-MAX Rib Ball
Model : HMRB230-02012



면조도(Surface rougness) Ra0.742㎛

Comment

동일한 공구 크기를 사용하여 공구 마모와 표면 조도를 기존 제품과 비교했습니다.
SUS304 가공에서 WMRB230은 기존 제품 HMRB230에 비해 공구 수명이 약 2배 증가했습니다.
또한 절삭면에서 고품질의 표면 조도를 실현했습니다.

Compare tool wear and surface finish to conventional products using the same tool size.
In SUS304 machining, WMRB230 has a tool life increase of approximately 2 times compared to the conventional HMRB230.
In addition, realized high-quality surface roughness on cutting face.

S45C 가공 후 공구 마모량과 가공면 조도 비교

Comparison of tool wear and cutting surface roughness after machining S45C

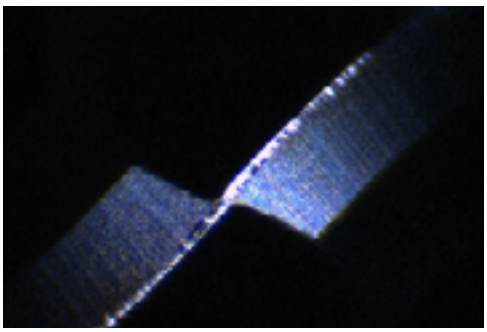
◆ 피삭재 : S45C (<800N/mm^2)
◆ 사용공구 : WIDE-MAX (WMRB230 R1 × 8)
HY-MAX (HMRB230 R1 × 8)

• Work Material : S45C (<800N/mm^2)
• Tool : WIDE-MAX (WMRB230 R1 × 8)
HY-MAX (HMRB230 R1 × 8)

사용공구 Tool	R1 × 8	절입깊이apxae(mm) Depth of cut	0.07 × 0.04
회전수(min^{-1}) Spindle speed	18,000	절삭유 Coolant	비수용성 절삭유 Oil
이송(mm/min) Feed	1,700	가공시간 Cutting time	1시간 20분 1hr 20min

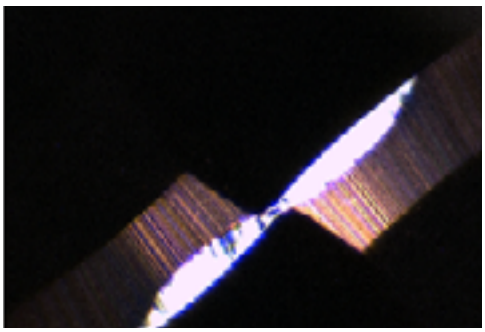
공구 마모 비교 Comparison of tool wear

◆ WIDE-MAX Rib Ball
Model : WMRB230-02008



마모량(Tool wear) 0.022mm

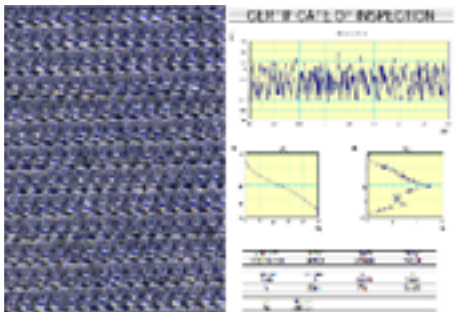
◆ HY-MAX Rib Ball
Model : HMRB230-02008



마모량(Tool wear) 0.068mm

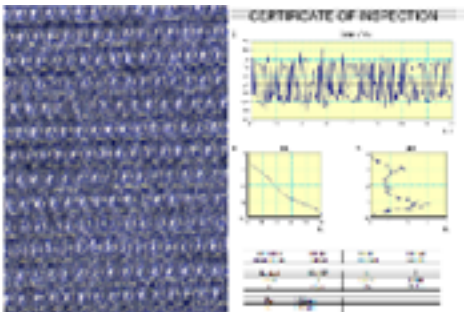
가공면 비교 Comparison of cutting surface

◆ WIDE-MAX Rib Ball
Model : WMRB230-02008



면조도(Surface rougness) Ra0.883㎛

◆ HY-MAX Rib Ball
Model : HMRB230-02008



면조도(Surface rougness) Ra1.512㎛

Comment

동일한 공구 크기를 사용하여 공구 마모와 표면 조도를 기존 제품과 비교했습니다.
S45C 가공에서 WMRB230은 기존 제품 HMRB230에 비해 공구 수명이 약 3배 증가했습니다.
또한, 가공면 조도가 약 2배 향상되었습니다.

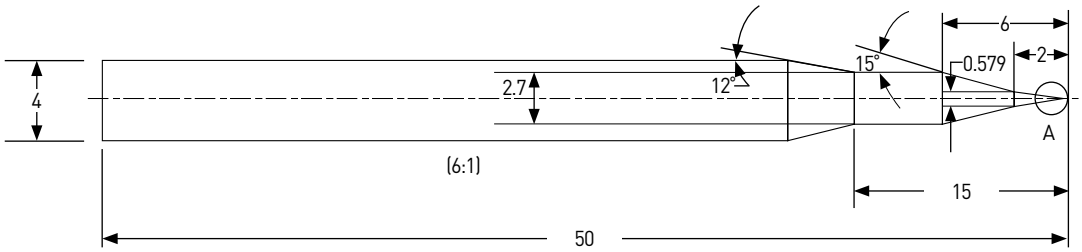
Compare tool wear and surface finish to conventional products using the same tool size.
In S45C machining, WMRB230 has a tool life increase of approximately 3 times compared to the conventional HMRB230.
In addition, the cutting surface roughness has been improved by about 2 times.

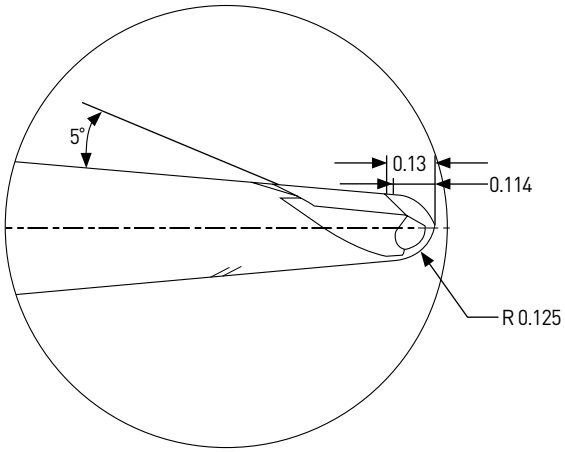
UM과 타사(A,B,C 사) 엔드밀과의 절삭성능 비교

Comparison of performance with competitor's A, B, C

◆ 피삭재 : STAVAX (HRC52)
◆ 사용공구 : HY-MAX (HMTNB230 R0.125 × 테이퍼넥5° × 15)
◆ 가공 아이템 : 금형 각인

• Work Material : STAVAX (HRC52)
• Tool : HY-MAX (HMTNB230 R0.125 × Taper Neck 5° × 15)
• Cutting Item : Engraving Mold

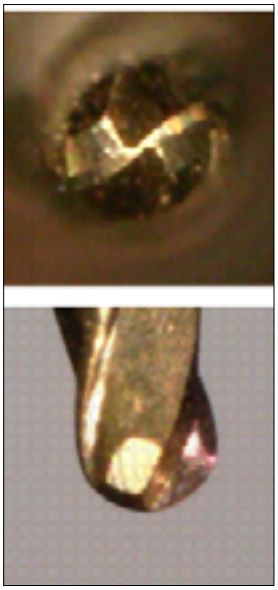
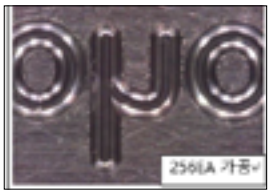




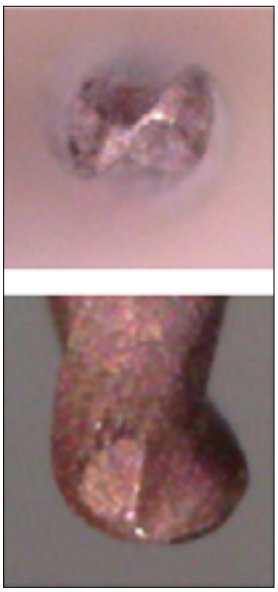
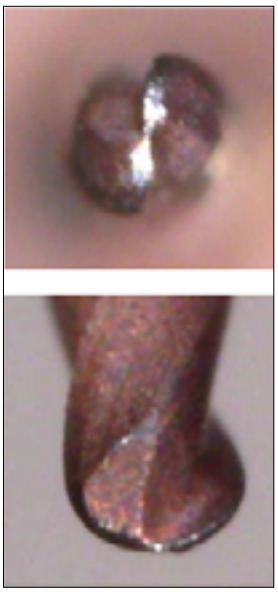
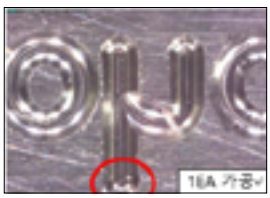
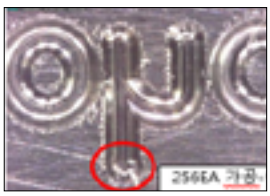
상세A(74:1)

사용공구 Tool	R0.125(Taper5°) × 15	절입깊이apxae(mm) Depth of cut	0.005
회전수(min^{1}) Spindle speed	35,000	절삭유 Coolant	Oil mist Oil mist
이송(mm/min) Feed	75	가공시간 Cutting time	3시간 10분 / 256개 3hr 10min / 256EA

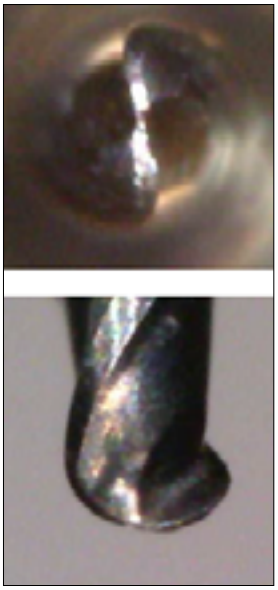
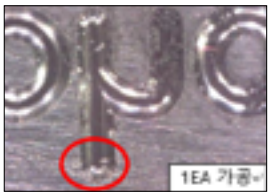
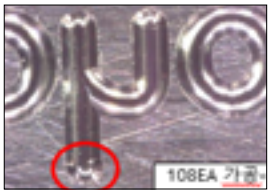
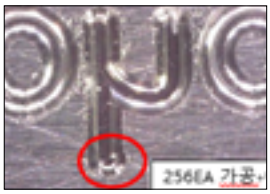
LOGO 각인용 공구 테스트 (UM) Tool Test for engraving(UM)

가공 전 Before	가공 후 After	각인 Engraving	
			Burr 발생 없음(GOOD) h자의 끝이 양호(GOOD) No Burr(GOOD) Good end of h(GOOD)
			미세 Burr(GOOD) h자의 끝 양호(GOOD) Micro Burr(GOOD) Good end of h(GOOD)
			미세 Burr(GOOD) h자의 끝 양호(GOOD) Micro Burr(GOOD) Good end of h(GOOD)

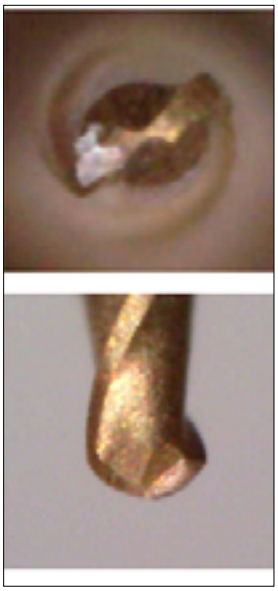
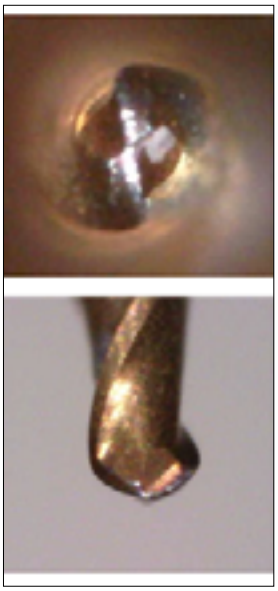
LOGO 각인용 공구 테스트 (A 社) Tool Test for engraving(competitor's A)

가공 전 Before	가공 후 After	각인 Engraving	
			Burr 발생 h자의 끝이 휘어짐(NG) Burr Generation The end of h is bent(NG)
			Burr 발생이 큼(NG) h자의 끝이 휘어짐(NG) Large Burr(NG) The end of h is bent(NG)
			Burr 발생이 큼(NG) h자의 끝이 휘어짐(NG) Large Burr(NG) The end of h is bent(NG)

LOGO 각인용 공구 테스트 (B 社) Tool Test for engraving(competitor's B)

가공 전 Before	가공 후 After	각인 Engraving	
			Burr 발생 없음(GOOD) h자의 끝이 휘어짐(NG) No Burr(GOOD) The end of h is bent(NG)
			미세 Burr(GOOD) h자의 끝이 휘어짐(NG) Micro Burr(GOOD) The end of h is bent(NG)
			Burr 발생 큼(NG) h자의 끝이 휘어짐(NG) Large Burr(NG) The end of h is bent(NG)

LOGO 각인용 공구 테스트 (C 社) Tool Test for engraving(competitor's C)

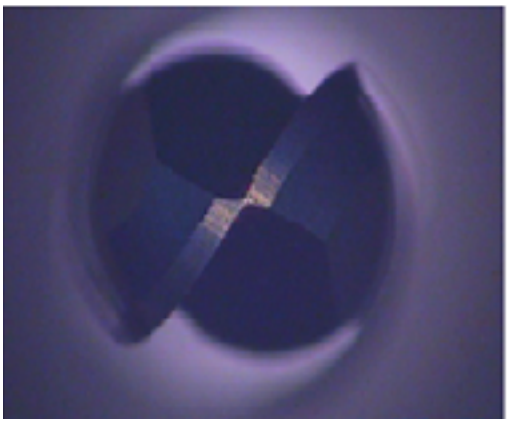
가공 전 Before	가공 후 After	각인 Engraving	
			Burr 발생 없음(GOOD) h자의 끝이 양호(GOOD) No Burr(GOOD) Good end of h(GOOD)
			Burr 발생 큼(NG) h자의 끝이 휘어짐(NG) Large Burr(NG) The end of h is bent(NG)
			Burr가 매우 심함(NG) h자의 끝이 휘어짐(NG) Very Large Burr(NG) The end of h is bent(NG)

타사 제품과의 공구 마모 비교

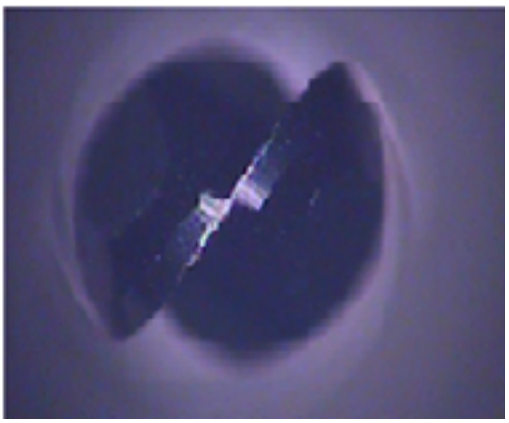
Comparison of tool wear with competitor

◆ 피삭재 : 동
◆ 사용공구 : CO-MAX (CMRB230 R0.5×6)
◆ 가공 아이템 : 동 전극

• Work Material : Copper
• Tool : CO-MAX (CMRB230 R0.5×6)
• Cutting Item : Copper Electrode



• CO-MAX Rib Ball



• 타사 엔드밀 Competitor tool

사용공구 Tool	R0.5 × 6	절입깊이apxae(mm) Depth of cut	0.03
회전수(min^{1}) Spindle speed	20,000	절삭유 Coolant	비수용성 절삭유 Oil
이송(mm/min) Feed	1,200	가공시간 Cutting time	2시간 2hr

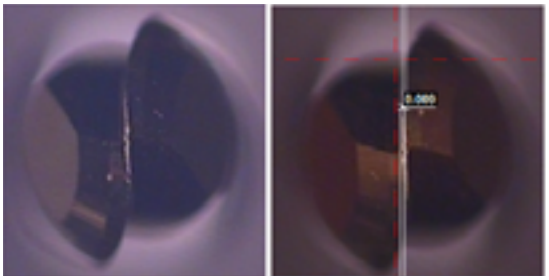
타사 제품과의 공구 마모량 비교

Comparison of tool wear with competitor

◆ 피삭재 : XPM ESR (프리하든 금형강/HRC38~40)
◆ 사용공구 : HY-MAX (HMRB230 R0.3×4)
HY-MAX (HMRB230 R0.4×4)
◆ 가공 아이템 : 몰드 프레임

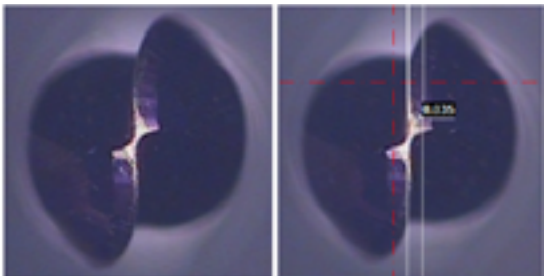
• Work Material : XPM ESR (Prehardened steel / HRC38~40)
• Tool : HY-MAX (HMRB230 R0.3×4)
HY-MAX (HMRB230 R0.4×4)
• Cutting Item : Mold Frame

• HY-MAX Rib Ball Model : HMRB230-00604



마모량(Tool wear)
0.009mm

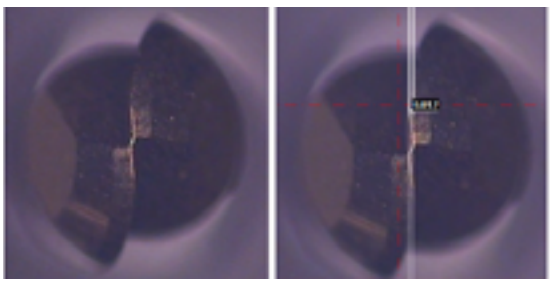
• 타사 엔드밀 Competitor tool



마모량(Tool wear)
0.035mm

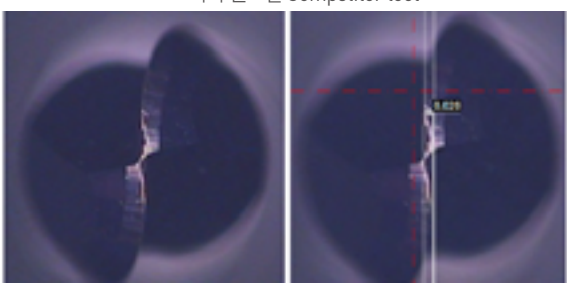
사용공구 Tool	R0.3 × 4	절입깊이apxae(mm) Depth of cut	0.02
회전수(min^{-1}) Spindle speed	18,000	절삭유 Coolant	수용성 절삭유 water soluble fluid
이송(mm/min) Feed	700	가공시간 Cutting time	2시간 2hr

• HY-MAX Rib Ball Model : HMRB230-00804



마모량(Tool wear)
0.012mm

• 타사 엔드밀 Competitor tool



마모량(Tool wear)
0.026mm

사용공구 Tool	R0.4 × 4	절입깊이apxae(mm) Depth of cut	0.03
회전수(min^{-1}) Spindle speed	17,000	절삭유 Coolant	수용성 절삭유 water soluble fluid
이송(mm/min) Feed	900	가공시간 Cutting time	2시간 30분 2hr 30min

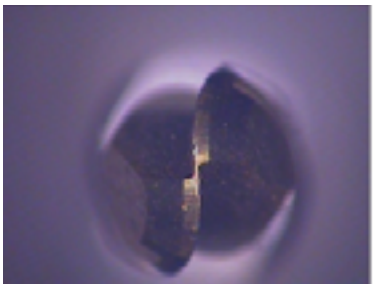
타사 제품과의 공구 마모 비교

Comparison of tool wear with competitor

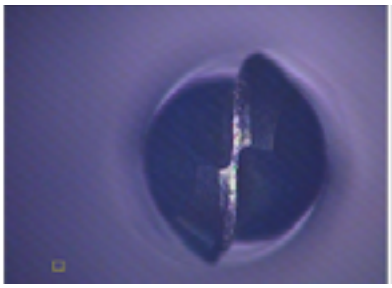
◆ 피삭재 : SKD11 (열처리강/HRC60)
◆ 사용공구 : HY-MAX (HMRB230 R0.5×4)
◆ 가공 아이템 : 몰드 프레임

• Work Material : SKD11 (Hardened steel / HRC60)
• Tool : HY-MAX (HMRB230 R0.5×4)
• Cutting Item : Mold Frame

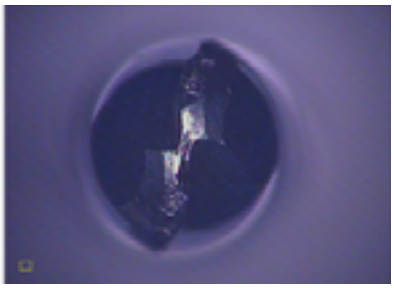
• HY-MAX Rib Ball
Model : HMRB230-01004



• 타사 엔드밀 Competitor tool ①



• 타사 엔드밀 Competitor tool ②



사용공구 Tool	R0.5 × 4	절입깊이apxae(mm) Depth of cut	0.018×0.01
회전수(min^{1}) Spindle speed	18,000	절삭유 Coolant	오일 Oil
이송(mm/min) Feed	800	가공시간 Cutting time	1시간 1hr

타사 제품과의 절삭 성능 비교

Comparison of cutting performance with competitors

◆ 피삭재 : SKD11 (열처리강/HRC60)
◆ 사용공구 : HY-MAX (HMB230 R3×10×60L)
◆ 가공 아이템 : 테스트 샘플

• Work Material : SKD11 (Hardened steel / HRC60)
• Tool : HY-MAX (HMB230 R3×10×60L)
• Cutting Item : Test Sample

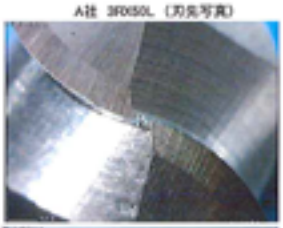
テストカット予定内容

1. A社 3R10L
2. HMB230 R3x10X60L
3. B社 R3

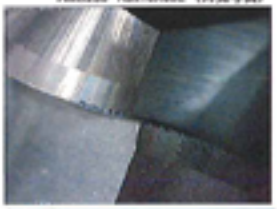
実施日 2014年12月24日
場 所 大阪府立産業技術総合研究所
機 械 森精機 Dura Vertical 5060 (BT40)
(水溶性切削油1.5MPa)

加工順	型番	工具内容	被削材	加工内容	Vc (m/min)	S (rpm)	Fz (mm/t)	F (mm/	ap (mm)	ae (mm)	MRR (cc/分)	備考	結果	切削抵抗 最大(N)
No.8-1	A社	Φ6 2枚刃 ボール HRC50以上	SKD11 (HRC60)	溝	18.5	3500	0.050	350	0.12	0.84	0.023		良好	67.5
No.8-2					26.4	5000	0.025	500	0.12	0.84	0.050		良好	64.3
No.8-3					36.9	7000	0.025	700	0.12	0.84	0.071	HMB230摩耗値	良好	73.6
No.8-4					36.9	7000	0.036	1000	0.12	0.84	0.101		良好	84.8
No.8-5					36.9	7000	0.054	1500	0.12	0.84	0.151		刃先若干摩耗	104.3
No.9-1	HMB230 R3x10X60L	Φ6 2枚刃 ボールHRC ~65			18.5	3500	0.050	350	0.12	0.84	0.023		良好	66.2
No.9-2					26.4	5000	0.025	500	0.12	0.84	0.050		良好	57.7
No.9-3					36.9	7000	0.025	700	0.12	0.84	0.071	HMB230摩耗値	良好	62.0
No.9-4					36.9	7000	0.036	1000	0.12	0.84	0.101		良好	72.6
No.9-5					36.9	7000	0.054	1500	0.12	0.84	0.151		刃先若干摩耗	83.9
No.10-1	B社	Φ6 2枚刃 ボールHRC ~45			18.5	3500	0.050	350	0.12	0.84	0.023		良好	68.8
No.10-2					26.4	5000	0.025	500	0.12	0.84	0.050		良好	83.4
No.10-3					36.9	7000	0.025	700	0.12	0.84	0.071	HMB230摩耗値	良好	87.1
No.10-4					36.9	7000	0.036	1000	0.12	0.84	0.101		良好	102.5
No.10-5					36.9	7000	0.054	1500	0.12	0.84	0.151		刃先摩耗大	121.7

A社 3R10L（刃先写真）



HMB230 R3x10X60L（刃先写真）

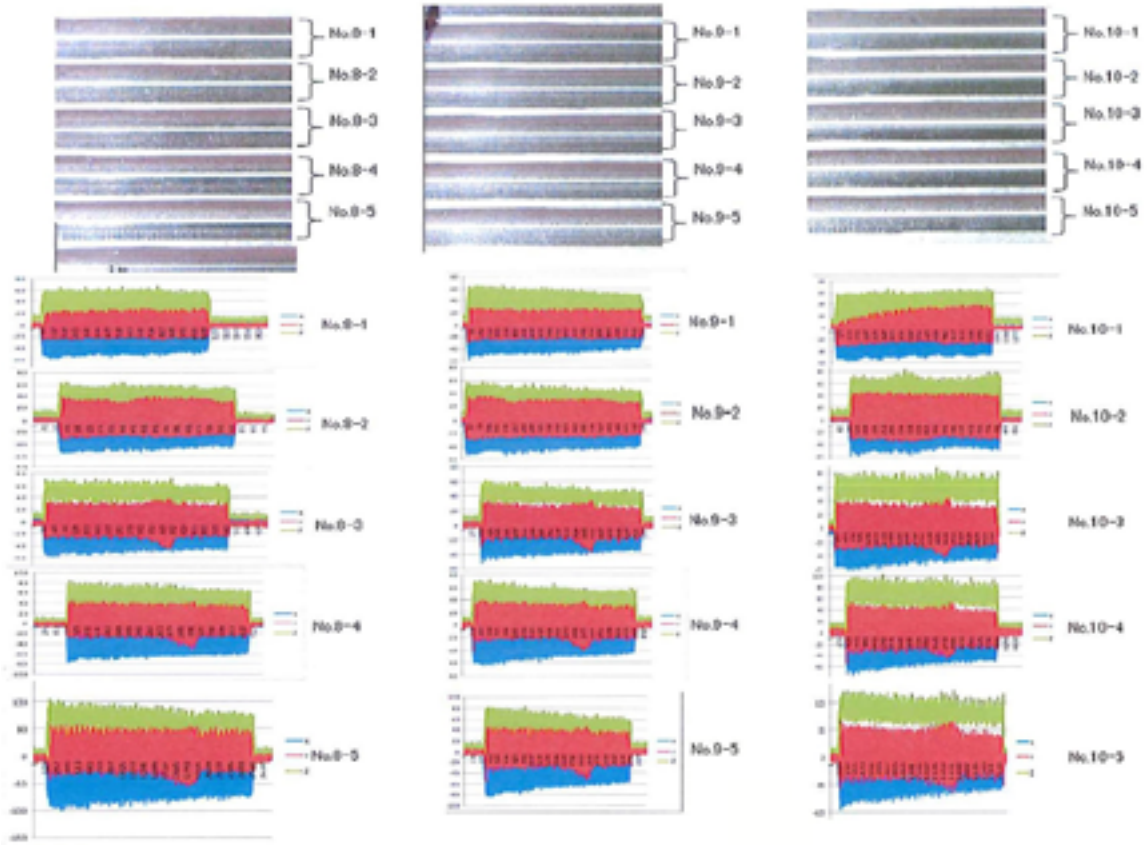


B社（刃先写真）

<考察>
刃先の摩耗状況、切削抵抗などから順位をつけると
1. HMB230
2. A社
3. B社
上記順番で良い結果が出た

今後は価格を比較して検討を進めたいと思います。

• 공구 마모와 절삭 저항 등을 바탕으로 UM제품이 가장 높은 등급을 받았습니다.
• Based on tool wear and cutting resistance, UM Tool has the highest rating.


No.9-1
No.9-2
No.9-3
No.9-4
No.9-5
No.9-1
No.9-2
No.9-3
No.9-4
No.9-5
No.10-1
No.10-2
No.10-3
No.10-4
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No.9-2
No.9-3
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No.9-5
No.9-1
No.9-2
No.9-3
No.9-4
No.9-5
No.10-1
No.10-2
No.10-3
No.10-4
No.10-5

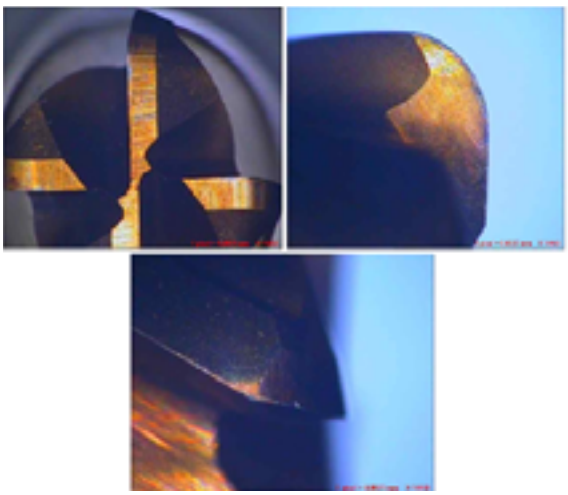
타사 제품과의 공구 마모 비교

Comparison of tool wear with competitor

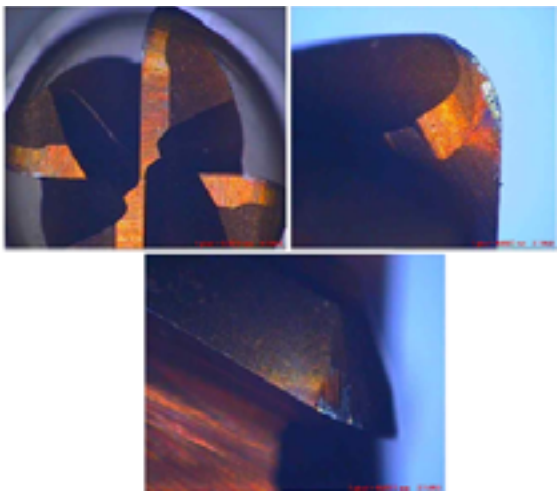
◆ 피삭재 : XPM ESR (프리하든 금형강/HRC38~42)
◆ 사용공구 : HY-MAX (HMRR430 3×R0.5×12)
◆ 가공 아이템 : 몰드 프레임

• Work Material : XPM ESR (Pre-hardened steel / HRC38~42)
• Tool : HY-MAX (HMRR430 3×R0.5×12)
• Cutting Item : Mold Frame

• HY-MAX RADIUS
Model : HMRR430-030R05-12



• 타사 엔드밀 Competitor tool



사용공구 Tool	3 × R0.5 × 12	절입깊이apxae(mm) Depth of cut	0.05×0.1
회전수(min[1]) Spindle speed	12,000~18,000	절삭유 Coolant	오일미스트 Oil-mist
이송(mm/min) Feed	2,000~3,000	가공시간 Cutting time	3시간 3hr

가공 사례
Cutting Example

◆ 피삭재 : CENA (프리하든강 / HRC40)
◆ 사용공구 : HY-MAX (HMRB230 R0.5×3)
◆ 가공 아이템 : 비구면 렌즈 코어

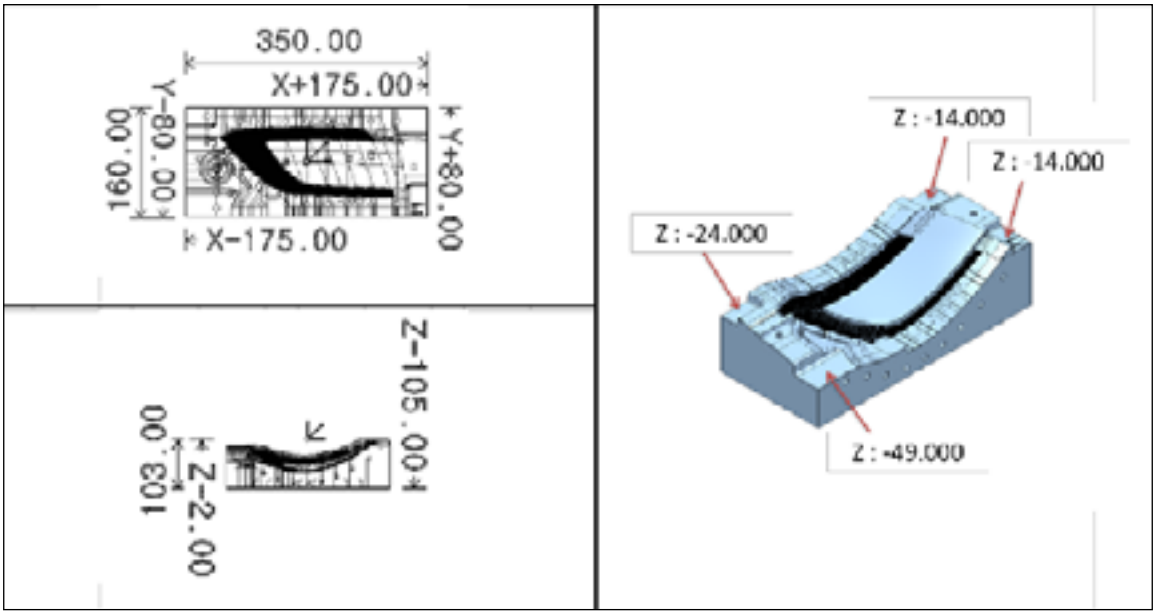
• Work Material : CENA (Pre-hardened steel / HRC40)
• Tool : HY-MAX (HMRB230 R0.5×3)
• Cutting Item : Aspherical Lens Core

사용공구 Tool	R0.5 × 3(Finishing)	절입깊이apxae(mm) Depth of cut	0.007×0.007
회전수(min^{1}) Spindle speed	40,000	절삭유 Coolant	오일미스트 Oil-mist
이송(mm/min) Feed	700	가공시간 Cutting time	30시간 30hr

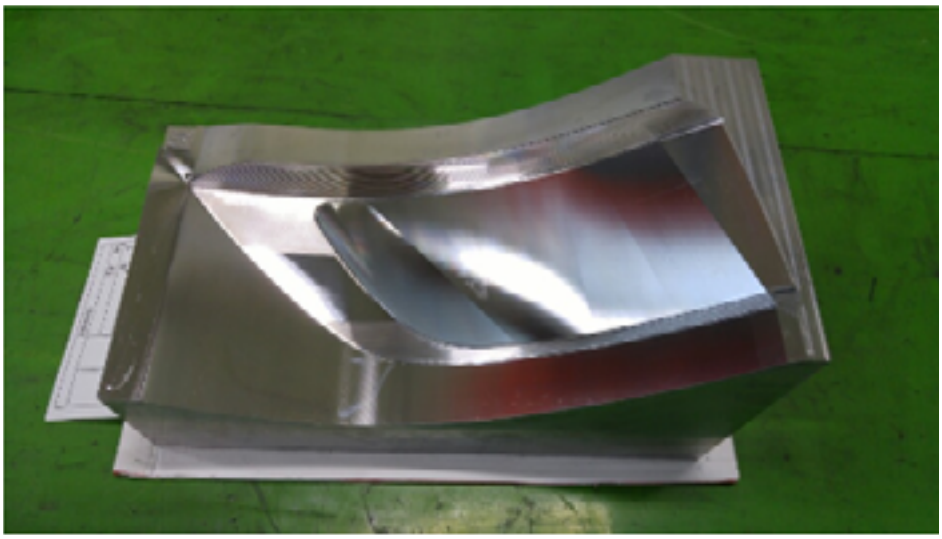
가공 사례
Cutting Example

◆ 피삭재 : CENA (프리하든강 / HRC40)
◆ 사용공구 : HY-MAX (HMB230 R3×12×90L)
HY-MAX (HMRB230 R0.3×2)
HY-MAX (HMRB230 R0.2×1)
◆ 가공 아이템 : 자동차 후방 램프 금형

• Work Material : CENA (Pre-hardened steel / HRC40)
• Tool : HY-MAX (HMB230 R3×12×90L)
HY-MAX (HMRB230 R0.3×2)
HY-MAX (HMRB230 R0.2×1)
• Cutting Item : Automotive rear lamp mold

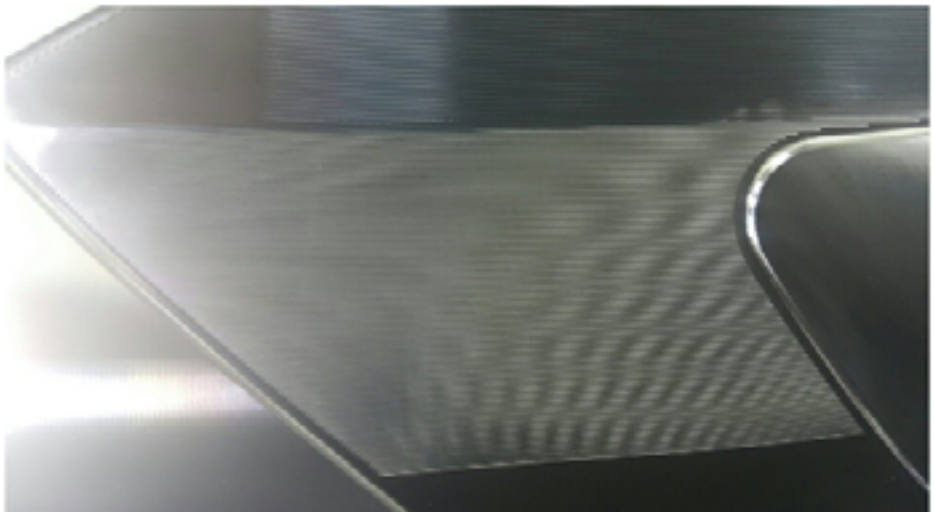


• 자동차 후방용 램프-1 / Rear lamp of Automobile-1



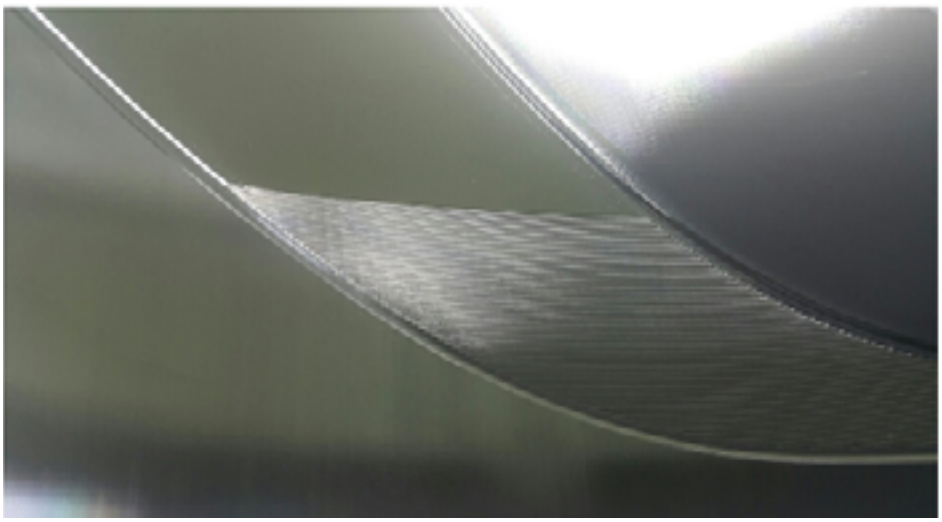
사용공구 1 Tool 1	R3 (Finishing)	절입깊이apxae(mm) Depth of cut	0.1×0.15
회전수(min^{-1}) Spindle speed	18,000	절삭유 Coolant	오일미스트 Oil-mist
이송(mm/min) Feed	2,500	가공시간 Cutting time	6시간 6hr

• 자동차 후방용 램프 패턴부-2 / Rear lamp pattern section of Automobile-2



사용공구 2 Tool 2	R0.3×2 (Pattern)	절입깊이apxae(mm) Depth of cut	0.003
회전수(min^{1}) Spindle speed	34,000	절삭유 Coolant	오일미스트 Oil-mist
이송(mm/min) Feed	800	가공시간 Cutting time	14시간 14hr

• 자동차 후방용 램프 패턴부-3 / Rear lamp pattern section of Automobile-3



사용공구 3 Tool 3	R0.2×1 (Pattern)	절입깊이apxae(mm) Depth of cut	0.002
회전수(min^{1}) Spindle speed	38,000	절삭유 Coolant	오일미스트 Oil-mist
이송(mm/min) Feed	500	가공시간 Cutting time	20시간 20hr

가공 사례
Cutting Example

◆ 피삭재 : 티타늄
◆ 가공 아이템 : 의료용 척추 고정장치 상부
◆ 피삭재 크기 : 92×19×13
◆ 사용공구 : HY-MAX series
◆ 총 가공시간 : 3시간50분

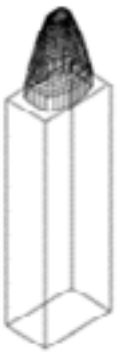
• Work Material : Titanium
• Cutting Item : Medical spinal fixation device TOP
• Work Material Size : 92×19×13
• Tool : HY-MAX Series
• Total Cutting Time : 3hr 50min

No	사용공구		회전수(min¹) Spindle Speed	이송(mm/min) Feed	여유 Stock	가공시간 Cutting Time
	Model No.	Tool				
1	HMRR430-060R10-20-060-S06	6×R1×20	5,000	3,000	0.07	0:36:29
2	HMRB230-03012-060-S06	R1.5×12	12,000	2,500	0.1	0:29:21
3	HMRR430-030R02-10-060-S06	3×R0.2×10	15,000	2,500	0.02	0:15:27
4	HMRB230-02008-045-S04	R1×8	20,000	2,500	0.01	0:26:52
5	HMRB230-01004-045-S04	R0.5×4	20,000	2,000	0	0:56:57
6	HMRR430-020R02-08-045-S04	2×R0.2×8	20,000	500	0	0:12:54
7	HMRE430-02008-045-S04	Φ2×8	20,000	500	0	0:26:21
8	HMRR430-010R02-06-045-S04	1×R0.2×6	20,000	200	0	0:12:47
9	HMRE430-01006-045-S04	Φ1×6	20,000	200	0	0:08:07

가공 사례
Cutting Example

◆ 피삭재 : SKD11 (열처리강/HRC60)
◆ 가공 아이템 : HUD 관련 코어
◆ 피삭재 크기 : 10×6×40.1
◆ 사용공구 : HY-MAX series
◆ 총 가공시간 : 3시간 50분 (5축 가공)

• Work Material : SKD11 (Hardened steel / HRC60)
• Cutting Item : HUD core
• Work Material Size : 10×6×40.1
• Tool : HY-MAX Series
• Total Cutting Time : 3hr 50min (5-axis machining)

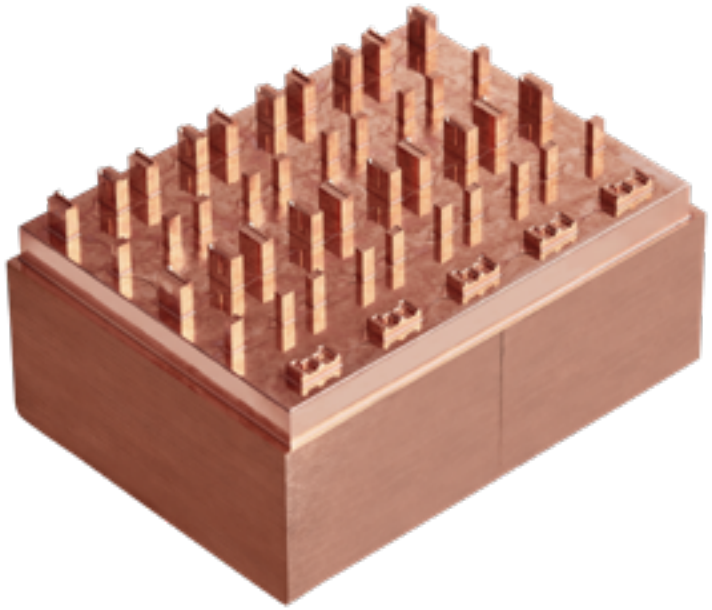


No	사용공구		회전수(min¹) Spindle Speed	이송(mm/min) Feed	여유 Stock	가공시간 Cutting Time
	Model No.	Tool				
1	HMRR430-060R10-20-060-S06	6×R1×20	5,000	3,000	0.07	0:15:17
2	HMRR430-060R05-20-060-S06	6×R0.5×20	5,000	2,000	0.05	0:18:28
3	HMRB230-02008-045-S04	R1×8	20,000	1,500	0.02	0:24:53
4	HMRB230-01004-045-S04	R0.5×4	20,000	700	0.01	1:02:11
5	HMRB230-00502-045-S04	R0.25×2	24,000	500	0.01	1:38:10

가공 사례
Cutting Example

◆ 피삭재 : 동 (크기 80×60×10)
◆ 가공 아이템 : 휴대폰 카메라 하우징 동전극
◆ 사용공구 : CO-MAX series
◆ 절삭유 : 수용성
◆ 총 가공시간 : 4시간 40분 (추가 정삭 포함)

• Work Material : Copper (Size 80×60×10)
• Cutting Item : Mobil phone camera housing copper electrode
• Tool : CO-MAX series
• Coolant : Water-soluble fluid
• Total Cutting Time : 4hr 40min (Include additional finish)

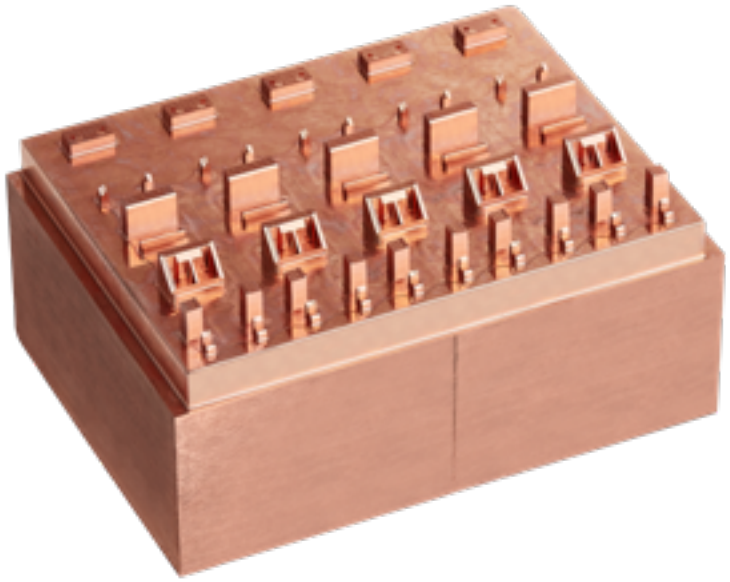


No	가공공정 Cutting Process	사용공구		회전수 (min^{-1}) Spindle Speed	이송 (mm/min) Feed	여유 Stock	스텝다운 Step Down	가공시간 Cutting Time
		Model No.	Tool					
1	황삭 Roughing	HME430-08020-065-S06	Φ8×20	11,000	3,000	0	0.4	0:13:06
2	황잔삭 Rest Area Clearance	CMRE345-03010-050-S06K	Φ3×10	15,000	2,200	0	0.15	0:11:54
3	황잔삭 Rest Area Clearance	CMRE345-01508-045-S04K	Φ1.5×8	16,000	1,600	0.01	0.1	0:02:20
4	중삭 Semi-finishing	CMRE230-01006-045-S04	Φ1×6	18,000	1,300	-0.04	0.2	0:21:39
5	중잔삭 Rest Area Clearance	CMRE230-00502-045-S04	Φ0.5×2	18,000	500	-0.04	0.025	0:05:49
6	중잔삭 Rest Area Clearance	CMRB230-00402-045-S04	R0.2×2	18,000	350	-0.04	0.03	0:30:41
7	정삭 Finishing	CMRE230-01006-045-S04	Φ1×6	18,000	700	-0.05	0.2	0:36:21
8	정잔삭 Rest Area Clearance	CMRE230-00502-045-S04	Φ0.5×2	18,000	500	-0.05	0.06	0:02:25
9	정잔삭 Rest Area Clearance	CMRE230-002015-045-S04	Φ0.2×1.5	18,000	250	-0.05	0.03	0:03:05
10	정잔삭 Rest Area Clearance	CMRB230-003015-045-S04	R0.15×1.5	18,000	300	-0.05	0.015	0:51:48
11	정잔삭 Rest Area Clearance	CMRB230-00201-045-S04	R0.1×1	18,000	250	-0.05	0.015	0:01:30
12	외곽바닥정삭 Finishing	CMRR230-080R05-24-065-S06	8×R0.5×24	11,000	1,000	0		0:02:26

가공 사례
Cutting Example

◆ 피삭재 : 동 (크기 80×60×10)
◆ 가공 아이템 : 휴대폰 카메라 하우징 동전극
◆ 사용공구 : CO-MAX series
◆ 절삭유 : 수용성
◆ 총 가공시간 : 5시간 30분 (추가 정삭 포함)

• Work Material : Copper (Size 80×60×10)
• Cutting Item : Mobil phone camera housing copper electrode
• Tool : CO-MAX series
• Coolant : Water-soluble fluid
• Total Cutting Time : 5hr 30min (Include additional finish)



No	가공공정 Cutting Process	사용공구		회전수 (min¹) Spindle Speed	이송 (mm/min) Feed	여유 Stock	스텝다운 Step Down	가공시간 Cutting Time
		Model No.	Tool					
1	황삭 Roughing	HME430-08020-065-S06	Φ8x20	11,000	3000	0	0.4	0:11:25
2	황잔삭 Rest Area Clearance	CMRE345-03010-050-S06K	Φ3x10	15,000	2200	0	0.15	0:14:10
3	황잔삭 Rest Area Clearance	CMRE345-01508-045-S04K	Φ1.5x8	16,000	1600	0.01	0.1	0:07:52
4	중삭 Semi-finishing	CMRE230-01006-045-S04	Φ1x6	18,000	1300	-0.04	0.2	0:21:31
5	중잔삭 Rest Area Clearance	CMRE230-00502-045-S04	Φ0.5x2	18,000	500	-0.04	0.03	0:17:47
6	중잔삭 Rest Area Clearance	CMRB230-01004-045-S04	R0.5x4	18,000	700	-0.04	0.1	0:03:46
7	중잔삭 Rest Area Clearance	CMRB230-00402-045-S04	R0.2x2	18,000	350	-0.04	0.03	0:17:54
8	중잔삭 Rest Area Clearance	CMRE230-00502-045-S04	Φ0.5x2	18,000	500	-0.04	0.03	0:02:23
9	정삭 Finishing	CMRE230-01006-045-S04	Φ1x6	18,000	700	-0.05	0.2	0:44:40
10	정잔삭 Rest Area Clearance	CMRE230-00502-045-S04	Φ0.5x2	18,000	500	-0.05	0.03	0:13:40
11	정잔삭 Rest Area Clearance	CMRE230-00502-045-S04	Φ0.5x2	18,000	500	0.1 / -0.05	0.06	0:02:01
12	정잔삭 Rest Area Clearance	CMRE230-00402-045-S04	Φ0.4x2	18,000	350	-0.05	0.007	0:03:13
13	정잔삭 Rest Area Clearance	CMRB230-00402-045-S04	R0.2x2	18,000	350	-0.05	0.02	0:42:04
14	정잔삭 Rest Area Clearance	CMRE230-00201-045-S04	Φ0.2x1	18,000	250	-0.05	0.005	0:05:19

Carbide End mill
World Class Quality Products

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Model number and specifications are can be changed without notification for quality improvement.

초경 엔드밀 종합 카탈로그

GENERAL CATALOG

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초경엔드밀 사용시 주의사항

- 엔드밀 케이스를 열고 케이스로 부터 공구를 분리할 때 조심해 주십시오.
- 맨손으로 공구의 날을 직접적으로 만지지 마십시오.
- 절삭가공 중에는 엔드밀이 매우 뜨거워서, 가공이 끝난 직후 엔드밀을 만지지 마십시오. 가공이 끝난 직후 절삭칩 또한 뜨거우니 맨손으로 만지지 마십시오.
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- 엔드밀 절삭 조건은 가공물 형상과 기계용량, 그리고 작업환경에 따라서 조정할 필요가 있습니다.

CAUTION

Precautions for safe use of Carbide End Mill

- Be careful when you open the end mill cases and remove the tools from cases.
- Do not touch directly the cutting edges with bare hands.
- During cutting operation, end mills get very hot. Do not touch end mills immediately after cutting. Do not touch cutting chips with bare hands. Chips will be hot after cutting.
- Please equip safety items, such as safety glasses and protective gloves.
- Please use correct end mills before starting cutting operation.
- It is necessary to adjust milling conditions according to the milling shape, machine capability and the operation environment.

CARBIDE END MILL

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