NS TOOL 「つくる」の先をつくる

日進工具株式会社

# NS TOOL
# ENDMILL CATALOG

Vol.18

2018.11—

ŞEVKET OĞLU®
MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# アイコンの見方 Description of Icons

## 素材 Material

エンドミルに使用している材質を示します

- MG 超微粒子超硬合金 Micro Grain Carbide
- SMG 極超微粒子超硬合金 Super Micro Grain Carbide
- WC 超硬合金 Regular Grain Carbide
- CBN CBN（立方晶窒化硼素） Cubic Boron Nitride
- PCD PCD Polycrystalline Diamond
- DIA 単結晶ダイヤ Monocrystalline Diamond

## 表面処理 Coating

刃部に施しているコーティングを示します

- Premium 無限コーティングプレミアム MUGEN-COATING PREMIUM
- ∞ 無限コーティング MUGEN-COATING
- Micro 無限マイクロコーティング MUGEN MICRO COATING
- X Xコーティング（TiCN系） X-COATING
- DLC DLCコーティング DLC COATING
- DIA ダイヤモンドコーティング DIAMOND COATING

## 刃数 Number of Flutes

エンドミルの刃数を示します

- 1 1枚刃 1 Flute
- 2 2枚刃 2 Flute
- 3 3枚刃 3 Flute
- 4 4枚刃 4 Flute
- 6 6枚刃 6 Flute
- 8 8枚刃 8 Flute
- 10 10枚刃 10 Flute

## ネジレ角 Helix Angle

刃部のネジレ角を示します

- -20° 左20° Left 20°
- -11° 左11° Left 11°
- 0° 0°
- 12° 12°
- 20° 20°
- 25° 25°
- 30° 30°
- 35° 35°
- 35°/38° 35°/38°
- 37.5° 37.5°
- 40° 40°
- 40°/42° 40°/42°
- 45° 45°

## コーナー形状 Corner Shape

刃部のコーナー形状を示します

- ピン角 Sharp Edge
- ラジアス Corner Radius

## 加工用途 Applications

主に使用する加工形状を示します

- Side 側面加工 Side milling
- Slot 溝加工 Slot milling
- 3D 曲面加工 3D milling
- Face 平面加工 Face milling
- Plunge 突込み加工 Plunging milling
- Drill 穴あけ加工 Drilling
- Thread ねじ切り加工 Thread milling
- C C面取り C Chamfering
- R R面取り R Chamfering

## 加工可能硬度 Cutting Possibility of Work Material Hardness

高硬度材の加工可能硬度を示します

- ≦55 HRC ～55HRCまで加工可能 Possible to cut up to 55HRC
- ≦62 HRC ～62HRCまで加工可能 Possible to cut up to 62HRC
- ≦65 HRC ～65HRCまで加工可能 Possible to cut up to 65HRC
- ≦68 HRC ～68HRCまで加工可能 Possible to cut up to 68HRC

ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# 目次 Index

## 1 各種検索方法 Search
[目的にあった商品の探し方です]


「形状」から探す Search from Type ..... A-002
「スクエアサイズ」から探す Search from Square Dia. ..... A-022
「ボールサイズ」から探す Search from Ball R ..... A-056
「ラジアスサイズ」から探す Search from Radius Dia. & Corner R ..... A-074
「商品コード」から探す Search from Code No. ..... A-088
「商品型番」から探す Search from Model ..... A-090


## 2 NS TOOL ENDMILL CATALOG
[NS TOOL の全製品の紹介です]


CBN Cubic Boron Nitride ..... B-002
ダイヤモンド Diamond ..... C-001
スクエア Square ..... D-001
ボール Ball ..... E-001
ラジアス Radius ..... F-001
テーパー Taper ..... G-001
ドリル Drilling ..... H-001
ねじ切り Thread milling ..... I-001
面取り Chamfering ..... J-001


## 3 技術資料 Technical Data
[NS TOOL 製品の技術資料です]


NS TOOL 製品の特長 Features of NS End Mill ..... K-002
加工データ Machining Data ..... K-007


## 4 参考資料 Technical Guidance
[エンドミルを使うための参考資料です]


..... K-037

# 新製品のご案内 New Products

## New アルミ専用エンドミル（3枚刃3倍刃長タイプ） 3-Flute Medium End Mill for Aluminum

# AL3D-345

**φ1～φ12　全9サイズ** Total 9 Sizes

●NS の AL シリーズは、あらゆる条件で安定した高能率加工を実現。
●幅広い領域で安定した加工面精度が得られ、高速加工でもビビリを抑制。
● 3 枚刃の採用で、加工能率が向上！

●AL-series realized a stable and high efficient machining.
●It exhibits stable excellent surface on a wide area and no chattering occurs even during high speed cutting.
●Realized high efficiency machining by adopting 3 flutes.

掲載ページ▶ D-137

## New アルミ用高能率エンドミル 3-Flute Power "Z" End Mill for Aluminum

# ALZ345

**φ1～φ12　全124サイズ** Total 124 Sizes

●NS の AL シリーズは、あらゆる条件で安定した高能率加工を実現。
●突込み性能が大幅アップ！
●切りくず排出性を高めた高能率タイプ。
●新たに有効長 5D タイプ・ロングシャンクタイプが加わり 124 サイズに！

●AL-series realized a stable and high efficient machining.
●Improved drilling capacity!
●High performance with better chip disposal.
●Add new 5D effective length type and long shank type to become 124 sizes.

掲載ページ▶ D-140

## New 銅電極加工用ロングネックエンドミル Long Neck End Mill for Copper Electrode

# DHR237

**φ0.1～φ6　全54サイズ** Total 54 Sizes

●銅合金の加工に特化したロングネックエンドミル。
●切れ味と仕上げ面品位を両立させるねじれ角【37.5°】を採用し、加工面への横スジ発生を抑制します。
●最適化された刃形状とDLC コーティングにより､長時間の高品位かつ安定した加工が可能です。
●銅タングステン電極の加工にも有効です。

●Long neck end mill specialized for processing copper alloy.
●Helix angle 37.5 degrees to achieve both sharpness and finished surface quality that prevents scratches on cutting surface.
●High quality and stable milling performance with long tool life by optimized design and DLC COATING.
●Processing copper tungsten electrodes is also effective.

掲載ページ▶ D-164

## New 銅電極加工用ロングネックボールエンドミル Long Neck Ball End Mill for Copper Electrode

# DRB230

**R0.05～R3 全57サイズ** Total 57 Sizes

- 銅合金の加工に特化したロングネックボールエンドミル。
- 切れ味鋭い刃形状と DLC コーティングにより、長時間の高品位かつ安定した加工が可能です。
- 銅タングステン電極の加工にも有効です。

- Long neck ball end mill specialized for processing copper alloy.
- Sharp edge shearing ability and DLC COATING realized high quality and stable a long life processing.
- Processing copper tungsten electrodes is also effective.

掲載ページ▶ E-087

## New CBNスーパースピードラジアスエンドミル CBN Super Speed Radius End Mill

# SSR200

**φ0.1～φ2 全172サイズ** Total 172 Sizes

- CBN の抜群の耐久性にコーナー R の高能率加工を実現。
- 切れ刃全体にわたるスムーズな連続刃付！抜群の面精度を実現可能。
- 調質（プリハードン）鋼～ 68HRC の高硬度材まで対応。
- φ0.1 から規格拡大し、全 172 サイズに！

- Realized high efficient machining with radius flute along with excellent wear resistance of CBN.
- Realized excellent surface roughness by introducing smooth tangent on all over flute.
- Applicable for work materials from tempered steel to hardened steel (up to 68 HRC).
- Lineup expansion from Dia.0.1mm. 172 sizes in total.

掲載ページ▶ B-020

New

# 無限コーティングプレミアム 高硬度用ロングネックラジアスエンドミル
MUGEN-COATING PREMIUM Long Neck Radius End Mill for Hardened Steel

## MHRH230R

(2 枚刃タイプ　2-Flute Type)

**φ0.2～φ0.9　全97サイズ** Total 97 Sizes

## MHRH430R

(4 枚刃タイプ　4-Flute Type)

**φ0.2～φ6　全326サイズ** Total 326 Sizes

- 高硬度材加工に最適な無限コーティングプレミアムを採用。
- 壁部でのビビリを抑える外周刃強バックテーパーの採用。
- コーナー半径精度は R±5μm の高精度（D2.5 以下）。
- 最小コーナー半径は R0.02 と微細な隅形状の加工に対応。
- 刃径φ0.2 から 4 枚刃をラインナップ。

- Adoption of MUGEN-COATING PREMIUM for hardened steels.
- Minimized chattering in side milling by adoption of strong back taper shape on the peripheral cutting edge.
- Corner R accuracy : ±5μm (2.5D and below).
- Smallest size from R0.02 suits minute corner milling.
- Expanded 4-flute lineup from φ0.2.

掲載ページ▶ F-010（MHRH230R）
掲載ページ▶ F-012（MHRH430R）

# NS TOOL オリジナルコーティングの紹介 NS TOOL Original Coating

## ∞ Premium 無限コーティングプレミアム MUGEN-COATING PREMIUM

高硬度材直彫り加工時の工具寿命を飛躍的に延ばしたのが無限コーティングプレミアムです。被膜硬度Hv3,600、酸化開始温度1,300℃と極めて高く、48～65HRCの高硬度材に適しています。

MUGEN-COATING PREMIUM has brought the tool life extension for the machining of hight hardened steels.
It is suited for hardened steels from 48 to 65 HRC with high coating hardness: 3,600Hv and oxidation onset temperature: 1,300deg. C.

## ∞ 無限コーティング MUGEN-COATING

無限コーティングはTiAlN(チタンアルミナイトライド) ベースのコーティングでありながら、被膜硬度Hv3,400、酸化開始温度1,100℃と高い耐性を持っています。焼き入れ鋼・調質鋼・生材・銅に対しても強い耐摩耗性と潤滑性を有しています。

MUGEN-COATING consists of TiAlN (Titanium Aluminum Nitride) with coating hardness: 3,400Hv and oxidation onset temperature: 1,100deg. C. It covers wide range of work materials such as hardened steels, pre-hardened steels, raw materials and even coppers as being strong tool wear resistance and lubricating ability.

## X Xコーティング (TiCN系) X-COATING

Xコーティングは、TiCN(チタンカーボンナイトライド) 系のコーティングです。被膜硬度Hv3,000と高く、密着力も優れたコーティングです。切削熱を緩和する湿式クーラントを用いた一般的な切削加工(切削速度100m/min以下) で威力を発揮します。

X-COATING consists of TiCN (Titanium Carbon Nitride) with coating hardness: 3,000Hv and high adhesion.
It is recommended for general use of various materials at less than 100m/min cutting speed with coolant fluid.

## DLC DLCコーティング DLC COATING

DLC(ダイヤモンドライクカーボン) コーティングは、ダイヤモンドに似た性質を持つ炭素膜で、ダイヤモンドとグラファイトの両方持つアモルファス(非結晶) 構造のコーティングです。硬度がHv6,000と高く、摩擦係数は0.1と低く、膜の表面粗さRa0.02 μmと非常に滑らかです。また、耐溶着性にも優れているので、アルミ合金の加工で良好な仕上げ面を維持することが出来ます。

DLC (Diamond like Carbon) is a carbon coating similar to diamond coating.
It is suited for the high accurate surface milling of Aluminum by the features of high coating hardness: 6,000Hv, low friction coefficient: 0.1 and strong welding resistance by smooth surface: Ra0.02 micro meter.

## DIA ダイヤモンドコーティング DIAMOND COATING

結合材・不純物を含まない高純度ダイヤモンドによる優れた耐摩耗性と高密着化技術により、高い安定性を実現。

Stable quality brought by strong wear-resistance and stickiness of pure diamond free from bond and impurity.

## 各種コーティングの被削材適用表 Coating application chart by materials

| コーティング種類 Coating | | 無限コーティングプレミアム MUGEN-COATING PREMIUM | 無限コーティング MUGEN-COATING | Xコーティング X-COATING | DLCコーティング DLC COATING | ダイヤモンドコーティング DIAMOND COATING |
|---|---|---|---|---|---|---|
| 被削材 Material | 焼き入れ鋼 56～65HRC Hardened Steels | ◎ | | | | |
| | 焼き入れ鋼 45～55HRC Hardened Steels | ◎ | ○ | | | |
| | 調質鋼 Prehardened Steels | ◎ | ◎ | ○ | | |
| | 生材 Raw Material | ○ | ◎ | ○ | | |
| | 銅 Copper | | ○ | | ◎ | |
| | アルミニウム合金 Aluminum Alloy | | | | ◎ | |
| | 硬脆材 Hard Brittle Materials | | | | | ◎ |
| | グラファイト Graphite | | | | | ◎ |

# 1

# 目的別検索方法

目的にあった製品の探し方です

Search


「形状」から探す A-002
Search from Type

「スクエアサイズ」から探す A-022
Search from Square Dia.

「ボールサイズ」から探す A-056
Search from Ball R

「ラジアスサイズ」から探す A-074
Search from Radius Dia. & Corner R

「商品コード」から探す A-088
Search from Code No.

「商品型番」から探す A-090
Search from Model

# 仕　様
Specification

## スクエアエンドミル

| 写　真 Photo | 型　番 Model | サイズ Size | ページ Page |
|---|---|---|---|
| CBN シリーズ　CBN End Mill Series | | | |
| | SMEZ120 | 0.03～0.1 | B-002 |
| | SSE400 | 0.1 | B-003 |
| | SSE600 | 0.2～1 | B-003 |
| PCD スクエアエンドミル　PCD End Mill | | | |
| | PCDSE | 0.1～1 | C-001 |
| 単結晶ダイヤエンドミル　Monocrystalline Diamond End Mill | | | |
| | CED100 | 0.1～2 | C-007 |
| ダイヤモンドコーティングシリーズ　DIAMOND COATING End Mill Series | | | |
| | DCMS | 0.3～2 | C-008 |
| | DCSE235 | 0.5～6 | C-010 |
| | DCHR230 | 0.5～6 | C-012 |
| 無限コーティングプレミアムシリーズ　MUGEN-COATING PREMIUM End Mill Series | | | |
| | MXH225 | 0.1～6 | D-001 |
| | MXH230 | 0.1～6 | D-002 |
| | MXH235 | 0.1～6 | D-003 |
| | MXH240 | 0.3～6 | D-004 |
| | MXH245 | 0.3～6 | D-004 |
| | MXH225P | 0.1～6 | D-005 |
| | MXH230P | 0.1～6 | D-006 |
| | MXH235P | 0.1～6 | D-007 |
| | MHDH445 | 1～4 | D-057 |
| | MHDH645 | 5～12 | D-057 |
| | MHRH230 | 0.1～3 | D-064 |

## 被削材 Work Material

## Square End Mill

| | 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ~55HRC | 焼き入れ鋼 Hardened Steels 55HRC~ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin | 超硬合金・硬脆材 Cemented Carbide・Hard Brittle Material | グラファイト Graphite | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CBN 超微細加工用 1枚刃左20° ネジレタイプ“マイクロエッジ Z” “CBN MICRO EDGE Z” | | | ◎ | ◎ | ◎ | | | | | | | | |
| CBN 4枚刃スクエアタイプ CBN Square End Mill | | | ○ | ◎ | ◎ | | | | | | | | |
| CBN 6枚刃スクエアタイプ CBN Square End Mill | | | ○ | ◎ | ◎ | | | | | | | | |
| PCD スクエアタイプ Polycrystalline Diamond Square End Mill | | | | | | | | | | | ◎ | | |
| 単結晶ダイヤモンド 1枚刃タイプ“クリアエッジ” Monocrystalline Diamond End Mill “CLEAR EDGE” | | | | | | | | ○ | ○ | | ◎ | | |
| 硬脆材加工用 スクエアタイプ DIAMOND COATING End Mill for Hard Brittle Materials | | | | | | | | | | | ◎ | | |
| 2枚刃35° ネジレタイプ DIAMOND COATING 2-Flute Square End Mill | | | | | | | | 高Siアルミニウム High Silicon Aluminum Alloy ○ | | 繊維入り樹脂 Fiber Reinforced Plastic (FRP) ○ | | ◎ | |
| 2枚刃30° ネジレ ロングネックタイプ DIAMOND COATING 2-Flute Long Neck Square End Mill | | | | | | | | 高Siアルミニウム High Silicon Aluminum Alloy ○ | | 繊維入り樹脂 Fiber Reinforced Plastic (FRP) ○ | | ◎ | |
| 無限コーティングプレミアム 2枚刃25° ネジレ 1倍刃長タイプ MUGEN-COATING PREMIUM 2-Flute LEAD25 End Mill | ○ | ○ | ◎ | ○ | | ◎ | ◎ | | | | | | ◎ |
| 無限コーティングプレミアム 2枚刃30° ネジレ 2倍刃長タイプ MUGEN-COATING PREMIUM 2-Flute LEAD30 End Mill | ○ | ○ | ◎ | ○ | | ◎ | ◎ | | | | | | ◎ |
| 無限コーティングプレミアム 2枚刃35° ネジレ 3倍刃長タイプ MUGEN-COATING PREMIUM 2-Flute LEAD35 End Mill | ○ | ○ | ◎ | ○ | | ◎ | ◎ | | | | | | ◎ |
| 無限コーティングプレミアム 2枚刃40° ネジレ 4倍刃長タイプ MUGEN-COATING PREMIUM 2-Flute LEAD40 End Mill | ○ | ○ | ◎ | ○ | | ◎ | ◎ | | | | | | ◎ |
| 無限コーティングプレミアム 2枚刃45° ネジレ 5倍刃長タイプ MUGEN-COATING PREMIUM 2-Flute LEAD45 End Mill | ○ | ○ | ◎ | ○ | | ◎ | ◎ | | | | | | ◎ |
| 無限コーティングプレミアム 2枚刃25° ネジレ ピンカド1倍刃長タイプ MUGEN-COATING PREMIUM 2-Flute Sharp Edge LEAD25 End Mill | ○ | ○ | ◎ | | | ◎ | ◎ | | | | | | ◎ |
| 無限コーティングプレミアム 2枚刃30° ネジレ ピンカド2倍刃長タイプ MUGEN-COATING PREMIUM 2-Flute Sharp Edge LEAD30 End Mill | ○ | ○ | ◎ | | | ◎ | ◎ | | | | | | ◎ |
| 無限コーティングプレミアム 2枚刃35° ネジレ ピンカド3倍刃長タイプ MUGEN-COATING PREMIUM 2-Flute Sharp Edge LEAD35 End Mill | ○ | ○ | ◎ | | | ◎ | ◎ | | | | | | ◎ |
| 高硬度用 4枚刃45° ネジレタイプ MUGEN-COATING PREMIUM 4-Flute Square End Mill for Hardened Steel | | | | ◎ | ◎ | | | | | | | | |
| 高硬度用 6枚刃45° ネジレタイプ MUGEN-COATING PREMIUM 6-Flute Square End Mill for Hardened Steel | | | | ◎ | ◎ | | | | | | | | |
| 高硬度用 2枚刃30° ネジレ ロングネックタイプ MUGEN-COATING PREMIUM 2-Flute Long Neck End Mill for Hardened Steel | | | ◎ | ◎ | ◎ | ○ | ○ | | | | | | ○ |

# 仕　様
Specification

## スクエアエンドミル

無限コーティングプレミアムシリーズ　MUGEN-COATING PREMIUM End Mill Series

| 写　真 Photo | 型　番 Model | サイズ Size | ページ Page |
|---|---|---|---|
| | MHRH430 | 1～6 | D-067 |

無限コーティングシリーズ　MUGEN-COATING End Mill Series

| 写　真 Photo | 型　番 Model | サイズ Size | ページ Page |
|---|---|---|---|
| | MX225 | 0.3～12 | D-016 |
| | MX230 | 0.1～12 | D-016 |
| | MX235 | 0.1～12 | D-018 |
| | MX240 | 0.3～12 | D-019 |
| | MX245 | 0.3～12 | D-020 |
| | MX425 | 1～12 | D-032 |
| | MX430 | 1～12 | D-032 |
| | MX435 | 1～12 | D-033 |
| | MX440 | 1～12 | D-033 |
| | MX445 | 1～12 | D-034 |
| | MSE230SS | 0.1～6 | D-026 |
| | MSES230P | 0.1～12 | D-027 |
| | MSE230 | 0.1～12 | D-027 |
| | MSE230M | 0.1～6 | D-029 |
| | MSEM230 | 0.5～12 | D-029 |
| | MSE430P | 1～12 | D-040 |
| | MSE430 | 1～20 | D-040 |
| | MSEM430 | 1～20 | D-041 |
| | MSE245 | 2～12 | D-044 |



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## 被削材 Work Material

## Square End Mill

| | 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ~55HRC | 焼き入れ鋼 Hardened Steels 55HRC~ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin | 超硬合金・硬脆材 Cemented Carbide・Hard Brittle Material | グラファイト Graphite | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 高硬度用 4枚刃30°ネジレ ロングネックタイプ MUGEN-COATING PREMIUM 4-Flute Long Neck End Mill for Hardened Steel | | | ◎ | ◎ | ◎ | ○ | ○ | | | | | | ○ |
| 2枚刃25°ネジレ 1倍刃長タイプ MUGEN-COATING 2-Flute LEAD25 End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30°ネジレ 2倍刃長タイプ MUGEN-COATING 2-Flute LEAD30 End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃35°ネジレ 3倍刃長タイプ MUGEN-COATING 2-Flute LEAD35 End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃40°ネジレ 4倍刃長タイプ MUGEN-COATING 2-Flute LEAD40 End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃45°ネジレ 5倍刃長タイプ MUGEN-COATING 2-Flute LEAD45 End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 4枚刃25°ネジレ 1倍刃長タイプ MUGEN-COATING 4-Flute LEAD25 End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 4枚刃30°ネジレ 2倍刃長タイプ MUGEN-COATING 4-Flute LEAD30 End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 4枚刃35°ネジレ 3倍刃長タイプ MUGEN-COATING 4-Flute LEAD35 End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 4枚刃40°ネジレ 4倍刃長タイプ MUGEN-COATING 4-Flute LEAD40 End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 4枚刃45°ネジレ 5倍刃長タイプ MUGEN-COATING 4-Flute LEAD45 End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30°ネジレ ショートタイプ MUGEN-COATING 2-Flute Super Short End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30°ネジレ ピンカドショートタイプ MUGEN-COATING 2-Flute Sharp Edge Short End Mill | ◎ | ◎ | ◎ | | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30°ネジレタイプ MUGEN-COATING 2-Flute End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 刃径表示 2枚刃30°ネジレタイプ MUGEN-COATING 2-Flute End Mill with Measured Diameter | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30°ネジレミディアムタイプ MUGEN-COATING 2-Flute Medium End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 4枚刃30°ネジレ ピンカドタイプ MUGEN-COATING 4-Flute Sharp Edge End Mill | ◎ | ◎ | ◎ | | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 4枚刃30°ネジレタイプ MUGEN-COATING 4-Flute End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 4枚刃30°ネジレ ミディアムタイプ MUGEN-COATING 4-Flute Medium End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃45°ネジレタイプ MUGEN-COATING 2-Flute End Mill | ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ | | | ○ |

# 仕　様
Specification

## スクエアエンドミル

無限コーティングシリーズ　MUGEN-COATING End Mill Series

| 写　真 Photo | 型　番 Model | サイズ Size | ページ Page |
|---|---|---|---|
| | MSE345 | 3～20 | D-044 |
| | MSE445 | 2～20 | D-045 |
| | MSZ345 | 1～12 | D-052 |
| | MSX440 | 3～20 | D-055 |
| | MHD445 | 1～4 | D-059 |
| | MHD645 | 5～12 | D-059 |
| | MHR230 | 0.1～6 | D-074 |
| | MHRLN230-6 | 0.3～2 | D-093 |
| | MHR430 | 1～10 | D-081 |

X コーティングシリーズ　X-COATING End Mill Series

| | | | |
|---|---|---|---|
| | NX-30X | 1～12 | D-062 |
| | NHR-2X | 0.5～5 | D-094 |

超硬ソリッドエンドミルシリーズ　Solid Carbide End Mill Series

| | | | |
|---|---|---|---|
| | NSME100 | 0.01～0.05 | D-097 |
| | NSME230 | 0.03～0.09 | D-097 |
| | NX-25 | 0.5～12 | D-098 |
| | NX-30 | 0.5～12 | D-100 |
| | NX-35 | 0.5～12 | D-102 |
| | NX-40 | 0.5～12 | D-104 |
| | NX-45 | 0.5～12 | D-106 |
| | NC-2 | 0.5～20 | D-113 |
| | NCM-2 | 0.5～20 | D-114 |

## 被削材 Work Material

## Square End Mill

| | 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ~55HRC | 焼き入れ鋼 Hardened Steels 55HRC~ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin | 超硬合金・硬脆材 Cemented Carbide・Hard Brittle Material | グラファイト Graphite | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3枚刃45° ネジレタイプ MUGEN-COATING 3-Flute End Mill | ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ | | | ○ |
| 4枚刃45° ネジレタイプ MUGEN-COATING 4-Flute End Mill | ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ | | | ○ |
| 高能率 3枚刃45° ネジレタイプ MUGEN-COATING 3-Flute Power "Z" End Mill | ◎ | ◎ | ◎ | | | ○ | | | | | | | |
| 難削材用 4枚刃不等リードタイプ MUGEN-COATING 4-Flute Power End Mill | ◎ | ◎ | ◎ | | | ◎ | ◎ | | | | | | ◎ |
| 高硬度用 4枚刃45° ネジレタイプ MUGEN-COATING 4-Flute End Mill for Hardened Steels | | | | ◎ | ◎ | | | | | | | | |
| 高硬度用 6枚刃45° ネジレタイプ MUGEN-COATING 6-Flute End Mill for Hardened Steels | | | | ◎ | ◎ | | | | | | | | |
| 2枚刃30° ネジレ ロングネックタイプ(深リブ用) MUGEN-COATING 2-Flute Long Neck End Mill | ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30° ネジレ ロングネック φ6シャンクタイプ(深リブ用) MUGEN-COATING 2-Flute Long Neck End Mill (Shank Dia. 6) | ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 4枚刃30° ネジレ ロングネックタイプ(深リブ用) MUGEN-COATING 4-Flute Long Neck End Mill | ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30° ネジレタイプ X-COATING 2-Flute End Mill | ◎ | ◎ | ◎ | | | ○ | | ○ | ○ | ○ | | | |
| 2枚刃30° ネジレ ロングネックタイプ(深リブ用) X-COATING 2-Flute Long Neck End Mill | ◎ | ◎ | ◎ | | | ○ | | ○ | ○ | ○ | | | |
| 超微細加工用 1枚刃タイプ "マイクロエッジ" Micro End Mill "MICRO EDGE" | ○ | ○ | ○ | | | ○ | ○ | ◎ | ◎ | ◎ | | | |
| 超微細加工用 2枚刃30° ネジレタイプ "マイクロエッジ" Micro End Mill "MICRO EDGE" | ○ | ○ | ○ | | | ○ | ○ | ◎ | ◎ | ◎ | | | |
| 2枚刃25° ネジレ 1倍刃長タイプ LEAD 25 End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 2枚刃30° ネジレ 2倍刃長タイプ LEAD 30 End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 2枚刃35° ネジレ 3倍刃長タイプ LEAD 35 End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 2枚刃40° ネジレ 4倍刃長タイプ LEAD 40 End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 2枚刃45° ネジレ 5倍刃長タイプ LEAD 45 End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 2枚刃30° ネジレタイプ CHAMPION SOLID 2-Flute End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 2枚刃30° ネジレ ミディアムタイプ CHAMPION SOLID 2-Flute Medium End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |

# 仕　様
Specification

## スクエアエンドミル

超硬ソリッドエンドミルシリーズ　Solid Carbide End Mill Series

| 写　真 Photo | 型　番 Model | サイズ Size | ページ Page |
|---|---|---|---|
| | NCL-2 | 1～12 | D-115 |
| | NC-LS-2 | 1～12 | D-115 |
| | NC-4 | 1～20 | D-119 |
| | NCM-4 | 1～20 | D-121 |
| | NCL-4 | 2～12 | D-121 |
| | NE-2 | 1～20 | D-125 |
| | NE-3 | 3～20 | D-125 |
| | NE-4 | 3～20 | D-126 |
| | NEL-3 | 6～20 | D-126 |
| | NSL-2 | 1～12 | D-130 |
| | NHR-2 | 0.5～5 | D-131 |
| | AL2D-2 | 0.5～12 | D-135 |
| | AL3D-2 | 1～12 | D-136 |
| | AL4D-2 | 1～12 | D-136 |
| | AL5D-2 | 1～12 | D-137 |
| | New AL3D-345 | 1～12 | D-137 |
| | AL2D-2DLC | 0.5～12 | D-138 |
| | AL3D-2DLC | 1～12 | D-138 |
| | AL4D-2DLC | 1～12 | D-139 |
| | AL5D-2DLC | 1～12 | D-139 |
| | New ALZ345 | 1～12 | D-140 |



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## 被削材 Work Material

## Square End Mill

| | 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ~55HRC | 焼き入れ鋼 Hardened Steels 55HRC~ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin | 超硬合金・硬脆材 Cemented Carbide・Hard Brittle Material | グラファイト Graphite | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2枚刃30°ネジレ ロングタイプ CHAMPION SOLID 2-Flute Long End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 2枚刃30°ネジレ ロングシャンクタイプ CHAMPION SOLID 2-Flute Long Shank End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 4枚刃30°ネジレタイプ CHAMPION SOLID 4-Flute End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 4枚刃30°ネジレ ミディアムタイプ CHAMPION SOLID 4-Flute Medium End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 4枚刃30°ネジレ ロングタイプ CHAMPION SOLID 4-Flute Long End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 2枚刃45°ネジレタイプ POWER SOLID 2-Flute End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 3枚刃45°ネジレタイプ POWER SOLID 3-Flute End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 4枚刃45°ネジレタイプ POWER SOLID 4-Flute End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 3枚刃45°ネジレ ロングタイプ POWER SOLID 3-Flute Long End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 2枚刃直刃タイプ Straight End Mill for Reforming | ○ | ○ | ○ | | | | | | | | | | |
| 2枚刃30°ネジレ ロングネックタイプ(深リブ用)(φD≧2.5、45°ネジレ) 2-Flute Long Neck End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| アルミ用 2枚刃45°ネジレ ピンカド2倍刃長タイプ 2-Flute End Mill for Aluminum | | | | | | | | ◎ | ○ | ○ | | | |
| アルミ用 2枚刃45°ネジレ ピンカド3倍刃長タイプ 2-Flute Medium End Mill for Aluminum | | | | | | | | ◎ | ○ | ○ | | | |
| アルミ用 2枚刃45°ネジレ ピンカド4倍刃長タイプ 2-Flute Medium End Mill for Aluminum | | | | | | | | ◎ | ○ | ○ | | | |
| アルミ用 2枚刃45°ネジレ ピンカド5倍刃長タイプ 2-Flute Long End Mill for Aluminum | | | | | | | | ◎ | ○ | ○ | | | |
| アルミ用 3枚刃45°ネジレ 3倍刃長タイプ 3-Flute Medium End Mill for Aluminum | | | | | | | | ◎ | ○ | ○ | | | |
| アルミ用 DLCコーティング 2枚刃45°ネジレ ピンカド2倍刃長タイプ DLC COATING 2-Flute End Mill for Aluminum | | | | | | | | ◎ | ○ | ○ | | | |
| アルミ用 DLCコーティング 2枚刃45°ネジレ ピンカド3倍刃長タイプ DLC COATING 2-Flute End Mill for Aluminum | | | | | | | | ◎ | ○ | ○ | | | |
| アルミ用 DLCコーティング 2枚刃45°ネジレ ピンカド4倍刃長タイプ DLC COATING 2-Flute End Mill for Aluminum | | | | | | | | ◎ | ○ | ○ | | | |
| アルミ用 DLCコーティング 2枚刃45°ネジレ ピンカド5倍刃長タイプ DLC COATING 2-Flute End Mill for Aluminum | | | | | | | | ◎ | ○ | ○ | | | |
| アルミ用高能率 3枚刃45°ネジレタイプ 3-Flute Power "Z" End Mill for Aluminum | | | | | | | | ◎ | ○ | ○ | | | |

# 仕　様
Specification

## スクエアエンドミル

超硬ソリッドエンドミルシリーズ　Solid Carbide End Mill Series

| 写　真 Photo | 型　番 Model | サイズ Size | ページ Page |
|---|---|---|---|
| | ALZ345-DLC | 1～12 | D-143 |
| | AL-3LS | 5～12 | D-144 |
| | NEA-2 | 3～25 | D-144 |
| | RSE230 | 0.1～6 | D-159 |
| | RSES230 | 0.1～6 | D-154 |
| | New DHR237 | 0.1～6 | D-164 |
| | DX | 0.5～20 | D-167 |
| | DXM | 3～20 | D-167 |
| | DXL | 3～20 | D-168 |
| | DSF | 1～20 | D-168 |
| | DHS | 6～20 | D-169 |

## ボールエンドミル

CBN シリーズ　CBN End Mill Series

| | | | |
|---|---|---|---|
| | SMB120 | R0.01～R0.05 | B-005 |
| | SFB200 | R0.1～R1 | B-006 |
| | SSPB220 | R0.1～R3 | B-007 |
| | SSPBL220 | R0.1～R1 | B-008 |
| | SSPBTN220 | R0.1～R1 | B-009 |
| | SSB200 | R0.1～R1 | B-011 |
| | SSBL200 | R0.05～R1 | B-012 |

PCD ボールエンドミル　PCD End Mill

| | | | |
|---|---|---|---|
| | PCDRB | R0.05～R1 | C-003 |



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## 被削材 Work Material

## Square End Mill

| | 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ~55HRC | 焼き入れ鋼 Hardened Steels 55HRC~ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin | 超硬合金・硬脆材 Cemented Carbide・Hard Brittle Material | グラファイト Graphite | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| アルミ用 DLCコーティング高能率 3枚刃45° ネジレタイプ DLC COATING 3-Flute Power "Z" End Mill for Aluminum | | | | | | | | ◎ | ○ | ○ | | | |
| アルミ用 3枚刃45° ネジレロングシャンクタイプ(アンダーシャンク) 3-Flute Long Shank End Mill for Aluminum | | | | | | | | ◎ | ○ | ○ | | | |
| アルミ用 2枚刃45° ネジレタイプ 2-Flute End Mill for Aluminum | | | | | | | | ◎ | ◎ | ◎ | | | |
| 樹脂用 2枚刃30° ネジレ ピンカドタイプ "クリアカット" End Mill for Resin | | | | | | | | ◎ | ◎ | ◎ | | | |
| 樹脂用 2枚刃30° ネジレ ピンカドショート刃長タイプ "クリアカット" Short Flute End Mill for Resin | | | | | | | | ◎ | ◎ | ◎ | | | |
| 銅電極用 ロングネックタイプ Long Neck End Mill for Copper Electrode | | | | | | | | | 銅タングステン Copper Tungsten ◎ | | | | |
| 銅電極・アルミ・プラ用 2枚刃25° ネジレ ピンカド2倍刃長タイプ 2-Flute End Mill for Nonferrous | | | | | | | | ◎ | ◎ | ◎ | | | |
| 銅電極・アルミ・プラ用 2枚刃25° ネジレ ピンカド4倍刃長タイプ 2-Flute Medium End Mill for Nonferrous | | | | | | | | ◎ | ◎ | ◎ | | | |
| 銅電極・アルミ・プラ用 2枚刃25° ネジレ ピンカド5倍刃長タイプ 2-Flute Long End Mill for Nonferrous | | | | | | | | ◎ | ◎ | ◎ | | | |
| 銅電極・アルミ・プラ用 1枚刃12° ネジレ ピンカド底面仕上タイプ Surface End Mill for Nonferrous | | | | | | | | ◎ | ◎ | ◎ | | | |
| 銅電極・アルミ・プラ用 3枚刃40° ネジレ 荒取りタイプ 3-Flute Semi-finishing End Mill for Nonferrous | | | | | | | | ◎ | ◎ | ◎ | | | |

## Ball End Mill

| | 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ~55HRC | 焼き入れ鋼 Hardened Steels 55HRC~ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin | 超硬合金・硬脆材 Cemented Carbide・Hard Brittle Material | グラファイト Graphite | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CBN 超微細加工用 1枚刃左20° ネジレタイプ "CBN マイクロボール" "CBN Micro Ball" End Mill | | | ◎ | ◎ | ◎ | | | | | | | | |
| CBN 超精密仕上加工用 2枚刃タイプ CBN Super Finish Ball End Mill | | | ◎ | ◎ | ◎ | | | | | | | | |
| CBN 光沢仕上加工用 2枚刃20° ネジレタイプ CBN Super Spiral Ball End Mill | | | ◎ | ◎ | ◎ | | | | | | | | |
| CBN 光沢仕上加工用 2枚刃20° ネジレ ロングネックタイプ CBN Super Spiral Long Neck Ball End Mill | | | ◎ | ◎ | ◎ | | | | | | | | |
| CBN 光沢仕上加工用 2枚刃20° ネジレ ロングテーパーネックタイプ CBN Super Spiral Long Taper Neck Ball End Mill | | | ◎ | ◎ | ◎ | | | | | | | | |
| CBN 2枚刃タイプ CBN Super Speed Ball End Mill | | | ◎ | ◎ | ◎ | | | | | | | | |
| CBN 2枚刃ロングネックタイプ CBN Super Speed Long Neck Ball End Mill | | | ◎ | ◎ | ◎ | | | | | | | | |
| PCD ボールタイプ Polycrystalline Diamond Ball End Mill | | | ◎ | ◎ | ◎ | | | | | | ◎ | | |

# 仕　様
Specification

## ボールエンドミル

ダイヤモンドコーティングシリーズ　DIAMOND COATING End Mill Series

| 写　真 Photo | 型　番 Model | サイズ Size | ページ Page |
|---|---|---|---|
| | DCMB | R0.1～R1 | C-014 |
| | DCRB230 | R0.2～R3 | C-016 |

無限コーティングプレミアムシリーズ　MUGEN-COATING PREMIUM End Mill Series

| | | | |
|---|---|---|---|
| | MSBH230 | R0.05～R6 | E-001 |
| | MSBH345 | R0.5～R3 | E-002 |
| | MACH225SF | R0.1～R3 | E-004 |
| | MACH225 | R0.1～R3 | E-005 |
| | MRBH230 | R0.05～R3 | E-021 |
| | MRBTNH230 | R0.1～R2 | E-048 |
| | MRBTNH345 | R0.5～R2 | E-056 |

無限コーティングシリーズ　MUGEN-COATING End Mill Series

| | | | |
|---|---|---|---|
| | MSB230G2 | R0.05～R3 | E-007 |
| | MSB230S | R0.1～R6 | E-007 |
| | MSB230SF | R0.1～R6 | E-008 |
| | MSB230 | R0.05～R10 | E-009 |
| | MSBL230 | R0.1～R5 | E-011 |
| | MSBXL230 | R0.5～R5 | E-016 |
| | MSB345 | R0.5～R6 | E-014 |
| | MRB230SF | R0.1～R1.5 | E-031 |
| | MRB230 | R0.05～R3 | E-035 |
| | MRBLN230-6 | R0.15～R1 | E-047 |
| | MRBTN230 | R0.1～R2 | E-060 |



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## 被削材 Work Material

## Ball End Mill

| | 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ~55HRC | 焼き入れ鋼 Hardened Steels 55HRC~ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin | 超硬合金・硬脆材 Cemented Carbide・Hard Brittle Material | グラファイト Graphite | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 硬脆材加工用 2枚刃20° ネジレタイプ DIAMOND COATING Ball End Mill for Hard Brittle Materials | | | | | | | | | | | ◎ | | |
| ダイヤモンドコーティング 2枚刃30° ネジレロングネックタイプ DIAMOND COATING 2-Flute Long Neck Ball End Mill | | | | | | | | 高Siアルミニウム High Silicon Aluminum Alloy ○ | | 繊維入り樹脂 Fiber Reinforced Plastic (FRP) ○ | | ◎ | |
| 高硬度用 2枚刃30° ネジレタイプ MUGEN-COATING PREMIUM 2-Flute Ball End Mill for Hardened Steel | | | ◎ | ◎ | ◎ | | | | | | | | |
| 高硬度用 3枚刃45° 不等分割タイプ MUGEN-COATING PREMIUM 3-Flute Ball End Mill for Hardened Steel | | | ◎ | ◎ | ◎ | | | | | | | | |
| 高速・高硬度用 2枚刃25° ネジレショートシャンクタイプ(焼きばめ対応) MUGEN-COATING PREMIUM 2-Flute Ball End Mill with Short Shank for Hardened Steel | | | ◎ | ◎ | ◎ | ◎ | ◎ | | | | | | |
| 高速・高硬度用 2枚刃25° ネジレタイプ MUGEN-COATING PREMIUM 2-Flute Ball End Mill for Hardened Steel | | | ◎ | ◎ | ◎ | ◎ | ◎ | | | | | | |
| 高硬度用 2枚刃30° ネジレロングネックタイプ MUGEN-COATING PREMIUM 2-Flute Long Neck Ball End Mill for Hardened Steel | | | ◎ | ◎ | ◎ | ○ | ○ | | | | | | |
| 高硬度用 2枚刃30° ネジレロングテーパーネックタイプ MUGEN-COATING PREMIUM 2-Flute Long Taper Neck Ball End Mill | | | ◎ | ◎ | ◎ | ○ | ○ | | | | | | |
| 高硬度用 3枚刃45° ネジレ不等分割ロングテーパーネックタイプ MUGEN-COATING PREMIUM 3-Flute Long Taper Neck Ball End Mill | | | ◎ | ◎ | ◎ | | | | | | | | |
| 高精度 2枚刃30° ネジレタイプ MUGEN-COATING Profit Ball End Mill | ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30° ネジレショートタイプ MUGEN-COATING 2-Flute Short Ball End Mill | ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30° ネジレショートシャンクタイプ(焼きばめ対応) MUGEN-COATING 2-Flute Ball End Mill with Short Shank | ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30° ネジレタイプ MUGEN-COATING 2-Flute Ball End Mill | ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30° ネジレロングタイプ MUGEN-COATING 2-Flute Long Ball End Mill | ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30° ネジレ超ロングタイプ MUGEN-COATING 2-Flute Extra Long Ball End Mill | ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 3枚刃45° ネジレ不等分割タイプ MUGEN-COATING 3-Flute Ball End Mill | ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30° ネジレロングネックショートシャンクタイプ(焼きばめ対応) MUGEN-COATING 2-Flute Long Neck Ball End Mill with Short Shank | ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30° ネジレロングネックタイプ(深リブ用) MUGEN-COATING 2-Flute Long Neck Ball End Mill | ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30° ネジレロングネック φ6シャンクタイプ(深リブ用) MUGEN-COATING 2-Flute Long Neck Ball End Mill (Shank Dia. 6) | ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30° ネジレロングテーパーネックタイプ MUGEN-COATING 2-Flute Long Taper Neck Ball End Mill | ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ | | | |

# 仕　様
Specification

## ボールエンドミル

無限コーティングシリーズ　MUGEN-COATING End Mill Series

| 写　真 Photo | 型　番 Model | サイズ Size | ページ Page |
|---|---|---|---|
| | MRBTN230L | R0.1～R5 | E-069 |

X コーティングシリーズ　X-COATING End Mill Series

| | | | |
|---|---|---|---|
| | NCB-2X | R0.2～R0.9 | E-017 |
| | NSB-2X | R1～R10 | E-018 |

超硬ソリッドエンドミルシリーズ　Solid Carbide End Mill Series

| | | | |
|---|---|---|---|
| | NSMB100 | R0.005～R0.05 | E-073 |
| | NCB-2 | R0.2～R0.9 | E-075 |
| | NSB-2 | R1～R10 | E-075 |
| | NSBL-2 | R3～R10 | E-077 |
| | NLBL-2 | R0.5～R10 | E-078 |
| | NHB-2 | R0.4～R5 | E-079 |
| | ALB225 | R0.3～R6 | E-082 |
| | ALB225-DLC | R0.3～R6 | E-083 |
| | RSB230 | R0.1～R3 | E-085 |
| | New DRB230 | R0.05～R3 | E-087 |
| | DB | R0.5～R10 | E-091 |
| | DHB | R0.5～R6 | E-092 |

## ラジアスエンドミル

CBN シリーズ　CBN End Mill Series

| | | | |
|---|---|---|---|
| | New SSR200 | 0.1～2 | B-020 |
| | SHR320 | 0.5～2 | B-024 |
| | SSF120 | 0.2～2 | B-025 |

## 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ~55HRC | 焼き入れ鋼 Hardened Steels 55HRC~ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin | 超硬合金・硬脆材 Cemented Carbide・Hard Brittle Material | グラファイト Graphite | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

## Ball End Mill

| | 炭素鋼 | 合金鋼・工具鋼 | 調質鋼 | 焼き入れ鋼 ~55HRC | 焼き入れ鋼 55HRC~ | ステンレス鋼 | チタン合金 | アルミニウム合金 | 銅 | 樹　脂 | 超硬合金・硬脆材 | グラファイト | 超耐熱合金 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2枚刃30° ネジレ超ロングテーパーネックタイプ MUGEN-COATING 2-Flute Extra Long Taper Neck Ball End Mill | ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30° ネジレミニチュアタイプ X-COATING 2-Flute Miniature Ball End Mill | ◎ | ◎ | ◎ | | | ○ | | ○ | ○ | ○ | | | |
| 2枚刃30° ネジレタイプ X-COATING 2-Flute Ball End Mill | ◎ | ◎ | ◎ | | | ○ | | ○ | ○ | ○ | | | |
| 超微細加工用 1枚刃タイプ“マイクロボール” “Micro Ball” End Mill | ○ | ○ | ○ | | | ○ | ○ | ◎ | ◎ | ◎ | | | |
| 2枚刃30° ネジレミニチュアタイプ 2-Flute Miniature Ball End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 2枚刃30° ネジレタイプ 2-Flute Ball End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 2枚刃30° ネジレロングタイプ 2-Flute Long Ball End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 2枚刃30° ネジレ超ロングタイプ 2-Flute Extra Long Ball End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 2枚刃30° ネジレロングネックタイプ(深リブ用) 2-Flute Long Neck Ball End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| アルミ用 2枚刃25° ネジレタイプ Ball End Mill for Aluminum | | | | | | | | ◎ | ○ | ○ | | | |
| アルミ用 DLCコーティング 2枚刃25° ネジレタイプ DLC COATING Ball End Mill for Aluminum | | | | | | | | ◎ | ○ | ○ | | | |
| 樹脂用 2枚刃30° ネジレタイプ“クリアカット” Ball End Mill for Resin | | | | | | | | ◎ | ◎ | ◎ | | | |
| 銅電極用 ロングネックタイプ Long Neck Ball End Mill for Copper Electrode | | | | | | | | | 銅タングステン Copper Tungsten ◎ | | | | |
| 銅電極・アルミ・プラ用 2枚刃25° ネジレタイプ 2-Flute Ball End Mill for Nonferrous | | | | | | | | ◎ | ◎ | ◎ | | | |
| 銅電極・アルミ・プラ用 2枚刃25° ネジレロングネックタイプ(深リブ用) 2-Flute Long Neck Ball End Mill for Nonferrous | | | | | | | | ◎ | ◎ | ◎ | | | |

## Radius End Mill

| | 炭素鋼 | 合金鋼・工具鋼 | 調質鋼 | 焼き入れ鋼 ~55HRC | 焼き入れ鋼 55HRC~ | ステンレス鋼 | チタン合金 | アルミニウム合金 | 銅 | 樹　脂 | 超硬合金・硬脆材 | グラファイト | 超耐熱合金 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CBN 2枚刃タイプ CBN Super Speed Radius End Mill | | | ◎ | ◎ | ◎ | | | | | | | | |
| CBN 高能率 3枚刃20° ネジレタイプ CBN High Efficient Radius End Mill | | | ◎ | ◎ | ◎ | | | | | | | | |
| CBN 底面仕上用 1枚刃20° ネジレタイプ CBN Super Surface End Mill | | | ◎ | ◎ | ◎ | | | | | | | | |

# 仕　様
Specification

## ラジアスエンドミル

PCD ラジアスエンドミル　PCD End Mill

| 写　真 Photo | 型　番 Model | サイズ Size | ページ Page |
|---|---|---|---|
| | PCDRS | 0.3～1 | C-005 |

無限コーティングプレミアムシリーズ　MUGEN-COATING PREMIUM End Mill Series

| | | | |
|---|---|---|---|
| | MSXH440R | 3～12 | F-001 |
| | MHDH445R | 3～4 | F-003 |
| | MHDH645R | 5～12 | F-003 |
| | New MHRH230R | 0.2～0.9 | F-010 |
| | New MHRH430R | 0.2～6 | F-012 |

無限コーティングシリーズ　MUGEN-COATING End Mill Series

| | | | |
|---|---|---|---|
| | MSRS230 | 1～5 | F-005 |
| | MSRS430 | 6～12 | F-006 |
| | MHR230R | 0.2～6 | F-021 |
| | MHR430R | 1～6 | F-032 |
| | MSTNR230 | 0.2～3 | F-040 |

超硬ソリッドエンドミルシリーズ　Solid Carbide End Mill Series

| | | | |
|---|---|---|---|
| | NSR-2 | 1～20 | F-008 |

## テーパーエンドミル

無限コーティングシリーズ　MUGEN-COATING End Mill Series

| | | | |
|---|---|---|---|
| | MTE230 | 0.2～10 | G-001 |
| | MRT425 | 0.2～3 | G-007 |

X コーティングシリーズ　X-COATING End Mill Series

| | | | |
|---|---|---|---|
| | NTE-2X | 0.5～2.5 | G-011 |
| | NTE-4X | 3～10 | G-012 |
| | NTEM-2X | 0.5～6 | G-014 |

## 被削材 Work Material

| | 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ~55HRC | 焼き入れ鋼 Hardened Steels 55HRC~ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin | 超硬合金・硬脆材 Cemented Carbide・Hard Brittle Material | グラファイト Graphite | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Radius End Mill** | | | | | | | | | | | | | |
| PCDラジアスタイプ PCD Radius End Mill | | | | | | | | | | | ◎ | | |
| 難削材用 4枚刃不等リードタイプ MUGEN-COATING PREMIUM Power Radius End Mill | ◎ | ◎ | ◎ | | | ◎ | ◎ | | | | | | ◎ |
| 高硬度用 4枚刃45°ネジレタイプ MUGEN-COATING PREMIUM 4-Flute Radius End Mill for Hardened Steel | | | | ◎ | ◎ | | | | | | | | |
| 高硬度用 6枚刃45°ネジレタイプ MUGEN-COATING PREMIUM 6-Flute Radius End Mill for Hardened Steel | | | | ◎ | ◎ | | | | | | | | |
| 高硬度用 2枚刃30°ネジレロングネックタイプ MUGEN-COATING PREMIUM 2-Flute Long Neck Radius End Mill for Hardened Steel | | | ◎ | ◎ | ◎ | ○ | ○ | | | | | | ○ |
| 高硬度用 4枚刃30°ネジレロングネックタイプ MUGEN-COATING PREMIUM 4-Flute Long Neck Radius End Mill for Hardened Steel | | | ◎ | ◎ | ◎ | ○ | ○ | | | | | | ○ |
| 2枚刃30°ネジレタイプ MUGEN-COATING 2-Flute Radius End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 4枚刃30°ネジレタイプ MUGEN-COATING 4-Flute Radius End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30°ネジレロングネックタイプ MUGEN-COATING 2-Flute Long Neck Radius End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 4枚刃30°ネジレロングネックタイプ MUGEN-COATING 4-Flute Long Neck Radius End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30°ネジレロングテーパーネックタイプ MUGEN-COATING 2-Flute Long Taper Neck Radius End Mill | ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30°ネジレタイプ 2-Flute Radius End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| **Taper End Mill** | | | | | | | | | | | | | |
| 2枚刃30°ネジレタイプ MUGEN-COATING 2-Flute Taper End Mill | ◎ | ◎ | ◎ | ○ | | ○ | ○ | ○ | ◎ | ○ | | | |
| 深リブ用 4枚刃(底刃2枚) 25°ネジレロング刃タイプ MUGEN-COATING 4-Flute Taper End Mill for Deep Rib | ◎ | ◎ | ◎ | ○ | | ○ | ○ | ○ | ◎ | ○ | | | |
| 2枚刃30°ネジレタイプ X-COATING 2-Flute Taper End Mill | ◎ | ◎ | ◎ | | | ○ | | ○ | ○ | ○ | | | |
| 4枚刃30°ネジレタイプ X-COATING 4-Flute Taper End Mill | ◎ | ◎ | ◎ | | | ○ | | ○ | ○ | ○ | | | |
| 2枚刃40°ネジレミディアムタイプ X-COATING 2-Flute Medium Taper End Mill | ◎ | ◎ | ◎ | | | ○ | | ○ | ○ | ○ | | | |

# 仕　様
Specification

## テーパーエンドミル

超硬ソリッドエンドミルシリーズ　Solid Carbide End Mill Series

| 写　真 Photo | 型　番 Model | サイズ Size | ページ Page |
|---|---|---|---|
| | NER-2 | 2～6 | G-016 |
| | NTE-2 | 0.5～10 | G-017 |
| | NTEM-2 | 1～4 | G-019 |
| | NTEL-2 | 1～3 | G-020 |
| | NTE-4 | 3～16 | G-021 |
| | NTEL-4 | 3～6 | G-023 |
| | NRF-4 | 0.5～2 | G-028 |
| | DTE | 1～10 | G-031 |
| | DTEL | 1～8 | G-033 |

## テーパーボールエンドミル

無限コーティングシリーズ　MUGEN-COATING End Mill Series

| | | | |
|---|---|---|---|
| | MTB230 | R0.1～R2 | G-035 |

超硬ソリッドエンドミルシリーズ　Solid Carbide End Mill Series

| | | | |
|---|---|---|---|
| | NERB-2 | R1～R3 | G-037 |
| | NTB-2 | R0.5～R5 | G-037 |

## テーパーラジアスエンドミル

X コーティングシリーズ　X-COATING End Mill Series

| | | | |
|---|---|---|---|
| | NERR-2X | 2～6 | G-039 |
| | NTER-2X | 1～6 | G-041 |

## ドリル

無限コーティングプレミアムシリーズ　MUGEN-COATING PREMIUM Series

| | | | |
|---|---|---|---|
| | MSDH | 0.1～1 | H-001 |

無限マイクロコーティングシリーズ　MUGEN MICRO COATING Series

| | | | |
|---|---|---|---|
| | NSMD-M | 0.01～0.1 | H-003 |



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## 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ~55HRC | 焼き入れ鋼 Hardened Steels 55HRC~ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin | 超硬合金・硬脆材 Cemented Carbide・Hard Brittle Material | グラファイト Graphite | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

## Taper End Mill

| | 炭素鋼 | 合金鋼・工具鋼 | 調質鋼 | ~55HRC | 55HRC~ | ステンレス鋼 | チタン合金 | アルミニウム合金 | 銅 | 樹脂 | 超硬合金・硬脆材 | グラファイト | 超耐熱合金 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 台形ランナー用 2枚刃30° ネジレタイプ 2-Flute Taper End Mill for Runner | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ○ | | | |
| 2枚刃30° ネジレタイプ 2-Flute Taper End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ○ | | | |
| 2枚刃30° ネジレミディアムタイプ 2-Flute Medium Taper End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ○ | | | |
| 2枚刃40° ネジレロングタイプ 2-Flute Long Taper End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ○ | | | |
| 4枚刃30° ネジレタイプ 4-Flute Taper End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ○ | | | |
| 4枚刃40° ネジレロングタイプ 4-Flute Long Taper End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ○ | | | |
| 深リブ用 4枚刃(底刃2枚)左ネジレロング刃タイプ 4-Flute Taper End Mill for Deep Rib | ○ | ○ | ○ | | | | | | | | | | |
| 銅電極・アルミ・プラ用 2枚刃25° ネジレ ピンカドタイプ 2-Flute Taper End Mill for Nonferrous | | | | | | | | ◎ | ◎ | ◎ | | | |
| 銅電極・アルミ・プラ用 2枚刃25° ネジレ ピンカドロングタイプ 2-Flute Long Taper End Mill for Nonferrous | | | | | | | | ◎ | ◎ | ◎ | | | |

## Taper Ball End Mill

| | 炭素鋼 | 合金鋼・工具鋼 | 調質鋼 | ~55HRC | 55HRC~ | ステンレス鋼 | チタン合金 | アルミニウム合金 | 銅 | 樹脂 | 超硬合金・硬脆材 | グラファイト | 超耐熱合金 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2枚刃30° ネジレタイプ MUGEN-COATING 2-Flute Taper Ball End Mill | ◎ | ◎ | ◎ | ○ | | ○ | ○ | ○ | ◎ | ○ | | | |
| 台形ランナー用 2枚刃30° ネジレタイプ 2-Flute Taper Ball End Mill for Runner | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 2枚刃35° ネジレタイプ 2-Flute Taper Ball End Mill | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |

## Taper Radius End Mill

| | 炭素鋼 | 合金鋼・工具鋼 | 調質鋼 | ~55HRC | 55HRC~ | ステンレス鋼 | チタン合金 | アルミニウム合金 | 銅 | 樹脂 | 超硬合金・硬脆材 | グラファイト | 超耐熱合金 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 台形ランナー用 2枚刃30° ネジレタイプ X-COATING 2-Flute Taper Radius End Mill for Runner | ◎ | ◎ | ◎ | | | ○ | | ○ | ○ | ○ | | | |
| 2枚刃30° ネジレタイプ X-COATING 2-Flute Taper Radius End Mill | ◎ | ◎ | ◎ | | | ○ | | ○ | ○ | ○ | | | |

## Drill

| | 炭素鋼 | 合金鋼・工具鋼 | 調質鋼 | ~55HRC | 55HRC~ | ステンレス鋼 | チタン合金 | アルミニウム合金 | 銅 | 樹脂 | 超硬合金・硬脆材 | グラファイト | 超耐熱合金 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 高硬度用小径ドリル MUGEN-COATING PREMIUM Precision Drill for Hardened Steels | | | ○ | ◎ | ◎ | | | | | | | | |
| 無限マイクロコーティング マイクロドリル MUGEN MICRO COATING Micro Drill | ◎ | ◎ | ◎ | | | ◎ | ◎ | ○ | ○ | ○ | | | |

# 仕　様
Specification

## ドリル

無限マイクロコーティングシリーズ　MUGEN MICRO COATING Series

| 写　真 Photo | 型　番 Model | サイズ Size | ページ Page |
|---|---|---|---|
| | NSMD-MS | 0.01～0.05 | H-004 |
| | NSPD-M | 0.01～0.1 | H-005 |

マイクロドリルシリーズ　Micro Drill Series

| | | | |
|---|---|---|---|
| | NSMD | 0.01～0.1 | H-006 |
| | NSMD-S | 0.01～0.05 | H-007 |
| | NSPD | 0.01～0.1 | H-008 |

無限コーティングシリーズ　MUGEN-COATING Series

| | | | |
|---|---|---|---|
| | MFD | 1～6 | H-010 |
| | MDR-R | 0.1～1 | H-012 |
| | MDR-PD | 0.1～1 | H-015 |

## ねじ切り

無限コーティングシリーズ　MUGEN-COATING Series

| | | | |
|---|---|---|---|
| | MMTS | S0.1～S1.4 | I-001 |
| | MMTM | M1～M6 | I-003 |

無限コーティングプレミアムシリーズ　MUGEN-COATING PREMIUM Series

| | | | |
|---|---|---|---|
| | MMTU | No.0-80UNF～1/4-28UNF | I-005 |

## 面取り

C面取りカッター　Chamfer Cutter

| | | | |
|---|---|---|---|
| | NSCV-M | 4・6 | J-001 |
| | NSCV | 4・6 | J-001 |

インナーRカッター　Inner Radius Cutter

| | | | |
|---|---|---|---|
| | MIR200 | R0.1～R5 | J-003 |
| | NCR-2X | R0.5～R3 | J-005 |
| | NCR-2 | R0.5～R5 | J-007 |
| | DIR | R0.1～R5 | J-009 |



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## 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ~55HRC | 焼き入れ鋼 Hardened Steels 55HRC~ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin | 超硬合金・硬脆材 Cemented Carbide・Hard Brittle Material | グラファイト Graphite | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

## Drill

| | 炭素鋼 | 合金鋼・工具鋼 | 調質鋼 | ~55HRC | 55HRC~ | ステンレス鋼 | チタン合金 | アルミニウム合金 | 銅 | 樹脂 | 超硬合金・硬脆材 | グラファイト | 超耐熱合金 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 無限マイクロコーティング マイクロドリル ショートタイプ MUGEN MICRO COATING Micro Drill Short | ◎ | ◎ | ◎ | | | ◎ | ◎ | ○ | ○ | ○ | | | |
| 無限マイクロコーティング マイクロポイントドリル(下穴加工用) MUGEN MICRO COATING Micro Point Drill (Drill for Guide Hole) | ◎ | ◎ | ◎ | | | ◎ | ◎ | ○ | ○ | ○ | | | |
| マイクロドリル Micro Drill | | | | | | | | ◎ | ◎ | ◎ | | | |
| マイクロドリル ショートタイプ Micro Drill Short | | | | | | | | ◎ | ◎ | ◎ | | | |
| マイクロポイントドリル(下穴加工用) Micro Point Dril (Drill for Guide Hole) | | | | | | | | ◎ | ◎ | ◎ | | | |
| 無限コーティング フラットドリル MUGEN-COATING Flat Drill | ◎ | ◎ | ○ | | | ◎ | ○ | ◎ | ◎ | | | | |
| 無限コーティング ミニチュアドリル MUGEN-COATING Miniature Drill | ◎ | ◎ | ◎ | | | ◎ | ◎ | ○ | ○ | ○ | | | ○ |
| 無限コーティング ポイントドリル(下穴加工用) MUGEN-COATING Point Drill (Drill for Guide Hole) | ◎ | ◎ | ◎ | | | ◎ | ◎ | ○ | ○ | ○ | | | ○ |

## Thread milling

| | 炭素鋼 | 合金鋼・工具鋼 | 調質鋼 | ~55HRC | 55HRC~ | ステンレス鋼 | チタン合金 | アルミニウム合金 | 銅 | 樹脂 | 超硬合金・硬脆材 | グラファイト | 超耐熱合金 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ミニチュア規格 ねじ切り工具 MUGEN-COATING Micro Thread Cutting Tool | ◎ | ◎ | ◎ | | | ◎ | ◎ | ◎ | ◎ | ◎ | | | |
| メートル規格 ねじ切り工具 MUGEN-COATING M-Thread Mill | ◎ | ◎ | ◎ | | | ◎ | ◎ | ◎ | ◎ | ◎ | | | |
| ユニファイ規格 ねじ切り工具 MUGEN-COATING PREMIUM Thread Cutting Tool (Unify) | ◎ | ◎ | ◎ | | | ◎ | ◎ | ◎ | ◎ | ◎ | | | ◎ |

## Chamfering

| | 炭素鋼 | 合金鋼・工具鋼 | 調質鋼 | ~55HRC | 55HRC~ | ステンレス鋼 | チタン合金 | アルミニウム合金 | 銅 | 樹脂 | 超硬合金・硬脆材 | グラファイト | 超耐熱合金 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 無限コーティング 3枚刃タイプ MUGEN-COATING 3-Flute Chamfer Cutter | ◎ | ◎ | ◎ | | | ◎ | ○ | ○ | ○ | ○ | | | |
| 非鉄用 3枚刃タイプ 3-Flute Chamfer Cutter | | | | | | | | ◎ | ◎ | ◎ | | | |
| 無限コーティング 2枚刃タイプ MUGEN-COATING 2-Flute Inner Radius Cutter | ◎ | ◎ | ◎ | | | ◎ | ○ | ○ | ◎ | ○ | | | |
| Xコーティング 2枚刃タイプ X-COATING 2-Flute Inner Radius Cutter | ◎ | ◎ | ◎ | | | ○ | | ○ | ○ | ○ | | | |
| 非鉄用 2枚刃タイプ 2-Flute Inner Radius Cutter | ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ | | | |
| 銅電極・アルミ・プラ用 2枚刃タイプ 2-Flute Inner Radius Cutter for Nonferrous | | | | | | | | ◎ | ◎ | ◎ | | | |





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単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| **φ0.01** | | | | |
| NSME100 | φ0.01 | 0.01 | 45 | D-097 |
| **φ0.02** | | | | |
| NSME100 | φ0.02 | 0.02 | 45 | D-097 |
| **φ0.03** | | | | |
| NSME100 | φ0.03 | 0.03 | 45 | D-097 |
| SMEZ120 | φ0.03 | 0.03 | 50 | B-002 |
| NSME230 | φ0.03 | 0.045 | 45 | D-097 |
| **φ0.04** | | | | |
| NSME100 | φ0.04 | 0.04 | 45 | D-097 |
| SMEZ120 | φ0.04 | 0.04 | 50 | B-002 |
| NSME230 | φ0.04 | 0.06 | 45 | D-097 |
| **φ0.05** | | | | |
| NSME100 | φ0.05 | 0.05 | 45 | D-097 |
| SMEZ120 | φ0.05 | 0.05 | 50 | B-002 |
| NSME230 | φ0.05 | 0.075 | 45 | D-097 |
| **φ0.06** | | | | |
| SMEZ120 | φ0.06 | 0.06 | 50 | B-002 |
| NSME230 | φ0.06 | 0.09 | 45 | D-097 |
| **φ0.07** | | | | |
| SMEZ120 | φ0.07 | 0.07 | 50 | B-002 |
| NSME230 | φ0.07 | 0.105 | 45 | D-097 |
| **φ0.08** | | | | |
| SMEZ120 | φ0.08 | 0.08 | 50 | B-002 |
| NSME230 | φ0.08 | 0.12 | 45 | D-097 |
| **φ0.09** | | | | |
| SMEZ120 | φ0.09 | 0.09 | 50 | B-002 |
| NSME230 | φ0.09 | 0.135 | 45 | D-097 |
| **φ0.1** | | | | |
| MXH225 | φ0.1 | 0.1 | 45 | D-001 |
| MXH225P | φ0.1 | 0.1 | 45 | D-005 |
| MSE230SS | φ0.1 | 0.1 | 45 | D-026 |
| SMEZ120 | φ0.1 | 0.1 | 50 | B-002 |
| MSE230 | φ0.1 | 0.15 | 45 | D-027 |
| MSES230P | φ0.1 | 0.15 | 45 | D-027 |
| MSE230M | φ0.1 | 0.15 | 45 | D-029 |
| RSES230 | φ0.1 | 0.15 | 50 | D-154 |
| MXH230 | φ0.1 | 0.2 | 45 | D-002 |
| MXH230P | φ0.1 | 0.2 | 45 | D-006 |
| MX230 | φ0.1 | 0.2 | 45 | D-016 |
| MXH235 | φ0.1 | 0.3 | 45 | D-003 |
| MXH235P | φ0.1 | 0.3 | 45 | D-007 |
| MX235 | φ0.1 | 0.3 | 45 | D-018 |
| RSE230 | φ0.1 | 0.3 | 45 | D-159 |
| PCDSE | φ0.1×0.1 | 0.02 | 48 | C-001 |
| SSE400 | φ0.1×0.2 | 0.04 | 53 | B-003 |
| CED100 | φ0.1×0.2 | 0.05 | 40 | C-007 |
| MHRH230 | φ0.1×0.3 | 0.08 | 45 | D-064 |
| MHR230 | φ0.1×0.3 | 0.15 | 45 | D-074 |
| RSES230 | φ0.1×0.3 | 0.15 | 50 | D-154 |
| DHR237 | φ0.1×0.3 | 0.2 | 45 | D-164 |
| SSE400 | φ0.1×0.5 | 0.04 | 53 | B-003 |
| MHRH230 | φ0.1×0.5 | 0.08 | 45 | D-064 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHR230 | φ0.1×0.5 | 0.15 | 45 | D-074 |
| RSES230 | φ0.1×0.5 | 0.15 | 50 | D-154 |
| DHR237 | φ0.1×0.5 | 0.2 | 45 | D-164 |
| MHRH230 | φ0.1×0.75 | 0.08 | 45 | D-064 |
| MHR230 | φ0.1×0.75 | 0.15 | 45 | D-074 |
| RSES230 | φ0.1×0.8 | 0.15 | 50 | D-154 |
| RSE230 | φ0.1×0.8 | 0.3 | 45 | D-159 |
| MHRH230 | φ0.1×1 | 0.08 | 45 | D-064 |
| MHR230 | φ0.1×1 | 0.15 | 45 | D-074 |
| RSES230 | φ0.1×1 | 0.15 | 50 | D-154 |
| RSE230 | φ0.1×1 | 0.3 | 45 | D-159 |
| **φ0.15** | | | | |
| MSE230SS | φ0.15 | 0.15 | 45 | D-026 |
| MSE230 | φ0.15 | 0.2 | 45 | D-027 |
| MSES230P | φ0.15 | 0.2 | 45 | D-027 |
| RSES230 | φ0.15 | 0.23 | 50 | D-154 |
| RSE230 | φ0.15 | 0.45 | 45 | D-159 |
| MHRH230 | φ0.15×0.3 | 0.12 | 45 | D-064 |
| MHR230 | φ0.15×0.3 | 0.2 | 45 | D-074 |
| MHRH230 | φ0.15×0.5 | 0.12 | 45 | D-064 |
| MHR230 | φ0.15×0.5 | 0.2 | 45 | D-074 |
| RSES230 | φ0.15×0.5 | 0.23 | 50 | D-154 |
| MHRH230 | φ0.15×0.75 | 0.12 | 45 | D-064 |
| MHR230 | φ0.15×0.75 | 0.2 | 45 | D-074 |
| RSES230 | φ0.15×0.8 | 0.23 | 50 | D-154 |
| MHRH230 | φ0.15×1 | 0.12 | 45 | D-064 |
| MHR230 | φ0.15×1 | 0.2 | 45 | D-074 |
| RSES230 | φ0.15×1 | 0.23 | 50 | D-154 |
| RSE230 | φ0.15×1 | 0.45 | 45 | D-159 |
| MHRH230 | φ0.15×1.5 | 0.12 | 45 | D-064 |
| MHR230 | φ0.15×1.5 | 0.2 | 45 | D-074 |
| RSES230 | φ0.15×1.5 | 0.23 | 50 | D-154 |
| RSE230 | φ0.15×1.5 | 0.45 | 45 | D-159 |
| **φ0.2** | | | | |
| MXH225 | φ0.2 | 0.2 | 45 | D-001 |
| MXH225P | φ0.2 | 0.2 | 45 | D-005 |
| MSE230SS | φ0.2 | 0.2 | 45 | D-026 |
| MSES230P | φ0.2 | 0.3 | 45 | D-027 |
| RSES230 | φ0.2 | 0.3 | 50 | D-154 |
| MXH230 | φ0.2 | 0.4 | 45 | D-002 |
| MXH230P | φ0.2 | 0.4 | 45 | D-006 |
| MX230 | φ0.2 | 0.4 | 45 | D-016 |
| MSE230 | φ0.2 | 0.4 | 45 | D-027 |
| MSE230M | φ0.2 | 0.4 | 45 | D-029 |
| MXH235 | φ0.2 | 0.6 | 45 | D-003 |
| MXH235P | φ0.2 | 0.6 | 45 | D-007 |
| MX235 | φ0.2 | 0.6 | 45 | D-018 |
| RSE230 | φ0.2 | 0.6 | 45 | D-159 |
| RSE230 | φ0.2 | 1 | 45 | D-159 |
| PCDSE | φ0.2×0.2 | 0.04 | 48 | C-001 |
| SSE600 | φ0.2×0.4 | 0.08 | 53 | B-003 |
| CED100 | φ0.2×0.4 | 0.1 | 40 | C-007 |
| MHRH230 | φ0.2×0.5 | 0.15 | 45 | D-064 |



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| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHR230 | φ0.2×0.5 | 0.3 | 45 | D-074 |
| DHR237 | φ0.2×0.5 | 0.4 | 45 | D-164 |
| RSES230 | φ0.2×0.6 | 0.3 | 50 | D-154 |
| MHRH230 | φ0.2×0.75 | 0.15 | 45 | D-064 |
| MHR230 | φ0.2×0.75 | 0.3 | 45 | D-074 |
| SSE600 | φ0.2×1 | 0.08 | 53 | B-003 |
| MHRH230 | φ0.2×1 | 0.15 | 45 | D-064 |
| MHR230 | φ0.2×1 | 0.3 | 45 | D-074 |
| RSES230 | φ0.2×1 | 0.3 | 50 | D-154 |
| DHR237 | φ0.2×1 | 0.4 | 45 | D-164 |
| RSE230 | φ0.2×1 | 0.6 | 45 | D-159 |
| MHRH230 | φ0.2×1.5 | 0.15 | 45 | D-064 |
| MHR230 | φ0.2×1.5 | 0.3 | 45 | D-074 |
| RSES230 | φ0.2×1.5 | 0.3 | 50 | D-154 |
| DHR237 | φ0.2×1.5 | 0.4 | 45 | D-164 |
| RSE230 | φ0.2×1.5 | 0.6 | 45 | D-159 |
| MHRH230 | φ0.2×2 | 0.15 | 45 | D-064 |
| MHR230 | φ0.2×2 | 0.3 | 45 | D-074 |
| RSES230 | φ0.2×2 | 0.3 | 50 | D-154 |
| RSE230 | φ0.2×2 | 0.6 | 45 | D-159 |
| MHRH230 | φ0.2×2.5 | 0.15 | 45 | D-064 |
| MHR230 | φ0.2×2.5 | 0.3 | 45 | D-074 |
| RSES230 | φ0.2×2.5 | 0.3 | 50 | D-154 |
| MHRH230 | φ0.2×3 | 0.15 | 45 | D-064 |
| MHR230 | φ0.2×3 | 0.3 | 45 | D-074 |
| RSES230 | φ0.2×3 | 0.3 | 50 | D-154 |
| MHR230 | φ0.2×3.5 | 0.3 | 45 | D-074 |
| RSES230 | φ0.2×3.5 | 0.3 | 50 | D-154 |
| MHR230 | φ0.2×4 | 0.3 | 45 | D-074 |
| RSES230 | φ0.2×4 | 0.3 | 50 | D-154 |
| **φ0.25** | | | | |
| MSES230P | φ0.25 | 0.3 | 45 | D-027 |
| MSE230 | φ0.25 | 0.5 | 45 | D-027 |
| **φ0.3** | | | | |
| MXH225 | φ0.3 | 0.3 | 45 | D-001 |
| MXH225P | φ0.3 | 0.3 | 45 | D-005 |
| MX225 | φ0.3 | 0.3 | 45 | D-016 |
| MSE230SS | φ0.3 | 0.3 | 45 | D-026 |
| MSES230P | φ0.3 | 0.4 | 45 | D-027 |
| RSES230 | φ0.3 | 0.45 | 50 | D-154 |
| MXH230 | φ0.3 | 0.6 | 45 | D-002 |
| MXH230P | φ0.3 | 0.6 | 45 | D-006 |
| MX230 | φ0.3 | 0.6 | 45 | D-016 |
| MSE230 | φ0.3 | 0.6 | 45 | D-027 |
| MSE230M | φ0.3 | 0.6 | 45 | D-029 |
| MXH235 | φ0.3 | 0.9 | 45 | D-003 |
| MXH235P | φ0.3 | 0.9 | 45 | D-007 |
| MX235 | φ0.3 | 0.9 | 45 | D-018 |
| RSE230 | φ0.3 | 0.9 | 45 | D-159 |
| MXH240 | φ0.3 | 1.2 | 45 | D-004 |
| MX240 | φ0.3 | 1.2 | 45 | D-019 |
| MXH245 | φ0.3 | 1.5 | 45 | D-004 |
| MX245 | φ0.3 | 1.5 | 45 | D-020 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| RSE230 | φ0.3 | 1.5 | 45 | D-159 |
| RSE230 | φ0.3 | 2 | 45 | D-159 |
| PCDSE | φ0.3×0.3 | 0.06 | 48 | C-001 |
| SSE600 | φ0.3×0.5 | 0.12 | 49 | B-003 |
| CED100 | φ0.3×0.6 | 0.15 | 40 | C-007 |
| DCMS | φ0.3×0.6 | 0.15 | 45 | C-008 |
| MHRH230 | φ0.3×1 | 0.25 | 45 | D-064 |
| MHR230 | φ0.3×1 | 0.4 | 45 | D-074 |
| RSES230 | φ0.3×1 | 0.45 | 50 | D-154 |
| DHR237 | φ0.3×1 | 0.6 | 45 | D-164 |
| DCMS | φ0.3×1.2 | 0.15 | 45 | C-008 |
| SSE600 | φ0.3×1.5 | 0.12 | 50 | B-003 |
| MHRH230 | φ0.3×1.5 | 0.25 | 45 | D-064 |
| MHR230 | φ0.3×1.5 | 0.4 | 45 | D-074 |
| RSES230 | φ0.3×1.5 | 0.45 | 50 | D-154 |
| DHR237 | φ0.3×1.5 | 0.6 | 45 | D-164 |
| RSE230 | φ0.3×1.5 | 0.9 | 45 | D-159 |
| MHRH230 | φ0.3×2 | 0.25 | 45 | D-064 |
| MHR230 | φ0.3×2 | 0.4 | 45 | D-074 |
| RSES230 | φ0.3×2 | 0.45 | 50 | D-155 |
| DHR237 | φ0.3×2 | 0.6 | 45 | D-164 |
| RSE230 | φ0.3×2 | 0.9 | 45 | D-159 |
| MHRH230 | φ0.3×2.5 | 0.25 | 45 | D-064 |
| MHR230 | φ0.3×2.5 | 0.4 | 45 | D-074 |
| RSES230 | φ0.3×2.5 | 0.45 | 50 | D-155 |
| RSE230 | φ0.3×2.5 | 0.9 | 45 | D-159 |
| MHRH230 | φ0.3×3 | 0.25 | 45 | D-064 |
| MHR230 | φ0.3×3 | 0.4 | 45 | D-074 |
| MHRLN230-6 | φ0.3×3 | 0.4 | 60 | D-093 |
| RSES230 | φ0.3×3 | 0.45 | 50 | D-155 |
| RSE230 | φ0.3×3 | 0.9 | 45 | D-159 |
| MHR230 | φ0.3×4 | 0.4 | 45 | D-074 |
| RSES230 | φ0.3×4 | 0.45 | 50 | D-155 |
| MHR230 | φ0.3×5 | 0.4 | 45 | D-074 |
| RSES230 | φ0.3×5 | 0.45 | 50 | D-155 |
| MHR230 | φ0.3×6 | 0.4 | 45 | D-074 |
| RSES230 | φ0.3×6 | 0.45 | 50 | D-155 |
| MHR230 | φ0.3×9 | 0.4 | 45 | D-074 |
| RSES230 | φ0.3×9 | 0.45 | 50 | D-155 |
| **φ0.35** | | | | |
| MSES230P | φ0.35 | 0.4 | 45 | D-027 |
| MSE230 | φ0.35 | 0.7 | 45 | D-027 |
| **φ0.4** | | | | |
| MXH225 | φ0.4 | 0.4 | 45 | D-001 |
| MXH225P | φ0.4 | 0.4 | 45 | D-005 |
| MX225 | φ0.4 | 0.4 | 45 | D-016 |
| MSE230SS | φ0.4 | 0.4 | 45 | D-026 |
| MSES230P | φ0.4 | 0.6 | 45 | D-027 |
| RSES230 | φ0.4 | 0.6 | 60 | D-155 |
| MXH230 | φ0.4 | 0.8 | 45 | D-002 |
| MXH230P | φ0.4 | 0.8 | 45 | D-006 |
| MX230 | φ0.4 | 0.8 | 45 | D-016 |
| MSE230 | φ0.4 | 0.8 | 45 | D-027 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSE230M | φ0.4 | 0.8 | 45 | D-029 |
| MXH235 | φ0.4 | 1.2 | 45 | D-003 |
| MXH235P | φ0.4 | 1.2 | 45 | D-007 |
| MX235 | φ0.4 | 1.2 | 45 | D-018 |
| RSE230 | φ0.4 | 1.2 | 45 | D-159 |
| MXH240 | φ0.4 | 1.6 | 45 | D-004 |
| MX240 | φ0.4 | 1.6 | 45 | D-019 |
| MXH245 | φ0.4 | 2 | 45 | D-004 |
| MX245 | φ0.4 | 2 | 45 | D-020 |
| RSE230 | φ0.4 | 2 | 45 | D-159 |
| RSE230 | φ0.4 | 3 | 45 | D-159 |
| PCDSE | φ0.4×0.4 | 0.08 | 48 | C-001 |
| SSE600 | φ0.4×0.8 | 0.16 | 49 | B-003 |
| CED100 | φ0.4×0.8 | 0.2 | 40 | C-007 |
| DCMS | φ0.4×0.8 | 0.2 | 45 | C-008 |
| MHRH230 | φ0.4×1 | 0.3 | 45 | D-064 |
| MHR230 | φ0.4×1 | 0.6 | 45 | D-074 |
| DHR237 | φ0.4×1 | 0.8 | 45 | D-164 |
| MHRH230 | φ0.4×1.5 | 0.3 | 45 | D-064 |
| MHR230 | φ0.4×1.5 | 0.6 | 45 | D-074 |
| RSES230 | φ0.4×1.5 | 0.6 | 60 | D-155 |
| DCMS | φ0.4×1.6 | 0.2 | 45 | C-008 |
| SSE600 | φ0.4×2 | 0.16 | 50 | B-003 |
| MHRH230 | φ0.4×2 | 0.3 | 45 | D-064 |
| MHR230 | φ0.4×2 | 0.6 | 45 | D-074 |
| RSES230 | φ0.4×2 | 0.6 | 60 | D-155 |
| DHR237 | φ0.4×2 | 0.8 | 45 | D-164 |
| RSE230 | φ0.4×2 | 1.2 | 45 | D-159 |
| MHRH230 | φ0.4×2.5 | 0.3 | 45 | D-064 |
| MHR230 | φ0.4×2.5 | 0.6 | 45 | D-074 |
| RSES230 | φ0.4×2.5 | 0.6 | 60 | D-155 |
| RSE230 | φ0.4×2.5 | 1.2 | 45 | D-160 |
| MHRH230 | φ0.4×3 | 0.3 | 45 | D-064 |
| MHR230 | φ0.4×3 | 0.6 | 45 | D-074 |
| RSES230 | φ0.4×3 | 0.6 | 60 | D-155 |
| MHRLN230-6 | φ0.4×3 | 0.6 | 60 | D-093 |
| DHR237 | φ0.4×3 | 0.8 | 45 | D-164 |
| RSE230 | φ0.4×3 | 1.2 | 45 | D-160 |
| MHRH230 | φ0.4×3.5 | 0.3 | 45 | D-064 |
| MHR230 | φ0.4×3.5 | 0.6 | 45 | D-075 |
| RSES230 | φ0.4×3.5 | 0.6 | 60 | D-155 |
| MHRH230 | φ0.4×4 | 0.3 | 45 | D-064 |
| MHR230 | φ0.4×4 | 0.6 | 45 | D-075 |
| RSES230 | φ0.4×4 | 0.6 | 60 | D-155 |
| MHRLN230-6 | φ0.4×4 | 0.6 | 60 | D-093 |
| DHR237 | φ0.4×4 | 0.8 | 45 | D-164 |
| RSE230 | φ0.4×4 | 1.2 | 45 | D-160 |
| MHRH230 | φ0.4×5 | 0.3 | 45 | D-064 |
| MHR230 | φ0.4×5 | 0.6 | 45 | D-075 |
| MHRLN230-6 | φ0.4×5 | 0.6 | 60 | D-093 |
| RSE230 | φ0.4×5 | 1.2 | 45 | D-160 |
| MHRH230 | φ0.4×6 | 0.3 | 45 | D-064 |
| MHR230 | φ0.4×6 | 0.6 | 45 | D-075 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| RSES230 | φ0.4×6 | 0.6 | 60 | D-155 |
| MHR230 | φ0.4×7 | 0.6 | 45 | D-075 |
| MHRH230 | φ0.4×8 | 0.3 | 45 | D-064 |
| MHR230 | φ0.4×8 | 0.6 | 45 | D-075 |
| RSES230 | φ0.4×8 | 0.6 | 60 | D-155 |
| MHR230 | φ0.4×9 | 0.6 | 45 | D-075 |
| MHRH230 | φ0.4×10 | 0.3 | 45 | D-064 |
| MHR230 | φ0.4×10 | 0.6 | 45 | D-075 |
| RSES230 | φ0.4×10 | 0.6 | 60 | D-155 |
| MHR230 | φ0.4×12 | 0.6 | 45 | D-075 |
| RSES230 | φ0.4×12 | 0.6 | 60 | D-155 |
| **φ0.45** | | | | |
| MSES230P | φ0.45 | 0.6 | 45 | D-027 |
| MSE230 | φ0.45 | 0.9 | 45 | D-027 |
| **φ0.5** | | | | |
| NX-25 | φ0.5 | 0.5 | 40 | D-098 |
| MXH225 | φ0.5 | 0.5 | 45 | D-001 |
| MXH225P | φ0.5 | 0.5 | 45 | D-005 |
| MX225 | φ0.5 | 0.5 | 45 | D-016 |
| MSE230SS | φ0.5 | 0.5 | 45 | D-026 |
| MSES230P | φ0.5 | 0.7 | 45 | D-027 |
| RSES230 | φ0.5 | 0.75 | 60 | D-155 |
| NC-2 | φ0.5 | 1 | 35 | D-113 |
| NX-30 | φ0.5 | 1 | 40 | D-100 |
| MXH230 | φ0.5 | 1 | 45 | D-002 |
| MXH230P | φ0.5 | 1 | 45 | D-006 |
| MX230 | φ0.5 | 1 | 45 | D-016 |
| AL2D-2 | φ0.5 | 1 | 45 | D-135 |
| AL2D-2DLC | φ0.5 | 1 | 45 | D-138 |
| DX | φ0.5 | 1 | 45 | D-167 |
| MSE230 | φ0.5 | 1.25 | 45 | D-027 |
| MSE230M | φ0.5 | 1.25 | 45 | D-029 |
| NCM-2 | φ0.5 | 1.5 | 35 | D-114 |
| NX-35 | φ0.5 | 1.5 | 40 | D-102 |
| DCSE235 | φ0.5 | 1.5 | 45 | C-010 |
| MXH235 | φ0.5 | 1.5 | 45 | D-003 |
| MXH235P | φ0.5 | 1.5 | 45 | D-007 |
| MX235 | φ0.5 | 1.5 | 45 | D-018 |
| RSE230 | φ0.5 | 1.5 | 45 | D-160 |
| NX-40 | φ0.5 | 2 | 40 | D-104 |
| MXH240 | φ0.5 | 2 | 45 | D-004 |
| MX240 | φ0.5 | 2 | 45 | D-019 |
| MSEM230 | φ0.5 | 2 | 50 | D-029 |
| NX-45 | φ0.5 | 2.5 | 40 | D-106 |
| MXH245 | φ0.5 | 2.5 | 45 | D-004 |
| MX245 | φ0.5 | 2.5 | 45 | D-020 |
| RSE230 | φ0.5 | 2.5 | 45 | D-160 |
| RSE230 | φ0.5 | 5 | 45 | D-160 |
| PCDSE | φ0.5×0.5 | 0.1 | 48 | C-001 |
| SSE600 | φ0.5×1 | 0.2 | 49 | B-003 |
| CED100 | φ0.5×1 | 0.25 | 40 | C-007 |
| DCMS | φ0.5×1 | 0.25 | 45 | C-008 |
| MHRH230 | φ0.5×1 | 0.4 | 45 | D-064 |



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| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHR230 | φ0.5×1 | 0.7 | 45 | D-075 |
| MHRH230 | φ0.5×1.5 | 0.4 | 45 | D-064 |
| MHR230 | φ0.5×1.5 | 0.7 | 45 | D-075 |
| DHR237 | φ0.5×1.5 | 1 | 45 | D-164 |
| DCMS | φ0.5×2 | 0.25 | 45 | C-008 |
| MHRH230 | φ0.5×2 | 0.4 | 45 | D-064 |
| NHR-2X | φ0.5×2 | 0.7 | 35 | D-094 |
| NHR-2 | φ0.5×2 | 0.7 | 35 | D-131 |
| MHR230 | φ0.5×2 | 0.7 | 45 | D-075 |
| RSES230 | φ0.5×2 | 0.75 | 60 | D-155 |
| DCHR230 | φ0.5×2 | 1 | 45 | C-012 |
| DHR237 | φ0.5×2 | 1 | 45 | D-164 |
| SSE600 | φ0.5×2.5 | 0.2 | 50 | B-003 |
| MHRH230 | φ0.5×2.5 | 0.4 | 45 | D-064 |
| MHR230 | φ0.5×2.5 | 0.7 | 45 | D-075 |
| MHRH230 | φ0.5×3 | 0.4 | 45 | D-065 |
| MHR230 | φ0.5×3 | 0.7 | 45 | D-075 |
| RSES230 | φ0.5×3 | 0.75 | 60 | D-155 |
| DHR237 | φ0.5×3 | 1 | 45 | D-164 |
| RSE230 | φ0.5×3 | 1.5 | 45 | D-160 |
| MHRH230 | φ0.5×3.5 | 0.4 | 45 | D-065 |
| MHR230 | φ0.5×3.5 | 0.7 | 45 | D-075 |
| MHRH230 | φ0.5×4 | 0.4 | 45 | D-065 |
| NHR-2X | φ0.5×4 | 0.7 | 35 | D-094 |
| NHR-2 | φ0.5×4 | 0.7 | 35 | D-131 |
| MHR230 | φ0.5×4 | 0.7 | 45 | D-075 |
| MHRLN230-6 | φ0.5×4 | 0.7 | 60 | D-093 |
| RSES230 | φ0.5×4 | 0.75 | 60 | D-155 |
| DCHR230 | φ0.5×4 | 1 | 45 | C-012 |
| DHR237 | φ0.5×4 | 1 | 45 | D-164 |
| RSE230 | φ0.5×4 | 1.5 | 45 | D-160 |
| MHRH230 | φ0.5×4.5 | 0.4 | 45 | D-065 |
| MHR230 | φ0.5×4.5 | 0.7 | 45 | D-075 |
| MHRH230 | φ0.5×5 | 0.4 | 45 | D-065 |
| MHR230 | φ0.5×5 | 0.7 | 45 | D-075 |
| MHRLN230-6 | φ0.5×5 | 0.7 | 60 | D-093 |
| MHRH230 | φ0.5×6 | 0.4 | 45 | D-065 |
| NHR-2X | φ0.5×6 | 0.7 | 35 | D-094 |
| NHR-2 | φ0.5×6 | 0.7 | 35 | D-131 |
| MHR230 | φ0.5×6 | 0.7 | 45 | D-075 |
| MHRLN230-6 | φ0.5×6 | 0.7 | 60 | D-093 |
| RSES230 | φ0.5×6 | 0.75 | 60 | D-155 |
| DCHR230 | φ0.5×6 | 1 | 45 | C-012 |
| DHR237 | φ0.5×6 | 1 | 45 | D-164 |
| RSE230 | φ0.5×6 | 1.5 | 45 | D-160 |
| MHRH230 | φ0.5×7 | 0.4 | 45 | D-065 |
| MHR230 | φ0.5×7 | 0.7 | 45 | D-075 |
| MHRH230 | φ0.5×8 | 0.4 | 50 | D-065 |
| MHR230 | φ0.5×8 | 0.7 | 50 | D-075 |
| RSES230 | φ0.5×8 | 0.75 | 60 | D-155 |
| RSE230 | φ0.5×8 | 1.5 | 50 | D-160 |
| MHRH230 | φ0.5×9 | 0.4 | 50 | D-065 |
| MHR230 | φ0.5×9 | 0.7 | 50 | D-075 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHRH230 | φ0.5×10 | 0.4 | 50 | D-065 |
| MHR230 | φ0.5×10 | 0.7 | 50 | D-075 |
| RSES230 | φ0.5×10 | 0.75 | 60 | D-155 |
| RSE230 | φ0.5×10 | 1.5 | 50 | D-160 |
| MHR230 | φ0.5×12 | 0.7 | 50 | D-075 |
| RSES230 | φ0.5×12 | 0.75 | 60 | D-155 |
| RSE230 | φ0.5×12 | 1.5 | 50 | D-160 |
| MHR230 | φ0.5×15 | 0.7 | 50 | D-075 |
| RSES230 | φ0.5×15 | 0.75 | 60 | D-155 |
| RSE230 | φ0.5×15 | 1.5 | 50 | D-160 |
| RSES230 | φ0.5×18 | 0.75 | 60 | D-155 |
| RSES230 | φ0.5×20 | 0.75 | 60 | D-155 |
| RSE230 | φ0.5×20 | 1.5 | 50 | D-160 |
| **φ0.55** | | | | |
| MSE230 | φ0.55 | 1.3 | 45 | D-027 |
| **φ0.6** | | | | |
| NX-25 | φ0.6 | 0.6 | 40 | D-098 |
| MXH225 | φ0.6 | 0.6 | 45 | D-001 |
| MXH225P | φ0.6 | 0.6 | 45 | D-005 |
| MSE230SS | φ0.6 | 0.6 | 45 | D-026 |
| RSES230 | φ0.6 | 0.9 | 60 | D-155 |
| MSES230P | φ0.6 | 1 | 45 | D-027 |
| NC-2 | φ0.6 | 1.2 | 35 | D-113 |
| NX-30 | φ0.6 | 1.2 | 40 | D-100 |
| MXH230 | φ0.6 | 1.2 | 45 | D-002 |
| MXH230P | φ0.6 | 1.2 | 45 | D-006 |
| MX230 | φ0.6 | 1.2 | 45 | D-016 |
| AL2D-2 | φ0.6 | 1.2 | 45 | D-135 |
| AL2D-2DLC | φ0.6 | 1.2 | 45 | D-138 |
| MSE230 | φ0.6 | 1.5 | 45 | D-027 |
| NCM-2 | φ0.6 | 1.8 | 35 | D-114 |
| NX-35 | φ0.6 | 1.8 | 40 | D-102 |
| MXH235 | φ0.6 | 1.8 | 45 | D-003 |
| MXH235P | φ0.6 | 1.8 | 45 | D-007 |
| MX235 | φ0.6 | 1.8 | 45 | D-018 |
| RSE230 | φ0.6 | 1.8 | 45 | D-160 |
| NX-40 | φ0.6 | 2.4 | 40 | D-104 |
| MX240 | φ0.6 | 2.4 | 45 | D-019 |
| MSEM230 | φ0.6 | 2.4 | 50 | D-029 |
| NX-45 | φ0.6 | 3 | 40 | D-106 |
| RSE230 | φ0.6 | 3 | 45 | D-160 |
| RSE230 | φ0.6 | 4 | 45 | D-160 |
| PCDSE | φ0.6×0.6 | 0.12 | 48 | C-001 |
| SSE600 | φ0.6×1.2 | 0.24 | 49 | B-003 |
| MHRH230 | φ0.6×1.5 | 0.5 | 45 | D-065 |
| MHR230 | φ0.6×1.5 | 0.9 | 45 | D-075 |
| MHRH230 | φ0.6×2 | 0.5 | 45 | D-065 |
| NHR-2X | φ0.6×2 | 0.9 | 35 | D-094 |
| NHR-2 | φ0.6×2 | 0.9 | 35 | D-131 |
| MHR230 | φ0.6×2 | 0.9 | 45 | D-075 |
| DHR237 | φ0.6×2 | 1.2 | 45 | D-164 |
| SSE600 | φ0.6×3 | 0.24 | 50 | B-003 |
| MHRH230 | φ0.6×3 | 0.5 | 45 | D-065 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHR230 | φ0.6×3 | 0.9 | 45 | D-075 |
| RSES230 | φ0.6×3 | 0.9 | 60 | D-155 |
| DHR237 | φ0.6×3 | 1.2 | 45 | D-164 |
| MHRH230 | φ0.6×4 | 0.5 | 45 | D-065 |
| NHR-2X | φ0.6×4 | 0.9 | 35 | D-094 |
| NHR-2 | φ0.6×4 | 0.9 | 35 | D-131 |
| MHR230 | φ0.6×4 | 0.9 | 45 | D-075 |
| RSES230 | φ0.6×4 | 0.9 | 60 | D-155 |
| MHRLN230-6 | φ0.6×4 | 0.9 | 60 | D-093 |
| DHR237 | φ0.6×4 | 1.2 | 45 | D-164 |
| RSE230 | φ0.6×4 | 1.8 | 45 | D-160 |
| MHRH230 | φ0.6×5 | 0.5 | 45 | D-065 |
| MHR230 | φ0.6×5 | 0.9 | 45 | D-075 |
| MHRH230 | φ0.6×6 | 0.5 | 45 | D-065 |
| NHR-2X | φ0.6×6 | 0.9 | 35 | D-094 |
| NHR-2 | φ0.6×6 | 0.9 | 35 | D-131 |
| MHR230 | φ0.6×6 | 0.9 | 45 | D-075 |
| RSES230 | φ0.6×6 | 0.9 | 60 | D-155 |
| MHRLN230-6 | φ0.6×6 | 0.9 | 60 | D-093 |
| DHR237 | φ0.6×6 | 1.2 | 45 | D-164 |
| RSE230 | φ0.6×6 | 1.8 | 45 | D-160 |
| MHR230 | φ0.6×7 | 0.9 | 45 | D-075 |
| MHR230 | φ0.6×8 | 0.9 | 50 | D-076 |
| RSES230 | φ0.6×8 | 0.9 | 60 | D-155 |
| RSE230 | φ0.6×8 | 1.8 | 50 | D-160 |
| MHR230 | φ0.6×9 | 0.9 | 50 | D-076 |
| MHR230 | φ0.6×10 | 0.9 | 50 | D-076 |
| RSES230 | φ0.6×10 | 0.9 | 60 | D-156 |
| RSE230 | φ0.6×10 | 1.8 | 50 | D-160 |
| MHR230 | φ0.6×12 | 0.9 | 50 | D-076 |
| RSES230 | φ0.6×12 | 0.9 | 60 | D-156 |
| RSE230 | φ0.6×12 | 1.8 | 50 | D-160 |
| MHR230 | φ0.6×15 | 0.9 | 50 | D-076 |
| RSES230 | φ0.6×15 | 0.9 | 60 | D-156 |
| MHR230 | φ0.6×18 | 0.9 | 50 | D-076 |
| RSES230 | φ0.6×18 | 0.9 | 60 | D-156 |
| **φ0.65** | | | | |
| MSE230 | φ0.65 | 1.5 | 45 | D-027 |
| **φ0.7** | | | | |
| NX-25 | φ0.7 | 0.7 | 40 | D-098 |
| MXH225 | φ0.7 | 0.7 | 45 | D-001 |
| MXH225P | φ0.7 | 0.7 | 45 | D-005 |
| MSE230SS | φ0.7 | 0.7 | 45 | D-026 |
| RSES230 | φ0.7 | 1.05 | 60 | D-156 |
| MSES230P | φ0.7 | 1.2 | 45 | D-027 |
| NC-2 | φ0.7 | 1.4 | 35 | D-113 |
| NX-30 | φ0.7 | 1.4 | 40 | D-100 |
| MXH230 | φ0.7 | 1.4 | 45 | D-002 |
| MXH230P | φ0.7 | 1.4 | 45 | D-006 |
| MX230 | φ0.7 | 1.4 | 45 | D-016 |
| AL2D-2 | φ0.7 | 1.4 | 45 | D-135 |
| AL2D-2DLC | φ0.7 | 1.4 | 45 | D-138 |
| MSE230 | φ0.7 | 1.8 | 45 | D-027 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NCM-2 | φ0.7 | 2.1 | 35 | D-114 |
| NX-35 | φ0.7 | 2.1 | 40 | D-102 |
| MXH235 | φ0.7 | 2.1 | 45 | D-003 |
| MXH235P | φ0.7 | 2.1 | 45 | D-007 |
| MX235 | φ0.7 | 2.1 | 45 | D-018 |
| NX-40 | φ0.7 | 2.8 | 40 | D-104 |
| MX240 | φ0.7 | 2.8 | 45 | D-019 |
| NX-45 | φ0.7 | 3.5 | 40 | D-106 |
| MHRH230 | φ0.7×2 | 0.55 | 45 | D-065 |
| MHR230 | φ0.7×2 | 1 | 45 | D-076 |
| NHR-2X | φ0.7×2 | 1 | 45 | D-094 |
| NHR-2 | φ0.7×2 | 1 | 45 | D-131 |
| MHRH230 | φ0.7×4 | 0.55 | 45 | D-065 |
| MHR230 | φ0.7×4 | 1 | 45 | D-076 |
| NHR-2X | φ0.7×4 | 1 | 45 | D-094 |
| NHR-2 | φ0.7×4 | 1 | 45 | D-131 |
| RSES230 | φ0.7×4 | 1.05 | 60 | D-156 |
| MHRH230 | φ0.7×6 | 0.55 | 45 | D-065 |
| MHR230 | φ0.7×6 | 1 | 45 | D-076 |
| NHR-2X | φ0.7×6 | 1 | 45 | D-094 |
| NHR-2 | φ0.7×6 | 1 | 45 | D-131 |
| RSES230 | φ0.7×6 | 1.05 | 60 | D-156 |
| MHRH230 | φ0.7×8 | 0.55 | 50 | D-065 |
| MHR230 | φ0.7×8 | 1 | 50 | D-076 |
| RSES230 | φ0.7×8 | 1.05 | 60 | D-156 |
| MHRH230 | φ0.7×10 | 0.55 | 50 | D-065 |
| MHR230 | φ0.7×10 | 1 | 50 | D-076 |
| RSES230 | φ0.7×10 | 1.05 | 60 | D-156 |
| RSES230 | φ0.7×12 | 1.05 | 60 | D-156 |
| RSES230 | φ0.7×14 | 1.05 | 60 | D-156 |
| **φ0.75** | | | | |
| MSE230 | φ0.75 | 1.8 | 45 | D-027 |
| **φ0.8** | | | | |
| NX-25 | φ0.8 | 0.8 | 40 | D-098 |
| MXH225 | φ0.8 | 0.8 | 45 | D-001 |
| MXH225P | φ0.8 | 0.8 | 45 | D-005 |
| MX225 | φ0.8 | 0.8 | 45 | D-016 |
| MSE230SS | φ0.8 | 0.8 | 45 | D-026 |
| RSES230 | φ0.8 | 1.2 | 60 | D-156 |
| MSES230P | φ0.8 | 1.5 | 45 | D-027 |
| NC-2 | φ0.8 | 1.6 | 35 | D-113 |
| NX-30 | φ0.8 | 1.6 | 40 | D-100 |
| MXH230 | φ0.8 | 1.6 | 45 | D-002 |
| MXH230P | φ0.8 | 1.6 | 45 | D-006 |
| MX230 | φ0.8 | 1.6 | 45 | D-016 |
| AL2D-2 | φ0.8 | 1.6 | 45 | D-135 |
| AL2D-2DLC | φ0.8 | 1.6 | 45 | D-138 |
| DX | φ0.8 | 1.6 | 45 | D-167 |
| MSE230 | φ0.8 | 2 | 45 | D-027 |
| MSE230M | φ0.8 | 2 | 45 | D-029 |
| NCM-2 | φ0.8 | 2.4 | 35 | D-114 |
| NX-35 | φ0.8 | 2.4 | 40 | D-102 |
| MXH235 | φ0.8 | 2.4 | 45 | D-003 |


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| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MXH235P | φ0.8 | 2.4 | 45 | D-007 |
| MX235 | φ0.8 | 2.4 | 45 | D-018 |
| RSE230 | φ0.8 | 2.4 | 45 | D-160 |
| NX-40 | φ0.8 | 3.2 | 40 | D-104 |
| MXH240 | φ0.8 | 3.2 | 45 | D-004 |
| MX240 | φ0.8 | 3.2 | 45 | D-019 |
| MSEM230 | φ0.8 | 3.2 | 50 | D-029 |
| NX-45 | φ0.8 | 4 | 40 | D-106 |
| MXH245 | φ0.8 | 4 | 45 | D-004 |
| MX245 | φ0.8 | 4 | 45 | D-020 |
| RSE230 | φ0.8 | 4 | 45 | D-160 |
| RSE230 | φ0.8 | 6 | 45 | D-160 |
| PCDSE | φ0.8×0.8 | 0.16 | 48 | C-001 |
| SSE600 | φ0.8×1.5 | 0.32 | 49 | B-003 |
| DCMS | φ0.8×1.6 | 0.4 | 45 | C-008 |
| MHRH230 | φ0.8×3 | 0.65 | 45 | D-065 |
| MHR230 | φ0.8×3 | 1.2 | 45 | D-076 |
| DHR237 | φ0.8×3 | 1.6 | 45 | D-164 |
| DCMS | φ0.8×3.2 | 0.4 | 45 | C-008 |
| SSE600 | φ0.8×4 | 0.32 | 52 | B-003 |
| MHRH230 | φ0.8×4 | 0.65 | 45 | D-065 |
| MHR230 | φ0.8×4 | 1.2 | 45 | D-076 |
| NHR-2X | φ0.8×4 | 1.2 | 45 | D-094 |
| NHR-2 | φ0.8×4 | 1.2 | 45 | D-131 |
| RSES230 | φ0.8×4 | 1.2 | 60 | D-156 |
| DHR237 | φ0.8×4 | 1.6 | 45 | D-164 |
| MHRH230 | φ0.8×5 | 0.65 | 45 | D-065 |
| MHR230 | φ0.8×5 | 1.2 | 45 | D-076 |
| MHRH230 | φ0.8×6 | 0.65 | 45 | D-065 |
| MHR230 | φ0.8×6 | 1.2 | 45 | D-076 |
| NHR-2X | φ0.8×6 | 1.2 | 45 | D-094 |
| NHR-2 | φ0.8×6 | 1.2 | 45 | D-131 |
| RSES230 | φ0.8×6 | 1.2 | 60 | D-156 |
| DHR237 | φ0.8×6 | 1.6 | 45 | D-164 |
| RSE230 | φ0.8×6 | 2.4 | 45 | D-160 |
| MHRH230 | φ0.8×8 | 0.65 | 50 | D-065 |
| NHR-2X | φ0.8×8 | 1.2 | 45 | D-094 |
| NHR-2 | φ0.8×8 | 1.2 | 45 | D-131 |
| MHR230 | φ0.8×8 | 1.2 | 50 | D-076 |
| RSES230 | φ0.8×8 | 1.2 | 60 | D-156 |
| MHRLN230-6 | φ0.8×8 | 1.2 | 60 | D-093 |
| DHR237 | φ0.8×8 | 1.6 | 50 | D-164 |
| RSE230 | φ0.8×8 | 2.4 | 50 | D-160 |
| MHRH230 | φ0.8×10 | 0.65 | 50 | D-065 |
| MHR230 | φ0.8×10 | 1.2 | 50 | D-076 |
| RSES230 | φ0.8×10 | 1.2 | 60 | D-156 |
| RSE230 | φ0.8×10 | 2.4 | 50 | D-160 |
| MHRH230 | φ0.8×12 | 0.65 | 50 | D-065 |
| MHR230 | φ0.8×12 | 1.2 | 50 | D-076 |
| RSES230 | φ0.8×12 | 1.2 | 60 | D-156 |
| RSE230 | φ0.8×12 | 2.4 | 50 | D-160 |
| MHR230 | φ0.8×14 | 1.2 | 50 | D-076 |
| RSES230 | φ0.8×14 | 1.2 | 60 | D-156 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHR230 | φ0.8×16 | 1.2 | 50 | D-076 |
| RSES230 | φ0.8×16 | 1.2 | 60 | D-156 |
| RSE230 | φ0.8×16 | 2.4 | 60 | D-160 |
| RSES230 | φ0.8×18 | 1.2 | 60 | D-156 |
| MHR230 | φ0.8×20 | 1.2 | 60 | D-076 |
| RSES230 | φ0.8×20 | 1.2 | 60 | D-156 |
| MHR230 | φ0.8×24 | 1.2 | 60 | D-076 |
| RSES230 | φ0.8×24 | 1.2 | 60 | D-156 |
| **φ0.85** | | | | |
| MSE230 | φ0.85 | 2 | 45 | D-027 |
| **φ0.9** | | | | |
| NX-25 | φ0.9 | 0.9 | 40 | D-098 |
| MXH225 | φ0.9 | 0.9 | 45 | D-001 |
| MXH225P | φ0.9 | 0.9 | 45 | D-005 |
| MSE230SS | φ0.9 | 0.9 | 45 | D-026 |
| RSES230 | φ0.9 | 1.35 | 60 | D-156 |
| NC-2 | φ0.9 | 1.8 | 35 | D-113 |
| NX-30 | φ0.9 | 1.8 | 40 | D-100 |
| MXH230 | φ0.9 | 1.8 | 45 | D-002 |
| MXH230P | φ0.9 | 1.8 | 45 | D-006 |
| MX230 | φ0.9 | 1.8 | 45 | D-016 |
| AL2D-2 | φ0.9 | 1.8 | 45 | D-135 |
| AL2D-2DLC | φ0.9 | 1.8 | 45 | D-138 |
| MSE230 | φ0.9 | 2 | 45 | D-027 |
| NCM-2 | φ0.9 | 2.7 | 35 | D-114 |
| NX-35 | φ0.9 | 2.7 | 40 | D-102 |
| MXH235 | φ0.9 | 2.7 | 45 | D-003 |
| MXH235P | φ0.9 | 2.7 | 45 | D-007 |
| MX235 | φ0.9 | 2.7 | 45 | D-018 |
| NX-40 | φ0.9 | 3.6 | 40 | D-104 |
| MX240 | φ0.9 | 3.6 | 45 | D-019 |
| NX-45 | φ0.9 | 4.5 | 40 | D-106 |
| MHR230 | φ0.9×4 | 1.4 | 45 | D-076 |
| NHR-2X | φ0.9×6 | 1.35 | 45 | D-094 |
| NHR-2 | φ0.9×6 | 1.35 | 45 | D-131 |
| RSES230 | φ0.9×6 | 1.35 | 60 | D-156 |
| MHR230 | φ0.9×6 | 1.4 | 45 | D-076 |
| NHR-2X | φ0.9×8 | 1.35 | 45 | D-094 |
| NHR-2 | φ0.9×8 | 1.35 | 45 | D-131 |
| RSES230 | φ0.9×8 | 1.35 | 60 | D-156 |
| MHR230 | φ0.9×8 | 1.4 | 50 | D-076 |
| NHR-2X | φ0.9×10 | 1.35 | 45 | D-094 |
| NHR-2 | φ0.9×10 | 1.35 | 45 | D-131 |
| RSES230 | φ0.9×10 | 1.35 | 60 | D-156 |
| MHR230 | φ0.9×10 | 1.4 | 50 | D-076 |
| RSES230 | φ0.9×12 | 1.35 | 60 | D-156 |
| MHR230 | φ0.9×12 | 1.4 | 50 | D-076 |
| MHR230 | φ0.9×15 | 1.4 | 60 | D-076 |
| RSES230 | φ0.9×16 | 1.35 | 60 | D-156 |
| RSES230 | φ0.9×18 | 1.35 | 60 | D-156 |
| **φ0.95** | | | | |
| MSE230 | φ0.95 | 2 | 45 | D-027 |
| **φ1** | | | | |
| NX-25 | φ1 | 1 | 40 | D-098 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MXH225 | φ1 | 1 | 45 | D-001 |
| MXH225P | φ1 | 1 | 45 | D-005 |
| MX225 | φ1 | 1 | 45 | D-016 |
| MSE230SS | φ1 | 1 | 45 | D-026 |
| MX425 | φ1 | 1 | 45 | D-032 |
| MSZ345 | φ1 | 1.5 | 45 | D-052 |
| MHD445 | φ1 | 1.5 | 60 | D-059 |
| RSES230 | φ1 | 1.5 | 70 | D-156 |
| NX-30X | φ1 | 2 | 40 | D-062 |
| NX-30 | φ1 | 2 | 40 | D-100 |
| MXH230 | φ1 | 2 | 45 | D-002 |
| MXH230P | φ1 | 2 | 45 | D-006 |
| MX230 | φ1 | 2 | 45 | D-016 |
| MSES230P | φ1 | 2 | 45 | D-027 |
| MX430 | φ1 | 2 | 45 | D-032 |
| NC-2 | φ1 | 2 | 45 | D-113 |
| NC-4 | φ1 | 2 | 45 | D-119 |
| NSL-2 | φ1 | 2 | 45 | D-130 |
| AL2D-2 | φ1 | 2 | 45 | D-135 |
| AL2D-2DLC | φ1 | 2 | 45 | D-138 |
| DX | φ1 | 2 | 45 | D-167 |
| MHDH445 | φ1 | 2 | 60 | D-057 |
| NC-LS-2 | φ1 | 2 | 100 | D-115 |
| MSE230 | φ1 | 2.5 | 45 | D-027 |
| MSE230M | φ1 | 2.5 | 45 | D-029 |
| MSE430 | φ1 | 2.5 | 45 | D-040 |
| MSE430P | φ1 | 2.5 | 45 | D-040 |
| NE-2 | φ1 | 2.5 | 45 | D-125 |
| DCSE235 | φ1 | 3 | 45 | C-010 |
| MXH235 | φ1 | 3 | 45 | D-003 |
| MXH235P | φ1 | 3 | 45 | D-007 |
| MX235 | φ1 | 3 | 45 | D-018 |
| MX435 | φ1 | 3 | 45 | D-033 |
| NX-35 | φ1 | 3 | 45 | D-102 |
| NCM-2 | φ1 | 3 | 45 | D-114 |
| NCM-4 | φ1 | 3 | 45 | D-121 |
| AL3D-2 | φ1 | 3 | 45 | D-136 |
| AL3D-2DLC | φ1 | 3 | 45 | D-138 |
| RSE230 | φ1 | 3 | 45 | D-160 |
| AL3D-345 | φ1 | 3 | 60 | D-137 |
| MXH240 | φ1 | 4 | 45 | D-004 |
| MX240 | φ1 | 4 | 45 | D-019 |
| MX440 | φ1 | 4 | 45 | D-033 |
| NX-40 | φ1 | 4 | 45 | D-104 |
| NCL-2 | φ1 | 4 | 45 | D-115 |
| MSEM230 | φ1 | 4 | 50 | D-029 |
| MSEM430 | φ1 | 4 | 50 | D-041 |
| AL4D-2 | φ1 | 4 | 50 | D-136 |
| AL4D-2DLC | φ1 | 4 | 50 | D-139 |
| MXH245 | φ1 | 5 | 45 | D-004 |
| MX245 | φ1 | 5 | 45 | D-020 |
| MX445 | φ1 | 5 | 45 | D-034 |
| NX-45 | φ1 | 5 | 45 | D-106 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| AL5D-2 | φ1 | 5 | 50 | D-137 |
| AL5D-2DLC | φ1 | 5 | 50 | D-139 |
| RSE230 | φ1 | 5 | 50 | D-160 |
| RSE230 | φ1 | 7.5 | 50 | D-160 |
| RSE230 | φ1 | 10 | 50 | D-161 |
| PCDSE | φ1×1 | 0.2 | 48 | C-001 |
| DSF | φ1×1 | 0.5 | 60 | D-168 |
| SSE600 | φ1×2 | 0.4 | 49 | B-003 |
| CED100 | φ1×2 | 0.5 | 40 | C-007 |
| DCMS | φ1×2 | 0.5 | 45 | C-008 |
| MHRH230 | φ1×2 | 0.8 | 50 | D-065 |
| MHR230 | φ1×2 | 1.5 | 50 | D-076 |
| MHRH230 | φ1×3 | 0.8 | 50 | D-065 |
| ALZ345-DLC | φ1×3 | 1.5 | 45 | D-143 |
| ALZ345 | φ1×3 | 1.5 | 45 | D-140 |
| MHR230 | φ1×3 | 1.5 | 50 | D-076 |
| MHRLN230-6 | φ1×3 | 1.5 | 60 | D-093 |
| DHR237 | φ1×3 | 2 | 45 | D-164 |
| DCMS | φ1×4 | 0.5 | 45 | C-008 |
| MHRH230 | φ1×4 | 0.8 | 50 | D-065 |
| MHRH430 | φ1×4 | 0.8 | 50 | D-067 |
| MHR230 | φ1×4 | 1.5 | 50 | D-076 |
| MHR430 | φ1×4 | 1.5 | 50 | D-081 |
| RSES230 | φ1×4 | 1.5 | 70 | D-156 |
| DHR237 | φ1×4 | 2 | 45 | D-164 |
| DCHR230 | φ1×4 | 2 | 50 | C-012 |
| SSE600 | φ1×5 | 0.4 | 52 | B-003 |
| MHRH230 | φ1×5 | 0.8 | 50 | D-065 |
| MHR230 | φ1×5 | 1.5 | 50 | D-076 |
| ALZ345 | φ1×5 | 1.5 | 60 | D-140 |
| DHR237 | φ1×5 | 2 | 45 | D-164 |
| MHRH230 | φ1×6 | 0.8 | 50 | D-065 |
| MHRH430 | φ1×6 | 0.8 | 50 | D-067 |
| NHR-2X | φ1×6 | 1.5 | 45 | D-094 |
| NHR-2 | φ1×6 | 1.5 | 45 | D-131 |
| MHR230 | φ1×6 | 1.5 | 50 | D-077 |
| MHR430 | φ1×6 | 1.5 | 50 | D-081 |
| MHRLN230-6 | φ1×6 | 1.5 | 60 | D-093 |
| RSES230 | φ1×6 | 1.5 | 70 | D-156 |
| DHR237 | φ1×6 | 2 | 45 | D-164 |
| DCHR230 | φ1×6 | 2 | 50 | C-012 |
| RSE230 | φ1×6 | 3 | 50 | D-161 |
| MHRH230 | φ1×7 | 0.8 | 50 | D-065 |
| MHR230 | φ1×7 | 1.5 | 50 | D-077 |
| MHRH230 | φ1×8 | 0.8 | 50 | D-065 |
| MHRH430 | φ1×8 | 0.8 | 50 | D-067 |
| NHR-2X | φ1×8 | 1.5 | 45 | D-094 |
| NHR-2 | φ1×8 | 1.5 | 45 | D-131 |
| MHR230 | φ1×8 | 1.5 | 50 | D-077 |
| MHR430 | φ1×8 | 1.5 | 50 | D-081 |
| MHRLN230-6 | φ1×8 | 1.5 | 60 | D-093 |
| RSES230 | φ1×8 | 1.5 | 70 | D-156 |
| DCHR230 | φ1×8 | 2 | 50 | C-012 |



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| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| DHR237 | φ1×8 | 2 | 50 | D-164 |
| RSE230 | φ1×8 | 3 | 50 | D-161 |
| MHRH230 | φ1×9 | 0.8 | 50 | D-065 |
| MHR230 | φ1×9 | 1.5 | 50 | D-077 |
| MHRH230 | φ1×10 | 0.8 | 50 | D-065 |
| MHRH430 | φ1×10 | 0.8 | 50 | D-067 |
| NHR-2X | φ1×10 | 1.5 | 45 | D-094 |
| NHR-2 | φ1×10 | 1.5 | 45 | D-131 |
| MHR230 | φ1×10 | 1.5 | 50 | D-077 |
| MHR430 | φ1×10 | 1.5 | 50 | D-081 |
| MHRLN230-6 | φ1×10 | 1.5 | 60 | D-093 |
| RSES230 | φ1×10 | 1.5 | 70 | D-156 |
| DCHR230 | φ1×10 | 2 | 50 | C-012 |
| DHR237 | φ1×10 | 2 | 50 | D-164 |
| RSE230 | φ1×10 | 3 | 50 | D-161 |
| MHRH230 | φ1×12 | 0.8 | 50 | D-065 |
| NHR-2X | φ1×12 | 1.5 | 45 | D-094 |
| NHR-2 | φ1×12 | 1.5 | 45 | D-131 |
| MHR230 | φ1×12 | 1.5 | 50 | D-077 |
| MHR430 | φ1×12 | 1.5 | 50 | D-081 |
| RSES230 | φ1×12 | 1.5 | 70 | D-157 |
| DHR237 | φ1×12 | 2 | 50 | D-164 |
| RSE230 | φ1×12 | 3 | 50 | D-161 |
| MHRH230 | φ1×14 | 0.8 | 50 | D-065 |
| MHR230 | φ1×14 | 1.5 | 50 | D-077 |
| RSES230 | φ1×14 | 1.5 | 70 | D-157 |
| RSES230 | φ1×15 | 1.5 | 70 | D-157 |
| RSE230 | φ1×15 | 3 | 60 | D-161 |
| MHRH230 | φ1×16 | 0.8 | 60 | D-065 |
| MHR430 | φ1×16 | 1.5 | 50 | D-081 |
| MHR230 | φ1×16 | 1.5 | 60 | D-077 |
| MHRH230 | φ1×18 | 0.8 | 60 | D-065 |
| MHR230 | φ1×18 | 1.5 | 60 | D-077 |
| RSES230 | φ1×18 | 1.5 | 70 | D-157 |
| MHRH230 | φ1×20 | 0.8 | 60 | D-065 |
| MHR230 | φ1×20 | 1.5 | 60 | D-077 |
| RSES230 | φ1×20 | 1.5 | 70 | D-157 |
| RSE230 | φ1×20 | 3 | 60 | D-161 |
| MHRH230 | φ1×22 | 0.8 | 60 | D-065 |
| MHR230 | φ1×22 | 1.5 | 60 | D-077 |
| MHR230 | φ1×25 | 1.5 | 70 | D-077 |
| RSES230 | φ1×25 | 1.5 | 70 | D-157 |
| RSE230 | φ1×25 | 3 | 70 | D-161 |
| MHR230 | φ1×30 | 1.5 | 70 | D-077 |
| RSES230 | φ1×30 | 1.5 | 70 | D-157 |
| RSE230 | φ1×30 | 3 | 70 | D-161 |
| RSES230 | φ1×35 | 1.5 | 70 | D-157 |
| RSE230 | φ1×35 | 3 | 80 | D-161 |
| **φ1.05** | | | | |
| MSE230 | φ1.05 | 2.5 | 45 | D-027 |
| **φ1.1** | | | | |
| NX-25 | φ1.1 | 1.1 | 40 | D-098 |
| MXH225 | φ1.1 | 1.1 | 45 | D-001 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MXH225P | φ1.1 | 1.1 | 45 | D-005 |
| MSE230SS | φ1.1 | 1.1 | 45 | D-026 |
| MSZ345 | φ1.1 | 1.7 | 45 | D-052 |
| NC-2 | φ1.1 | 2 | 45 | D-113 |
| NX-30 | φ1.1 | 2.2 | 40 | D-100 |
| MXH230 | φ1.1 | 2.2 | 45 | D-002 |
| MXH230P | φ1.1 | 2.2 | 45 | D-006 |
| MX230 | φ1.1 | 2.2 | 45 | D-016 |
| NC-4 | φ1.1 | 2.2 | 45 | D-119 |
| AL2D-2 | φ1.1 | 2.2 | 45 | D-135 |
| MSE230 | φ1.1 | 2.5 | 45 | D-027 |
| MXH235 | φ1.1 | 3.3 | 45 | D-003 |
| MXH235P | φ1.1 | 3.3 | 45 | D-007 |
| MX235 | φ1.1 | 3.3 | 45 | D-018 |
| NX-35 | φ1.1 | 3.3 | 45 | D-102 |
| NCM-2 | φ1.1 | 3.5 | 45 | D-114 |
| MX240 | φ1.1 | 4.4 | 45 | D-019 |
| NX-40 | φ1.1 | 4.4 | 45 | D-104 |
| NX-45 | φ1.1 | 5.5 | 50 | D-106 |
| ALZ345 | φ1.1×3.3 | 1.7 | 45 | D-140 |
| MHR430 | φ1.1×6 | 1.7 | 50 | D-081 |
| MHR430 | φ1.1×10 | 1.7 | 50 | D-081 |
| MHR430 | φ1.1×16 | 1.7 | 60 | D-081 |
| **φ1.15** | | | | |
| MSE230 | φ1.15 | 2.5 | 45 | D-027 |
| **φ1.2** | | | | |
| NX-25 | φ1.2 | 1.2 | 40 | D-098 |
| MXH225 | φ1.2 | 1.2 | 45 | D-001 |
| MXH225P | φ1.2 | 1.2 | 45 | D-005 |
| MX225 | φ1.2 | 1.2 | 45 | D-016 |
| MSE230SS | φ1.2 | 1.2 | 45 | D-026 |
| MSZ345 | φ1.2 | 1.8 | 45 | D-052 |
| NX-30 | φ1.2 | 2.4 | 40 | D-100 |
| MXH230 | φ1.2 | 2.4 | 45 | D-002 |
| MXH230P | φ1.2 | 2.4 | 45 | D-006 |
| MX230 | φ1.2 | 2.4 | 45 | D-016 |
| NC-4 | φ1.2 | 2.4 | 45 | D-119 |
| AL2D-2 | φ1.2 | 2.4 | 45 | D-135 |
| MSES230P | φ1.2 | 2.5 | 45 | D-027 |
| NC-2 | φ1.2 | 2.5 | 45 | D-113 |
| MSE230 | φ1.2 | 3 | 45 | D-027 |
| NCM-2 | φ1.2 | 3.5 | 45 | D-114 |
| MXH235 | φ1.2 | 3.6 | 45 | D-003 |
| MXH235P | φ1.2 | 3.6 | 45 | D-007 |
| MX235 | φ1.2 | 3.6 | 45 | D-018 |
| NX-35 | φ1.2 | 3.6 | 45 | D-102 |
| MXH240 | φ1.2 | 4.8 | 45 | D-004 |
| MX240 | φ1.2 | 4.8 | 45 | D-019 |
| NX-40 | φ1.2 | 4.8 | 45 | D-104 |
| MXH245 | φ1.2 | 6 | 45 | D-004 |
| MX245 | φ1.2 | 6 | 45 | D-020 |
| NX-45 | φ1.2 | 6 | 50 | D-106 |
| CED100 | φ1.2×2.4 | 0.6 | 40 | C-007 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| ALZ345 | φ1.2×3.6 | 1.8 | 45 | D-140 |
| MHR230 | φ1.2×4 | 1.8 | 50 | D-077 |
| MHRH230 | φ1.2×6 | 1 | 50 | D-065 |
| MHRH430 | φ1.2×6 | 1 | 50 | D-067 |
| NHR-2X | φ1.2×6 | 1.8 | 45 | D-094 |
| NHR-2 | φ1.2×6 | 1.8 | 45 | D-131 |
| MHR230 | φ1.2×6 | 1.8 | 50 | D-077 |
| MHR430 | φ1.2×6 | 1.8 | 50 | D-081 |
| MHRH230 | φ1.2×8 | 1 | 50 | D-065 |
| MHRH430 | φ1.2×8 | 1 | 50 | D-067 |
| NHR-2X | φ1.2×8 | 1.8 | 45 | D-094 |
| NHR-2 | φ1.2×8 | 1.8 | 45 | D-131 |
| MHR230 | φ1.2×8 | 1.8 | 50 | D-077 |
| MHR430 | φ1.2×8 | 1.8 | 50 | D-081 |
| MHRH230 | φ1.2×10 | 1 | 50 | D-065 |
| MHRH430 | φ1.2×10 | 1 | 50 | D-067 |
| NHR-2X | φ1.2×10 | 1.8 | 45 | D-094 |
| NHR-2 | φ1.2×10 | 1.8 | 45 | D-131 |
| MHR230 | φ1.2×10 | 1.8 | 50 | D-077 |
| MHR430 | φ1.2×10 | 1.8 | 50 | D-081 |
| MHRH230 | φ1.2×12 | 1 | 50 | D-065 |
| MHRH430 | φ1.2×12 | 1 | 50 | D-067 |
| NHR-2X | φ1.2×12 | 1.8 | 45 | D-094 |
| NHR-2 | φ1.2×12 | 1.8 | 45 | D-131 |
| MHR230 | φ1.2×12 | 1.8 | 50 | D-077 |
| MHR430 | φ1.2×12 | 1.8 | 50 | D-081 |
| MHRH230 | φ1.2×16 | 1 | 60 | D-065 |
| MHR230 | φ1.2×16 | 1.8 | 60 | D-077 |
| MHR430 | φ1.2×16 | 1.8 | 60 | D-081 |
| MHR230 | φ1.2×20 | 1.8 | 60 | D-077 |
| **φ1.25** | | | | |
| MSE230 | φ1.25 | 3 | 45 | D-027 |
| **φ1.3** | | | | |
| NX-25 | φ1.3 | 1.3 | 40 | D-098 |
| MXH225 | φ1.3 | 1.3 | 45 | D-001 |
| MXH225P | φ1.3 | 1.3 | 45 | D-005 |
| MSE230SS | φ1.3 | 1.3 | 45 | D-026 |
| MSZ345 | φ1.3 | 2 | 45 | D-052 |
| NC-2 | φ1.3 | 2.5 | 45 | D-113 |
| NX-30 | φ1.3 | 2.6 | 40 | D-100 |
| MXH230 | φ1.3 | 2.6 | 45 | D-002 |
| MXH230P | φ1.3 | 2.6 | 45 | D-006 |
| MX230 | φ1.3 | 2.6 | 45 | D-016 |
| NC-4 | φ1.3 | 2.6 | 45 | D-119 |
| AL2D-2 | φ1.3 | 2.6 | 45 | D-135 |
| MSE230 | φ1.3 | 3 | 45 | D-027 |
| MXH235 | φ1.3 | 3.9 | 45 | D-003 |
| MXH235P | φ1.3 | 3.9 | 45 | D-007 |
| MX235 | φ1.3 | 3.9 | 45 | D-018 |
| NX-35 | φ1.3 | 3.9 | 45 | D-102 |
| NCM-2 | φ1.3 | 4 | 45 | D-114 |
| MX240 | φ1.3 | 5.2 | 45 | D-019 |
| NX-40 | φ1.3 | 5.2 | 45 | D-104 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NX-45 | φ1.3 | 6.5 | 50 | D-106 |
| ALZ345 | φ1.3×3.9 | 2 | 45 | D-140 |
| MHR430 | φ1.3×6 | 1.9 | 50 | D-081 |
| MHR430 | φ1.3×12 | 1.9 | 50 | D-081 |
| MHR430 | φ1.3×18 | 1.9 | 60 | D-081 |
| **φ1.35** | | | | |
| MSE230 | φ1.35 | 3 | 45 | D-027 |
| **φ1.4** | | | | |
| NX-25 | φ1.4 | 1.4 | 40 | D-098 |
| MXH225 | φ1.4 | 1.4 | 45 | D-001 |
| MXH225P | φ1.4 | 1.4 | 45 | D-005 |
| MSE230SS | φ1.4 | 1.4 | 45 | D-026 |
| MSZ345 | φ1.4 | 2.1 | 45 | D-052 |
| NX-30 | φ1.4 | 2.8 | 40 | D-100 |
| MXH230 | φ1.4 | 2.8 | 45 | D-002 |
| MXH230P | φ1.4 | 2.8 | 45 | D-006 |
| MX230 | φ1.4 | 2.8 | 45 | D-016 |
| NC-4 | φ1.4 | 2.8 | 45 | D-119 |
| AL2D-2 | φ1.4 | 2.8 | 45 | D-135 |
| NC-2 | φ1.4 | 3 | 45 | D-113 |
| MSE230 | φ1.4 | 3.5 | 45 | D-028 |
| MXH235 | φ1.4 | 4.2 | 45 | D-003 |
| MXH235P | φ1.4 | 4.2 | 45 | D-007 |
| MX235 | φ1.4 | 4.2 | 45 | D-018 |
| NX-35 | φ1.4 | 4.2 | 45 | D-102 |
| NCM-2 | φ1.4 | 4.5 | 45 | D-114 |
| MX240 | φ1.4 | 5.6 | 45 | D-019 |
| NX-40 | φ1.4 | 5.6 | 45 | D-104 |
| NX-45 | φ1.4 | 7 | 50 | D-106 |
| ALZ345 | φ1.4×4.2 | 2.1 | 45 | D-140 |
| MHRH230 | φ1.4×6 | 1.1 | 50 | D-065 |
| NHR-2X | φ1.4×6 | 2.1 | 45 | D-094 |
| NHR-2 | φ1.4×6 | 2.1 | 45 | D-131 |
| MHR230 | φ1.4×6 | 2.1 | 50 | D-077 |
| MHR430 | φ1.4×6 | 2.1 | 50 | D-081 |
| NHR-2X | φ1.4×8 | 2.1 | 45 | D-094 |
| NHR-2 | φ1.4×8 | 2.1 | 45 | D-131 |
| MHR230 | φ1.4×8 | 2.1 | 50 | D-077 |
| MHR430 | φ1.4×8 | 2.1 | 50 | D-081 |
| NHR-2X | φ1.4×10 | 2.1 | 45 | D-094 |
| NHR-2 | φ1.4×10 | 2.1 | 45 | D-131 |
| MHR230 | φ1.4×10 | 2.1 | 50 | D-077 |
| MHR430 | φ1.4×10 | 2.1 | 50 | D-081 |
| MHRH230 | φ1.4×12 | 1.1 | 50 | D-065 |
| NHR-2X | φ1.4×12 | 2.1 | 45 | D-094 |
| NHR-2 | φ1.4×12 | 2.1 | 45 | D-131 |
| MHR230 | φ1.4×12 | 2.1 | 50 | D-077 |
| MHR430 | φ1.4×12 | 2.1 | 50 | D-081 |
| NHR-2X | φ1.4×14 | 2.1 | 50 | D-094 |
| NHR-2 | φ1.4×14 | 2.1 | 50 | D-131 |
| MHR230 | φ1.4×14 | 2.1 | 60 | D-077 |
| MHR430 | φ1.4×14 | 2.1 | 60 | D-081 |
| NHR-2X | φ1.4×16 | 2.1 | 50 | D-094 |



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| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NHR-2 | φ1.4×16 | 2.1 | 50 | D-131 |
| MHR230 | φ1.4×16 | 2.1 | 60 | D-077 |
| MHR430 | φ1.4×16 | 2.1 | 60 | D-081 |
| MHR230 | φ1.4×22 | 2.1 | 60 | D-077 |
| MHR430 | φ1.4×22 | 2.1 | 60 | D-081 |
| **φ1.45** | | | | |
| MSE230 | φ1.45 | 3.5 | 45 | D-028 |
| **φ1.5** | | | | |
| NX-25 | φ1.5 | 1.5 | 40 | D-098 |
| MXH225 | φ1.5 | 1.5 | 45 | D-001 |
| MXH225P | φ1.5 | 1.5 | 45 | D-005 |
| MX225 | φ1.5 | 1.5 | 45 | D-016 |
| MSE230SS | φ1.5 | 1.5 | 45 | D-026 |
| MX425 | φ1.5 | 1.5 | 45 | D-032 |
| RSES230 | φ1.5 | 2.25 | 70 | D-157 |
| MSZ345 | φ1.5 | 2.3 | 45 | D-052 |
| MHD445 | φ1.5 | 2.5 | 60 | D-059 |
| NX-30X | φ1.5 | 3 | 40 | D-062 |
| NX-30 | φ1.5 | 3 | 40 | D-100 |
| MXH230 | φ1.5 | 3 | 45 | D-002 |
| MXH230P | φ1.5 | 3 | 45 | D-006 |
| MX230 | φ1.5 | 3 | 45 | D-016 |
| MSES230P | φ1.5 | 3 | 45 | D-027 |
| MX430 | φ1.5 | 3 | 45 | D-032 |
| NC-2 | φ1.5 | 3 | 45 | D-113 |
| NC-4 | φ1.5 | 3 | 45 | D-119 |
| NE-2 | φ1.5 | 3 | 45 | D-125 |
| NSL-2 | φ1.5 | 3 | 45 | D-130 |
| AL2D-2 | φ1.5 | 3 | 45 | D-135 |
| AL2D-2DLC | φ1.5 | 3 | 45 | D-138 |
| DX | φ1.5 | 3 | 45 | D-167 |
| MHDH445 | φ1.5 | 3 | 60 | D-057 |
| NC-LS-2 | φ1.5 | 3 | 100 | D-115 |
| MSE230 | φ1.5 | 4 | 45 | D-028 |
| MSE230M | φ1.5 | 4 | 45 | D-029 |
| MSE430 | φ1.5 | 4 | 45 | D-040 |
| MSE430P | φ1.5 | 4 | 45 | D-040 |
| DCSE235 | φ1.5 | 4.5 | 45 | C-010 |
| MXH235 | φ1.5 | 4.5 | 45 | D-003 |
| MXH235P | φ1.5 | 4.5 | 45 | D-007 |
| MX235 | φ1.5 | 4.5 | 45 | D-018 |
| MX435 | φ1.5 | 4.5 | 45 | D-033 |
| NX-35 | φ1.5 | 4.5 | 45 | D-102 |
| NCM-2 | φ1.5 | 4.5 | 45 | D-114 |
| NCM-4 | φ1.5 | 4.5 | 45 | D-121 |
| AL3D-2 | φ1.5 | 4.5 | 45 | D-136 |
| AL3D-2DLC | φ1.5 | 4.5 | 45 | D-138 |
| RSE230 | φ1.5 | 4.5 | 45 | D-161 |
| MXH240 | φ1.5 | 6 | 45 | D-004 |
| MX240 | φ1.5 | 6 | 45 | D-019 |
| MX440 | φ1.5 | 6 | 45 | D-033 |
| NX-40 | φ1.5 | 6 | 45 | D-104 |
| NCL-2 | φ1.5 | 6 | 45 | D-115 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSEM230 | φ1.5 | 6 | 50 | D-029 |
| MSEM430 | φ1.5 | 6 | 50 | D-041 |
| AL4D-2 | φ1.5 | 6 | 50 | D-136 |
| AL4D-2DLC | φ1.5 | 6 | 50 | D-139 |
| MXH245 | φ1.5 | 7.5 | 45 | D-004 |
| MX245 | φ1.5 | 7.5 | 45 | D-020 |
| MX445 | φ1.5 | 7.5 | 45 | D-034 |
| NX-45 | φ1.5 | 7.5 | 50 | D-106 |
| AL5D-2 | φ1.5 | 7.5 | 50 | D-137 |
| AL5D-2DLC | φ1.5 | 7.5 | 50 | D-139 |
| RSE230 | φ1.5 | 7.5 | 50 | D-161 |
| RSE230 | φ1.5 | 15 | 60 | D-161 |
| CED100 | φ1.5×3 | 0.75 | 40 | C-007 |
| DCMS | φ1.5×3 | 0.75 | 45 | C-008 |
| MHRLN230-6 | φ1.5×3 | 2.3 | 60 | D-093 |
| MHRH230 | φ1.5×4 | 1.2 | 50 | D-066 |
| MHR230 | φ1.5×4 | 2.3 | 50 | D-077 |
| ALZ345-DLC | φ1.5×4.5 | 2.3 | 45 | D-143 |
| ALZ345 | φ1.5×4.5 | 2.3 | 45 | D-140 |
| MHRLN230-6 | φ1.5×5 | 2.3 | 60 | D-093 |
| DCMS | φ1.5×6 | 0.75 | 45 | C-008 |
| MHRH230 | φ1.5×6 | 1.2 | 50 | D-066 |
| MHRH430 | φ1.5×6 | 1.2 | 50 | D-067 |
| RSES230 | φ1.5×6 | 2.25 | 70 | D-157 |
| NHR-2X | φ1.5×6 | 2.3 | 45 | D-094 |
| NHR-2 | φ1.5×6 | 2.3 | 45 | D-131 |
| MHR230 | φ1.5×6 | 2.3 | 50 | D-077 |
| MHR430 | φ1.5×6 | 2.3 | 50 | D-081 |
| DCHR230 | φ1.5×6 | 3 | 50 | C-012 |
| DHR237 | φ1.5×6 | 3 | 50 | D-164 |
| MHRH230 | φ1.5×8 | 1.2 | 50 | D-066 |
| MHRH430 | φ1.5×8 | 1.2 | 50 | D-067 |
| RSES230 | φ1.5×8 | 2.25 | 70 | D-157 |
| NHR-2X | φ1.5×8 | 2.3 | 45 | D-094 |
| NHR-2 | φ1.5×8 | 2.3 | 45 | D-132 |
| MHR230 | φ1.5×8 | 2.3 | 50 | D-077 |
| MHR430 | φ1.5×8 | 2.3 | 50 | D-081 |
| DHR237 | φ1.5×8 | 3 | 50 | D-164 |
| MHRH230 | φ1.5×10 | 1.2 | 50 | D-066 |
| MHRH430 | φ1.5×10 | 1.2 | 50 | D-067 |
| RSES230 | φ1.5×10 | 2.25 | 70 | D-157 |
| NHR-2X | φ1.5×10 | 2.3 | 45 | D-094 |
| NHR-2 | φ1.5×10 | 2.3 | 45 | D-132 |
| MHR230 | φ1.5×10 | 2.3 | 50 | D-077 |
| MHR430 | φ1.5×10 | 2.3 | 50 | D-081 |
| MHRLN230-6 | φ1.5×10 | 2.3 | 60 | D-093 |
| RSE230 | φ1.5×10 | 4.5 | 50 | D-161 |
| MHRH230 | φ1.5×12 | 1.2 | 50 | D-066 |
| MHRH430 | φ1.5×12 | 1.2 | 50 | D-067 |
| RSES230 | φ1.5×12 | 2.25 | 70 | D-157 |
| NHR-2X | φ1.5×12 | 2.3 | 45 | D-094 |
| NHR-2 | φ1.5×12 | 2.3 | 45 | D-132 |
| MHR230 | φ1.5×12 | 2.3 | 50 | D-077 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHR430 | φ1.5×12 | 2.3 | 50 | D-081 |
| DCHR230 | φ1.5×12 | 3 | 50 | C-012 |
| DHR237 | φ1.5×12 | 3 | 50 | D-164 |
| RSE230 | φ1.5×12 | 4.5 | 50 | D-161 |
| MHRH230 | φ1.5×14 | 1.2 | 60 | D-066 |
| MHRH430 | φ1.5×14 | 1.2 | 60 | D-067 |
| NHR-2X | φ1.5×14 | 2.3 | 50 | D-094 |
| NHR-2 | φ1.5×14 | 2.3 | 50 | D-132 |
| MHR230 | φ1.5×14 | 2.3 | 60 | D-078 |
| MHR430 | φ1.5×14 | 2.3 | 60 | D-081 |
| RSES230 | φ1.5×15 | 2.25 | 70 | D-157 |
| MHRLN230-6 | φ1.5×15 | 2.3 | 60 | D-093 |
| RSE230 | φ1.5×15 | 4.5 | 60 | D-161 |
| MHRH230 | φ1.5×16 | 1.2 | 60 | D-066 |
| MHRH430 | φ1.5×16 | 1.2 | 60 | D-067 |
| NHR-2X | φ1.5×16 | 2.3 | 50 | D-094 |
| NHR-2 | φ1.5×16 | 2.3 | 50 | D-132 |
| MHR230 | φ1.5×16 | 2.3 | 60 | D-078 |
| MHR430 | φ1.5×16 | 2.3 | 60 | D-081 |
| DHR237 | φ1.5×16 | 3 | 60 | D-164 |
| MHRH230 | φ1.5×18 | 1.2 | 60 | D-066 |
| RSES230 | φ1.5×18 | 2.25 | 70 | D-157 |
| NHR-2X | φ1.5×18 | 2.3 | 55 | D-094 |
| NHR-2 | φ1.5×18 | 2.3 | 55 | D-132 |
| MHR230 | φ1.5×18 | 2.3 | 60 | D-078 |
| MHR430 | φ1.5×18 | 2.3 | 60 | D-081 |
| RSE230 | φ1.5×18 | 4.5 | 60 | D-161 |
| MHRH230 | φ1.5×20 | 1.2 | 60 | D-066 |
| RSES230 | φ1.5×20 | 2.25 | 70 | D-157 |
| NHR-2X | φ1.5×20 | 2.3 | 55 | D-094 |
| NHR-2 | φ1.5×20 | 2.3 | 55 | D-132 |
| MHR230 | φ1.5×20 | 2.3 | 60 | D-078 |
| MHR430 | φ1.5×20 | 2.3 | 60 | D-081 |
| DCHR230 | φ1.5×20 | 3 | 60 | C-012 |
| RSES230 | φ1.5×23 | 2.25 | 70 | D-157 |
| RSE230 | φ1.5×23 | 4.5 | 70 | D-161 |
| MHRH230 | φ1.5×25 | 1.2 | 70 | D-066 |
| RSES230 | φ1.5×25 | 2.25 | 70 | D-157 |
| MHR230 | φ1.5×25 | 2.3 | 70 | D-078 |
| MHRH230 | φ1.5×30 | 1.2 | 70 | D-066 |
| RSES230 | φ1.5×30 | 2.25 | 70 | D-157 |
| MHR230 | φ1.5×30 | 2.3 | 70 | D-078 |
| RSE230 | φ1.5×30 | 4.5 | 70 | D-161 |
| MHRH230 | φ1.5×35 | 1.2 | 80 | D-066 |
| RSES230 | φ1.5×35 | 2.25 | 70 | D-157 |
| MHR230 | φ1.5×35 | 2.3 | 80 | D-078 |
| MHR230 | φ1.5×38 | 2.3 | 80 | D-078 |
| RSE230 | φ1.5×38 | 4.5 | 80 | D-161 |
| RSES230 | φ1.5×40 | 2.25 | 100 | D-157 |
| MHR230 | φ1.5×40 | 2.3 | 80 | D-078 |
| RSES230 | φ1.5×45 | 2.25 | 100 | D-157 |
| MHR230 | φ1.5×45 | 2.3 | 80 | D-078 |
| RSE230 | φ1.5×45 | 4.5 | 90 | D-161 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| RSES230 | φ1.5×53 | 2.25 | 100 | D-157 |
| RSE230 | φ1.5×53 | 4.5 | 90 | D-161 |
| **φ1.55** | | | | |
| MSE230 | φ1.55 | 4 | 45 | D-028 |
| **φ1.6** | | | | |
| NX-25 | φ1.6 | 1.6 | 40 | D-098 |
| MXH225 | φ1.6 | 1.6 | 45 | D-001 |
| MXH225P | φ1.6 | 1.6 | 45 | D-005 |
| MSE230SS | φ1.6 | 1.6 | 45 | D-026 |
| MSZ345 | φ1.6 | 2.4 | 45 | D-052 |
| MSES230P | φ1.6 | 3 | 45 | D-027 |
| NC-2 | φ1.6 | 3 | 45 | D-113 |
| NX-30 | φ1.6 | 3.2 | 40 | D-100 |
| MXH230 | φ1.6 | 3.2 | 45 | D-002 |
| MXH230P | φ1.6 | 3.2 | 45 | D-006 |
| MX230 | φ1.6 | 3.2 | 45 | D-016 |
| NC-4 | φ1.6 | 3.2 | 45 | D-119 |
| AL2D-2 | φ1.6 | 3.2 | 45 | D-135 |
| MSE230 | φ1.6 | 4 | 45 | D-028 |
| MXH235 | φ1.6 | 4.8 | 45 | D-003 |
| MXH235P | φ1.6 | 4.8 | 45 | D-007 |
| MX235 | φ1.6 | 4.8 | 45 | D-018 |
| NX-35 | φ1.6 | 4.8 | 45 | D-102 |
| NCM-2 | φ1.6 | 5 | 45 | D-114 |
| MX240 | φ1.6 | 6.4 | 45 | D-019 |
| NX-40 | φ1.6 | 6.4 | 50 | D-104 |
| NX-45 | φ1.6 | 8 | 50 | D-106 |
| ALZ345 | φ1.6×4.8 | 2.4 | 45 | D-140 |
| MHRH230 | φ1.6×6 | 1.3 | 50 | D-066 |
| NHR-2X | φ1.6×6 | 2.4 | 45 | D-094 |
| NHR-2 | φ1.6×6 | 2.4 | 45 | D-132 |
| MHR230 | φ1.6×6 | 2.4 | 50 | D-078 |
| MHR430 | φ1.6×6 | 2.4 | 50 | D-082 |
| MHRH230 | φ1.6×8 | 1.3 | 50 | D-066 |
| NHR-2X | φ1.6×8 | 2.4 | 45 | D-094 |
| NHR-2 | φ1.6×8 | 2.4 | 45 | D-132 |
| MHR230 | φ1.6×8 | 2.4 | 50 | D-078 |
| MHR430 | φ1.6×8 | 2.4 | 50 | D-082 |
| NHR-2X | φ1.6×10 | 2.4 | 45 | D-094 |
| NHR-2 | φ1.6×10 | 2.4 | 45 | D-132 |
| MHR230 | φ1.6×10 | 2.4 | 50 | D-078 |
| MHR430 | φ1.6×10 | 2.4 | 50 | D-082 |
| NHR-2X | φ1.6×12 | 2.4 | 45 | D-094 |
| NHR-2 | φ1.6×12 | 2.4 | 45 | D-132 |
| MHR230 | φ1.6×12 | 2.4 | 50 | D-078 |
| MHR430 | φ1.6×12 | 2.4 | 50 | D-082 |
| NHR-2X | φ1.6×14 | 2.4 | 50 | D-094 |
| NHR-2 | φ1.6×14 | 2.4 | 50 | D-132 |
| MHR230 | φ1.6×14 | 2.4 | 60 | D-078 |
| MHR430 | φ1.6×14 | 2.4 | 60 | D-082 |
| NHR-2X | φ1.6×16 | 2.4 | 50 | D-094 |
| NHR-2 | φ1.6×16 | 2.4 | 50 | D-132 |
| MHR230 | φ1.6×16 | 2.4 | 60 | D-078 |



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| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHR430 | φ1.6×16 | 2.4 | 60 | D-082 |
| NHR-2X | φ1.6×18 | 2.4 | 55 | D-094 |
| NHR-2 | φ1.6×18 | 2.4 | 55 | D-132 |
| MHR230 | φ1.6×18 | 2.4 | 60 | D-078 |
| MHR430 | φ1.6×18 | 2.4 | 60 | D-082 |
| NHR-2X | φ1.6×20 | 2.4 | 55 | D-094 |
| NHR-2 | φ1.6×20 | 2.4 | 55 | D-132 |
| MHR230 | φ1.6×20 | 2.4 | 60 | D-078 |
| MHR430 | φ1.6×20 | 2.4 | 60 | D-082 |
| MHR230 | φ1.6×26 | 2.4 | 60 | D-078 |
| MHR430 | φ1.6×26 | 2.4 | 70 | D-082 |
| **φ1.65** | | | | |
| MSE230 | φ1.65 | 4 | 45 | D-028 |
| **φ1.7** | | | | |
| NX-25 | φ1.7 | 1.7 | 40 | D-098 |
| MXH225 | φ1.7 | 1.7 | 45 | D-001 |
| MXH225P | φ1.7 | 1.7 | 45 | D-005 |
| MSE230SS | φ1.7 | 1.7 | 45 | D-026 |
| MSZ345 | φ1.7 | 2.6 | 45 | D-052 |
| NX-30 | φ1.7 | 3.4 | 40 | D-100 |
| MXH230 | φ1.7 | 3.4 | 45 | D-002 |
| MXH230P | φ1.7 | 3.4 | 45 | D-006 |
| MX230 | φ1.7 | 3.4 | 45 | D-016 |
| NC-4 | φ1.7 | 3.4 | 45 | D-119 |
| AL2D-2 | φ1.7 | 3.4 | 45 | D-135 |
| NC-2 | φ1.7 | 4 | 45 | D-113 |
| MSE230 | φ1.7 | 4.5 | 45 | D-028 |
| NCM-2 | φ1.7 | 5 | 45 | D-114 |
| MXH235 | φ1.7 | 5.1 | 45 | D-003 |
| MXH235P | φ1.7 | 5.1 | 45 | D-007 |
| MX235 | φ1.7 | 5.1 | 45 | D-018 |
| NX-35 | φ1.7 | 5.1 | 45 | D-102 |
| MX240 | φ1.7 | 6.8 | 45 | D-019 |
| NX-40 | φ1.7 | 6.8 | 50 | D-104 |
| NX-45 | φ1.7 | 8.5 | 50 | D-106 |
| ALZ345 | φ1.7×5.1 | 2.6 | 45 | D-140 |
| MHR430 | φ1.7×6 | 2.5 | 50 | D-082 |
| MHR430 | φ1.7×14 | 2.5 | 60 | D-082 |
| MHR430 | φ1.7×24 | 2.5 | 70 | D-082 |
| **φ1.75** | | | | |
| MSE230 | φ1.75 | 4.5 | 45 | D-028 |
| **φ1.8** | | | | |
| NX-25 | φ1.8 | 1.8 | 40 | D-098 |
| MXH225 | φ1.8 | 1.8 | 45 | D-001 |
| MXH225P | φ1.8 | 1.8 | 45 | D-005 |
| MX225 | φ1.8 | 1.8 | 45 | D-016 |
| MSE230SS | φ1.8 | 1.8 | 45 | D-026 |
| MSZ345 | φ1.8 | 2.7 | 45 | D-052 |
| MSES230P | φ1.8 | 3.5 | 45 | D-027 |
| NX-30 | φ1.8 | 3.6 | 40 | D-100 |
| MXH230 | φ1.8 | 3.6 | 45 | D-002 |
| MXH230P | φ1.8 | 3.6 | 45 | D-006 |
| MX230 | φ1.8 | 3.6 | 45 | D-016 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NC-4 | φ1.8 | 3.6 | 45 | D-119 |
| AL2D-2 | φ1.8 | 3.6 | 45 | D-135 |
| NC-2 | φ1.8 | 4 | 45 | D-113 |
| MSE230 | φ1.8 | 4.5 | 45 | D-028 |
| MXH235 | φ1.8 | 5.4 | 45 | D-003 |
| MXH235P | φ1.8 | 5.4 | 45 | D-007 |
| MX235 | φ1.8 | 5.4 | 45 | D-018 |
| NX-35 | φ1.8 | 5.4 | 45 | D-102 |
| NCM-2 | φ1.8 | 5.5 | 45 | D-114 |
| MXH240 | φ1.8 | 7.2 | 45 | D-004 |
| MX240 | φ1.8 | 7.2 | 45 | D-019 |
| NX-40 | φ1.8 | 7.2 | 50 | D-104 |
| MXH245 | φ1.8 | 9 | 50 | D-004 |
| MX245 | φ1.8 | 9 | 50 | D-020 |
| NX-45 | φ1.8 | 9 | 50 | D-106 |
| ALZ345 | φ1.8×5.4 | 2.7 | 45 | D-140 |
| MHRH230 | φ1.8×6 | 1.4 | 50 | D-066 |
| MHRH430 | φ1.8×6 | 1.4 | 50 | D-067 |
| NHR-2X | φ1.8×6 | 2.7 | 45 | D-094 |
| NHR-2 | φ1.8×6 | 2.7 | 45 | D-132 |
| MHR230 | φ1.8×6 | 2.7 | 50 | D-078 |
| MHR430 | φ1.8×6 | 2.7 | 50 | D-082 |
| MHRH230 | φ1.8×8 | 1.4 | 50 | D-066 |
| MHRH430 | φ1.8×8 | 1.4 | 50 | D-067 |
| NHR-2X | φ1.8×8 | 2.7 | 45 | D-094 |
| NHR-2 | φ1.8×8 | 2.7 | 45 | D-132 |
| MHR230 | φ1.8×8 | 2.7 | 50 | D-078 |
| MHR430 | φ1.8×8 | 2.7 | 50 | D-082 |
| MHRH230 | φ1.8×10 | 1.4 | 50 | D-066 |
| MHRH430 | φ1.8×10 | 1.4 | 50 | D-067 |
| NHR-2X | φ1.8×10 | 2.7 | 45 | D-094 |
| NHR-2 | φ1.8×10 | 2.7 | 45 | D-132 |
| MHR230 | φ1.8×10 | 2.7 | 50 | D-078 |
| MHR430 | φ1.8×10 | 2.7 | 50 | D-082 |
| MHRH230 | φ1.8×12 | 1.4 | 50 | D-066 |
| MHRH430 | φ1.8×12 | 1.4 | 50 | D-067 |
| NHR-2X | φ1.8×12 | 2.7 | 45 | D-094 |
| NHR-2 | φ1.8×12 | 2.7 | 45 | D-132 |
| MHR230 | φ1.8×12 | 2.7 | 50 | D-078 |
| MHR430 | φ1.8×12 | 2.7 | 50 | D-082 |
| MHRH230 | φ1.8×14 | 1.4 | 50 | D-066 |
| MHRH430 | φ1.8×14 | 1.4 | 60 | D-067 |
| MHR230 | φ1.8×14 | 2.7 | 50 | D-078 |
| NHR-2X | φ1.8×14 | 2.7 | 50 | D-094 |
| NHR-2 | φ1.8×14 | 2.7 | 50 | D-132 |
| MHR430 | φ1.8×14 | 2.7 | 60 | D-082 |
| MHRH230 | φ1.8×16 | 1.4 | 60 | D-066 |
| MHRH430 | φ1.8×16 | 1.4 | 60 | D-067 |
| NHR-2X | φ1.8×16 | 2.7 | 50 | D-094 |
| NHR-2 | φ1.8×16 | 2.7 | 50 | D-132 |
| MHR230 | φ1.8×16 | 2.7 | 60 | D-078 |
| MHR430 | φ1.8×16 | 2.7 | 60 | D-082 |
| MHRH230 | φ1.8×18 | 1.4 | 60 | D-066 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHRH430 | φ1.8×18 | 1.4 | 60 | D-067 |
| NHR-2X | φ1.8×18 | 2.7 | 55 | D-094 |
| NHR-2 | φ1.8×18 | 2.7 | 55 | D-132 |
| MHR230 | φ1.8×18 | 2.7 | 60 | D-078 |
| MHR430 | φ1.8×18 | 2.7 | 60 | D-082 |
| NHR-2X | φ1.8×20 | 2.7 | 55 | D-094 |
| NHR-2 | φ1.8×20 | 2.7 | 55 | D-132 |
| MHR230 | φ1.8×20 | 2.7 | 60 | D-078 |
| MHR430 | φ1.8×20 | 2.7 | 60 | D-082 |
| MHR230 | φ1.8×25 | 2.7 | 70 | D-078 |
| MHR430 | φ1.8×25 | 2.7 | 70 | D-082 |
| **φ1.85** | | | | |
| MSE230 | φ1.85 | 4.5 | 45 | D-028 |
| **φ1.9** | | | | |
| NX-25 | φ1.9 | 1.9 | 40 | D-098 |
| MXH225 | φ1.9 | 1.9 | 45 | D-001 |
| MXH225P | φ1.9 | 1.9 | 45 | D-005 |
| MSE230SS | φ1.9 | 1.9 | 45 | D-026 |
| MSZ345 | φ1.9 | 2.9 | 45 | D-052 |
| NX-30 | φ1.9 | 3.8 | 40 | D-100 |
| MXH230 | φ1.9 | 3.8 | 45 | D-002 |
| MXH230P | φ1.9 | 3.8 | 45 | D-006 |
| MX230 | φ1.9 | 3.8 | 45 | D-016 |
| NC-4 | φ1.9 | 3.8 | 45 | D-119 |
| AL2D-2 | φ1.9 | 3.8 | 45 | D-135 |
| NC-2 | φ1.9 | 4 | 45 | D-113 |
| MSE230 | φ1.9 | 5 | 45 | D-028 |
| MXH235 | φ1.9 | 5.7 | 45 | D-003 |
| MXH235P | φ1.9 | 5.7 | 45 | D-007 |
| MX235 | φ1.9 | 5.7 | 45 | D-018 |
| NX-35 | φ1.9 | 5.7 | 45 | D-102 |
| NCM-2 | φ1.9 | 6 | 45 | D-114 |
| MX240 | φ1.9 | 7.6 | 45 | D-019 |
| NX-40 | φ1.9 | 7.6 | 50 | D-104 |
| NX-45 | φ1.9 | 9.5 | 50 | D-106 |
| ALZ345 | φ1.9×5.7 | 2.9 | 45 | D-140 |
| MHR430 | φ1.9×6 | 2.8 | 50 | D-082 |
| MHR430 | φ1.9×16 | 2.8 | 60 | D-082 |
| MHR430 | φ1.9×28 | 2.8 | 70 | D-082 |
| **φ1.95** | | | | |
| MSE230 | φ1.95 | 5 | 45 | D-028 |
| **φ2** | | | | |
| NX-25 | φ2 | 2 | 40 | D-098 |
| MXH225 | φ2 | 2 | 45 | D-001 |
| MXH225P | φ2 | 2 | 45 | D-005 |
| MX225 | φ2 | 2 | 45 | D-016 |
| MSE230SS | φ2 | 2 | 45 | D-026 |
| MX425 | φ2 | 2 | 45 | D-032 |
| MSZ345 | φ2 | 3 | 45 | D-052 |
| RSES230 | φ2 | 3 | 60 | D-157 |
| NX-30X | φ2 | 4 | 40 | D-062 |
| NX-30 | φ2 | 4 | 40 | D-100 |
| MXH230 | φ2 | 4 | 45 | D-002 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MXH230P | φ2 | 4 | 45 | D-006 |
| MX230 | φ2 | 4 | 45 | D-016 |
| MSES230P | φ2 | 4 | 45 | D-027 |
| MX430 | φ2 | 4 | 45 | D-032 |
| NC-2 | φ2 | 4 | 45 | D-113 |
| NC-4 | φ2 | 4 | 45 | D-119 |
| NSL-2 | φ2 | 4 | 45 | D-130 |
| AL2D-2 | φ2 | 4 | 45 | D-135 |
| AL2D-2DLC | φ2 | 4 | 45 | D-138 |
| DX | φ2 | 4 | 45 | D-167 |
| MHDH445 | φ2 | 4 | 60 | D-057 |
| MHD445 | φ2 | 4 | 60 | D-059 |
| NC-LS-2 | φ2 | 4 | 100 | D-115 |
| MSE230 | φ2 | 5 | 45 | D-028 |
| MSE230M | φ2 | 5 | 45 | D-029 |
| MSE430 | φ2 | 5 | 45 | D-040 |
| MSE430P | φ2 | 5 | 45 | D-040 |
| MSE245 | φ2 | 5 | 45 | D-044 |
| MSE445 | φ2 | 5 | 45 | D-045 |
| DCSE235 | φ2 | 6 | 45 | C-010 |
| MXH235 | φ2 | 6 | 45 | D-003 |
| MXH235P | φ2 | 6 | 45 | D-007 |
| MX235 | φ2 | 6 | 45 | D-018 |
| MX435 | φ2 | 6 | 45 | D-033 |
| NX-35 | φ2 | 6 | 45 | D-102 |
| NCM-2 | φ2 | 6 | 45 | D-114 |
| NCM-4 | φ2 | 6 | 45 | D-121 |
| NE-2 | φ2 | 6 | 45 | D-125 |
| AL3D-2 | φ2 | 6 | 45 | D-136 |
| AL3D-2DLC | φ2 | 6 | 45 | D-138 |
| RSE230 | φ2 | 6 | 50 | D-161 |
| AL3D-345 | φ2 | 6 | 60 | D-137 |
| MXH240 | φ2 | 8 | 45 | D-004 |
| MX240 | φ2 | 8 | 45 | D-019 |
| MX440 | φ2 | 8 | 45 | D-033 |
| MSEM230 | φ2 | 8 | 50 | D-029 |
| MSEM430 | φ2 | 8 | 50 | D-041 |
| NX-40 | φ2 | 8 | 50 | D-104 |
| AL4D-2 | φ2 | 8 | 50 | D-136 |
| AL4D-2DLC | φ2 | 8 | 50 | D-139 |
| MXH245 | φ2 | 10 | 50 | D-004 |
| MX245 | φ2 | 10 | 50 | D-020 |
| MX445 | φ2 | 10 | 50 | D-034 |
| NX-45 | φ2 | 10 | 50 | D-106 |
| NCL-2 | φ2 | 10 | 50 | D-115 |
| NCL-4 | φ2 | 10 | 50 | D-121 |
| AL5D-2 | φ2 | 10 | 50 | D-137 |
| AL5D-2DLC | φ2 | 10 | 50 | D-139 |
| RSE230 | φ2 | 10 | 50 | D-161 |
| RSE230 | φ2 | 15 | 60 | D-161 |
| RSE230 | φ2 | 20 | 60 | D-161 |
| DSF | φ2×2 | 1 | 60 | D-168 |
| CED100 | φ2×4 | 1 | 40 | C-007 |



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| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| DCMS | φ2×4 | 1 | 45 | C-008 |
| MHRH230 | φ2×4 | 1.6 | 50 | D-066 |
| MHR230 | φ2×4 | 3 | 50 | D-078 |
| MHRH230 | φ2×6 | 1.6 | 50 | D-066 |
| MHRH430 | φ2×6 | 1.6 | 50 | D-067 |
| NHR-2X | φ2×6 | 3 | 45 | D-094 |
| NHR-2 | φ2×6 | 3 | 45 | D-132 |
| ALZ345-DLC | φ2×6 | 3 | 45 | D-143 |
| ALZ345 | φ2×6 | 3 | 45 | D-140 |
| MHR230 | φ2×6 | 3 | 50 | D-078 |
| MHR430 | φ2×6 | 3 | 50 | D-082 |
| RSES230 | φ2×6 | 3 | 60 | D-157 |
| DCHR230 | φ2×6 | 4 | 50 | C-012 |
| DHR237 | φ2×6 | 4 | 50 | D-165 |
| DCMS | φ2×8 | 1 | 45 | C-008 |
| MHRH230 | φ2×8 | 1.6 | 50 | D-066 |
| MHRH430 | φ2×8 | 1.6 | 50 | D-067 |
| NHR-2X | φ2×8 | 3 | 45 | D-094 |
| NHR-2 | φ2×8 | 3 | 45 | D-132 |
| MHR230 | φ2×8 | 3 | 50 | D-078 |
| MHR430 | φ2×8 | 3 | 50 | D-082 |
| RSES230 | φ2×8 | 3 | 60 | D-157 |
| DHR237 | φ2×8 | 4 | 50 | D-165 |
| MHRH230 | φ2×10 | 1.6 | 50 | D-066 |
| MHRH430 | φ2×10 | 1.6 | 50 | D-067 |
| NHR-2X | φ2×10 | 3 | 45 | D-094 |
| NHR-2 | φ2×10 | 3 | 45 | D-132 |
| MHR230 | φ2×10 | 3 | 50 | D-078 |
| MHR430 | φ2×10 | 3 | 50 | D-082 |
| RSES230 | φ2×10 | 3 | 60 | D-157 |
| ALZ345 | φ2×10 | 3 | 60 | D-140 |
| DCHR230 | φ2×10 | 4 | 50 | C-012 |
| DHR237 | φ2×10 | 4 | 50 | D-165 |
| MHRH230 | φ2×12 | 1.6 | 50 | D-066 |
| MHRH430 | φ2×12 | 1.6 | 50 | D-067 |
| NHR-2X | φ2×12 | 3 | 45 | D-094 |
| NHR-2 | φ2×12 | 3 | 45 | D-132 |
| MHR230 | φ2×12 | 3 | 50 | D-079 |
| MHR430 | φ2×12 | 3 | 50 | D-082 |
| RSES230 | φ2×12 | 3 | 60 | D-157 |
| DHR237 | φ2×12 | 4 | 50 | D-165 |
| RSE230 | φ2×12 | 6 | 60 | D-161 |
| MHRH230 | φ2×14 | 1.6 | 60 | D-066 |
| MHRH430 | φ2×14 | 1.6 | 60 | D-067 |
| NHR-2X | φ2×14 | 3 | 50 | D-094 |
| NHR-2 | φ2×14 | 3 | 50 | D-132 |
| MHR230 | φ2×14 | 3 | 60 | D-079 |
| MHR430 | φ2×14 | 3 | 60 | D-082 |
| DHR237 | φ2×14 | 4 | 50 | D-165 |
| RSES230 | φ2×15 | 3 | 60 | D-157 |
| RSE230 | φ2×15 | 6 | 60 | D-161 |
| MHRH230 | φ2×16 | 1.6 | 60 | D-066 |
| MHRH430 | φ2×16 | 1.6 | 60 | D-067 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NHR-2X | φ2×16 | 3 | 50 | D-095 |
| NHR-2 | φ2×16 | 3 | 50 | D-132 |
| MHR230 | φ2×16 | 3 | 60 | D-079 |
| MHR430 | φ2×16 | 3 | 60 | D-082 |
| DCHR230 | φ2×16 | 4 | 60 | C-012 |
| DHR237 | φ2×16 | 4 | 60 | D-165 |
| MHRH230 | φ2×18 | 1.6 | 60 | D-066 |
| MHRH430 | φ2×18 | 1.6 | 60 | D-067 |
| NHR-2X | φ2×18 | 3 | 55 | D-095 |
| NHR-2 | φ2×18 | 3 | 55 | D-132 |
| MHR230 | φ2×18 | 3 | 60 | D-079 |
| MHR430 | φ2×18 | 3 | 60 | D-082 |
| MHRH230 | φ2×20 | 1.6 | 60 | D-066 |
| MHRH430 | φ2×20 | 1.6 | 60 | D-067 |
| NHR-2X | φ2×20 | 3 | 55 | D-095 |
| NHR-2 | φ2×20 | 3 | 55 | D-133 |
| MHR230 | φ2×20 | 3 | 60 | D-079 |
| MHR430 | φ2×20 | 3 | 60 | D-082 |
| MHRLN230-6 | φ2×20 | 3 | 60 | D-093 |
| RSES230 | φ2×20 | 3 | 80 | D-157 |
| DCHR230 | φ2×20 | 4 | 60 | C-012 |
| DHR237 | φ2×20 | 4 | 60 | D-165 |
| RSE230 | φ2×20 | 6 | 60 | D-161 |
| RSES230 | φ2×24 | 3 | 80 | D-157 |
| RSE230 | φ2×24 | 6 | 70 | D-161 |
| MHRH230 | φ2×25 | 1.6 | 70 | D-066 |
| MHR230 | φ2×25 | 3 | 70 | D-079 |
| MHR430 | φ2×25 | 3 | 70 | D-083 |
| MHRH230 | φ2×30 | 1.6 | 70 | D-066 |
| MHR230 | φ2×30 | 3 | 70 | D-079 |
| MHR430 | φ2×30 | 3 | 70 | D-083 |
| RSES230 | φ2×30 | 3 | 80 | D-157 |
| RSE230 | φ2×30 | 6 | 80 | D-161 |
| MHRH230 | φ2×35 | 1.6 | 80 | D-066 |
| MHR230 | φ2×35 | 3 | 80 | D-079 |
| MHRH230 | φ2×40 | 1.6 | 90 | D-066 |
| MHR230 | φ2×40 | 3 | 90 | D-079 |
| RSES230 | φ2×40 | 3 | 100 | D-157 |
| RSE230 | φ2×40 | 6 | 90 | D-161 |
| MHRH230 | φ2×50 | 1.6 | 100 | D-066 |
| MHR230 | φ2×50 | 3 | 100 | D-079 |
| RSES230 | φ2×50 | 3 | 100 | D-157 |
| RSE230 | φ2×50 | 6 | 110 | D-161 |
| MHR230 | φ2×60 | 3 | 110 | D-079 |
| RSES230 | φ2×60 | 3 | 120 | D-158 |
| RSE230 | φ2×60 | 6 | 110 | D-161 |
| RSES230 | φ2×70 | 3 | 150 | D-158 |
| RSE230 | φ2×70 | 6 | 110 | D-162 |
| **φ2.05** | | | | |
| MSE230 | φ2.05 | 5 | 45 | D-028 |
| **φ2.1** | | | | |
| NX-25 | φ2.1 | 2.1 | 40 | D-098 |
| MSE230SS | φ2.1 | 2.1 | 45 | D-026 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSZ345 | φ2.1 | 3.2 | 45 | D-052 |
| NX-30 | φ2.1 | 4.2 | 40 | D-100 |
| MXH230 | φ2.1 | 4.2 | 45 | D-002 |
| MXH230P | φ2.1 | 4.2 | 45 | D-006 |
| MX230 | φ2.1 | 4.2 | 45 | D-016 |
| NC-4 | φ2.1 | 4.2 | 45 | D-119 |
| AL2D-2 | φ2.1 | 4.2 | 45 | D-135 |
| MSE230 | φ2.1 | 5.5 | 45 | D-028 |
| MXH235 | φ2.1 | 6.3 | 45 | D-003 |
| MXH235P | φ2.1 | 6.3 | 45 | D-007 |
| MX235 | φ2.1 | 6.3 | 45 | D-018 |
| NX-35 | φ2.1 | 6.3 | 45 | D-102 |
| MX240 | φ2.1 | 8.4 | 45 | D-019 |
| NX-40 | φ2.1 | 8.4 | 50 | D-104 |
| NX-45 | φ2.1 | 10.5 | 50 | D-106 |
| ALZ345 | φ2.1×6.3 | 3.2 | 45 | D-140 |
| **φ2.15** | | | | |
| MSE230 | φ2.15 | 5.5 | 45 | D-028 |
| **φ2.2** | | | | |
| NX-25 | φ2.2 | 2.2 | 40 | D-098 |
| MSE230SS | φ2.2 | 2.2 | 45 | D-026 |
| MSZ345 | φ2.2 | 3.3 | 45 | D-052 |
| NX-30 | φ2.2 | 4.4 | 40 | D-100 |
| MXH230 | φ2.2 | 4.4 | 45 | D-002 |
| MXH230P | φ2.2 | 4.4 | 45 | D-006 |
| MX230 | φ2.2 | 4.4 | 45 | D-016 |
| NC-4 | φ2.2 | 4.4 | 45 | D-119 |
| AL2D-2 | φ2.2 | 4.4 | 45 | D-135 |
| MSE230 | φ2.2 | 5.5 | 45 | D-028 |
| MXH235 | φ2.2 | 6.6 | 45 | D-003 |
| MXH235P | φ2.2 | 6.6 | 45 | D-007 |
| MX235 | φ2.2 | 6.6 | 45 | D-018 |
| NX-35 | φ2.2 | 6.6 | 45 | D-102 |
| MX240 | φ2.2 | 8.8 | 45 | D-019 |
| NX-40 | φ2.2 | 8.8 | 50 | D-104 |
| NX-45 | φ2.2 | 11 | 50 | D-106 |
| ALZ345 | φ2.2×6.6 | 3.3 | 45 | D-140 |
| **φ2.25** | | | | |
| MSE230 | φ2.25 | 5.5 | 45 | D-028 |
| **φ2.3** | | | | |
| NX-25 | φ2.3 | 2.3 | 40 | D-098 |
| MSE230SS | φ2.3 | 2.3 | 45 | D-026 |
| MSZ345 | φ2.3 | 3.5 | 45 | D-052 |
| NX-30 | φ2.3 | 4.6 | 40 | D-100 |
| MXH230 | φ2.3 | 4.6 | 45 | D-002 |
| MXH230P | φ2.3 | 4.6 | 45 | D-006 |
| MX230 | φ2.3 | 4.6 | 45 | D-016 |
| NC-4 | φ2.3 | 4.6 | 45 | D-119 |
| AL2D-2 | φ2.3 | 4.6 | 45 | D-135 |
| MSE230 | φ2.3 | 6 | 45 | D-028 |
| MXH235 | φ2.3 | 6.9 | 45 | D-003 |
| MXH235P | φ2.3 | 6.9 | 45 | D-007 |
| MX235 | φ2.3 | 6.9 | 45 | D-018 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NX-35 | φ2.3 | 6.9 | 45 | D-102 |
| MX240 | φ2.3 | 9.2 | 45 | D-019 |
| NX-40 | φ2.3 | 9.2 | 50 | D-104 |
| NX-45 | φ2.3 | 11.5 | 50 | D-106 |
| ALZ345 | φ2.3×6.9 | 3.5 | 45 | D-140 |
| **φ2.35** | | | | |
| MSE230 | φ2.35 | 6 | 45 | D-028 |
| **φ2.4** | | | | |
| NX-25 | φ2.4 | 2.4 | 40 | D-098 |
| MSE230SS | φ2.4 | 2.4 | 45 | D-026 |
| MSZ345 | φ2.4 | 3.6 | 45 | D-052 |
| NX-30 | φ2.4 | 4.8 | 40 | D-100 |
| MXH230 | φ2.4 | 4.8 | 45 | D-002 |
| MXH230P | φ2.4 | 4.8 | 45 | D-006 |
| MX230 | φ2.4 | 4.8 | 45 | D-016 |
| NC-4 | φ2.4 | 4.8 | 45 | D-119 |
| AL2D-2 | φ2.4 | 4.8 | 45 | D-135 |
| MSE230 | φ2.4 | 6 | 45 | D-028 |
| MXH235 | φ2.4 | 7.2 | 45 | D-003 |
| MXH235P | φ2.4 | 7.2 | 45 | D-007 |
| MX235 | φ2.4 | 7.2 | 45 | D-018 |
| NX-35 | φ2.4 | 7.2 | 45 | D-102 |
| MX240 | φ2.4 | 9.6 | 45 | D-019 |
| NX-40 | φ2.4 | 9.6 | 50 | D-104 |
| NX-45 | φ2.4 | 12 | 50 | D-106 |
| ALZ345 | φ2.4×7.2 | 3.6 | 45 | D-140 |
| **φ2.45** | | | | |
| MSE230 | φ2.45 | 6 | 45 | D-028 |
| **φ2.5** | | | | |
| NX-25 | φ2.5 | 2.5 | 40 | D-098 |
| MXH225 | φ2.5 | 2.5 | 45 | D-001 |
| MXH225P | φ2.5 | 2.5 | 45 | D-005 |
| MX225 | φ2.5 | 2.5 | 45 | D-016 |
| MSE230SS | φ2.5 | 2.5 | 45 | D-026 |
| MX425 | φ2.5 | 2.5 | 45 | D-032 |
| MSZ345 | φ2.5 | 3.8 | 45 | D-052 |
| NX-30X | φ2.5 | 5 | 40 | D-062 |
| NX-30 | φ2.5 | 5 | 40 | D-100 |
| MXH230 | φ2.5 | 5 | 45 | D-002 |
| MXH230P | φ2.5 | 5 | 45 | D-006 |
| MX230 | φ2.5 | 5 | 45 | D-017 |
| MSES230P | φ2.5 | 5 | 45 | D-027 |
| MX430 | φ2.5 | 5 | 45 | D-032 |
| NC-2 | φ2.5 | 5 | 45 | D-113 |
| NC-4 | φ2.5 | 5 | 45 | D-119 |
| NSL-2 | φ2.5 | 5 | 45 | D-130 |
| AL2D-2 | φ2.5 | 5 | 45 | D-135 |
| AL2D-2DLC | φ2.5 | 5 | 45 | D-138 |
| DX | φ2.5 | 5 | 45 | D-167 |
| NC-LS-2 | φ2.5 | 5 | 100 | D-115 |
| MSE230 | φ2.5 | 7 | 45 | D-028 |
| MSE230M | φ2.5 | 7 | 45 | D-029 |
| MSE430 | φ2.5 | 7 | 45 | D-040 |



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| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSE430P | φ2.5 | 7 | 45 | D-040 |
| MSE245 | φ2.5 | 7 | 45 | D-044 |
| MSE445 | φ2.5 | 7 | 45 | D-045 |
| MXH235 | φ2.5 | 7.5 | 45 | D-003 |
| MXH235P | φ2.5 | 7.5 | 45 | D-007 |
| MX235 | φ2.5 | 7.5 | 45 | D-018 |
| MX435 | φ2.5 | 7.5 | 45 | D-033 |
| NX-35 | φ2.5 | 7.5 | 45 | D-102 |
| AL3D-2 | φ2.5 | 7.5 | 45 | D-136 |
| AL3D-2DLC | φ2.5 | 7.5 | 45 | D-138 |
| NCM-2 | φ2.5 | 8 | 45 | D-114 |
| NCM-4 | φ2.5 | 8 | 45 | D-121 |
| NE-2 | φ2.5 | 8 | 45 | D-125 |
| MXH240 | φ2.5 | 10 | 45 | D-004 |
| MX240 | φ2.5 | 10 | 45 | D-019 |
| MX440 | φ2.5 | 10 | 45 | D-033 |
| MSEM230 | φ2.5 | 10 | 50 | D-029 |
| MSEM430 | φ2.5 | 10 | 50 | D-041 |
| NX-40 | φ2.5 | 10 | 50 | D-104 |
| AL4D-2 | φ2.5 | 10 | 50 | D-136 |
| AL4D-2DLC | φ2.5 | 10 | 50 | D-139 |
| NCL-2 | φ2.5 | 12 | 50 | D-115 |
| MXH245 | φ2.5 | 12.5 | 50 | D-004 |
| MX245 | φ2.5 | 12.5 | 50 | D-020 |
| MX445 | φ2.5 | 12.5 | 50 | D-034 |
| NX-45 | φ2.5 | 12.5 | 50 | D-106 |
| AL5D-2 | φ2.5 | 12.5 | 50 | D-137 |
| AL5D-2DLC | φ2.5 | 12.5 | 50 | D-139 |
| ALZ345-DLC | φ2.5×7.5 | 3.8 | 45 | D-143 |
| ALZ345 | φ2.5×7.5 | 3.8 | 45 | D-140 |
| MHRH230 | φ2.5×8 | 2 | 50 | D-066 |
| MHRH430 | φ2.5×8 | 2 | 50 | D-068 |
| NHR-2X | φ2.5×8 | 3.7 | 45 | D-095 |
| NHR-2 | φ2.5×8 | 3.7 | 45 | D-133 |
| MHR230 | φ2.5×8 | 3.7 | 50 | D-079 |
| MHR430 | φ2.5×8 | 3.7 | 50 | D-083 |
| MHR230 | φ2.5×10 | 3.7 | 50 | D-079 |
| MHRH230 | φ2.5×12 | 2 | 50 | D-066 |
| MHRH430 | φ2.5×12 | 2 | 50 | D-068 |
| NHR-2X | φ2.5×12 | 3.7 | 45 | D-095 |
| NHR-2 | φ2.5×12 | 3.7 | 45 | D-133 |
| MHR230 | φ2.5×12 | 3.7 | 50 | D-079 |
| MHR430 | φ2.5×12 | 3.7 | 50 | D-083 |
| MHR230 | φ2.5×14 | 3.7 | 50 | D-079 |
| MHRH230 | φ2.5×16 | 2 | 60 | D-066 |
| MHRH430 | φ2.5×16 | 2 | 60 | D-068 |
| NHR-2X | φ2.5×16 | 3.7 | 55 | D-095 |
| NHR-2 | φ2.5×16 | 3.7 | 55 | D-133 |
| MHR230 | φ2.5×16 | 3.7 | 60 | D-079 |
| MHR430 | φ2.5×16 | 3.7 | 60 | D-083 |
| MHR230 | φ2.5×18 | 3.7 | 60 | D-079 |
| MHRH230 | φ2.5×20 | 2 | 60 | D-066 |
| MHRH430 | φ2.5×20 | 2 | 60 | D-068 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHR230 | φ2.5×20 | 3.7 | 60 | D-079 |
| MHR430 | φ2.5×20 | 3.7 | 60 | D-083 |
| NHR-2X | φ2.5×20 | 3.7 | 60 | D-095 |
| NHR-2 | φ2.5×20 | 3.7 | 60 | D-133 |
| MHRH430 | φ2.5×25 | 2 | 70 | D-068 |
| MHR230 | φ2.5×25 | 3.7 | 70 | D-079 |
| MHR430 | φ2.5×25 | 3.7 | 70 | D-083 |
| MHRH230 | φ2.5×30 | 2 | 70 | D-066 |
| MHR230 | φ2.5×30 | 3.7 | 70 | D-079 |
| MHRH230 | φ2.5×40 | 2 | 90 | D-066 |
| MHR230 | φ2.5×40 | 3.7 | 90 | D-079 |
| MHRH230 | φ2.5×50 | 2 | 100 | D-066 |
| MHR230 | φ2.5×50 | 3.7 | 100 | D-079 |
| **φ2.55** | | | | |
| MSE230 | φ2.55 | 7 | 45 | D-028 |
| **φ2.6** | | | | |
| NX-25 | φ2.6 | 2.6 | 40 | D-098 |
| MSE230SS | φ2.6 | 2.6 | 45 | D-026 |
| MSZ345 | φ2.6 | 3.9 | 45 | D-052 |
| MXH230 | φ2.6 | 5.2 | 45 | D-002 |
| MXH230P | φ2.6 | 5.2 | 45 | D-006 |
| MX230 | φ2.6 | 5.2 | 45 | D-017 |
| AL2D-2 | φ2.6 | 5.2 | 45 | D-135 |
| NX-30 | φ2.6 | 5.2 | 45 | D-100 |
| NC-4 | φ2.6 | 5.2 | 45 | D-119 |
| MSE230 | φ2.6 | 7 | 45 | D-028 |
| MXH235 | φ2.6 | 7.8 | 45 | D-003 |
| MXH235P | φ2.6 | 7.8 | 45 | D-007 |
| MX235 | φ2.6 | 7.8 | 45 | D-018 |
| NX-35 | φ2.6 | 7.8 | 45 | D-102 |
| MX240 | φ2.6 | 10.4 | 50 | D-019 |
| NX-40 | φ2.6 | 10.4 | 50 | D-104 |
| NX-45 | φ2.6 | 13 | 55 | D-106 |
| ALZ345 | φ2.6×7.8 | 3.9 | 55 | D-140 |
| **φ2.65** | | | | |
| MSE230 | φ2.65 | 7 | 45 | D-028 |
| **φ2.7** | | | | |
| NX-25 | φ2.7 | 2.7 | 40 | D-098 |
| MSE230SS | φ2.7 | 2.7 | 45 | D-026 |
| MSZ345 | φ2.7 | 4.1 | 45 | D-052 |
| MXH230 | φ2.7 | 5.4 | 45 | D-002 |
| MXH230P | φ2.7 | 5.4 | 45 | D-006 |
| MX230 | φ2.7 | 5.4 | 45 | D-017 |
| AL2D-2 | φ2.7 | 5.4 | 45 | D-135 |
| NX-30 | φ2.7 | 5.4 | 45 | D-100 |
| NC-4 | φ2.7 | 5.4 | 45 | D-119 |
| MSE230 | φ2.7 | 7 | 45 | D-028 |
| MXH235 | φ2.7 | 8.1 | 45 | D-003 |
| MXH235P | φ2.7 | 8.1 | 45 | D-007 |
| MX235 | φ2.7 | 8.1 | 45 | D-018 |
| NX-35 | φ2.7 | 8.1 | 45 | D-102 |
| MX240 | φ2.7 | 10.8 | 50 | D-019 |
| NX-40 | φ2.7 | 10.8 | 50 | D-104 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NX-45 | φ2.7 | 13.5 | 55 | D-106 |
| ALZ345 | φ2.7×8.1 | 4.1 | 55 | D-140 |
| **φ2.75** | | | | |
| MSE230 | φ2.75 | 7 | 45 | D-028 |
| **φ2.8** | | | | |
| NX-25 | φ2.8 | 2.8 | 40 | D-098 |
| MSE230SS | φ2.8 | 2.8 | 45 | D-026 |
| MSZ345 | φ2.8 | 4.2 | 45 | D-052 |
| MXH230 | φ2.8 | 5.6 | 45 | D-002 |
| MXH230P | φ2.8 | 5.6 | 45 | D-006 |
| MX230 | φ2.8 | 5.6 | 45 | D-017 |
| AL2D-2 | φ2.8 | 5.6 | 45 | D-135 |
| NX-30 | φ2.8 | 5.6 | 45 | D-100 |
| NC-4 | φ2.8 | 5.6 | 45 | D-119 |
| MSE230 | φ2.8 | 7 | 45 | D-028 |
| MXH235 | φ2.8 | 8.4 | 45 | D-003 |
| MXH235P | φ2.8 | 8.4 | 45 | D-007 |
| MX235 | φ2.8 | 8.4 | 45 | D-018 |
| NX-35 | φ2.8 | 8.4 | 45 | D-102 |
| MX240 | φ2.8 | 11.2 | 50 | D-019 |
| NX-40 | φ2.8 | 11.2 | 50 | D-104 |
| NX-45 | φ2.8 | 14 | 55 | D-106 |
| ALZ345 | φ2.8×8.4 | 4.2 | 55 | D-140 |
| **φ2.85** | | | | |
| MSE230 | φ2.85 | 8 | 50 | D-028 |
| **φ2.9** | | | | |
| NX-25 | φ2.9 | 2.9 | 40 | D-098 |
| MSE230SS | φ2.9 | 2.9 | 50 | D-026 |
| MSZ345 | φ2.9 | 4.5 | 45 | D-052 |
| MXH230 | φ2.9 | 5.8 | 45 | D-002 |
| MXH230P | φ2.9 | 5.8 | 45 | D-006 |
| MX230 | φ2.9 | 5.8 | 45 | D-017 |
| NX-30 | φ2.9 | 5.8 | 45 | D-100 |
| NC-4 | φ2.9 | 5.8 | 45 | D-119 |
| AL2D-2 | φ2.9 | 5.8 | 50 | D-135 |
| MSE230 | φ2.9 | 8 | 50 | D-028 |
| MXH235 | φ2.9 | 8.7 | 45 | D-003 |
| MXH235P | φ2.9 | 8.7 | 45 | D-007 |
| MX235 | φ2.9 | 8.7 | 45 | D-018 |
| NX-35 | φ2.9 | 8.7 | 45 | D-102 |
| MX240 | φ2.9 | 11.6 | 50 | D-019 |
| NX-40 | φ2.9 | 11.6 | 50 | D-104 |
| NX-45 | φ2.9 | 14.5 | 55 | D-106 |
| ALZ345 | φ2.9×8.7 | 4.4 | 55 | D-140 |
| **φ2.95** | | | | |
| MSE230 | φ2.95 | 8 | 50 | D-028 |
| **φ3** | | | | |
| NX-25 | φ3 | 3 | 40 | D-098 |
| MXH225 | φ3 | 3 | 45 | D-001 |
| MXH225P | φ3 | 3 | 45 | D-005 |
| MX225 | φ3 | 3 | 45 | D-016 |
| MX425 | φ3 | 3 | 45 | D-032 |
| MSE230SS | φ3 | 3 | 50 | D-026 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| RSES230 | φ3 | 4.5 | 80 | D-158 |
| MXH230 | φ3 | 6 | 45 | D-002 |
| MXH230P | φ3 | 6 | 45 | D-006 |
| MX230 | φ3 | 6 | 45 | D-017 |
| MX430 | φ3 | 6 | 45 | D-032 |
| NX-30X | φ3 | 6 | 45 | D-062 |
| NX-30 | φ3 | 6 | 45 | D-100 |
| NC-2 | φ3 | 6 | 45 | D-113 |
| NC-4 | φ3 | 6 | 45 | D-119 |
| NSL-2 | φ3 | 6 | 45 | D-130 |
| MSES230P | φ3 | 6 | 50 | D-027 |
| MSZ345 | φ3 | 6 | 50 | D-052 |
| AL2D-2 | φ3 | 6 | 50 | D-135 |
| AL2D-2DLC | φ3 | 6 | 50 | D-138 |
| DX | φ3 | 6 | 50 | D-167 |
| MHDH445 | φ3 | 6 | 60 | D-057 |
| MHD445 | φ3 | 6 | 60 | D-059 |
| NC-LS-2 | φ3 | 6 | 120 | D-115 |
| NE-2 | φ3 | 8 | 45 | D-125 |
| NE-3 | φ3 | 8 | 45 | D-125 |
| NE-4 | φ3 | 8 | 45 | D-126 |
| MSE430P | φ3 | 8 | 50 | D-040 |
| MSE230 | φ3 | 8 | 50 | D-028 |
| MSE230M | φ3 | 8 | 50 | D-029 |
| MSE430 | φ3 | 8 | 50 | D-040 |
| MSE245 | φ3 | 8 | 50 | D-044 |
| MSE345 | φ3 | 8 | 50 | D-044 |
| MSE445 | φ3 | 8 | 50 | D-045 |
| MSX440 | φ3 | 8 | 55 | D-055 |
| DCSE235 | φ3 | 9 | 45 | C-010 |
| MXH235 | φ3 | 9 | 45 | D-003 |
| MXH235P | φ3 | 9 | 45 | D-007 |
| MX235 | φ3 | 9 | 45 | D-018 |
| MX435 | φ3 | 9 | 45 | D-033 |
| NX-35 | φ3 | 9 | 45 | D-102 |
| AL3D-2 | φ3 | 9 | 50 | D-136 |
| AL3D-2DLC | φ3 | 9 | 50 | D-138 |
| RSE230 | φ3 | 9 | 50 | D-162 |
| AL3D-345 | φ3 | 9 | 60 | D-137 |
| RSE230 | φ3 | 9 | 100 | D-162 |
| NCM-2 | φ3 | 10 | 45 | D-114 |
| NCM-4 | φ3 | 10 | 45 | D-121 |
| NEA-2 | φ3 | 10 | 50 | D-144 |
| MXH240 | φ3 | 12 | 50 | D-004 |
| MX240 | φ3 | 12 | 50 | D-019 |
| MX440 | φ3 | 12 | 50 | D-033 |
| NX-40 | φ3 | 12 | 50 | D-104 |
| MSEM230 | φ3 | 12 | 55 | D-029 |
| MSEM430 | φ3 | 12 | 55 | D-041 |
| AL4D-2 | φ3 | 12 | 55 | D-136 |
| AL4D-2DLC | φ3 | 12 | 55 | D-139 |
| DXM | φ3 | 12 | 60 | D-167 |
| MXH245 | φ3 | 15 | 55 | D-004 |


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| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MX245 | φ3 | 15 | 55 | D-020 |
| MX445 | φ3 | 15 | 55 | D-034 |
| NX-45 | φ3 | 15 | 55 | D-106 |
| NEA-2 | φ3 | 15 | 55 | D-144 |
| AL5D-2 | φ3 | 15 | 55 | D-137 |
| AL5D-2DLC | φ3 | 15 | 55 | D-139 |
| RSE230 | φ3 | 15 | 60 | D-162 |
| DXL | φ3 | 15 | 70 | D-168 |
| RSE230 | φ3 | 15 | 100 | D-162 |
| NCL-2 | φ3 | 18 | 60 | D-115 |
| NCL-4 | φ3 | 18 | 60 | D-121 |
| NEA-2 | φ3 | 20 | 60 | D-144 |
| RSE230 | φ3 | 20 | 60 | D-162 |
| RSE230 | φ3 | 25 | 70 | D-162 |
| RSE230 | φ3 | 30 | 70 | D-162 |
| DSF | φ3×3 | 1.5 | 60 | D-168 |
| NHR-2X | φ3×8 | 4.5 | 45 | D-095 |
| NHR-2 | φ3×8 | 4.5 | 45 | D-133 |
| MHRH230 | φ3×8 | 4.5 | 50 | D-066 |
| MHRH430 | φ3×8 | 4.5 | 50 | D-068 |
| MHR230 | φ3×8 | 4.5 | 50 | D-079 |
| MHR430 | φ3×8 | 4.5 | 50 | D-083 |
| ALZ345-DLC | φ3×9 | 4.5 | 55 | D-143 |
| ALZ345 | φ3×9 | 4.5 | 55 | D-140 |
| MHR230 | φ3×10 | 4.5 | 50 | D-079 |
| RSES230 | φ3×10 | 4.5 | 80 | D-158 |
| DHR237 | φ3×10 | 6 | 50 | D-165 |
| NHR-2X | φ3×12 | 4.5 | 45 | D-095 |
| NHR-2 | φ3×12 | 4.5 | 45 | D-133 |
| MHRH230 | φ3×12 | 4.5 | 50 | D-066 |
| MHRH430 | φ3×12 | 4.5 | 50 | D-068 |
| MHR230 | φ3×12 | 4.5 | 50 | D-079 |
| MHR430 | φ3×12 | 4.5 | 50 | D-083 |
| RSES230 | φ3×12 | 4.5 | 80 | D-158 |
| MHR230 | φ3×14 | 4.5 | 50 | D-079 |
| ALZ345 | φ3×15 | 4.5 | 60 | D-140 |
| RSES230 | φ3×15 | 4.5 | 80 | D-158 |
| DHR237 | φ3×15 | 6 | 60 | D-165 |
| RSE230 | φ3×15 | 9 | 60 | D-162 |
| NHR-2X | φ3×16 | 4.5 | 55 | D-095 |
| NHR-2 | φ3×16 | 4.5 | 55 | D-133 |
| MHRH230 | φ3×16 | 4.5 | 60 | D-066 |
| MHRH430 | φ3×16 | 4.5 | 60 | D-068 |
| MHR230 | φ3×16 | 4.5 | 60 | D-079 |
| MHR430 | φ3×16 | 4.5 | 60 | D-083 |
| DCHR230 | φ3×16 | 6 | 60 | C-012 |
| MHR230 | φ3×18 | 4.5 | 60 | D-079 |
| MHRH230 | φ3×20 | 4.5 | 60 | D-066 |
| MHRH430 | φ3×20 | 4.5 | 60 | D-068 |
| MHR230 | φ3×20 | 4.5 | 60 | D-079 |
| MHR430 | φ3×20 | 4.5 | 60 | D-083 |
| NHR-2X | φ3×20 | 4.5 | 60 | D-095 |
| NHR-2 | φ3×20 | 4.5 | 60 | D-133 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| RSES230 | φ3×20 | 4.5 | 80 | D-158 |
| DHR237 | φ3×20 | 6 | 60 | D-165 |
| RSE230 | φ3×20 | 9 | 60 | D-162 |
| RSES230 | φ3×24 | 4.5 | 80 | D-158 |
| RSE230 | φ3×24 | 9 | 70 | D-162 |
| NHR-2X | φ3×25 | 4.5 | 65 | D-095 |
| NHR-2 | φ3×25 | 4.5 | 65 | D-133 |
| MHRH230 | φ3×25 | 4.5 | 70 | D-066 |
| MHRH430 | φ3×25 | 4.5 | 70 | D-068 |
| MHR230 | φ3×25 | 4.5 | 70 | D-079 |
| MHR430 | φ3×25 | 4.5 | 70 | D-083 |
| DHR237 | φ3×25 | 6 | 70 | D-165 |
| MHRH230 | φ3×30 | 4.5 | 70 | D-066 |
| MHRH430 | φ3×30 | 4.5 | 70 | D-068 |
| MHR230 | φ3×30 | 4.5 | 70 | D-079 |
| MHR430 | φ3×30 | 4.5 | 70 | D-083 |
| RSES230 | φ3×30 | 4.5 | 80 | D-158 |
| DCHR230 | φ3×30 | 6 | 70 | C-012 |
| RSE230 | φ3×30 | 9 | 70 | D-162 |
| MHR230 | φ3×35 | 4.5 | 80 | D-079 |
| RSES230 | φ3×36 | 4.5 | 80 | D-158 |
| RSE230 | φ3×36 | 9 | 80 | D-162 |
| MHR230 | φ3×40 | 4.5 | 90 | D-080 |
| RSES230 | φ3×45 | 4.5 | 100 | D-158 |
| RSE230 | φ3×45 | 9 | 90 | D-162 |
| MHR230 | φ3×50 | 4.5 | 100 | D-080 |
| RSES230 | φ3×60 | 4.5 | 120 | D-158 |
| RSE230 | φ3×60 | 9 | 110 | D-162 |
| RSES230 | φ3×75 | 4.5 | 150 | D-158 |
| RSE230 | φ3×75 | 9 | 120 | D-162 |
| **φ3.1** | | | | |
| NX-25 | φ3.1 | 3.1 | 40 | D-098 |
| MSE230SS | φ3.1 | 3.1 | 50 | D-026 |
| MX230 | φ3.1 | 6.2 | 45 | D-017 |
| NX-30 | φ3.1 | 6.2 | 45 | D-100 |
| NC-4 | φ3.1 | 6.2 | 45 | D-119 |
| MSZ345 | φ3.1 | 6.2 | 50 | D-052 |
| MSE230 | φ3.1 | 8 | 50 | D-028 |
| MX235 | φ3.1 | 9.3 | 45 | D-018 |
| NX-35 | φ3.1 | 9.3 | 50 | D-102 |
| MX240 | φ3.1 | 12.4 | 50 | D-019 |
| NX-40 | φ3.1 | 12.4 | 55 | D-104 |
| NX-45 | φ3.1 | 15.5 | 60 | D-106 |
| ALZ345 | φ3.1×9.3 | 4.7 | 55 | D-140 |
| **φ3.2** | | | | |
| NX-25 | φ3.2 | 3.2 | 40 | D-098 |
| MSE230SS | φ3.2 | 3.2 | 50 | D-026 |
| MX230 | φ3.2 | 6.4 | 45 | D-017 |
| NX-30 | φ3.2 | 6.4 | 45 | D-100 |
| NC-4 | φ3.2 | 6.4 | 45 | D-119 |
| MSZ345 | φ3.2 | 6.4 | 50 | D-052 |
| MSE230 | φ3.2 | 8 | 50 | D-028 |
| MX235 | φ3.2 | 9.6 | 45 | D-018 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NX-35 | φ3.2 | 9.6 | 50 | D-102 |
| MX240 | φ3.2 | 12.8 | 50 | D-019 |
| NX-40 | φ3.2 | 12.8 | 55 | D-104 |
| NX-45 | φ3.2 | 16 | 60 | D-106 |
| ALZ345 | φ3.2×9.6 | 4.8 | 55 | D-140 |
| **φ3.3** | | | | |
| NX-25 | φ3.3 | 3.3 | 40 | D-098 |
| MSE230SS | φ3.3 | 3.3 | 50 | D-026 |
| MX230 | φ3.3 | 6.6 | 45 | D-017 |
| NX-30 | φ3.3 | 6.6 | 45 | D-100 |
| NC-4 | φ3.3 | 6.6 | 45 | D-119 |
| MSZ345 | φ3.3 | 6.6 | 50 | D-052 |
| MSE230 | φ3.3 | 9 | 50 | D-028 |
| MX235 | φ3.3 | 9.9 | 45 | D-018 |
| NX-35 | φ3.3 | 9.9 | 50 | D-102 |
| MX240 | φ3.3 | 13.2 | 50 | D-019 |
| NX-40 | φ3.3 | 13.2 | 55 | D-104 |
| NX-45 | φ3.3 | 16.5 | 60 | D-106 |
| ALZ345 | φ3.3×9.9 | 5 | 55 | D-141 |
| **φ3.4** | | | | |
| NX-25 | φ3.4 | 3.4 | 40 | D-098 |
| MSE230SS | φ3.4 | 3.4 | 50 | D-026 |
| MX230 | φ3.4 | 6.8 | 45 | D-017 |
| NX-30 | φ3.4 | 6.8 | 45 | D-100 |
| NC-4 | φ3.4 | 6.8 | 45 | D-119 |
| MSZ345 | φ3.4 | 6.8 | 50 | D-052 |
| MSE230 | φ3.4 | 9 | 50 | D-028 |
| MX235 | φ3.4 | 10.2 | 45 | D-018 |
| NX-35 | φ3.4 | 10.2 | 50 | D-102 |
| MX240 | φ3.4 | 13.6 | 50 | D-019 |
| NX-40 | φ3.4 | 13.6 | 55 | D-104 |
| NX-45 | φ3.4 | 17 | 60 | D-106 |
| ALZ345 | φ3.4×10.2 | 5.1 | 55 | D-141 |
| **φ3.5** | | | | |
| NX-25 | φ3.5 | 3.5 | 40 | D-098 |
| MX425 | φ3.5 | 3.5 | 45 | D-032 |
| MSE230SS | φ3.5 | 3.5 | 50 | D-026 |
| MXH230 | φ3.5 | 7 | 45 | D-002 |
| MXH230P | φ3.5 | 7 | 45 | D-006 |
| MX230 | φ3.5 | 7 | 45 | D-017 |
| MX430 | φ3.5 | 7 | 45 | D-032 |
| NX-30 | φ3.5 | 7 | 45 | D-100 |
| NC-2 | φ3.5 | 7 | 45 | D-113 |
| NC-4 | φ3.5 | 7 | 45 | D-119 |
| MSZ345 | φ3.5 | 7 | 50 | D-052 |
| AL2D-2 | φ3.5 | 7 | 50 | D-135 |
| AL2D-2DLC | φ3.5 | 7 | 50 | D-138 |
| NE-2 | φ3.5 | 9 | 45 | D-125 |
| MSE230 | φ3.5 | 9 | 50 | D-028 |
| MSE430 | φ3.5 | 9 | 50 | D-040 |
| NE-3 | φ3.5 | 10 | 45 | D-125 |
| MXH235 | φ3.5 | 10.5 | 45 | D-003 |
| MXH235P | φ3.5 | 10.5 | 45 | D-007 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MX235 | φ3.5 | 10.5 | 45 | D-018 |
| MX435 | φ3.5 | 10.5 | 45 | D-033 |
| NX-35 | φ3.5 | 10.5 | 50 | D-102 |
| NCM-2 | φ3.5 | 11 | 50 | D-114 |
| NCM-4 | φ3.5 | 11 | 50 | D-121 |
| MX240 | φ3.5 | 14 | 50 | D-019 |
| MX440 | φ3.5 | 14 | 50 | D-033 |
| NX-40 | φ3.5 | 14 | 55 | D-104 |
| MX445 | φ3.5 | 17.5 | 60 | D-034 |
| NX-45 | φ3.5 | 17.5 | 60 | D-106 |
| ALZ345-DLC | φ3.5×10.5 | 5.3 | 55 | D-143 |
| ALZ345 | φ3.5×10.5 | 5.3 | 55 | D-141 |
| NHR-2X | φ3.5×12 | 5.25 | 45 | D-095 |
| NHR-2 | φ3.5×12 | 5.25 | 45 | D-133 |
| MHR430 | φ3.5×15 | 5.5 | 60 | D-083 |
| NHR-2X | φ3.5×16 | 5.25 | 55 | D-095 |
| NHR-2 | φ3.5×16 | 5.25 | 55 | D-133 |
| NHR-2X | φ3.5×20 | 5.25 | 60 | D-095 |
| NHR-2 | φ3.5×20 | 5.25 | 60 | D-133 |
| NHR-2X | φ3.5×25 | 5.25 | 65 | D-095 |
| NHR-2 | φ3.5×25 | 5.25 | 65 | D-133 |
| MHR430 | φ3.5×25 | 5.5 | 70 | D-083 |
| NHR-2X | φ3.5×30 | 5.25 | 75 | D-095 |
| NHR-2 | φ3.5×30 | 5.25 | 75 | D-133 |
| MHR430 | φ3.5×35 | 5.5 | 80 | D-083 |
| **φ3.6** | | | | |
| NX-25 | φ3.6 | 3.6 | 40 | D-098 |
| MSE230SS | φ3.6 | 3.6 | 50 | D-026 |
| MX230 | φ3.6 | 7.2 | 45 | D-017 |
| NX-30 | φ3.6 | 7.2 | 45 | D-100 |
| NC-4 | φ3.6 | 7.2 | 45 | D-119 |
| MSZ345 | φ3.6 | 7.2 | 50 | D-052 |
| MSE230 | φ3.6 | 9 | 50 | D-028 |
| MX235 | φ3.6 | 10.8 | 45 | D-018 |
| NX-35 | φ3.6 | 10.8 | 50 | D-102 |
| MX240 | φ3.6 | 14.4 | 50 | D-019 |
| NX-40 | φ3.6 | 14.4 | 55 | D-104 |
| NX-45 | φ3.6 | 18 | 60 | D-106 |
| ALZ345 | φ3.6×10.8 | 5.4 | 55 | D-141 |
| **φ3.7** | | | | |
| NX-25 | φ3.7 | 3.7 | 40 | D-098 |
| MSE230SS | φ3.7 | 3.7 | 50 | D-026 |
| MX230 | φ3.7 | 7.4 | 45 | D-017 |
| NX-30 | φ3.7 | 7.4 | 45 | D-100 |
| NC-4 | φ3.7 | 7.4 | 45 | D-119 |
| MSZ345 | φ3.7 | 7.4 | 50 | D-052 |
| MSE230 | φ3.7 | 10 | 50 | D-028 |
| MX235 | φ3.7 | 11.1 | 45 | D-018 |
| NX-35 | φ3.7 | 11.1 | 50 | D-102 |
| MX240 | φ3.7 | 14.8 | 50 | D-019 |
| NX-40 | φ3.7 | 14.8 | 55 | D-104 |
| NX-45 | φ3.7 | 18.5 | 60 | D-106 |
| ALZ345 | φ3.7×11.1 | 5.6 | 55 | D-141 |


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| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| **φ3.8** | | | | |
| NX-25 | φ3.8 | 3.8 | 40 | D-098 |
| MSE230SS | φ3.8 | 3.8 | 50 | D-026 |
| MX230 | φ3.8 | 7.6 | 45 | D-017 |
| NX-30 | φ3.8 | 7.6 | 45 | D-100 |
| NC-4 | φ3.8 | 7.6 | 45 | D-119 |
| MSZ345 | φ3.8 | 7.6 | 50 | D-052 |
| MSE230 | φ3.8 | 10 | 50 | D-028 |
| MX235 | φ3.8 | 11.4 | 45 | D-018 |
| NX-35 | φ3.8 | 11.4 | 50 | D-102 |
| MX240 | φ3.8 | 15.2 | 50 | D-019 |
| NX-40 | φ3.8 | 15.2 | 55 | D-104 |
| NX-45 | φ3.8 | 19 | 60 | D-106 |
| ALZ345 | φ3.8×11.4 | 5.7 | 55 | D-141 |
| **φ3.9** | | | | |
| NX-25 | φ3.9 | 3.9 | 40 | D-098 |
| MSE230SS | φ3.9 | 3.9 | 50 | D-026 |
| MX230 | φ3.9 | 7.8 | 45 | D-017 |
| NX-30 | φ3.9 | 7.8 | 45 | D-100 |
| NC-4 | φ3.9 | 7.8 | 45 | D-119 |
| MSZ345 | φ3.9 | 7.8 | 50 | D-052 |
| MSE230 | φ3.9 | 10 | 50 | D-028 |
| MX235 | φ3.9 | 11.7 | 45 | D-018 |
| NX-35 | φ3.9 | 11.7 | 50 | D-102 |
| MX240 | φ3.9 | 15.6 | 50 | D-019 |
| NX-40 | φ3.9 | 15.6 | 55 | D-104 |
| NX-45 | φ3.9 | 19.5 | 60 | D-106 |
| ALZ345 | φ3.9×11.7 | 5.9 | 55 | D-141 |
| **φ4** | | | | |
| NX-25 | φ4 | 4 | 40 | D-098 |
| MXH225 | φ4 | 4 | 45 | D-001 |
| MXH225P | φ4 | 4 | 45 | D-005 |
| MX225 | φ4 | 4 | 45 | D-016 |
| MX425 | φ4 | 4 | 45 | D-032 |
| MSE230SS | φ4 | 4 | 50 | D-026 |
| RSES230 | φ4 | 6 | 80 | D-158 |
| MXH230 | φ4 | 8 | 45 | D-002 |
| MXH230P | φ4 | 8 | 45 | D-006 |
| MX230 | φ4 | 8 | 45 | D-017 |
| MX430 | φ4 | 8 | 45 | D-032 |
| NX-30X | φ4 | 8 | 45 | D-062 |
| NX-30 | φ4 | 8 | 45 | D-100 |
| NC-2 | φ4 | 8 | 45 | D-113 |
| NC-4 | φ4 | 8 | 45 | D-119 |
| NSL-2 | φ4 | 8 | 45 | D-130 |
| MSES230P | φ4 | 8 | 50 | D-027 |
| MSZ345 | φ4 | 8 | 50 | D-052 |
| AL2D-2 | φ4 | 8 | 50 | D-135 |
| AL2D-2DLC | φ4 | 8 | 50 | D-138 |
| DX | φ4 | 8 | 50 | D-167 |
| MHDH445 | φ4 | 8 | 60 | D-057 |
| MHD445 | φ4 | 8 | 60 | D-059 |
| NC-LS-2 | φ4 | 8 | 120 | D-115 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NE-2 | φ4 | 10 | 45 | D-125 |
| NE-3 | φ4 | 10 | 45 | D-125 |
| NE-4 | φ4 | 10 | 45 | D-126 |
| MSE430P | φ4 | 10 | 50 | D-040 |
| MSE230 | φ4 | 10 | 50 | D-028 |
| MSE230M | φ4 | 10 | 50 | D-029 |
| MSE430 | φ4 | 10 | 50 | D-040 |
| MSE245 | φ4 | 10 | 50 | D-044 |
| MSE345 | φ4 | 10 | 50 | D-044 |
| MSE445 | φ4 | 10 | 50 | D-045 |
| MSX440 | φ4 | 11 | 55 | D-055 |
| DCSE235 | φ4 | 12 | 50 | C-010 |
| MXH235 | φ4 | 12 | 50 | D-003 |
| MXH235P | φ4 | 12 | 50 | D-007 |
| MX235 | φ4 | 12 | 50 | D-018 |
| MX435 | φ4 | 12 | 50 | D-033 |
| NX-35 | φ4 | 12 | 50 | D-102 |
| NCM-2 | φ4 | 12 | 50 | D-114 |
| NEA-2 | φ4 | 12 | 50 | D-144 |
| NCM-4 | φ4 | 12 | 50 | D-121 |
| AL3D-2 | φ4 | 12 | 50 | D-136 |
| AL3D-2DLC | φ4 | 12 | 50 | D-138 |
| RSE230 | φ4 | 12 | 50 | D-162 |
| AL3D-345 | φ4 | 12 | 70 | D-137 |
| RSE230 | φ4 | 12 | 120 | D-162 |
| MXH240 | φ4 | 16 | 55 | D-004 |
| MX240 | φ4 | 16 | 55 | D-019 |
| MX440 | φ4 | 16 | 55 | D-033 |
| NX-40 | φ4 | 16 | 55 | D-104 |
| NEA-2 | φ4 | 16 | 55 | D-144 |
| MSEM230 | φ4 | 16 | 60 | D-029 |
| MSEM430 | φ4 | 16 | 60 | D-041 |
| AL4D-2 | φ4 | 16 | 60 | D-136 |
| AL4D-2DLC | φ4 | 16 | 60 | D-139 |
| DXM | φ4 | 16 | 60 | D-167 |
| MXH245 | φ4 | 20 | 60 | D-004 |
| MX245 | φ4 | 20 | 60 | D-020 |
| MX445 | φ4 | 20 | 60 | D-034 |
| NX-45 | φ4 | 20 | 60 | D-106 |
| AL5D-2 | φ4 | 20 | 60 | D-137 |
| AL5D-2DLC | φ4 | 20 | 60 | D-139 |
| RSE230 | φ4 | 20 | 60 | D-162 |
| DXL | φ4 | 20 | 70 | D-168 |
| RSE230 | φ4 | 20 | 120 | D-162 |
| NEA-2 | φ4 | 22 | 60 | D-144 |
| NCL-2 | φ4 | 22 | 60 | D-115 |
| NCL-4 | φ4 | 22 | 60 | D-121 |
| RSE230 | φ4 | 30 | 70 | D-162 |
| RSE230 | φ4 | 40 | 90 | D-162 |
| DSF | φ4×4 | 2 | 60 | D-168 |
| RSES230 | φ4×10 | 6 | 80 | D-158 |
| NHR-2X | φ4×12 | 6 | 45 | D-095 |
| NHR-2 | φ4×12 | 6 | 45 | D-133 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHRH430 | φ4×12 | 6 | 50 | D-068 |
| MHR230 | φ4×12 | 6 | 50 | D-080 |
| MHR430 | φ4×12 | 6 | 50 | D-083 |
| ALZ345-DLC | φ4×12 | 6 | 55 | D-143 |
| ALZ345 | φ4×12 | 6 | 55 | D-141 |
| RSES230 | φ4×15 | 6 | 80 | D-158 |
| DHR237 | φ4×15 | 8 | 60 | D-165 |
| NHR-2X | φ4×16 | 6 | 55 | D-095 |
| NHR-2 | φ4×16 | 6 | 55 | D-133 |
| MHRH430 | φ4×16 | 6 | 60 | D-068 |
| MHR230 | φ4×16 | 6 | 60 | D-080 |
| MHR430 | φ4×16 | 6 | 60 | D-083 |
| MHRH430 | φ4×20 | 6 | 60 | D-068 |
| MHR230 | φ4×20 | 6 | 60 | D-080 |
| MHR430 | φ4×20 | 6 | 60 | D-083 |
| NHR-2X | φ4×20 | 6 | 60 | D-095 |
| NHR-2 | φ4×20 | 6 | 60 | D-133 |
| ALZ345 | φ4×20 | 6 | 70 | D-141 |
| RSES230 | φ4×20 | 6 | 80 | D-158 |
| DCHR230 | φ4×20 | 8 | 60 | C-012 |
| DHR237 | φ4×20 | 8 | 60 | D-165 |
| RSE230 | φ4×20 | 12 | 60 | D-162 |
| NHR-2X | φ4×25 | 6 | 65 | D-095 |
| NHR-2 | φ4×25 | 6 | 65 | D-133 |
| MHRH430 | φ4×25 | 6 | 70 | D-068 |
| MHR230 | φ4×25 | 6 | 70 | D-080 |
| MHR430 | φ4×25 | 6 | 70 | D-083 |
| DHR237 | φ4×25 | 8 | 70 | D-165 |
| MHRH430 | φ4×30 | 6 | 70 | D-068 |
| MHR230 | φ4×30 | 6 | 70 | D-080 |
| MHR430 | φ4×30 | 6 | 70 | D-083 |
| NHR-2X | φ4×30 | 6 | 70 | D-095 |
| NHR-2 | φ4×30 | 6 | 70 | D-133 |
| RSES230 | φ4×30 | 6 | 80 | D-158 |
| DHR237 | φ4×30 | 8 | 70 | D-165 |
| RSE230 | φ4×30 | 12 | 70 | D-162 |
| NHR-2X | φ4×35 | 6 | 75 | D-095 |
| NHR-2 | φ4×35 | 6 | 75 | D-133 |
| MHRH430 | φ4×35 | 6 | 80 | D-068 |
| MHR230 | φ4×35 | 6 | 80 | D-080 |
| MHR430 | φ4×35 | 6 | 80 | D-083 |
| MHRH430 | φ4×40 | 6 | 90 | D-068 |
| MHR230 | φ4×40 | 6 | 90 | D-080 |
| MHR430 | φ4×40 | 6 | 90 | D-083 |
| RSES230 | φ4×40 | 6 | 100 | D-158 |
| DCHR230 | φ4×40 | 8 | 90 | C-012 |
| RSE230 | φ4×40 | 12 | 90 | D-162 |
| MHR230 | φ4×45 | 6 | 90 | D-080 |
| MHR430 | φ4×45 | 6 | 90 | D-083 |
| MHR230 | φ4×50 | 6 | 100 | D-080 |
| MHR430 | φ4×50 | 6 | 100 | D-083 |
| RSES230 | φ4×55 | 6 | 120 | D-158 |
| RSE230 | φ4×55 | 12 | 110 | D-162 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHR230 | φ4×60 | 6 | 110 | D-080 |
| RSES230 | φ4×70 | 6 | 150 | D-158 |
| RSE230 | φ4×70 | 12 | 120 | D-162 |
| **φ4.1** | | | | |
| NX-25 | φ4.1 | 4.1 | 45 | D-098 |
| MSE230SS | φ4.1 | 4.1 | 50 | D-026 |
| MX230 | φ4.1 | 8.2 | 45 | D-017 |
| NC-4 | φ4.1 | 8.2 | 45 | D-119 |
| MSZ345 | φ4.1 | 8.2 | 50 | D-052 |
| NX-30 | φ4.1 | 8.2 | 50 | D-100 |
| MSE230 | φ4.1 | 11 | 50 | D-028 |
| MX235 | φ4.1 | 12.3 | 50 | D-018 |
| NX-35 | φ4.1 | 12.3 | 55 | D-102 |
| MX240 | φ4.1 | 16.4 | 55 | D-019 |
| NX-40 | φ4.1 | 16.4 | 60 | D-104 |
| NX-45 | φ4.1 | 20.5 | 65 | D-106 |
| ALZ345 | φ4.1×12.3 | 6.2 | 55 | D-141 |
| **φ4.2** | | | | |
| NX-25 | φ4.2 | 4.2 | 45 | D-098 |
| MSE230SS | φ4.2 | 4.2 | 50 | D-026 |
| MX230 | φ4.2 | 8.4 | 45 | D-017 |
| NC-4 | φ4.2 | 8.4 | 45 | D-119 |
| MSZ345 | φ4.2 | 8.4 | 50 | D-052 |
| NX-30 | φ4.2 | 8.4 | 50 | D-100 |
| MSE230 | φ4.2 | 11 | 50 | D-028 |
| MX235 | φ4.2 | 12.6 | 50 | D-018 |
| NX-35 | φ4.2 | 12.6 | 55 | D-102 |
| MX240 | φ4.2 | 16.8 | 55 | D-019 |
| NX-40 | φ4.2 | 16.8 | 60 | D-104 |
| NX-45 | φ4.2 | 21 | 65 | D-106 |
| ALZ345 | φ4.2×12.6 | 6.3 | 55 | D-141 |
| **φ4.3** | | | | |
| NX-25 | φ4.3 | 4.3 | 45 | D-098 |
| MSE230SS | φ4.3 | 4.3 | 50 | D-026 |
| MX230 | φ4.3 | 8.6 | 45 | D-017 |
| NC-4 | φ4.3 | 8.6 | 45 | D-119 |
| MSZ345 | φ4.3 | 8.6 | 50 | D-052 |
| NX-30 | φ4.3 | 8.6 | 50 | D-100 |
| MSE230 | φ4.3 | 11 | 50 | D-028 |
| MX235 | φ4.3 | 12.9 | 50 | D-018 |
| NX-35 | φ4.3 | 12.9 | 55 | D-102 |
| MX240 | φ4.3 | 17.2 | 55 | D-019 |
| NX-40 | φ4.3 | 17.2 | 60 | D-104 |
| NX-45 | φ4.3 | 21.5 | 65 | D-106 |
| ALZ345 | φ4.3×12.9 | 6.5 | 55 | D-141 |
| **φ4.4** | | | | |
| NX-25 | φ4.4 | 4.4 | 45 | D-098 |
| MSE230SS | φ4.4 | 4.4 | 50 | D-026 |
| MX230 | φ4.4 | 8.8 | 45 | D-017 |
| NC-4 | φ4.4 | 8.8 | 45 | D-119 |
| MSZ345 | φ4.4 | 8.8 | 50 | D-052 |
| NX-30 | φ4.4 | 8.8 | 50 | D-100 |
| MSE230 | φ4.4 | 11 | 50 | D-028 |



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| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MX235 | φ4.4 | 13.2 | 50 | D-018 |
| NX-35 | φ4.4 | 13.2 | 55 | D-102 |
| MX240 | φ4.4 | 17.6 | 55 | D-019 |
| NX-40 | φ4.4 | 17.6 | 60 | D-104 |
| NX-45 | φ4.4 | 22 | 65 | D-106 |
| ALZ345 | φ4.4×13.2 | 6.6 | 55 | D-141 |
| **φ4.5** | | | | |
| NX-25 | φ4.5 | 4.5 | 45 | D-098 |
| MX425 | φ4.5 | 4.5 | 50 | D-032 |
| MSE230SS | φ4.5 | 4.5 | 55 | D-026 |
| NC-2 | φ4.5 | 9 | 45 | D-113 |
| NC-4 | φ4.5 | 9 | 45 | D-119 |
| MXH230 | φ4.5 | 9 | 50 | D-002 |
| MXH230P | φ4.5 | 9 | 50 | D-006 |
| MX230 | φ4.5 | 9 | 50 | D-017 |
| MX430 | φ4.5 | 9 | 50 | D-032 |
| MSZ345 | φ4.5 | 9 | 50 | D-052 |
| NX-30 | φ4.5 | 9 | 50 | D-100 |
| AL2D-2 | φ4.5 | 9 | 55 | D-135 |
| AL2D-2DLC | φ4.5 | 9 | 55 | D-138 |
| MSE230 | φ4.5 | 12 | 55 | D-028 |
| MSE430 | φ4.5 | 12 | 55 | D-040 |
| NE-2 | φ4.5 | 13 | 50 | D-125 |
| NE-3 | φ4.5 | 13 | 50 | D-125 |
| NE-4 | φ4.5 | 13 | 50 | D-126 |
| MXH235 | φ4.5 | 13.5 | 50 | D-003 |
| MXH235P | φ4.5 | 13.5 | 50 | D-007 |
| MX235 | φ4.5 | 13.5 | 50 | D-018 |
| MX435 | φ4.5 | 13.5 | 50 | D-033 |
| NX-35 | φ4.5 | 13.5 | 55 | D-102 |
| NCM-2 | φ4.5 | 14 | 55 | D-114 |
| NCM-4 | φ4.5 | 14 | 55 | D-121 |
| MX240 | φ4.5 | 18 | 55 | D-019 |
| MX440 | φ4.5 | 18 | 55 | D-033 |
| NX-40 | φ4.5 | 18 | 60 | D-104 |
| MX445 | φ4.5 | 22.5 | 65 | D-034 |
| NX-45 | φ4.5 | 22.5 | 65 | D-106 |
| ALZ345-DLC | φ4.5×13.5 | 6.8 | 55 | D-143 |
| ALZ345 | φ4.5×13.5 | 6.8 | 55 | D-141 |
| **φ4.6** | | | | |
| NX-25 | φ4.6 | 4.6 | 45 | D-098 |
| MSE230SS | φ4.6 | 4.6 | 55 | D-026 |
| MX230 | φ4.6 | 9.2 | 50 | D-017 |
| MSZ345 | φ4.6 | 9.2 | 50 | D-052 |
| NX-30 | φ4.6 | 9.2 | 50 | D-100 |
| NC-4 | φ4.6 | 9.2 | 50 | D-119 |
| MSE230 | φ4.6 | 12 | 55 | D-028 |
| MX235 | φ4.6 | 13.8 | 55 | D-018 |
| NX-35 | φ4.6 | 13.8 | 55 | D-102 |
| MX240 | φ4.6 | 18.4 | 55 | D-019 |
| NX-40 | φ4.6 | 18.4 | 60 | D-104 |
| NX-45 | φ4.6 | 23 | 65 | D-106 |
| ALZ345 | φ4.6×13.8 | 6.9 | 55 | D-141 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| **φ4.7** | | | | |
| NX-25 | φ4.7 | 4.7 | 45 | D-098 |
| MSE230SS | φ4.7 | 4.7 | 55 | D-026 |
| MX230 | φ4.7 | 9.4 | 50 | D-017 |
| MSZ345 | φ4.7 | 9.4 | 50 | D-052 |
| NX-30 | φ4.7 | 9.4 | 50 | D-100 |
| NC-4 | φ4.7 | 9.4 | 50 | D-119 |
| MSE230 | φ4.7 | 12 | 55 | D-028 |
| MX235 | φ4.7 | 14.1 | 55 | D-018 |
| NX-35 | φ4.7 | 14.1 | 55 | D-102 |
| MX240 | φ4.7 | 18.8 | 55 | D-019 |
| NX-40 | φ4.7 | 18.8 | 60 | D-104 |
| NX-45 | φ4.7 | 23.5 | 65 | D-106 |
| ALZ345 | φ4.7×14.1 | 7.1 | 55 | D-141 |
| **φ4.8** | | | | |
| NX-25 | φ4.8 | 4.8 | 45 | D-098 |
| MSE230SS | φ4.8 | 4.8 | 55 | D-026 |
| MX230 | φ4.8 | 9.6 | 50 | D-017 |
| MSZ345 | φ4.8 | 9.6 | 50 | D-052 |
| NX-30 | φ4.8 | 9.6 | 50 | D-100 |
| NC-4 | φ4.8 | 9.6 | 50 | D-119 |
| MSE230 | φ4.8 | 12 | 55 | D-028 |
| MX235 | φ4.8 | 14.4 | 55 | D-018 |
| NX-35 | φ4.8 | 14.4 | 55 | D-102 |
| MX240 | φ4.8 | 19.2 | 55 | D-019 |
| NX-40 | φ4.8 | 19.2 | 60 | D-104 |
| NX-45 | φ4.8 | 24 | 65 | D-106 |
| ALZ345 | φ4.8×14.4 | 7.2 | 55 | D-141 |
| **φ4.9** | | | | |
| NX-25 | φ4.9 | 4.9 | 45 | D-098 |
| MSE230SS | φ4.9 | 4.9 | 55 | D-026 |
| MX230 | φ4.9 | 9.8 | 50 | D-017 |
| MSZ345 | φ4.9 | 9.8 | 50 | D-052 |
| NX-30 | φ4.9 | 9.8 | 50 | D-100 |
| NC-4 | φ4.9 | 9.8 | 50 | D-119 |
| MSE230 | φ4.9 | 13 | 55 | D-028 |
| MX235 | φ4.9 | 14.7 | 55 | D-018 |
| NX-35 | φ4.9 | 14.7 | 55 | D-102 |
| MX240 | φ4.9 | 19.6 | 55 | D-019 |
| NX-40 | φ4.9 | 19.6 | 60 | D-104 |
| NX-45 | φ4.9 | 24.5 | 65 | D-106 |
| ALZ345 | φ4.9×14.7 | 7.4 | 55 | D-141 |
| **φ5** | | | | |
| NX-25 | φ5 | 5 | 45 | D-098 |
| MXH225 | φ5 | 5 | 50 | D-001 |
| MXH225P | φ5 | 5 | 50 | D-005 |
| MX225 | φ5 | 5 | 50 | D-016 |
| MX425 | φ5 | 5 | 50 | D-032 |
| MSE230SS | φ5 | 5 | 55 | D-026 |
| AL-3LS | φ5 | 7.5 | 80 | D-144 |
| RSES230 | φ5 | 7.5 | 80 | D-158 |
| MXH230 | φ5 | 10 | 50 | D-002 |
| MXH230P | φ5 | 10 | 50 | D-006 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MX230 | φ5 | 10 | 50 | D-017 |
| MX430 | φ5 | 10 | 50 | D-032 |
| MSZ345 | φ5 | 10 | 50 | D-052 |
| NX-30X | φ5 | 10 | 50 | D-062 |
| NX-30 | φ5 | 10 | 50 | D-100 |
| NC-2 | φ5 | 10 | 50 | D-113 |
| NC-4 | φ5 | 10 | 50 | D-119 |
| NSL-2 | φ5 | 10 | 50 | D-130 |
| MSES230P | φ5 | 10 | 55 | D-027 |
| AL2D-2 | φ5 | 10 | 55 | D-135 |
| AL2D-2DLC | φ5 | 10 | 55 | D-138 |
| MHDH645 | φ5 | 10 | 60 | D-057 |
| MHD645 | φ5 | 10 | 60 | D-059 |
| RSE230 | φ5 | 10 | 60 | D-162 |
| DX | φ5 | 10 | 60 | D-167 |
| NC-LS-2 | φ5 | 10 | 130 | D-115 |
| NE-2 | φ5 | 13 | 50 | D-125 |
| NE-3 | φ5 | 13 | 50 | D-125 |
| NE-4 | φ5 | 13 | 50 | D-126 |
| MSE230 | φ5 | 13 | 55 | D-028 |
| MSE230M | φ5 | 13 | 55 | D-029 |
| MSE430 | φ5 | 13 | 55 | D-040 |
| MSE430P | φ5 | 13 | 55 | D-040 |
| MSE245 | φ5 | 13 | 55 | D-044 |
| MSE345 | φ5 | 13 | 55 | D-044 |
| MSE445 | φ5 | 13 | 55 | D-045 |
| MSX440 | φ5 | 13 | 55 | D-055 |
| NEA-2 | φ5 | 14 | 55 | D-144 |
| DCSE235 | φ5 | 15 | 55 | C-010 |
| MXH235 | φ5 | 15 | 55 | D-003 |
| MXH235P | φ5 | 15 | 55 | D-007 |
| MX235 | φ5 | 15 | 55 | D-018 |
| MX435 | φ5 | 15 | 55 | D-033 |
| NX-35 | φ5 | 15 | 55 | D-102 |
| NCM-2 | φ5 | 15 | 55 | D-114 |
| NCM-4 | φ5 | 15 | 55 | D-121 |
| AL3D-2 | φ5 | 15 | 55 | D-136 |
| AL3D-2DLC | φ5 | 15 | 55 | D-138 |
| MHDH645 | φ5 | 15 | 65 | D-057 |
| RSE230 | φ5 | 15 | 70 | D-162 |
| AL3D-345 | φ5 | 15 | 80 | D-137 |
| MXH240 | φ5 | 20 | 60 | D-004 |
| MX240 | φ5 | 20 | 60 | D-019 |
| MX440 | φ5 | 20 | 60 | D-033 |
| NX-40 | φ5 | 20 | 60 | D-104 |
| MSEM230 | φ5 | 20 | 65 | D-029 |
| MSEM430 | φ5 | 20 | 65 | D-041 |
| AL4D-2 | φ5 | 20 | 65 | D-136 |
| AL4D-2DLC | φ5 | 20 | 65 | D-139 |
| DXM | φ5 | 20 | 70 | D-167 |
| NEA-2 | φ5 | 22 | 60 | D-144 |
| MXH245 | φ5 | 25 | 65 | D-004 |
| MX245 | φ5 | 25 | 65 | D-020 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MX445 | φ5 | 25 | 65 | D-034 |
| NX-45 | φ5 | 25 | 65 | D-106 |
| NCL-2 | φ5 | 25 | 65 | D-115 |
| NCL-4 | φ5 | 25 | 65 | D-121 |
| AL5D-2 | φ5 | 25 | 65 | D-137 |
| AL5D-2DLC | φ5 | 25 | 65 | D-139 |
| RSE230 | φ5 | 25 | 80 | D-162 |
| DXL | φ5 | 25 | 80 | D-168 |
| NEA-2 | φ5 | 28 | 65 | D-144 |
| RSE230 | φ5 | 35 | 90 | D-162 |
| RSE230 | φ5 | 40 | 100 | D-162 |
| DSF | φ5×5 | 2.5 | 60 | D-168 |
| ALZ345-DLC | φ5×15 | 7.5 | 55 | D-143 |
| ALZ345 | φ5×15 | 7.5 | 55 | D-141 |
| NHR-2X | φ5×16 | 7.5 | 55 | D-095 |
| NHR-2 | φ5×16 | 7.5 | 55 | D-133 |
| MHRH430 | φ5×16 | 7.5 | 60 | D-068 |
| MHR230 | φ5×16 | 7.5 | 60 | D-080 |
| MHR430 | φ5×16 | 7.5 | 60 | D-083 |
| MHR230 | φ5×20 | 7.5 | 60 | D-080 |
| NHR-2X | φ5×20 | 7.5 | 60 | D-095 |
| NHR-2 | φ5×20 | 7.5 | 60 | D-133 |
| NHR-2X | φ5×25 | 7.5 | 65 | D-095 |
| NHR-2 | φ5×25 | 7.5 | 65 | D-133 |
| MHRH430 | φ5×25 | 7.5 | 70 | D-068 |
| MHR230 | φ5×25 | 7.5 | 70 | D-080 |
| MHR430 | φ5×25 | 7.5 | 70 | D-083 |
| ALZ345 | φ5×25 | 7.5 | 80 | D-141 |
| NHR-2X | φ5×30 | 7.5 | 75 | D-095 |
| NHR-2 | φ5×30 | 7.5 | 75 | D-133 |
| MHR230 | φ5×30 | 7.5 | 80 | D-080 |
| RSES230 | φ5×30 | 7.5 | 80 | D-158 |
| RSE230 | φ5×30 | 15 | 90 | D-162 |
| MHRH430 | φ5×35 | 7.5 | 80 | D-068 |
| MHR230 | φ5×35 | 7.5 | 80 | D-080 |
| MHR430 | φ5×35 | 7.5 | 80 | D-083 |
| NHR-2X | φ5×35 | 7.5 | 80 | D-095 |
| NHR-2 | φ5×35 | 7.5 | 80 | D-133 |
| MHR230 | φ5×40 | 7.5 | 90 | D-080 |
| NHR-2X | φ5×40 | 7.5 | 90 | D-095 |
| NHR-2 | φ5×40 | 7.5 | 90 | D-133 |
| RSES230 | φ5×40 | 7.5 | 100 | D-158 |
| RSE230 | φ5×40 | 15 | 100 | D-162 |
| MHRH430 | φ5×50 | 7.5 | 110 | D-068 |
| MHR230 | φ5×50 | 7.5 | 110 | D-080 |
| MHR430 | φ5×50 | 7.5 | 110 | D-083 |
| RSES230 | φ5×55 | 7.5 | 120 | D-158 |
| RSE230 | φ5×55 | 15 | 120 | D-163 |
| MHR230 | φ5×60 | 7.5 | 120 | D-080 |
| RSES230 | φ5×70 | 7.5 | 150 | D-158 |
| RSE230 | φ5×70 | 15 | 130 | D-163 |


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| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| **φ5.1** | | | | |
| **NX-25** | φ5.1 | 5.1 | 50 | D-098 |
| **MSE230SS** | φ5.1 | 5.1 | 55 | D-026 |
| **MX230** | φ5.1 | 10.2 | 50 | D-017 |
| **NX-30** | φ5.1 | 10.2 | 50 | D-100 |
| **NC-4** | φ5.1 | 10.2 | 50 | D-119 |
| **MSZ345** | φ5.1 | 10.2 | 55 | D-052 |
| **MSE230** | φ5.1 | 13 | 55 | D-028 |
| **MX235** | φ5.1 | 15.3 | 55 | D-018 |
| **NX-35** | φ5.1 | 15.3 | 60 | D-102 |
| **MX240** | φ5.1 | 20.4 | 60 | D-019 |
| **NX-40** | φ5.1 | 20.4 | 65 | D-104 |
| **NX-45** | φ5.1 | 25.5 | 75 | D-106 |
| **ALZ345** | φ5.1×15.3 | 7.7 | 55 | D-141 |
| **φ5.2** | | | | |
| **NX-25** | φ5.2 | 5.2 | 50 | D-098 |
| **MSE230SS** | φ5.2 | 5.2 | 55 | D-026 |
| **MX230** | φ5.2 | 10.4 | 50 | D-017 |
| **NX-30** | φ5.2 | 10.4 | 50 | D-100 |
| **NC-4** | φ5.2 | 10.4 | 50 | D-119 |
| **MSZ345** | φ5.2 | 10.4 | 55 | D-052 |
| **MSE230** | φ5.2 | 13 | 55 | D-028 |
| **MX235** | φ5.2 | 15.6 | 55 | D-018 |
| **NX-35** | φ5.2 | 15.6 | 60 | D-102 |
| **MX240** | φ5.2 | 20.8 | 60 | D-019 |
| **NX-40** | φ5.2 | 20.8 | 65 | D-104 |
| **NX-45** | φ5.2 | 26 | 75 | D-106 |
| **ALZ345** | φ5.2×15.6 | 7.8 | 55 | D-141 |
| **φ5.3** | | | | |
| **NX-25** | φ5.3 | 5.3 | 50 | D-098 |
| **MSE230SS** | φ5.3 | 5.3 | 55 | D-026 |
| **MX230** | φ5.3 | 10.6 | 50 | D-017 |
| **NX-30** | φ5.3 | 10.6 | 50 | D-100 |
| **NC-4** | φ5.3 | 10.6 | 50 | D-119 |
| **MSZ345** | φ5.3 | 10.6 | 55 | D-052 |
| **MSE230** | φ5.3 | 14 | 55 | D-028 |
| **MX235** | φ5.3 | 15.9 | 55 | D-018 |
| **NX-35** | φ5.3 | 15.9 | 60 | D-102 |
| **MX240** | φ5.3 | 21.2 | 60 | D-019 |
| **NX-40** | φ5.3 | 21.2 | 65 | D-104 |
| **NX-45** | φ5.3 | 26.5 | 75 | D-106 |
| **ALZ345** | φ5.3×15.9 | 8 | 55 | D-141 |
| **φ5.4** | | | | |
| **NX-25** | φ5.4 | 5.4 | 50 | D-098 |
| **MSE230SS** | φ5.4 | 5.4 | 55 | D-026 |
| **MX230** | φ5.4 | 10.8 | 50 | D-017 |
| **NX-30** | φ5.4 | 10.8 | 50 | D-100 |
| **NC-4** | φ5.4 | 10.8 | 50 | D-119 |
| **MSZ345** | φ5.4 | 10.8 | 55 | D-052 |
| **MSE230** | φ5.4 | 14 | 55 | D-028 |
| **MX235** | φ5.4 | 16.2 | 55 | D-018 |
| **NX-35** | φ5.4 | 16.2 | 60 | D-102 |
| **MX240** | φ5.4 | 21.6 | 60 | D-019 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| **NX-40** | φ5.4 | 21.6 | 65 | D-104 |
| **NX-45** | φ5.4 | 27 | 75 | D-106 |
| **ALZ345** | φ5.4×16.2 | 8.1 | 55 | D-141 |
| **φ5.5** | | | | |
| **MX425** | φ5.5 | 5.5 | 50 | D-032 |
| **NX-25** | φ5.5 | 5.5 | 50 | D-098 |
| **MSE230SS** | φ5.5 | 5.5 | 55 | D-026 |
| **MXH230** | φ5.5 | 11 | 50 | D-002 |
| **MXH230P** | φ5.5 | 11 | 50 | D-006 |
| **MX230** | φ5.5 | 11 | 50 | D-017 |
| **MX430** | φ5.5 | 11 | 50 | D-032 |
| **NX-30** | φ5.5 | 11 | 50 | D-100 |
| **NC-2** | φ5.5 | 11 | 50 | D-113 |
| **NC-4** | φ5.5 | 11 | 50 | D-119 |
| **AL2D-2** | φ5.5 | 11 | 55 | D-135 |
| **AL2D-2DLC** | φ5.5 | 11 | 55 | D-138 |
| **MSZ345** | φ5.5 | 11.2 | 55 | D-052 |
| **NE-2** | φ5.5 | 13 | 50 | D-125 |
| **NE-3** | φ5.5 | 13 | 50 | D-125 |
| **MSE230** | φ5.5 | 14 | 55 | D-028 |
| **MSE430** | φ5.5 | 14 | 55 | D-040 |
| **MXH235** | φ5.5 | 16.5 | 60 | D-003 |
| **MXH235P** | φ5.5 | 16.5 | 60 | D-007 |
| **MX235** | φ5.5 | 16.5 | 60 | D-018 |
| **MX435** | φ5.5 | 16.5 | 60 | D-033 |
| **NX-35** | φ5.5 | 16.5 | 60 | D-102 |
| **NCM-2** | φ5.5 | 17 | 55 | D-114 |
| **NCM-4** | φ5.5 | 17 | 55 | D-121 |
| **MX240** | φ5.5 | 22 | 65 | D-019 |
| **MX440** | φ5.5 | 22 | 65 | D-033 |
| **NX-40** | φ5.5 | 22 | 65 | D-104 |
| **MX445** | φ5.5 | 27.5 | 75 | D-034 |
| **NX-45** | φ5.5 | 27.5 | 75 | D-106 |
| **ALZ345-DLC** | φ5.5×16.5 | 8.3 | 55 | D-143 |
| **ALZ345** | φ5.5×16.5 | 8.3 | 55 | D-141 |
| **φ5.6** | | | | |
| **NX-25** | φ5.6 | 5.6 | 50 | D-098 |
| **MSE230SS** | φ5.6 | 5.6 | 55 | D-026 |
| **MX230** | φ5.6 | 11.2 | 50 | D-017 |
| **NX-30** | φ5.6 | 11.2 | 50 | D-100 |
| **NC-4** | φ5.6 | 11.2 | 55 | D-119 |
| **MSZ345** | φ5.6 | 11.4 | 55 | D-052 |
| **MSE230** | φ5.6 | 14 | 55 | D-028 |
| **MX235** | φ5.6 | 16.8 | 60 | D-018 |
| **NX-35** | φ5.6 | 16.8 | 60 | D-102 |
| **MX240** | φ5.6 | 22.4 | 65 | D-019 |
| **NX-40** | φ5.6 | 22.4 | 65 | D-104 |
| **NX-45** | φ5.6 | 28 | 75 | D-106 |
| **ALZ345** | φ5.6×16.8 | 8.4 | 55 | D-141 |
| **φ5.7** | | | | |
| **NX-25** | φ5.7 | 5.7 | 50 | D-098 |
| **MSE230SS** | φ5.7 | 5.7 | 55 | D-026 |
| **MX230** | φ5.7 | 11.4 | 50 | D-017 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NX-30 | φ5.7 | 11.4 | 50 | D-100 |
| NC-4 | φ5.7 | 11.4 | 55 | D-119 |
| MSZ345 | φ5.7 | 11.6 | 55 | D-052 |
| MSE230 | φ5.7 | 15 | 55 | D-028 |
| MX235 | φ5.7 | 17.1 | 60 | D-018 |
| NX-35 | φ5.7 | 17.1 | 60 | D-102 |
| MX240 | φ5.7 | 22.8 | 65 | D-019 |
| NX-40 | φ5.7 | 22.8 | 65 | D-104 |
| NX-45 | φ5.7 | 28.5 | 75 | D-106 |
| ALZ345 | φ5.7×17.1 | 8.6 | 55 | D-141 |
| **φ5.8** | | | | |
| NX-25 | φ5.8 | 5.8 | 50 | D-098 |
| MSE230SS | φ5.8 | 5.8 | 55 | D-026 |
| MX230 | φ5.8 | 11.6 | 50 | D-017 |
| NX-30 | φ5.8 | 11.6 | 50 | D-100 |
| NC-4 | φ5.8 | 11.6 | 55 | D-119 |
| MSZ345 | φ5.8 | 12 | 55 | D-052 |
| MSE230 | φ5.8 | 15 | 55 | D-028 |
| MX235 | φ5.8 | 17.4 | 60 | D-018 |
| NX-35 | φ5.8 | 17.4 | 60 | D-102 |
| MX240 | φ5.8 | 23.2 | 65 | D-019 |
| NX-40 | φ5.8 | 23.2 | 65 | D-104 |
| NX-45 | φ5.8 | 29 | 75 | D-106 |
| ALZ345 | φ5.8×17.4 | 8.7 | 55 | D-141 |
| **φ5.9** | | | | |
| NX-25 | φ5.9 | 5.9 | 50 | D-098 |
| MSE230SS | φ5.9 | 5.9 | 55 | D-026 |
| MX230 | φ5.9 | 11.8 | 50 | D-017 |
| NX-30 | φ5.9 | 11.8 | 50 | D-100 |
| NC-4 | φ5.9 | 11.8 | 55 | D-119 |
| MSZ345 | φ5.9 | 12.4 | 55 | D-052 |
| MSE230 | φ5.9 | 15 | 55 | D-028 |
| MX235 | φ5.9 | 17.7 | 60 | D-018 |
| NX-35 | φ5.9 | 17.7 | 60 | D-102 |
| MX240 | φ5.9 | 23.6 | 65 | D-019 |
| NX-40 | φ5.9 | 23.6 | 65 | D-104 |
| NX-45 | φ5.9 | 29.5 | 75 | D-106 |
| ALZ345 | φ5.9×17.7 | 8.9 | 55 | D-141 |
| **φ6** | | | | |
| MXH225 | φ6 | 6 | 50 | D-001 |
| MXH225P | φ6 | 6 | 50 | D-005 |
| MX225 | φ6 | 6 | 50 | D-016 |
| MX425 | φ6 | 6 | 50 | D-032 |
| NX-25 | φ6 | 6 | 50 | D-098 |
| MSE230SS | φ6 | 6 | 55 | D-026 |
| AL-3LS | φ6 | 9 | 80 | D-144 |
| RSES230 | φ6 | 9 | 90 | D-158 |
| ALZ345 | φ6 | 9 | 110 | D-141 |
| MXH230 | φ6 | 12 | 50 | D-002 |
| MXH230P | φ6 | 12 | 50 | D-006 |
| MX230 | φ6 | 12 | 50 | D-017 |
| MX430 | φ6 | 12 | 50 | D-032 |
| NX-30X | φ6 | 12 | 50 | D-062 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NX-30 | φ6 | 12 | 50 | D-100 |
| MSES230P | φ6 | 12 | 55 | D-027 |
| NC-2 | φ6 | 12 | 55 | D-113 |
| NC-4 | φ6 | 12 | 55 | D-119 |
| NSL-2 | φ6 | 12 | 55 | D-130 |
| AL2D-2 | φ6 | 12 | 55 | D-135 |
| AL2D-2DLC | φ6 | 12 | 55 | D-138 |
| MHDH645 | φ6 | 12 | 60 | D-057 |
| DX | φ6 | 12 | 60 | D-167 |
| RSE230 | φ6 | 12 | 70 | D-163 |
| NC-LS-2 | φ6 | 12 | 130 | D-115 |
| NE-2 | φ6 | 13 | 50 | D-125 |
| NE-3 | φ6 | 13 | 50 | D-125 |
| NE-4 | φ6 | 13 | 50 | D-126 |
| MSZ345 | φ6 | 13 | 55 | D-052 |
| MSX440 | φ6 | 13 | 55 | D-055 |
| MSE230 | φ6 | 15 | 55 | D-028 |
| MSE230M | φ6 | 15 | 55 | D-029 |
| MSE430 | φ6 | 15 | 55 | D-040 |
| MSE430P | φ6 | 15 | 55 | D-040 |
| MSE245 | φ6 | 15 | 55 | D-044 |
| MSE345 | φ6 | 15 | 55 | D-044 |
| MSE445 | φ6 | 15 | 55 | D-045 |
| MHD645 | φ6 | 15 | 60 | D-059 |
| DHS | φ6 | 15 | 70 | D-169 |
| NEA-2 | φ6 | 16 | 55 | D-144 |
| DCSE235 | φ6 | 18 | 60 | C-010 |
| MXH235 | φ6 | 18 | 60 | D-003 |
| MXH235P | φ6 | 18 | 60 | D-007 |
| MX235 | φ6 | 18 | 60 | D-018 |
| MX435 | φ6 | 18 | 60 | D-033 |
| NX-35 | φ6 | 18 | 60 | D-102 |
| NCM-2 | φ6 | 18 | 60 | D-114 |
| NCM-4 | φ6 | 18 | 60 | D-121 |
| AL3D-2 | φ6 | 18 | 60 | D-136 |
| AL3D-2DLC | φ6 | 18 | 60 | D-138 |
| MHDH645 | φ6 | 18 | 65 | D-057 |
| RSE230 | φ6 | 18 | 80 | D-163 |
| AL3D-345 | φ6 | 18 | 80 | D-137 |
| NEA-2 | φ6 | 22 | 60 | D-144 |
| MXH240 | φ6 | 24 | 65 | D-004 |
| MX240 | φ6 | 24 | 65 | D-019 |
| MX440 | φ6 | 24 | 65 | D-033 |
| NX-40 | φ6 | 24 | 65 | D-104 |
| DXM | φ6 | 24 | 70 | D-167 |
| MSEM230 | φ6 | 24 | 75 | D-029 |
| MSEM430 | φ6 | 24 | 75 | D-041 |
| AL4D-2 | φ6 | 24 | 75 | D-136 |
| AL4D-2DLC | φ6 | 24 | 75 | D-139 |
| NCL-2 | φ6 | 25 | 65 | D-115 |
| NCL-4 | φ6 | 25 | 65 | D-121 |
| NEL-3 | φ6 | 25 | 75 | D-126 |
| RSE230 | φ6 | 25 | 80 | D-163 |



ŞEVKET ÖZLÜ® MAKINA TİCARET VE SAN. LTD. ŞTİ.

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NEA-2 | φ6 | 30 | 70 | D-144 |
| MXH245 | φ6 | 30 | 75 | D-004 |
| MX245 | φ6 | 30 | 75 | D-020 |
| MX445 | φ6 | 30 | 75 | D-034 |
| NX-45 | φ6 | 30 | 75 | D-106 |
| AL5D-2 | φ6 | 30 | 75 | D-137 |
| AL5D-2DLC | φ6 | 30 | 75 | D-139 |
| DXL | φ6 | 30 | 80 | D-168 |
| RSE230 | φ6 | 30 | 90 | D-163 |
| RSE230 | φ6 | 40 | 100 | D-163 |
| RSE230 | φ6 | 50 | 120 | D-163 |
| DSF | φ6×6 | 3 | 60 | D-168 |
| ALZ345-DLC | φ6×18 | 9 | 60 | D-143 |
| ALZ345 | φ6×18 | 9 | 60 | D-141 |
| MHRH430 | φ6×20 | 9 | 80 | D-068 |
| MHR230 | φ6×20 | 9 | 80 | D-080 |
| MHR430 | φ6×20 | 9 | 80 | D-083 |
| DHR237 | φ6×20 | 12 | 60 | D-165 |
| ALZ345 | φ6×30 | 9 | 80 | D-141 |
| MHRH430 | φ6×30 | 9 | 90 | D-068 |
| MHR230 | φ6×30 | 9 | 90 | D-080 |
| MHR430 | φ6×30 | 9 | 90 | D-083 |
| DHR237 | φ6×30 | 12 | 70 | D-165 |
| DCHR230 | φ6×30 | 12 | 90 | C-012 |
| RSES230 | φ6×40 | 9 | 90 | D-158 |
| MHRH430 | φ6×40 | 9 | 100 | D-068 |
| MHR230 | φ6×40 | 9 | 100 | D-080 |
| MHR430 | φ6×40 | 9 | 100 | D-083 |
| RSE230 | φ6×40 | 18 | 100 | D-163 |
| MHRH430 | φ6×50 | 9 | 110 | D-068 |
| MHR230 | φ6×50 | 9 | 110 | D-080 |
| MHR430 | φ6×50 | 9 | 110 | D-084 |
| DHR237 | φ6×50 | 12 | 90 | D-165 |
| MHR230 | φ6×60 | 9 | 120 | D-080 |
| RSES230 | φ6×60 | 9 | 120 | D-158 |
| RSE230 | φ6×60 | 18 | 120 | D-163 |
| RSES230 | φ6×80 | 9 | 150 | D-158 |
| RSE230 | φ6×80 | 18 | 130 | D-163 |
| **φ6.1** | | | | |
| NX-25 | φ6.1 | 6.1 | 55 | D-098 |
| NC-4 | φ6.1 | 12.2 | 55 | D-119 |
| NX-30 | φ6.1 | 12.2 | 60 | D-100 |
| MSZ345 | φ6.1 | 13 | 65 | D-053 |
| NX-35 | φ6.1 | 18.3 | 70 | D-102 |
| NX-40 | φ6.1 | 24.4 | 80 | D-104 |
| NX-45 | φ6.1 | 30.5 | 90 | D-106 |
| ALZ345 | φ6.1×18.3 | 9.2 | 70 | D-141 |
| **φ6.2** | | | | |
| NX-25 | φ6.2 | 6.2 | 55 | D-098 |
| NC-4 | φ6.2 | 12.4 | 55 | D-119 |
| NX-30 | φ6.2 | 12.4 | 60 | D-100 |
| MSZ345 | φ6.2 | 13 | 65 | D-053 |
| NX-35 | φ6.2 | 18.6 | 70 | D-102 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NX-40 | φ6.2 | 24.8 | 80 | D-104 |
| NX-45 | φ6.2 | 31 | 90 | D-106 |
| ALZ345 | φ6.2×18.6 | 9.3 | 70 | D-141 |
| **φ6.3** | | | | |
| NX-25 | φ6.3 | 6.3 | 55 | D-099 |
| NC-4 | φ6.3 | 12.6 | 55 | D-119 |
| NX-30 | φ6.3 | 12.6 | 60 | D-101 |
| MSZ345 | φ6.3 | 13.5 | 65 | D-053 |
| NX-35 | φ6.3 | 18.9 | 70 | D-103 |
| NX-40 | φ6.3 | 25.2 | 80 | D-105 |
| NX-45 | φ6.3 | 31.5 | 90 | D-107 |
| ALZ345 | φ6.3×18.9 | 9.5 | 70 | D-141 |
| **φ6.4** | | | | |
| NX-25 | φ6.4 | 6.4 | 55 | D-099 |
| NC-4 | φ6.4 | 12.8 | 55 | D-119 |
| NX-30 | φ6.4 | 12.8 | 60 | D-101 |
| MSZ345 | φ6.4 | 13.5 | 65 | D-053 |
| NX-35 | φ6.4 | 19.2 | 70 | D-103 |
| NX-40 | φ6.4 | 25.6 | 80 | D-105 |
| NX-45 | φ6.4 | 32 | 90 | D-107 |
| ALZ345 | φ6.4×19.2 | 9.6 | 70 | D-141 |
| **φ6.5** | | | | |
| NX-25 | φ6.5 | 6.5 | 55 | D-099 |
| NC-2 | φ6.5 | 13 | 55 | D-113 |
| NC-4 | φ6.5 | 13 | 55 | D-119 |
| NX-30 | φ6.5 | 13 | 60 | D-101 |
| MSZ345 | φ6.5 | 13.5 | 65 | D-053 |
| MSE230 | φ6.5 | 17 | 60 | D-028 |
| MSE430 | φ6.5 | 17 | 60 | D-040 |
| NE-2 | φ6.5 | 18 | 60 | D-125 |
| NE-3 | φ6.5 | 18 | 60 | D-125 |
| NX-35 | φ6.5 | 19.5 | 70 | D-103 |
| NCM-2 | φ6.5 | 20 | 65 | D-114 |
| NCM-4 | φ6.5 | 20 | 65 | D-121 |
| NX-40 | φ6.5 | 26 | 80 | D-105 |
| NX-45 | φ6.5 | 32.5 | 90 | D-107 |
| ALZ345 | φ6.5×19.5 | 9.8 | 70 | D-141 |
| **φ6.6** | | | | |
| NX-25 | φ6.6 | 6.6 | 55 | D-099 |
| NX-30 | φ6.6 | 13.2 | 60 | D-101 |
| NC-4 | φ6.6 | 13.2 | 60 | D-119 |
| MSZ345 | φ6.6 | 14 | 65 | D-053 |
| NX-35 | φ6.6 | 19.8 | 70 | D-103 |
| NX-40 | φ6.6 | 26.4 | 80 | D-105 |
| NX-45 | φ6.6 | 33 | 90 | D-107 |
| ALZ345 | φ6.6×19.8 | 9.9 | 70 | D-141 |
| **φ6.7** | | | | |
| NX-25 | φ6.7 | 6.7 | 55 | D-099 |
| NX-30 | φ6.7 | 13.4 | 60 | D-101 |
| NC-4 | φ6.7 | 13.4 | 60 | D-119 |
| MSZ345 | φ6.7 | 14 | 65 | D-053 |
| NX-35 | φ6.7 | 20.1 | 70 | D-103 |
| NX-40 | φ6.7 | 26.8 | 80 | D-105 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NX-45 | φ6.7 | 33.5 | 90 | D-107 |
| ALZ345 | φ6.7×20.1 | 10.1 | 70 | D-141 |
| **φ6.8** | | | | |
| NX-25 | φ6.8 | 6.8 | 55 | D-099 |
| NX-30 | φ6.8 | 13.6 | 60 | D-101 |
| NC-4 | φ6.8 | 13.6 | 60 | D-119 |
| MSZ345 | φ6.8 | 15 | 65 | D-053 |
| NX-35 | φ6.8 | 20.4 | 70 | D-103 |
| NX-40 | φ6.8 | 27.2 | 80 | D-105 |
| NX-45 | φ6.8 | 34 | 90 | D-107 |
| ALZ345 | φ6.8×20.4 | 10.2 | 70 | D-141 |
| **φ6.9** | | | | |
| NX-25 | φ6.9 | 6.9 | 55 | D-099 |
| NX-30 | φ6.9 | 13.8 | 60 | D-101 |
| NC-4 | φ6.9 | 13.8 | 60 | D-119 |
| MSZ345 | φ6.9 | 15 | 65 | D-053 |
| NX-35 | φ6.9 | 20.7 | 70 | D-103 |
| NX-40 | φ6.9 | 27.6 | 80 | D-105 |
| NX-45 | φ6.9 | 34.5 | 90 | D-107 |
| ALZ345 | φ6.9×20.7 | 10.4 | 70 | D-141 |
| **φ7** | | | | |
| NX-25 | φ7 | 7 | 55 | D-099 |
| MX225 | φ7 | 7 | 65 | D-016 |
| NX-30 | φ7 | 14 | 60 | D-101 |
| NC-2 | φ7 | 14 | 60 | D-113 |
| NC-4 | φ7 | 14 | 60 | D-120 |
| NSL-2 | φ7 | 14 | 60 | D-130 |
| MX230 | φ7 | 14 | 65 | D-017 |
| AL2D-2 | φ7 | 14 | 70 | D-135 |
| AL2D-2DLC | φ7 | 14 | 70 | D-138 |
| NC-LS-2 | φ7 | 14 | 140 | D-115 |
| MSZ345 | φ7 | 16 | 65 | D-053 |
| NE-2 | φ7 | 18 | 60 | D-125 |
| NE-3 | φ7 | 18 | 60 | D-125 |
| NE-4 | φ7 | 18 | 60 | D-126 |
| MSE230 | φ7 | 18 | 65 | D-028 |
| MSE430 | φ7 | 18 | 65 | D-040 |
| MSX440 | φ7 | 19 | 60 | D-055 |
| MX235 | φ7 | 21 | 65 | D-018 |
| NCM-2 | φ7 | 21 | 65 | D-114 |
| NCM-4 | φ7 | 21 | 65 | D-121 |
| NX-35 | φ7 | 21 | 70 | D-103 |
| AL3D-2 | φ7 | 21 | 70 | D-136 |
| AL3D-2DLC | φ7 | 21 | 70 | D-138 |
| NX-40 | φ7 | 28 | 80 | D-105 |
| MX240 | φ7 | 28 | 90 | D-019 |
| AL4D-2 | φ7 | 28 | 90 | D-136 |
| AL4D-2DLC | φ7 | 28 | 90 | D-139 |
| MX245 | φ7 | 35 | 90 | D-020 |
| NX-45 | φ7 | 35 | 90 | D-107 |
| AL5D-2 | φ7 | 35 | 90 | D-137 |
| AL5D-2DLC | φ7 | 35 | 90 | D-139 |
| ALZ345-DLC | φ7×21 | 10.5 | 70 | D-143 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| ALZ345 | φ7×21 | 10.5 | 70 | D-141 |
| **φ7.1** | | | | |
| NX-25 | φ7.1 | 7.1 | 55 | D-099 |
| NX-30 | φ7.1 | 14.2 | 60 | D-101 |
| NC-4 | φ7.1 | 14.2 | 60 | D-120 |
| MSZ345 | φ7.1 | 16 | 65 | D-053 |
| NX-35 | φ7.1 | 21.3 | 70 | D-103 |
| NX-40 | φ7.1 | 28.4 | 80 | D-105 |
| NX-45 | φ7.1 | 35.5 | 90 | D-107 |
| ALZ345 | φ7.1×21.3 | 10.7 | 70 | D-141 |
| **φ7.2** | | | | |
| NX-25 | φ7.2 | 7.2 | 55 | D-099 |
| NX-30 | φ7.2 | 14.4 | 60 | D-101 |
| NC-4 | φ7.2 | 14.4 | 60 | D-120 |
| MSZ345 | φ7.2 | 16 | 65 | D-053 |
| NX-35 | φ7.2 | 21.6 | 70 | D-103 |
| NX-40 | φ7.2 | 28.8 | 80 | D-105 |
| NX-45 | φ7.2 | 36 | 90 | D-107 |
| ALZ345 | φ7.2×21.6 | 10.8 | 70 | D-141 |
| **φ7.3** | | | | |
| NX-25 | φ7.3 | 7.3 | 55 | D-099 |
| NX-30 | φ7.3 | 14.6 | 60 | D-101 |
| NC-4 | φ7.3 | 14.6 | 60 | D-120 |
| MSZ345 | φ7.3 | 16 | 65 | D-053 |
| NX-35 | φ7.3 | 21.9 | 70 | D-103 |
| NX-40 | φ7.3 | 29.2 | 80 | D-105 |
| NX-45 | φ7.3 | 36.5 | 90 | D-107 |
| ALZ345 | φ7.3×21.9 | 11 | 70 | D-141 |
| **φ7.4** | | | | |
| NX-25 | φ7.4 | 7.4 | 55 | D-099 |
| NX-30 | φ7.4 | 14.8 | 60 | D-101 |
| NC-4 | φ7.4 | 14.8 | 60 | D-120 |
| MSZ345 | φ7.4 | 16 | 65 | D-053 |
| NX-35 | φ7.4 | 22.2 | 70 | D-103 |
| NX-40 | φ7.4 | 29.6 | 80 | D-105 |
| NX-45 | φ7.4 | 37 | 90 | D-107 |
| ALZ345 | φ7.4×22.2 | 11.1 | 70 | D-141 |
| **φ7.5** | | | | |
| NX-25 | φ7.5 | 7.5 | 55 | D-099 |
| NX-30 | φ7.5 | 15 | 60 | D-101 |
| NC-2 | φ7.5 | 15 | 60 | D-113 |
| NC-4 | φ7.5 | 15 | 60 | D-120 |
| MSZ345 | φ7.5 | 16 | 65 | D-053 |
| NE-2 | φ7.5 | 18 | 60 | D-125 |
| NE-3 | φ7.5 | 18 | 60 | D-125 |
| MSE230 | φ7.5 | 19 | 65 | D-028 |
| MSE430 | φ7.5 | 19 | 65 | D-040 |
| NX-35 | φ7.5 | 22.5 | 70 | D-103 |
| NCM-2 | φ7.5 | 23 | 70 | D-114 |
| NCM-4 | φ7.5 | 23 | 70 | D-121 |
| NX-40 | φ7.5 | 30 | 80 | D-105 |
| NX-45 | φ7.5 | 37.5 | 90 | D-107 |
| ALZ345 | φ7.5×22.5 | 11.3 | 70 | D-141 |


SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| **φ7.6** | | | | |
| NX-25 | φ7.6 | 7.6 | 55 | D-099 |
| NX-30 | φ7.6 | 15.2 | 60 | D-101 |
| NC-4 | φ7.6 | 15.2 | 60 | D-120 |
| MSZ345 | φ7.6 | 17 | 65 | D-053 |
| NX-35 | φ7.6 | 22.8 | 70 | D-103 |
| NX-40 | φ7.6 | 30.4 | 80 | D-105 |
| NX-45 | φ7.6 | 38 | 90 | D-107 |
| ALZ345 | φ7.6×22.8 | 11.4 | 70 | D-141 |
| **φ7.7** | | | | |
| NX-25 | φ7.7 | 7.7 | 55 | D-099 |
| NX-30 | φ7.7 | 15.4 | 60 | D-101 |
| NC-4 | φ7.7 | 15.4 | 60 | D-120 |
| MSZ345 | φ7.7 | 17 | 65 | D-053 |
| NX-35 | φ7.7 | 23.1 | 70 | D-103 |
| NX-40 | φ7.7 | 30.8 | 80 | D-105 |
| NX-45 | φ7.7 | 38.5 | 90 | D-107 |
| ALZ345 | φ7.7×23.1 | 11.6 | 70 | D-141 |
| **φ7.8** | | | | |
| NX-25 | φ7.8 | 7.8 | 55 | D-099 |
| NX-30 | φ7.8 | 15.6 | 60 | D-101 |
| NC-4 | φ7.8 | 15.6 | 60 | D-120 |
| MSZ345 | φ7.8 | 17 | 65 | D-053 |
| NX-35 | φ7.8 | 23.4 | 70 | D-103 |
| NX-40 | φ7.8 | 31.2 | 80 | D-105 |
| NX-45 | φ7.8 | 39 | 90 | D-107 |
| ALZ345 | φ7.8×23.4 | 11.7 | 70 | D-141 |
| **φ7.9** | | | | |
| NX-25 | φ7.9 | 7.9 | 55 | D-099 |
| NX-30 | φ7.9 | 15.8 | 60 | D-101 |
| NC-4 | φ7.9 | 15.8 | 60 | D-120 |
| MSZ345 | φ7.9 | 17 | 65 | D-053 |
| NX-35 | φ7.9 | 23.7 | 70 | D-103 |
| NX-40 | φ7.9 | 31.6 | 80 | D-105 |
| NX-45 | φ7.9 | 39.5 | 90 | D-107 |
| ALZ345 | φ7.9×23.7 | 11.9 | 70 | D-142 |
| **φ8** | | | | |
| NX-25 | φ8 | 8 | 55 | D-099 |
| MX225 | φ8 | 8 | 65 | D-016 |
| MX425 | φ8 | 8 | 65 | D-032 |
| AL-3LS | φ8 | 12 | 110 | D-144 |
| ALZ345 | φ8 | 12 | 120 | D-142 |
| NX-30X | φ8 | 16 | 60 | D-062 |
| NX-30 | φ8 | 16 | 60 | D-101 |
| NC-2 | φ8 | 16 | 60 | D-113 |
| NC-4 | φ8 | 16 | 60 | D-120 |
| NSL-2 | φ8 | 16 | 60 | D-130 |
| MX230 | φ8 | 16 | 65 | D-017 |
| MSES230P | φ8 | 16 | 65 | D-027 |
| MX430 | φ8 | 16 | 65 | D-032 |
| MHDH645 | φ8 | 16 | 65 | D-057 |
| AL2D-2 | φ8 | 16 | 70 | D-135 |
| AL2D-2DLC | φ8 | 16 | 70 | D-138 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| DX | φ8 | 16 | 70 | D-167 |
| NC-LS-2 | φ8 | 16 | 140 | D-115 |
| NE-2 | φ8 | 18 | 60 | D-125 |
| NE-3 | φ8 | 18 | 60 | D-125 |
| NE-4 | φ8 | 18 | 60 | D-126 |
| MSX440 | φ8 | 19 | 60 | D-055 |
| MSZ345 | φ8 | 19 | 65 | D-053 |
| MSE230 | φ8 | 20 | 65 | D-028 |
| MSE430 | φ8 | 20 | 65 | D-040 |
| MSE430P | φ8 | 20 | 65 | D-040 |
| MSE245 | φ8 | 20 | 65 | D-044 |
| MSE345 | φ8 | 20 | 65 | D-044 |
| MSE445 | φ8 | 20 | 65 | D-045 |
| MHD645 | φ8 | 20 | 65 | D-059 |
| DHS | φ8 | 20 | 80 | D-169 |
| NEA-2 | φ8 | 22 | 70 | D-144 |
| MX235 | φ8 | 24 | 65 | D-018 |
| MX435 | φ8 | 24 | 65 | D-033 |
| MHDH645 | φ8 | 24 | 70 | D-057 |
| NX-35 | φ8 | 24 | 70 | D-103 |
| NCM-2 | φ8 | 24 | 70 | D-114 |
| NCM-4 | φ8 | 24 | 70 | D-121 |
| AL3D-2 | φ8 | 24 | 70 | D-136 |
| AL3D-2DLC | φ8 | 24 | 70 | D-138 |
| AL3D-345 | φ8 | 24 | 90 | D-137 |
| NEA-2 | φ8 | 28 | 75 | D-144 |
| NX-40 | φ8 | 32 | 80 | D-105 |
| MX240 | φ8 | 32 | 90 | D-019 |
| MSEM230 | φ8 | 32 | 90 | D-029 |
| MX440 | φ8 | 32 | 90 | D-033 |
| MSEM430 | φ8 | 32 | 90 | D-041 |
| AL4D-2 | φ8 | 32 | 90 | D-136 |
| AL4D-2DLC | φ8 | 32 | 90 | D-139 |
| DXM | φ8 | 32 | 90 | D-167 |
| NCL-2 | φ8 | 35 | 80 | D-115 |
| NCL-4 | φ8 | 35 | 80 | D-121 |
| NEL-3 | φ8 | 35 | 90 | D-126 |
| NEA-2 | φ8 | 36 | 90 | D-144 |
| MX245 | φ8 | 40 | 90 | D-020 |
| MX445 | φ8 | 40 | 90 | D-034 |
| NX-45 | φ8 | 40 | 90 | D-107 |
| AL5D-2 | φ8 | 40 | 90 | D-137 |
| AL5D-2DLC | φ8 | 40 | 90 | D-139 |
| DXL | φ8 | 40 | 100 | D-168 |
| DSF | φ8×8 | 4 | 70 | D-168 |
| ALZ345-DLC | φ8×24 | 12 | 70 | D-143 |
| ALZ345 | φ8×24 | 12 | 70 | D-142 |
| MHR430 | φ8×30 | 12 | 100 | D-084 |
| ALZ345 | φ8×40 | 12 | 90 | D-142 |
| MHR430 | φ8×50 | 12 | 120 | D-084 |
| MHR430 | φ8×60 | 12 | 130 | D-084 |
| **φ8.1** | | | | |
| NX-25 | φ8.1 | 8.1 | 65 | D-099 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NC-4 | φ8.1 | 16.2 | 60 | D-120 |
| NX-30 | φ8.1 | 16.2 | 70 | D-101 |
| MSZ345 | φ8.1 | 18 | 75 | D-053 |
| NX-35 | φ8.1 | 24.3 | 80 | D-103 |
| NX-40 | φ8.1 | 32.4 | 100 | D-105 |
| NX-45 | φ8.1 | 40.5 | 100 | D-107 |
| ALZ345 | φ8.1×24.3 | 12.2 | 75 | D-142 |
| **φ8.2** | | | | |
| NX-25 | φ8.2 | 8.2 | 65 | D-099 |
| NC-4 | φ8.2 | 16.4 | 60 | D-120 |
| NX-30 | φ8.2 | 16.4 | 70 | D-101 |
| MSZ345 | φ8.2 | 18 | 75 | D-053 |
| NX-35 | φ8.2 | 24.6 | 80 | D-103 |
| NX-40 | φ8.2 | 32.8 | 100 | D-105 |
| NX-45 | φ8.2 | 41 | 100 | D-107 |
| ALZ345 | φ8.2×24.6 | 12.3 | 75 | D-142 |
| **φ8.3** | | | | |
| NX-25 | φ8.3 | 8.3 | 65 | D-099 |
| NC-4 | φ8.3 | 16.6 | 60 | D-120 |
| NX-30 | φ8.3 | 16.6 | 70 | D-101 |
| MSZ345 | φ8.3 | 18 | 75 | D-053 |
| NX-35 | φ8.3 | 24.9 | 80 | D-103 |
| NX-40 | φ8.3 | 33.2 | 100 | D-105 |
| NX-45 | φ8.3 | 41.5 | 100 | D-107 |
| ALZ345 | φ8.3×24.9 | 12.5 | 75 | D-142 |
| **φ8.4** | | | | |
| NX-25 | φ8.4 | 8.4 | 65 | D-099 |
| NC-4 | φ8.4 | 16.8 | 60 | D-120 |
| NX-30 | φ8.4 | 16.8 | 70 | D-101 |
| MSZ345 | φ8.4 | 18 | 75 | D-053 |
| NX-35 | φ8.4 | 25.2 | 80 | D-103 |
| NX-40 | φ8.4 | 33.6 | 100 | D-105 |
| NX-45 | φ8.4 | 42 | 100 | D-107 |
| ALZ345 | φ8.4×25.2 | 12.6 | 75 | D-142 |
| **φ8.5** | | | | |
| NX-25 | φ8.5 | 8.5 | 65 | D-099 |
| NC-2 | φ8.5 | 17 | 60 | D-113 |
| NC-4 | φ8.5 | 17 | 60 | D-120 |
| NX-30 | φ8.5 | 17 | 70 | D-101 |
| MSZ345 | φ8.5 | 18 | 75 | D-053 |
| NE-2 | φ8.5 | 20 | 65 | D-125 |
| NE-3 | φ8.5 | 20 | 65 | D-125 |
| MSE230 | φ8.5 | 22 | 70 | D-028 |
| MSE430 | φ8.5 | 22 | 70 | D-040 |
| NCM-2 | φ8.5 | 25 | 70 | D-114 |
| NCM-4 | φ8.5 | 25 | 70 | D-121 |
| NX-35 | φ8.5 | 25.5 | 80 | D-103 |
| NX-40 | φ8.5 | 34 | 100 | D-105 |
| NX-45 | φ8.5 | 42.5 | 100 | D-107 |
| ALZ345 | φ8.5×25.5 | 12.8 | 75 | D-142 |
| **φ8.6** | | | | |
| NX-25 | φ8.6 | 8.6 | 65 | D-099 |
| NC-4 | φ8.6 | 17.2 | 65 | D-120 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NX-30 | φ8.6 | 17.2 | 70 | D-101 |
| MSZ345 | φ8.6 | 19 | 75 | D-053 |
| NX-35 | φ8.6 | 25.8 | 80 | D-103 |
| NX-40 | φ8.6 | 34.4 | 100 | D-105 |
| NX-45 | φ8.6 | 43 | 100 | D-107 |
| ALZ345 | φ8.6×25.8 | 12.9 | 75 | D-142 |
| **φ8.7** | | | | |
| NX-25 | φ8.7 | 8.7 | 65 | D-099 |
| NC-4 | φ8.7 | 17.4 | 65 | D-120 |
| NX-30 | φ8.7 | 17.4 | 70 | D-101 |
| MSZ345 | φ8.7 | 19 | 75 | D-053 |
| NX-35 | φ8.7 | 26.1 | 80 | D-103 |
| NX-40 | φ8.7 | 34.8 | 100 | D-105 |
| NX-45 | φ8.7 | 43.5 | 100 | D-107 |
| ALZ345 | φ8.7×26.1 | 13.1 | 75 | D-142 |
| **φ8.8** | | | | |
| NX-25 | φ8.8 | 8.8 | 65 | D-099 |
| NC-4 | φ8.8 | 17.6 | 65 | D-120 |
| NX-30 | φ8.8 | 17.6 | 70 | D-101 |
| MSZ345 | φ8.8 | 19 | 75 | D-053 |
| NX-35 | φ8.8 | 26.4 | 80 | D-103 |
| NX-40 | φ8.8 | 35.2 | 100 | D-105 |
| NX-45 | φ8.8 | 44 | 100 | D-107 |
| ALZ345 | φ8.8×26.4 | 13.2 | 75 | D-142 |
| **φ8.9** | | | | |
| NX-25 | φ8.9 | 8.9 | 65 | D-099 |
| NC-4 | φ8.9 | 17.8 | 65 | D-120 |
| NX-30 | φ8.9 | 17.8 | 70 | D-101 |
| MSZ345 | φ8.9 | 19 | 75 | D-053 |
| NX-35 | φ8.9 | 26.7 | 80 | D-103 |
| NX-40 | φ8.9 | 35.6 | 100 | D-105 |
| NX-45 | φ8.9 | 44.5 | 100 | D-107 |
| ALZ345 | φ8.9×26.7 | 13.4 | 75 | D-142 |
| **φ9** | | | | |
| NX-25 | φ9 | 9 | 65 | D-099 |
| MX225 | φ9 | 9 | 75 | D-016 |
| NC-2 | φ9 | 18 | 65 | D-113 |
| NC-4 | φ9 | 18 | 65 | D-120 |
| NSL-2 | φ9 | 18 | 65 | D-130 |
| NX-30 | φ9 | 18 | 70 | D-101 |
| MX230 | φ9 | 18 | 75 | D-017 |
| AL2D-2 | φ9 | 18 | 75 | D-135 |
| AL2D-2DLC | φ9 | 18 | 75 | D-138 |
| NC-LS-2 | φ9 | 18 | 150 | D-115 |
| MSZ345 | φ9 | 19 | 75 | D-053 |
| NE-2 | φ9 | 20 | 65 | D-125 |
| NE-3 | φ9 | 20 | 65 | D-125 |
| MSX440 | φ9 | 22 | 70 | D-055 |
| MSE230 | φ9 | 23 | 70 | D-028 |
| MSE430 | φ9 | 23 | 70 | D-040 |
| MX235 | φ9 | 27 | 75 | D-018 |
| NCM-2 | φ9 | 27 | 75 | D-114 |
| NCM-4 | φ9 | 27 | 75 | D-121 |


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| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| AL3D-2 | φ9 | 27 | 75 | D-136 |
| AL3D-2DLC | φ9 | 27 | 75 | D-138 |
| NX-35 | φ9 | 27 | 80 | D-103 |
| MX240 | φ9 | 36 | 100 | D-019 |
| NX-40 | φ9 | 36 | 100 | D-105 |
| AL4D-2 | φ9 | 36 | 100 | D-136 |
| AL4D-2DLC | φ9 | 36 | 100 | D-139 |
| MX245 | φ9 | 45 | 100 | D-020 |
| NX-45 | φ9 | 45 | 100 | D-107 |
| AL5D-2 | φ9 | 45 | 100 | D-137 |
| AL5D-2DLC | φ9 | 45 | 100 | D-139 |
| ALZ345-DLC | φ9×27 | 13.5 | 75 | D-143 |
| ALZ345 | φ9×27 | 13.5 | 75 | D-142 |
| **φ9.1** | | | | |
| NX-25 | φ9.1 | 9.1 | 65 | D-099 |
| NC-4 | φ9.1 | 18.2 | 65 | D-120 |
| NX-30 | φ9.1 | 18.2 | 70 | D-101 |
| MSZ345 | φ9.1 | 20 | 75 | D-053 |
| NX-35 | φ9.1 | 27.3 | 80 | D-103 |
| NX-40 | φ9.1 | 36.4 | 100 | D-105 |
| NX-45 | φ9.1 | 45.5 | 100 | D-107 |
| ALZ345 | φ9.1×27.3 | 13.7 | 75 | D-142 |
| **φ9.2** | | | | |
| NX-25 | φ9.2 | 9.2 | 65 | D-099 |
| NC-4 | φ9.2 | 18.4 | 65 | D-120 |
| NX-30 | φ9.2 | 18.4 | 70 | D-101 |
| MSZ345 | φ9.2 | 20 | 75 | D-053 |
| NX-35 | φ9.2 | 27.6 | 80 | D-103 |
| NX-40 | φ9.2 | 36.8 | 100 | D-105 |
| NX-45 | φ9.2 | 46 | 100 | D-107 |
| ALZ345 | φ9.2×27.6 | 13.8 | 75 | D-142 |
| **φ9.3** | | | | |
| NX-25 | φ9.3 | 9.3 | 65 | D-099 |
| NC-4 | φ9.3 | 18.6 | 65 | D-120 |
| NX-30 | φ9.3 | 18.6 | 70 | D-101 |
| MSZ345 | φ9.3 | 20 | 75 | D-053 |
| NX-35 | φ9.3 | 27.9 | 80 | D-103 |
| NX-40 | φ9.3 | 37.2 | 100 | D-105 |
| NX-45 | φ9.3 | 46.5 | 100 | D-107 |
| ALZ345 | φ9.3×27.9 | 14 | 75 | D-142 |
| **φ9.4** | | | | |
| NX-25 | φ9.4 | 9.4 | 65 | D-099 |
| NC-4 | φ9.4 | 18.8 | 65 | D-120 |
| NX-30 | φ9.4 | 18.8 | 70 | D-101 |
| MSZ345 | φ9.4 | 20 | 75 | D-053 |
| NX-35 | φ9.4 | 28.2 | 80 | D-103 |
| NX-40 | φ9.4 | 37.6 | 100 | D-105 |
| NX-45 | φ9.4 | 47 | 100 | D-107 |
| ALZ345 | φ9.4×28.2 | 14.1 | 75 | D-142 |
| **φ9.5** | | | | |
| NX-25 | φ9.5 | 9.5 | 65 | D-099 |
| NC-2 | φ9.5 | 19 | 65 | D-113 |
| NC-4 | φ9.5 | 19 | 65 | D-120 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NX-30 | φ9.5 | 19 | 70 | D-101 |
| NE-2 | φ9.5 | 20 | 65 | D-125 |
| NE-3 | φ9.5 | 20 | 65 | D-125 |
| MSZ345 | φ9.5 | 20 | 75 | D-053 |
| MSE230 | φ9.5 | 24 | 75 | D-028 |
| MSE430 | φ9.5 | 24 | 75 | D-040 |
| NCM-2 | φ9.5 | 28 | 75 | D-114 |
| NCM-4 | φ9.5 | 28 | 75 | D-121 |
| NX-35 | φ9.5 | 28.5 | 80 | D-103 |
| NX-40 | φ9.5 | 38 | 100 | D-105 |
| NX-45 | φ9.5 | 47.5 | 100 | D-107 |
| ALZ345 | φ9.5×28.5 | 14.3 | 75 | D-142 |
| **φ9.6** | | | | |
| NX-25 | φ9.6 | 9.6 | 65 | D-099 |
| NX-30 | φ9.6 | 19.2 | 70 | D-101 |
| NC-4 | φ9.6 | 19.2 | 70 | D-120 |
| MSZ345 | φ9.6 | 21 | 75 | D-053 |
| NX-35 | φ9.6 | 28.8 | 80 | D-103 |
| NX-40 | φ9.6 | 38.4 | 100 | D-105 |
| NX-45 | φ9.6 | 48 | 100 | D-107 |
| ALZ345 | φ9.6×28.8 | 14.4 | 75 | D-142 |
| **φ9.7** | | | | |
| NX-25 | φ9.7 | 9.7 | 65 | D-099 |
| NX-30 | φ9.7 | 19.4 | 70 | D-101 |
| NC-4 | φ9.7 | 19.4 | 70 | D-120 |
| MSZ345 | φ9.7 | 21 | 75 | D-053 |
| NX-35 | φ9.7 | 29.1 | 80 | D-103 |
| NX-40 | φ9.7 | 38.8 | 100 | D-105 |
| NX-45 | φ9.7 | 48.5 | 100 | D-107 |
| ALZ345 | φ9.7×29.1 | 14.6 | 75 | D-142 |
| **φ9.8** | | | | |
| NX-25 | φ9.8 | 9.8 | 65 | D-099 |
| NX-30 | φ9.8 | 19.6 | 70 | D-101 |
| NC-4 | φ9.8 | 19.6 | 70 | D-120 |
| MSZ345 | φ9.8 | 21 | 75 | D-053 |
| NX-35 | φ9.8 | 29.4 | 80 | D-103 |
| NX-40 | φ9.8 | 39.2 | 100 | D-105 |
| NX-45 | φ9.8 | 49 | 100 | D-107 |
| ALZ345 | φ9.8×29.4 | 14.7 | 75 | D-142 |
| **φ9.9** | | | | |
| NX-25 | φ9.9 | 9.9 | 65 | D-099 |
| NX-30 | φ9.9 | 19.8 | 70 | D-101 |
| NC-4 | φ9.9 | 19.8 | 70 | D-120 |
| MSZ345 | φ9.9 | 21 | 75 | D-053 |
| NX-35 | φ9.9 | 29.7 | 80 | D-103 |
| NX-40 | φ9.9 | 39.6 | 100 | D-105 |
| NX-45 | φ9.9 | 49.5 | 100 | D-107 |
| ALZ345 | φ9.9×29.7 | 14.9 | 75 | D-142 |
| **φ10** | | | | |
| NX-25 | φ10 | 10 | 65 | D-099 |
| MX225 | φ10 | 10 | 75 | D-016 |
| MX425 | φ10 | 10 | 75 | D-032 |
| AL-3LS | φ10 | 15 | 130 | D-144 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| ALZ345 | φ10 | 15 | 130 | D-142 |
| NE-2 | φ10 | 20 | 65 | D-125 |
| NE-3 | φ10 | 20 | 65 | D-125 |
| NE-4 | φ10 | 20 | 65 | D-126 |
| NX-30X | φ10 | 20 | 70 | D-062 |
| NX-30 | φ10 | 20 | 70 | D-101 |
| NC-2 | φ10 | 20 | 70 | D-113 |
| NC-4 | φ10 | 20 | 70 | D-120 |
| NSL-2 | φ10 | 20 | 70 | D-130 |
| MX230 | φ10 | 20 | 75 | D-017 |
| MSES230P | φ10 | 20 | 75 | D-027 |
| MX430 | φ10 | 20 | 75 | D-032 |
| MHDH645 | φ10 | 20 | 75 | D-057 |
| AL2D-2 | φ10 | 20 | 75 | D-135 |
| AL2D-2DLC | φ10 | 20 | 75 | D-138 |
| DX | φ10 | 20 | 80 | D-167 |
| NC-LS-2 | φ10 | 20 | 150 | D-115 |
| MSX440 | φ10 | 22 | 70 | D-055 |
| MSZ345 | φ10 | 22 | 75 | D-053 |
| MSE230 | φ10 | 25 | 75 | D-028 |
| MSE430 | φ10 | 25 | 75 | D-040 |
| MSE430P | φ10 | 25 | 75 | D-040 |
| MSE245 | φ10 | 25 | 75 | D-044 |
| MSE345 | φ10 | 25 | 75 | D-044 |
| MSE445 | φ10 | 25 | 75 | D-045 |
| MHD645 | φ10 | 25 | 75 | D-059 |
| DHS | φ10 | 25 | 90 | D-169 |
| NEA-2 | φ10 | 26 | 75 | D-144 |
| MX235 | φ10 | 30 | 75 | D-018 |
| MX435 | φ10 | 30 | 75 | D-033 |
| AL3D-2 | φ10 | 30 | 75 | D-136 |
| AL3D-2DLC | φ10 | 30 | 75 | D-138 |
| MHDH645 | φ10 | 30 | 80 | D-057 |
| NX-35 | φ10 | 30 | 80 | D-103 |
| NCM-2 | φ10 | 30 | 80 | D-114 |
| NCM-4 | φ10 | 30 | 80 | D-121 |
| AL3D-345 | φ10 | 30 | 100 | D-137 |
| NEA-2 | φ10 | 36 | 85 | D-144 |
| MX240 | φ10 | 40 | 100 | D-019 |
| MSEM230 | φ10 | 40 | 100 | D-029 |
| MX440 | φ10 | 40 | 100 | D-033 |
| MSEM430 | φ10 | 40 | 100 | D-041 |
| NX-40 | φ10 | 40 | 100 | D-105 |
| AL4D-2 | φ10 | 40 | 100 | D-136 |
| AL4D-2DLC | φ10 | 40 | 100 | D-139 |
| DXM | φ10 | 40 | 100 | D-167 |
| NCL-2 | φ10 | 42 | 100 | D-115 |
| NCL-4 | φ10 | 42 | 100 | D-121 |
| NEL-3 | φ10 | 45 | 110 | D-126 |
| NEA-2 | φ10 | 46 | 95 | D-144 |
| MX245 | φ10 | 50 | 100 | D-020 |
| MX445 | φ10 | 50 | 100 | D-034 |
| NX-45 | φ10 | 50 | 100 | D-107 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| AL5D-2 | φ10 | 50 | 100 | D-137 |
| AL5D-2DLC | φ10 | 50 | 100 | D-139 |
| DXL | φ10 | 50 | 110 | D-168 |
| DSF | φ10×10 | 5 | 80 | D-168 |
| ALZ345-DLC | φ10×30 | 15 | 75 | D-143 |
| ALZ345 | φ10×30 | 15 | 75 | D-142 |
| MHR430 | φ10×40 | 15 | 110 | D-084 |
| ALZ345 | φ10×50 | 15 | 100 | D-142 |
| MHR430 | φ10×60 | 15 | 130 | D-084 |
| MHR430 | φ10×80 | 15 | 150 | D-084 |
| **φ10.1** | | | | |
| NX-25 | φ10.1 | 10.1 | 70 | D-099 |
| NX-30 | φ10.1 | 20.2 | 75 | D-101 |
| NC-4 | φ10.1 | 20.2 | 75 | D-120 |
| MSZ345 | φ10.1 | 22 | 80 | D-053 |
| NX-35 | φ10.1 | 30.3 | 80 | D-103 |
| NX-40 | φ10.1 | 40.4 | 105 | D-105 |
| NX-45 | φ10.1 | 50.5 | 110 | D-107 |
| ALZ345 | φ10.1×30.3 | 15.2 | 80 | D-142 |
| **φ10.2** | | | | |
| NX-25 | φ10.2 | 10.2 | 70 | D-099 |
| NX-30 | φ10.2 | 20.4 | 75 | D-101 |
| NC-4 | φ10.2 | 20.4 | 75 | D-120 |
| MSZ345 | φ10.2 | 22 | 80 | D-053 |
| NX-35 | φ10.2 | 30.6 | 80 | D-103 |
| NX-40 | φ10.2 | 40.8 | 105 | D-105 |
| NX-45 | φ10.2 | 51 | 110 | D-107 |
| ALZ345 | φ10.2×30.6 | 15.3 | 80 | D-142 |
| **φ10.3** | | | | |
| NX-25 | φ10.3 | 10.3 | 70 | D-099 |
| NX-30 | φ10.3 | 20.6 | 75 | D-101 |
| NC-4 | φ10.3 | 20.6 | 75 | D-120 |
| MSZ345 | φ10.3 | 22 | 80 | D-053 |
| NX-35 | φ10.3 | 30.9 | 80 | D-103 |
| NX-40 | φ10.3 | 41.2 | 105 | D-105 |
| NX-45 | φ10.3 | 51.5 | 110 | D-107 |
| ALZ345 | φ10.3×30.9 | 15.5 | 80 | D-142 |
| **φ10.4** | | | | |
| NX-25 | φ10.4 | 10.4 | 70 | D-099 |
| NX-30 | φ10.4 | 20.8 | 75 | D-101 |
| NC-4 | φ10.4 | 20.8 | 75 | D-120 |
| MSZ345 | φ10.4 | 22 | 80 | D-053 |
| NX-35 | φ10.4 | 31.2 | 80 | D-103 |
| NX-40 | φ10.4 | 41.6 | 105 | D-105 |
| NX-45 | φ10.4 | 52 | 110 | D-107 |
| ALZ345 | φ10.4×31.2 | 15.6 | 80 | D-142 |
| **φ10.5** | | | | |
| NX-25 | φ10.5 | 10.5 | 70 | D-099 |
| NX-30 | φ10.5 | 21 | 75 | D-101 |
| NC-4 | φ10.5 | 21 | 75 | D-120 |
| MSZ345 | φ10.5 | 22 | 80 | D-053 |
| MSE230 | φ10.5 | 27 | 80 | D-028 |
| NX-35 | φ10.5 | 31.5 | 80 | D-103 |


ŞEVKET OĞLU® MAKINA TİCARET VE SAN. LTD. ŞTİ.

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NX-40 | φ10.5 | 42 | 105 | D-105 |
| NX-45 | φ10.5 | 52.5 | 110 | D-107 |
| ALZ345 | φ10.5×31.5 | 15.8 | 80 | D-142 |
| **φ10.6** | | | | |
| NX-25 | φ10.6 | 10.6 | 70 | D-099 |
| NX-30 | φ10.6 | 21.2 | 75 | D-101 |
| NC-4 | φ10.6 | 21.2 | 75 | D-120 |
| MSZ345 | φ10.6 | 22 | 80 | D-053 |
| NX-35 | φ10.6 | 31.8 | 80 | D-103 |
| NX-40 | φ10.6 | 42.4 | 105 | D-105 |
| NX-45 | φ10.6 | 53 | 110 | D-107 |
| ALZ345 | φ10.6×31.8 | 15.9 | 80 | D-142 |
| **φ10.7** | | | | |
| NX-25 | φ10.7 | 10.7 | 70 | D-099 |
| NX-30 | φ10.7 | 21.4 | 75 | D-101 |
| NC-4 | φ10.7 | 21.4 | 75 | D-120 |
| MSZ345 | φ10.7 | 22 | 80 | D-053 |
| NX-35 | φ10.7 | 32.1 | 80 | D-103 |
| NX-40 | φ10.7 | 42.8 | 105 | D-105 |
| NX-45 | φ10.7 | 53.5 | 110 | D-107 |
| ALZ345 | φ10.7×32.1 | 16.1 | 80 | D-142 |
| **φ10.8** | | | | |
| NX-25 | φ10.8 | 10.8 | 70 | D-099 |
| NX-30 | φ10.8 | 21.6 | 75 | D-101 |
| NC-4 | φ10.8 | 21.6 | 75 | D-120 |
| MSZ345 | φ10.8 | 22 | 80 | D-053 |
| NX-35 | φ10.8 | 32.4 | 80 | D-103 |
| NX-40 | φ10.8 | 43.2 | 105 | D-105 |
| NX-45 | φ10.8 | 54 | 110 | D-107 |
| ALZ345 | φ10.8×32.4 | 16.2 | 80 | D-142 |
| **φ10.9** | | | | |
| NX-25 | φ10.9 | 10.9 | 70 | D-099 |
| NX-30 | φ10.9 | 21.8 | 75 | D-101 |
| NC-4 | φ10.9 | 21.8 | 75 | D-120 |
| MSZ345 | φ10.9 | 22 | 80 | D-053 |
| NX-35 | φ10.9 | 32.7 | 80 | D-103 |
| NX-40 | φ10.9 | 43.6 | 105 | D-105 |
| NX-45 | φ10.9 | 54.5 | 110 | D-107 |
| ALZ345 | φ10.9×32.7 | 16.4 | 80 | D-142 |
| **φ11** | | | | |
| NX-25 | φ11 | 11 | 70 | D-099 |
| NX-30 | φ11 | 22 | 75 | D-101 |
| NC-2 | φ11 | 22 | 75 | D-113 |
| NC-4 | φ11 | 22 | 75 | D-120 |
| NSL-2 | φ11 | 22 | 75 | D-130 |
| MSZ345 | φ11 | 22 | 80 | D-053 |
| AL2D-2 | φ11 | 22 | 80 | D-135 |
| AL2D-2DLC | φ11 | 22 | 80 | D-138 |
| NC-LS-2 | φ11 | 22 | 170 | D-115 |
| NE-2 | φ11 | 23 | 70 | D-125 |
| NE-3 | φ11 | 23 | 70 | D-125 |
| MSX440 | φ11 | 26 | 80 | D-055 |
| MSE230 | φ11 | 28 | 80 | D-028 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NX-35 | φ11 | 33 | 80 | D-103 |
| NCM-2 | φ11 | 33 | 80 | D-114 |
| NCM-4 | φ11 | 33 | 80 | D-121 |
| AL3D-2 | φ11 | 33 | 90 | D-136 |
| AL3D-2DLC | φ11 | 33 | 90 | D-138 |
| NX-40 | φ11 | 44 | 105 | D-105 |
| AL4D-2 | φ11 | 44 | 110 | D-136 |
| AL4D-2DLC | φ11 | 44 | 110 | D-139 |
| NX-45 | φ11 | 55 | 110 | D-107 |
| AL5D-2 | φ11 | 55 | 110 | D-137 |
| AL5D-2DLC | φ11 | 55 | 110 | D-139 |
| ALZ345-DLC | φ11×33 | 16.5 | 80 | D-143 |
| ALZ345 | φ11×33 | 16.5 | 80 | D-142 |
| **φ11.1** | | | | |
| NX-25 | φ11.1 | 11.1 | 70 | D-099 |
| NX-30 | φ11.1 | 22.2 | 75 | D-101 |
| NC-4 | φ11.1 | 22.2 | 75 | D-120 |
| MSZ345 | φ11.1 | 25 | 80 | D-053 |
| NX-35 | φ11.1 | 33.3 | 80 | D-103 |
| NX-40 | φ11.1 | 44.4 | 105 | D-105 |
| NX-45 | φ11.1 | 55.5 | 110 | D-107 |
| ALZ345 | φ11.1×33.3 | 16.7 | 80 | D-142 |
| **φ11.2** | | | | |
| NX-25 | φ11.2 | 11.2 | 70 | D-099 |
| NX-30 | φ11.2 | 22.4 | 75 | D-101 |
| NC-4 | φ11.2 | 22.4 | 75 | D-120 |
| MSZ345 | φ11.2 | 25 | 80 | D-053 |
| NX-35 | φ11.2 | 33.6 | 80 | D-103 |
| NX-40 | φ11.2 | 44.8 | 105 | D-105 |
| NX-45 | φ11.2 | 56 | 110 | D-107 |
| ALZ345 | φ11.2×33.6 | 16.8 | 80 | D-142 |
| **φ11.3** | | | | |
| NX-25 | φ11.3 | 11.3 | 70 | D-099 |
| NX-30 | φ11.3 | 22.6 | 75 | D-101 |
| NC-4 | φ11.3 | 22.6 | 75 | D-120 |
| MSZ345 | φ11.3 | 25 | 80 | D-053 |
| NX-35 | φ11.3 | 33.9 | 80 | D-103 |
| NX-40 | φ11.3 | 45.2 | 105 | D-105 |
| NX-45 | φ11.3 | 56.5 | 110 | D-107 |
| ALZ345 | φ11.3×33.9 | 17 | 80 | D-142 |
| **φ11.4** | | | | |
| NX-25 | φ11.4 | 11.4 | 70 | D-099 |
| NX-30 | φ11.4 | 22.8 | 75 | D-101 |
| NC-4 | φ11.4 | 22.8 | 75 | D-120 |
| MSZ345 | φ11.4 | 25 | 80 | D-053 |
| NX-35 | φ11.4 | 34.2 | 80 | D-103 |
| NX-40 | φ11.4 | 45.6 | 105 | D-105 |
| NX-45 | φ11.4 | 57 | 110 | D-107 |
| ALZ345 | φ11.4×34.2 | 17.1 | 80 | D-142 |
| **φ11.5** | | | | |
| NX-25 | φ11.5 | 11.5 | 70 | D-099 |
| NX-30 | φ11.5 | 23 | 75 | D-101 |
| NC-4 | φ11.5 | 23 | 75 | D-120 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSZ345 | φ11.5 | 25 | 80 | D-053 |
| MSE230 | φ11.5 | 29 | 80 | D-028 |
| NX-35 | φ11.5 | 34.5 | 80 | D-103 |
| NX-40 | φ11.5 | 46 | 105 | D-105 |
| NX-45 | φ11.5 | 57.5 | 110 | D-107 |
| ALZ345 | φ11.5×34.5 | 17.3 | 80 | D-142 |
| **φ11.6** | | | | |
| NX-25 | φ11.6 | 11.6 | 70 | D-099 |
| NX-30 | φ11.6 | 23.2 | 75 | D-101 |
| NC-4 | φ11.6 | 23.2 | 75 | D-120 |
| MSZ345 | φ11.6 | 25 | 80 | D-053 |
| NX-35 | φ11.6 | 34.8 | 80 | D-103 |
| NX-40 | φ11.6 | 46.4 | 105 | D-105 |
| NX-45 | φ11.6 | 58 | 110 | D-107 |
| ALZ345 | φ11.6×34.8 | 17.4 | 80 | D-142 |
| **φ11.7** | | | | |
| NX-25 | φ11.7 | 11.7 | 70 | D-099 |
| NX-30 | φ11.7 | 23.4 | 75 | D-101 |
| NC-4 | φ11.7 | 23.4 | 75 | D-120 |
| MSZ345 | φ11.7 | 25 | 80 | D-053 |
| NX-35 | φ11.7 | 35.1 | 80 | D-103 |
| NX-40 | φ11.7 | 46.8 | 105 | D-105 |
| NX-45 | φ11.7 | 58.5 | 110 | D-107 |
| ALZ345 | φ11.7×35.1 | 17.6 | 80 | D-142 |
| **φ11.8** | | | | |
| NX-25 | φ11.8 | 11.8 | 70 | D-099 |
| NX-30 | φ11.8 | 23.6 | 75 | D-101 |
| NC-4 | φ11.8 | 23.6 | 75 | D-120 |
| MSZ345 | φ11.8 | 25 | 80 | D-053 |
| NX-35 | φ11.8 | 35.4 | 80 | D-103 |
| NX-40 | φ11.8 | 47.2 | 105 | D-105 |
| NX-45 | φ11.8 | 59 | 110 | D-107 |
| ALZ345 | φ11.8×35.4 | 17.7 | 80 | D-142 |
| **φ11.9** | | | | |
| NX-25 | φ11.9 | 11.9 | 70 | D-099 |
| NX-30 | φ11.9 | 23.8 | 75 | D-101 |
| NC-4 | φ11.9 | 23.8 | 75 | D-120 |
| MSZ345 | φ11.9 | 25 | 80 | D-053 |
| NX-35 | φ11.9 | 35.7 | 80 | D-103 |
| NX-40 | φ11.9 | 47.6 | 105 | D-105 |
| NX-45 | φ11.9 | 59.5 | 110 | D-107 |
| ALZ345 | φ11.9×35.7 | 17.9 | 80 | D-142 |
| **φ12** | | | | |
| NX-25 | φ12 | 12 | 70 | D-099 |
| MX225 | φ12 | 12 | 80 | D-016 |
| MX425 | φ12 | 12 | 80 | D-032 |
| AL-3LS | φ12 | 18 | 150 | D-144 |
| ALZ345 | φ12 | 18 | 150 | D-142 |
| NE-2 | φ12 | 23 | 70 | D-125 |
| NE-3 | φ12 | 23 | 70 | D-125 |
| NE-4 | φ12 | 23 | 70 | D-126 |
| NX-30X | φ12 | 24 | 75 | D-062 |
| NX-30 | φ12 | 24 | 75 | D-101 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NC-2 | φ12 | 24 | 75 | D-113 |
| NC-4 | φ12 | 24 | 75 | D-120 |
| NSL-2 | φ12 | 24 | 75 | D-130 |
| MX230 | φ12 | 24 | 80 | D-017 |
| MSES230P | φ12 | 24 | 80 | D-027 |
| MX430 | φ12 | 24 | 80 | D-032 |
| MHDH645 | φ12 | 24 | 80 | D-057 |
| AL2D-2 | φ12 | 24 | 80 | D-135 |
| AL2D-2DLC | φ12 | 24 | 80 | D-138 |
| DX | φ12 | 24 | 80 | D-167 |
| NC-LS-2 | φ12 | 24 | 170 | D-115 |
| MSZ345 | φ12 | 26 | 80 | D-053 |
| MSX440 | φ12 | 26 | 80 | D-055 |
| NEA-2 | φ12 | 28 | 80 | D-144 |
| MSE230 | φ12 | 30 | 80 | D-028 |
| MSE430 | φ12 | 30 | 80 | D-040 |
| MSE430P | φ12 | 30 | 80 | D-040 |
| MSE245 | φ12 | 30 | 80 | D-044 |
| MSE345 | φ12 | 30 | 80 | D-044 |
| MSE445 | φ12 | 30 | 80 | D-045 |
| MHD645 | φ12 | 30 | 80 | D-059 |
| DHS | φ12 | 30 | 90 | D-169 |
| MX235 | φ12 | 36 | 80 | D-018 |
| MX435 | φ12 | 36 | 80 | D-033 |
| NX-35 | φ12 | 36 | 85 | D-103 |
| NCM-2 | φ12 | 36 | 85 | D-114 |
| NCM-4 | φ12 | 36 | 85 | D-121 |
| MHDH645 | φ12 | 36 | 90 | D-057 |
| AL3D-2 | φ12 | 36 | 90 | D-136 |
| AL3D-2DLC | φ12 | 36 | 90 | D-138 |
| AL3D-345 | φ12 | 36 | 110 | D-137 |
| NEA-2 | φ12 | 38 | 90 | D-144 |
| NCL-2 | φ12 | 45 | 100 | D-115 |
| NCL-4 | φ12 | 45 | 100 | D-121 |
| NEA-2 | φ12 | 48 | 100 | D-144 |
| MX240 | φ12 | 48 | 105 | D-019 |
| MX440 | φ12 | 48 | 105 | D-033 |
| NX-40 | φ12 | 48 | 105 | D-105 |
| MSEM230 | φ12 | 48 | 110 | D-029 |
| MSEM430 | φ12 | 48 | 110 | D-041 |
| AL4D-2 | φ12 | 48 | 110 | D-136 |
| AL4D-2DLC | φ12 | 48 | 110 | D-139 |
| DXM | φ12 | 48 | 110 | D-167 |
| NEL-3 | φ12 | 55 | 120 | D-126 |
| MX245 | φ12 | 60 | 105 | D-020 |
| MX445 | φ12 | 60 | 105 | D-034 |
| NX-45 | φ12 | 60 | 110 | D-107 |
| AL5D-2 | φ12 | 60 | 110 | D-137 |
| AL5D-2DLC | φ12 | 60 | 110 | D-139 |
| DXL | φ12 | 60 | 120 | D-168 |
| DSF | φ12×12 | 6 | 80 | D-168 |
| ALZ345-DLC | φ12×36 | 18 | 80 | D-143 |
| ALZ345 | φ12×36 | 18 | 80 | D-142 |



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| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| ALZ345 | φ12×60 | 18 | 110 | D-142 |
| **φ13** | | | | |
| MSX440 | φ13 | 26 | 90 | D-055 |
| NE-3 | φ13 | 30 | 85 | D-125 |
| **φ14** | | | | |
| MSX440 | φ14 | 26 | 90 | D-055 |
| NC-2 | φ14 | 28 | 85 | D-113 |
| NC-4 | φ14 | 28 | 85 | D-120 |
| NE-2 | φ14 | 30 | 85 | D-125 |
| NE-3 | φ14 | 30 | 85 | D-125 |
| NE-4 | φ14 | 30 | 85 | D-126 |
| MSE430 | φ14 | 35 | 100 | D-040 |
| NCM-2 | φ14 | 42 | 100 | D-114 |
| NCM-4 | φ14 | 42 | 100 | D-121 |
| NEL-3 | φ14 | 65 | 140 | D-126 |
| **φ15** | | | | |
| NC-2 | φ15 | 30 | 100 | D-113 |
| NC-4 | φ15 | 30 | 100 | D-120 |
| MSX440 | φ15 | 32 | 90 | D-055 |
| NE-2 | φ15 | 35 | 90 | D-125 |
| NE-3 | φ15 | 35 | 90 | D-125 |
| NE-4 | φ15 | 35 | 90 | D-126 |
| MSE430 | φ15 | 40 | 110 | D-040 |
| NCM-2 | φ15 | 45 | 110 | D-114 |
| NCM-4 | φ15 | 45 | 110 | D-121 |
| **φ16** | | | | |
| MSX440 | φ16 | 32 | 90 | D-055 |
| NC-2 | φ16 | 32 | 100 | D-113 |
| NC-4 | φ16 | 32 | 100 | D-120 |
| DX | φ16 | 32 | 100 | D-167 |
| NE-2 | φ16 | 35 | 90 | D-125 |
| NE-3 | φ16 | 35 | 90 | D-125 |
| NE-4 | φ16 | 35 | 90 | D-126 |
| NEA-2 | φ16 | 40 | 100 | D-144 |
| DHS | φ16 | 40 | 100 | D-169 |
| MSE430 | φ16 | 40 | 110 | D-040 |
| MSE345 | φ16 | 40 | 110 | D-044 |
| MSE445 | φ16 | 40 | 110 | D-045 |
| NCM-2 | φ16 | 50 | 110 | D-114 |
| NCM-4 | φ16 | 50 | 110 | D-121 |
| MSEM430 | φ16 | 64 | 130 | D-041 |
| DXM | φ16 | 64 | 140 | D-167 |
| NEA-2 | φ16 | 65 | 130 | D-144 |
| NEL-3 | φ16 | 65 | 140 | D-126 |
| DXL | φ16 | 80 | 160 | D-168 |
| DSF | φ16×16 | 8 | 100 | D-168 |
| **φ18** | | | | |
| MSX440 | φ18 | 32 | 105 | D-055 |
| NC-2 | φ18 | 36 | 110 | D-113 |
| NC-4 | φ18 | 36 | 110 | D-120 |
| NE-2 | φ18 | 40 | 100 | D-125 |
| NE-3 | φ18 | 40 | 100 | D-125 |
| NE-4 | φ18 | 40 | 100 | D-126 |

| 型　番 Model | 刃径(×有効長) Dia.(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSE430 | φ18 | 45 | 120 | D-040 |
| NCM-2 | φ18 | 55 | 130 | D-114 |
| NCM-4 | φ18 | 55 | 130 | D-121 |
| NEL-3 | φ18 | 75 | 155 | D-126 |
| **φ20** | | | | |
| MSX440 | φ20 | 38 | 105 | D-055 |
| NC-2 | φ20 | 40 | 115 | D-113 |
| NC-4 | φ20 | 40 | 115 | D-120 |
| DX | φ20 | 40 | 120 | D-167 |
| NEA-2 | φ20 | 45 | 110 | D-144 |
| NE-2 | φ20 | 45 | 110 | D-125 |
| NE-3 | φ20 | 45 | 110 | D-125 |
| NE-4 | φ20 | 45 | 110 | D-126 |
| DHS | φ20 | 50 | 120 | D-169 |
| MSE430 | φ20 | 50 | 135 | D-040 |
| MSE345 | φ20 | 50 | 135 | D-044 |
| MSE445 | φ20 | 50 | 135 | D-045 |
| NCM-2 | φ20 | 60 | 135 | D-114 |
| NCM-4 | φ20 | 60 | 135 | D-121 |
| MSEM430 | φ20 | 80 | 140 | D-041 |
| NEA-2 | φ20 | 80 | 140 | D-144 |
| DXM | φ20 | 80 | 160 | D-167 |
| NEL-3 | φ20 | 85 | 165 | D-126 |
| DXL | φ20 | 100 | 190 | D-168 |
| DSF | φ20×20 | 10 | 120 | D-168 |
| **φ25** | | | | |
| NEA-2 | φ25 | 50 | 120 | D-144 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| **R0.005** | | | | |
| **NSMB100** | R0.005 | 0.01 | 45 | E-073 |
| **R0.01** | | | | |
| **NSMB100** | R0.01 | 0.02 | 45 | E-073 |
| **SMB120** | R0.01 | 0.02 | 50 | B-005 |
| **R0.015** | | | | |
| **NSMB100** | R0.015 | 0.03 | 45 | E-073 |
| **SMB120** | R0.015 | 0.03 | 50 | B-005 |
| **R0.02** | | | | |
| **NSMB100** | R0.02 | 0.04 | 45 | E-073 |
| **SMB120** | R0.02 | 0.04 | 50 | B-005 |
| **R0.025** | | | | |
| **NSMB100** | R0.025 | 0.05 | 45 | E-073 |
| **SMB120** | R0.025 | 0.05 | 50 | B-005 |
| **R0.03** | | | | |
| **NSMB100** | R0.03 | 0.06 | 45 | E-073 |
| **SMB120** | R0.03 | 0.06 | 50 | B-005 |
| **R0.04** | | | | |
| **NSMB100** | R0.04 | 0.08 | 45 | E-073 |
| **SMB120** | R0.04 | 0.08 | 50 | B-005 |
| **R0.05** | | | | |
| **NSMB100** | R0.05 | 0.1 | 45 | E-073 |
| **MSB230** | R0.05 | 0.1 | 50 | E-009 |
| **MSB230G2** | R0.05 | 0.1 | 50 | E-007 |
| **MSBH230** | R0.05 | 0.1 | 50 | E-001 |
| **SMB120** | R0.05 | 0.1 | 50 | B-005 |
| **PCDRB** | R0.05×0.15 | 0.05 | 48 | C-003 |
| **MRBH230** | R0.05×0.2 | 0.07 | 45 | E-021 |
| **PCDRB** | R0.05×0.25 | 0.05 | 48 | C-003 |
| **DRB230** | R0.05×0.3 | 0.07 | 45 | E-087 |
| **MRB230** | R0.05×0.3 | 0.07 | 45 | E-035 |
| **MRBH230** | R0.05×0.3 | 0.07 | 45 | E-021 |
| **SSBL200** | R0.05×0.3 | 0.08 | 50 | B-012 |
| **DRB230** | R0.05×0.5 | 0.07 | 45 | E-087 |
| **MRB230** | R0.05×0.5 | 0.07 | 45 | E-035 |
| **MRBH230** | R0.05×0.5 | 0.07 | 45 | E-021 |
| **SSBL200** | R0.05×0.5 | 0.08 | 50 | B-012 |
| **R0.075** | | | | |
| **MSBH230** | R0.075 | 0.15 | 50 | E-001 |
| **MSB230** | R0.075 | 0.15 | 50 | E-009 |
| **PCDRB** | R0.075×0.23 | 0.075 | 48 | C-003 |
| **MRB230** | R0.075×0.3 | 0.1 | 45 | E-035 |
| **MRBH230** | R0.075×0.3 | 0.1 | 45 | E-021 |
| **PCDRB** | R0.075×0.38 | 0.075 | 48 | C-003 |
| **SSBL200** | R0.075×0.45 | 0.12 | 50 | B-012 |
| **MRB230** | R0.075×0.5 | 0.1 | 45 | E-035 |
| **MRBH230** | R0.075×0.5 | 0.1 | 45 | E-021 |
| **SSBL200** | R0.075×0.75 | 0.12 | 50 | B-012 |
| **MRB230** | R0.075×1 | 0.1 | 45 | E-035 |
| **MRBH230** | R0.075×1 | 0.1 | 45 | E-021 |
| **R0.1** | | | | |
| **DCMB** | R0.1 | 0.15 | 45 | C-014 |

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| **MSB230SF** | R0.1 | 0.2 | 35 | E-008 |
| **MSB230S** | R0.1 | 0.2 | 50 | E-007 |
| **MSB230G2** | R0.1 | 0.2 | 50 | E-007 |
| **MSBH230** | R0.1 | 0.2 | 50 | E-001 |
| **MSB230** | R0.1 | 0.2 | 50 | E-009 |
| **MSBL230** | R0.1 | 0.5 | 70 | E-011 |
| **RSB230** | R0.1 | 0.6 | 50 | E-085 |
| **RSB230** | R0.1 | 1 | 50 | E-085 |
| **MRBH230** | R0.1×0.3 | 0.15 | 45 | E-021 |
| **SSB200** | R0.1×0.3 | 0.15 | 50 | B-011 |
| **SSPB220** | R0.1×0.3 | 0.15 | 50 | B-007 |
| **PCDRB** | R0.1×0.5 | 0.1 | 48 | C-003 |
| **DCMB** | R0.1×0.5 | 0.12 | 45 | C-014 |
| **MRB230SF** | R0.1×0.5 | 0.15 | 35 | E-031 |
| **DRB230** | R0.1×0.5 | 0.15 | 45 | E-087 |
| **MRB230** | R0.1×0.5 | 0.15 | 45 | E-035 |
| **MRBH230** | R0.1×0.5 | 0.15 | 45 | E-021 |
| **SFB200** | R0.1×0.5 | 0.15 | 50 | B-006 |
| **MRB230** | R0.1×0.5 | 0.15 | 50 | E-035 |
| **MACH225SF** | R0.1×0.5 | 0.2 | 35 | E-004 |
| **MACH225** | R0.1×0.5 | 0.2 | 50 | E-005 |
| **SSPB220** | R0.1×0.6 | 0.15 | 50 | B-007 |
| **SSBL200** | R0.1×0.6 | 0.15 | 50 | B-012 |
| **MRB230SF** | R0.1×0.75 | 0.15 | 35 | E-031 |
| **MRB230** | R0.1×0.75 | 0.15 | 45 | E-035 |
| **MRBH230** | R0.1×0.75 | 0.15 | 45 | E-021 |
| **MRB230SF** | R0.1×1 | 0.15 | 35 | E-031 |
| **DRB230** | R0.1×1 | 0.15 | 45 | E-087 |
| **MRB230** | R0.1×1 | 0.15 | 45 | E-035 |
| **MRBH230** | R0.1×1 | 0.15 | 45 | E-021 |
| **SSPBL220** | R0.1×1 | 0.15 | 50 | B-008 |
| **SSBL200** | R0.1×1 | 0.15 | 50 | B-012 |
| **MRB230** | R0.1×1 | 0.15 | 50 | E-035 |
| **MRBH230** | R0.1×1 | 0.15 | 50 | E-021 |
| **MRBTN230** | R0.1×1 | 0.2 | 50 | E-060 |
| **MRB230SF** | R0.1×1.25 | 0.15 | 35 | E-031 |
| **MRB230** | R0.1×1.25 | 0.15 | 45 | E-035 |
| **MRBH230** | R0.1×1.25 | 0.15 | 45 | E-021 |
| **DRB230** | R0.1×1.5 | 0.15 | 45 | E-087 |
| **MRB230** | R0.1×1.5 | 0.15 | 45 | E-035 |
| **MRBH230** | R0.1×1.5 | 0.15 | 45 | E-021 |
| **SSPBTN220** | R0.1×1.5 | 0.15 | 50 | B-009 |
| **MRBTNH230** | R0.1×1.5 | 0.15 | 50 | E-048 |
| **MRB230** | R0.1×1.5 | 0.15 | 50 | E-035 |
| **MRBTN230** | R0.1×1.5 | 0.2 | 50 | E-060 |
| **MRB230** | R0.1×1.75 | 0.15 | 45 | E-035 |
| **MRBH230** | R0.1×1.75 | 0.15 | 45 | E-021 |
| **MRB230** | R0.1×2 | 0.15 | 45 | E-035 |
| **MRBH230** | R0.1×2 | 0.15 | 45 | E-021 |
| **SSPBTN220** | R0.1×2 | 0.15 | 50 | B-009 |
| **MRBTNH230** | R0.1×2 | 0.15 | 50 | E-048 |
| **MRB230** | R0.1×2 | 0.15 | 50 | E-035 |



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| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MRBTN230 | R0.1×2 | 0.2 | 50 | E-060 |
| RSB230 | R0.1×2 | 0.6 | 50 | E-085 |
| MRBH230 | R0.1×2.5 | 0.15 | 45 | E-021 |
| MRB230 | R0.1×2.5 | 0.15 | 45 | E-035 |
| MRBTN230L | R0.1×2.5 | 0.2 | 50 | E-069 |
| MRBH230 | R0.1×3 | 0.15 | 45 | E-021 |
| MRB230 | R0.1×3 | 0.15 | 45 | E-035 |
| MRBTN230L | R0.1×3 | 0.2 | 50 | E-069 |
| **R0.15** | | | | |
| MSB230S | R0.15 | 0.3 | 50 | E-007 |
| MSB230G2 | R0.15 | 0.3 | 50 | E-007 |
| MSBH230 | R0.15 | 0.3 | 50 | E-001 |
| MSB230 | R0.15 | 0.3 | 50 | E-009 |
| MSBL230 | R0.15 | 0.75 | 70 | E-011 |
| RSB230 | R0.15 | 0.9 | 50 | E-085 |
| RSB230 | R0.15 | 1.5 | 50 | E-085 |
| SSB200 | R0.15×0.3 | 0.23 | 50 | B-011 |
| SSPB220 | R0.15×0.3 | 0.23 | 50 | B-007 |
| MRB230SF | R0.15×0.5 | 0.2 | 35 | E-031 |
| MRBH230 | R0.15×0.5 | 0.2 | 45 | E-021 |
| MRB230 | R0.15×0.5 | 0.2 | 45 | E-035 |
| SSB200 | R0.15×0.5 | 0.23 | 50 | B-011 |
| SSPB220 | R0.15×0.5 | 0.23 | 50 | B-007 |
| MRB230SF | R0.15×0.6 | 0.2 | 35 | E-031 |
| MRBH230 | R0.15×0.6 | 0.2 | 45 | E-021 |
| MRB230 | R0.15×0.6 | 0.2 | 45 | E-035 |
| MRB230SF | R0.15×0.75 | 0.2 | 35 | E-031 |
| MRBH230 | R0.15×0.75 | 0.2 | 45 | E-021 |
| MRB230 | R0.15×0.75 | 0.2 | 45 | E-035 |
| SSB200 | R0.15×0.75 | 0.23 | 50 | B-011 |
| SSPB220 | R0.15×0.75 | 0.23 | 50 | B-007 |
| SSPBL220 | R0.15×0.9 | 0.23 | 50 | B-008 |
| SSBL200 | R0.15×0.9 | 0.23 | 50 | B-012 |
| MRB230SF | R0.15×1 | 0.2 | 35 | E-031 |
| DRB230 | R0.15×1 | 0.2 | 45 | E-087 |
| MRBH230 | R0.15×1 | 0.2 | 45 | E-021 |
| MRB230 | R0.15×1 | 0.2 | 45 | E-035 |
| MRB230 | R0.15×1 | 0.2 | 50 | E-035 |
| MRB230SF | R0.15×1.25 | 0.2 | 35 | E-031 |
| MRBH230 | R0.15×1.25 | 0.2 | 45 | E-021 |
| MRB230 | R0.15×1.25 | 0.2 | 45 | E-035 |
| MRB230SF | R0.15×1.5 | 0.2 | 35 | E-031 |
| DRB230 | R0.15×1.5 | 0.2 | 45 | E-087 |
| MRBH230 | R0.15×1.5 | 0.2 | 45 | E-021 |
| MRB230 | R0.15×1.5 | 0.2 | 45 | E-035 |
| MRBH230 | R0.15×1.5 | 0.2 | 50 | E-021 |
| MRB230 | R0.15×1.5 | 0.2 | 50 | E-035 |
| SSPBL220 | R0.15×1.5 | 0.23 | 50 | B-008 |
| SSBL200 | R0.15×1.5 | 0.23 | 50 | B-012 |
| MRB230SF | R0.15×1.75 | 0.2 | 35 | E-031 |
| MRBH230 | R0.15×1.75 | 0.2 | 45 | E-021 |
| MRB230 | R0.15×1.75 | 0.2 | 45 | E-035 |

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| DRB230 | R0.15×2 | 0.2 | 45 | E-087 |
| MRBH230 | R0.15×2 | 0.2 | 45 | E-021 |
| MRB230 | R0.15×2 | 0.2 | 45 | E-035 |
| MRBTNH230 | R0.15×2 | 0.2 | 50 | E-048 |
| MRB230 | R0.15×2 | 0.2 | 50 | E-035 |
| SSPBTN220 | R0.15×2 | 0.23 | 50 | B-009 |
| MRBTN230 | R0.15×2 | 0.3 | 50 | E-060 |
| MRBH230 | R0.15×2.25 | 0.2 | 45 | E-021 |
| MRB230 | R0.15×2.25 | 0.2 | 45 | E-035 |
| MRBH230 | R0.15×2.5 | 0.2 | 45 | E-021 |
| MRB230 | R0.15×2.5 | 0.2 | 45 | E-035 |
| MRB230 | R0.15×2.75 | 0.2 | 45 | E-035 |
| MRBH230 | R0.15×3 | 0.2 | 45 | E-021 |
| MRB230 | R0.15×3 | 0.2 | 45 | E-036 |
| MRBTNH230 | R0.15×3 | 0.2 | 50 | E-048 |
| SSPBTN220 | R0.15×3 | 0.23 | 52 | B-009 |
| MRBTN230 | R0.15×3 | 0.3 | 50 | E-060 |
| MRBLN230-6 | R0.15×3 | 0.3 | 60 | E-047 |
| RSB230 | R0.15×3 | 0.9 | 50 | E-085 |
| MRBH230 | R0.15×3.5 | 0.2 | 45 | E-022 |
| MRB230 | R0.15×3.5 | 0.2 | 45 | E-036 |
| MRBH230 | R0.15×4 | 0.2 | 45 | E-022 |
| MRB230 | R0.15×4 | 0.2 | 45 | E-036 |
| MRBTN230L | R0.15×4 | 0.3 | 50 | E-069 |
| MRB230 | R0.15×4.5 | 0.2 | 45 | E-036 |
| MRB230 | R0.15×5 | 0.2 | 45 | E-036 |
| **R0.2** | | | | |
| DCMB | R0.2 | 0.3 | 45 | C-014 |
| MSB230SF | R0.2 | 0.4 | 35 | E-008 |
| MSB230S | R0.2 | 0.4 | 50 | E-007 |
| MSB230G2 | R0.2 | 0.6 | 50 | E-007 |
| MSBH230 | R0.2 | 0.6 | 50 | E-001 |
| MSB230 | R0.2 | 0.6 | 50 | E-009 |
| NCB-2 | R0.2 | 0.8 | 35 | E-075 |
| NCB-2X | R0.2 | 0.8 | 35 | E-017 |
| MSBL230 | R0.2 | 1 | 70 | E-011 |
| RSB230 | R0.2 | 1.2 | 50 | E-085 |
| RSB230 | R0.2 | 2 | 50 | E-085 |
| MRBH230 | R0.2×0.5 | 0.3 | 45 | E-022 |
| MRB230 | R0.2×0.5 | 0.3 | 45 | E-036 |
| SSB200 | R0.2×0.5 | 0.3 | 50 | B-011 |
| SSPB220 | R0.2×0.5 | 0.3 | 50 | B-007 |
| MRB230SF | R0.2×0.75 | 0.3 | 35 | E-031 |
| MRB230 | R0.2×0.75 | 0.3 | 45 | E-036 |
| SSB200 | R0.2×0.75 | 0.3 | 50 | B-011 |
| SSPB220 | R0.2×0.75 | 0.3 | 50 | B-007 |
| MRBH230 | R0.2×0.8 | 0.3 | 45 | E-022 |
| PCDRB | R0.2×1 | 0.2 | 48 | C-003 |
| DCMB | R0.2×1 | 0.25 | 45 | C-014 |
| MRB230SF | R0.2×1 | 0.3 | 35 | E-031 |
| DCRB230 | R0.2×1 | 0.3 | 45 | C-016 |
| DRB230 | R0.2×1 | 0.3 | 45 | E-087 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MRBH230 | R0.2×1 | 0.3 | 45 | E-022 |
| MRB230 | R0.2×1 | 0.3 | 45 | E-036 |
| SFB200 | R0.2×1 | 0.3 | 50 | B-006 |
| SSB200 | R0.2×1 | 0.3 | 50 | B-011 |
| SSPB220 | R0.2×1 | 0.3 | 50 | B-007 |
| MRBH230 | R0.2×1 | 0.3 | 50 | E-022 |
| MRB230 | R0.2×1 | 0.3 | 50 | E-036 |
| MACH225SF | R0.2×1 | 0.4 | 35 | E-004 |
| MACH225 | R0.2×1 | 0.4 | 50 | E-005 |
| SSBL200 | R0.2×1.2 | 0.3 | 50 | B-012 |
| SSPB220 | R0.2×1.2 | 0.3 | 50 | B-007 |
| MRB230SF | R0.2×1.5 | 0.3 | 35 | E-031 |
| MRBH230 | R0.2×1.5 | 0.3 | 45 | E-022 |
| MRB230 | R0.2×1.5 | 0.3 | 45 | E-036 |
| MRB230 | R0.2×1.5 | 0.3 | 50 | E-036 |
| MRB230SF | R0.2×2 | 0.3 | 35 | E-031 |
| DCRB230 | R0.2×2 | 0.3 | 45 | C-016 |
| DRB230 | R0.2×2 | 0.3 | 45 | E-087 |
| MRBH230 | R0.2×2 | 0.3 | 45 | E-022 |
| MRB230 | R0.2×2 | 0.3 | 45 | E-036 |
| SSPBL220 | R0.2×2 | 0.3 | 50 | B-008 |
| SSBL200 | R0.2×2 | 0.3 | 50 | B-012 |
| MRBH230 | R0.2×2 | 0.3 | 50 | E-022 |
| MRB230 | R0.2×2 | 0.3 | 50 | E-036 |
| MRBTN230 | R0.2×2 | 0.4 | 50 | E-060･061 |
| MRB230SF | R0.2×2.5 | 0.3 | 35 | E-031 |
| MRBH230 | R0.2×2.5 | 0.3 | 45 | E-022 |
| MRB230 | R0.2×2.5 | 0.3 | 45 | E-036 |
| MRB230 | R0.2×2.5 | 0.3 | 50 | E-036 |
| DRB230 | R0.2×3 | 0.3 | 45 | E-087 |
| MRBH230 | R0.2×3 | 0.3 | 45 | E-022 |
| MRB230 | R0.2×3 | 0.3 | 45 | E-036 |
| SSPBTN220 | R0.2×3 | 0.3 | 50 | B-009 |
| MRBTNH230 | R0.2×3 | 0.3 | 50 | E-048 |
| MRB230 | R0.2×3 | 0.3 | 50 | E-036 |
| SSPBL220 | R0.2×3 | 0.3 | 52 | B-008 |
| MRBTN230 | R0.2×3 | 0.4 | 50 | E-060･061 |
| MRBH230 | R0.2×3.5 | 0.3 | 45 | E-022 |
| MRB230 | R0.2×3.5 | 0.3 | 45 | E-036 |
| DCRB230 | R0.2×4 | 0.3 | 45 | C-016 |
| DRB230 | R0.2×4 | 0.3 | 45 | E-087 |
| MRBH230 | R0.2×4 | 0.3 | 45 | E-022 |
| MRB230 | R0.2×4 | 0.3 | 45 | E-036 |
| MRBTNH230 | R0.2×4 | 0.3 | 50 | E-048 |
| SSPBTN220 | R0.2×4 | 0.3 | 52 | B-009 |
| MRBTN230 | R0.2×4 | 0.4 | 50 | E-060･061 |
| MRBLN230-6 | R0.2×4 | 0.4 | 60 | E-047 |
| RSB230 | R0.2×4 | 1.2 | 50 | E-085 |
| MRBH230 | R0.2×4.5 | 0.3 | 45 | E-022 |
| MRB230 | R0.2×4.5 | 0.3 | 45 | E-036 |
| MRBH230 | R0.2×5 | 0.3 | 45 | E-022 |
| MRB230 | R0.2×5 | 0.3 | 45 | E-036 |

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MRBTN230L | R0.2×5 | 0.4 | 50 | E-069 |
| RSB230 | R0.2×5 | 1.2 | 50 | E-085 |
| MRB230 | R0.2×5.5 | 0.3 | 45 | E-036 |
| DCRB230 | R0.2×6 | 0.3 | 45 | C-016 |
| MRBH230 | R0.2×6 | 0.3 | 45 | E-022 |
| MRB230 | R0.2×6 | 0.3 | 45 | E-036 |
| MRBTNH230 | R0.2×6 | 0.3 | 50 | E-048 |
| MRBTN230L | R0.2×6 | 0.4 | 50 | E-069 |
| **R0.25** | | | | |
| MSB230S | R0.25 | 0.5 | 50 | E-007 |
| MSB230G2 | R0.25 | 0.8 | 50 | E-007 |
| MSBH230 | R0.25 | 0.8 | 50 | E-001 |
| MSB230 | R0.25 | 0.8 | 50 | E-009 |
| NCB-2 | R0.25 | 1 | 35 | E-075 |
| NCB-2X | R0.25 | 1 | 35 | E-017 |
| MSBL230 | R0.25 | 1.25 | 70 | E-011 |
| RSB230 | R0.25 | 1.5 | 50 | E-085 |
| RSB230 | R0.25 | 2.5 | 50 | E-085 |
| RSB230 | R0.25 | 5 | 50 | E-085 |
| MRB230SF | R0.25×1 | 0.35 | 35 | E-031 |
| MRBH230 | R0.25×1 | 0.35 | 45 | E-022 |
| MRB230 | R0.25×1 | 0.35 | 45 | E-036 |
| SSB200 | R0.25×1 | 0.38 | 50 | B-011 |
| SSPB220 | R0.25×1 | 0.38 | 50 | B-007 |
| SFB200 | R0.25×1.25 | 0.38 | 50 | B-006 |
| MACH225 | R0.25×1.25 | 0.5 | 50 | E-005 |
| MRB230SF | R0.25×1.5 | 0.35 | 35 | E-031 |
| MRBH230 | R0.25×1.5 | 0.35 | 45 | E-022 |
| MRB230 | R0.25×1.5 | 0.35 | 45 | E-036 |
| MRB230 | R0.25×1.5 | 0.35 | 50 | E-036 |
| SSPBL220 | R0.25×1.5 | 0.38 | 50 | B-008 |
| SSBL200 | R0.25×1.5 | 0.38 | 50 | B-012 |
| MRB230SF | R0.25×2 | 0.35 | 35 | E-031 |
| DRB230 | R0.25×2 | 0.35 | 45 | E-087 |
| MRBH230 | R0.25×2 | 0.35 | 45 | E-022 |
| MRB230 | R0.25×2 | 0.35 | 45 | E-036 |
| MRB230 | R0.25×2 | 0.35 | 50 | E-036 |
| MRB230SF | R0.25×2.5 | 0.35 | 35 | E-031 |
| MRBH230 | R0.25×2.5 | 0.35 | 45 | E-022 |
| MRB230 | R0.25×2.5 | 0.35 | 45 | E-036 |
| SSPBL220 | R0.25×2.5 | 0.38 | 50 | B-008 |
| SSBL200 | R0.25×2.5 | 0.38 | 50 | B-012 |
| MRB230SF | R0.25×3 | 0.35 | 35 | E-031 |
| DRB230 | R0.25×3 | 0.35 | 45 | E-087 |
| MRBH230 | R0.25×3 | 0.35 | 45 | E-022 |
| MRB230 | R0.25×3 | 0.35 | 45 | E-036 |
| MRBTN230 | R0.25×3 | 0.5 | 50 | E-061 |
| MRBH230 | R0.25×3.5 | 0.35 | 45 | E-022 |
| MRB230 | R0.25×3.5 | 0.35 | 45 | E-036 |
| SSPBL220 | R0.25×3.5 | 0.38 | 52 | B-008 |
| DRB230 | R0.25×4 | 0.35 | 45 | E-087 |
| MRBH230 | R0.25×4 | 0.35 | 45 | E-022 |



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| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MRB230 | R0.25×4 | 0.35 | 45 | E-036 |
| MRBTNH230 | R0.25×4 | 0.35 | 50 | E-049 |
| MRB230 | R0.25×4 | 0.35 | 50 | E-036 |
| SSPBTN220 | R0.25×4 | 0.38 | 52 | B-009 |
| MRBH230 | R0.25×4.5 | 0.35 | 45 | E-022 |
| MRB230 | R0.25×4.5 | 0.35 | 45 | E-036 |
| DRB230 | R0.25×5 | 0.35 | 45 | E-087 |
| MRBH230 | R0.25×5 | 0.35 | 45 | E-022 |
| MRB230 | R0.25×5 | 0.35 | 45 | E-036 |
| MRBTNH230 | R0.25×5 | 0.35 | 50 | E-049 |
| MRB230 | R0.25×5 | 0.35 | 50 | E-036 |
| SSPBTN220 | R0.25×5 | 0.38 | 52 | B-009 |
| MRBTN230 | R0.25×5 | 0.5 | 50 | E-061 |
| MRBLN230-6 | R0.25×5 | 0.8 | 60 | E-047 |
| MRBH230 | R0.25×5.5 | 0.35 | 45 | E-022 |
| MRB230 | R0.25×5.5 | 0.35 | 45 | E-036 |
| MRBH230 | R0.25×6 | 0.35 | 45 | E-022 |
| MRB230 | R0.25×6 | 0.35 | 45 | E-036 |
| MRB230 | R0.25×6 | 0.35 | 50 | E-036 |
| MRBTN230L | R0.25×6 | 0.5 | 50 | E-069･070 |
| MRB230 | R0.25×7 | 0.35 | 45 | E-036 |
| MRBTN230L | R0.25×7 | 0.5 | 50 | E-069･070 |
| MRBH230 | R0.25×8 | 0.35 | 45 | E-022 |
| MRB230 | R0.25×8 | 0.35 | 45 | E-036 |
| MRB230 | R0.25×8 | 0.35 | 50 | E-036 |
| MRB230 | R0.25×9 | 0.35 | 55 | E-036 |
| MRBH230 | R0.25×10 | 0.35 | 45 | E-022 |
| MRB230 | R0.25×10 | 0.35 | 55 | E-036 |
| RSB230 | R0.25×10 | 1.5 | 50 | E-085 |
| RSB230 | R0.25×15 | 1.5 | 50 | E-085 |
| RSB230 | R0.25×20 | 1.5 | 60 | E-085 |
| **R0.3** | | | | |
| DCMB | R0.3 | 0.45 | 45 | C-014 |
| MSB230SF | R0.3 | 0.6 | 35 | E-008 |
| MSB230S | R0.3 | 0.6 | 50 | E-007 |
| MSB230G2 | R0.3 | 0.9 | 50 | E-007 |
| MSBH230 | R0.3 | 0.9 | 50 | E-001 |
| MSB230 | R0.3 | 0.9 | 50 | E-009 |
| NCB-2 | R0.3 | 1.2 | 35 | E-075 |
| NCB-2X | R0.3 | 1.2 | 35 | E-017 |
| MSBL230 | R0.3 | 1.5 | 70 | E-011 |
| RSB230 | R0.3 | 1.8 | 50 | E-085 |
| RSB230 | R0.3 | 3 | 50 | E-085 |
| MRBH230 | R0.3×1 | 0.45 | 45 | E-022 |
| MRB230 | R0.3×1 | 0.45 | 45 | E-037 |
| SSPB220 | R0.3×1.2 | 0.5 | 50 | B-007 |
| PCDRB | R0.3×1.5 | 0.3 | 48 | C-003 |
| DCMB | R0.3×1.5 | 0.35 | 45 | C-014 |
| MRB230SF | R0.3×1.5 | 0.45 | 35 | E-031 |
| MRBH230 | R0.3×1.5 | 0.45 | 45 | E-022 |
| MRB230 | R0.3×1.5 | 0.45 | 45 | E-037 |
| SFB200 | R0.3×1.5 | 0.5 | 50 | B-006 |

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| SSB200 | R0.3×1.5 | 0.5 | 50 | B-011 |
| SSPB220 | R0.3×1.5 | 0.5 | 50 | B-007 |
| MACH225SF | R0.3×1.5 | 0.6 | 35 | E-004 |
| MACH225 | R0.3×1.5 | 0.6 | 50 | E-005 |
| MRB230SF | R0.3×2 | 0.45 | 35 | E-031 |
| DRB230 | R0.3×2 | 0.45 | 45 | E-087 |
| MRBH230 | R0.3×2 | 0.45 | 45 | E-022 |
| MRB230 | R0.3×2 | 0.45 | 45 | E-037 |
| MRBH230 | R0.3×2 | 0.45 | 50 | E-022 |
| MRB230 | R0.3×2 | 0.45 | 50 | E-037 |
| MRB230SF | R0.3×2.5 | 0.45 | 35 | E-031 |
| MRBH230 | R0.3×2.5 | 0.45 | 45 | E-022 |
| MRB230 | R0.3×2.5 | 0.45 | 45 | E-037 |
| MRB230SF | R0.3×3 | 0.45 | 35 | E-031 |
| DCRB230 | R0.3×3 | 0.45 | 45 | C-016 |
| DRB230 | R0.3×3 | 0.45 | 45 | E-087 |
| MRBH230 | R0.3×3 | 0.45 | 45 | E-022 |
| MRB230 | R0.3×3 | 0.45 | 45 | E-037 |
| MRBH230 | R0.3×3 | 0.45 | 50 | E-022 |
| MRB230 | R0.3×3 | 0.45 | 50 | E-037 |
| ALB225 | R0.3×3 | 0.45 | 60 | E-082 |
| ALB225-DLC | R0.3×3 | 0.45 | 60 | E-083 |
| SSPBL220 | R0.3×3 | 0.5 | 50 | B-008 |
| SSBL200 | R0.3×3 | 0.5 | 50 | B-012 |
| MRBLN230-6 | R0.3×3 | 1 | 60 | E-047 |
| MRB230SF | R0.3×3.5 | 0.45 | 35 | E-031 |
| MRBH230 | R0.3×3.5 | 0.45 | 45 | E-022 |
| MRB230 | R0.3×3.5 | 0.45 | 45 | E-037 |
| MRB230SF | R0.3×4 | 0.45 | 40 | E-031 |
| DRB230 | R0.3×4 | 0.45 | 45 | E-087 |
| MRBH230 | R0.3×4 | 0.45 | 45 | E-022 |
| MRB230 | R0.3×4 | 0.45 | 45 | E-037 |
| MRBTNH230 | R0.3×4 | 0.45 | 50 | E-049 |
| MRBH230 | R0.3×4 | 0.45 | 50 | E-022 |
| MRB230 | R0.3×4 | 0.45 | 50 | E-037 |
| SSBL200 | R0.3×4 | 0.5 | 52 | B-012 |
| SSPBL220 | R0.3×4 | 0.5 | 53 | B-008 |
| MRBTN230 | R0.3×4 | 0.6 | 50 | E-061 |
| MRB230SF | R0.3×4.5 | 0.45 | 40 | E-031 |
| MRBH230 | R0.3×4.5 | 0.45 | 45 | E-022 |
| MRB230 | R0.3×4.5 | 0.45 | 45 | E-037 |
| MRB230SF | R0.3×5 | 0.45 | 40 | E-031 |
| DRB230 | R0.3×5 | 0.45 | 45 | E-087 |
| MRBH230 | R0.3×5 | 0.45 | 45 | E-022 |
| MRB230 | R0.3×5 | 0.45 | 45 | E-037 |
| MRBTNH230 | R0.3×5 | 0.45 | 50 | E-049 |
| SSBL200 | R0.3×5 | 0.5 | 52 | B-012 |
| SSPBL220 | R0.3×5 | 0.5 | 53 | B-008 |
| SSPBTN220 | R0.3×5 | 0.5 | 53 | B-010 |
| MRBTN230 | R0.3×5 | 0.6 | 50 | E-061 |
| MRBLN230-6 | R0.3×5 | 1 | 60 | E-047 |
| MRB230SF | R0.3×5.5 | 0.45 | 40 | E-031 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MRBH230 | R0.3×5.5 | 0.45 | 45 | E-022 |
| MRB230 | R0.3×5.5 | 0.45 | 45 | E-037 |
| MRB230SF | R0.3×6 | 0.45 | 40 | E-031 |
| DCRB230 | R0.3×6 | 0.45 | 45 | C-016 |
| DRB230 | R0.3×6 | 0.45 | 45 | E-087 |
| MRBH230 | R0.3×6 | 0.45 | 45 | E-022 |
| MRB230 | R0.3×6 | 0.45 | 45 | E-037 |
| MRBTNH230 | R0.3×6 | 0.45 | 50 | E-049 |
| MRB230 | R0.3×6 | 0.45 | 50 | E-037 |
| SSPBL220 | R0.3×6 | 0.5 | 53 | B-008 |
| SSPBTN220 | R0.3×6 | 0.5 | 53 | B-010 |
| MRBTN230 | R0.3×6 | 0.6 | 50 | E-061 |
| MRBLN230-6 | R0.3×6 | 1 | 60 | E-047 |
| RSB230 | R0.3×6 | 1.8 | 50 | E-085 |
| MRB230 | R0.3×6.5 | 0.45 | 45 | E-037 |
| MRBH230 | R0.3×7 | 0.45 | 45 | E-023 |
| MRB230 | R0.3×7 | 0.45 | 45 | E-037 |
| MRB230 | R0.3×7.5 | 0.45 | 45 | E-037 |
| MRBH230 | R0.3×8 | 0.45 | 45 | E-023 |
| MRB230 | R0.3×8 | 0.45 | 45 | E-037 |
| MRBTNH230 | R0.3×8 | 0.45 | 50 | E-049 |
| MRB230 | R0.3×8 | 0.45 | 50 | E-037 |
| MRBTN230 | R0.3×8 | 0.6 | 50 | E-061 |
| MRB230 | R0.3×8.5 | 0.45 | 45 | E-037 |
| DCRB230 | R0.3×9 | 0.45 | 45 | C-016 |
| MRBH230 | R0.3×9 | 0.45 | 45 | E-023 |
| MRB230 | R0.3×9 | 0.45 | 45 | E-037 |
| MRB230 | R0.3×9.5 | 0.45 | 45 | E-037 |
| MRBH230 | R0.3×10 | 0.45 | 45 | E-023 |
| MRB230 | R0.3×10 | 0.45 | 45 | E-037 |
| MRB230 | R0.3×10 | 0.45 | 50 | E-037 |
| MRBTN230L | R0.3×10 | 0.6 | 60 | E-070 |
| RSB230 | R0.3×10 | 1.8 | 50 | E-085 |
| MRB230 | R0.3×11 | 0.45 | 45 | E-037 |
| DCRB230 | R0.3×12 | 0.45 | 45 | C-016 |
| MRBH230 | R0.3×12 | 0.45 | 45 | E-023 |
| MRB230 | R0.3×12 | 0.45 | 45 | E-037 |
| MRBTN230L | R0.3×12 | 0.6 | 60 | E-070 |
| MRBTN230L | R0.3×20 | 0.6 | 60 | E-070 |
| **R0.35** | | | | |
| MSB230S | R0.35 | 0.7 | 50 | E-007 |
| MSB230 | R0.35 | 1.1 | 50 | E-009 |
| NCB-2 | R0.35 | 1.4 | 35 | E-075 |
| NCB-2X | R0.35 | 1.4 | 35 | E-017 |
| MSBL230 | R0.35 | 1.75 | 70 | E-011 |
| MRBH230 | R0.35×2 | 0.5 | 45 | E-023 |
| MRB230 | R0.35×2 | 0.5 | 45 | E-037 |
| MRBH230 | R0.35×4 | 0.5 | 45 | E-023 |
| MRB230 | R0.35×4 | 0.5 | 45 | E-037 |
| MRBH230 | R0.35×6 | 0.5 | 45 | E-023 |
| MRB230 | R0.35×6 | 0.5 | 45 | E-037 |
| MRBH230 | R0.35×8 | 0.5 | 45 | E-023 |

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MRB230 | R0.35×8 | 0.5 | 45 | E-037 |
| **R0.4** | | | | |
| MSB230SF | R0.4 | 0.8 | 35 | E-008 |
| MSB230S | R0.4 | 0.8 | 50 | E-007 |
| MSB230G2 | R0.4 | 1.2 | 50 | E-007 |
| MSBH230 | R0.4 | 1.2 | 50 | E-001 |
| MSB230 | R0.4 | 1.2 | 50 | E-009 |
| NCB-2 | R0.4 | 1.6 | 35 | E-075 |
| NCB-2X | R0.4 | 1.6 | 35 | E-017 |
| MSBL230 | R0.4 | 2 | 70 | E-011 |
| RSB230 | R0.4 | 2.4 | 50 | E-085 |
| RSB230 | R0.4 | 4 | 50 | E-085 |
| SSPB220 | R0.4×1.6 | 0.6 | 50 | B-007 |
| MRB230SF | R0.4×2 | 0.6 | 35 | E-032 |
| MRBH230 | R0.4×2 | 0.6 | 45 | E-023 |
| MRB230 | R0.4×2 | 0.6 | 45 | E-037 |
| SFB200 | R0.4×2 | 0.6 | 50 | B-006 |
| SSB200 | R0.4×2 | 0.6 | 50 | B-011 |
| SSPB220 | R0.4×2 | 0.6 | 50 | B-007 |
| MRBH230 | R0.4×2 | 0.6 | 50 | E-023 |
| MRB230 | R0.4×2 | 0.6 | 50 | E-037 |
| MACH225SF | R0.4×2 | 0.8 | 35 | E-004 |
| MACH225 | R0.4×2 | 0.8 | 50 | E-005 |
| MRB230SF | R0.4×3 | 0.6 | 35 | E-032 |
| DRB230 | R0.4×3 | 0.6 | 45 | E-088 |
| MRBH230 | R0.4×3 | 0.6 | 45 | E-023 |
| MRB230 | R0.4×3 | 0.6 | 45 | E-037 |
| MRB230 | R0.4×3 | 0.6 | 50 | E-037 |
| MRB230SF | R0.4×4 | 0.6 | 40 | E-032 |
| DRB230 | R0.4×4 | 0.6 | 45 | E-088 |
| MRBH230 | R0.4×4 | 0.6 | 45 | E-023 |
| MRB230 | R0.4×4 | 0.6 | 45 | E-037 |
| MRB230 | R0.4×4 | 0.6 | 50 | E-037 |
| SSPBL220 | R0.4×4 | 0.6 | 53 | B-008 |
| SSBL200 | R0.4×4 | 0.6 | 53 | B-012 |
| ALB225 | R0.4×4 | 0.6 | 60 | E-082 |
| ALB225-DLC | R0.4×4 | 0.6 | 60 | E-083 |
| MRB230SF | R0.4×5 | 0.6 | 40 | E-032 |
| MRBH230 | R0.4×5 | 0.6 | 45 | E-023 |
| MRB230 | R0.4×5 | 0.6 | 45 | E-037 |
| NHB-2 | R0.4×6 | 0.6 | 45 | E-079 |
| DRB230 | R0.4×6 | 0.6 | 45 | E-088 |
| MRBH230 | R0.4×6 | 0.6 | 45 | E-023 |
| MRB230 | R0.4×6 | 0.6 | 45 | E-037 |
| MRB230 | R0.4×6 | 0.6 | 50 | E-037 |
| SSPBL220 | R0.4×6 | 0.6 | 53 | B-008 |
| MRBH230 | R0.4×7 | 0.6 | 45 | E-023 |
| MRB230 | R0.4×7 | 0.6 | 45 | E-037 |
| NHB-2 | R0.4×8 | 0.6 | 45 | E-079 |
| DRB230 | R0.4×8 | 0.6 | 45 | E-088 |
| MRBH230 | R0.4×8 | 0.6 | 45 | E-023 |
| MRB230 | R0.4×8 | 0.6 | 45 | E-037 |



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| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MRB230 | R0.4×8 | 0.6 | 50 | E-037 |
| MRBTNH230 | R0.4×8 | 0.6 | 60 | E-049 |
| MRBTN230 | R0.4×8 | 0.8 | 50 | E-061・062 |
| MRBLN230-6 | R0.4×8 | 1.4 | 60 | E-047 |
| RSB230 | R0.4×8 | 2.4 | 50 | E-085 |
| MRB230 | R0.4×9 | 0.6 | 45 | E-037 |
| MRBH230 | R0.4×10 | 0.6 | 45 | E-023 |
| MRB230 | R0.4×10 | 0.6 | 45 | E-038 |
| MRB230 | R0.4×10 | 0.6 | 50 | E-038 |
| MRBH230 | R0.4×12 | 0.6 | 45 | E-023 |
| MRB230 | R0.4×12 | 0.6 | 45 | E-038 |
| MRBTNH230 | R0.4×12 | 0.6 | 60 | E-049 |
| MRBTN230 | R0.4×12 | 0.8 | 60 | E-061・062 |
| RSB230 | R0.4×12 | 2.4 | 50 | E-085 |
| MRBTN230L | R0.4×16 | 0.8 | 60 | E-070 |
| MRBTN230L | R0.4×19.8 | 0.8 | 60 | E-070 |
| MRBTN230L | R0.4×20 | 0.8 | 60 | E-070 |
| **R0.45** | | | | |
| MSB230S | R0.45 | 0.9 | 50 | E-007 |
| MSB230 | R0.45 | 1.4 | 50 | E-009 |
| NCB-2 | R0.45 | 1.8 | 35 | E-075 |
| NCB-2X | R0.45 | 1.8 | 35 | E-017 |
| MSBL230 | R0.45 | 2.25 | 70 | E-011 |
| MRBH230 | R0.45×2 | 0.65 | 45 | E-023 |
| MRB230 | R0.45×2 | 0.65 | 45 | E-038 |
| MRBH230 | R0.45×4 | 0.65 | 45 | E-023 |
| MRB230 | R0.45×4 | 0.65 | 45 | E-038 |
| MRBH230 | R0.45×6 | 0.65 | 45 | E-023 |
| MRB230 | R0.45×6 | 0.65 | 45 | E-038 |
| MRBH230 | R0.45×8 | 0.65 | 45 | E-023 |
| MRB230 | R0.45×8 | 0.65 | 45 | E-038 |
| **R0.5** | | | | |
| DCMB | R0.5 | 0.75 | 45 | C-014 |
| MSB230SF | R0.5 | 1 | 40 | E-008 |
| MSB230S | R0.5 | 1 | 50 | E-007 |
| MSB230G2 | R0.5 | 1.5 | 50 | E-007 |
| MSBH230 | R0.5 | 1.5 | 50 | E-001 |
| MSB230 | R0.5 | 1.5 | 50 | E-009 |
| MSB345 | R0.5 | 1.5 | 60 | E-014 |
| MSBH345 | R0.5 | 1.5 | 60 | E-002 |
| NCB-2 | R0.5 | 2 | 35 | E-075 |
| NCB-2X | R0.5 | 2 | 35 | E-017 |
| DB | R0.5 | 2 | 45 | E-091 |
| ALB225 | R0.5 | 2 | 60 | E-082 |
| ALB225-DLC | R0.5 | 2 | 60 | E-083 |
| MSBL230 | R0.5 | 2.5 | 70 | E-011 |
| MSBXL230 | R0.5 | 2.5 | 100 | E-016 |
| RSB230 | R0.5 | 3 | 50 | E-085 |
| NLBL-2 | R0.5 | 5 | 50 | E-078 |
| RSB230 | R0.5 | 5 | 50 | E-085 |
| RSB230 | R0.5 | 10 | 50 | E-085 |
| SSPB220 | R0.5×2 | 0.7 | 50 | B-007 |

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MRBH230 | R0.5×2 | 0.75 | 45 | E-023 |
| MRB230 | R0.5×2 | 0.75 | 45 | E-038 |
| PCDRB | R0.5×2.5 | 0.5 | 50 | C-003 |
| DCMB | R0.5×2.5 | 0.6 | 45 | C-014 |
| SFB200 | R0.5×2.5 | 0.7 | 50 | B-006 |
| SSB200 | R0.5×2.5 | 0.7 | 50 | B-011 |
| SSPB220 | R0.5×2.5 | 0.7 | 50 | B-007 |
| MRBH230 | R0.5×2.5 | 0.75 | 45 | E-023 |
| MRB230 | R0.5×2.5 | 0.75 | 45 | E-038 |
| MACH225SF | R0.5×2.5 | 1 | 40 | E-004 |
| MACH225 | R0.5×2.5 | 1 | 50 | E-005 |
| MRB230SF | R0.5×3 | 0.75 | 35 | E-032 |
| DRB230 | R0.5×3 | 0.75 | 45 | E-088 |
| MRBH230 | R0.5×3 | 0.75 | 45 | E-023 |
| MRB230 | R0.5×3 | 0.75 | 45 | E-038 |
| MRBH230 | R0.5×3 | 0.75 | 50 | E-023 |
| MRB230 | R0.5×3 | 0.75 | 50 | E-038 |
| SSPBL220 | R0.5×4 | 0.7 | 51 | B-008 |
| SSBL200 | R0.5×4 | 0.7 | 53 | B-012 |
| MRB230SF | R0.5×4 | 0.75 | 35 | E-032 |
| DCRB230 | R0.5×4 | 0.75 | 45 | C-016 |
| DRB230 | R0.5×4 | 0.75 | 45 | E-088 |
| MRBH230 | R0.5×4 | 0.75 | 45 | E-023 |
| MRB230 | R0.5×4 | 0.75 | 45 | E-038 |
| MRBH230 | R0.5×4 | 0.75 | 50 | E-023 |
| MRB230 | R0.5×4 | 0.75 | 50 | E-038 |
| MACH225 | R0.5×4 | 1 | 50 | E-005 |
| DHB | R0.5×4 | 1.5 | 50 | E-092 |
| SSBL200 | R0.5×5 | 0.7 | 53 | B-012 |
| MRB230SF | R0.5×5 | 0.75 | 40 | E-032 |
| DRB230 | R0.5×5 | 0.75 | 45 | E-088 |
| MRBH230 | R0.5×5 | 0.75 | 45 | E-023 |
| MRB230 | R0.5×5 | 0.75 | 45 | E-038 |
| MRBH230 | R0.5×5 | 0.75 | 50 | E-023 |
| MRB230 | R0.5×5 | 0.75 | 50 | E-038 |
| ALB225 | R0.5×5 | 0.75 | 60 | E-082 |
| ALB225-DLC | R0.5×5 | 0.75 | 60 | E-083 |
| SSPBL220 | R0.5×6 | 0.7 | 53 | B-008 |
| SSBL200 | R0.5×6 | 0.7 | 53 | B-012 |
| MRB230SF | R0.5×6 | 0.75 | 40 | E-032 |
| DCRB230 | R0.5×6 | 0.75 | 45 | C-016 |
| DRB230 | R0.5×6 | 0.75 | 45 | E-088 |
| MRBH230 | R0.5×6 | 0.75 | 45 | E-023 |
| MRB230 | R0.5×6 | 0.75 | 45 | E-038 |
| MRBH230 | R0.5×6 | 0.75 | 50 | E-023 |
| MRB230 | R0.5×6 | 0.75 | 50 | E-038 |
| MRBTNH230 | R0.5×6 | 0.75 | 60 | E-049・050 |
| MACH225 | R0.5×6 | 1 | 50 | E-005 |
| MRBTN230 | R0.5×6 | 1 | 60 | E-062 |
| DHB | R0.5×6 | 1.5 | 50 | E-092 |
| MRBH230 | R0.5×7 | 0.75 | 45 | E-023 |
| MRB230 | R0.5×7 | 0.75 | 45 | E-038 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MRBH230 | R0.5×7 | 0.75 | 50 | E-023 |
| SSPBL220 | R0.5×8 | 0.7 | 53 | B-008 |
| SSBL200 | R0.5×8 | 0.7 | 53 | B-012 |
| SSPBTN220 | R0.5×8 | 0.7 | 53 | B-010 |
| MRB230SF | R0.5×8 | 0.75 | 40 | E-032 |
| NHB-2 | R0.5×8 | 0.75 | 45 | E-079 |
| DRB230 | R0.5×8 | 0.75 | 45 | E-088 |
| MRBH230 | R0.5×8 | 0.75 | 45 | E-023 |
| MRB230 | R0.5×8 | 0.75 | 45 | E-038 |
| MRBH230 | R0.5×8 | 0.75 | 50 | E-023 |
| MRB230 | R0.5×8 | 0.75 | 50 | E-038 |
| MRBTNH230 | R0.5×8 | 0.75 | 60 | E-049･050 |
| MRBTN230 | R0.5×8 | 1 | 60 | E-062 |
| MRBH230 | R0.5×9 | 0.75 | 45 | E-023 |
| MRB230 | R0.5×9 | 0.75 | 45 | E-038 |
| SSPBL220 | R0.5×10 | 0.7 | 53 | B-008 |
| SSBL200 | R0.5×10 | 0.7 | 53 | B-012 |
| SSPBTN220 | R0.5×10 | 0.7 | 53 | B-010 |
| MRB230SF | R0.5×10 | 0.75 | 40 | E-032 |
| DRB230 | R0.5×10 | 0.75 | 45 | E-088 |
| MRBH230 | R0.5×10 | 0.75 | 45 | E-023 |
| MRB230 | R0.5×10 | 0.75 | 45 | E-038 |
| DCRB230 | R0.5×10 | 0.75 | 50 | C-016 |
| MRBH230 | R0.5×10 | 0.75 | 50 | E-023 |
| MRB230 | R0.5×10 | 0.75 | 50 | E-038 |
| ALB225 | R0.5×10 | 0.75 | 60 | E-082 |
| ALB225-DLC | R0.5×10 | 0.75 | 60 | E-083 |
| MRBTNH230 | R0.5×10 | 0.75 | 60 | E-049･050 |
| MRBTN230 | R0.5×10 | 1 | 60 | E-062 |
| DHB | R0.5×10 | 1.5 | 50 | E-092 |
| MRBLN230-6 | R0.5×10 | 1.5 | 60 | E-047 |
| RSB230 | R0.5×10 | 3 | 50 | E-085 |
| NHB-2 | R0.5×12 | 0.75 | 45 | E-079 |
| DRB230 | R0.5×12 | 0.75 | 45 | E-088 |
| MRBH230 | R0.5×12 | 0.75 | 45 | E-023 |
| MRB230 | R0.5×12 | 0.75 | 45 | E-038 |
| MRB230 | R0.5×12 | 0.75 | 50 | E-038 |
| MRBTNH230 | R0.5×12 | 0.75 | 60 | E-049･050 |
| MRBTNH345 | R0.5×12 | 0.75 | 60 | E-056 |
| MRBTN230 | R0.5×12 | 1 | 60 | E-062 |
| MRBH230 | R0.5×13 | 0.75 | 45 | E-023 |
| MRB230 | R0.5×13 | 0.75 | 45 | E-038 |
| MRBH230 | R0.5×14 | 0.75 | 50 | E-023 |
| MRB230 | R0.5×14 | 0.75 | 50 | E-038 |
| MRBTN230 | R0.5×15 | 1 | 60 | E-062 |
| RSB230 | R0.5×15 | 3 | 60 | E-086 |
| DCRB230 | R0.5×16 | 0.75 | 50 | C-016 |
| MRBH230 | R0.5×16 | 0.75 | 50 | E-024 |
| MRB230 | R0.5×16 | 0.75 | 50 | E-038 |
| MRBTNH230 | R0.5×16 | 0.75 | 60 | E-049･050 |
| MRBTNH345 | R0.5×16 | 0.75 | 60 | E-056 |
| MRB230 | R0.5×16 | 0.75 | 60 | E-038 |

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MRBTN230 | R0.5×16 | 1 | 60 | E-062 |
| MRBH230 | R0.5×18 | 0.75 | 55 | E-024 |
| MRB230 | R0.5×18 | 0.75 | 55 | E-038 |
| DCRB230 | R0.5×20 | 0.75 | 55 | C-016 |
| MRBH230 | R0.5×20 | 0.75 | 55 | E-024 |
| MRB230 | R0.5×20 | 0.75 | 55 | E-038 |
| MRB230 | R0.5×20 | 0.75 | 60 | E-038 |
| MRBTNH230 | R0.5×20 | 0.75 | 70 | E-049･050 |
| MRBTNH345 | R0.5×20 | 0.75 | 70 | E-056 |
| MRBTN230 | R0.5×20 | 1 | 70 | E-062 |
| RSB230 | R0.5×20 | 3 | 60 | E-086 |
| MRBH230 | R0.5×22 | 0.75 | 60 | E-024 |
| MRB230 | R0.5×22 | 0.75 | 60 | E-038 |
| MRBTN230 | R0.5×22 | 1 | 70 | E-062 |
| MRBTNH230 | R0.5×25 | 0.75 | 70 | E-049･050 |
| MRBTNH345 | R0.5×25 | 0.75 | 70 | E-056 |
| MRBTN230 | R0.5×25 | 1 | 70 | E-062 |
| MRBTNH230 | R0.5×30 | 0.75 | 70 | E-049･050 |
| MRBTNH345 | R0.5×30 | 0.75 | 70 | E-056 |
| MRBTN230L | R0.5×30 | 1 | 70 | E-070･071 |
| RSB230 | R0.5×30 | 3 | 70 | E-086 |
| MRBTN230L | R0.5×30.5 | 1 | 70 | E-071 |
| MRBTN230L | R0.5×30.6 | 1 | 70 | E-071 |
| MRBTN230 | R0.5×36 | 1 | 70 | E-062 |
| MRBTN230L | R0.5×49.7 | 1 | 90 | E-071 |
| MRBTN230L | R0.5×50 | 1 | 90 | E-070･071 |
| MRBTN230L | R0.5×53.4 | 1 | 90 | E-071 |
| MRBTN230L | R0.5×73.5 | 1 | 130 | E-071 |
| MRBTN230L | R0.5×80 | 1 | 130 | E-070･071 |
| **R0.55** | | | | |
| MSB230 | R0.55 | 1.7 | 50 | E-009 |
| MSBL230 | R0.55 | 2.75 | 70 | E-011 |
| **R0.6** | | | | |
| MSB230SF | R0.6 | 1.2 | 40 | E-008 |
| MSB230S | R0.6 | 1.2 | 50 | E-007 |
| MSB230 | R0.6 | 1.8 | 50 | E-009 |
| MSB345 | R0.6 | 2 | 60 | E-014 |
| MSBH345 | R0.6 | 2 | 60 | E-002 |
| NCB-2 | R0.6 | 2.4 | 35 | E-075 |
| NCB-2X | R0.6 | 2.4 | 35 | E-017 |
| MSBL230 | R0.6 | 3 | 70 | E-011 |
| SSPB220 | R0.6×2.4 | 0.8 | 50 | B-007 |
| MRBH230 | R0.6×2.4 | 0.9 | 45 | E-024 |
| MRB230 | R0.6×2.4 | 0.9 | 45 | E-038 |
| SFB200 | R0.6×3 | 0.8 | 50 | B-006 |
| SSB200 | R0.6×3 | 0.8 | 50 | B-011 |
| SSPB220 | R0.6×3 | 0.8 | 50 | B-007 |
| MACH225SF | R0.6×3 | 1.2 | 40 | E-004 |
| MRBH230 | R0.6×4 | 0.9 | 45 | E-024 |
| MRB230 | R0.6×4 | 0.9 | 45 | E-038 |
| SSPBL220 | R0.6×6 | 0.8 | 53 | B-008 |
| MRBH230 | R0.6×6 | 0.9 | 45 | E-024 |


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| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MRB230 | R0.6×6 | 0.9 | 45 | E-038 |
| MRB230 | R0.6×6 | 0.9 | 50 | E-038 |
| NHB-2 | R0.6×8 | 0.9 | 45 | E-079 |
| MRBH230 | R0.6×8 | 0.9 | 45 | E-024 |
| MRB230 | R0.6×8 | 0.9 | 45 | E-038 |
| MRB230 | R0.6×8 | 0.9 | 50 | E-038 |
| MRBH230 | R0.6×10 | 0.9 | 45 | E-024 |
| MRB230 | R0.6×10 | 0.9 | 45 | E-038 |
| MRB230 | R0.6×10 | 0.9 | 50 | E-038 |
| NHB-2 | R0.6×12 | 0.9 | 45 | E-079 |
| MRBH230 | R0.6×12 | 0.9 | 45 | E-024 |
| MRB230 | R0.6×12 | 0.9 | 45 | E-038 |
| MRB230 | R0.6×12 | 0.9 | 50 | E-038 |
| MRBTN230 | R0.6×12 | 1.2 | 60 | E-062･063 |
| MRBH230 | R0.6×14 | 0.9 | 50 | E-024 |
| MRB230 | R0.6×14 | 0.9 | 50 | E-038 |
| MRBH230 | R0.6×16 | 0.9 | 50 | E-024 |
| MRB230 | R0.6×16 | 0.9 | 50 | E-039 |
| MRB230 | R0.6×16 | 0.9 | 60 | E-039 |
| MRB230 | R0.6×18 | 0.9 | 55 | E-039 |
| MRB230 | R0.6×20 | 0.9 | 55 | E-039 |
| MRB230 | R0.6×24 | 0.9 | 60 | E-039 |
| MRBTN230 | R0.6×24 | 1.2 | 70 | E-062･063 |
| MRBTN230L | R0.6×36 | 1.2 | 80 | E-071 |
| MRBTN230L | R0.6×41.2 | 1.2 | 90 | E-071 |
| MRBTN230L | R0.6×48 | 1.2 | 90 | E-071 |
| **R0.65** | | | | |
| MSB230 | R0.65 | 2 | 50 | E-009 |
| MSBL230 | R0.65 | 3.25 | 70 | E-011 |
| **R0.7** | | | | |
| MSB230S | R0.7 | 1.4 | 50 | E-007 |
| MSB230 | R0.7 | 2.1 | 50 | E-009 |
| NCB-2 | R0.7 | 2.8 | 35 | E-075 |
| NCB-2X | R0.7 | 2.8 | 35 | E-017 |
| MSB345 | R0.7 | 3 | 60 | E-014 |
| MSBH345 | R0.7 | 3 | 60 | E-002 |
| MSBL230 | R0.7 | 3.5 | 70 | E-011 |
| SFB200 | R0.7×3.5 | 1 | 52 | B-006 |
| NHB-2 | R0.7×8 | 1 | 45 | E-079 |
| MRBH230 | R0.7×8 | 1 | 45 | E-024 |
| MRB230 | R0.7×8 | 1 | 45 | E-039 |
| NHB-2 | R0.7×12 | 1 | 45 | E-079 |
| MRBH230 | R0.7×12 | 1 | 50 | E-024 |
| MRB230 | R0.7×12 | 1 | 50 | E-039 |
| NHB-2 | R0.7×16 | 1 | 50 | E-079 |
| MRBH230 | R0.7×16 | 1 | 50 | E-024 |
| MRB230 | R0.7×16 | 1 | 50 | E-039 |
| **R0.75** | | | | |
| DCMB | R0.75 | 1.1 | 45 | C-014 |
| MSB230SF | R0.75 | 1.5 | 40 | E-008 |
| MSB230S | R0.75 | 1.5 | 50 | E-007 |
| MSB230G2 | R0.75 | 2.3 | 50 | E-007 |

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSBH230 | R0.75 | 2.3 | 50 | E-001 |
| MSB230 | R0.75 | 2.3 | 50 | E-009 |
| NCB-2 | R0.75 | 3 | 35 | E-075 |
| NCB-2X | R0.75 | 3 | 35 | E-017 |
| DB | R0.75 | 3 | 45 | E-091 |
| ALB225 | R0.75 | 3 | 60 | E-082 |
| ALB225-DLC | R0.75 | 3 | 60 | E-083 |
| MSBL230 | R0.75 | 3.75 | 70 | E-011 |
| RSB230 | R0.75 | 4.5 | 50 | E-086 |
| RSB230 | R0.75 | 7.5 | 50 | E-086 |
| NLBL-2 | R0.75 | 8 | 50 | E-078 |
| RSB230 | R0.75 | 15 | 60 | E-086 |
| SSPB220 | R0.75×3 | 1 | 52 | B-007 |
| MRB230SF | R0.75×3 | 1.1 | 35 | E-032 |
| MRBH230 | R0.75×3 | 1.1 | 45 | E-024 |
| MRB230 | R0.75×3 | 1.1 | 45 | E-039 |
| PCDRB | R0.75×3.8 | 0.75 | 48 | C-003 |
| DCMB | R0.75×3.8 | 0.9 | 45 | C-014 |
| SFB200 | R0.75×3.8 | 1 | 52 | B-006 |
| SSB200 | R0.75×3.8 | 1 | 52 | B-011 |
| SSPB220 | R0.75×3.8 | 1 | 52 | B-007 |
| MACH225SF | R0.75×3.8 | 1.5 | 40 | E-004 |
| MACH225 | R0.75×3.8 | 1.5 | 50 | E-005 |
| MRB230SF | R0.75×4 | 1.1 | 35 | E-032 |
| MRBH230 | R0.75×4 | 1.1 | 45 | E-024 |
| MRB230 | R0.75×4 | 1.1 | 45 | E-039 |
| MRB230SF | R0.75×6 | 1.1 | 40 | E-032 |
| MRBH230 | R0.75×6 | 1.1 | 45 | E-024 |
| MRB230 | R0.75×6 | 1.1 | 45 | E-039 |
| DRB230 | R0.75×6 | 1.1 | 50 | E-088 |
| MRBH230 | R0.75×6 | 1.1 | 50 | E-024 |
| DHB | R0.75×6 | 2.25 | 50 | E-092 |
| SSPBL220 | R0.75×7.5 | 1 | 52 | B-008 |
| SSBL200 | R0.75×7.5 | 1 | 52 | B-012 |
| ALB225 | R0.75×7.5 | 1.1 | 60 | E-082 |
| ALB225-DLC | R0.75×7.5 | 1.1 | 60 | E-083 |
| MRB230SF | R0.75×8 | 1.1 | 40 | E-032 |
| NHB-2 | R0.75×8 | 1.1 | 45 | E-079 |
| MRBH230 | R0.75×8 | 1.1 | 45 | E-024 |
| MRB230 | R0.75×8 | 1.1 | 45 | E-039 |
| MRBH230 | R0.75×8 | 1.1 | 50 | E-024 |
| MRB230 | R0.75×8 | 1.1 | 50 | E-039 |
| SSPBL220 | R0.75×10 | 1 | 52 | B-008 |
| SSPBTN220 | R0.75×10 | 1 | 52 | B-010 |
| MRB230SF | R0.75×10 | 1.1 | 40 | E-032 |
| MRBH230 | R0.75×10 | 1.1 | 45 | E-024 |
| MRB230 | R0.75×10 | 1.1 | 45 | E-039 |
| MRBTNH230 | R0.75×10 | 1.1 | 60 | E-050 |
| MRBTN230 | R0.75×10 | 1.5 | 60 | E-063 |
| DHB | R0.75×10 | 2.25 | 50 | E-092 |
| NHB-2 | R0.75×12 | 1.1 | 45 | E-079 |
| MRBH230 | R0.75×12 | 1.1 | 45 | E-024 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MRB230 | R0.75×12 | 1.1 | 45 | E-039 |
| DRB230 | R0.75×12 | 1.1 | 50 | E-088 |
| MRB230 | R0.75×12 | 1.1 | 50 | E-039 |
| MRBTNH345 | R0.75×12 | 1.1 | 60 | E-056 |
| MRBH230 | R0.75×14 | 1.1 | 50 | E-024 |
| MRB230 | R0.75×14 | 1.1 | 50 | E-039 |
| SSPBL220 | R0.75×15 | 1 | 52 | B-008 |
| SSPBTN220 | R0.75×15 | 1 | 52 | B-010 |
| ALB225 | R0.75×15 | 1.1 | 60 | E-082 |
| ALB225-DLC | R0.75×15 | 1.1 | 60 | E-083 |
| MRBTNH230 | R0.75×15 | 1.1 | 60 | E-050 |
| MRBTN230 | R0.75×15 | 1.5 | 60 | E-063 |
| MRBLN230-6 | R0.75×15 | 1.75 | 60 | E-047 |
| RSB230 | R0.75×15 | 4.5 | 60 | E-086 |
| NHB-2 | R0.75×16 | 1.1 | 50 | E-079 |
| MRBH230 | R0.75×16 | 1.1 | 50 | E-024 |
| MRB230 | R0.75×16 | 1.1 | 50 | E-039 |
| MRBTNH345 | R0.75×16 | 1.1 | 60 | E-056 |
| MRB230 | R0.75×16 | 1.1 | 60 | E-039 |
| DHB | R0.75×16 | 2.25 | 50 | E-092 |
| DRB230 | R0.75×18 | 1.1 | 50 | E-088 |
| MRBH230 | R0.75×18 | 1.1 | 55 | E-024 |
| MRB230 | R0.75×18 | 1.1 | 55 | E-039 |
| NHB-2 | R0.75×20 | 1.1 | 55 | E-079 |
| MRBH230 | R0.75×20 | 1.1 | 55 | E-024 |
| MRB230 | R0.75×20 | 1.1 | 55 | E-039 |
| MRB230 | R0.75×20 | 1.1 | 60 | E-039 |
| MRBTNH230 | R0.75×20 | 1.1 | 70 | E-050 |
| MRBTNH345 | R0.75×20 | 1.1 | 70 | E-056 |
| MRBTN230 | R0.75×20 | 1.5 | 60 | E-063 |
| MRB230 | R0.75×22 | 1.1 | 55 | E-039 |
| MRBH230 | R0.75×22 | 1.1 | 60 | E-024 |
| MRBTNH230 | R0.75×25 | 1.1 | 70 | E-050 |
| MRBTNH345 | R0.75×25 | 1.1 | 70 | E-056 |
| MRBTN230 | R0.75×28.7 | 1.5 | 70 | E-063 |
| MRBTNH230 | R0.75×30 | 1.1 | 70 | E-050 |
| MRBH230 | R0.75×30 | 1.1 | 70 | E-024 |
| MRB230 | R0.75×30 | 1.1 | 70 | E-039 |
| MRBTNH345 | R0.75×30 | 1.1 | 70 | E-056 |
| MRBTN230 | R0.75×30 | 1.5 | 70 | E-063 |
| RSB230 | R0.75×30 | 4.5 | 70 | E-086 |
| MRBTN230L | R0.75×45 | 1.5 | 90 | E-071 |
| RSB230 | R0.75×45 | 4.5 | 90 | E-086 |
| MRBTN230L | R0.75×45.9 | 1.5 | 90 | E-071 |
| MRBTN230L | R0.75×60 | 1.5 | 110 | E-071 |
| **R0.8** | | | | |
| MSB230S | R0.8 | 1.6 | 50 | E-007 |
| MSB230 | R0.8 | 2.4 | 50 | E-009 |
| MSB345 | R0.8 | 3 | 60 | E-014 |
| MSBH345 | R0.8 | 3 | 60 | E-002 |
| NCB-2 | R0.8 | 3.2 | 35 | E-075 |
| NCB-2X | R0.8 | 3.2 | 35 | E-017 |

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSBL230 | R0.8 | 4 | 70 | E-011 |
| SFB200 | R0.8×4 | 1 | 52 | B-006 |
| MRB230 | R0.8×4 | 1.2 | 45 | E-039 |
| NHB-2 | R0.8×8 | 1.2 | 45 | E-079 |
| MRBH230 | R0.8×8 | 1.2 | 45 | E-024 |
| MRB230 | R0.8×8 | 1.2 | 45 | E-039 |
| NHB-2 | R0.8×12 | 1.2 | 45 | E-079 |
| MRBH230 | R0.8×12 | 1.2 | 45 | E-024 |
| MRB230 | R0.8×12 | 1.2 | 45 | E-039 |
| NHB-2 | R0.8×16 | 1.2 | 50 | E-079 |
| MRBH230 | R0.8×16 | 1.2 | 50 | E-024 |
| MRB230 | R0.8×16 | 1.2 | 50 | E-039 |
| NHB-2 | R0.8×20 | 1.2 | 55 | E-079 |
| MRBH230 | R0.8×20 | 1.2 | 55 | E-024 |
| MRB230 | R0.8×20 | 1.2 | 55 | E-039 |
| **R0.85** | | | | |
| MSB230 | R0.85 | 2.6 | 50 | E-009 |
| MSBL230 | R0.85 | 4.25 | 70 | E-011 |
| **R0.9** | | | | |
| MSB230S | R0.9 | 1.8 | 50 | E-007 |
| MSB230 | R0.9 | 2.7 | 50 | E-009 |
| MSB345 | R0.9 | 3 | 60 | E-014 |
| MSBH345 | R0.9 | 3 | 60 | E-002 |
| NCB-2 | R0.9 | 3.6 | 35 | E-075 |
| NCB-2X | R0.9 | 3.6 | 35 | E-017 |
| MSBL230 | R0.9 | 4.5 | 70 | E-011 |
| SFB200 | R0.9×4.5 | 1.2 | 52 | B-006 |
| NHB-2 | R0.9×8 | 1.3 | 45 | E-079 |
| MRB230 | R0.9×8 | 1.3 | 45 | E-039 |
| NHB-2 | R0.9×12 | 1.3 | 45 | E-079 |
| MRB230 | R0.9×12 | 1.3 | 45 | E-039 |
| NHB-2 | R0.9×16 | 1.3 | 50 | E-079 |
| MRB230 | R0.9×16 | 1.3 | 50 | E-039 |
| NHB-2 | R0.9×20 | 1.3 | 55 | E-079 |
| MRB230 | R0.9×20 | 1.3 | 55 | E-039 |
| **R0.95** | | | | |
| MSB230 | R0.95 | 2.9 | 50 | E-009 |
| MSBL230 | R0.95 | 4.75 | 70 | E-011 |
| **R1** | | | | |
| DCMB | R1 | 1.5 | 45 | C-014 |
| MSB230SF | R1 | 2 | 40 | E-008 |
| MSB230S | R1 | 2 | 60 | E-007 |
| NSB-2 | R1 | 3 | 60 | E-075 |
| NSB-2X | R1 | 3 | 60 | E-018 |
| MSB230G2 | R1 | 3 | 60 | E-007 |
| MSBH230 | R1 | 3 | 60 | E-001 |
| MSB230 | R1 | 3 | 60 | E-009 |
| MSB345 | R1 | 3 | 60 | E-014 |
| MSBH345 | R1 | 3 | 60 | E-002 |
| ALB225 | R1 | 4 | 60 | E-082 |
| ALB225-DLC | R1 | 4 | 60 | E-083 |
| DB | R1 | 4 | 60 | E-091 |


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| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSBL230 | R1 | 5 | 70 | E-011 |
| MSBXL230 | R1 | 5 | 100 | E-016 |
| RSB230 | R1 | 6 | 50 | E-086 |
| RSB230 | R1 | 10 | 50 | E-086 |
| NLBL-2 | R1 | 10 | 100 | E-078 |
| RSB230 | R1 | 20 | 60 | E-086 |
| MRB230SF | R1×3 | 1.5 | 35 | E-032 |
| MRBH230 | R1×3 | 1.5 | 45 | E-025 |
| MRB230 | R1×3 | 1.5 | 45 | E-039 |
| SSB200 | R1×4 | 1.2 | 52 | B-011 |
| SSPB220 | R1×4 | 1.2 | 52 | B-007 |
| MRB230SF | R1×4 | 1.5 | 35 | E-032 |
| MRBH230 | R1×4 | 1.5 | 45 | E-025 |
| MRB230 | R1×4 | 1.5 | 45 | E-039 |
| DRB230 | R1×4 | 1.5 | 50 | E-088 |
| MRBH230 | R1×4 | 1.5 | 50 | E-025 |
| MRB230 | R1×4 | 1.5 | 50 | E-039 |
| PCDRB | R1×5 | 1 | 48 | C-003 |
| DCMB | R1×5 | 1.2 | 45 | C-014 |
| SFB200 | R1×5 | 1.2 | 52 | B-006 |
| SSB200 | R1×5 | 1.2 | 52 | B-011 |
| SSPB220 | R1×5 | 1.2 | 52 | B-007 |
| MACH225SF | R1×5 | 2 | 40 | E-004 |
| MACH225 | R1×5 | 2 | 50 | E-005 |
| SSBL200 | R1×6 | 1.2 | 52 | B-012 |
| SSPBL220 | R1×6 | 1.2 | 53 | B-008 |
| MRB230SF | R1×6 | 1.5 | 35 | E-032 |
| DCRB230 | R1×6 | 1.5 | 45 | C-016 |
| MRBH230 | R1×6 | 1.5 | 45 | E-025 |
| MRB230 | R1×6 | 1.5 | 45 | E-039 |
| DRB230 | R1×6 | 1.5 | 50 | E-088 |
| MRBH230 | R1×6 | 1.5 | 50 | E-025 |
| MRB230 | R1×6 | 1.5 | 50 | E-039 |
| MACH225 | R1×6 | 2 | 50 | E-005 |
| SSBL200 | R1×8 | 1.2 | 52 | B-012 |
| SSPBL220 | R1×8 | 1.2 | 53 | B-008 |
| MRB230SF | R1×8 | 1.5 | 40 | E-032 |
| NHB-2 | R1×8 | 1.5 | 45 | E-079 |
| MRBH230 | R1×8 | 1.5 | 45 | E-025 |
| MRB230 | R1×8 | 1.5 | 45 | E-039 |
| DRB230 | R1×8 | 1.5 | 50 | E-088 |
| MRBH230 | R1×8 | 1.5 | 50 | E-025 |
| MRB230 | R1×8 | 1.5 | 50 | E-039 |
| MACH225 | R1×8 | 2 | 50 | E-005 |
| DHB | R1×8 | 3 | 50 | E-092 |
| SSBL200 | R1×10 | 1.2 | 52 | B-012 |
| SSPBL220 | R1×10 | 1.2 | 53 | B-008 |
| MRB230SF | R1×10 | 1.5 | 40 | E-032 |
| DCRB230 | R1×10 | 1.5 | 45 | C-016 |
| MRBH230 | R1×10 | 1.5 | 45 | E-025 |
| MRB230 | R1×10 | 1.5 | 45 | E-039 |
| DRB230 | R1×10 | 1.5 | 50 | E-088 |

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MRBH230 | R1×10 | 1.5 | 50 | E-025 |
| MRB230 | R1×10 | 1.5 | 50 | E-039 |
| ALB225 | R1×10 | 1.5 | 60 | E-082 |
| ALB225-DLC | R1×10 | 1.5 | 60 | E-083 |
| NHB-2 | R1×12 | 1.5 | 45 | E-079 |
| MRB230SF | R1×12 | 1.5 | 45 | E-032 |
| MRBH230 | R1×12 | 1.5 | 45 | E-025 |
| MRB230 | R1×12 | 1.5 | 45 | E-039 |
| DRB230 | R1×12 | 1.5 | 50 | E-088 |
| MRB230 | R1×12 | 1.5 | 50 | E-039 |
| MRBTNH230 | R1×12 | 1.5 | 60 | E-050･051 |
| MRBTNH345 | R1×12 | 1.5 | 60 | E-057 |
| MRBTN230 | R1×12 | 2 | 60 | E-063･064 |
| MRBH230 | R1×13 | 1.5 | 45 | E-025 |
| MRB230 | R1×13 | 1.5 | 45 | E-040 |
| SSPBL220 | R1×14 | 1.2 | 53 | B-008 |
| MRB230SF | R1×14 | 1.5 | 45 | E-032 |
| MRBH230 | R1×14 | 1.5 | 50 | E-025 |
| MRB230 | R1×14 | 1.5 | 50 | E-040 |
| DHB | R1×14 | 3 | 50 | E-092 |
| SSPBTN220 | R1×16 | 1.2 | 53 | B-010 |
| MRB230SF | R1×16 | 1.5 | 45 | E-032 |
| DCRB230 | R1×16 | 1.5 | 50 | C-016 |
| NHB-2 | R1×16 | 1.5 | 50 | E-079 |
| DRB230 | R1×16 | 1.5 | 50 | E-088 |
| MRBH230 | R1×16 | 1.5 | 50 | E-025 |
| MRB230 | R1×16 | 1.5 | 50 | E-040 |
| MRBTNH230 | R1×16 | 1.5 | 60 | E-050･051 |
| MRBTNH345 | R1×16 | 1.5 | 60 | E-057 |
| MRBH230 | R1×16 | 1.5 | 60 | E-025 |
| MRB230 | R1×16 | 1.5 | 60 | E-040 |
| MRBTN230 | R1×16 | 2 | 60 | E-063･064 |
| MRB230SF | R1×18 | 1.5 | 50 | E-032 |
| MRBH230 | R1×18 | 1.5 | 55 | E-025 |
| MRB230 | R1×18 | 1.5 | 55 | E-040 |
| SSPBL220 | R1×20 | 1.2 | 53 | B-008 |
| SSPBTN220 | R1×20 | 1.2 | 53 | B-010 |
| MRB230SF | R1×20 | 1.5 | 50 | E-032 |
| NHB-2 | R1×20 | 1.5 | 55 | E-079 |
| MRBH230 | R1×20 | 1.5 | 55 | E-025 |
| MRB230 | R1×20 | 1.5 | 55 | E-040 |
| ALB225 | R1×20 | 1.5 | 60 | E-082 |
| ALB225-DLC | R1×20 | 1.5 | 60 | E-083 |
| DRB230 | R1×20 | 1.5 | 60 | E-088 |
| MRB230 | R1×20 | 1.5 | 60 | E-040 |
| DCRB230 | R1×20 | 1.5 | 70 | C-016 |
| MRBTNH230 | R1×20 | 1.5 | 70 | E-050･051 |
| MRBTNH345 | R1×20 | 1.5 | 70 | E-057 |
| MRBTN230 | R1×20 | 2 | 60 | E-063･064 |
| MRBLN230-6 | R1×20 | 2 | 60 | E-047 |
| MRBTN230 | R1×20 | 2 | 70 | E-064 |
| DHB | R1×20 | 3 | 50 | E-092 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| RSB230 | R1×20 | 6 | 60 | E-086 |
| MRBH230 | R1×22 | 1.5 | 60 | E-025 |
| MRB230 | R1×22 | 1.5 | 60 | E-040 |
| DRB230 | R1×25 | 1.5 | 60 | E-088 |
| MRBH230 | R1×25 | 1.5 | 65 | E-025 |
| MRB230 | R1×25 | 1.5 | 65 | E-040 |
| MRBH230 | R1×25 | 1.5 | 65 | E-025 |
| MRBTNH230 | R1×25 | 1.5 | 70 | E-050・051 |
| MRBTNH345 | R1×25 | 1.5 | 70 | E-057 |
| MRB230 | R1×25 | 1.5 | 80 | E-040 |
| MRBTN230 | R1×25 | 2 | 60 | E-063 |
| MRBTN230 | R1×26.8 | 2 | 70 | E-064 |
| DCRB230 | R1×30 | 1.5 | 70 | C-016 |
| MRBTNH230 | R1×30 | 1.5 | 70 | E-050・051 |
| MRBH230 | R1×30 | 1.5 | 70 | E-025 |
| MRB230 | R1×30 | 1.5 | 70 | E-040 |
| MRBTNH345 | R1×30 | 1.5 | 70 | E-057 |
| MRB230 | R1×30 | 1.5 | 80 | E-040 |
| MRBTN230 | R1×30 | 2 | 70 | E-063・064 |
| RSB230 | R1×30 | 6 | 80 | E-086 |
| MRBH230 | R1×35 | 1.5 | 70 | E-025 |
| MRB230 | R1×35 | 1.5 | 70 | E-040 |
| MRBTNH230 | R1×35 | 1.5 | 80 | E-050・051 |
| MRB230 | R1×35 | 1.5 | 80 | E-040 |
| MRBTN230 | R1×35 | 2 | 80 | E-063 |
| MRBTN230 | R1×38.2 | 2 | 80 | E-064 |
| MRBTNH230 | R1×40 | 1.5 | 80 | E-050・051 |
| MRBTNH345 | R1×40 | 1.5 | 80 | E-057 |
| MRBH230 | R1×40 | 1.5 | 90 | E-025 |
| MRB230 | R1×40 | 1.5 | 90 | E-040 |
| MRBTN230 | R1×40 | 2 | 80 | E-063・064 |
| MRBTN230L | R1×49.7 | 2 | 100 | E-072 |
| MRBTNH230 | R1×50 | 1.5 | 90 | E-050・051 |
| MRBTN230L | R1×50 | 2 | 100 | E-071・072 |
| RSB230 | R1×50 | 6 | 110 | E-086 |
| RSB230 | R1×70 | 6 | 110 | E-086 |
| MRBTN230L | R1×80 | 2 | 130 | E-071 |
| MRBTN230L | R1×80.3 | 2 | 130 | E-071・072 |
| **R1.05** | | | | |
| MSB230 | R1.05 | 3.2 | 60 | E-009 |
| NSB-2X | R1.05 | 3.5 | 60 | E-018 |
| **R1.1** | | | | |
| MSB230 | R1.1 | 3.3 | 60 | E-009 |
| NSB-2X | R1.1 | 3.5 | 60 | E-018 |
| MSB345 | R1.1 | 3.5 | 60 | E-014 |
| MSBH345 | R1.1 | 3.5 | 60 | E-002 |
| MSBL230 | R1.1 | 5.5 | 80 | E-011 |
| **R1.15** | | | | |
| NSB-2X | R1.15 | 3.5 | 60 | E-018 |
| MSB230 | R1.15 | 3.5 | 60 | E-009 |
| **R1.2** | | | | |
| NSB-2X | R1.2 | 3.5 | 60 | E-018 |

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSB230 | R1.2 | 3.6 | 60 | E-009 |
| MSB345 | R1.2 | 4 | 60 | E-014 |
| MSBH345 | R1.2 | 4 | 60 | E-002 |
| MSBL230 | R1.2 | 6 | 80 | E-011 |
| **R1.25** | | | | |
| MSB230S | R1.25 | 2.5 | 60 | E-007 |
| NSB-2 | R1.25 | 3.5 | 60 | E-075 |
| NSB-2X | R1.25 | 3.5 | 60 | E-018 |
| MSB230 | R1.25 | 3.8 | 60 | E-009 |
| MSBH230 | R1.25 | 3.8 | 60 | E-001 |
| DB | R1.25 | 5 | 60 | E-091 |
| MSBL230 | R1.25 | 6.25 | 80 | E-011 |
| NLBL-2 | R1.25 | 13 | 100 | E-078 |
| MRBH230 | R1.25×6 | 2.3 | 45 | E-025 |
| MRB230 | R1.25×6 | 2.3 | 45 | E-040 |
| MRBH230 | R1.25×8 | 2.3 | 45 | E-025 |
| MRBH230 | R1.25×10 | 2.3 | 45 | E-025 |
| MRB230 | R1.25×10 | 2.3 | 45 | E-040 |
| MRBH230 | R1.25×15 | 2.3 | 50 | E-025 |
| MRB230 | R1.25×15 | 2.3 | 50 | E-040 |
| MRBH230 | R1.25×20 | 2.3 | 55 | E-025 |
| MRB230 | R1.25×20 | 2.3 | 55 | E-040 |
| MRBH230 | R1.25×25 | 2.3 | 65 | E-025 |
| MRB230 | R1.25×25 | 2.3 | 65 | E-040 |
| MRBH230 | R1.25×30 | 2.3 | 70 | E-025 |
| MRB230 | R1.25×30 | 2.3 | 70 | E-040 |
| MRBH230 | R1.25×35 | 2.3 | 70 | E-025 |
| MRB230 | R1.25×35 | 2.3 | 70 | E-040 |
| **R1.3** | | | | |
| MSB230 | R1.3 | 3.9 | 60 | E-009 |
| NSB-2X | R1.3 | 4 | 60 | E-018 |
| MSB345 | R1.3 | 4 | 60 | E-014 |
| MSBH345 | R1.3 | 4 | 60 | E-002 |
| MSBL230 | R1.3 | 6.5 | 80 | E-011 |
| **R1.35** | | | | |
| NSB-2X | R1.35 | 4 | 60 | E-018 |
| MSB230 | R1.35 | 4.1 | 60 | E-009 |
| **R1.4** | | | | |
| NSB-2X | R1.4 | 4 | 60 | E-018 |
| MSB230 | R1.4 | 4.2 | 60 | E-009 |
| MSB345 | R1.4 | 5 | 60 | E-014 |
| MSBH345 | R1.4 | 5 | 60 | E-002 |
| MSBL230 | R1.4 | 7 | 80 | E-011 |
| **R1.45** | | | | |
| NSB-2X | R1.45 | 4 | 60 | E-018 |
| MSB230 | R1.45 | 4.4 | 60 | E-009 |
| **R1.5** | | | | |
| MSB230SF | R1.5 | 3 | 40 | E-008 |
| MSB230S | R1.5 | 3 | 60 | E-007 |
| NSB-2 | R1.5 | 4 | 60 | E-075 |
| NSB-2X | R1.5 | 4 | 60 | E-018 |
| MSB230 | R1.5 | 5 | 60 | E-009 |


ŞEVKET OĞLU® MAKINA TİCARET VE SAN. LTD. ŞTİ.

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSB230G2 | R1.5 | 5 | 60 | E-007 |
| MSB345 | R1.5 | 5 | 60 | E-014 |
| MSBH345 | R1.5 | 5 | 60 | E-002 |
| MSBH230 | R1.5 | 5 | 60 | E-001 |
| DB | R1.5 | 6 | 60 | E-091 |
| ALB225 | R1.5 | 6 | 60 | E-082 |
| ALB225-DLC | R1.5 | 6 | 60 | E-083 |
| MSBL230 | R1.5 | 7.5 | 80 | E-011 |
| MSBXL230 | R1.5 | 7.5 | 120 | E-016 |
| RSB230 | R1.5 | 9 | 50 | E-086 |
| RSB230 | R1.5 | 9 | 100 | E-086 |
| NLBL-2 | R1.5 | 10 | 60 | E-078 |
| RSB230 | R1.5 | 15 | 60 | E-086 |
| NLBL-2 | R1.5 | 15 | 100 | E-078 |
| SSPB220 | R1.5×6 | 1.8 | 50 | B-007 |
| MRB230SF | R1.5×6 | 2.5 | 40 | E-032 |
| MRB230 | R1.5×6 | 2.5 | 60 | E-040 |
| MRBH230 | R1.5×6 | 2.5 | 60 | E-025 |
| MRB230SF | R1.5×8 | 2.5 | 40 | E-032 |
| MRBH230 | R1.5×8 | 2.5 | 60 | E-025 |
| MRB230 | R1.5×8 | 2.5 | 60 | E-040 |
| MACH225SF | R1.5×8 | 3 | 40 | E-004 |
| MACH225 | R1.5×8 | 3 | 60 | E-005 |
| SSPB220 | R1.5×9 | 1.8 | 70 | B-007 |
| MRB230SF | R1.5×10 | 2.5 | 40 | E-032 |
| NHB-2 | R1.5×10 | 2.5 | 60 | E-079 |
| DRB230 | R1.5×10 | 2.5 | 60 | E-088 |
| MRBH230 | R1.5×10 | 2.5 | 60 | E-025 |
| MRB230 | R1.5×10 | 2.5 | 60 | E-040 |
| MACH225 | R1.5×10 | 3 | 60 | E-005 |
| MRB230SF | R1.5×12 | 2.5 | 40 | E-032 |
| MRBH230 | R1.5×12 | 2.5 | 60 | E-025 |
| MRB230 | R1.5×12 | 2.5 | 60 | E-040 |
| MRBH230 | R1.5×14 | 2.5 | 60 | E-025 |
| MRB230 | R1.5×14 | 2.5 | 60 | E-040 |
| ALB225 | R1.5×15 | 2.5 | 60 | E-082 |
| ALB225-DLC | R1.5×15 | 2.5 | 60 | E-083 |
| NHB-2 | R1.5×15 | 2.5 | 60 | E-079 |
| MRB230 | R1.5×15 | 2.5 | 60 | E-040 |
| DRB230 | R1.5×15 | 2.5 | 70 | E-088 |
| MRBTNH230 | R1.5×15 | 2.5 | 70 | E-051 |
| MACH225 | R1.5×15 | 3 | 60 | E-005 |
| MRBTN230 | R1.5×15 | 3 | 70 | E-064 |
| DHB | R1.5×15 | 4.5 | 60 | E-092 |
| MRBTNH345 | R1.5×15 | 4.5 | 70 | E-057 |
| MRBH230 | R1.5×16 | 2.5 | 60 | E-025 |
| MRB230 | R1.5×16 | 2.5 | 60 | E-040 |
| DCRB230 | R1.5×20 | 2.5 | 65 | C-016 |
| NHB-2 | R1.5×20 | 2.5 | 65 | E-079 |
| MRBH230 | R1.5×20 | 2.5 | 65 | E-025 |
| MRB230 | R1.5×20 | 2.5 | 65 | E-040 |
| DRB230 | R1.5×20 | 2.5 | 70 | E-088 |

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MRBTNH230 | R1.5×20 | 2.5 | 70 | E-051 |
| MRBTN230 | R1.5×20 | 3 | 70 | E-064 |
| MRBTNH345 | R1.5×20 | 4.5 | 70 | E-057 |
| MRBTN230 | R1.5×23.1 | 3 | 70 | E-064 |
| NHB-2 | R1.5×25 | 2.5 | 65 | E-079 |
| MRBH230 | R1.5×25 | 2.5 | 65 | E-025 |
| MRB230 | R1.5×25 | 2.5 | 65 | E-040 |
| DRB230 | R1.5×25 | 2.5 | 70 | E-088 |
| MRBTNH230 | R1.5×25 | 2.5 | 70 | E-051 |
| DHB | R1.5×25 | 4.5 | 60 | E-092 |
| MRBTNH345 | R1.5×25 | 4.5 | 70 | E-057 |
| ALB225 | R1.5×30 | 2.5 | 70 | E-082 |
| ALB225-DLC | R1.5×30 | 2.5 | 70 | E-083 |
| DRB230 | R1.5×30 | 2.5 | 70 | E-088 |
| MRBTNH230 | R1.5×30 | 2.5 | 70 | E-051 |
| MRBH230 | R1.5×30 | 2.5 | 70 | E-025 |
| MRB230 | R1.5×30 | 2.5 | 70 | E-040 |
| MRBTN230 | R1.5×30 | 3 | 70 | E-064 |
| MRBTNH345 | R1.5×30 | 4.5 | 70 | E-057 |
| RSB230 | R1.5×30 | 9 | 70 | E-086 |
| MRBH230 | R1.5×35 | 2.5 | 80 | E-025 |
| MRB230 | R1.5×35 | 2.5 | 80 | E-040 |
| DHB | R1.5×35 | 4.5 | 80 | E-092 |
| MRBTNH230 | R1.5×40 | 2.5 | 80 | E-051 |
| DCRB230 | R1.5×40 | 2.5 | 90 | C-016 |
| MRBH230 | R1.5×40 | 2.5 | 90 | E-025 |
| MRB230 | R1.5×40 | 2.5 | 90 | E-040 |
| MRBTN230 | R1.5×40 | 3 | 80 | E-064 |
| MRBTNH345 | R1.5×40 | 4.5 | 80 | E-057 |
| RSB230 | R1.5×45 | 9 | 90 | E-086 |
| MRBTN230 | R1.5×48.9 | 3 | 90 | E-064 |
| MRBTNH230 | R1.5×50 | 2.5 | 90 | E-051 |
| MRBTN230 | R1.5×50 | 3 | 90 | E-064 |
| MRBTNH345 | R1.5×50 | 4.5 | 100 | E-057 |
| RSB230 | R1.5×60 | 9 | 110 | E-086 |
| MRBTN230L | R1.5×72.7 | 3 | 130 | E-072 |
| MRBTN230L | R1.5×77.5 | 3 | 130 | E-072 |
| MRBTN230L | R1.5×80 | 3 | 130 | E-072 |
| **R1.55** | | | | |
| NSB-2X | R1.55 | 5 | 60 | E-018 |
| MSB230 | R1.55 | 5 | 60 | E-009 |
| **R1.6** | | | | |
| MSB345 | R1.6 | 5 | 60 | E-014 |
| MSBH345 | R1.6 | 5 | 60 | E-002 |
| NSB-2X | R1.6 | 5 | 60 | E-018 |
| MSB230 | R1.6 | 5 | 60 | E-009 |
| MSBL230 | R1.6 | 8 | 120 | E-011 |
| **R1.65** | | | | |
| NSB-2X | R1.65 | 5 | 60 | E-018 |
| MSB230 | R1.65 | 5 | 60 | E-009 |
| **R1.7** | | | | |
| NSB-2X | R1.7 | 5 | 60 | E-018 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSB230 | R1.7 | 5.1 | 60 | E-009 |
| MSB345 | R1.7 | 6 | 60 | E-014 |
| MSBH345 | R1.7 | 6 | 60 | E-002 |
| MSBL230 | R1.7 | 8.5 | 120 | E-011 |
| **R1.75** | | | | |
| MSB230S | R1.75 | 3.5 | 60 | E-007 |
| NSB-2 | R1.75 | 5 | 60 | E-075 |
| NSB-2X | R1.75 | 5 | 60 | E-018 |
| MSB230 | R1.75 | 5.3 | 60 | E-009 |
| DB | R1.75 | 7 | 60 | E-091 |
| NLBL-2 | R1.75 | 10 | 60 | E-078 |
| NLBL-2 | R1.75 | 18 | 100 | E-078 |
| MRB230 | R1.75×10 | 2.8 | 60 | E-040 |
| MRBH230 | R1.75×15 | 2.8 | 60 | E-026 |
| MRB230 | R1.75×15 | 2.8 | 60 | E-040 |
| MRBH230 | R1.75×20 | 2.8 | 65 | E-026 |
| MRB230 | R1.75×20 | 2.8 | 65 | E-040 |
| MRBH230 | R1.75×25 | 2.8 | 65 | E-026 |
| MRB230 | R1.75×25 | 2.8 | 65 | E-040 |
| MRBH230 | R1.75×30 | 2.8 | 70 | E-026 |
| MRB230 | R1.75×30 | 2.8 | 70 | E-040 |
| MRBH230 | R1.75×35 | 2.8 | 80 | E-026 |
| MRB230 | R1.75×35 | 2.8 | 80 | E-040 |
| MRBH230 | R1.75×40 | 2.8 | 90 | E-026 |
| MRB230 | R1.75×40 | 2.8 | 90 | E-040 |
| MRBH230 | R1.75×45 | 2.8 | 90 | E-026 |
| MRB230 | R1.75×45 | 2.8 | 90 | E-040 |
| **R1.8** | | | | |
| MSB230 | R1.8 | 5.4 | 60 | E-010 |
| MSB345 | R1.8 | 6 | 60 | E-014 |
| MSBH345 | R1.8 | 6 | 60 | E-002 |
| NSB-2X | R1.8 | 6 | 60 | E-018 |
| MSBL230 | R1.8 | 9 | 120 | E-011 |
| **R1.85** | | | | |
| MSB230 | R1.85 | 5.6 | 60 | E-010 |
| NSB-2X | R1.85 | 6 | 60 | E-018 |
| **R1.9** | | | | |
| MSB230 | R1.9 | 5.7 | 60 | E-010 |
| MSB345 | R1.9 | 6 | 60 | E-014 |
| MSBH345 | R1.9 | 6 | 60 | E-002 |
| NSB-2X | R1.9 | 6 | 60 | E-018 |
| MSBL230 | R1.9 | 9.5 | 120 | E-011 |
| **R1.95** | | | | |
| MSB230 | R1.95 | 5.9 | 60 | E-010 |
| NSB-2X | R1.95 | 6 | 60 | E-018 |
| **R2** | | | | |
| MSB230SF | R2 | 4 | 40 | E-008 |
| MSB230S | R2 | 4 | 60 | E-007 |
| NSB-2 | R2 | 6 | 60 | E-075 |
| NSB-2X | R2 | 6 | 60 | E-018 |
| MSBH230 | R2 | 6 | 70 | E-001 |
| MSB230G2 | R2 | 6 | 70 | E-007 |

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSB345 | R2 | 6 | 70 | E-014 |
| MSBH345 | R2 | 6 | 70 | E-002 |
| MSB230 | R2 | 6 | 70 | E-010 |
| DB | R2 | 8 | 60 | E-091 |
| ALB225 | R2 | 8 | 70 | E-082 |
| ALB225-DLC | R2 | 8 | 70 | E-083 |
| NLBL-2 | R2 | 10 | 60 | E-078 |
| MSBL230 | R2 | 10 | 120 | E-011 |
| MSBXL230 | R2 | 10 | 150 | E-016 |
| RSB230 | R2 | 12 | 50 | E-086 |
| RSB230 | R2 | 12 | 120 | E-086 |
| NLBL-2 | R2 | 15 | 80 | E-078 |
| RSB230 | R2 | 20 | 60 | E-086 |
| NLBL-2 | R2 | 20 | 100 | E-078 |
| SSPB220 | R2×8 | 2.4 | 50 | B-007 |
| MRBH230 | R2×8 | 3 | 65 | E-026 |
| DRB230 | R2×10 | 3 | 60 | E-088 |
| MRBH230 | R2×10 | 3 | 65 | E-026 |
| MRB230 | R2×10 | 3 | 65 | E-041 |
| MACH225SF | R2×10 | 4 | 40 | E-004 |
| MACH225 | R2×10 | 4 | 60 | E-005 |
| SSPB220 | R2×12 | 2.4 | 70 | B-007 |
| MRBH230 | R2×12 | 3 | 65 | E-026 |
| MRB230 | R2×12 | 3 | 65 | E-041 |
| MRBH230 | R2×14 | 3 | 65 | E-026 |
| MRB230 | R2×14 | 3 | 65 | E-041 |
| DRB230 | R2×15 | 3 | 60 | E-088 |
| DCRB230 | R2×15 | 3 | 65 | C-016 |
| NHB-2 | R2×15 | 3 | 65 | E-080 |
| MRBH230 | R2×15 | 3 | 65 | E-026 |
| MRB230 | R2×15 | 3 | 65 | E-041 |
| MRB230 | R2×16 | 3 | 65 | E-041 |
| DRB230 | R2×20 | 3 | 60 | E-088 |
| NHB-2 | R2×20 | 3 | 65 | E-080 |
| MRBH230 | R2×20 | 3 | 65 | E-026 |
| MRB230 | R2×20 | 3 | 65 | E-041 |
| ALB225 | R2×20 | 3 | 80 | E-082 |
| ALB225-DLC | R2×20 | 3 | 80 | E-083 |
| MRBTNH230 | R2×20 | 3 | 80 | E-051 |
| MRBTN230 | R2×20 | 4 | 70 | E-064 |
| DHB | R2×20 | 6 | 60 | E-092 |
| NHB-2 | R2×25 | 3 | 70 | E-080 |
| DRB230 | R2×25 | 3 | 70 | E-088 |
| MRBH230 | R2×25 | 3 | 70 | E-026 |
| MRB230 | R2×25 | 3 | 70 | E-041 |
| DCRB230 | R2×30 | 3 | 70 | C-016 |
| NHB-2 | R2×30 | 3 | 70 | E-080 |
| DRB230 | R2×30 | 3 | 70 | E-088 |
| MRBH230 | R2×30 | 3 | 70 | E-026 |
| MRB230 | R2×30 | 3 | 70 | E-041 |
| MRBTNH230 | R2×30 | 3 | 80 | E-051 |
| DHB | R2×30 | 6 | 70 | E-092 |


ŞEVKET ÖLÜ® MAKINA TİCARET VE SAN. LTD. ŞTİ.

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MRBTNH345 | R2×30 | 6 | 80 | E-057 |
| RSB230 | R2×30 | 12 | 70 | E-086 |
| MRBH230 | R2×35 | 3 | 80 | E-026 |
| MRB230 | R2×35 | 3 | 80 | E-041 |
| DRB230 | R2×40 | 3 | 80 | E-088 |
| MRBTNH230 | R2×40 | 3 | 80 | E-051 |
| MRBH230 | R2×40 | 3 | 85 | E-026 |
| MRB230 | R2×40 | 3 | 85 | E-041 |
| ALB225 | R2×40 | 3 | 90 | E-082 |
| ALB225-DLC | R2×40 | 3 | 90 | E-083 |
| DCRB230 | R2×40 | 3 | 90 | C-016 |
| MRBTN230 | R2×40 | 4 | 90 | E-064 |
| MRBTNH345 | R2×40 | 6 | 80 | E-057 |
| DHB | R2×40 | 6 | 90 | E-092 |
| RSB230 | R2×40 | 12 | 90 | E-086 |
| MRBH230 | R2×45 | 3 | 90 | E-026 |
| MRB230 | R2×45 | 3 | 90 | E-041 |
| MRBH230 | R2×50 | 3 | 100 | E-026 |
| MRB230 | R2×50 | 3 | 100 | E-041 |
| MRBTNH345 | R2×50 | 6 | 100 | E-057 |
| MRBTN230 | R2×60 | 4 | 110 | E-064 |
| MRBTN230L | R2×60 | 4 | 110 | E-072 |
| MRBTNH230 | R2×61.1 | 3 | 110 | E-051 |
| MRBTNH345 | R2×65.2 | 6 | 110 | E-057 |
| RSB230 | R2×70 | 12 | 120 | E-086 |
| MRBTN230L | R2×80 | 4 | 130 | E-072 |
| MRBTN230L | R2×84.3 | 4 | 130 | E-072 |
| **R2.05** | | | | |
| MSB230 | R2.05 | 6.2 | 70 | E-010 |
| NSB-2X | R2.05 | 8 | 60 | E-018 |
| **R2.1** | | | | |
| MSB230 | R2.1 | 6.3 | 70 | E-010 |
| MSB345 | R2.1 | 7 | 70 | E-014 |
| MSBH345 | R2.1 | 7 | 70 | E-002 |
| NSB-2X | R2.1 | 8 | 60 | E-018 |
| MSBL230 | R2.1 | 10.5 | 150 | E-011 |
| **R2.15** | | | | |
| MSB230 | R2.15 | 6.5 | 70 | E-010 |
| NSB-2X | R2.15 | 8 | 60 | E-018 |
| **R2.2** | | | | |
| MSB230 | R2.2 | 6.6 | 70 | E-010 |
| MSB345 | R2.2 | 7 | 70 | E-014 |
| MSBH345 | R2.2 | 7 | 70 | E-002 |
| NSB-2X | R2.2 | 8 | 60 | E-018 |
| MSBL230 | R2.2 | 11 | 150 | E-011 |
| **R2.25** | | | | |
| MSB230 | R2.25 | 6.8 | 70 | E-010 |
| NSB-2X | R2.25 | 8 | 60 | E-018 |
| NLBL-2 | R2.25 | 22 | 100 | E-078 |
| **R2.3** | | | | |
| MSB230 | R2.3 | 6.9 | 70 | E-010 |
| MSB345 | R2.3 | 7 | 70 | E-014 |

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSBH345 | R2.3 | 7 | 70 | E-002 |
| NSB-2X | R2.3 | 8 | 60 | E-018 |
| MSBL230 | R2.3 | 11.5 | 150 | E-011 |
| **R2.35** | | | | |
| MSB230 | R2.35 | 7.1 | 70 | E-010 |
| NSB-2X | R2.35 | 8 | 60 | E-018 |
| **R2.4** | | | | |
| MSB230 | R2.4 | 7.2 | 70 | E-010 |
| NSB-2X | R2.4 | 8 | 60 | E-018 |
| MSB345 | R2.4 | 8 | 70 | E-014 |
| MSBH345 | R2.4 | 8 | 70 | E-002 |
| MSBL230 | R2.4 | 12 | 150 | E-011 |
| **R2.45** | | | | |
| MSB230 | R2.45 | 7.4 | 70 | E-010 |
| NSB-2X | R2.45 | 8 | 60 | E-018 |
| **R2.5** | | | | |
| MSB230SF | R2.5 | 5 | 50 | E-008 |
| MSB230S | R2.5 | 5 | 70 | E-007 |
| NSB-2 | R2.5 | 8 | 60 | E-075 |
| NSB-2X | R2.5 | 8 | 60 | E-018 |
| MSB230G2 | R2.5 | 8 | 70 | E-007 |
| MSBH230 | R2.5 | 8 | 70 | E-001 |
| MSB345 | R2.5 | 8 | 70 | E-014 |
| MSBH345 | R2.5 | 8 | 70 | E-002 |
| MSB230 | R2.5 | 8 | 70 | E-010 |
| DB | R2.5 | 10 | 60 | E-091 |
| ALB225 | R2.5 | 10 | 80 | E-082 |
| ALB225-DLC | R2.5 | 10 | 80 | E-083 |
| MSBL230 | R2.5 | 12.5 | 150 | E-011 |
| MSBXL230 | R2.5 | 12.5 | 180 | E-016 |
| NLBL-2 | R2.5 | 15 | 60 | E-078 |
| RSB230 | R2.5 | 15 | 70 | E-086 |
| NLBL-2 | R2.5 | 20 | 80 | E-078 |
| RSB230 | R2.5 | 25 | 80 | E-086 |
| NLBL-2 | R2.5 | 25 | 100 | E-078 |
| SSPB220 | R2.5×10 | 3 | 60 | B-007 |
| MRBH230 | R2.5×10 | 3.5 | 70 | E-026 |
| MRB230 | R2.5×10 | 3.5 | 70 | E-041 |
| MACH225SF | R2.5×12 | 5 | 45 | E-004 |
| MACH225 | R2.5×12 | 5 | 60 | E-005 |
| SSPB220 | R2.5×15 | 3 | 80 | B-007 |
| MRBH230 | R2.5×15 | 3.5 | 70 | E-026 |
| MRB230 | R2.5×15 | 3.5 | 70 | E-041 |
| NHB-2 | R2.5×20 | 3.5 | 70 | E-080 |
| MRBH230 | R2.5×20 | 3.5 | 70 | E-026 |
| MRB230 | R2.5×20 | 3.5 | 70 | E-041 |
| DHB | R2.5×20 | 7.5 | 60 | E-092 |
| NHB-2 | R2.5×25 | 3.5 | 70 | E-080 |
| MRBH230 | R2.5×25 | 3.5 | 70 | E-026 |
| MRB230 | R2.5×25 | 3.5 | 70 | E-041 |
| ALB225 | R2.5×25 | 3.5 | 80 | E-082 |
| ALB225-DLC | R2.5×25 | 3.5 | 80 | E-083 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NHB-2 | R2.5×30 | 3.5 | 80 | E-080 |
| MRBH230 | R2.5×30 | 3.5 | 80 | E-026 |
| MRB230 | R2.5×30 | 3.5 | 80 | E-041 |
| DHB | R2.5×30 | 7.5 | 70 | E-092 |
| NHB-2 | R2.5×35 | 3.5 | 80 | E-080 |
| MRB230 | R2.5×35 | 3.5 | 80 | E-041 |
| MRBH230 | R2.5×40 | 3.5 | 90 | E-026 |
| MRB230 | R2.5×40 | 3.5 | 90 | E-041 |
| DHB | R2.5×40 | 7.5 | 90 | E-092 |
| MRB230 | R2.5×45 | 3.5 | 100 | E-041 |
| ALB225 | R2.5×50 | 3.5 | 100 | E-082 |
| ALB225-DLC | R2.5×50 | 3.5 | 100 | E-083 |
| MRB230 | R2.5×50 | 3.5 | 100 | E-041 |
| MRBTN230L | R2.5×50 | 5 | 100 | E-072 |
| MRBTN230L | R2.5×52.9 | 5 | 100 | E-072 |
| MRBTN230L | R2.5×57.7 | 5 | 110 | E-072 |
| MRBTN230L | R2.5×80 | 5 | 130 | E-072 |
| MRBTN230L | R2.5×81.5 | 5 | 130 | E-072 |
| **R2.55** | | | | |
| MSB230 | R2.55 | 8 | 70 | E-010 |
| NSB-2X | R2.55 | 10 | 80 | E-018 |
| **R2.6** | | | | |
| MSB345 | R2.6 | 8 | 70 | E-014 |
| MSBH345 | R2.6 | 8 | 70 | E-002 |
| MSB230 | R2.6 | 8 | 70 | E-010 |
| NSB-2X | R2.6 | 10 | 80 | E-018 |
| MSBL230 | R2.6 | 13 | 150 | E-011 |
| **R2.65** | | | | |
| MSB230 | R2.65 | 8 | 70 | E-010 |
| NSB-2X | R2.65 | 10 | 80 | E-018 |
| **R2.7** | | | | |
| MSB230 | R2.7 | 8.1 | 70 | E-010 |
| MSB345 | R2.7 | 9 | 70 | E-014 |
| MSBH345 | R2.7 | 9 | 70 | E-002 |
| NSB-2X | R2.7 | 10 | 80 | E-018 |
| MSBL230 | R2.7 | 13.5 | 150 | E-011 |
| **R2.75** | | | | |
| MSB230 | R2.75 | 8.3 | 70 | E-010 |
| NSB-2X | R2.75 | 10 | 80 | E-018 |
| NLBL-2 | R2.75 | 28 | 100 | E-078 |
| **R2.8** | | | | |
| MSB230 | R2.8 | 8.4 | 70 | E-010 |
| MSB345 | R2.8 | 9 | 70 | E-014 |
| MSBH345 | R2.8 | 9 | 70 | E-002 |
| NSB-2X | R2.8 | 10 | 80 | E-018 |
| MSBL230 | R2.8 | 14 | 150 | E-011 |
| **R2.85** | | | | |
| MSB230 | R2.85 | 8.6 | 70 | E-010 |
| NSB-2X | R2.85 | 10 | 80 | E-018 |
| **R2.9** | | | | |
| MSB230 | R2.9 | 8.7 | 70 | E-010 |
| MSB345 | R2.9 | 9 | 70 | E-014 |

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSBH345 | R2.9 | 9 | 70 | E-002 |
| NSB-2X | R2.9 | 10 | 80 | E-018 |
| MSBL230 | R2.9 | 14.5 | 150 | E-011 |
| **R2.95** | | | | |
| MSB230 | R2.95 | 8.9 | 70 | E-010 |
| NSB-2X | R2.95 | 10 | 80 | E-018 |
| **R3** | | | | |
| MSB230SF | R3 | 6 | 50 | E-008 |
| MSB230S | R3 | 6 | 80 | E-007 |
| NSB-2 | R3 | 10 | 80 | E-075 |
| MSB230G2 | R3 | 10 | 80 | E-007 |
| MSBH230 | R3 | 10 | 80 | E-001 |
| MSB345 | R3 | 10 | 80 | E-014 |
| MSBH345 | R3 | 10 | 80 | E-002 |
| NSB-2X | R3 | 10 | 80 | E-018 |
| MSB230 | R3 | 10 | 80 | E-010 |
| DB | R3 | 12 | 80 | E-091 |
| ALB225 | R3 | 12 | 90 | E-082 |
| ALB225-DLC | R3 | 12 | 90 | E-083 |
| NSBL-2 | R3 | 15 | 120 | E-077 |
| MSBL230 | R3 | 15 | 150 | E-011 |
| MSBXL230 | R3 | 15 | 180 | E-016 |
| RSB230 | R3 | 18 | 80 | E-086 |
| NLBL-2 | R3 | 20 | 100 | E-078 |
| RSB230 | R3 | 30 | 90 | E-086 |
| NLBL-2 | R3 | 30 | 150 | E-078 |
| MRBH230 | R3×10 | 6 | 70 | E-026 |
| MRB230 | R3×10 | 6 | 70 | E-041 |
| SSPB220 | R3×12 | 3.6 | 60 | B-007 |
| MACH225SF | R3×15 | 6 | 45 | E-004 |
| MACH225 | R3×15 | 6 | 60 | E-005 |
| MRBH230 | R3×15 | 6 | 70 | E-026 |
| MRB230 | R3×15 | 6 | 70 | E-041 |
| SSPB220 | R3×18 | 3.6 | 80 | B-007 |
| DRB230 | R3×20 | 6 | 70 | E-088 |
| MRBH230 | R3×20 | 6 | 70 | E-026 |
| MRB230 | R3×20 | 6 | 70 | E-041 |
| DHB | R3×20 | 9 | 60 | E-092 |
| MRBH230 | R3×25 | 6 | 70 | E-026 |
| MRB230 | R3×25 | 6 | 70 | E-041 |
| DCRB230 | R3×30 | 6 | 80 | C-016 |
| NHB-2 | R3×30 | 6 | 80 | E-080 |
| DRB230 | R3×30 | 6 | 80 | E-088 |
| MRBH230 | R3×30 | 6 | 80 | E-026 |
| MRB230 | R3×30 | 6 | 80 | E-041 |
| ALB225 | R3×30 | 6 | 90 | E-082 |
| ALB225-DLC | R3×30 | 6 | 90 | E-083 |
| DHB | R3×30 | 9 | 90 | E-092 |
| MRB230 | R3×35 | 6 | 80 | E-041 |
| MRBH230 | R3×35 | 6 | 85 | E-026 |
| MRBH230 | R3×40 | 6 | 90 | E-026 |
| MRB230 | R3×40 | 6 | 90 | E-041 |


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| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| RSB230 | R3×40 | 18 | 100 | E-086 |
| MRB230 | R3×45 | 6 | 100 | E-041 |
| DRB230 | R3×50 | 6 | 100 | E-088 |
| NHB-2 | R3×50 | 6 | 120 | E-080 |
| MRBH230 | R3×50 | 6 | 120 | E-026 |
| MRB230 | R3×50 | 6 | 120 | E-041 |
| DHB | R3×50 | 9 | 110 | E-092 |
| ALB225 | R3×60 | 6 | 120 | E-082 |
| ALB225-DLC | R3×60 | 6 | 120 | E-083 |
| DCRB230 | R3×60 | 6 | 120 | C-016 |
| MRBH230 | R3×60 | 6 | 120 | E-026 |
| RSB230 | R3×60 | 18 | 120 | E-086 |
| MRBTN230L | R3×69.2 | 6 | 130 | E-072 |
| MRBTN230L | R3×69.3 | 6 | 130 | E-072 |
| RSB230 | R3×80 | 18 | 130 | E-086 |
| MRBTN230L | R3×88.3 | 6 | 140 | E-072 |
| **R3.1** | | | | |
| MSB345 | R3.1 | 10 | 90 | E-014 |
| NSB-2X | R3.1 | 13 | 90 | E-018 |
| **R3.2** | | | | |
| MSB345 | R3.2 | 10 | 90 | E-014 |
| NSB-2X | R3.2 | 13 | 90 | E-018 |
| **R3.3** | | | | |
| MSB345 | R3.3 | 10 | 90 | E-014 |
| NSB-2X | R3.3 | 13 | 90 | E-018 |
| **R3.4** | | | | |
| MSB345 | R3.4 | 11 | 90 | E-014 |
| NSB-2X | R3.4 | 13 | 90 | E-018 |
| **R3.5** | | | | |
| MSB230 | R3.5 | 10.5 | 80 | E-010 |
| MSB345 | R3.5 | 11 | 90 | E-014 |
| NSB-2 | R3.5 | 13 | 90 | E-075 |
| NSB-2X | R3.5 | 13 | 90 | E-018 |
| NLBL-2 | R3.5 | 20 | 90 | E-078 |
| NLBL-2 | R3.5 | 35 | 150 | E-078 |
| **R3.6** | | | | |
| MSB345 | R3.6 | 11 | 90 | E-014 |
| NSB-2X | R3.6 | 13 | 90 | E-018 |
| **R3.7** | | | | |
| MSB345 | R3.7 | 12 | 90 | E-014 |
| NSB-2X | R3.7 | 13 | 90 | E-018 |
| **R3.8** | | | | |
| MSB345 | R3.8 | 12 | 90 | E-014 |
| NSB-2X | R3.8 | 13 | 90 | E-018 |
| **R3.9** | | | | |
| MSB345 | R3.9 | 12 | 90 | E-014 |
| NSB-2X | R3.9 | 13 | 90 | E-018 |
| **R4** | | | | |
| MSB230SF | R4 | 8 | 60 | E-008 |
| MSB230S | R4 | 8 | 90 | E-007 |
| MSBH230 | R4 | 12 | 90 | E-001 |
| MSB345 | R4 | 12 | 90 | E-014 |

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSB230 | R4 | 12 | 90 | E-010 |
| NSB-2 | R4 | 13 | 90 | E-075 |
| NSB-2X | R4 | 13 | 90 | E-018 |
| DB | R4 | 16 | 90 | E-091 |
| ALB225 | R4 | 16 | 90 | E-082 |
| ALB225-DLC | R4 | 16 | 90 | E-083 |
| NLBL-2 | R4 | 20 | 90 | E-078 |
| NSBL-2 | R4 | 20 | 130 | E-077 |
| MSBL230 | R4 | 20 | 160 | E-011 |
| MSBXL230 | R4 | 20 | 200 | E-016 |
| NLBL-2 | R4 | 40 | 150 | E-078 |
| DHB | R4×20 | 12 | 70 | E-092 |
| NHB-2 | R4×40 | 8 | 90 | E-080 |
| DHB | R4×40 | 12 | 100 | E-092 |
| NHB-2 | R4×60 | 8 | 130 | E-080 |
| DHB | R4×60 | 12 | 120 | E-092 |
| MRBTN230L | R4×73.2 | 8 | 130 | E-072 |
| MRBTN230L | R4×80 | 8 | 130 | E-072 |
| **R4.1** | | | | |
| MSB345 | R4.1 | 13 | 100 | E-014 |
| NSB-2X | R4.1 | 15 | 100 | E-018 |
| **R4.2** | | | | |
| MSB345 | R4.2 | 13 | 100 | E-014 |
| NSB-2X | R4.2 | 15 | 100 | E-018 |
| **R4.3** | | | | |
| MSB345 | R4.3 | 13 | 100 | E-014 |
| NSB-2X | R4.3 | 15 | 100 | E-018 |
| **R4.4** | | | | |
| MSB345 | R4.4 | 14 | 100 | E-014 |
| NSB-2X | R4.4 | 15 | 100 | E-018 |
| **R4.5** | | | | |
| MSB230 | R4.5 | 13.5 | 90 | E-010 |
| MSB345 | R4.5 | 14 | 100 | E-014 |
| NSB-2 | R4.5 | 15 | 100 | E-075 |
| NSB-2X | R4.5 | 15 | 100 | E-018 |
| NLBL-2 | R4.5 | 25 | 100 | E-078 |
| NLBL-2 | R4.5 | 45 | 150 | E-078 |
| **R4.6** | | | | |
| MSB345 | R4.6 | 14 | 100 | E-014 |
| NSB-2X | R4.6 | 15 | 100 | E-018 |
| **R4.7** | | | | |
| MSB345 | R4.7 | 15 | 100 | E-014 |
| NSB-2X | R4.7 | 15 | 100 | E-018 |
| **R4.8** | | | | |
| MSB345 | R4.8 | 15 | 100 | E-014 |
| NSB-2X | R4.8 | 15 | 100 | E-018 |
| **R4.9** | | | | |
| MSB345 | R4.9 | 15 | 100 | E-014 |
| NSB-2X | R4.9 | 15 | 100 | E-018 |
| **R5** | | | | |
| MSB230SF | R5 | 10 | 60 | E-008 |
| MSB230S | R5 | 10 | 100 | E-007 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NSB-2 | R5 | 15 | 100 | E-075 |
| MSBH230 | R5 | 15 | 100 | E-001 |
| MSB345 | R5 | 15 | 100 | E-014 |
| NSB-2X | R5 | 15 | 100 | E-019 |
| MSB230 | R5 | 15 | 100 | E-010 |
| DB | R5 | 20 | 100 | E-091 |
| ALB225 | R5 | 20 | 100 | E-082 |
| ALB225-DLC | R5 | 20 | 100 | E-083 |
| NSBL-2 | R5 | 25 | 150 | E-077 |
| MSBL230 | R5 | 25 | 200 | E-011 |
| MSBXL230 | R5 | 25 | 250 | E-016 |
| NLBL-2 | R5 | 30 | 100 | E-078 |
| NLBL-2 | R5 | 40 | 150 | E-078 |
| NLBL-2 | R5 | 50 | 200 | E-078 |
| DHB | R5×30 | 15 | 90 | E-092 |
| NHB-2 | R5×50 | 10 | 100 | E-080 |
| DHB | R5×50 | 15 | 120 | E-092 |
| MRBTN230L | R5×58.2 | 10 | 110 | E-072 |
| NHB-2 | R5×70 | 10 | 150 | E-080 |
| DHB | R5×70 | 15 | 140 | E-092 |
| MRBTN230L | R5×77.2 | 10 | 130 | E-072 |
| **R5.1** | | | | |
| NSB-2X | R5.1 | 15 | 110 | E-019 |
| MSB345 | R5.1 | 16 | 110 | E-014 |
| **R5.2** | | | | |
| NSB-2X | R5.2 | 15 | 110 | E-019 |
| MSB345 | R5.2 | 16 | 110 | E-014 |
| **R5.3** | | | | |
| NSB-2X | R5.3 | 15 | 110 | E-019 |
| MSB345 | R5.3 | 16 | 110 | E-014 |
| **R5.4** | | | | |
| NSB-2X | R5.4 | 15 | 110 | E-019 |
| MSB345 | R5.4 | 17 | 110 | E-014 |
| **R5.5** | | | | |
| NSB-2 | R5.5 | 15 | 110 | E-075 |
| NSB-2X | R5.5 | 15 | 110 | E-019 |
| MSB230 | R5.5 | 16.5 | 100 | E-010 |
| MSB345 | R5.5 | 17 | 110 | E-014 |
| NLBL-2 | R5.5 | 30 | 110 | E-078 |
| NLBL-2 | R5.5 | 50 | 150 | E-078 |
| **R5.6** | | | | |
| NSB-2X | R5.6 | 15 | 110 | E-019 |
| MSB345 | R5.6 | 17 | 110 | E-014 |
| **R5.7** | | | | |
| NSB-2X | R5.7 | 15 | 110 | E-019 |
| MSB345 | R5.7 | 18 | 110 | E-014 |
| **R5.8** | | | | |
| NSB-2X | R5.8 | 15 | 110 | E-019 |
| MSB345 | R5.8 | 18 | 110 | E-014 |
| **R5.9** | | | | |
| NSB-2X | R5.9 | 15 | 110 | E-019 |
| MSB345 | R5.9 | 18 | 110 | E-014 |

| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| **R6** | | | | |
| MSB230SF | R6 | 12 | 60 | E-008 |
| MSB230S | R6 | 12 | 110 | E-007 |
| NSB-2 | R6 | 15 | 110 | E-075 |
| NSB-2X | R6 | 15 | 110 | E-019 |
| MSBH230 | R6 | 20 | 100 | E-001 |
| MSB345 | R6 | 20 | 110 | E-014 |
| MSB230 | R6 | 20 | 110 | E-010 |
| DB | R6 | 24 | 110 | E-091 |
| ALB225 | R6 | 24 | 110 | E-082 |
| ALB225-DLC | R6 | 24 | 110 | E-083 |
| NLBL-2 | R6 | 30 | 110 | E-078 |
| NSBL-2 | R6 | 30 | 180 | E-077 |
| NLBL-2 | R6 | 55 | 150 | E-078 |
| DHB | R6×40 | 18 | 110 | E-092 |
| DHB | R6×60 | 18 | 130 | E-092 |
| DHB | R6×80 | 18 | 160 | E-092 |
| **R6.5** | | | | |
| NSB-2X | R6.5 | 20 | 110 | E-019 |
| NLBL-2 | R6.5 | 30 | 120 | E-078 |
| NLBL-2 | R6.5 | 55 | 150 | E-078 |
| **R7** | | | | |
| NSB-2 | R7 | 20 | 160 | E-075 |
| NSB-2X | R7 | 20 | 160 | E-019 |
| MSB230 | R7 | 21 | 160 | E-010 |
| NLBL-2 | R7 | 30 | 140 | E-078 |
| NLBL-2 | R7 | 55 | 200 | E-078 |
| **R7.5** | | | | |
| NSB-2X | R7.5 | 20 | 160 | E-019 |
| NLBL-2 | R7.5 | 35 | 160 | E-078 |
| NLBL-2 | R7.5 | 60 | 200 | E-078 |
| **R8** | | | | |
| NSB-2 | R8 | 20 | 160 | E-075 |
| NSB-2X | R8 | 20 | 160 | E-019 |
| MSB230 | R8 | 25 | 160 | E-010 |
| DB | R8 | 32 | 150 | E-091 |
| NLBL-2 | R8 | 35 | 160 | E-078 |
| NSBL-2 | R8 | 40 | 200 | E-077 |
| NLBL-2 | R8 | 50 | 200 | E-078 |
| NLBL-2 | R8 | 60 | 230 | E-078 |
| **R8.5** | | | | |
| NSB-2X | R8.5 | 25 | 170 | E-019 |
| NLBL-2 | R8.5 | 35 | 160 | E-078 |
| NLBL-2 | R8.5 | 60 | 200 | E-078 |
| **R9** | | | | |
| NSB-2 | R9 | 25 | 170 | E-075 |
| NSB-2X | R9 | 25 | 170 | E-019 |
| MSB230 | R9 | 27 | 170 | E-010 |
| NLBL-2 | R9 | 40 | 170 | E-078 |
| NLBL-2 | R9 | 70 | 250 | E-078 |
| **R9.5** | | | | |
| NSB-2X | R9.5 | 25 | 170 | E-019 |



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| 型　番 Model | ボール半径(×有効長) Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| **NLBL-2** | R9.5 | 40 | 170 | E-078 |
| **NLBL-2** | R9.5 | 70 | 250 | E-078 |
| **R10** | | | | |
| **NSB-2** | R10 | 25 | 170 | E-075 |
| **NSB-2X** | R10 | 25 | 170 | E-019 |
| **MSB230** | R10 | 30 | 170 | E-010 |
| **DB** | R10 | 40 | 170 | E-091 |
| **NLBL-2** | R10 | 40 | 170 | E-078 |
| **NSBL-2** | R10 | 50 | 220 | E-077 |
| **NLBL-2** | R10 | 55 | 200 | E-078 |
| **NLBL-2** | R10 | 70 | 250 | E-078 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.×Corner Radius (×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| **φ0.1** | | | | |
| SSR200 | φ0.1×R0.02×0.2 | 0.04 | 50 | B-020 |
| SSR200 | φ0.1×R0.02×0.3 | 0.04 | 50 | B-020 |
| SSR200 | φ0.1×R0.02×0.5 | 0.04 | 50 | B-020 |
| SSR200 | φ0.1×R0.03×0.2 | 0.04 | 50 | B-020 |
| SSR200 | φ0.1×R0.03×0.3 | 0.04 | 50 | B-020 |
| SSR200 | φ0.1×R0.03×0.5 | 0.04 | 50 | B-020 |
| **φ0.15** | | | | |
| SSR200 | φ0.15×R0.02×0.2 | 0.06 | 50 | B-020 |
| SSR200 | φ0.15×R0.02×0.3 | 0.06 | 50 | B-020 |
| SSR200 | φ0.15×R0.02×0.5 | 0.06 | 50 | B-020 |
| SSR200 | φ0.15×R0.03×0.2 | 0.06 | 50 | B-020 |
| SSR200 | φ0.15×R0.03×0.3 | 0.06 | 50 | B-020 |
| SSR200 | φ0.15×R0.03×0.5 | 0.06 | 50 | B-020 |
| **φ0.2** | | | | |
| SSR200 | φ0.2×R0.02×0.3 | 0.08 | 50 | B-020 |
| SSR200 | φ0.2×R0.02×0.5 | 0.08 | 50 | B-020 |
| MHRH230R | φ0.2×R0.02×0.5 | 0.15 | 45 | F-010 |
| MHRH430R | φ0.2×R0.02×0.5 | 0.15 | 45 | F-012 |
| SSR200 | φ0.2×R0.02×1 | 0.08 | 50 | B-020 |
| MHRH230R | φ0.2×R0.02×1 | 0.15 | 45 | F-010 |
| MHRH430R | φ0.2×R0.02×1 | 0.15 | 45 | F-012 |
| MHRH230R | φ0.2×R0.02×1.5 | 0.15 | 45 | F-010 |
| MHRH430R | φ0.2×R0.02×1.5 | 0.15 | 45 | F-012 |
| MHRH230R | φ0.2×R0.02×2 | 0.15 | 45 | F-010 |
| MHRH430R | φ0.2×R0.02×2 | 0.15 | 45 | F-012 |
| SSR200 | φ0.2×R0.03×0.3 | 0.08 | 50 | B-020 |
| SSR200 | φ0.2×R0.03×0.5 | 0.08 | 50 | B-020 |
| SSR200 | φ0.2×R0.03×1 | 0.08 | 50 | B-020 |
| SSR200 | φ0.2×R0.05×0.3 | 0.08 | 50 | B-020 |
| SSR200 | φ0.2×R0.05×0.5 | 0.08 | 50 | B-020 |
| SSF120 | φ0.2×R0.05×0.5 | 0.1 | 50 | B-025 |
| MHRH230R | φ0.2×R0.05×0.5 | 0.15 | 45 | F-010 |
| MHRH430R | φ0.2×R0.05×0.5 | 0.15 | 45 | F-012 |
| MHR230R | φ0.2×R0.05×0.5 | 0.15 | 45 | F-021 |
| MHR230R | φ0.2×R0.05×0.5 | 0.15 | 50 | F-021 |
| SSR200 | φ0.2×R0.05×1 | 0.08 | 50 | B-020 |
| MHRH230R | φ0.2×R0.05×1 | 0.15 | 45 | F-010 |
| MHRH430R | φ0.2×R0.05×1 | 0.15 | 45 | F-012 |
| MHR230R | φ0.2×R0.05×1 | 0.15 | 45 | F-021 |
| MSTNR230 | φ0.2×R0.05×1 | 0.15 | 50 | F-040 |
| MHR230R | φ0.2×R0.05×1 | 0.15 | 50 | F-021 |
| MHRH230R | φ0.2×R0.05×1.5 | 0.15 | 45 | F-010 |
| MHRH430R | φ0.2×R0.05×1.5 | 0.15 | 45 | F-012 |
| MHR230R | φ0.2×R0.05×1.5 | 0.15 | 45 | F-021 |
| MHRH230R | φ0.2×R0.05×2 | 0.15 | 45 | F-010 |
| MHRH430R | φ0.2×R0.05×2 | 0.15 | 45 | F-012 |
| MHR230R | φ0.2×R0.05×2 | 0.15 | 45 | F-021 |
| MSTNR230 | φ0.2×R0.05×2 | 0.15 | 50 | F-040 |
| **φ0.3** | | | | |
| SSR200 | φ0.3×R0.02×0.5 | 0.13 | 50 | B-020 |
| SSR200 | φ0.3×R0.02×0.75 | 0.13 | 50 | B-020 |
| SSR200 | φ0.3×R0.02×1 | 0.13 | 50 | B-020 |
| MHRH230R | φ0.3×R0.02×1 | 0.25 | 45 | F-010 |
| MHRH430R | φ0.3×R0.02×1 | 0.25 | 45 | F-012 |
| SSR200 | φ0.3×R0.02×1.5 | 0.13 | 50 | B-020 |
| MHRH230R | φ0.3×R0.02×1.5 | 0.25 | 45 | F-010 |
| MHRH430R | φ0.3×R0.02×1.5 | 0.25 | 45 | F-012 |
| SSR200 | φ0.3×R0.02×2 | 0.13 | 50 | B-020 |
| MHRH230R | φ0.3×R0.02×2 | 0.25 | 45 | F-010 |
| MHRH430R | φ0.3×R0.02×2 | 0.25 | 45 | F-012 |
| MHRH230R | φ0.3×R0.02×2.5 | 0.25 | 45 | F-010 |
| MHRH430R | φ0.3×R0.02×2.5 | 0.25 | 45 | F-012 |
| MHRH230R | φ0.3×R0.02×3 | 0.25 | 45 | F-010 |
| MHRH430R | φ0.3×R0.02×3 | 0.25 | 45 | F-012 |
| SSR200 | φ0.3×R0.03×0.5 | 0.13 | 50 | B-020 |
| SSR200 | φ0.3×R0.03×0.75 | 0.13 | 50 | B-020 |
| SSR200 | φ0.3×R0.03×1 | 0.13 | 50 | B-020 |
| SSR200 | φ0.3×R0.03×1.5 | 0.13 | 50 | B-020 |
| SSR200 | φ0.3×R0.03×2 | 0.13 | 50 | B-020 |
| PCDRS | φ0.3×R0.05×0.3 | 0.09 | 48 | C-005 |
| SSR200 | φ0.3×R0.05×0.5 | 0.13 | 50 | B-020 |
| SSR200 | φ0.3×R0.05×0.75 | 0.13 | 50 | B-020 |
| SSF120 | φ0.3×R0.05×0.75 | 0.15 | 50 | B-025 |
| SSR200 | φ0.3×R0.05×1 | 0.13 | 50 | B-020 |
| MHRH230R | φ0.3×R0.05×1 | 0.25 | 45 | F-010 |
| MHRH430R | φ0.3×R0.05×1 | 0.25 | 45 | F-012 |
| MHR230R | φ0.3×R0.05×1 | 0.25 | 45 | F-021 |
| MHR230R | φ0.3×R0.05×1 | 0.25 | 50 | F-021 |
| SSR200 | φ0.3×R0.05×1.5 | 0.13 | 50 | B-020 |
| MHRH230R | φ0.3×R0.05×1.5 | 0.25 | 45 | F-010 |
| MHRH430R | φ0.3×R0.05×1.5 | 0.25 | 45 | F-012 |
| MHR230R | φ0.3×R0.05×1.5 | 0.25 | 45 | F-021 |
| SSR200 | φ0.3×R0.05×2 | 0.13 | 50 | B-020 |
| MHRH230R | φ0.3×R0.05×2 | 0.25 | 45 | F-010 |
| MHRH430R | φ0.3×R0.05×2 | 0.25 | 45 | F-012 |
| MHR230R | φ0.3×R0.05×2 | 0.25 | 45 | F-021 |
| MSTNR230 | φ0.3×R0.05×2 | 0.25 | 50 | F-040 |
| MHR230R | φ0.3×R0.05×2 | 0.25 | 50 | F-021 |
| MHRH230R | φ0.3×R0.05×2.5 | 0.25 | 45 | F-010 |
| MHRH430R | φ0.3×R0.05×2.5 | 0.25 | 45 | F-012 |
| MHR230R | φ0.3×R0.05×2.5 | 0.25 | 45 | F-021 |
| MHRH230R | φ0.3×R0.05×3 | 0.25 | 45 | F-010 |
| MHRH430R | φ0.3×R0.05×3 | 0.25 | 45 | F-012 |
| MHR230R | φ0.3×R0.05×3 | 0.25 | 45 | F-021 |
| MSTNR230 | φ0.3×R0.05×3 | 0.25 | 50 | F-040 |
| **φ0.4** | | | | |
| SSR200 | φ0.4×R0.02×0.5 | 0.24 | 50 | B-021 |
| SSR200 | φ0.4×R0.02×1 | 0.24 | 50 | B-021 |
| MHRH230R | φ0.4×R0.02×1 | 0.3 | 45 | F-010 |
| MHRH430R | φ0.4×R0.02×1 | 0.3 | 45 | F-012 |
| SSR200 | φ0.4×R0.02×1.5 | 0.24 | 50 | B-021 |
| MHRH230R | φ0.4×R0.02×1.5 | 0.3 | 45 | F-010 |
| MHRH430R | φ0.4×R0.02×1.5 | 0.3 | 45 | F-012 |



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| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.xCorner Radius(xEffective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| SSR200 | ϕ0.4×R0.02×2 | 0.24 | 50 | B-021 |
| MHRH230R | ϕ0.4×R0.02×2 | 0.3 | 45 | F-010 |
| MHRH430R | ϕ0.4×R0.02×2 | 0.3 | 45 | F-012 |
| MHRH230R | ϕ0.4×R0.02×2.5 | 0.3 | 45 | F-010 |
| MHRH430R | ϕ0.4×R0.02×2.5 | 0.3 | 45 | F-012 |
| MHRH230R | ϕ0.4×R0.02×3 | 0.3 | 45 | F-010 |
| MHRH430R | ϕ0.4×R0.02×3 | 0.3 | 45 | F-012 |
| MHRH230R | ϕ0.4×R0.02×4 | 0.3 | 45 | F-010 |
| MHRH430R | ϕ0.4×R0.02×4 | 0.3 | 45 | F-012 |
| SSR200 | ϕ0.4×R0.03×0.5 | 0.24 | 50 | B-021 |
| SSR200 | ϕ0.4×R0.03×1 | 0.24 | 50 | B-021 |
| SSR200 | ϕ0.4×R0.03×1.5 | 0.24 | 50 | B-021 |
| SSR200 | ϕ0.4×R0.03×2 | 0.24 | 50 | B-021 |
| PCDRS | ϕ0.4×R0.05×0.4 | 0.12 | 48 | C-005 |
| SSR200 | ϕ0.4×R0.05×0.5 | 0.24 | 50 | B-021 |
| SSF120 | ϕ0.4×R0.05×1 | 0.2 | 50 | B-025 |
| SSR200 | ϕ0.4×R0.05×1 | 0.24 | 50 | B-021 |
| MHRH230R | ϕ0.4×R0.05×1 | 0.3 | 45 | F-010 |
| MHRH430R | ϕ0.4×R0.05×1 | 0.3 | 45 | F-012 |
| MHR230R | ϕ0.4×R0.05×1 | 0.3 | 45 | F-021 |
| SSR200 | ϕ0.4×R0.05×1.5 | 0.24 | 50 | B-021 |
| MHRH230R | ϕ0.4×R0.05×1.5 | 0.3 | 45 | F-010 |
| MHRH430R | ϕ0.4×R0.05×1.5 | 0.3 | 45 | F-012 |
| MHR230R | ϕ0.4×R0.05×1.5 | 0.3 | 45 | F-021 |
| SSR200 | ϕ0.4×R0.05×2 | 0.24 | 50 | B-021 |
| MHRH230R | ϕ0.4×R0.05×2 | 0.3 | 45 | F-010 |
| MHRH430R | ϕ0.4×R0.05×2 | 0.3 | 45 | F-012 |
| MHR230R | ϕ0.4×R0.05×2 | 0.3 | 45 | F-021 |
| MHR230R | ϕ0.4×R0.05×2 | 0.3 | 50 | F-021 |
| MHRH230R | ϕ0.4×R0.05×2.5 | 0.3 | 45 | F-010 |
| MHRH430R | ϕ0.4×R0.05×2.5 | 0.3 | 45 | F-012 |
| MHRH230R | ϕ0.4×R0.05×3 | 0.3 | 45 | F-010 |
| MHRH430R | ϕ0.4×R0.05×3 | 0.3 | 45 | F-012 |
| MHR230R | ϕ0.4×R0.05×3 | 0.3 | 45 | F-021 |
| MSTNR230 | ϕ0.4×R0.05×3 | 0.3 | 50 | F-040 |
| MHR230R | ϕ0.4×R0.05×3 | 0.3 | 50 | F-021 |
| MHRH230R | ϕ0.4×R0.05×4 | 0.3 | 45 | F-010 |
| MHRH430R | ϕ0.4×R0.05×4 | 0.3 | 45 | F-012 |
| MHR230R | ϕ0.4×R0.05×4 | 0.3 | 45 | F-021 |
| MSTNR230 | ϕ0.4×R0.05×4 | 0.3 | 50 | F-040 |
| MHR230R | ϕ0.4×R0.05×4 | 0.3 | 50 | F-021 |
| SSR200 | ϕ0.4×R0.1×0.5 | 0.24 | 50 | B-021 |
| SSR200 | ϕ0.4×R0.1×1 | 0.24 | 50 | B-021 |
| MHRH230R | ϕ0.4×R0.1×1 | 0.3 | 45 | F-010 |
| MHRH430R | ϕ0.4×R0.1×1 | 0.3 | 45 | F-012 |
| MHR230R | ϕ0.4×R0.1×1 | 0.3 | 45 | F-021 |
| SSR200 | ϕ0.4×R0.1×1.5 | 0.24 | 50 | B-021 |
| MHR230R | ϕ0.4×R0.1×1.5 | 0.3 | 45 | F-021 |
| SSR200 | ϕ0.4×R0.1×2 | 0.24 | 50 | B-021 |
| MHRH230R | ϕ0.4×R0.1×2 | 0.3 | 45 | F-010 |
| MHRH430R | ϕ0.4×R0.1×2 | 0.3 | 45 | F-012 |
| MHR230R | ϕ0.4×R0.1×2 | 0.3 | 45 | F-021 |

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.xCorner Radius(xEffective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHR230R | ϕ0.4×R0.1×2 | 0.3 | 50 | F-021 |
| MHRH230R | ϕ0.4×R0.1×3 | 0.3 | 45 | F-010 |
| MHRH430R | ϕ0.4×R0.1×3 | 0.3 | 45 | F-012 |
| MHR230R | ϕ0.4×R0.1×3 | 0.3 | 45 | F-021 |
| MSTNR230 | ϕ0.4×R0.1×3 | 0.3 | 50 | F-040 |
| MHR230R | ϕ0.4×R0.1×3 | 0.3 | 50 | F-021 |
| MHRH230R | ϕ0.4×R0.1×4 | 0.3 | 45 | F-010 |
| MHRH430R | ϕ0.4×R0.1×4 | 0.3 | 45 | F-012 |
| MHR230R | ϕ0.4×R0.1×4 | 0.3 | 45 | F-021 |
| MSTNR230 | ϕ0.4×R0.1×4 | 0.3 | 50 | F-040 |
| MHR230R | ϕ0.4×R0.1×4 | 0.3 | 50 | F-021 |
| **ϕ0.5** | | | | |
| SSR200 | ϕ0.5×R0.02×0.5 | 0.3 | 48 | B-021 |
| SSR200 | ϕ0.5×R0.02×1 | 0.3 | 50 | B-021 |
| MHRH230R | ϕ0.5×R0.02×1 | 0.4 | 45 | F-010 |
| MHRH430R | ϕ0.5×R0.02×1 | 0.4 | 45 | F-012 |
| SSR200 | ϕ0.5×R0.02×1.5 | 0.3 | 50 | B-021 |
| MHRH230R | ϕ0.5×R0.02×2 | 0.4 | 45 | F-010 |
| MHRH430R | ϕ0.5×R0.02×2 | 0.4 | 45 | F-012 |
| SSR200 | ϕ0.5×R0.02×2.5 | 0.3 | 50 | B-021 |
| MHRH230R | ϕ0.5×R0.02×3 | 0.4 | 45 | F-010 |
| MHRH430R | ϕ0.5×R0.02×3 | 0.4 | 45 | F-012 |
| MHRH230R | ϕ0.5×R0.02×4 | 0.4 | 45 | F-010 |
| MHRH430R | ϕ0.5×R0.02×4 | 0.4 | 45 | F-012 |
| MHRH230R | ϕ0.5×R0.02×5 | 0.4 | 45 | F-010 |
| MHRH430R | ϕ0.5×R0.02×5 | 0.4 | 45 | F-012 |
| MHRH230R | ϕ0.5×R0.02×6 | 0.4 | 45 | F-010 |
| MHRH430R | ϕ0.5×R0.02×6 | 0.4 | 45 | F-012 |
| SSR200 | ϕ0.5×R0.03×0.5 | 0.3 | 48 | B-021 |
| SSR200 | ϕ0.5×R0.03×1 | 0.3 | 50 | B-021 |
| SSR200 | ϕ0.5×R0.03×1.5 | 0.3 | 50 | B-021 |
| SSR200 | ϕ0.5×R0.03×2.5 | 0.3 | 50 | B-021 |
| PCDRS | ϕ0.5×R0.05×0.5 | 0.15 | 48 | C-005 |
| SSR200 | ϕ0.5×R0.05×0.5 | 0.3 | 48 | B-021 |
| SSR200 | ϕ0.5×R0.05×1 | 0.3 | 50 | B-021 |
| MHRH230R | ϕ0.5×R0.05×1 | 0.4 | 45 | F-010 |
| MHRH430R | ϕ0.5×R0.05×1 | 0.4 | 45 | F-013 |
| MHR230R | ϕ0.5×R0.05×1 | 0.4 | 45 | F-022 |
| SSF120 | ϕ0.5×R0.05×1.25 | 0.25 | 50 | B-025 |
| SSR200 | ϕ0.5×R0.05×1.5 | 0.3 | 50 | B-021 |
| MHRH230R | ϕ0.5×R0.05×2 | 0.4 | 45 | F-010 |
| MHRH430R | ϕ0.5×R0.05×2 | 0.4 | 45 | F-013 |
| MHR230R | ϕ0.5×R0.05×2 | 0.4 | 45 | F-022 |
| MHR230R | ϕ0.5×R0.05×2 | 0.4 | 50 | F-022 |
| SSR200 | ϕ0.5×R0.05×2.5 | 0.3 | 50 | B-021 |
| MHRH230R | ϕ0.5×R0.05×3 | 0.4 | 45 | F-010 |
| MHRH430R | ϕ0.5×R0.05×3 | 0.4 | 45 | F-013 |
| MHR230R | ϕ0.5×R0.05×3 | 0.4 | 45 | F-022 |
| MSTNR230 | ϕ0.5×R0.05×3 | 0.4 | 50 | F-040 |
| MSTNR230 | ϕ0.5×R0.05×3 | 0.4 | 50 | F-041 |
| MHR230R | ϕ0.5×R0.05×3 | 0.4 | 50 | F-022 |
| MHRH230R | ϕ0.5×R0.05×4 | 0.4 | 45 | F-010 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.×Corner Radius (×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHRH430R | φ0.5×R0.05×4 | 0.4 | 45 | F-013 |
| MHR230R | φ0.5×R0.05×4 | 0.4 | 45 | F-022 |
| MHR230R | φ0.5×R0.05×4 | 0.4 | 50 | F-022 |
| MHRH230R | φ0.5×R0.05×5 | 0.4 | 45 | F-010 |
| MHRH430R | φ0.5×R0.05×5 | 0.4 | 45 | F-013 |
| MHR230R | φ0.5×R0.05×5 | 0.4 | 45 | F-022 |
| MSTNR230 | φ0.5×R0.05×5 | 0.4 | 50 | F-040 |
| MSTNR230 | φ0.5×R0.05×5 | 0.4 | 50 | F-041 |
| MHR230R | φ0.5×R0.05×5 | 0.4 | 50 | F-022 |
| MHRH230R | φ0.5×R0.05×6 | 0.4 | 45 | F-010 |
| MHRH430R | φ0.5×R0.05×6 | 0.4 | 45 | F-013 |
| MHR230R | φ0.5×R0.05×6 | 0.4 | 45 | F-022 |
| MSTNR230 | φ0.5×R0.05×8 | 0.4 | 50 | F-040 |
| MSTNR230 | φ0.5×R0.05×8 | 0.4 | 50 | F-041 |
| MSTNR230 | φ0.5×R0.05×10 | 0.4 | 50 | F-040 |
| MSTNR230 | φ0.5×R0.05×10 | 0.4 | 50 | F-041 |
| MSTNR230 | φ0.5×R0.05×12 | 0.4 | 50 | F-040 |
| MSTNR230 | φ0.5×R0.05×12 | 0.4 | 50 | F-041 |
| PCDRS | φ0.5×R0.1×0.5 | 0.15 | 48 | C-005 |
| SSR200 | φ0.5×R0.1×0.5 | 0.3 | 48 | B-021 |
| SSR200 | φ0.5×R0.1×1 | 0.3 | 50 | B-021 |
| MHRH230R | φ0.5×R0.1×1 | 0.4 | 45 | F-011 |
| MHRH430R | φ0.5×R0.1×1 | 0.4 | 45 | F-013 |
| MHR230R | φ0.5×R0.1×1 | 0.4 | 45 | F-022 |
| SHR320 | φ0.5×R0.1×1.5 | 0.25 | 50 | B-024 |
| SSR200 | φ0.5×R0.1×1.5 | 0.3 | 50 | B-021 |
| MHRH230R | φ0.5×R0.1×2 | 0.4 | 45 | F-011 |
| MHRH430R | φ0.5×R0.1×2 | 0.4 | 45 | F-013 |
| MHR230R | φ0.5×R0.1×2 | 0.4 | 45 | F-022 |
| MHR230R | φ0.5×R0.1×2 | 0.4 | 50 | F-022 |
| SHR320 | φ0.5×R0.1×2.5 | 0.25 | 50 | B-024 |
| SSR200 | φ0.5×R0.1×2.5 | 0.3 | 50 | B-021 |
| MHRH230R | φ0.5×R0.1×3 | 0.4 | 45 | F-011 |
| MHRH430R | φ0.5×R0.1×3 | 0.4 | 45 | F-013 |
| MHR230R | φ0.5×R0.1×3 | 0.4 | 45 | F-022 |
| MSTNR230 | φ0.5×R0.1×3 | 0.4 | 50 | F-041 |
| MHR230R | φ0.5×R0.1×3 | 0.4 | 50 | F-022 |
| MHRH230R | φ0.5×R0.1×4 | 0.4 | 45 | F-011 |
| MHRH430R | φ0.5×R0.1×4 | 0.4 | 45 | F-013 |
| MHR230R | φ0.5×R0.1×4 | 0.4 | 45 | F-022 |
| MHR230R | φ0.5×R0.1×4 | 0.4 | 50 | F-022 |
| MHRH230R | φ0.5×R0.1×5 | 0.4 | 45 | F-011 |
| MHRH430R | φ0.5×R0.1×5 | 0.4 | 45 | F-013 |
| MHR230R | φ0.5×R0.1×5 | 0.4 | 45 | F-022 |
| MSTNR230 | φ0.5×R0.1×5 | 0.4 | 50 | F-041 |
| MHR230R | φ0.5×R0.1×5 | 0.4 | 50 | F-022 |
| MHRH230R | φ0.5×R0.1×6 | 0.4 | 45 | F-011 |
| MHRH430R | φ0.5×R0.1×6 | 0.4 | 45 | F-013 |
| MHR230R | φ0.5×R0.1×6 | 0.4 | 45 | F-022 |
| MSTNR230 | φ0.5×R0.1×8 | 0.4 | 50 | F-041 |
| MSTNR230 | φ0.5×R0.1×10 | 0.4 | 50 | F-041 |
| MSTNR230 | φ0.5×R0.1×12 | 0.4 | 50 | F-041 |

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.×Corner Radius (×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| **φ0.6** | | | | |
| SSR200 | φ0.6×R0.02×0.5 | 0.3 | 48 | B-021 |
| SSR200 | φ0.6×R0.02×1 | 0.3 | 50 | B-021 |
| SSR200 | φ0.6×R0.02×1.5 | 0.3 | 50 | B-021 |
| MHRH230R | φ0.6×R0.02×2 | 0.5 | 45 | F-011 |
| MHRH430R | φ0.6×R0.02×2 | 0.5 | 45 | F-013 |
| SSR200 | φ0.6×R0.02×2.5 | 0.3 | 50 | B-021 |
| MHRH230R | φ0.6×R0.02×4 | 0.5 | 45 | F-011 |
| MHRH430R | φ0.6×R0.02×4 | 0.5 | 45 | F-013 |
| MHRH230R | φ0.6×R0.02×6 | 0.5 | 45 | F-011 |
| MHRH430R | φ0.6×R0.02×6 | 0.5 | 45 | F-013 |
| MHRH230R | φ0.6×R0.02×8 | 0.5 | 50 | F-011 |
| MHRH430R | φ0.6×R0.02×8 | 0.5 | 50 | F-013 |
| MHRH230R | φ0.6×R0.02×10 | 0.5 | 50 | F-011 |
| MHRH430R | φ0.6×R0.02×10 | 0.5 | 50 | F-013 |
| SSR200 | φ0.6×R0.03×0.5 | 0.3 | 48 | B-021 |
| SSR200 | φ0.6×R0.03×1 | 0.3 | 50 | B-021 |
| SSR200 | φ0.6×R0.03×1.5 | 0.3 | 50 | B-021 |
| SSR200 | φ0.6×R0.03×2.5 | 0.3 | 50 | B-021 |
| SSR200 | φ0.6×R0.05×0.5 | 0.3 | 48 | B-021 |
| PCDRS | φ0.6×R0.05×0.6 | 0.18 | 48 | C-005 |
| SSR200 | φ0.6×R0.05×1 | 0.3 | 50 | B-021 |
| SSR200 | φ0.6×R0.05×1.5 | 0.3 | 50 | B-021 |
| SSF120 | φ0.6×R0.05×1.5 | 0.3 | 50 | B-025 |
| MHRH230R | φ0.6×R0.05×2 | 0.5 | 45 | F-011 |
| MHRH430R | φ0.6×R0.05×2 | 0.5 | 45 | F-013 |
| MHR230R | φ0.6×R0.05×2 | 0.5 | 45 | F-022 |
| MHR230R | φ0.6×R0.05×2 | 0.5 | 50 | F-022 |
| SSR200 | φ0.6×R0.05×2.5 | 0.3 | 50 | B-021 |
| MHR230R | φ0.6×R0.05×3 | 0.5 | 45 | F-022 |
| MHRH230R | φ0.6×R0.05×4 | 0.5 | 45 | F-011 |
| MHRH430R | φ0.6×R0.05×4 | 0.5 | 45 | F-013 |
| MHR230R | φ0.6×R0.05×4 | 0.5 | 45 | F-022 |
| MHR230R | φ0.6×R0.05×4 | 0.5 | 50 | F-022 |
| MHRH230R | φ0.6×R0.05×6 | 0.5 | 45 | F-011 |
| MHRH430R | φ0.6×R0.05×6 | 0.5 | 45 | F-013 |
| MHR230R | φ0.6×R0.05×6 | 0.5 | 45 | F-022 |
| MHR230R | φ0.6×R0.05×6 | 0.5 | 50 | F-022 |
| MHRH230R | φ0.6×R0.05×8 | 0.5 | 50 | F-011 |
| MHRH430R | φ0.6×R0.05×8 | 0.5 | 50 | F-013 |
| MHR230R | φ0.6×R0.05×8 | 0.5 | 50 | F-022 |
| MHRH230R | φ0.6×R0.05×10 | 0.5 | 50 | F-011 |
| MHRH430R | φ0.6×R0.05×10 | 0.5 | 50 | F-013 |
| SSR200 | φ0.6×R0.1×0.5 | 0.3 | 48 | B-021 |
| PCDRS | φ0.6×R0.1×0.6 | 0.18 | 48 | C-005 |
| SSR200 | φ0.6×R0.1×1 | 0.3 | 50 | B-021 |
| SSR200 | φ0.6×R0.1×1.5 | 0.3 | 50 | B-021 |
| MHRH230R | φ0.6×R0.1×2 | 0.5 | 45 | F-011 |
| MHRH430R | φ0.6×R0.1×2 | 0.5 | 45 | F-013 |
| MHR230R | φ0.6×R0.1×2 | 0.5 | 45 | F-022 |
| SSR200 | φ0.6×R0.1×2.5 | 0.3 | 50 | B-021 |
| MHR230R | φ0.6×R0.1×3 | 0.5 | 45 | F-022 |



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| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.xCorner Radius(xEffective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHRH230R | ϕ0.6×R0.1×4 | 0.5 | 45 | F-011 |
| MHRH430R | ϕ0.6×R0.1×4 | 0.5 | 45 | F-013 |
| MHR230R | ϕ0.6×R0.1×4 | 0.5 | 45 | F-022 |
| MHR230R | ϕ0.6×R0.1×4 | 0.5 | 50 | F-022 |
| MHRH230R | ϕ0.6×R0.1×6 | 0.5 | 45 | F-011 |
| MHRH430R | ϕ0.6×R0.1×6 | 0.5 | 45 | F-013 |
| MHR230R | ϕ0.6×R0.1×6 | 0.5 | 45 | F-022 |
| MHR230R | ϕ0.6×R0.1×6 | 0.5 | 50 | F-022 |
| MHRH230R | ϕ0.6×R0.1×8 | 0.5 | 50 | F-011 |
| MHRH430R | ϕ0.6×R0.1×8 | 0.5 | 50 | F-013 |
| MHR230R | ϕ0.6×R0.1×8 | 0.5 | 50 | F-022 |
| MHRH230R | ϕ0.6×R0.1×10 | 0.5 | 50 | F-011 |
| MHRH430R | ϕ0.6×R0.1×10 | 0.5 | 50 | F-013 |
| MHR230R | ϕ0.6×R0.2×2 | 0.5 | 45 | F-022 |
| MHR230R | ϕ0.6×R0.2×3 | 0.5 | 45 | F-022 |
| MHR230R | ϕ0.6×R0.2×4 | 0.5 | 45 | F-023 |
| MHR230R | ϕ0.6×R0.2×6 | 0.5 | 45 | F-023 |
| MHR230R | ϕ0.6×R0.2×8 | 0.5 | 50 | F-023 |
| **ϕ0.7** | | | | |
| MHRH230R | ϕ0.7×R0.02×2 | 0.55 | 45 | F-011 |
| MHRH430R | ϕ0.7×R0.02×2 | 0.55 | 45 | F-013 |
| MHRH230R | ϕ0.7×R0.02×4 | 0.55 | 45 | F-011 |
| MHRH430R | ϕ0.7×R0.02×4 | 0.55 | 45 | F-013 |
| MHRH230R | ϕ0.7×R0.02×6 | 0.55 | 45 | F-011 |
| MHRH430R | ϕ0.7×R0.02×6 | 0.55 | 45 | F-013 |
| MHRH230R | ϕ0.7×R0.05×2 | 0.55 | 45 | F-011 |
| MHRH430R | ϕ0.7×R0.05×2 | 0.55 | 45 | F-013 |
| MHRH230R | ϕ0.7×R0.05×4 | 0.55 | 45 | F-011 |
| MHRH430R | ϕ0.7×R0.05×4 | 0.55 | 45 | F-013 |
| MHR230R | ϕ0.7×R0.05×4 | 0.55 | 45 | F-023 |
| MHR230R | ϕ0.7×R0.05×4 | 0.55 | 50 | F-023 |
| MHRH230R | ϕ0.7×R0.05×6 | 0.55 | 45 | F-011 |
| MHRH430R | ϕ0.7×R0.05×6 | 0.55 | 45 | F-013 |
| MHR230R | ϕ0.7×R0.05×6 | 0.55 | 45 | F-023 |
| MHR230R | ϕ0.7×R0.05×6 | 0.55 | 50 | F-023 |
| MHRH230R | ϕ0.7×R0.1×2 | 0.55 | 45 | F-011 |
| MHRH430R | ϕ0.7×R0.1×2 | 0.55 | 45 | F-013 |
| MHRH230R | ϕ0.7×R0.1×4 | 0.55 | 45 | F-011 |
| MHRH430R | ϕ0.7×R0.1×4 | 0.55 | 45 | F-013 |
| MHR230R | ϕ0.7×R0.1×4 | 0.55 | 45 | F-023 |
| MHR230R | ϕ0.7×R0.1×4 | 0.55 | 50 | F-023 |
| MHRH230R | ϕ0.7×R0.1×6 | 0.55 | 45 | F-011 |
| MHRH430R | ϕ0.7×R0.1×6 | 0.55 | 45 | F-013 |
| MHR230R | ϕ0.7×R0.1×6 | 0.55 | 45 | F-023 |
| MHR230R | ϕ0.7×R0.1×6 | 0.55 | 50 | F-023 |
| **ϕ0.8** | | | | |
| SSR200 | ϕ0.8×R0.02×1.5 | 0.56 | 50 | B-021 |
| MHRH230R | ϕ0.8×R0.02×2 | 0.65 | 45 | F-011 |
| MHRH430R | ϕ0.8×R0.02×2 | 0.65 | 45 | F-013 |
| SSR200 | ϕ0.8×R0.02×2.5 | 0.56 | 50 | B-021 |
| MHRH230R | ϕ0.8×R0.02×4 | 0.65 | 45 | F-011 |
| MHRH430R | ϕ0.8×R0.02×4 | 0.65 | 45 | F-013 |

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.xCorner Radius(xEffective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| SSR200 | ϕ0.8×R0.02×5 | 0.56 | 53 | B-021 |
| MHRH230R | ϕ0.8×R0.02×6 | 0.65 | 45 | F-011 |
| MHRH430R | ϕ0.8×R0.02×6 | 0.65 | 45 | F-013 |
| MHRH230R | ϕ0.8×R0.02×8 | 0.65 | 50 | F-011 |
| MHRH430R | ϕ0.8×R0.02×8 | 0.65 | 50 | F-013 |
| SSR200 | ϕ0.8×R0.03×1.5 | 0.56 | 50 | B-022 |
| SSR200 | ϕ0.8×R0.03×2.5 | 0.56 | 50 | B-022 |
| SSR200 | ϕ0.8×R0.03×5 | 0.56 | 53 | B-022 |
| PCDRS | ϕ0.8×R0.05×0.8 | 0.24 | 48 | C-005 |
| SSR200 | ϕ0.8×R0.05×1.5 | 0.56 | 50 | B-022 |
| SSF120 | ϕ0.8×R0.05×2 | 0.4 | 50 | B-025 |
| MHRH230R | ϕ0.8×R0.05×2 | 0.65 | 45 | F-011 |
| MHRH430R | ϕ0.8×R0.05×2 | 0.65 | 45 | F-013 |
| SSR200 | ϕ0.8×R0.05×2.5 | 0.56 | 50 | B-022 |
| MHRH230R | ϕ0.8×R0.05×4 | 0.65 | 45 | F-011 |
| MHRH430R | ϕ0.8×R0.05×4 | 0.65 | 45 | F-013 |
| MHR230R | ϕ0.8×R0.05×4 | 0.65 | 45 | F-023 |
| MHR230R | ϕ0.8×R0.05×4 | 0.65 | 50 | F-023 |
| SSR200 | ϕ0.8×R0.05×5 | 0.56 | 53 | B-022 |
| MSTNR230 | ϕ0.8×R0.05×5 | 0.65 | 50 | F-041 |
| MHRH230R | ϕ0.8×R0.05×6 | 0.65 | 45 | F-011 |
| MHRH430R | ϕ0.8×R0.05×6 | 0.65 | 45 | F-013 |
| MHR230R | ϕ0.8×R0.05×6 | 0.65 | 45 | F-023 |
| MHR230R | ϕ0.8×R0.05×6 | 0.65 | 50 | F-023 |
| MSTNR230 | ϕ0.8×R0.05×8 | 0.65 | 50 | F-041 |
| MHRH230R | ϕ0.8×R0.05×8 | 0.65 | 50 | F-011 |
| MHRH430R | ϕ0.8×R0.05×8 | 0.65 | 50 | F-013 |
| MHR230R | ϕ0.8×R0.05×8 | 0.65 | 50 | F-023 |
| MHRH230R | ϕ0.8×R0.05×12 | 0.65 | 50 | F-011 |
| MHRH430R | ϕ0.8×R0.05×12 | 0.65 | 50 | F-013 |
| PCDRS | ϕ0.8×R0.1×0.8 | 0.24 | 48 | C-005 |
| SSR200 | ϕ0.8×R0.1×1.5 | 0.56 | 50 | B-022 |
| MHRH230R | ϕ0.8×R0.1×2 | 0.65 | 45 | F-011 |
| MHRH430R | ϕ0.8×R0.1×2 | 0.65 | 45 | F-013 |
| SSR200 | ϕ0.8×R0.1×2.5 | 0.56 | 50 | B-022 |
| MHRH230R | ϕ0.8×R0.1×4 | 0.65 | 45 | F-011 |
| MHRH430R | ϕ0.8×R0.1×4 | 0.65 | 45 | F-013 |
| MHR230R | ϕ0.8×R0.1×4 | 0.65 | 45 | F-023 |
| MHR230R | ϕ0.8×R0.1×4 | 0.65 | 50 | F-023 |
| SSR200 | ϕ0.8×R0.1×5 | 0.56 | 53 | B-022 |
| MSTNR230 | ϕ0.8×R0.1×5 | 0.65 | 50 | F-041 |
| MHRH230R | ϕ0.8×R0.1×6 | 0.65 | 45 | F-011 |
| MHRH430R | ϕ0.8×R0.1×6 | 0.65 | 45 | F-013 |
| MHR230R | ϕ0.8×R0.1×6 | 0.65 | 45 | F-023 |
| MHR230R | ϕ0.8×R0.1×6 | 0.65 | 50 | F-023 |
| MSTNR230 | ϕ0.8×R0.1×8 | 0.65 | 50 | F-041 |
| MHRH230R | ϕ0.8×R0.1×8 | 0.65 | 50 | F-011 |
| MHRH430R | ϕ0.8×R0.1×8 | 0.65 | 50 | F-013 |
| MHR230R | ϕ0.8×R0.1×8 | 0.65 | 50 | F-023 |
| MHRH230R | ϕ0.8×R0.1×12 | 0.65 | 50 | F-011 |
| MHRH430R | ϕ0.8×R0.1×12 | 0.65 | 50 | F-013 |
| MHRH230R | ϕ0.8×R0.2×2 | 0.65 | 45 | F-011 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.×Corner Radius (×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| **MHRH430R** | φ0.8×R0.2×2 | 0.65 | 45 | F-013 |
| **MHRH230R** | φ0.8×R0.2×4 | 0.65 | 45 | F-011 |
| **MHRH430R** | φ0.8×R0.2×4 | 0.65 | 45 | F-013 |
| **MHR230R** | φ0.8×R0.2×4 | 0.65 | 45 | F-023 |
| **MHR230R** | φ0.8×R0.2×4 | 0.65 | 50 | F-023 |
| **MSTNR230** | φ0.8×R0.2×5 | 0.65 | 50 | F-041 |
| **MHRH230R** | φ0.8×R0.2×6 | 0.65 | 45 | F-011 |
| **MHRH430R** | φ0.8×R0.2×6 | 0.65 | 45 | F-013 |
| **MHR230R** | φ0.8×R0.2×6 | 0.65 | 45 | F-023 |
| **MHR230R** | φ0.8×R0.2×6 | 0.65 | 50 | F-023 |
| **MSTNR230** | φ0.8×R0.2×8 | 0.65 | 50 | F-041 |
| **MHRH230R** | φ0.8×R0.2×8 | 0.65 | 50 | F-011 |
| **MHRH430R** | φ0.8×R0.2×8 | 0.65 | 50 | F-013 |
| **MHR230R** | φ0.8×R0.2×8 | 0.65 | 50 | F-023 |
| **MHRH230R** | φ0.8×R0.2×12 | 0.65 | 50 | F-011 |
| **MHRH430R** | φ0.8×R0.2×12 | 0.65 | 50 | F-013 |
| **φ0.9** | | | | |
| **MHRH230R** | φ0.9×R0.1×4 | 0.7 | 45 | F-011 |
| **MHRH430R** | φ0.9×R0.1×4 | 0.7 | 45 | F-014 |
| **MHR230R** | φ0.9×R0.1×4 | 0.7 | 45 | F-023 |
| **MHR230R** | φ0.9×R0.1×4 | 0.7 | 50 | F-023 |
| **MHRH230R** | φ0.9×R0.1×8 | 0.7 | 50 | F-011 |
| **MHRH430R** | φ0.9×R0.1×8 | 0.7 | 50 | F-014 |
| **MHR230R** | φ0.9×R0.1×8 | 0.7 | 50 | F-023 |
| **φ1** | | | | |
| **SSR200** | φ1×R0.02×1 | 0.7 | 49 | B-022 |
| **SSR200** | φ1×R0.02×2 | 0.7 | 50 | B-022 |
| **MHRH430R** | φ1×R0.02×2 | 0.8 | 50 | F-014 |
| **SSR200** | φ1×R0.02×3 | 0.7 | 50 | B-022 |
| **MHRH430R** | φ1×R0.02×3 | 0.8 | 50 | F-014 |
| **MHRH430R** | φ1×R0.02×4 | 0.8 | 50 | F-014 |
| **SSR200** | φ1×R0.02×5 | 0.7 | 53 | B-022 |
| **MHRH430R** | φ1×R0.02×5 | 0.8 | 50 | F-014 |
| **MHRH430R** | φ1×R0.02×6 | 0.8 | 50 | F-014 |
| **MHRH430R** | φ1×R0.02×8 | 0.8 | 50 | F-014 |
| **MHRH430R** | φ1×R0.02×10 | 0.8 | 50 | F-014 |
| **SSR200** | φ1×R0.03×1 | 0.7 | 49 | B-022 |
| **SSR200** | φ1×R0.03×2 | 0.7 | 50 | B-022 |
| **SSR200** | φ1×R0.03×3 | 0.7 | 50 | B-022 |
| **SSR200** | φ1×R0.03×5 | 0.7 | 53 | B-022 |
| **PCDRS** | φ1×R0.05×1 | 0.3 | 48 | C-005 |
| **SSR200** | φ1×R0.05×1 | 0.7 | 49 | B-022 |
| **SSR200** | φ1×R0.05×2 | 0.7 | 50 | B-022 |
| **MHRH430R** | φ1×R0.05×2 | 0.8 | 50 | F-014 |
| **MHR230R** | φ1×R0.05×2 | 0.8 | 50 | F-023 |
| **SSR200** | φ1×R0.05×3 | 0.7 | 50 | B-022 |
| **MHRH430R** | φ1×R0.05×3 | 0.8 | 50 | F-014 |
| **MHR230R** | φ1×R0.05×3 | 0.8 | 50 | F-023 |
| **MHR430R** | φ1×R0.05×3 | 0.8 | 50 | F-032 |
| **MHRH430R** | φ1×R0.05×4 | 0.8 | 50 | F-014 |
| **MHR230R** | φ1×R0.05×4 | 0.8 | 50 | F-023・024 |
| **MHR430R** | φ1×R0.05×4 | 0.8 | 50 | F-032 |

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.×Corner Radius (×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| **SSR200** | φ1×R0.05×5 | 0.7 | 53 | B-022 |
| **MHRH430R** | φ1×R0.05×5 | 0.8 | 50 | F-014 |
| **MHR230R** | φ1×R0.05×5 | 0.8 | 50 | F-024 |
| **MHR430R** | φ1×R0.05×5 | 0.8 | 50 | F-032 |
| **MSTNR230** | φ1×R0.05×6 | 0.8 | 50 | F-041・042 |
| **MHRH430R** | φ1×R0.05×6 | 0.8 | 50 | F-014 |
| **MHR230R** | φ1×R0.05×6 | 0.8 | 50 | F-024 |
| **MHR430R** | φ1×R0.05×6 | 0.8 | 50 | F-032 |
| **MHRH430R** | φ1×R0.05×8 | 0.8 | 50 | F-014 |
| **MHR230R** | φ1×R0.05×8 | 0.8 | 50 | F-024 |
| **MHR430R** | φ1×R0.05×8 | 0.8 | 50 | F-032 |
| **MHRH430R** | φ1×R0.05×10 | 0.8 | 50 | F-014 |
| **MHR230R** | φ1×R0.05×10 | 0.8 | 50 | F-024 |
| **MHR430R** | φ1×R0.05×10 | 0.8 | 50 | F-032 |
| **MSTNR230** | φ1×R0.05×10 | 0.8 | 60 | F-041・042 |
| **MHR230R** | φ1×R0.05×12 | 0.8 | 50 | F-024 |
| **MHR430R** | φ1×R0.05×12 | 0.8 | 50 | F-032 |
| **MSTNR230** | φ1×R0.05×15 | 0.8 | 60 | F-041 |
| **MHR230R** | φ1×R0.05×16 | 0.8 | 60 | F-024 |
| **MSTNR230** | φ1×R0.05×20 | 0.8 | 60 | F-041 |
| **MHR230R** | φ1×R0.05×20 | 0.8 | 60 | F-024 |
| **MSTNR230** | φ1×R0.05×25 | 0.8 | 70 | F-042 |
| **MSTNR230** | φ1×R0.05×30 | 0.8 | 80 | F-042 |
| **MSTNR230** | φ1×R0.05×35 | 0.8 | 80 | F-042 |
| **MSRS230** | φ1×R0.1 | 2 | 60 | F-005 |
| **PCDRS** | φ1×R0.1×1 | 0.3 | 48 | C-005 |
| **SSR200** | φ1×R0.1×1 | 0.7 | 49 | B-022 |
| **SSR200** | φ1×R0.1×2 | 0.7 | 50 | B-022 |
| **MHRH430R** | φ1×R0.1×2 | 0.8 | 50 | F-014 |
| **MHR230R** | φ1×R0.1×2 | 0.8 | 50 | F-024 |
| **SSF120** | φ1×R0.1×2.5 | 0.5 | 50 | B-025 |
| **SHR320** | φ1×R0.1×3 | 0.5 | 50 | B-024 |
| **SSR200** | φ1×R0.1×3 | 0.7 | 50 | B-022 |
| **MHRH430R** | φ1×R0.1×3 | 0.8 | 50 | F-014 |
| **MHR230R** | φ1×R0.1×3 | 0.8 | 50 | F-024 |
| **MHR430R** | φ1×R0.1×3 | 0.8 | 50 | F-032 |
| **MHRH430R** | φ1×R0.1×4 | 0.8 | 50 | F-014 |
| **MHR230R** | φ1×R0.1×4 | 0.8 | 50 | F-024 |
| **MHR430R** | φ1×R0.1×4 | 0.8 | 50 | F-032 |
| **SHR320** | φ1×R0.1×5 | 0.5 | 52 | B-024 |
| **SSR200** | φ1×R0.1×5 | 0.7 | 53 | B-022 |
| **MHRH430R** | φ1×R0.1×5 | 0.8 | 50 | F-014 |
| **MHR230R** | φ1×R0.1×5 | 0.8 | 50 | F-024 |
| **MHR430R** | φ1×R0.1×5 | 0.8 | 50 | F-032 |
| **MSTNR230** | φ1×R0.1×6 | 0.8 | 50 | F-042 |
| **MHRH430R** | φ1×R0.1×6 | 0.8 | 50 | F-014 |
| **MHR230R** | φ1×R0.1×6 | 0.8 | 50 | F-024 |
| **MHR430R** | φ1×R0.1×6 | 0.8 | 50 | F-032 |
| **MHRH430R** | φ1×R0.1×8 | 0.8 | 50 | F-014 |
| **MHR230R** | φ1×R0.1×8 | 0.8 | 50 | F-024 |
| **MHR430R** | φ1×R0.1×8 | 0.8 | 50 | F-032 |
| **MHRH430R** | φ1×R0.1×10 | 0.8 | 50 | F-014 |



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| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.xCorner Radius(xEffective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHR230R | φ1×R0.1×10 | 0.8 | 50 | F-024 |
| MHR430R | φ1×R0.1×10 | 0.8 | 50 | F-032 |
| MSTNR230 | φ1×R0.1×10 | 0.8 | 60 | F-042 |
| MHR230R | φ1×R0.1×12 | 0.8 | 50 | F-024 |
| MHR430R | φ1×R0.1×12 | 0.8 | 50 | F-032 |
| MSTNR230 | φ1×R0.1×15 | 0.8 | 60 | F-042 |
| MHR230R | φ1×R0.1×16 | 0.8 | 60 | F-024 |
| MSTNR230 | φ1×R0.1×20 | 0.8 | 60 | F-042 |
| MHR230R | φ1×R0.1×20 | 0.8 | 60 | F-024 |
| MSTNR230 | φ1×R0.1×25 | 0.8 | 70 | F-042 |
| MSTNR230 | φ1×R0.1×30 | 0.8 | 80 | F-042 |
| MSTNR230 | φ1×R0.1×35 | 0.8 | 80 | F-042 |
| MSRS230 | φ1×R0.2 | 2 | 60 | F-005 |
| NSR-2 | φ1×R0.2 | 3 | 45 | F-008 |
| SSR200 | φ1×R0.2×1 | 0.7 | 49 | B-022 |
| SSR200 | φ1×R0.2×2 | 0.7 | 50 | B-022 |
| MHRH430R | φ1×R0.2×2 | 0.8 | 50 | F-014 |
| MHR230R | φ1×R0.2×2 | 0.8 | 50 | F-024 |
| SHR320 | φ1×R0.2×3 | 0.5 | 50 | B-024 |
| SSR200 | φ1×R0.2×3 | 0.7 | 50 | B-022 |
| MHRH430R | φ1×R0.2×3 | 0.8 | 50 | F-014 |
| MHR230R | φ1×R0.2×3 | 0.8 | 50 | F-024 |
| MHR430R | φ1×R0.2×3 | 0.8 | 50 | F-032 |
| MHRH430R | φ1×R0.2×4 | 0.8 | 50 | F-014 |
| MHR230R | φ1×R0.2×4 | 0.8 | 50 | F-024 |
| MHR430R | φ1×R0.2×4 | 0.8 | 50 | F-032 |
| SHR320 | φ1×R0.2×5 | 0.5 | 52 | B-024 |
| SSR200 | φ1×R0.2×5 | 0.7 | 53 | B-022 |
| MHRH430R | φ1×R0.2×5 | 0.8 | 50 | F-014 |
| MHR230R | φ1×R0.2×5 | 0.8 | 50 | F-024 |
| MHR430R | φ1×R0.2×5 | 0.8 | 50 | F-032 |
| MSTNR230 | φ1×R0.2×6 | 0.8 | 50 | F-042 |
| MHRH430R | φ1×R0.2×6 | 0.8 | 50 | F-014 |
| MHR230R | φ1×R0.2×6 | 0.8 | 50 | F-025 |
| MHR430R | φ1×R0.2×6 | 0.8 | 50 | F-032 |
| MHRH430R | φ1×R0.2×8 | 0.8 | 50 | F-014 |
| MHR230R | φ1×R0.2×8 | 0.8 | 50 | F-025 |
| MHR430R | φ1×R0.2×8 | 0.8 | 50 | F-032 |
| MHRH430R | φ1×R0.2×10 | 0.8 | 50 | F-014 |
| MHR230R | φ1×R0.2×10 | 0.8 | 50 | F-025 |
| MHR430R | φ1×R0.2×10 | 0.8 | 50 | F-032 |
| MSTNR230 | φ1×R0.2×10 | 0.8 | 60 | F-042 |
| MHR230R | φ1×R0.2×12 | 0.8 | 50 | F-025 |
| MHR430R | φ1×R0.2×12 | 0.8 | 50 | F-032 |
| MSTNR230 | φ1×R0.2×15 | 0.8 | 60 | F-042 |
| MHR230R | φ1×R0.2×16 | 0.8 | 60 | F-025 |
| MSTNR230 | φ1×R0.2×20 | 0.8 | 60 | F-042 |
| MHR230R | φ1×R0.2×20 | 0.8 | 60 | F-025 |
| MSTNR230 | φ1×R0.2×25 | 0.8 | 70 | F-042 |
| MSTNR230 | φ1×R0.2×30 | 0.8 | 80 | F-042 |
| MSTNR230 | φ1×R0.2×35 | 0.8 | 80 | F-042 |
| MSRS230 | φ1×R0.3 | 2 | 60 | F-005 |

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.xCorner Radius(xEffective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| SSR200 | φ1×R0.3×1 | 0.7 | 49 | B-022 |
| SSR200 | φ1×R0.3×2 | 0.7 | 50 | B-022 |
| MHRH430R | φ1×R0.3×2 | 0.8 | 50 | F-014 |
| MHR230R | φ1×R0.3×2 | 0.8 | 50 | F-025 |
| SSR200 | φ1×R0.3×3 | 0.7 | 50 | B-022 |
| MHRH430R | φ1×R0.3×3 | 0.8 | 50 | F-014 |
| MHR230R | φ1×R0.3×3 | 0.8 | 50 | F-025 |
| MHR430R | φ1×R0.3×3 | 0.8 | 50 | F-032 |
| MHRH430R | φ1×R0.3×4 | 0.8 | 50 | F-014 |
| MHR230R | φ1×R0.3×4 | 0.8 | 50 | F-025 |
| MHR430R | φ1×R0.3×4 | 0.8 | 50 | F-032 |
| SSR200 | φ1×R0.3×5 | 0.7 | 53 | B-022 |
| MHRH430R | φ1×R0.3×5 | 0.8 | 50 | F-014 |
| MHR230R | φ1×R0.3×5 | 0.8 | 50 | F-025 |
| MHR430R | φ1×R0.3×5 | 0.8 | 50 | F-032 |
| MSTNR230 | φ1×R0.3×6 | 0.8 | 50 | F-042 |
| MHRH430R | φ1×R0.3×6 | 0.8 | 50 | F-014 |
| MHR230R | φ1×R0.3×6 | 0.8 | 50 | F-025 |
| MHR430R | φ1×R0.3×6 | 0.8 | 50 | F-032 |
| MHRH430R | φ1×R0.3×8 | 0.8 | 50 | F-014 |
| MHR230R | φ1×R0.3×8 | 0.8 | 50 | F-025 |
| MHR430R | φ1×R0.3×8 | 0.8 | 50 | F-032 |
| MHRH430R | φ1×R0.3×10 | 0.8 | 50 | F-014 |
| MHR230R | φ1×R0.3×10 | 0.8 | 50 | F-025 |
| MHR430R | φ1×R0.3×10 | 0.8 | 50 | F-032 |
| MSTNR230 | φ1×R0.3×10 | 0.8 | 60 | F-042 |
| MHR230R | φ1×R0.3×12 | 0.8 | 50 | F-025 |
| MHR430R | φ1×R0.3×12 | 0.8 | 50 | F-032 |
| MSTNR230 | φ1×R0.3×15 | 0.8 | 60 | F-042 |
| MHR230R | φ1×R0.3×16 | 0.8 | 60 | F-025 |
| MSTNR230 | φ1×R0.3×20 | 0.8 | 60 | F-042 |
| MHR230R | φ1×R0.3×20 | 0.8 | 60 | F-025 |
| MSTNR230 | φ1×R0.3×25 | 0.8 | 70 | F-042 |
| MSTNR230 | φ1×R0.3×30 | 0.8 | 80 | F-042 |
| MSTNR230 | φ1×R0.3×35 | 0.8 | 80 | F-042 |
| **φ1.2** | | | | |
| MHRH430R | φ1.2×R0.1×5 | 1 | 50 | F-014 |
| MHR430R | φ1.2×R0.1×5 | 1 | 50 | F-032 |
| MHR230R | φ1.2×R0.1×5 | 1 | 50 | F-025 |
| MHR230R | φ1.2×R0.1×6 | 1 | 50 | F-025 |
| MHR230R | φ1.2×R0.1×8 | 1 | 50 | F-025 |
| MHRH430R | φ1.2×R0.1×10 | 1 | 50 | F-014 |
| MHR230R | φ1.2×R0.1×10 | 1 | 50 | F-025 |
| MHR430R | φ1.2×R0.1×10 | 1 | 50 | F-032 |
| MHR230R | φ1.2×R0.1×12 | 1 | 50 | F-025 |
| MHR230R | φ1.2×R0.1×15 | 1 | 60 | F-025 |
| MHR430R | φ1.2×R0.1×15 | 1 | 60 | F-032 |
| MHR230R | φ1.2×R0.1×16 | 1 | 60 | F-025 |
| MHR230R | φ1.2×R0.1×20 | 1 | 60 | F-025 |
| MHRH430R | φ1.2×R0.2×5 | 1 | 50 | F-014 |
| MHR230R | φ1.2×R0.2×5 | 1 | 50 | F-025 |
| MHR430R | φ1.2×R0.2×5 | 1 | 50 | F-033 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.×Corner Radius (×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHR230R | φ1.2×R0.2×6 | 1 | 50 | F-026 |
| MHR230R | φ1.2×R0.2×8 | 1 | 50 | F-026 |
| MHRH430R | φ1.2×R0.2×10 | 1 | 50 | F-014 |
| MHR230R | φ1.2×R0.2×10 | 1 | 50 | F-026 |
| MHR430R | φ1.2×R0.2×10 | 1 | 50 | F-033 |
| MHR230R | φ1.2×R0.2×12 | 1 | 50 | F-026 |
| MHR430R | φ1.2×R0.2×15 | 1 | 60 | F-033 |
| MHR230R | φ1.2×R0.2×15 | 1 | 60 | F-026 |
| MHR230R | φ1.2×R0.2×16 | 1 | 60 | F-026 |
| MHR230R | φ1.2×R0.2×20 | 1 | 60 | F-026 |
| MHRH430R | φ1.2×R0.3×5 | 1 | 50 | F-014 |
| MHR430R | φ1.2×R0.3×5 | 1 | 50 | F-033 |
| MHR230R | φ1.2×R0.3×5 | 1 | 50 | F-026 |
| MHR230R | φ1.2×R0.3×6 | 1 | 50 | F-026 |
| MHR230R | φ1.2×R0.3×8 | 1 | 50 | F-026 |
| MHRH430R | φ1.2×R0.3×10 | 1 | 50 | F-014 |
| MHR230R | φ1.2×R0.3×10 | 1 | 50 | F-026 |
| MHR430R | φ1.2×R0.3×10 | 1 | 50 | F-033 |
| MHR230R | φ1.2×R0.3×12 | 1 | 50 | F-026 |
| MHR430R | φ1.2×R0.3×15 | 1 | 60 | F-033 |
| MHR230R | φ1.2×R0.3×15 | 1 | 60 | F-026 |
| MHR230R | φ1.2×R0.3×16 | 1 | 60 | F-026 |
| MHR230R | φ1.2×R0.3×20 | 1 | 60 | F-026 |
| **φ1.5** | | | | |
| SSR200 | φ1.5×R0.02×2 | 1 | 52 | B-022 |
| SSR200 | φ1.5×R0.02×3 | 1 | 52 | B-022 |
| MHRH430R | φ1.5×R0.02×3 | 1.2 | 50 | F-014 |
| MHRH430R | φ1.5×R0.02×4 | 1.2 | 50 | F-014 |
| SSR200 | φ1.5×R0.02×4.5 | 1 | 52 | B-022 |
| MHRH430R | φ1.5×R0.02×6 | 1.2 | 50 | F-014 |
| SSR200 | φ1.5×R0.02×7.5 | 1 | 52 | B-022 |
| MHRH430R | φ1.5×R0.02×8 | 1.2 | 50 | F-014 |
| MHRH430R | φ1.5×R0.02×12 | 1.2 | 50 | F-014 |
| MHRH430R | φ1.5×R0.02×15 | 1.2 | 50 | F-014 |
| SSR200 | φ1.5×R0.03×2 | 1 | 52 | B-022 |
| SSR200 | φ1.5×R0.03×3 | 1 | 52 | B-022 |
| SSR200 | φ1.5×R0.03×4.5 | 1 | 52 | B-022 |
| SSR200 | φ1.5×R0.03×7.5 | 1 | 52 | B-022 |
| SSR200 | φ1.5×R0.05×2 | 1 | 52 | B-022 |
| SSR200 | φ1.5×R0.05×3 | 1 | 52 | B-022 |
| MHRH430R | φ1.5×R0.05×3 | 1.2 | 50 | F-014 |
| MHRH430R | φ1.5×R0.05×4 | 1.2 | 50 | F-014 |
| SSR200 | φ1.5×R0.05×4.5 | 1 | 52 | B-022 |
| MHRH430R | φ1.5×R0.05×6 | 1.2 | 50 | F-014 |
| SSR200 | φ1.5×R0.05×7.5 | 1 | 52 | B-022 |
| MHRH430R | φ1.5×R0.05×8 | 1.2 | 50 | F-014 |
| MHRH430R | φ1.5×R0.05×12 | 1.2 | 50 | F-014 |
| MHRH430R | φ1.5×R0.05×15 | 1.2 | 50 | F-014 |
| MSRS230 | φ1.5×R0.1 | 3 | 60 | F-005 |
| SSR200 | φ1.5×R0.1×2 | 1 | 52 | B-022 |
| SSR200 | φ1.5×R0.1×3 | 1 | 52 | B-022 |
| MHRH430R | φ1.5×R0.1×3 | 1.2 | 50 | F-015 |

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.×Corner Radius (×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| SSF120 | φ1.5×R0.1×3.8 | 0.75 | 52 | B-025 |
| MHRH430R | φ1.5×R0.1×4 | 1.2 | 50 | F-015 |
| MHR230R | φ1.5×R0.1×4 | 1.2 | 50 | F-026 |
| SHR320 | φ1.5×R0.1×4.5 | 0.75 | 52 | B-024 |
| SSR200 | φ1.5×R0.1×4.5 | 1 | 52 | B-022 |
| MHRH430R | φ1.5×R0.1×6 | 1.2 | 50 | F-015 |
| MHR230R | φ1.5×R0.1×6 | 1.2 | 50 | F-026 |
| MHR430R | φ1.5×R0.1×6 | 1.2 | 50 | F-033 |
| SHR320 | φ1.5×R0.1×7.5 | 0.75 | 52 | B-024 |
| SSR200 | φ1.5×R0.1×7.5 | 1 | 52 | B-022 |
| MHRH430R | φ1.5×R0.1×8 | 1.2 | 50 | F-015 |
| MHR230R | φ1.5×R0.1×8 | 1.2 | 50 | F-026 |
| MHR230R | φ1.5×R0.1×10 | 1.2 | 50 | F-026 |
| MSTNR230 | φ1.5×R0.1×10 | 1.2 | 60 | F-042 |
| MHRH430R | φ1.5×R0.1×12 | 1.2 | 50 | F-015 |
| MHR230R | φ1.5×R0.1×12 | 1.2 | 50 | F-026 |
| MHR430R | φ1.5×R0.1×12 | 1.2 | 50 | F-033 |
| MSTNR230 | φ1.5×R0.1×15 | 1.2 | 60 | F-042 |
| MHRH430R | φ1.5×R0.1×15 | 1.2 | 60 | F-015 |
| MHR230R | φ1.5×R0.1×16 | 1.2 | 60 | F-026 |
| MHR230R | φ1.5×R0.1×18 | 1.2 | 60 | F-026 |
| MHR430R | φ1.5×R0.1×18 | 1.2 | 60 | F-033 |
| MSTNR230 | φ1.5×R0.1×20 | 1.2 | 60 | F-042 |
| MHR230R | φ1.5×R0.1×20 | 1.2 | 60 | F-026 |
| MSTNR230 | φ1.5×R0.1×25 | 1.2 | 70 | F-042 |
| MSTNR230 | φ1.5×R0.1×30 | 1.2 | 80 | F-042 |
| MSRS230 | φ1.5×R0.2 | 3 | 60 | F-005 |
| NSR-2 | φ1.5×R0.2 | 4.5 | 45 | F-008 |
| SSR200 | φ1.5×R0.2×2 | 1 | 52 | B-023 |
| SSR200 | φ1.5×R0.2×3 | 1 | 52 | B-023 |
| MHRH430R | φ1.5×R0.2×3 | 1.2 | 50 | F-015 |
| MHRH430R | φ1.5×R0.2×4 | 1.2 | 50 | F-015 |
| MHR230R | φ1.5×R0.2×4 | 1.2 | 50 | F-026 |
| SHR320 | φ1.5×R0.2×4.5 | 0.75 | 52 | B-024 |
| SSR200 | φ1.5×R0.2×4.5 | 1 | 52 | B-023 |
| MHRH430R | φ1.5×R0.2×6 | 1.2 | 50 | F-015 |
| MHR230R | φ1.5×R0.2×6 | 1.2 | 50 | F-026 |
| MHR430R | φ1.5×R0.2×6 | 1.2 | 50 | F-033 |
| SHR320 | φ1.5×R0.2×7.5 | 0.75 | 52 | B-024 |
| SSR200 | φ1.5×R0.2×7.5 | 1 | 52 | B-023 |
| MHRH430R | φ1.5×R0.2×8 | 1.2 | 50 | F-015 |
| MHR230R | φ1.5×R0.2×8 | 1.2 | 50 | F-026 |
| MHR230R | φ1.5×R0.2×10 | 1.2 | 50 | F-026 |
| MSTNR230 | φ1.5×R0.2×10 | 1.2 | 60 | F-043 |
| MHRH430R | φ1.5×R0.2×12 | 1.2 | 50 | F-015 |
| MHR230R | φ1.5×R0.2×12 | 1.2 | 50 | F-026 |
| MHR430R | φ1.5×R0.2×12 | 1.2 | 50 | F-033 |
| MSTNR230 | φ1.5×R0.2×15 | 1.2 | 60 | F-043 |
| MHRH430R | φ1.5×R0.2×15 | 1.2 | 60 | F-015 |
| MHR230R | φ1.5×R0.2×16 | 1.2 | 60 | F-026 |
| MHR230R | φ1.5×R0.2×18 | 1.2 | 60 | F-026・027 |
| MHR430R | φ1.5×R0.2×18 | 1.2 | 60 | F-033 |



ŞEVKET OĞLU® MAKINA TİCARET VE SAN. LTD. ŞTİ.

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.xCorner Radius(xEffective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSTNR230 | ϕ1.5×R0.2×20 | 1.2 | 60 | F-043 |
| MHR230R | ϕ1.5×R0.2×20 | 1.2 | 60 | F-027 |
| MSTNR230 | ϕ1.5×R0.2×25 | 1.2 | 70 | F-043 |
| MSTNR230 | ϕ1.5×R0.2×30 | 1.2 | 80 | F-043 |
| MSRS230 | ϕ1.5×R0.3 | 3 | 60 | F-005 |
| SSR200 | ϕ1.5×R0.3×2 | 1 | 52 | B-023 |
| SSR200 | ϕ1.5×R0.3×3 | 1 | 52 | B-023 |
| MHRH430R | ϕ1.5×R0.3×3 | 1.2 | 50 | F-015 |
| MHRH430R | ϕ1.5×R0.3×4 | 1.2 | 50 | F-015 |
| MHR230R | ϕ1.5×R0.3×4 | 1.2 | 50 | F-027 |
| SSR200 | ϕ1.5×R0.3×4.5 | 1 | 52 | B-023 |
| MHRH430R | ϕ1.5×R0.3×6 | 1.2 | 50 | F-015 |
| MHR230R | ϕ1.5×R0.3×6 | 1.2 | 50 | F-027 |
| MHR430R | ϕ1.5×R0.3×6 | 1.2 | 50 | F-033 |
| SSR200 | ϕ1.5×R0.3×7.5 | 1 | 52 | B-023 |
| MHRH430R | ϕ1.5×R0.3×8 | 1.2 | 50 | F-015 |
| MHR230R | ϕ1.5×R0.3×8 | 1.2 | 50 | F-027 |
| MHR230R | ϕ1.5×R0.3×10 | 1.2 | 50 | F-027 |
| MSTNR230 | ϕ1.5×R0.3×10 | 1.2 | 60 | F-043 |
| MHRH430R | ϕ1.5×R0.3×12 | 1.2 | 50 | F-015 |
| MHR230R | ϕ1.5×R0.3×12 | 1.2 | 50 | F-027 |
| MHR430R | ϕ1.5×R0.3×12 | 1.2 | 50 | F-033 |
| MSTNR230 | ϕ1.5×R0.3×15 | 1.2 | 60 | F-043 |
| MHRH430R | ϕ1.5×R0.3×15 | 1.2 | 60 | F-015 |
| MHR230R | ϕ1.5×R0.3×16 | 1.2 | 60 | F-027 |
| MHR230R | ϕ1.5×R0.3×18 | 1.2 | 60 | F-027 |
| MHR430R | ϕ1.5×R0.3×18 | 1.2 | 60 | F-033 |
| MSTNR230 | ϕ1.5×R0.3×20 | 1.2 | 60 | F-043 |
| MHR230R | ϕ1.5×R0.3×20 | 1.2 | 60 | F-027 |
| MSTNR230 | ϕ1.5×R0.3×25 | 1.2 | 70 | F-043 |
| MSTNR230 | ϕ1.5×R0.3×30 | 1.2 | 80 | F-043 |
| MSRS230 | ϕ1.5×R0.5 | 3 | 60 | F-005 |
| NSR-2 | ϕ1.5×R0.5 | 4.5 | 45 | F-008 |
| MHRH430R | ϕ1.5×R0.5×3 | 1.2 | 50 | F-015 |
| MHRH430R | ϕ1.5×R0.5×4 | 1.2 | 50 | F-015 |
| MHR230R | ϕ1.5×R0.5×4 | 1.2 | 50 | F-027 |
| MHRH430R | ϕ1.5×R0.5×6 | 1.2 | 50 | F-015 |
| MHR230R | ϕ1.5×R0.5×6 | 1.2 | 50 | F-027 |
| MHR430R | ϕ1.5×R0.5×6 | 1.2 | 50 | F-033 |
| MHRH430R | ϕ1.5×R0.5×8 | 1.2 | 50 | F-015 |
| MHR230R | ϕ1.5×R0.5×8 | 1.2 | 50 | F-027 |
| MHR230R | ϕ1.5×R0.5×10 | 1.2 | 50 | F-027 |
| MHRH430R | ϕ1.5×R0.5×12 | 1.2 | 50 | F-015 |
| MHR230R | ϕ1.5×R0.5×12 | 1.2 | 50 | F-027 |
| MHR430R | ϕ1.5×R0.5×12 | 1.2 | 50 | F-033 |
| MHRH430R | ϕ1.5×R0.5×15 | 1.2 | 60 | F-015 |
| MHR230R | ϕ1.5×R0.5×16 | 1.2 | 60 | F-027 |
| MHR230R | ϕ1.5×R0.5×18 | 1.2 | 60 | F-027 |
| MHR430R | ϕ1.5×R0.5×18 | 1.2 | 60 | F-033 |
| MHR230R | ϕ1.5×R0.5×20 | 1.2 | 60 | F-027 |
| **ϕ2** | | | | |
| SSR200 | ϕ2×R0.02×3 | 1.2 | 53 | B-023 |

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.xCorner Radius(xEffective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| SSR200 | ϕ2×R0.02×4 | 1.2 | 53 | B-023 |
| MHRH430R | ϕ2×R0.02×4 | 1.6 | 50 | F-015 |
| SSR200 | ϕ2×R0.02×6 | 1.2 | 53 | B-023 |
| MHRH430R | ϕ2×R0.02×6 | 1.6 | 50 | F-015 |
| MHRH430R | ϕ2×R0.02×8 | 1.6 | 50 | F-015 |
| SSR200 | ϕ2×R0.02×10 | 1.2 | 53 | B-023 |
| MHRH430R | ϕ2×R0.02×12 | 1.6 | 50 | F-015 |
| MHRH430R | ϕ2×R0.02×16 | 1.6 | 60 | F-015 |
| MHRH430R | ϕ2×R0.02×20 | 1.6 | 60 | F-015 |
| SSR200 | ϕ2×R0.03×3 | 1.2 | 53 | B-023 |
| SSR200 | ϕ2×R0.03×4 | 1.2 | 53 | B-023 |
| SSR200 | ϕ2×R0.03×6 | 1.2 | 53 | B-023 |
| SSR200 | ϕ2×R0.03×10 | 1.2 | 53 | B-023 |
| SSR200 | ϕ2×R0.05×3 | 1.2 | 53 | B-023 |
| SSR200 | ϕ2×R0.05×4 | 1.2 | 53 | B-023 |
| MHRH430R | ϕ2×R0.05×4 | 1.6 | 50 | F-015 |
| SSR200 | ϕ2×R0.05×6 | 1.2 | 53 | B-023 |
| MHRH430R | ϕ2×R0.05×6 | 1.6 | 50 | F-015 |
| MHRH430R | ϕ2×R0.05×8 | 1.6 | 50 | F-015 |
| SSR200 | ϕ2×R0.05×10 | 1.2 | 53 | B-023 |
| MHRH430R | ϕ2×R0.05×12 | 1.6 | 50 | F-015 |
| MHRH430R | ϕ2×R0.05×16 | 1.6 | 60 | F-015 |
| MHRH430R | ϕ2×R0.05×20 | 1.6 | 60 | F-015 |
| MSRS230 | ϕ2×R0.1 | 4 | 60 | F-005 |
| SSR200 | ϕ2×R0.1×3 | 1.2 | 53 | B-023 |
| SSR200 | ϕ2×R0.1×4 | 1.2 | 53 | B-023 |
| MHRH430R | ϕ2×R0.1×4 | 1.6 | 50 | F-015 |
| MHR230R | ϕ2×R0.1×4 | 1.6 | 50 | F-027 |
| SSF120 | ϕ2×R0.1×5 | 1 | 52 | B-025 |
| SHR320 | ϕ2×R0.1×6 | 1 | 52 | B-024 |
| SSR200 | ϕ2×R0.1×6 | 1.2 | 52 | B-023 |
| MHRH430R | ϕ2×R0.1×6 | 1.6 | 50 | F-015 |
| MHR230R | ϕ2×R0.1×6 | 1.6 | 50 | F-027 |
| MHRH430R | ϕ2×R0.1×8 | 1.6 | 50 | F-015 |
| MHR230R | ϕ2×R0.1×8 | 1.6 | 50 | F-027 |
| MHR430R | ϕ2×R0.1×8 | 1.6 | 50 | F-033 |
| SHR320 | ϕ2×R0.1×10 | 1 | 52 | B-024 |
| SSR200 | ϕ2×R0.1×10 | 1.2 | 52 | B-023 |
| MHR230R | ϕ2×R0.1×10 | 1.6 | 50 | F-027 |
| MHRH430R | ϕ2×R0.1×12 | 1.6 | 50 | F-015 |
| MHR230R | ϕ2×R0.1×12 | 1.6 | 50 | F-027 |
| MHR430R | ϕ2×R0.1×12 | 1.6 | 50 | F-033 |
| MSTNR230 | ϕ2×R0.1×15 | 1.6 | 60 | F-043 |
| MHRH430R | ϕ2×R0.1×16 | 1.6 | 60 | F-015 |
| MHR230R | ϕ2×R0.1×16 | 1.6 | 60 | F-027 |
| MHR430R | ϕ2×R0.1×16 | 1.6 | 60 | F-033 |
| MSTNR230 | ϕ2×R0.1×20 | 1.6 | 60 | F-043 |
| MHRH430R | ϕ2×R0.1×20 | 1.6 | 60 | F-015 |
| MHR230R | ϕ2×R0.1×20 | 1.6 | 60 | F-027 |
| MHR430R | ϕ2×R0.1×20 | 1.6 | 60 | F-033 |
| MHR230R | ϕ2×R0.1×24 | 1.6 | 70 | F-027 |
| MHR430R | ϕ2×R0.1×24 | 1.6 | 70 | F-033 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.×Corner Radius (×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSTNR230 | φ2×R0.1×25 | 1.6 | 70 | F-043 |
| MHR230R | φ2×R0.1×26 | 1.6 | 70 | F-028 |
| MHR230R | φ2×R0.1×30 | 1.6 | 70 | F-028 |
| MSTNR230 | φ2×R0.1×30 | 1.6 | 80 | F-043 |
| MSTNR230 | φ2×R0.1×40 | 1.6 | 80 | F-043 |
| MSTNR230 | φ2×R0.1×50 | 1.6 | 100 | F-043 |
| MSRS230 | φ2×R0.2 | 4 | 60 | F-005 |
| NSR-2 | φ2×R0.2 | 6 | 45 | F-008 |
| SSR200 | φ2×R0.2×3 | 1.2 | 53 | B-023 |
| SSR200 | φ2×R0.2×4 | 1.2 | 53 | B-023 |
| MHRH430R | φ2×R0.2×4 | 1.6 | 50 | F-015 |
| MHR230R | φ2×R0.2×4 | 1.6 | 50 | F-028 |
| SSR200 | φ2×R0.2×6 | 1.2 | 52 | B-023 |
| MHRH430R | φ2×R0.2×6 | 1.6 | 50 | F-015 |
| MHR230R | φ2×R0.2×6 | 1.6 | 50 | F-028 |
| MHRH430R | φ2×R0.2×8 | 1.6 | 50 | F-015 |
| MHR230R | φ2×R0.2×8 | 1.6 | 50 | F-028 |
| MHR430R | φ2×R0.2×8 | 1.6 | 50 | F-033 |
| SSR200 | φ2×R0.2×10 | 1.2 | 52 | B-023 |
| MHR230R | φ2×R0.2×10 | 1.6 | 50 | F-028 |
| MHRH430R | φ2×R0.2×12 | 1.6 | 50 | F-015 |
| MHR230R | φ2×R0.2×12 | 1.6 | 50 | F-028 |
| MHR430R | φ2×R0.2×12 | 1.6 | 50 | F-033 |
| MSTNR230 | φ2×R0.2×15 | 1.6 | 60 | F-043 |
| MHRH430R | φ2×R0.2×16 | 1.6 | 60 | F-015 |
| MHR230R | φ2×R0.2×16 | 1.6 | 60 | F-028 |
| MHR430R | φ2×R0.2×16 | 1.6 | 60 | F-033 |
| MSTNR230 | φ2×R0.2×20 | 1.6 | 60 | F-043 |
| MHRH430R | φ2×R0.2×20 | 1.6 | 60 | F-015 |
| MHR230R | φ2×R0.2×20 | 1.6 | 60 | F-028 |
| MHR430R | φ2×R0.2×20 | 1.6 | 60 | F-033 |
| MHR230R | φ2×R0.2×24 | 1.6 | 70 | F-028 |
| MHR430R | φ2×R0.2×24 | 1.6 | 70 | F-033 |
| MSTNR230 | φ2×R0.2×25 | 1.6 | 70 | F-043 |
| MHR230R | φ2×R0.2×26 | 1.6 | 70 | F-028 |
| MHR230R | φ2×R0.2×30 | 1.6 | 70 | F-028 |
| MSTNR230 | φ2×R0.2×30 | 1.6 | 80 | F-043 |
| MSTNR230 | φ2×R0.2×40 | 1.6 | 80 | F-043 |
| MSTNR230 | φ2×R0.2×50 | 1.6 | 100 | F-043 |
| MSRS230 | φ2×R0.3 | 4 | 60 | F-005 |
| SSR200 | φ2×R0.3×3 | 1.2 | 53 | B-023 |
| SSR200 | φ2×R0.3×4 | 1.2 | 53 | B-023 |
| MHRH430R | φ2×R0.3×4 | 1.6 | 50 | F-015 |
| MHR230R | φ2×R0.3×4 | 1.6 | 50 | F-028 |
| SHR320 | φ2×R0.3×6 | 1 | 52 | B-024 |
| SSR200 | φ2×R0.3×6 | 1.2 | 52 | B-023 |
| MHRH430R | φ2×R0.3×6 | 1.6 | 50 | F-015 |
| MHR230R | φ2×R0.3×6 | 1.6 | 50 | F-028 |
| MHRH430R | φ2×R0.3×8 | 1.6 | 50 | F-015 |
| MHR230R | φ2×R0.3×8 | 1.6 | 50 | F-028 |
| MHR430R | φ2×R0.3×8 | 1.6 | 50 | F-033 |
| SHR320 | φ2×R0.3×10 | 1 | 52 | B-024 |

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.×Corner Radius (×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| SSR200 | φ2×R0.3×10 | 1.2 | 52 | B-023 |
| MHR230R | φ2×R0.3×10 | 1.6 | 50 | F-028 |
| MHRH430R | φ2×R0.3×12 | 1.6 | 50 | F-015 |
| MHR230R | φ2×R0.3×12 | 1.6 | 50 | F-028 |
| MHR430R | φ2×R0.3×12 | 1.6 | 50 | F-033 |
| MSTNR230 | φ2×R0.3×15 | 1.6 | 60 | F-043 |
| MHRH430R | φ2×R0.3×16 | 1.6 | 60 | F-015 |
| MHR230R | φ2×R0.3×16 | 1.6 | 60 | F-028 |
| MHR430R | φ2×R0.3×16 | 1.6 | 60 | F-033 |
| MSTNR230 | φ2×R0.3×20 | 1.6 | 60 | F-043 |
| MHRH430R | φ2×R0.3×20 | 1.6 | 60 | F-015 |
| MHR230R | φ2×R0.3×20 | 1.6 | 60 | F-028 |
| MHR430R | φ2×R0.3×20 | 1.6 | 60 | F-033 |
| MHR230R | φ2×R0.3×24 | 1.6 | 70 | F-028 |
| MHR430R | φ2×R0.3×24 | 1.6 | 70 | F-033 |
| MSTNR230 | φ2×R0.3×25 | 1.6 | 70 | F-043 |
| MHR230R | φ2×R0.3×26 | 1.6 | 70 | F-028 |
| MHR230R | φ2×R0.3×30 | 1.6 | 70 | F-028 |
| MSTNR230 | φ2×R0.3×30 | 1.6 | 80 | F-043 |
| MSTNR230 | φ2×R0.3×40 | 1.6 | 80 | F-043 |
| MSTNR230 | φ2×R0.3×50 | 1.6 | 100 | F-043 |
| MSRS230 | φ2×R0.5 | 4 | 60 | F-005 |
| NSR-2 | φ2×R0.5 | 6 | 45 | F-008 |
| SSR200 | φ2×R0.5×3 | 1.2 | 53 | B-023 |
| SSR200 | φ2×R0.5×4 | 1.2 | 53 | B-023 |
| MHRH430R | φ2×R0.5×4 | 1.6 | 50 | F-015 |
| MHR230R | φ2×R0.5×4 | 1.6 | 50 | F-028 |
| SSR200 | φ2×R0.5×6 | 1.2 | 52 | B-023 |
| MHRH430R | φ2×R0.5×6 | 1.6 | 50 | F-015 |
| MHR230R | φ2×R0.5×6 | 1.6 | 50 | F-028 |
| MHRH430R | φ2×R0.5×8 | 1.6 | 50 | F-015 |
| MHR230R | φ2×R0.5×8 | 1.6 | 50 | F-028 |
| MHR430R | φ2×R0.5×8 | 1.6 | 50 | F-033 |
| SSR200 | φ2×R0.5×10 | 1.2 | 52 | B-023 |
| MHR230R | φ2×R0.5×10 | 1.6 | 50 | F-028 |
| MHRH430R | φ2×R0.5×12 | 1.6 | 50 | F-015 |
| MHR230R | φ2×R0.5×12 | 1.6 | 50 | F-029 |
| MHR430R | φ2×R0.5×12 | 1.6 | 50 | F-033 |
| MSTNR230 | φ2×R0.5×15 | 1.6 | 60 | F-044 |
| MHRH430R | φ2×R0.5×16 | 1.6 | 60 | F-015 |
| MHR230R | φ2×R0.5×16 | 1.6 | 60 | F-029 |
| MHR430R | φ2×R0.5×16 | 1.6 | 60 | F-033 |
| MSTNR230 | φ2×R0.5×20 | 1.6 | 60 | F-044 |
| MHRH430R | φ2×R0.5×20 | 1.6 | 60 | F-015 |
| MHR230R | φ2×R0.5×20 | 1.6 | 60 | F-029 |
| MHR430R | φ2×R0.5×20 | 1.6 | 60 | F-033 |
| MHR230R | φ2×R0.5×24 | 1.6 | 70 | F-029 |
| MHR430R | φ2×R0.5×24 | 1.6 | 70 | F-033 |
| MSTNR230 | φ2×R0.5×25 | 1.6 | 70 | F-044 |
| MHR230R | φ2×R0.5×26 | 1.6 | 70 | F-029 |
| MHR230R | φ2×R0.5×30 | 1.6 | 70 | F-029 |
| MSTNR230 | φ2×R0.5×30 | 1.6 | 80 | F-044 |



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| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.xCorner Radius(xEffective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSTNR230 | ϕ2×R0.5×40 | 1.6 | 80 | F-044 |
| MSTNR230 | ϕ2×R0.5×50 | 1.6 | 100 | F-044 |
| **ϕ2.5** | | | | |
| MSRS230 | ϕ2.5×R0.1 | 5 | 60 | F-005 |
| MHRH430R | ϕ2.5×R0.1×10 | 2 | 50 | F-016 |
| MHR230R | ϕ2.5×R0.1×10 | 2 | 50 | F-029 |
| MHR430R | ϕ2.5×R0.1×10 | 2 | 50 | F-034 |
| MHRH430R | ϕ2.5×R0.1×20 | 2 | 60 | F-016 |
| MHR230R | ϕ2.5×R0.1×20 | 2 | 60 | F-029 |
| MHR430R | ϕ2.5×R0.1×20 | 2 | 60 | F-034 |
| MHRH430R | ϕ2.5×R0.1×30 | 2 | 70 | F-016 |
| MHR230R | ϕ2.5×R0.1×30 | 2 | 70 | F-029 |
| MHR430R | ϕ2.5×R0.1×30 | 2 | 70 | F-034 |
| MSRS230 | ϕ2.5×R0.2 | 5 | 60 | F-005 |
| NSR-2 | ϕ2.5×R0.2 | 8 | 45 | F-008 |
| MHRH430R | ϕ2.5×R0.2×10 | 2 | 50 | F-016 |
| MHR230R | ϕ2.5×R0.2×10 | 2 | 50 | F-029 |
| MHR430R | ϕ2.5×R0.2×10 | 2 | 50 | F-034 |
| MHRH430R | ϕ2.5×R0.2×20 | 2 | 60 | F-016 |
| MHR230R | ϕ2.5×R0.2×20 | 2 | 60 | F-029 |
| MHR430R | ϕ2.5×R0.2×20 | 2 | 60 | F-034 |
| MHRH430R | ϕ2.5×R0.2×30 | 2 | 70 | F-016 |
| MHR230R | ϕ2.5×R0.2×30 | 2 | 70 | F-029 |
| MHR430R | ϕ2.5×R0.2×30 | 2 | 70 | F-034 |
| MSRS230 | ϕ2.5×R0.3 | 5 | 60 | F-005 |
| MHRH430R | ϕ2.5×R0.3×10 | 2 | 50 | F-016 |
| MHR230R | ϕ2.5×R0.3×10 | 2 | 50 | F-029 |
| MHR430R | ϕ2.5×R0.3×10 | 2 | 50 | F-034 |
| MHRH430R | ϕ2.5×R0.3×20 | 2 | 60 | F-016 |
| MHR230R | ϕ2.5×R0.3×20 | 2 | 60 | F-029 |
| MHR430R | ϕ2.5×R0.3×20 | 2 | 60 | F-034 |
| MHRH430R | ϕ2.5×R0.3×30 | 2 | 70 | F-016 |
| MHR230R | ϕ2.5×R0.3×30 | 2 | 70 | F-029 |
| MHR430R | ϕ2.5×R0.3×30 | 2 | 70 | F-034 |
| MSRS230 | ϕ2.5×R0.5 | 5 | 60 | F-005 |
| NSR-2 | ϕ2.5×R0.5 | 8 | 45 | F-008 |
| MHRH430R | ϕ2.5×R0.5×10 | 2 | 50 | F-016 |
| MHR230R | ϕ2.5×R0.5×10 | 2 | 50 | F-029 |
| MHR430R | ϕ2.5×R0.5×10 | 2 | 50 | F-034 |
| MHRH430R | ϕ2.5×R0.5×20 | 2 | 60 | F-016 |
| MHR230R | ϕ2.5×R0.5×20 | 2 | 60 | F-029 |
| MHR430R | ϕ2.5×R0.5×20 | 2 | 60 | F-034 |
| MHRH430R | ϕ2.5×R0.5×30 | 2 | 70 | F-016 |
| MHR230R | ϕ2.5×R0.5×30 | 2 | 70 | F-029 |
| MHR430R | ϕ2.5×R0.5×30 | 2 | 70 | F-034 |
| **ϕ3** | | | | |
| MHRH430R | ϕ3×R0.05×4 | 2.5 | 50 | F-016 |
| MHRH430R | ϕ3×R0.05×6 | 2.5 | 50 | F-016 |
| MHRH430R | ϕ3×R0.05×8 | 2.5 | 50 | F-016 |
| MHRH430R | ϕ3×R0.05×12 | 2.5 | 50 | F-016 |
| MHRH430R | ϕ3×R0.05×16 | 2.5 | 60 | F-016 |
| MHRH430R | ϕ3×R0.05×20 | 2.5 | 60 | F-016 |

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.xCorner Radius(xEffective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MSRS230 | ϕ3×R0.1 | 6 | 60 | F-005 |
| MHRH430R | ϕ3×R0.1×4 | 2.5 | 50 | F-016 |
| MHRH430R | ϕ3×R0.1×6 | 2.5 | 50 | F-016 |
| MHRH430R | ϕ3×R0.1×8 | 2.5 | 50 | F-016 |
| MHRH430R | ϕ3×R0.1×12 | 2.5 | 50 | F-016 |
| MHR430R | ϕ3×R0.1×12 | 2.5 | 50 | F-034 |
| MHR230R | ϕ3×R0.1×12 | 4.5 | 50 | F-029 |
| MHRH430R | ϕ3×R0.1×16 | 2.5 | 60 | F-016 |
| MHR430R | ϕ3×R0.1×18 | 2.5 | 60 | F-034 |
| MHR230R | ϕ3×R0.1×18 | 4.5 | 60 | F-029 |
| MHRH430R | ϕ3×R0.1×20 | 2.5 | 60 | F-016 |
| MHR430R | ϕ3×R0.1×24 | 2.5 | 70 | F-034 |
| MHR230R | ϕ3×R0.1×24 | 4.5 | 70 | F-029 |
| MHRH430R | ϕ3×R0.1×25 | 2.5 | 70 | F-016 |
| MHRH430R | ϕ3×R0.1×30 | 2.5 | 70 | F-016 |
| MHR430R | ϕ3×R0.1×30 | 2.5 | 70 | F-034 |
| MHR230R | ϕ3×R0.1×30 | 4.5 | 70 | F-030 |
| MHR430R | ϕ3×R0.1×36 | 2.5 | 80 | F-034 |
| MHR230R | ϕ3×R0.1×36 | 4.5 | 80 | F-030 |
| MHDH445R | ϕ3×R0.2 | 6 | 60 | F-003 |
| MSRS230 | ϕ3×R0.2 | 6 | 60 | F-005 |
| NSR-2 | ϕ3×R0.2 | 10 | 45 | F-008 |
| MHRH430R | ϕ3×R0.2×4 | 2.5 | 50 | F-016 |
| MHRH430R | ϕ3×R0.2×6 | 2.5 | 50 | F-016 |
| MHRH430R | ϕ3×R0.2×8 | 2.5 | 50 | F-016 |
| MHRH430R | ϕ3×R0.2×12 | 2.5 | 50 | F-016 |
| MHR430R | ϕ3×R0.2×12 | 2.5 | 50 | F-034 |
| MHR230R | ϕ3×R0.2×12 | 4.5 | 50 | F-030 |
| MSTNR230 | ϕ3×R0.2×15 | 2.5 | 60 | F-044 |
| MHRH430R | ϕ3×R0.2×16 | 2.5 | 60 | F-016 |
| MHR430R | ϕ3×R0.2×18 | 2.5 | 60 | F-034 |
| MHR230R | ϕ3×R0.2×18 | 4.5 | 60 | F-030 |
| MSTNR230 | ϕ3×R0.2×20 | 2.5 | 60 | F-044 |
| MHRH430R | ϕ3×R0.2×20 | 2.5 | 60 | F-016 |
| MHR430R | ϕ3×R0.2×24 | 2.5 | 70 | F-034 |
| MHR230R | ϕ3×R0.2×24 | 4.5 | 70 | F-030 |
| MHRH430R | ϕ3×R0.2×25 | 2.5 | 70 | F-016 |
| MHRH430R | ϕ3×R0.2×30 | 2.5 | 70 | F-016 |
| MHR430R | ϕ3×R0.2×30 | 2.5 | 70 | F-034 |
| MSTNR230 | ϕ3×R0.2×30 | 2.5 | 80 | F-044 |
| MHR230R | ϕ3×R0.2×30 | 4.5 | 70 | F-030 |
| MHR430R | ϕ3×R0.2×36 | 2.5 | 80 | F-034 |
| MHR230R | ϕ3×R0.2×36 | 4.5 | 80 | F-030 |
| MSTNR230 | ϕ3×R0.2×40 | 2.5 | 80 | F-044 |
| MSTNR230 | ϕ3×R0.2×50 | 2.5 | 100 | F-044 |
| MSTNR230 | ϕ3×R0.2×60 | 2.5 | 110 | F-044 |
| MHDH445R | ϕ3×R0.3 | 6 | 60 | F-003 |
| MSRS230 | ϕ3×R0.3 | 6 | 60 | F-005 |
| MSXH440R | ϕ3×R0.3 | 8 | 60 | F-001 |
| MHRH430R | ϕ3×R0.3×4 | 2.5 | 50 | F-016 |
| MHRH430R | ϕ3×R0.3×6 | 2.5 | 50 | F-016 |
| MHRH430R | ϕ3×R0.3×8 | 2.5 | 50 | F-016 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.×Corner Radius (×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHRH430R | φ3×R0.3×12 | 2.5 | 50 | F-016 |
| MHR430R | φ3×R0.3×12 | 2.5 | 50 | F-034 |
| MHR230R | φ3×R0.3×12 | 4.5 | 50 | F-030 |
| MHRH430R | φ3×R0.3×16 | 2.5 | 60 | F-016 |
| MHR230R | φ3×R0.3×18 | 4.5 | 60 | F-030 |
| MHRH430R | φ3×R0.3×20 | 2.5 | 60 | F-016 |
| MHR430R | φ3×R0.3×20 | 2.5 | 60 | F-034 |
| MHR430R | φ3×R0.3×24 | 2.5 | 70 | F-034 |
| MHR230R | φ3×R0.3×24 | 4.5 | 70 | F-030 |
| MHRH430R | φ3×R0.3×25 | 2.5 | 70 | F-016 |
| MHRH430R | φ3×R0.3×30 | 2.5 | 70 | F-016 |
| MHR430R | φ3×R0.3×30 | 2.5 | 70 | F-034 |
| MHR230R | φ3×R0.3×30 | 4.5 | 70 | F-030 |
| MHR430R | φ3×R0.3×36 | 2.5 | 80 | F-034 |
| MHR230R | φ3×R0.3×36 | 4.5 | 80 | F-030 |
| MHDH445R | φ3×R0.5 | 6 | 60 | F-003 |
| MSRS230 | φ3×R0.5 | 6 | 60 | F-005 |
| MSXH440R | φ3×R0.5 | 8 | 60 | F-001 |
| NSR-2 | φ3×R0.5 | 10 | 45 | F-008 |
| MHRH430R | φ3×R0.5×4 | 2.5 | 50 | F-016 |
| MHRH430R | φ3×R0.5×6 | 2.5 | 50 | F-016 |
| MHRH430R | φ3×R0.5×8 | 2.5 | 50 | F-016 |
| MHRH430R | φ3×R0.5×12 | 2.5 | 50 | F-016 |
| MHR430R | φ3×R0.5×12 | 2.5 | 50 | F-034 |
| MHR230R | φ3×R0.5×12 | 4.5 | 50 | F-030 |
| MSTNR230 | φ3×R0.5×15 | 2.5 | 60 | F-044 |
| MHRH430R | φ3×R0.5×16 | 2.5 | 60 | F-016 |
| MHR230R | φ3×R0.5×18 | 4.5 | 60 | F-030 |
| MSTNR230 | φ3×R0.5×20 | 2.5 | 60 | F-044 |
| MHRH430R | φ3×R0.5×20 | 2.5 | 60 | F-016 |
| MHR430R | φ3×R0.5×20 | 2.5 | 60 | F-034 |
| MHR430R | φ3×R0.5×24 | 2.5 | 70 | F-034 |
| MHR230R | φ3×R0.5×24 | 4.5 | 70 | F-030 |
| MHRH430R | φ3×R0.5×25 | 2.5 | 70 | F-016 |
| MHRH430R | φ3×R0.5×30 | 2.5 | 70 | F-016 |
| MHR430R | φ3×R0.5×30 | 2.5 | 70 | F-034 |
| MSTNR230 | φ3×R0.5×30 | 2.5 | 80 | F-044 |
| MHR230R | φ3×R0.5×30 | 4.5 | 70 | F-030 |
| MHR430R | φ3×R0.5×36 | 2.5 | 80 | F-034 |
| MHR230R | φ3×R0.5×36 | 4.5 | 80 | F-030 |
| MSTNR230 | φ3×R0.5×40 | 2.5 | 80 | F-044 |
| MSTNR230 | φ3×R0.5×50 | 2.5 | 100 | F-044 |
| MSTNR230 | φ3×R0.5×60 | 2.5 | 110 | F-044 |
| MSRS230 | φ3×R1 | 6 | 60 | F-005 |
| NSR-2 | φ3×R1 | 10 | 45 | F-008 |
| MHRH430R | φ3×R1×8 | 2.5 | 50 | F-016 |
| MHRH430R | φ3×R1×12 | 2.5 | 50 | F-016 |
| MHR430R | φ3×R1×12 | 2.5 | 50 | F-034 |
| MHR230R | φ3×R1×12 | 4.5 | 50 | F-030 |
| MHRH430R | φ3×R1×16 | 2.5 | 60 | F-016 |
| MHR230R | φ3×R1×18 | 4.5 | 60 | F-030 |
| MHRH430R | φ3×R1×20 | 2.5 | 60 | F-016 |

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.×Corner Radius (×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHR430R | φ3×R1×20 | 2.5 | 60 | F-034 |
| MHR430R | φ3×R1×24 | 2.5 | 70 | F-034 |
| MHR230R | φ3×R1×24 | 4.5 | 70 | F-030 |
| MHRH430R | φ3×R1×25 | 2.5 | 70 | F-016 |
| MHRH430R | φ3×R1×30 | 2.5 | 70 | F-016 |
| MHR430R | φ3×R1×30 | 2.5 | 70 | F-034 |
| MHR230R | φ3×R1×30 | 4.5 | 70 | F-030 |
| MHR430R | φ3×R1×36 | 2.5 | 80 | F-034 |
| MHR230R | φ3×R1×36 | 4.5 | 80 | F-030 |
| **φ4** | | | | |
| MSRS230 | φ4×R0.1 | 8 | 65 | F-005 |
| MHRH430R | φ4×R0.1×8 | 3.2 | 60 | F-017 |
| MHRH430R | φ4×R0.1×12 | 3.2 | 60 | F-017 |
| MHRH430R | φ4×R0.1×16 | 3.2 | 60 | F-017 |
| MHR430R | φ4×R0.1×16 | 3.2 | 60 | F-035 |
| MHR230R | φ4×R0.1×16 | 6 | 60 | F-030 |
| MHRH430R | φ4×R0.1×24 | 3.2 | 70 | F-017 |
| MHR430R | φ4×R0.1×24 | 3.2 | 70 | F-035 |
| MHR230R | φ4×R0.1×24 | 6 | 70 | F-030 |
| MHRH430R | φ4×R0.1×32 | 3.2 | 70 | F-017 |
| MHR430R | φ4×R0.1×32 | 3.2 | 70 | F-035 |
| MHR230R | φ4×R0.1×32 | 6 | 70 | F-030 |
| MHR430R | φ4×R0.1×48 | 3.2 | 100 | F-035 |
| MHR230R | φ4×R0.1×48 | 6 | 100 | F-030 |
| MHDH445R | φ4×R0.2 | 8 | 60 | F-003 |
| MSRS230 | φ4×R0.2 | 8 | 65 | F-005 |
| NSR-2 | φ4×R0.2 | 12 | 50 | F-008 |
| MHRH430R | φ4×R0.2×8 | 3.2 | 60 | F-017 |
| MHRH430R | φ4×R0.2×12 | 3.2 | 60 | F-017 |
| MHRH430R | φ4×R0.2×16 | 3.2 | 60 | F-017 |
| MHR430R | φ4×R0.2×16 | 3.2 | 60 | F-035 |
| MHR230R | φ4×R0.2×16 | 6 | 60 | F-030 |
| MHRH430R | φ4×R0.2×24 | 3.2 | 70 | F-017 |
| MHR430R | φ4×R0.2×24 | 3.2 | 70 | F-035 |
| MHR230R | φ4×R0.2×24 | 6 | 70 | F-030 |
| MHRH430R | φ4×R0.2×32 | 3.2 | 70 | F-017 |
| MHR430R | φ4×R0.2×32 | 3.2 | 70 | F-035 |
| MHR230R | φ4×R0.2×32 | 6 | 70 | F-030 |
| MHR430R | φ4×R0.2×48 | 3.2 | 100 | F-035 |
| MHR230R | φ4×R0.2×48 | 6 | 100 | F-030 |
| MHDH445R | φ4×R0.3 | 8 | 60 | F-003 |
| MSRS230 | φ4×R0.3 | 8 | 65 | F-005 |
| MSXH440R | φ4×R0.3 | 11 | 60 | F-001 |
| MHRH430R | φ4×R0.3×8 | 3.2 | 60 | F-017 |
| MHRH430R | φ4×R0.3×12 | 3.2 | 60 | F-017 |
| MHRH430R | φ4×R0.3×16 | 3.2 | 60 | F-017 |
| MHR430R | φ4×R0.3×16 | 3.2 | 60 | F-035 |
| MHR230R | φ4×R0.3×16 | 6 | 60 | F-030 |
| MHRH430R | φ4×R0.3×24 | 3.2 | 70 | F-017 |
| MHR430R | φ4×R0.3×24 | 3.2 | 70 | F-035 |
| MHR230R | φ4×R0.3×24 | 6 | 70 | F-030 |
| MHRH430R | φ4×R0.3×32 | 3.2 | 70 | F-017 |



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| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.×Corner Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHR430R | φ4×R0.3×32 | 3.2 | 70 | F-035 |
| MHR230R | φ4×R0.3×32 | 6 | 70 | F-030 |
| MHR430R | φ4×R0.3×48 | 3.2 | 100 | F-035 |
| MHR230R | φ4×R0.3×48 | 6 | 100 | F-030 |
| MHDH445R | φ4×R0.5 | 8 | 60 | F-003 |
| MSRS230 | φ4×R0.5 | 8 | 65 | F-005 |
| MSXH440R | φ4×R0.5 | 11 | 60 | F-001 |
| NSR-2 | φ4×R0.5 | 12 | 50 | F-008 |
| MHRH430R | φ4×R0.5×8 | 3.2 | 60 | F-017 |
| MHRH430R | φ4×R0.5×12 | 3.2 | 60 | F-017 |
| MHRH430R | φ4×R0.5×16 | 3.2 | 60 | F-017 |
| MHR430R | φ4×R0.5×16 | 3.2 | 60 | F-035 |
| MHR230R | φ4×R0.5×16 | 6 | 60 | F-030 |
| MHRH430R | φ4×R0.5×24 | 3.2 | 70 | F-017 |
| MHR430R | φ4×R0.5×24 | 3.2 | 70 | F-035 |
| MHR230R | φ4×R0.5×24 | 6 | 70 | F-030 |
| MHRH430R | φ4×R0.5×32 | 3.2 | 70 | F-017 |
| MHR430R | φ4×R0.5×32 | 3.2 | 70 | F-035 |
| MHR230R | φ4×R0.5×32 | 6 | 70 | F-030 |
| MHR430R | φ4×R0.5×48 | 3.2 | 100 | F-035 |
| MHR230R | φ4×R0.5×48 | 6 | 100 | F-031 |
| MSRS230 | φ4×R1 | 8 | 65 | F-005 |
| MSXH440R | φ4×R1 | 11 | 60 | F-001 |
| NSR-2 | φ4×R1 | 12 | 50 | F-008 |
| MHRH430R | φ4×R1×8 | 3.2 | 60 | F-017 |
| MHRH430R | φ4×R1×12 | 3.2 | 60 | F-017 |
| MHRH430R | φ4×R1×16 | 3.2 | 60 | F-017 |
| MHR430R | φ4×R1×16 | 3.2 | 60 | F-035 |
| MHR230R | φ4×R1×16 | 6 | 60 | F-031 |
| MHRH430R | φ4×R1×24 | 3.2 | 70 | F-017 |
| MHR430R | φ4×R1×24 | 3.2 | 70 | F-035 |
| MHR230R | φ4×R1×24 | 6 | 70 | F-031 |
| MHRH430R | φ4×R1×32 | 3.2 | 70 | F-017 |
| MHR430R | φ4×R1×32 | 3.2 | 70 | F-035 |
| MHR230R | φ4×R1×32 | 6 | 70 | F-031 |
| MHR430R | φ4×R1×48 | 3.2 | 100 | F-035 |
| MHR230R | φ4×R1×48 | 6 | 100 | F-031 |
| **φ5** | | | | |
| MSRS230 | φ5×R0.1 | 10 | 70 | F-005 |
| MHRH430R | φ5×R0.1×15 | 4 | 70 | F-017 |
| MHRH430R | φ5×R0.1×20 | 4 | 70 | F-017 |
| MHR430R | φ5×R0.1×20 | 4 | 70 | F-035 |
| MHR230R | φ5×R0.1×20 | 7.5 | 70 | F-031 |
| MHRH430R | φ5×R0.1×40 | 4 | 90 | F-017 |
| MHR430R | φ5×R0.1×40 | 4 | 90 | F-035 |
| MHR230R | φ5×R0.1×40 | 7.5 | 90 | F-031 |
| MHDH645R | φ5×R0.2 | 10 | 60 | F-003 |
| MSRS230 | φ5×R0.2 | 10 | 70 | F-005 |
| NSR-2 | φ5×R0.2 | 15 | 55 | F-008 |
| MHRH430R | φ5×R0.2×15 | 4 | 70 | F-017 |
| MHRH430R | φ5×R0.2×20 | 4 | 70 | F-017 |
| MHR430R | φ5×R0.2×20 | 4 | 70 | F-035 |

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.×Corner Radius(×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHR230R | φ5×R0.2×20 | 7.5 | 70 | F-031 |
| MHRH430R | φ5×R0.2×40 | 4 | 90 | F-017 |
| MHR430R | φ5×R0.2×40 | 4 | 90 | F-035 |
| MHR230R | φ5×R0.2×40 | 7.5 | 90 | F-031 |
| MHDH645R | φ5×R0.3 | 10 | 60 | F-003 |
| MSRS230 | φ5×R0.3 | 10 | 70 | F-005 |
| MSXH440R | φ5×R0.3 | 13 | 60 | F-001 |
| MHRH430R | φ5×R0.3×15 | 4 | 70 | F-017 |
| MHRH430R | φ5×R0.3×20 | 4 | 70 | F-017 |
| MHR430R | φ5×R0.3×20 | 4 | 70 | F-035 |
| MHR230R | φ5×R0.3×20 | 7.5 | 70 | F-031 |
| MHRH430R | φ5×R0.3×40 | 4 | 90 | F-017 |
| MHR430R | φ5×R0.3×40 | 4 | 90 | F-035 |
| MHR230R | φ5×R0.3×40 | 7.5 | 90 | F-031 |
| MHDH645R | φ5×R0.5 | 10 | 60 | F-003 |
| MSRS230 | φ5×R0.5 | 10 | 70 | F-005 |
| MSXH440R | φ5×R0.5 | 13 | 60 | F-001 |
| NSR-2 | φ5×R0.5 | 15 | 55 | F-008 |
| MHRH430R | φ5×R0.5×15 | 4 | 70 | F-017 |
| MHRH430R | φ5×R0.5×20 | 4 | 70 | F-017 |
| MHR430R | φ5×R0.5×20 | 4 | 70 | F-035 |
| MHR230R | φ5×R0.5×20 | 7.5 | 70 | F-031 |
| MHRH430R | φ5×R0.5×40 | 4 | 90 | F-017 |
| MHR430R | φ5×R0.5×40 | 4 | 90 | F-035 |
| MHR230R | φ5×R0.5×40 | 7.5 | 90 | F-031 |
| MHDH645R | φ5×R1 | 10 | 60 | F-003 |
| MSRS230 | φ5×R1 | 10 | 70 | F-005 |
| MSXH440R | φ5×R1 | 13 | 60 | F-001 |
| NSR-2 | φ5×R1 | 15 | 55 | F-008 |
| MHRH430R | φ5×R1×15 | 4 | 70 | F-017 |
| MHRH430R | φ5×R1×20 | 4 | 70 | F-017 |
| MHR430R | φ5×R1×20 | 4 | 70 | F-035 |
| MHR230R | φ5×R1×20 | 7.5 | 70 | F-031 |
| MHRH430R | φ5×R1×40 | 4 | 90 | F-017 |
| MHR430R | φ5×R1×40 | 4 | 90 | F-035 |
| MHR230R | φ5×R1×40 | 7.5 | 90 | F-031 |
| MSRS230 | φ5×R1.5 | 10 | 70 | F-005 |
| NSR-2 | φ5×R1.5 | 15 | 55 | F-008 |
| **φ6** | | | | |
| MSRS430 | φ6×R0.1 | 12 | 80 | F-006 |
| MHRH430R | φ6×R0.1×12 | 5 | 70 | F-017 |
| MHRH430R | φ6×R0.1×18 | 5 | 90 | F-017 |
| MHRH430R | φ6×R0.1×24 | 5 | 90 | F-017 |
| MHR430R | φ6×R0.1×24 | 5 | 90 | F-035 |
| MHR230R | φ6×R0.1×24 | 9 | 90 | F-031 |
| MHRH430R | φ6×R0.1×48 | 5 | 110 | F-017 |
| MHR430R | φ6×R0.1×48 | 5 | 110 | F-035 |
| MHR230R | φ6×R0.1×48 | 9 | 110 | F-031 |
| MHDH645R | φ6×R0.2 | 12 | 60 | F-003 |
| MSRS430 | φ6×R0.2 | 12 | 80 | F-006 |
| NSR-2 | φ6×R0.2 | 18 | 60 | F-008 |
| MHRH430R | φ6×R0.2×12 | 5 | 70 | F-017 |

単位［寸法：mm］ Unit [Size : mm]

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.×Corner Radius (×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| MHRH430R | φ6×R0.2×18 | 5 | 90 | F-017 |
| MHRH430R | φ6×R0.2×24 | 5 | 90 | F-017 |
| MHR430R | φ6×R0.2×24 | 5 | 90 | F-035 |
| MHR230R | φ6×R0.2×24 | 9 | 90 | F-031 |
| MHRH430R | φ6×R0.2×48 | 5 | 110 | F-017 |
| MHR430R | φ6×R0.2×48 | 5 | 110 | F-035 |
| MHR230R | φ6×R0.2×48 | 9 | 110 | F-031 |
| MHDH645R | φ6×R0.3 | 12 | 60 | F-003 |
| MSRS430 | φ6×R0.3 | 12 | 80 | F-006 |
| MHRH430R | φ6×R0.3×12 | 5 | 70 | F-017 |
| MHRH430R | φ6×R0.3×18 | 5 | 90 | F-017 |
| MHRH430R | φ6×R0.3×24 | 5 | 90 | F-017 |
| MHR430R | φ6×R0.3×24 | 5 | 90 | F-035 |
| MHR230R | φ6×R0.3×24 | 9 | 90 | F-031 |
| MHRH430R | φ6×R0.3×48 | 5 | 110 | F-017 |
| MHR430R | φ6×R0.3×48 | 5 | 110 | F-035 |
| MHR230R | φ6×R0.3×48 | 9 | 110 | F-031 |
| MHDH645R | φ6×R0.5 | 12 | 60 | F-003 |
| MSRS430 | φ6×R0.5 | 12 | 80 | F-006 |
| MSXH440R | φ6×R0.5 | 13 | 60 | F-001 |
| NSR-2 | φ6×R0.5 | 18 | 60 | F-008 |
| MHRH430R | φ6×R0.5×12 | 5 | 70 | F-017 |
| MHRH430R | φ6×R0.5×18 | 5 | 90 | F-017 |
| MHRH430R | φ6×R0.5×24 | 5 | 90 | F-017 |
| MHR430R | φ6×R0.5×24 | 5 | 90 | F-035 |
| MHR230R | φ6×R0.5×24 | 9 | 90 | F-031 |
| MHRH430R | φ6×R0.5×48 | 5 | 110 | F-017 |
| MHR430R | φ6×R0.5×48 | 5 | 110 | F-035 |
| MHR230R | φ6×R0.5×48 | 9 | 110 | F-031 |
| MHDH645R | φ6×R1 | 12 | 60 | F-003 |
| MSRS430 | φ6×R1 | 12 | 80 | F-006 |
| MSXH440R | φ6×R1 | 13 | 60 | F-001 |
| NSR-2 | φ6×R1 | 18 | 60 | F-008 |
| MHRH430R | φ6×R1×12 | 5 | 70 | F-017 |
| MHRH430R | φ6×R1×18 | 5 | 90 | F-017 |
| MHRH430R | φ6×R1×24 | 5 | 90 | F-017 |
| MHR430R | φ6×R1×24 | 5 | 90 | F-035 |
| MHR230R | φ6×R1×24 | 9 | 90 | F-031 |
| MHRH430R | φ6×R1×48 | 5 | 110 | F-017 |
| MHR430R | φ6×R1×48 | 5 | 110 | F-035 |
| MHR230R | φ6×R1×48 | 9 | 110 | F-031 |
| MSRS430 | φ6×R1.5 | 12 | 80 | F-006 |
| NSR-2 | φ6×R1.5 | 18 | 60 | F-008 |
| MSRS430 | φ6×R2 | 12 | 80 | F-006 |
| NSR-2 | φ6×R2 | 18 | 60 | F-008 |
| **φ8** | | | | |
| MSRS430 | φ8×R0.1 | 16 | 90 | F-006 |
| MSRS430 | φ8×R0.2 | 16 | 90 | F-006 |
| MHDH645R | φ8×R0.3 | 16 | 65 | F-003 |
| MHDH645R | φ8×R0.5 | 16 | 65 | F-003 |
| MSRS430 | φ8×R0.5 | 16 | 90 | F-006 |
| MSXH440R | φ8×R0.5 | 19 | 65 | F-001 |

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.×Corner Radius (×Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| NSR-2 | φ8×R0.5 | 24 | 70 | F-008 |
| MHDH645R | φ8×R1 | 16 | 65 | F-003 |
| MSRS430 | φ8×R1 | 16 | 90 | F-006 |
| MSXH440R | φ8×R1 | 19 | 65 | F-001 |
| NSR-2 | φ8×R1 | 24 | 70 | F-008 |
| MHDH645R | φ8×R1.5 | 16 | 65 | F-003 |
| MSRS430 | φ8×R1.5 | 16 | 90 | F-006 |
| NSR-2 | φ8×R1.5 | 24 | 70 | F-008 |
| MSRS430 | φ8×R2 | 16 | 90 | F-006 |
| NSR-2 | φ8×R2 | 24 | 70 | F-008 |
| MSRS430 | φ8×R2.5 | 16 | 90 | F-006 |
| NSR-2 | φ8×R2.5 | 24 | 70 | F-008 |
| MSRS430 | φ8×R3 | 16 | 90 | F-006 |
| NSR-2 | φ8×R3 | 24 | 70 | F-008 |
| **φ10** | | | | |
| MSRS430 | φ10×R0.1 | 20 | 100 | F-006 |
| MSRS430 | φ10×R0.2 | 20 | 100 | F-006 |
| MHDH645R | φ10×R0.3 | 20 | 75 | F-003 |
| MSRS430 | φ10×R0.3 | 20 | 100 | F-006 |
| MHDH645R | φ10×R0.5 | 20 | 75 | F-003 |
| MSRS430 | φ10×R0.5 | 20 | 100 | F-006 |
| MSXH440R | φ10×R0.5 | 22 | 75 | F-001 |
| NSR-2 | φ10×R0.5 | 30 | 80 | F-008 |
| MHDH645R | φ10×R1 | 20 | 75 | F-003 |
| MSRS430 | φ10×R1 | 20 | 100 | F-006 |
| MSXH440R | φ10×R1 | 22 | 75 | F-001 |
| NSR-2 | φ10×R1 | 30 | 80 | F-008 |
| MHDH645R | φ10×R1.5 | 20 | 75 | F-003 |
| MSRS430 | φ10×R1.5 | 20 | 100 | F-006 |
| NSR-2 | φ10×R1.5 | 30 | 80 | F-008 |
| MHDH645R | φ10×R2 | 20 | 75 | F-003 |
| MSRS430 | φ10×R2 | 20 | 100 | F-006 |
| MSXH440R | φ10×R2 | 22 | 75 | F-001 |
| NSR-2 | φ10×R2 | 30 | 80 | F-008 |
| MSRS430 | φ10×R2.5 | 20 | 100 | F-006 |
| NSR-2 | φ10×R2.5 | 30 | 80 | F-008 |
| MSRS430 | φ10×R3 | 20 | 100 | F-006 |
| MSXH440R | φ10×R3 | 22 | 75 | F-001 |
| NSR-2 | φ10×R3 | 30 | 80 | F-008 |
| **φ12** | | | | |
| MSRS430 | φ12×R0.1 | 24 | 110 | F-006 |
| MSRS430 | φ12×R0.2 | 24 | 110 | F-006 |
| MSRS430 | φ12×R0.3 | 24 | 110 | F-006 |
| MHDH645R | φ12×R0.5 | 24 | 80 | F-003 |
| MSRS430 | φ12×R0.5 | 24 | 110 | F-006 |
| MSXH440R | φ12×R0.5 | 26 | 80 | F-001 |
| NSR-2 | φ12×R0.5 | 36 | 85 | F-008 |
| MHDH645R | φ12×R1 | 24 | 80 | F-003 |
| MSRS430 | φ12×R1 | 24 | 110 | F-006 |
| MSXH440R | φ12×R1 | 26 | 80 | F-001 |
| NSR-2 | φ12×R1 | 36 | 85 | F-008 |
| MHDH645R | φ12×R1.5 | 24 | 80 | F-003 |



ŞEVKET OĞLU® MAKINA TİCARET VE SAN. LTD. ŞTİ.

| 型　番 Model | 刃径×コーナー半径(×有効長) Dia.x Corner Radius (x Effective Length) | 刃長 Length of Cut | 全長 Overall Length | ページ Page |
|---|---|---|---|---|
| **MSRS430** | φ12×R1.5 | 24 | 110 | F-006 |
| **NSR-2** | φ12×R1.5 | 36 | 85 | F-008 |
| **MHDH645R** | φ12×R2 | 24 | 80 | F-003 |
| **MSRS430** | φ12×R2 | 24 | 110 | F-006 |
| **MSXH440R** | φ12×R2 | 26 | 80 | F-001 |
| **NSR-2** | φ12×R2 | 36 | 85 | F-008 |
| **MSRS430** | φ12×R2.5 | 24 | 110 | F-006 |
| **NSR-2** | φ12×R2.5 | 36 | 85 | F-008 |
| **MSRS430** | φ12×R3 | 24 | 110 | F-006 |
| **NSR-2** | φ12×R3 | 36 | 85 | F-008 |
| **φ16** | | | | |
| **NSR-2** | φ16×R1 | 50 | 110 | F-008 |
| **NSR-2** | φ16×R1.5 | 50 | 110 | F-008 |
| **NSR-2** | φ16×R2 | 50 | 110 | F-008 |
| **NSR-2** | φ16×R2.5 | 50 | 110 | F-008 |
| **NSR-2** | φ16×R3 | 50 | 110 | F-008 |
| **NSR-2** | φ16×R4 | 50 | 110 | F-008 |
| **NSR-2** | φ16×R5 | 50 | 110 | F-008 |
| **φ20** | | | | |
| **NSR-2** | φ20×R1 | 60 | 135 | F-008 |
| **NSR-2** | φ20×R1.5 | 60 | 135 | F-008 |
| **NSR-2** | φ20×R2 | 60 | 135 | F-008 |
| **NSR-2** | φ20×R2.5 | 60 | 135 | F-008 |
| **NSR-2** | φ20×R3 | 60 | 135 | F-008 |
| **NSR-2** | φ20×R4 | 60 | 135 | F-008 |
| **NSR-2** | φ20×R5 | 60 | 135 | F-008 |

| コード No. Code No. | 型　番 Model | ページ Page |
|---|---|---|
| 01- | | |
| 01-00001 | NSME100 | D-097 |
| 01-00002 | NSME230 | D-097 |
| 01-00003 | NSMB100 | E-073 |
| 01-00025 | NX-25 | D-098 |
| 01-00030 | NX-30 | D-100 |
| 01-00031 | NX-30X | D-062 |
| 01-00035 | NX-35 | D-102 |
| 01-00040 | NX-40 | D-104 |
| 01-00045 | NX-45 | D-106 |
| 01-00112 | NE-2 | D-125 |
| 01-00113 | NE-3 | D-125 |
| 01-00114 | NE-4 | D-126 |
| 01-00116 | NEL-3 | D-126 |
| 01-00212 | NC-2 | D-113 |
| 01-00222 | NCL-2 | D-115 |
| 01-00224 | NCL-4 | D-121 |
| 01-00232 | NCM-2 | D-114 |
| 01-00234 | NCM-4 | D-121 |
| 01-00242 | NC-LS-2 | D-115 |
| 01-00244 | NC-4 | D-119 |
| 01-00312 | NTE-2 | G-017 |
| 01-00313 | | |
| 01-00314 | NTE-4 | G-021 |
| 01-00315 | | |
| 01-00316 | NTE-2X | G-011 |
| 01-00317 | NTE-4X | G-012 |
| 01-00322 | NTEL-2 | G-020 |
| 01-00323 | | |
| 01-00324 | NTEL-4 | G-023 |
| 01-00325 | | |
| 01-00332 | NTEM-2 | G-019 |
| 01-00336 | NTEM-2X | G-014 |
| 01-00352 | NTB-2 | G-037 |
| 01-00362 | NTER-2X | G-041 |
| 01-00412 | NHR-2 | D-131 |
| 01-00413 | NHR-2X | D-094 |
| 01-00425 | NRF-4 | G-028 |
| 01-00432 | NHB-2 | E-079 |
| 01-00440 | SSE400 | B-003 |
| 01-00450 | SSE600 | B-003 |
| 01-00460 | SMB120 | B-005 |
| 01-00470 | SSF120 | B-025 |
| 01-00480 | SMEZ120 | B-002 |
| 01-00490 | SSR200 | B-020 |
| 01-00495 | SHR320 | B-024 |
| 01-00500 | SFB200 | B-006 |
| 01-00505 | SSPB220 | B-007 |
| 01-00506 | SSPBL220 | B-008 |
| 01-00507 | SSPBTN220 | B-009 |
| 01-00510 | SSB200 | B-011 |

| コード No. Code No. | 型　番 Model | ページ Page |
|---|---|---|
| 01- | | |
| 01-00511 | SSBL200 | B-012 |
| 01-00512 | NCB-2 | E-075 |
| 01-00513 | NCB-2X | E-017 |
| 01-00522 | NSB-2 | E-075 |
| 01-00523 | NSB-2X | E-018 |
| 01-00528 | NLBL-2 | E-078 |
| 01-00530 | NSBL-2 | E-077 |
| 01-00622 | NEA-2 | D-144 |
| 01-00631 | AL2D-2 | D-135 |
| 01-00632 | AL3D-2 | D-136 |
| 01-00633 | AL4D-2 | D-136 |
| 01-00634 | AL5D-2 | D-137 |
| 01-00635 | AL3D-2DLC | D-138 |
| 01-00636 | ALZ345 | D-140 |
| 01-00637 | AL-3LS | D-144 |
| 01-00638 | ALB225 | E-082 |
| 01-00639 | AL3D-345 | D-137 |
| 01-00640 | RSES230 | D-154 |
| 01-00644 | RSE230 | D-159 |
| 01-00654 | RSB230 | E-085 |
| 01-00661 | AL2D-2DLC | D-138 |
| 01-00663 | AL4D-2DLC | D-139 |
| 01-00664 | AL5D-2DLC | D-139 |
| 01-00666 | ALZ345-DLC | D-143 |
| 01-00668 | ALB225-DLC | E-083 |
| 01-00712 | NER-2 | G-016 |
| 01-00722 | NERB-2 | G-037 |
| 01-00732 | NERR-2X | G-039 |
| 01-00772 | NSR-2 | F-008 |
| 01-00812 | NSL-2 | D-130 |
| 01-00912 | NCR-2 | J-007 |
| 01-00913 | NCR-2X | J-005 |
| 04- | | |
| 04-00001 | NSMD | H-006 |
| 04-00002 | NSMD-M | H-003 |
| 04-00005 | NSMD-S | H-007 |
| 04-00006 | NSMD-MS | H-004 |
| 04-00010 | NSPD | H-008 |
| 04-00012 | NSPD-M | H-005 |
| 04-00050 | MSDH | H-001 |
| 04-00100 | CED100 | C-007 |
| 04-00200 | MDR-R | H-012 |
| 04-00210 | MDR-PD | H-015 |
| 04-00230 | MFD | H-010 |
| 04-00250 | NSCV | J-001 |
| 04-00260 | NSCV-M | J-001 |
| 04-00300 | PCDSE | C-001 |
| 04-00500 | PCDRB | C-003 |
| 04-00700 | PCDRS | C-005 |


ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| コード No. Code No. | 型　番 Model | ページ Page |
|---|---|---|
| 05- | | |
| 05-00035 | DCSE235 | C-010 |
| 05-00100 | DCMS | C-008 |
| 05-00200 | DCHR230 | C-012 |
| 05-00500 | DCMB | C-014 |
| 05-00520 | DCRB230 | C-016 |
| 06- | | |
| 06-00001 | MMTS | I-001 |
| 06-00002 | MMTM | I-003 |
| 06-00003 | MMTU | I-005 |
| 07- | | |
| 07-00001 | DSF | D-168 |
| 07-00036 | DX | D-167 |
| 07-00040 | DXM | D-167 |
| 07-00045 | DXL | D-168 |
| 07-00100 | DHR237 | D-164 |
| 07-00313 | DTE | G-031 |
| 07-00322 | DTEL | G-033 |
| 07-00333 | DHS | D-169 |
| 07-00432 | DHB | E-092 |
| 07-00523 | DB | E-091 |
| 07-00530 | DRB230 | E-087 |
| 07-00913 | DIR | J-009 |
| 08- | | |
| 08-00005 | MXH225 | D-001 |
| 08-00006 | MXH230 | D-002 |
| 08-00007 | MXH235 | D-003 |
| 08-00008 | MXH240 | D-004 |
| 08-00009 | MXH245 | D-004 |
| 08-00015 | MXH225P | D-005 |
| 08-00016 | MXH230P | D-006 |
| 08-00017 | MXH235P | D-007 |
| 08-00025 | MX225 | D-016 |
| 08-00030 | MX230 | D-016 |
| 08-00035 | MX235 | D-018 |
| 08-00040 | MX240 | D-019 |
| 08-00045 | MX245 | D-020 |
| 08-00075 | MX425 | D-032 |
| 08-00080 | MX430 | D-032 |
| 08-00085 | MX435 | D-033 |
| 08-00090 | MX440 | D-033 |
| 08-00095 | MX445 | D-034 |
| 08-00100 | MSE230 | D-027 |
| 08-00101 | MSEM230 | D-029 |
| 08-00102 | MSES230P | D-027 |
| 08-00103 | MSE230SS | D-026 |
| 08-00105 | MSE230M | D-029 |
| 08-00110 | MSE430 | D-040 |
| 08-00111 | MSEM430 | D-041 |
| 08-00112 | MSE430P | D-040 |
| 08-00120 | MSE245 | D-044 |

| コード No. Code No. | 型　番 Model | ページ Page |
|---|---|---|
| 08- | | |
| 08-00130 | MSE345 | D-044 |
| 08-00133 | MSZ345 | D-052 |
| 08-00140 | MSE445 | D-045 |
| 08-00144 | MSX440 | D-055 |
| 08-00150 | MSXH440R | F-001 |
| 08-00200 | MHR230 | D-074 |
| 08-00202 | MHRLN230-6 | D-093 |
| 08-00207 | MHRH230 | D-064 |
| 08-00210 | MHR430 | D-081 |
| 08-00217 | MHRH430 | D-067 |
| 08-00220 | MHR230R | F-021 |
| 08-00221 | | |
| 08-00227 | MHRH230R | F-010 |
| 08-00230 | MHR430R | F-032 |
| 08-00237 | MHRH430R | F-012 |
| 08-00300 | MTE230 | G-001 |
| 08-00310 | MRT425 | G-007 |
| 08-00400 | MHD445 | D-059 |
| 08-00410 | MHD645 | D-059 |
| 08-00427 | MHDH445 | D-057 |
| 08-00428 | MHDH645 | D-057 |
| 08-00437 | MHDH445R | F-003 |
| 08-00438 | MHDH645R | F-003 |
| 08-00500 | MSB230 | E-009 |
| 08-00501 | | |
| 08-00504 | MSB230SF | E-008 |
| 08-00505 | MSB230G2 | E-007 |
| 08-00507 | MSBH230 | E-001 |
| 08-00510 | MSBL230 | E-011 |
| 08-00511 | MSBXL230 | E-016 |
| 08-00520 | MRB230 | E-035 |
| 08-00521 | | |
| 08-00522 | MRBLN230-6 | E-047 |
| 08-00525 | MRB230SF | E-031 |
| 08-00527 | MRBH230 | E-021 |
| 08-00528 | | |
| 08-00530 | MSB230S | E-007 |
| 08-00540 | MTB230 | G-035 |
| 08-00554 | MACH225SF | E-004 |
| 08-00555 | MACH225 | E-005 |
| 08-00570 | MRBTN230 | E-060 |
| 08-00580 | MRBTN230L | E-069 |
| 08-00588 | MRBTNH230 | E-048 |
| 08-00590 | MRBTNH345 | E-056 |
| 08-00600 | MSB345 | E-014 |
| 08-00607 | MSBH345 | E-002 |
| 08-00700 | MSRS230 | F-005 |
| 08-00710 | MSRS430 | F-006 |
| 08-00770 | MSTNR230 | F-040 |
| 08-00900 | MIR200 | J-003 |

| 型　番 Model | コード No. Code No. | ページ Page |
|---|---|---|
| A | | |
| AL-3LS | 01-00637 | D-144 |
| AL2D-2 | 01-00631 | D-135 |
| AL2D-2DLC | 01-00661 | D-138 |
| AL3D-2 | 01-00632 | D-136 |
| AL3D-2DLC | 01-00635 | D-138 |
| AL3D-345 | 01-00639 | D-137 |
| AL4D-2 | 01-00633 | D-136 |
| AL4D-2DLC | 01-00663 | D-139 |
| AL5D-2 | 01-00634 | D-137 |
| AL5D-2DLC | 01-00664 | D-139 |
| ALB225 | 01-00638 | E-082 |
| ALB225-DLC | 01-00668 | E-083 |
| ALZ345 | 01-00636 | D-140 |
| ALZ345-DLC | 01-00666 | D-143 |
| C | | |
| CED100 | 04-00100 | C-007 |
| D | | |
| DB | 07-00523 | E-091 |
| DCHR230 | 05-00200 | C-012 |
| DCMB | 05-00500 | C-014 |
| DCMS | 05-00100 | C-008 |
| DCRB230 | 05-00520 | C-016 |
| DCSE235 | 05-00035 | C-010 |
| DHB | 07-00432 | E-092 |
| DHR237 | 07-00100 | D-164 |
| DHS | 07-00333 | D-169 |
| DIR | 07-00913 | J-009 |
| DRB230 | 07-00530 | E-087 |
| DSF | 07-00001 | D-168 |
| DTE | 07-00313 | G-031 |
| DTEL | 07-00322 | G-033 |
| DX | 07-00036 | D-167 |
| DXL | 07-00045 | D-168 |
| DXM | 07-00040 | D-167 |
| M | | |
| MACH225 | 08-00555 | E-005 |
| MACH225SF | 08-00554 | E-004 |
| MDR-PD | 04-00210 | H-015 |
| MDR-R | 04-00200 | H-012 |
| MFD | 04-00230 | H-010 |
| MHD445 | 08-00400 | D-059 |
| MHD645 | 08-00410 | D-059 |
| MHDH445 | 08-00427 | D-057 |
| MHDH445R | 08-00437 | F-003 |
| MHDH645 | 08-00428 | D-057 |
| MHDH645R | 08-00438 | F-003 |
| MHR230 | 08-00200 | D-074 |
| MHR230R | 08-00220 | F-021 |
| | 08-00221 | F-021 |
| MHR430 | 08-00210 | D-081 |

| 型　番 Model | コード No. Code No. | ページ Page |
|---|---|---|
| M | | |
| MHR430R | 08-00230 | F-032 |
| MHRH230 | 08-00207 | D-064 |
| MHRH230R | 08-00227 | F-010 |
| MHRH430 | 08-00217 | D-067 |
| MHRH430R | 08-00237 | F-012 |
| MHRLN230-6 | 08-00202 | D-093 |
| MIR200 | 08-00900 | J-003 |
| MMTM | 06-00002 | I-003 |
| MMTS | 06-00001 | I-001 |
| MMTU | 06-00003 | I-005 |
| MRB230 | 08-00520 | E-035 |
| | 08-00521 | E-035 |
| MRB230SF | 08-00525 | E-031 |
| MRBH230 | 08-00527 | E-021 |
| | 08-00528 | E-021 |
| MRBLN230-6 | 08-00522 | E-047 |
| MRBTN230 | 08-00570 | E-060 |
| MRBTN230L | 08-00580 | E-069 |
| MRBTNH230 | 08-00588 | E-048 |
| MRBTNH345 | 08-00590 | E-056 |
| MRT425 | 08-00310 | G-007 |
| MSB230 | 08-00500 | E-009 |
| | 08-00501 | E-009 |
| MSB230G2 | 08-00505 | E-007 |
| MSB230S | 08-00530 | E-007 |
| MSB230SF | 08-00504 | E-008 |
| MSB345 | 08-00600 | E-014 |
| MSBH230 | 08-00507 | E-001 |
| MSBH345 | 08-00607 | E-002 |
| MSBL230 | 08-00510 | E-011 |
| MSBXL230 | 08-00511 | E-016 |
| MSDH | 04-00050 | H-001 |
| MSE230 | 08-00100 | D-027 |
| MSE230M | 08-00105 | D-029 |
| MSE230SS | 08-00103 | D-026 |
| MSE245 | 08-00120 | D-044 |
| MSE345 | 08-00130 | D-044 |
| MSE430 | 08-00110 | D-040 |
| MSE430P | 08-00112 | D-040 |
| MSE445 | 08-00140 | D-045 |
| MSEM230 | 08-00101 | D-029 |
| MSEM430 | 08-00111 | D-041 |
| MSES230P | 08-00102 | D-027 |
| MSRS230 | 08-00700 | F-005 |
| MSRS430 | 08-00710 | F-006 |
| MSTNR230 | 08-00770 | F-040 |
| MSX440 | 08-00144 | D-055 |
| MSXH440R | 08-00150 | F-001 |
| MSZ345 | 08-00133 | D-052 |
| MTB230 | 08-00540 | G-035 |




SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

| 型　番 Model | コード No. Code No. | ページ Page |
|---|---|---|
| **M** | | |
| MTE230 | 08-00300 | G-001 |
| MX225 | 08-00025 | D-016 |
| MX230 | 08-00030 | D-016 |
| MX235 | 08-00035 | D-018 |
| MX240 | 08-00040 | D-019 |
| MX245 | 08-00045 | D-020 |
| MX425 | 08-00075 | D-032 |
| MX430 | 08-00080 | D-032 |
| MX435 | 08-00085 | D-033 |
| MX440 | 08-00090 | D-033 |
| MX445 | 08-00095 | D-034 |
| MXH225 | 08-00005 | D-001 |
| MXH225P | 08-00015 | D-005 |
| MXH230 | 08-00006 | D-002 |
| MXH230P | 08-00016 | D-006 |
| MXH235 | 08-00007 | D-003 |
| MXH235P | 08-00017 | D-007 |
| MXH240 | 08-00008 | D-004 |
| MXH245 | 08-00009 | D-004 |
| **N** | | |
| NC-2 | 01-00212 | D-113 |
| NC-4 | 01-00244 | D-119 |
| NC-LS-2 | 01-00242 | D-115 |
| NCB-2 | 01-00512 | E-075 |
| NCB-2X | 01-00513 | E-017 |
| NCL-2 | 01-00222 | D-115 |
| NCL-4 | 01-00224 | D-121 |
| NCM-2 | 01-00232 | D-114 |
| NCM-4 | 01-00234 | D-121 |
| NCR-2 | 01-00912 | J-007 |
| NCR-2X | 01-00913 | J-005 |
| NE-2 | 01-00112 | D-125 |
| NE-3 | 01-00113 | D-125 |
| NE-4 | 01-00114 | D-126 |
| NEA-2 | 01-00622 | D-144 |
| NEL-3 | 01-00116 | D-126 |
| NER-2 | 01-00712 | G-016 |
| NERB-2 | 01-00722 | G-037 |
| NERR-2X | 01-00732 | G-039 |
| NHB-2 | 01-00432 | E-079 |
| NHR-2 | 01-00412 | D-131 |
| NHR-2X | 01-00413 | D-094 |
| NLBL-2 | 01-00528 | E-078 |
| NRF-4 | 01-00425 | G-028 |
| NSB-2 | 01-00522 | E-075 |
| NSB-2X | 01-00523 | E-018 |
| NSBL-2 | 01-00530 | E-077 |
| NSCV | 04-00250 | J-001 |
| NSCV-M | 04-00260 | J-001 |
| NSL-2 | 01-00812 | D-130 |
| NSMB100 | 01-00003 | E-073 |

| 型　番 Model | コード No. Code No. | ページ Page |
|---|---|---|
| **N** | | |
| NSMD | 04-00001 | H-006 |
| NSMD-M | 04-00002 | H-003 |
| NSMD-MS | 04-00006 | H-004 |
| NSMD-S | 04-00005 | H-007 |
| NSME100 | 01-00001 | D-097 |
| NSME230 | 01-00002 | D-097 |
| NSPD | 04-00010 | H-008 |
| NSPD-M | 04-00012 | H-005 |
| NSR-2 | 01-00772 | F-008 |
| NTB-2 | 01-00352 | G-037 |
| NTE-2 | 01-00312 | G-017 |
| | 01-00313 | G-017 |
| NTE-2X | 01-00316 | G-011 |
| NTE-4 | 01-00314 | G-021 |
| | 01-00315 | G-021 |
| NTE-4X | 01-00317 | G-012 |
| NTEL-2 | 01-00322 | G-020 |
| | 01-00323 | G-020 |
| NTEL-4 | 01-00324 | G-023 |
| | 01-00325 | G-023 |
| NTEM-2 | 01-00332 | G-019 |
| NTEM-2X | 01-00336 | G-014 |
| NTER-2X | 01-00362 | G-041 |
| NX-25 | 01-00025 | D-098 |
| NX-30 | 01-00030 | D-100 |
| NX-30X | 01-00031 | D-062 |
| NX-35 | 01-00035 | D-102 |
| NX-40 | 01-00040 | D-104 |
| NX-45 | 01-00045 | D-106 |
| **P** | | |
| PCDRB | 04-00500 | C-003 |
| PCDRS | 04-00700 | C-005 |
| PCDSE | 04-00300 | C-001 |
| **R** | | |
| RSB230 | 01-00654 | E-085 |
| RSE230 | 01-00644 | D-159 |
| RSES230 | 01-00640 | D-154 |
| **S** | | |
| SFB200 | 01-00500 | B-006 |
| SHR320 | 01-00495 | B-024 |
| SMB120 | 01-00460 | B-005 |
| SMEZ120 | 01-00480 | B-002 |
| SSB200 | 01-00510 | B-011 |
| SSBL200 | 01-00511 | B-012 |
| SSE400 | 01-00440 | B-003 |
| SSE600 | 01-00450 | B-003 |
| SSF120 | 01-00470 | B-025 |
| SSPB220 | 01-00505 | B-007 |
| SSPBL220 | 01-00506 | B-008 |
| SSPBTN220 | 01-00507 | B-009 |
| SSR200 | 01-00490 | B-020 |

# 2

# NS TOOL ENDMILL CATALOG

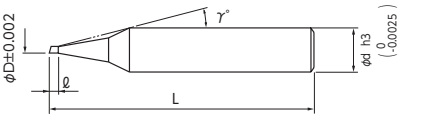
NS TOOLの全製品の紹介です


| | | |
|---|---|---|
| CBN | Cubic Boron Nitride | B-002 |
| ダイヤモンド | Diamond | C-001 |
| スクエア | Square | D-001 |
| ボール | Ball | E-001 |
| ラジアス | Radius | F-001 |
| テーパー | Taper | G-001 |
| ドリル | Drilling | H-001 |
| ねじ切り | Thread milling | I-001 |
| 面取り | Chamfering | J-001 |

# SMEZ120

## 超微細加工用　CBN エンドミル“マイクロエッジZ”

CBN “MICRO EDGE Z”




- NS の加工技術と厳選された CBN 素材とのマッチングでシャープエッジを実現。
- 刃径精度± 2 μ m。
- シャンク径公差 h3（0 ～ -0.0025）。
- NS engineering technology and selected CBN material realize sharp edge.
- Tolerance of flute diameter is ±2μm.
- Tolerance of shank diameter is h3 (0~-0.0025).

### 被削材　Work Material

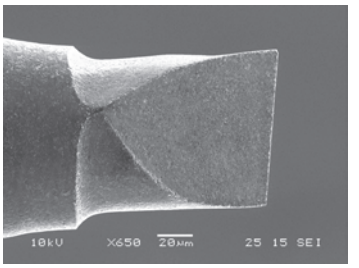
| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～ 55HRC | 焼き入れ鋼 Hardened Steels 55HRC ～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ◎ | ◎ | ◎ | | | | | |

単位［寸法：mm / 価格：円］　Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00480-00030 | **0.03** | 0.03 | 15° | 4 | 50 | 60,000 |
| 01-00480-00040 | **0.04** | 0.04 | 15° | 4 | 50 | 50,000 |
| 01-00480-00050 | **0.05** | 0.05 | 15° | 4 | 50 | 45,000 |
| 01-00480-00060 | **0.06** | 0.06 | 15° | 4 | 50 | 42,000 |
| 01-00480-00070 | **0.07** | 0.07 | 15° | 4 | 50 | 42,000 |
| 01-00480-00080 | **0.08** | 0.08 | 15° | 4 | 50 | 39,000 |
| 01-00480-00090 | **0.09** | 0.09 | 15° | 4 | 50 | 39,000 |
| 01-00480-00100 | **0.1** | 0.1 | 15° | 4 | 50 | 34,000 |

**オーダー方法**　SMEZ120 刃径(D)を指示してください。　※(γ)は参考値です。
When you order, indicate SMEZ 120 (D).　※(γ) is reference value.

SMEZ120



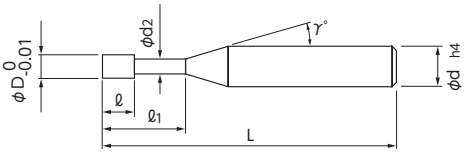

CBNマイクロエッジZ特殊刃形状(PAT.P)
CBN Micro Edge Z original flute design.



SEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# SSE400

## CBNスクエアエンドミル
CBN Square End Mill




●高硬度材への隅エッジ部の加工が可能。
● NS 独自の多刃形状を採用し、耐摩耗性をアップ！
●Possible to machine the corner edge of hardened steels.
●Intensified wear resistance by NS original design of cutting edge.

Face | CBN | 4 | 0° | ≦68 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ○ | ◎ | ◎ | | | | | |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00440-01002 | 0.1 | 0.2 | 0.04 | 0.075 | 15° | 4 | 53 | 33,000 |
| 01-00440-01005 | | 0.5 | 0.04 | 0.08 | 15° | 4 | 53 | 35,000 |

オーダー方法 SSE400 刃径(D)×有効長(ℓ1)を指示してください。 ※(γ)は参考値です。
When you order, indicate SSE400 (D)×(ℓ1). ※(γ) is reference value.

●切削条件表はB-004に記載
●Recommended Milling Conditions are shown on page B-004.

# SSE600

## CBNスクエアエンドミル
CBN Square End Mill

●高硬度材への隅エッジ部の加工が可能。
● NS 独自の多刃形状を採用し、耐摩耗性をアップ！
●Possible to machine the corner edge of hardened steels.
●Intensified wear resistance by NS original design of cutting edge!

技術資料 K-007

Face | CBN | 6 | 0° | ≦68 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ○ | ◎ | ◎ | | | | | |

★再研磨可能(全長35mm以上のもの。詳細はお問い合わせください。)

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00450-02004 | 0.2 | 0.4 | 0.08 | 0.175 | 15° | 4 | 53 | 31,000 |
| 01-00450-02010 | | 1 | 0.08 | 0.175 | 15° | 4 | 53 | 32,500 |
| 01-00450-03005 | 0.3 | 0.5 | 0.12 | 0.275 | 15° | 4 | 49 | 31,000 |
| 01-00450-03015 | | 1.5 | 0.12 | 0.275 | 15° | 4 | 50 | 32,000 |
| 01-00450-04008 | 0.4 | 0.8 | 0.16 | 0.37 | 15° | 4 | 49 | 29,500 |
| 01-00450-04020 | | 2 | 0.16 | 0.37 | 15° | 4 | 50 | 31,000 |
| ★ 01-00450-05010 | 0.5 | 1 | 0.2 | 0.46 | 15° | 4 | 49 | 25,600 |
| ★ 01-00450-05025 | | 2.5 | 0.2 | 0.46 | 15° | 4 | 50 | 28,000 |
| ★ 01-00450-06012 | 0.6 | 1.2 | 0.24 | 0.56 | 15° | 4 | 49 | 25,600 |
| ★ 01-00450-06030 | | 3 | 0.24 | 0.56 | 15° | 4 | 50 | 28,000 |
| ★ 01-00450-08015 | 0.8 | 1.5 | 0.32 | 0.76 | 15° | 4 | 49 | 25,600 |
| ★ 01-00450-08040 | | 4 | 0.32 | 0.76 | 15° | 4 | 52 | 28,000 |
| ★ 01-00450-10020 | 1 | 2 | 0.4 | 0.95 | 15° | 4 | 49 | 23,000 |
| ★ 01-00450-10050 | | 5 | 0.4 | 0.95 | 15° | 4 | 52 | 25,400 |

オーダー方法 SSE600 刃径(D)×有効長(ℓ1)を指示してください。 ※(γ)は参考値です。
When you order, indicate SSE600 (D)×(ℓ1). ※(γ) is reference value.

●切削条件表はB-004に記載
●Recommended Milling Conditions are shown on page B-004.

# SSE400・SSE600

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-007

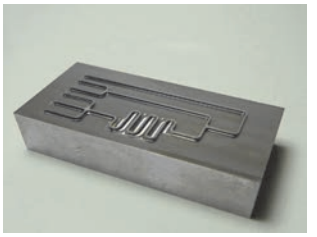
| 被削材 Work Material | | 焼き入れ鋼 Hardened Steels HPM-38・STAVAX・SKD61 (~55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (~62HRC) | | | | ハイス High Speed Tool Steels SKH (~65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 有効長 Effective Length | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.1 | 0.2 | 0.001 | 0.002 | 250 | 40,000 | 0.001 | 0.002 | 200 | 40,000 | 0.001 | 0.002 | 150 | 40,000 |
| | 0.5 | 0.001 | 0.002 | 200 | 40,000 | 0.001 | 0.002 | 150 | 40,000 | 0.001 | 0.001 | 100 | 40,000 |
| 0.2 | 0.4 | 0.003 | 0.002 | 400 | 40,000 | 0.002 | 0.002 | 300 | 40,000 | 0.002 | 0.002 | 200 | 40,000 |
| | 1 | 0.003 | 0.002 | 300 | 40,000 | 0.002 | 0.002 | 200 | 40,000 | 0.002 | 0.002 | 100 | 40,000 |
| 0.3 | 0.5 | 0.005 | 0.003 | 600 | 40,000 | 0.004 | 0.003 | 400 | 40,000 | 0.003 | 0.003 | 400 | 40,000 |
| | 1.5 | 0.005 | 0.002 | 500 | 40,000 | 0.004 | 0.002 | 300 | 40,000 | 0.003 | 0.002 | 200 | 40,000 |
| 0.4 | 0.8 | 0.007 | 0.004 | 700 | 40,000 | 0.005 | 0.003 | 600 | 40,000 | 0.003 | 0.003 | 600 | 40,000 |
| | 2 | 0.007 | 0.003 | 600 | 40,000 | 0.005 | 0.002 | 400 | 40,000 | 0.003 | 0.002 | 400 | 40,000 |
| 0.5 | 1 | 0.01 | 0.005 | 800 | 40,000 | 0.007 | 0.003 | 700 | 40,000 | 0.005 | 0.003 | 600 | 40,000 |
| | 2.5 | 0.01 | 0.004 | 800 | 40,000 | 0.007 | 0.002 | 500 | 40,000 | 0.005 | 0.002 | 400 | 40,000 |
| 0.6 | 1.2 | 0.01 | 0.005 | 800 | 40,000 | 0.007 | 0.003 | 700 | 40,000 | 0.005 | 0.003 | 600 | 40,000 |
| | 3 | 0.01 | 0.004 | 800 | 40,000 | 0.007 | 0.002 | 500 | 40,000 | 0.005 | 0.002 | 400 | 40,000 |
| 0.8 | 1.5 | 0.01 | 0.005 | 800 | 40,000 | 0.007 | 0.004 | 800 | 40,000 | 0.005 | 0.004 | 700 | 40,000 |
| | 3.5 | 0.01 | 0.004 | 800 | 40,000 | 0.007 | 0.003 | 600 | 40,000 | 0.005 | 0.003 | 500 | 40,000 |
| 1 | 2 | 0.01 | 0.006 | 800 | 40,000 | 0.007 | 0.006 | 800 | 40,000 | 0.005 | 0.006 | 800 | 40,000 |
| | 5 | 0.01 | 0.005 | 800 | 40,000 | 0.007 | 0.005 | 600 | 40,000 | 0.005 | 0.005 | 600 | 40,000 |

**備考 Notes**

※切り込み量は等高線仕上げ加工を行う場合の最大値です。
※切り込み量の ap は深さ方向の切り込み量、ae は半径方向の切り込み量を示します。
※オイルミストクーラントをご使用ください。
※工具突出し量は必要以上に出さないでください。
※チャッキングの振れは極力抑えてください。(可能ならば使用される回転数での動的振れ精度を確認してください。)
※底面仕上げ加工を行う場合、送り速度は切削条件参考表の 50%程度、切り込み量 ap はφ 0.1：0.001mm、φ 0.2・φ 0.3：～ 0.002mm、φ 0.4 ～φ 1：～ 0.003mm、切り込み量 ae は刃径× 0.05mm を参考値としてください。
※Depth of Cut is the maximum effective value for the contour line tool path.
※ap: Axial Depth of Cut, ae: Radial Depth of Cut.
※Recommended oil mist coolant.
※Minimize a possible tool overhang length.
※Minimize chucking runout. (Recommend to measure actual runout of activated spindle speed.)
※For the reference value, when finishing process of bottom surface, reduce the feed approx. 50% of the recommended milling conditions and Depth of Cut (ap): 0.001mm for Dia. 0.1mm, up to 0.002mm for Dia. 0.2mm and 0.3mm, for Dia. 0.4 to 1mm, up to 0.003mm, (ae): Dia. x 0.05mm.

## 加工事例 1 Technical Data 1

流路モデル Flow Channel Model



ワークサイズ:40×20mm(加工深さ0.5mm)
Work Size : 40×20mm　Cutting depth : 0.5mm

・被削材：HAP40 64HRC　Material : HAP40 64HRC
・クーラント：オイルミスト　Coolant : Oil mist
・総加工時間：7 時間 30 分　Total cutting time : 7hr 30min

| 加工工程 Process | 大荒取り Pre-roughing | 荒取り (2本) Roughing (2 pcs) | 中仕上げ Semi-finishing | 等高線仕上げ Contour line finishing | 底面仕上げ Bottom finishing |
|---|---|---|---|---|---|
| 使用工具 Tool | MHRH430 φ2.5×8 | MHRH430 φ1×4 | SSR200 φ1×R0.02×1 | SSE600 φ1×2 | |
| 回転数 [$min^{-1}$] Spindle speed | 8,000 | 20,000 | 30,000 | | |
| 送り速度 [mm/min] Feed | 1,000 | | 600 | 300 | 90 |
| 切り込み量 ap×ae[mm] Depth of cut | 0.03×0.75 | 0.02×0.3 | 0.005×0.01～0.05 | 0.005×0.005 | 0.001×0.5 |
| 加工時間 Cutting time | 13分 13min | 1時間44分 1hr44min | 1時間18分 1hr18min | 4時間15分 4hr15min | |

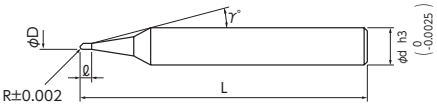


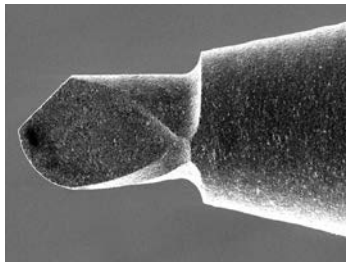
ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# SMB120

## 超微細加工用　CBN ボールエンドミル　“CBN マイクロボール”

CBN Ball End Mill for precision machining “CBN Micro Ball”



●世界初！ CBN 素材のマイクロボールエンドミル。
●微細切削加工分野の新たな領域を開拓。
● R サイズ R0.01 より標準化を実現。
● CBN 素材の特長を最大限に活かしたシャープエッジを実現。
●調質鋼から焼き入れ鋼（60HRC 以上）まで、長時間の加工が可能。
●The world's first CBN Micro Ball End Mill.
●CBN Micro Ball develops new machining capability in high-precision technology.
●Standarized sizes from R0.01.
●Realized sharp edge by maximizing features of CBN.
●Long machining on pre-hardened to high-hardened steels (60HRC～).

### 被削材　Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ | | | | | |
| | | ◎ | ◎ | ◎ | | | | | |

単位［寸法：mm / 価格：円］　Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 01-00460-00010 | R0.01 | 0.02 | 0.02 | 15° | 4 | 50 | 72,000 |
| 01-00460-00015 | R0.015 | 0.03 | 0.03 | 15° | 4 | 50 | 62,000 |
| 01-00460-00020 | R0.02 | 0.04 | 0.04 | 15° | 4 | 50 | 51,600 |
| 01-00460-00025 | R0.025 | 0.05 | 0.05 | 15° | 4 | 50 | 47,400 |
| 01-00460-00030 | R0.03 | 0.06 | 0.06 | 15° | 4 | 50 | 43,200 |
| 01-00460-00040 | R0.04 | 0.08 | 0.08 | 15° | 4 | 50 | 39,600 |
| 01-00460-00050 | R0.05 | 0.1 | 0.1 | 15° | 4 | 50 | 36,000 |

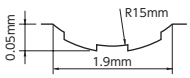
**オーダー方法**　SMB120 ボール半径(R)を指示してください。
When you order, indicate SMB120 (R).

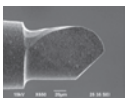
※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はB-013に記載
●Recommended Milling Conditions are shown on page B-013.

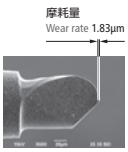
## 加工事例 1　Technical Data 1

R0.05　NS 文字加工 NS Logo



切削前
Before machining



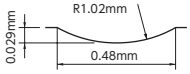

切削後
After machining

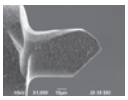
| 被削材 Material | STAVAX 52HRC | |
|---|---|---|
| 回転数 Spindle speed | 80,000min$^{-1}$ | |
| 送り速度 Feed | 荒取り：200mm/min Roughing | 仕上げ：50mm/min Finishing |
| 切り込み量※ Depth of cut | 荒取り：2μm×5μm Roughing (ap × ae) | 仕上げ：2μm×2μm Finishing (ap × ae) |
| 加工時間 Cutting time | 1 時間 50 分 1hr 50min | |
| 加工距離 Cutting length | 7.7m | |
| クーラント Coolant | オイルミスト Oil mist | |

●荒取り・仕上げを同一工具で行いました。
Full process done by one tool.
※ap は切り込み深さ、ae は切り込み幅を示します。
ap: Axial Depth of Cut,
ae: Radial Depth of Cut.

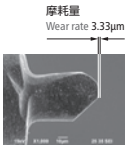
## 加工事例 2　Technical Data 2

R0.03　レンズアレイモデル Lens Array Model



切削前
Before machining




切削後
After machining

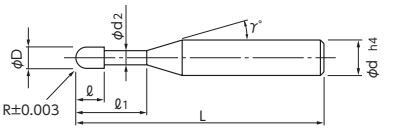
| 被削材 Material | PD613 60HRC | |
|---|---|---|
| 回転数 Spindle speed | 80,000min$^{-1}$ | |
| 送り速度 Feed | 荒取り：50mm/min Roughing | 仕上げ：30mm/min Finishing |
| 切り込み量※ Depth of cut | 荒取り：1μm×2μm Roughing (ap × ae) | 仕上げ：1μm×1μm Finishing (ap × ae) |
| 加工時間 Cutting time | 4 時間 4hr | |
| 加工距離 Cutting length | 10.4m | |
| クーラント Coolant | オイルミスト Oil mist | |

●荒取り・仕上げを同一工具で行いました。
Full process done by one tool.
※ap は切り込み深さ、ae は切り込み幅を示します。
ap: Axial Depth of Cut,
ae: Radial Depth of Cut.

# SFB200

特許取得 PAT. No. 3759098

## CBNスーパーフィニッシュボールエンドミル
CBN Super Finish Ball End Mill




●新発想の刃形状でR中心部まで切れ味が抜群。
● 60HRC の焼き入れ鋼で連続 10 時間以上の仕上げ加工を実現。
●加工面精度 Rz1.0 μ m が長時間持続。
●金型の磨き加工時間を大幅に削減。
●Sharpened edge at R-center improves shearing ability.
●Continuous 10 hours machining on hardened steel of 60HRC.
●Long-lasting high surface accuracy Rz1.0μm.
●Save significant time at polishing process.

3D CBN 2 0° ≦68 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ◎ | ◎ | ◎ | | | | | |

★再研磨可能(全長35mm以上のもの。詳細はお問い合わせください。)

単位 [寸法：mm / 価格：円] Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00500-00100 | R0.1 | 0.5 | 0.15 | 0.2 | 0.18 | 12° | 4 | 50 | 39,300 |
| ★ 01-00500-00200 | R0.2 | 1 | 0.3 | 0.4 | 0.37 | 12° | 4 | 50 | 36,000 |
| ★ 01-00500-00250 | R0.25 | 1.25 | 0.38 | 0.5 | 0.46 | 12° | 4 | 50 | 36,000 |
| ★ 01-00500-00300 | R0.3 | 1.5 | 0.5 | 0.6 | 0.56 | 12° | 4 | 50 | 32,900 |
| ★ 01-00500-00400 | R0.4 | 2 | 0.6 | 0.8 | 0.76 | 12° | 4 | 50 | 34,800 |
| ★ 01-00500-00500 | R0.5 | 2.5 | 0.7 | 1 | 0.95 | 12° | 4 | 50 | 31,700 |
| ★ 01-00500-00600 | R0.6 | 3 | 0.8 | 1.2 | 1.15 | 12° | 4 | 50 | 33,600 |
| ★ 01-00500-00700 | R0.7 | 3.5 | 1 | 1.4 | 1.35 | 12° | 4 | 52 | 35,800 |
| ★ 01-00500-00750 | R0.75 | 3.8 | 1 | 1.5 | 1.45 | 12° | 4 | 52 | 33,400 |
| ★ 01-00500-00800 | R0.8 | 4 | 1 | 1.6 | 1.55 | 12° | 4 | 52 | 35,300 |
| ★ 01-00500-00900 | R0.9 | 4.5 | 1.2 | 1.8 | 1.75 | 12° | 4 | 52 | 35,000 |
| ★ 01-00500-01000 | R1 | 5 | 1.2 | 2 | 1.94 | 12° | 4 | 52 | 30,000 |

**オーダー方法** SFB200 ボール半径(R)を指示してください。 ※(γ)は参考値です。
When you order, indicate SFB 200 (R). ※(γ) is reference value.

●切削条件表はB-013に記載
●Recommended Milling Conditions are shown on page B-013.

ワークサイズ：20 × 20mm
Work size : 20×20mm

SFB200

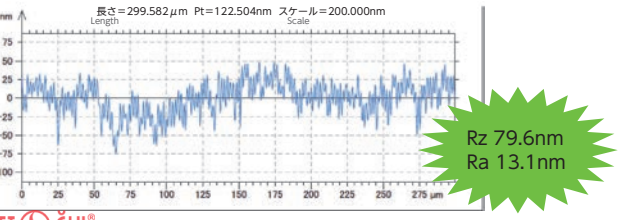
新発想・新形状の採用でR中心刃の切れ味が抜群です。長時間の超精密仕上げ加工に最適です。
Sharp tooth edge guarantees long and consistent accuracy.

### 加工事例 1 Technical Data 1

リフレクター Reflector

・被削材：ELMAX 60HRC Material : ELMAX 60HRC
・クーラント：オイルミスト Coolant : Oil mist
・総加工時間：19 時間 10 分 Total cutting time : 19hr 10min

| 加工工程 Process | 荒取り Roughing | 中仕上げ Semi-finishing | 仕上げ Finishing |
|---|---|---|---|
| 使用工具 Tool | MSBH230 R0.2 | SSBL200 R0.2×1.2 | SFB200 R0.2 |
| 回転数 [min⁻¹] Spindle speed | 40,000 | | |
| 送り速度 [mm/min] Feed | 800 | 700 | 400 |
| 切り込み量 ap×ae[mm] Depth of cut | 0.015×0.05 | 0.005×0.01 | 0.004×0.002 |
| 加工時間 Cutting time | 3時間23分 3hr 23min | 2時間10分 2hr 10min | 13時間37分 13hr 37min |

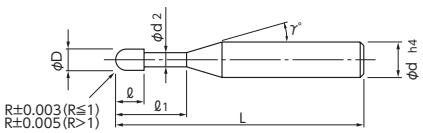





SEVKET OGLU® MAKINA TICARET VE SAN. LTD. ŞTI.

# SSPB220

## CBNスーパースパイラルボールエンドミル
CBN Super Spiral Ball End Mill




●刃先の切れ味を向上させるスパイラルボール形状を採用しました。
●刃先の耐チッピング性を向上させる刃先形状を採用しました。
●外周刃が加工面へ接触すると、切削抵抗の増加からビビリ振動が発生し、工具寿命や加工面品位に影響を与えます。
強めのバックテーパー形状を採用することで、この影響を軽減できます。
● R3 まで規格が拡大し、更に加工範囲が広がります。
●Adopted spiral ball shape to improve sharpness of cutting edge.
●Adopted cutting edge shape to improve the chipping resistance of cutting edge.
●When peripheral cutting edge makes contact with cutting surface, vibration occurs by an increase in cutting resistance and it affects tool life and cutting surface quality.The influence can be reduced by adoption of the strong back taper shape.
●Enlarged standard tool size up to R3 to extend application range.

技術資料 K-009

3D CBN 2 20° ≦68 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ◎ | ◎ | ◎ | | | | | |

★再研磨可能(全長35mm以上のもの。詳細はお問い合わせください。)　単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00505-00101 | R0.1 | 0.3 | 0.15 | 0.2 | 0.18 | 15° | 4 | 50 | 30,500 |
| 01-00505-00100 | | 0.6 | 0.15 | 0.2 | 0.18 | 15° | 4 | 50 | 31,500 |
| 01-00505-00150 | R0.15 | 0.3 | 0.23 | 0.3 | 0.28 | 15° | 4 | 50 | 30,000 |
| 01-00505-00151 | | 0.5 | 0.23 | 0.3 | 0.28 | 15° | 4 | 50 | 30,500 |
| 01-00505-00152 | | 0.75 | 0.23 | 0.3 | 0.28 | 15° | 4 | 50 | 31,000 |
| 01-00505-00201 | R0.2 | 0.5 | 0.3 | 0.4 | 0.37 | 15° | 4 | 50 | 27,100 |
| 01-00505-00202 | | 0.75 | 0.3 | 0.4 | 0.37 | 15° | 4 | 50 | 27,600 |
| 01-00505-00203 | | 1 | 0.3 | 0.4 | 0.37 | 15° | 4 | 50 | 28,100 |
| 01-00505-00200 | | 1.2 | 0.3 | 0.4 | 0.37 | 15° | 4 | 50 | 28,600 |
| 01-00505-00251 | R0.25 | 1 | 0.38 | 0.5 | 0.46 | 15° | 4 | 50 | 28,100 |
| ★ 01-00505-00301 | R0.3 | 1.2 | 0.5 | 0.6 | 0.56 | 15° | 4 | 50 | 25,900 |
| ★ 01-00505-00300 | | 1.5 | 0.5 | 0.6 | 0.56 | 15° | 4 | 50 | 26,400 |
| ★ 01-00505-00401 | R0.4 | 1.6 | 0.6 | 0.8 | 0.76 | 15° | 4 | 50 | 25,900 |
| ★ 01-00505-00400 | | 2 | 0.6 | 0.8 | 0.76 | 15° | 4 | 50 | 26,400 |
| ★ 01-00505-00501 | R0.5 | 2 | 0.7 | 1 | 0.95 | 15° | 4 | 50 | 25,900 |
| ★ 01-00505-00500 | | 2.5 | 0.7 | 1 | 0.95 | 15° | 4 | 50 | 26,400 |
| ★ 01-00505-00601 | R0.6 | 2.4 | 0.8 | 1.2 | 1.15 | 15° | 4 | 50 | 27,000 |
| ★ 01-00505-00600 | | 3 | 0.8 | 1.2 | 1.15 | 15° | 4 | 50 | 27,500 |
| ★ 01-00505-00751 | R0.75 | 3 | 1 | 1.5 | 1.45 | 15° | 4 | 52 | 27,000 |
| ★ 01-00505-00750 | | 3.8 | 1 | 1.5 | 1.45 | 15° | 4 | 52 | 27,500 |
| ★ 01-00505-01000 | R1 | 4 | 1.2 | 2 | 1.94 | 15° | 4 | 52 | 27,500 |
| ★ 01-00505-01001 | | 5 | 1.2 | 2 | 1.94 | 15° | 4 | 52 | 27,500 |
| ★ 01-00505-01506 | R1.5 | 6 | 1.8 | 3 | 2.85 | 12° | 6 | 50 | 29,000 |
| ★ 01-00505-01509 | | 9 | 1.8 | 3 | 2.85 | 12° | 6 | 70 | 30,000 |
| ★ 01-00505-02008 | R2 | 8 | 2.4 | 4 | 3.8 | 12° | 6 | 50 | 35,000 |
| ★ 01-00505-02012 | | 12 | 2.4 | 4 | 3.8 | 12° | 6 | 70 | 36,000 |
| ★ 01-00505-02510 | R2.5 | 10 | 3 | 5 | 4.8 | 12° | 6 | 60 | 41,000 |
| ★ 01-00505-02515 | | 15 | 3 | 5 | 4.8 | 12° | 6 | 80 | 42,000 |
| ★ 01-00505-03012 | R3 | 12 | 3.6 | 6 | 5.8 | – | 6 | 60 | 48,000 |
| ★ 01-00505-03018 | | 18 | 3.6 | 6 | 5.8 | – | 6 | 80 | 49,000 |

オーダー方法　SSPB220 ボール半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate SSPB220 (R)X(ℓ1).

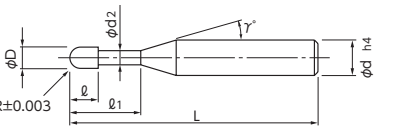
※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はB-014に記載
●Recommended Milling Conditions are shown on page B-014.

# SSPBL220

## CBNスーパースパイラルロングネックボールエンドミル

CBN Super Spiral Long Neck Ball End Mill




● SSPB220 の有効長を更に延長した規格が標準化しました。
●切れ味と耐チッピング性を両立させたスパイラルボール形状と、強めのバックテーパー形状の採用で、SSPB220 の特長を活かしながら、更に深部の仕上げ加工に対応します。
● Added longer effective length type to SSPB220 series.
● Realized deeper milling by adoption of spiral ball shape and strong back taper shape to improve both sharpness and the chipping resistance of cutting edges.

技術資料 K-011

3D CBN 2 20° ≦68 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ◎ | ◎ | ◎ | | | | | |

★再研磨可能(全長35mm以上のもの。詳細はお問い合わせください。)

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00506-00101 | R0.1 | 1 | 0.15 | 0.2 | 0.18 | 15° | 4 | 50 | 33,000 |
| 01-00506-00151 | R0.15 | 0.9 | 0.23 | 0.3 | 0.28 | 15° | 4 | 50 | 31,500 |
| 01-00506-00152 | | 1.5 | 0.23 | 0.3 | 0.28 | 15° | 4 | 50 | 31,500 |
| 01-00506-00201 | R0.2 | 2 | 0.3 | 0.4 | 0.37 | 15° | 4 | 50 | 30,000 |
| 01-00506-00202 | | 3 | 0.3 | 0.4 | 0.37 | 15° | 4 | 52 | 30,000 |
| 01-00506-00251 | R0.25 | 1.5 | 0.38 | 0.5 | 0.46 | 15° | 4 | 50 | 29,000 |
| 01-00506-00252 | | 2.5 | 0.38 | 0.5 | 0.46 | 15° | 4 | 50 | 29,000 |
| 01-00506-00253 | | 3.5 | 0.38 | 0.5 | 0.46 | 15° | 4 | 52 | 29,000 |
| ★ 01-00506-00301 | R0.3 | 3 | 0.5 | 0.6 | 0.56 | 15° | 4 | 50 | 28,000 |
| ★ 01-00506-00302 | | 4 | 0.5 | 0.6 | 0.56 | 15° | 4 | 53 | 28,000 |
| ★ 01-00506-00303 | | 5 | 0.5 | 0.6 | 0.56 | 15° | 4 | 53 | 28,500 |
| ★ 01-00506-00304 | | 6 | 0.5 | 0.6 | 0.56 | 15° | 4 | 53 | 28,500 |
| ★ 01-00506-00401 | R0.4 | 4 | 0.6 | 0.8 | 0.76 | 15° | 4 | 53 | 28,000 |
| ★ 01-00506-00402 | | 6 | 0.6 | 0.8 | 0.76 | 15° | 4 | 53 | 28,000 |
| ★ 01-00506-00501 | R0.5 | 4 | 0.7 | 1 | 0.95 | 15° | 4 | 51 | 28,000 |
| ★ 01-00506-00502 | | 6 | 0.7 | 1 | 0.95 | 15° | 4 | 53 | 28,000 |
| ★ 01-00506-00503 | | 8 | 0.7 | 1 | 0.95 | 15° | 4 | 53 | 28,500 |
| ★ 01-00506-00504 | | 10 | 0.7 | 1 | 0.95 | 15° | 4 | 53 | 28,500 |
| ★ 01-00506-00601 | R0.6 | 6 | 0.8 | 1.2 | 1.15 | 15° | 4 | 53 | 29,000 |
| ★ 01-00506-00751 | R0.75 | 7.5 | 1 | 1.5 | 1.45 | 15° | 4 | 52 | 29,000 |
| ★ 01-00506-00752 | | 10 | 1 | 1.5 | 1.45 | 15° | 4 | 52 | 29,000 |
| ★ 01-00506-00753 | | 15 | 1 | 1.5 | 1.45 | 15° | 4 | 52 | 29,000 |
| ★ 01-00506-01001 | R1 | 6 | 1.2 | 2 | 1.94 | 15° | 4 | 53 | 29,000 |
| ★ 01-00506-01002 | | 8 | 1.2 | 2 | 1.94 | 15° | 4 | 53 | 29,000 |
| ★ 01-00506-01003 | | 10 | 1.2 | 2 | 1.94 | 15° | 4 | 53 | 29,500 |
| ★ 01-00506-01004 | | 14 | 1.2 | 2 | 1.94 | 15° | 4 | 53 | 29,500 |
| ★ 01-00506-01005 | | 20 | 1.2 | 2 | 1.94 | 15° | 4 | 53 | 29,500 |

オーダー方法 SSPBL220 ボール半径(R)×有効長(ℓ1)を指示してください。 ※(γ)は参考値です。
When you order, indicate SSPBL220 (R)X(ℓ1). ※(γ) is reference value.

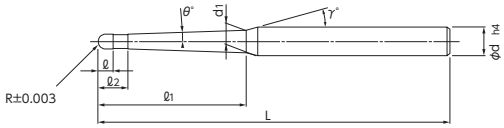
●切削条件表はB-015に記載
●Recommended Milling Conditions are shown on page B-015.



ŞEVKET ÖĞÜT® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# SSPBTN220

## CBNスーパースパイラルロングテーパーネックボールエンドミル
CBN Super Spiral Long Taper Neck Ball End Mill




●高剛性化を可能にするテーパーネック形状を採用した CBN ロングネックボールエンドミル。
●切れ味を向上させたスパイラルボール形状と合わせて、深部の仕上げ加工で精度・能率が向上します。
●To realize more rigid, CBN long neck ball end mill with taper neck are adopted.
●Both efficiency and accuracy are increasing by taper neck design and spiral ball shape with improved sharpness in finish processing on deep milling.

技術資料 K-012

3D CBN 2 20° ≦68 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ◎ | ◎ | ◎ | | | | | |

★再研磨可能(全長35mm以上のもの。詳細はお問い合わせください。)

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (α)有効勾配角 Effective Wall Gradient Angle | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01-00507-01020 | R0.1 | 30′ | 1.5 | 0°15′ | 0.22 | 0.15 | 0.25 | 15° | 4 | 50 | 38,000 |
| 01-00507-01021 | | | 2 | 0°15′ | 0.22 | 0.15 | 0.25 | 15° | 4 | 50 | 38,500 |
| 01-00507-01030 | | 1° | 1.5 | 0°45′ | 0.24 | 0.15 | 0.25 | 15° | 4 | 50 | 38,000 |
| 01-00507-01031 | | | 2 | 0°45′ | 0.25 | 0.15 | 0.25 | 15° | 4 | 50 | 38,500 |
| 01-00507-01040 | | 1°30′ | 1.5 | 1°15′ | 0.27 | 0.15 | 0.25 | 15° | 4 | 50 | 38,000 |
| 01-00507-01041 | | | 2 | 1°15′ | 0.29 | 0.15 | 0.25 | 15° | 4 | 50 | 38,500 |
| 01-00507-01050 | | 2° | 1.5 | 1°45′ | 0.29 | 0.15 | 0.25 | 15° | 4 | 50 | 38,000 |
| 01-00507-01051 | | | 2 | 1°45′ | 0.32 | 0.15 | 0.25 | 15° | 4 | 50 | 38,500 |
| 01-00507-01520 | R0.15 | 30′ | 2 | 0°16′ | 0.32 | 0.23 | 0.38 | 15° | 4 | 50 | 36,000 |
| 01-00507-01521 | | | 3 | 0°16′ | 0.33 | 0.23 | 0.38 | 15° | 4 | 52 | 36,500 |
| 01-00507-01530 | | 1° | 2 | 0°46′ | 0.35 | 0.23 | 0.38 | 15° | 4 | 50 | 36,000 |
| 01-00507-01531 | | | 3 | 0°46′ | 0.38 | 0.23 | 0.38 | 15° | 4 | 52 | 36,500 |
| 01-00507-01540 | | 1°30′ | 2 | 1°16′ | 0.39 | 0.23 | 0.38 | 15° | 4 | 50 | 36,000 |
| 01-00507-01541 | | | 3 | 1°16′ | 0.43 | 0.23 | 0.38 | 15° | 4 | 52 | 36,500 |
| 01-00507-01550 | | 2° | 2 | 1°46′ | 0.42 | 0.23 | 0.38 | 15° | 4 | 50 | 36,000 |
| 01-00507-01551 | | | 3 | 1°46′ | 0.48 | 0.23 | 0.38 | 15° | 4 | 52 | 36,500 |
| 01-00507-02020 | R0.2 | 30′ | 3 | 0°18′ | 0.43 | 0.3 | 0.5 | 15° | 4 | 50 | 34,500 |
| 01-00507-02021 | | | 4 | 0°18′ | 0.44 | 0.3 | 0.5 | 15° | 4 | 52 | 35,000 |
| 01-00507-02030 | | 1° | 3 | 0°48′ | 0.48 | 0.3 | 0.5 | 15° | 4 | 50 | 34,500 |
| 01-00507-02031 | | | 4 | 0°48′ | 0.51 | 0.3 | 0.5 | 15° | 4 | 52 | 35,000 |
| 01-00507-02040 | | 1°30′ | 3 | 1°18′ | 0.53 | 0.3 | 0.5 | 15° | 4 | 50 | 34,500 |
| 01-00507-02041 | | | 4 | 1°18′ | 0.58 | 0.3 | 0.5 | 15° | 4 | 52 | 35,000 |
| 01-00507-02050 | | 2° | 3 | 1°48′ | 0.58 | 0.3 | 0.5 | 15° | 4 | 50 | 34,500 |
| 01-00507-02051 | | | 4 | 1°48′ | 0.64 | 0.3 | 0.5 | 15° | 4 | 52 | 35,000 |
| 01-00507-02520 | R0.25 | 30′ | 4 | 0°18′ | 0.54 | 0.38 | 0.62 | 15° | 4 | 52 | 33,500 |
| 01-00507-02521 | | | 5 | 0°18′ | 0.55 | 0.38 | 0.62 | 15° | 4 | 52 | 34,000 |
| 01-00507-02530 | | 1° | 4 | 0°48′ | 0.61 | 0.38 | 0.62 | 15° | 4 | 52 | 33,500 |
| 01-00507-02531 | | | 5 | 0°48′ | 0.64 | 0.38 | 0.62 | 15° | 4 | 52 | 34,000 |
| 01-00507-02540 | | 1°30′ | 4 | 1°18′ | 0.67 | 0.38 | 0.62 | 15° | 4 | 52 | 33,500 |
| 01-00507-02541 | | | 5 | 1°18′ | 0.72 | 0.38 | 0.62 | 15° | 4 | 52 | 34,000 |
| 01-00507-02550 | | 2° | 4 | 1°48′ | 0.74 | 0.38 | 0.62 | 15° | 4 | 52 | 33,500 |
| 01-00507-02551 | | | 5 | 1°48′ | 0.8 | 0.38 | 0.62 | 15° | 4 | 52 | 34,000 |

オーダー方法 SSPBTN220 ボール半径(R)×首角(θ)×有効長(ℓ1)を指示してください。
When you order, indicate SSPBTN220 (R)X(θ)X(ℓ1).

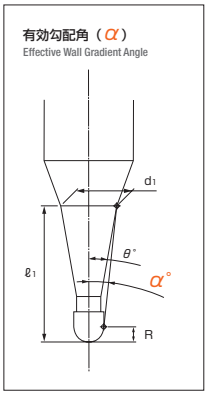
※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はB-016に記載
●Recommended Milling Conditions are shown on page B-016.

# SSPBTN220

## CBNスーパースパイラルロングテーパーネックボールエンドミル

CBN Super Spiral Long Taper Neck Ball End Mill




★再研磨可能(全長35mm以上のもの。詳細はお問い合わせください。)

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (α)有効勾配角 Effective Wall Gradient Angle | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ★ 01-00507-03020 | R0.3 | 30′ | 5 | 0°18′ | 0.65 | 0.5 | 0.75 | 15° | 4 | 53 | 32,500 |
| ★ 01-00507-03021 | | | 6 | 0°18′ | 0.66 | 0.5 | 0.75 | 15° | 4 | 53 | 33,000 |
| ★ 01-00507-03030 | | 1° | 5 | 0°48′ | 0.74 | 0.5 | 0.75 | 15° | 4 | 53 | 32,500 |
| ★ 01-00507-03031 | | | 6 | 0°48′ | 0.76 | 0.5 | 0.75 | 15° | 4 | 53 | 33,000 |
| ★ 01-00507-03040 | | 1°30′ | 5 | 1°18′ | 0.82 | 0.5 | 0.75 | 15° | 4 | 53 | 32,500 |
| ★ 01-00507-03041 | | | 6 | 1°18′ | 0.86 | 0.5 | 0.75 | 15° | 4 | 53 | 33,000 |
| ★ 01-00507-03050 | | 2° | 5 | 1°48′ | 0.9 | 0.5 | 0.75 | 15° | 4 | 53 | 32,500 |
| ★ 01-00507-03051 | | | 6 | 1°48′ | 0.96 | 0.5 | 0.75 | 15° | 4 | 53 | 33,000 |
| ★ 01-00507-05020 | R0.5 | 30′ | 8 | 0°21′ | 1.1 | 0.7 | 1.25 | 15° | 4 | 53 | 32,000 |
| ★ 01-00507-05021 | | | 10 | 0°21′ | 1.12 | 0.7 | 1.25 | 15° | 4 | 53 | 32,500 |
| ★ 01-00507-05030 | | 1° | 8 | 0°51′ | 1.23 | 0.7 | 1.25 | 15° | 4 | 53 | 32,000 |
| ★ 01-00507-05031 | | | 10 | 0°51′ | 1.29 | 0.7 | 1.25 | 15° | 4 | 53 | 32,500 |
| ★ 01-00507-05040 | | 1°30′ | 8 | 1°21′ | 1.36 | 0.7 | 1.25 | 15° | 4 | 53 | 32,000 |
| ★ 01-00507-05041 | | | 10 | 1°21′ | 1.45 | 0.7 | 1.25 | 15° | 4 | 53 | 32,500 |
| ★ 01-00507-05050 | | 2° | 8 | 1°51′ | 1.49 | 0.7 | 1.25 | 15° | 4 | 53 | 32,000 |
| ★ 01-00507-05051 | | | 10 | 1°51′ | 1.62 | 0.7 | 1.25 | 15° | 4 | 53 | 32,500 |
| ★ 01-00507-07520 | R0.75 | 30′ | 10 | 0°22′ | 1.62 | 1 | 1.9 | 15° | 4 | 52 | 33,500 |
| ★ 01-00507-07521 | | | 15 | 0°22′ | 1.69 | 1 | 1.9 | 15° | 4 | 52 | 34,000 |
| ★ 01-00507-07530 | | 1° | 10 | 0°52′ | 1.78 | 1 | 1.9 | 15° | 4 | 52 | 33,500 |
| ★ 01-00507-07531 | | | 15 | 0°52′ | 1.94 | 1 | 1.9 | 15° | 4 | 52 | 34,000 |
| ★ 01-00507-07540 | | 1°30′ | 10 | 1°22′ | 1.95 | 1 | 1.9 | 15° | 4 | 52 | 33,500 |
| ★ 01-00507-07541 | | | 15 | 1°22′ | 2.18 | 1 | 1.9 | 15° | 4 | 52 | 34,000 |
| ★ 01-00507-07550 | | 2° | 10 | 1°52′ | 2.11 | 1 | 1.9 | 15° | 4 | 52 | 33,500 |
| ★ 01-00507-07551 | | | 15 | 1°52′ | 2.43 | 1 | 1.9 | 15° | 4 | 52 | 34,000 |
| ★ 01-00507-10020 | R1 | 30′ | 16 | 0°24′ | 2.21 | 1.2 | 2.5 | 15° | 4 | 53 | 33,500 |
| ★ 01-00507-10021 | | | 20 | 0°24′ | 2.27 | 1.2 | 2.5 | 15° | 4 | 53 | 34,000 |
| ★ 01-00507-10030 | | 1° | 16 | 0°54′ | 2.48 | 1.2 | 2.5 | 15° | 4 | 53 | 33,500 |
| ★ 01-00507-10031 | | | 20 | 0°54′ | 2.6 | 1.2 | 2.5 | 15° | 4 | 53 | 34,000 |
| ★ 01-00507-10040 | | 1°30′ | 16 | 1°24′ | 2.74 | 1.2 | 2.5 | 15° | 4 | 53 | 33,500 |
| ★ 01-00507-10041 | | | 20 | 1°24′ | 2.93 | 1.2 | 2.5 | 15° | 4 | 53 | 34,000 |
| ★ 01-00507-10050 | | 2° | 16 | 1°54′ | 3 | 1.2 | 2.5 | 15° | 4 | 53 | 33,500 |
| ★ 01-00507-10051 | | | 20 | 1°54′ | 3.26 | 1.2 | 2.5 | 15° | 4 | 53 | 34,000 |

**オーダー方法**

SSPBTN220 ボール半径(R)×首角(θ)×有効長(ℓ1)を指示してください。
When you order, indicate SSPBTN220 (R)X(θ)X(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

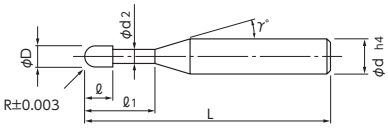
●切削条件表はB-016に記載
●Recommended Milling Conditions are shown on page B-016.



ŞEVKET ÖLÜ® MAKINA TİCARET VE SAN. LTD. ŞTİ.

# SSB200

## CBNスーパースピードボールエンドミル
CBN Super Speed Ball End Mill




●CBN の長寿命・高精度と超硬の使い易さを両立した高能率 CBN ボールエンドミル。
●超硬の仕上げと同等の切り込みが可能。
●独自の刃形状により R 精度± 0.003・耐チッピング性能が UP！
●R 刃と外周刃のつなぎが、スムーズな段差の無い形状。
●～ 68HRC の高硬度材まで加工可能！
●This CBN Ball End Mill has realized both advantages of CBN and Carbide.
●Depth of Cut can be increased at the equivalent level to Carbide.
●Unique flute design with R-accuracy ±0.003 prevents chipping!
●Flute is smoothly tangent from straight line to R-curve.
●Applicable for hardened materials up to 68HRC!

技術資料 K-008

3D CBN 2 0° ≦68 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ◎ | ◎ | ◎ | | | | | |

★再研磨可能(全長35mm以上のもの。詳細はお問い合わせください。)

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00510-00100 | R0.1 | 0.3 | 0.15 | 0.2 | 0.18 | 15° | 4 | 50 | 26,000 |
| 01-00510-00150 | R0.15 | 0.3 | 0.23 | 0.3 | 0.28 | 15° | 4 | 50 | 26,000 |
| 01-00510-00151 | | 0.5 | 0.23 | 0.3 | 0.28 | 15° | 4 | 50 | 26,000 |
| 01-00510-00152 | | 0.75 | 0.23 | 0.3 | 0.28 | 15° | 4 | 50 | 26,500 |
| ★ 01-00510-00200 | R0.2 | 0.5 | 0.3 | 0.4 | 0.37 | 15° | 4 | 50 | 25,000 |
| ★ 01-00510-00201 | | 0.75 | 0.3 | 0.4 | 0.37 | 15° | 4 | 50 | 25,500 |
| ★ 01-00510-00202 | | 1 | 0.3 | 0.4 | 0.37 | 15° | 4 | 50 | 25,500 |
| ★ 01-00510-00250 | R0.25 | 1 | 0.38 | 0.5 | 0.46 | 15° | 4 | 50 | 25,000 |
| ★ 01-00510-00300 | R0.3 | 1.5 | 0.5 | 0.6 | 0.56 | 15° | 4 | 50 | 24,000 |
| ★ 01-00510-00400 | R0.4 | 2 | 0.6 | 0.8 | 0.76 | 15° | 4 | 50 | 24,000 |
| ★ 01-00510-00500 | R0.5 | 2.5 | 0.7 | 1 | 0.95 | 15° | 4 | 50 | 24,000 |
| ★ 01-00510-00600 | R0.6 | 3 | 0.8 | 1.2 | 1.15 | 15° | 4 | 50 | 25,000 |
| ★ 01-00510-00750 | R0.75 | 3.8 | 1 | 1.5 | 1.45 | 15° | 4 | 52 | 25,000 |
| ★ 01-00510-01001 | R1 | 4 | 1.2 | 2 | 1.94 | 15° | 4 | 52 | 25,000 |
| ★ 01-00510-01000 | | 5 | 1.2 | 2 | 1.94 | 15° | 4 | 52 | 25,000 |

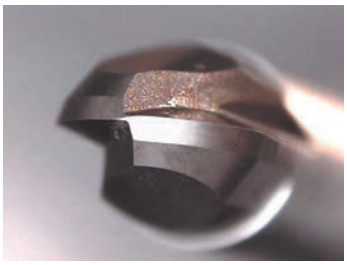
オーダー方法

SSB200 ボール半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate SSB200 (R)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はB-018に記載
●Recommended Milling Conditions are shown on page B-018.

SSB200

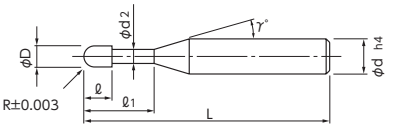


切りくず排出性が非常に良好で、切り込み量を超硬（仕上げ）と同等に多くとることが可能で高能率な加工に最適です。
Bigger cutting depth was realized with better chip disposal.

# SSBL200

## CBNスーパースピードロングネックボールエンドミル

CBN Super Speed Long Neck Ball End Mill




- ●深彫り加工に対応。ロングネックタイプをシリーズ化！全 25 サイズ！
- ●有効長が 10mm まで。今までの CBN 工具に比べ、より深い加工に対応。
- ●CBN の長寿命と、ロングネックにより新たな加工領域を実現。
- ●極小径サイズ R0.05 から規格化！
- ●独自の刃形状により R 精度±0.003、耐チッピング性能が UP！
- ●Lineup of CBN tool with long neck applicable to deep milling, available 25 sizes in total.
- ●Enables milling more deeply by long effective length up to 10mm comparing with conventional CBN tools.
- ●Enables wider application for milling by long neck in addition to long life and accurate finishing.
- ●Standardized in R0.05 at smallest.
- ●Unique flute design with R-accuracy ±0.003 prevents chipping!

3D CBN 2 0° ≦68 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ◎ | ◎ | ◎ | | | | | |

★再研磨可能(全長35mm以上のもの。詳細はお問い合わせください。)

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00511-00051 | R0.05 | 0.3 | 0.08 | 0.1 | 0.085 | 15° | 4 | 50 | 38,200 |
| 01-00511-00052 | | 0.5 | 0.08 | 0.1 | 0.085 | 15° | 4 | 50 | 39,800 |
| 01-00511-00075 | R0.075 | 0.45 | 0.12 | 0.15 | 0.13 | 15° | 4 | 50 | 38,200 |
| 01-00511-00076 | | 0.75 | 0.12 | 0.15 | 0.13 | 15° | 4 | 50 | 39,800 |
| 01-00511-00101 | R0.1 | 0.6 | 0.15 | 0.2 | 0.18 | 15° | 4 | 50 | 28,600 |
| 01-00511-00102 | | 1 | 0.15 | 0.2 | 0.18 | 15° | 4 | 50 | 30,000 |
| 01-00511-00151 | R0.15 | 0.9 | 0.23 | 0.3 | 0.28 | 15° | 4 | 50 | 28,600 |
| 01-00511-00152 | | 1.5 | 0.23 | 0.3 | 0.28 | 15° | 4 | 50 | 30,000 |
| ★ 01-00511-00201 | R0.2 | 1.2 | 0.3 | 0.4 | 0.37 | 15° | 4 | 50 | 26,000 |
| ★ 01-00511-00202 | | 2 | 0.3 | 0.4 | 0.37 | 15° | 4 | 50 | 27,600 |
| ★ 01-00511-00251 | R0.25 | 1.5 | 0.38 | 0.5 | 0.46 | 15° | 4 | 50 | 26,000 |
| ★ 01-00511-00252 | | 2.5 | 0.38 | 0.5 | 0.46 | 15° | 4 | 50 | 27,600 |
| ★ 01-00511-00301 | R0.3 | 3 | 0.5 | 0.6 | 0.56 | 15° | 4 | 50 | 25,600 |
| ★ 01-00511-00302 | | 4 | 0.5 | 0.6 | 0.56 | 15° | 4 | 52 | 25,600 |
| ★ 01-00511-00303 | | 5 | 0.5 | 0.6 | 0.56 | 15° | 4 | 52 | 26,000 |
| ★ 01-00511-00401 | R0.4 | 4 | 0.6 | 0.8 | 0.76 | 12° | 4 | 53 | 25,600 |
| ★ 01-00511-00501 | R0.5 | 4 | 0.7 | 1 | 0.95 | 12° | 4 | 53 | 25,600 |
| ★ 01-00511-00502 | | 5 | 0.7 | 1 | 0.95 | 12° | 4 | 53 | 25,600 |
| ★ 01-00511-00504 | | 6 | 0.7 | 1 | 0.95 | 15° | 4 | 53 | 25,600 |
| ★ 01-00511-00506 | | 8 | 0.7 | 1 | 0.95 | 15° | 4 | 53 | 26,000 |
| ★ 01-00511-00508 | | 10 | 0.7 | 1 | 0.95 | 15° | 4 | 53 | 26,600 |
| ★ 01-00511-00751 | R0.75 | 7.5 | 1 | 1.5 | 1.45 | 15° | 4 | 52 | 27,600 |
| ★ 01-00511-01001 | R1 | 6 | 1.2 | 2 | 1.94 | 15° | 4 | 52 | 25,000 |
| ★ 01-00511-01003 | | 8 | 1.2 | 2 | 1.94 | 15° | 4 | 52 | 27,600 |
| ★ 01-00511-01005 | | 10 | 1.2 | 2 | 1.94 | 15° | 4 | 52 | 27,600 |

**オーダー方法**

SSBL200 ボール半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate SSBL 200 (R)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はB-019に記載
●Recommended Milling Conditions are shown on page B-019.



SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTİ.

# SMB120

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 焼き入れ鋼 Hardened Steels STAVAX・SKD11・PD613 (～62HRC) | | | | |
|---|---|---|---|---|---|
| Rサイズ Radius | 切り込み量 Depth of Cut | | 送り速度 Feed | アプローチ速度 Approaching Feed | 回転数 Spindle Speed |
| | ap mm | ae mm | mm/min | mm/min | $min^{-1}$ |
| 0.01 | 0.0005 | 0.001 | 5 | 3 | 80,000 |
| 0.02 | 0.001 | 0.001 | 30 | 5 | 80,000 |
| 0.03 | 0.001 | 0.002 | 70 | 10 | 80,000 |
| 0.04 | 0.002 | 0.003 | 100 | 30 | 80,000 |
| 0.05 | 0.002 | 0.005 | 200 | 30 | 80,000 |

**備　考 Notes**

※切り込み量の、ap は深さ方向の切り込み量、ae はピックフィードを示します。
※工具の着脱やプリセット時には細心の注意を払ってください。
※オイルミストクーラントをご使用ください。
※チャッキングの振れは極力抑えてください。
（可能ならば使用される回転数での動的振れ精度を確認してください。）
※アプローチ角は３°以下にしてください。
※切り込み量の増加は工具折損の要因となります。特に ap の数値には気を付けてください。
※Depth of Cut : ap=Axial Depth of Cut / ae=Radial Depth of Cut.
※Handle with care when exchanging and presetting tool.
※We recommend using oil mist coolant.
※Minimize chucking runout.
(Recommend to measure actual runout at activated spindle speed.)
※Tool approaching angle must be 3 degrees or below.
※Increase of Depth of Cut may cause a tool breakage, especially careful for Axial Depth of Cut.

# SFB200

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 調質鋼・焼き入れ鋼・ハイス Prehardened Steels・Hardened Steels・High Speed Tool Steels NAK・SKD・SKH・HAP (～68HRC) | | | | | |
|---|---|---|---|---|---|---|
| Rサイズ Radius | 切り込み量 Depth of Cut | | 通常条件 Normal Speed | | 高速条件 High Speed | |
| | | | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed |
| | ap mm | ae mm | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ |
| 0.1～0.2 | 0.005 | 0.01 | 600 | 20,000 | 1,500 | 50,000 |
| 0.25～0.3 | 0.01 | 0.01 | 800 | | 2,000 | |
| 0.4～0.6 | 0.01 | 0.02 | 1,200 | | 3,000 | |
| 0.7～0.8 | 0.01 | 0.02 | 1,600 | | 4,000 | |
| 0.9～1 | 0.02 | 0.05 | 2,000 | | 5,000 | |

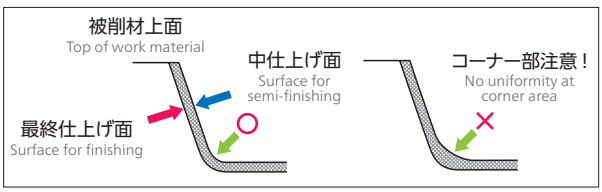
**備　考 Notes**

※超精密仕上げ加工用のエンドミルです。超硬工具での仕上げ加工後にご使用ください。
※切り込み量は、切削条件参考表の数値以内で、一定にしてご使用ください。
※コーナー部の加工では、特に条件設定（ツールパスなど）に注意してください。
※オイルミストクーラントをご使用ください。
※ミーリングチャック、機械は、出来るだけ精度の高いものをお奨めします。
※SFB200 is a Super-Finish Ball End Mill recommended to use after the finish process of carbide end mill.
※Cutting depth must be fixed all through the milling process according to the recommended milling conditions.
※Pay a special attention when choosing tool path and deciding a milling condition for corner milling.
※We recommend using oil mist coolant.
※Machine, tool chuck must be sufficiently accurate.

### CBNエンドミルをより良くご使用いただくためのポイント
Main points to ensure an effective use of CBN End Mill.

加工面全体が、均一な取り代となるようにしてください（特にコーナー部等ご注意ください）。
これらの事が、加工精度・工具寿命に影響します。

Uniforming removal stock is important for machining accuracy and tool life, especially at corner area.



# SSPB220

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-009

| 被削材 Work Material | | 調質鋼・焼き入れ鋼 Prehardened Steels・Hardened Steels NAK80・STAVAX・SKD61 (~52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・ELMAX (~62HRC) | | | | ハイス High Speed Tool Steels SKH・HAP (~68HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R サイズ Radius | 有効長 Effective Length | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.1 | 0.3 | 0.005 | 0.005 | 600 | 40,000 | 0.005 | 0.005 | 450 | 40,000 | 0.003 | 0.003 | 300 | 40,000 |
| | 0.6 | 0.005 | 0.005 | 500 | 40,000 | 0.005 | 0.005 | 350 | 40,000 | 0.003 | 0.003 | 250 | 40,000 |
| 0.15 | 0.3 | 0.005 | 0.005 | 800 | 40,000 | 0.005 | 0.005 | 600 | 40,000 | 0.003 | 0.003 | 450 | 40,000 |
| | 0.5 | 0.005 | 0.005 | 750 | 40,000 | 0.005 | 0.005 | 550 | 40,000 | 0.003 | 0.003 | 400 | 40,000 |
| | 0.75 | 0.005 | 0.005 | 700 | 40,000 | 0.005 | 0.005 | 500 | 40,000 | 0.003 | 0.003 | 400 | 40,000 |
| 0.2 | 0.5 | 0.005 | 0.01 | 1,200 | 40,000 | 0.005 | 0.01 | 900 | 40,000 | 0.005 | 0.005 | 600 | 40,000 |
| | 0.75 | 0.005 | 0.01 | 1,100 | 40,000 | 0.005 | 0.01 | 850 | 40,000 | 0.005 | 0.005 | 550 | 40,000 |
| | 1 | 0.005 | 0.01 | 1,000 | 40,000 | 0.005 | 0.01 | 800 | 40,000 | 0.005 | 0.005 | 500 | 40,000 |
| | 1.2 | 0.005 | 0.01 | 1,000 | 40,000 | 0.005 | 0.01 | 800 | 40,000 | 0.005 | 0.005 | 500 | 40,000 |
| 0.25 | 1 | 0.01 | 0.01 | 1,200 | 40,000 | 0.01 | 0.01 | 1,000 | 40,000 | 0.005 | 0.005 | 700 | 40,000 |
| 0.3 | 1.2 | 0.01 | 0.02 | 1,800 | 40,000 | 0.01 | 0.02 | 1,500 | 40,000 | 0.005 | 0.01 | 1,000 | 40,000 |
| | 1.5 | 0.01 | 0.02 | 1,500 | 40,000 | 0.01 | 0.02 | 1,200 | 40,000 | 0.005 | 0.01 | 800 | 40,000 |
| 0.4 | 1.6 | 0.01 | 0.02 | 1,800 | 40,000 | 0.01 | 0.02 | 1,500 | 40,000 | 0.005 | 0.01 | 1,000 | 40,000 |
| | 2 | 0.01 | 0.02 | 1,500 | 40,000 | 0.01 | 0.02 | 1,200 | 40,000 | 0.005 | 0.01 | 800 | 40,000 |
| 0.5 | 2 | 0.02 | 0.04 | 2,500 | 40,000 | 0.02 | 0.03 | 1,800 | 40,000 | 0.01 | 0.02 | 1,200 | 40,000 |
| | 2.5 | 0.02 | 0.04 | 2,000 | 40,000 | 0.02 | 0.03 | 1,500 | 40,000 | 0.01 | 0.02 | 1,000 | 40,000 |
| 0.6 | 2.4 | 0.02 | 0.04 | 2,500 | 40,000 | 0.02 | 0.03 | 2,000 | 40,000 | 0.01 | 0.02 | 1,500 | 40,000 |
| | 3 | 0.02 | 0.04 | 2,500 | 40,000 | 0.02 | 0.03 | 2,000 | 40,000 | 0.01 | 0.02 | 1,500 | 40,000 |
| 0.75 | 3 | 0.03 | 0.05 | 3,000 | 40,000 | 0.03 | 0.05 | 3,000 | 40,000 | 0.02 | 0.03 | 2,000 | 30,000 |
| | 3.8 | 0.03 | 0.05 | 3,000 | 40,000 | 0.03 | 0.05 | 3,000 | 40,000 | 0.02 | 0.03 | 2,000 | 30,000 |
| 1 | 4 | 0.05 | 0.1 | 3,000 | 30,000 | 0.03 | 0.05 | 3,000 | 30,000 | 0.03 | 0.03 | 2,000 | 25,000 |
| | 5 | 0.05 | 0.1 | 3,000 | 30,000 | 0.03 | 0.05 | 3,000 | 30,000 | 0.03 | 0.03 | 2,000 | 25,000 |
| 1.5 | 6 | 0.08 | 0.15 | 2,300 | 20,000 | 0.05 | 0.075 | 2,100 | 20,000 | 0.04 | 0.06 | 1,300 | 15,000 |
| | 9 | 0.06 | 0.12 | 2,200 | 20,000 | 0.04 | 0.06 | 2,000 | 20,000 | 0.04 | 0.05 | 1,200 | 15,000 |
| 2 | 8 | 0.1 | 0.18 | 2,300 | 17,000 | 0.06 | 0.09 | 2,100 | 15,000 | 0.05 | 0.07 | 1,300 | 12,000 |
| | 12 | 0.08 | 0.15 | 2,000 | 17,000 | 0.05 | 0.08 | 1,700 | 15,000 | 0.04 | 0.06 | 1,200 | 12,000 |
| 2.5 | 10 | 0.11 | 0.21 | 2,200 | 13,000 | 0.08 | 0.12 | 1,800 | 12,000 | 0.07 | 0.1 | 1,300 | 11,000 |
| | 15 | 0.1 | 0.18 | 1,900 | 13,000 | 0.06 | 0.1 | 1,500 | 12,000 | 0.06 | 0.08 | 1,100 | 11,000 |
| 3 | 12 | 0.13 | 0.24 | 2,000 | 10,000 | 0.09 | 0.15 | 1,600 | 10,000 | 0.08 | 0.12 | 1,200 | 10,000 |
| | 18 | 0.11 | 0.21 | 1,700 | 10,000 | 0.08 | 0.12 | 1,400 | 10,000 | 0.07 | 0.1 | 1,000 | 10,000 |

**備考 Notes**

※切り込み量は、中仕上げ・仕上げ加工を行う場合の最大値です。機械剛性や要求精度などに合わせて調整してください。
※仕上げ代が加工面に対して均一になるよう、前加工（中仕上げ）時に注意してください。
※コーナー部等負荷が高くなる加工箇所では、条件設定やツールパスなどに注意してください。
※高品位な加工面を求める場合、加工条件で切り込み量を 70%、送り速度を 70%程度に調整して加工を行ってください。
※クーラントはオイルミストをお奨めします。
※加工機械の都合で回転数を調整する場合、同じ割合で送り速度を調整してください。
※Max. Depth of Cut for semi-finishing and finishing. Adjust milling conditions depending on the rigidity of the machine and desired accuracy.
※Obtain uniform stock amount on the cutting surface in the pre-stage cutting (semi-finishing).
※Required careful set up of milling conditions, tool path and etc. at cutting parts, such as corners where will become overloaded.
※Adjust both Depth of Cut and feed rate at 70% of the recommended milling conditions for high quality milling surface.
※Oil mist coolant is recommended.
※Adjust feed rate at same rate as spindle speed if necessary to adjust spindle speed from recommended milling conditions.



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# SSPBL220

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-011

| 被削材 Work Material | | 調質鋼・焼き入れ鋼 Prehardened Steels・Hardened Steels NAK80・STAVAX・SKD61 (~52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・ELMAX (~62HRC) | | | | ハイス High Speed Tool Steels SKH・HAP (~68HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 有効長 Effective Length | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.1 | 1 | 0.005 | 0.005 | 200 | 40,000 | 0.005 | 0.005 | 150 | 40,000 | 0.003 | 0.003 | 100 | 40,000 |
| 0.15 | 0.9 | 0.005 | 0.005 | 600 | 40,000 | 0.005 | 0.005 | 400 | 40,000 | 0.003 | 0.005 | 300 | 40,000 |
| | 1.5 | 0.005 | 0.005 | 320 | 40,000 | 0.005 | 0.005 | 240 | 40,000 | 0.003 | 0.005 | 160 | 40,000 |
| 0.2 | 2 | 0.005 | 0.01 | 500 | 40,000 | 0.005 | 0.01 | 400 | 40,000 | 0.005 | 0.005 | 320 | 40,000 |
| | 3 | 0.005 | 0.005 | 250 | 40,000 | 0.005 | 0.005 | 200 | 40,000 | 0.003 | 0.005 | 120 | 40,000 |
| 0.25 | 1.5 | 0.01 | 0.01 | 1,200 | 40,000 | 0.01 | 0.01 | 1,000 | 40,000 | 0.005 | 0.01 | 600 | 40,000 |
| | 2.5 | 0.01 | 0.01 | 720 | 40,000 | 0.01 | 0.01 | 600 | 40,000 | 0.005 | 0.01 | 480 | 40,000 |
| | 3.5 | 0.01 | 0.01 | 400 | 36,000 | 0.005 | 0.01 | 320 | 36,000 | 0.005 | 0.005 | 240 | 36,000 |
| 0.3 | 3 | 0.01 | 0.02 | 1,200 | 40,000 | 0.01 | 0.02 | 800 | 40,000 | 0.01 | 0.01 | 600 | 40,000 |
| | 4 | 0.01 | 0.01 | 540 | 36,000 | 0.01 | 0.01 | 400 | 36,000 | 0.005 | 0.01 | 320 | 36,000 |
| | 5 | 0.01 | 0.01 | 360 | 30,000 | 0.005 | 0.01 | 320 | 30,000 | 0.005 | 0.005 | 240 | 30,000 |
| | 6 | 0.005 | 0.005 | 240 | 24,000 | 0.005 | 0.005 | 200 | 24,000 | 0.003 | 0.003 | 160 | 24,000 |
| 0.4 | 4 | 0.01 | 0.015 | 1,000 | 40,000 | 0.01 | 0.015 | 800 | 40,000 | 0.005 | 0.01 | 600 | 40,000 |
| | 6 | 0.005 | 0.01 | 720 | 30,000 | 0.005 | 0.01 | 540 | 30,000 | 0.005 | 0.005 | 400 | 30,000 |
| 0.5 | 4 | 0.02 | 0.03 | 1,600 | 40,000 | 0.02 | 0.02 | 1,200 | 40,000 | 0.01 | 0.015 | 800 | 40,000 |
| | 6 | 0.015 | 0.02 | 1,200 | 30,000 | 0.015 | 0.015 | 900 | 30,000 | 0.01 | 0.01 | 600 | 30,000 |
| | 8 | 0.01 | 0.015 | 720 | 20,000 | 0.01 | 0.01 | 540 | 20,000 | 0.005 | 0.01 | 400 | 20,000 |
| | 10 | 0.01 | 0.01 | 540 | 16,000 | 0.005 | 0.01 | 400 | 16,000 | 0.005 | 0.005 | 300 | 16,000 |
| 0.6 | 6 | 0.02 | 0.02 | 1,400 | 32,000 | 0.015 | 0.02 | 1,000 | 32,000 | 0.01 | 0.015 | 720 | 32,000 |
| 0.75 | 7.5 | 0.02 | 0.03 | 1,600 | 32,000 | 0.015 | 0.03 | 1,400 | 32,000 | 0.01 | 0.01 | 1,000 | 32,000 |
| | 10 | 0.015 | 0.02 | 900 | 20,000 | 0.01 | 0.02 | 720 | 20,000 | 0.01 | 0.01 | 540 | 20,000 |
| | 15 | 0.01 | 0.02 | 480 | 12,000 | 0.01 | 0.01 | 400 | 12,000 | 0.005 | 0.01 | 300 | 12,000 |
| 1 | 6 | 0.03 | 0.05 | 2,400 | 40,000 | 0.03 | 0.03 | 2,000 | 40,000 | 0.02 | 0.02 | 1,600 | 40,000 |
| | 8 | 0.03 | 0.03 | 2,000 | 36,000 | 0.02 | 0.03 | 1,400 | 36,000 | 0.01 | 0.02 | 1,000 | 36,000 |
| | 10 | 0.02 | 0.03 | 1,600 | 32,000 | 0.015 | 0.03 | 800 | 32,000 | 0.01 | 0.015 | 600 | 32,000 |
| | 14 | 0.02 | 0.02 | 900 | 20,000 | 0.01 | 0.02 | 720 | 20,000 | 0.01 | 0.01 | 540 | 20,000 |
| | 20 | 0.02 | 0.02 | 360 | 8,000 | 0.01 | 0.02 | 320 | 8,000 | 0.01 | 0.01 | 240 | 8,000 |

**備考 Notes**

※切り込み量は、中仕上げ・仕上げ加工を行う場合の最大値です。機械剛性や要求精度などに合わせて調整してください。
※仕上げ代が加工面に対して均一になるよう、前加工（中仕上げ）時にご注意ください。
※ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。また、主軸回転数が足りない場合も同様に同じ割合で下げてください。
※コーナー部等負荷が高くなる加工箇所では、特に条件設定やツールパスなどに注意してください。
※深い部分を加工する際は、クーラントの給油および切りくずの排出性に十分注意してください。
※オイルミストクーラントをお奨めします。

※Max. Depth of Cut for semi-finishing and finishing. Adjust milling conditions depending on the rigidity of the machine and desired accuracy.
※Obtain uniform stock amount on the cutting surface in the pre-stage cutting (semi-finishing).
※Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.
※Required careful set up of milling conditions, tool path and etc. at cutting parts, such as corners where will become overloaded.
※Coolant supply and chip disposal in the deep portion are very important.
※Oil mist coolant is recommended.

# SSPBTN220

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-012

| 被削材 Work Material | | | 調質鋼・焼き入れ鋼 Prehardened Steels・Hardened Steels NAK80・STAVAX・SKD61 (~52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・ELMAX (~62HRC) | | | | ハイス High Speed Tool Steels SKH・HAP (~68HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 首角 Neck Taper Angle | 有効長 Effective Length | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.1 | 30′ | 1.5 | 0.003 | 0.005 | 140 | 40,000 | 0.003 | 0.003 | 120 | 40,000 | 0.002 | 0.003 | 100 | 40,000 |
| | | 2 | 0.003 | 0.003 | 120 | 40,000 | 0.002 | 0.003 | 100 | 40,000 | 0.002 | 0.002 | 80 | 40,000 |
| | 1° | 1.5 | 0.003 | 0.005 | 160 | 40,000 | 0.003 | 0.003 | 140 | 40,000 | 0.002 | 0.003 | 120 | 40,000 |
| | | 2 | 0.003 | 0.003 | 140 | 40,000 | 0.002 | 0.003 | 120 | 40,000 | 0.002 | 0.002 | 90 | 40,000 |
| | 1°30′ | 1.5 | 0.003 | 0.005 | 200 | 40,000 | 0.003 | 0.003 | 160 | 40,000 | 0.002 | 0.003 | 140 | 40,000 |
| | | 2 | 0.003 | 0.003 | 160 | 40,000 | 0.002 | 0.003 | 140 | 40,000 | 0.002 | 0.002 | 100 | 40,000 |
| | 2° | 1.5 | 0.003 | 0.005 | 240 | 40,000 | 0.003 | 0.003 | 200 | 40,000 | 0.002 | 0.003 | 160 | 40,000 |
| | | 2 | 0.003 | 0.003 | 200 | 40,000 | 0.002 | 0.003 | 160 | 40,000 | 0.002 | 0.002 | 120 | 40,000 |
| 0.15 | 30′ | 2 | 0.005 | 0.005 | 200 | 40,000 | 0.005 | 0.005 | 160 | 40,000 | 0.003 | 0.005 | 120 | 40,000 |
| | | 3 | 0.003 | 0.005 | 160 | 40,000 | 0.003 | 0.003 | 120 | 40,000 | 0.002 | 0.003 | 100 | 40,000 |
| | 1° | 2 | 0.005 | 0.005 | 240 | 40,000 | 0.005 | 0.005 | 200 | 40,000 | 0.003 | 0.005 | 160 | 40,000 |
| | | 3 | 0.003 | 0.005 | 200 | 40,000 | 0.003 | 0.003 | 160 | 40,000 | 0.002 | 0.003 | 120 | 40,000 |
| | 1°30′ | 2 | 0.005 | 0.005 | 320 | 40,000 | 0.005 | 0.005 | 240 | 40,000 | 0.003 | 0.005 | 200 | 40,000 |
| | | 3 | 0.003 | 0.005 | 240 | 40,000 | 0.003 | 0.003 | 200 | 40,000 | 0.002 | 0.003 | 160 | 40,000 |
| | 2° | 2 | 0.005 | 0.005 | 400 | 40,000 | 0.005 | 0.005 | 300 | 40,000 | 0.003 | 0.005 | 240 | 40,000 |
| | | 3 | 0.003 | 0.005 | 300 | 40,000 | 0.003 | 0.003 | 240 | 40,000 | 0.002 | 0.003 | 180 | 40,000 |
| 0.2 | 30′ | 3 | 0.007 | 0.01 | 320 | 40,000 | 0.005 | 0.01 | 240 | 40,000 | 0.005 | 0.005 | 160 | 40,000 |
| | | 4 | 0.005 | 0.005 | 240 | 36,000 | 0.005 | 0.005 | 180 | 36,000 | 0.003 | 0.005 | 120 | 36,000 |
| | 1° | 3 | 0.007 | 0.01 | 400 | 40,000 | 0.005 | 0.01 | 300 | 40,000 | 0.005 | 0.005 | 200 | 40,000 |
| | | 4 | 0.005 | 0.005 | 320 | 36,000 | 0.005 | 0.005 | 240 | 36,000 | 0.003 | 0.005 | 160 | 36,000 |
| | 1°30′ | 3 | 0.007 | 0.01 | 480 | 40,000 | 0.005 | 0.01 | 360 | 40,000 | 0.005 | 0.005 | 240 | 40,000 |
| | | 4 | 0.005 | 0.005 | 400 | 36,000 | 0.005 | 0.005 | 320 | 36,000 | 0.003 | 0.005 | 200 | 36,000 |
| | 2° | 3 | 0.007 | 0.01 | 540 | 40,000 | 0.005 | 0.01 | 400 | 40,000 | 0.005 | 0.005 | 300 | 40,000 |
| | | 4 | 0.005 | 0.005 | 480 | 36,000 | 0.005 | 0.005 | 360 | 36,000 | 0.003 | 0.005 | 240 | 36,000 |
| 0.25 | 30′ | 4 | 0.01 | 0.01 | 400 | 36,000 | 0.005 | 0.01 | 320 | 36,000 | 0.005 | 0.005 | 240 | 36,000 |
| | | 5 | 0.005 | 0.01 | 320 | 32,000 | 0.005 | 0.005 | 240 | 32,000 | 0.003 | 0.005 | 160 | 32,000 |
| | 1° | 4 | 0.01 | 0.01 | 480 | 36,000 | 0.005 | 0.01 | 400 | 36,000 | 0.005 | 0.005 | 300 | 36,000 |
| | | 5 | 0.005 | 0.01 | 400 | 32,000 | 0.005 | 0.005 | 320 | 32,000 | 0.003 | 0.005 | 240 | 32,000 |
| | 1°30′ | 4 | 0.01 | 0.01 | 640 | 36,000 | 0.005 | 0.01 | 480 | 36,000 | 0.005 | 0.005 | 360 | 36,000 |
| | | 5 | 0.005 | 0.01 | 540 | 32,000 | 0.005 | 0.005 | 400 | 32,000 | 0.003 | 0.005 | 300 | 32,000 |
| | 2° | 4 | 0.01 | 0.01 | 720 | 36,000 | 0.005 | 0.01 | 540 | 36,000 | 0.005 | 0.005 | 400 | 36,000 |
| | | 5 | 0.005 | 0.01 | 640 | 32,000 | 0.005 | 0.005 | 480 | 32,000 | 0.003 | 0.005 | 360 | 32,000 |
| 0.3 | 30′ | 5 | 0.01 | 0.01 | 480 | 36,000 | 0.005 | 0.01 | 400 | 36,000 | 0.005 | 0.005 | 300 | 36,000 |
| | | 6 | 0.005 | 0.01 | 400 | 32,000 | 0.005 | 0.005 | 360 | 32,000 | 0.003 | 0.005 | 240 | 32,000 |
| | 1° | 5 | 0.01 | 0.01 | 640 | 36,000 | 0.005 | 0.01 | 480 | 36,000 | 0.005 | 0.005 | 400 | 36,000 |
| | | 6 | 0.005 | 0.01 | 540 | 32,000 | 0.005 | 0.005 | 400 | 32,000 | 0.003 | 0.005 | 300 | 32,000 |
| | 1°30′ | 5 | 0.01 | 0.01 | 800 | 36,000 | 0.005 | 0.01 | 640 | 36,000 | 0.005 | 0.005 | 480 | 36,000 |
| | | 6 | 0.005 | 0.01 | 720 | 32,000 | 0.005 | 0.005 | 540 | 32,000 | 0.003 | 0.005 | 400 | 32,000 |
| | 2° | 5 | 0.01 | 0.01 | 900 | 36,000 | 0.005 | 0.01 | 720 | 36,000 | 0.005 | 0.005 | 540 | 36,000 |
| | | 6 | 0.005 | 0.01 | 800 | 32,000 | 0.005 | 0.005 | 640 | 32,000 | 0.003 | 0.005 | 480 | 32,000 |



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| 被削材 Work Material | | | 調質鋼・焼き入れ鋼 Prehardened Steels・Hardened Steels NAK80・STAVAX・SKD61 (~52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・ELMAX (~62HRC) | | | | ハイス High Speed Tool Steels SKH・HAP (~68HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 首角 Neck Taper Angle | 有効長 Effective Length | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ∂p mm | ∂e mm | mm/min | min$^{-1}$ | ∂p mm | ∂e mm | mm/min | min$^{-1}$ | ∂p mm | ∂e mm | mm/min | min$^{-1}$ |
| 0.5 | 30′ | 8 | 0.01 | 0.02 | 900 | 20,000 | 0.01 | 0.02 | 800 | 20,000 | 0.01 | 0.01 | 640 | 20,000 |
| | | 10 | 0.01 | 0.02 | 720 | 16,000 | 0.005 | 0.01 | 640 | 16,000 | 0.005 | 0.005 | 480 | 16,000 |
| | 1° | 8 | 0.01 | 0.02 | 1,000 | 20,000 | 0.01 | 0.02 | 900 | 20,000 | 0.01 | 0.01 | 800 | 20,000 |
| | | 10 | 0.01 | 0.02 | 800 | 16,000 | 0.005 | 0.01 | 720 | 16,000 | 0.005 | 0.005 | 640 | 16,000 |
| | 1°30′ | 8 | 0.01 | 0.02 | 1,200 | 20,000 | 0.01 | 0.02 | 1,000 | 20,000 | 0.01 | 0.01 | 900 | 20,000 |
| | | 10 | 0.01 | 0.02 | 900 | 16,000 | 0.005 | 0.01 | 800 | 16,000 | 0.005 | 0.005 | 720 | 16,000 |
| | 2° | 8 | 0.01 | 0.02 | 1,400 | 20,000 | 0.01 | 0.02 | 1,200 | 20,000 | 0.01 | 0.01 | 1,000 | 20,000 |
| | | 10 | 0.01 | 0.02 | 1,000 | 16,000 | 0.005 | 0.01 | 900 | 16,000 | 0.005 | 0.005 | 800 | 16,000 |
| 0.75 | 30′ | 10 | 0.02 | 0.02 | 800 | 16,000 | 0.015 | 0.02 | 900 | 16,000 | 0.01 | 0.015 | 600 | 16,000 |
| | | 15 | 0.01 | 0.02 | 540 | 12,000 | 0.01 | 0.01 | 480 | 12,000 | 0.005 | 0.01 | 400 | 12,000 |
| | 1° | 10 | 0.02 | 0.02 | 900 | 16,000 | 0.015 | 0.02 | 1,000 | 16,000 | 0.01 | 0.015 | 720 | 16,000 |
| | | 15 | 0.01 | 0.02 | 680 | 12,000 | 0.01 | 0.01 | 600 | 12,000 | 0.005 | 0.01 | 540 | 12,000 |
| | 1°30′ | 10 | 0.02 | 0.02 | 1,200 | 20,000 | 0.015 | 0.02 | 1,000 | 20,000 | 0.01 | 0.015 | 900 | 20,000 |
| | | 15 | 0.01 | 0.02 | 900 | 16,000 | 0.01 | 0.01 | 800 | 16,000 | 0.005 | 0.01 | 720 | 16,000 |
| | 2° | 10 | 0.02 | 0.02 | 1,400 | 20,000 | 0.015 | 0.02 | 1,200 | 20,000 | 0.01 | 0.015 | 1,000 | 20,000 |
| | | 15 | 0.01 | 0.02 | 1,000 | 16,000 | 0.01 | 0.01 | 900 | 16,000 | 0.005 | 0.01 | 800 | 16,000 |
| 1 | 30′ | 16 | 0.02 | 0.03 | 720 | 12,000 | 0.015 | 0.03 | 540 | 12,000 | 0.01 | 0.02 | 400 | 12,000 |
| | | 20 | 0.02 | 0.02 | 400 | 8,000 | 0.01 | 0.02 | 360 | 8,000 | 0.01 | 0.01 | 240 | 8,000 |
| | 1° | 16 | 0.02 | 0.03 | 1,000 | 16,000 | 0.015 | 0.03 | 800 | 16,000 | 0.01 | 0.02 | 600 | 16,000 |
| | | 20 | 0.02 | 0.02 | 600 | 12,000 | 0.01 | 0.02 | 540 | 12,000 | 0.01 | 0.01 | 400 | 12,000 |
| | 1°30′ | 16 | 0.02 | 0.03 | 1,200 | 20,000 | 0.015 | 0.03 | 1,000 | 20,000 | 0.01 | 0.02 | 800 | 20,000 |
| | | 20 | 0.02 | 0.02 | 900 | 16,000 | 0.01 | 0.02 | 800 | 16,000 | 0.01 | 0.01 | 600 | 16,000 |
| | 2° | 16 | 0.02 | 0.03 | 1,400 | 20,000 | 0.015 | 0.03 | 1,200 | 20,000 | 0.01 | 0.02 | 1,000 | 20,000 |
| | | 20 | 0.02 | 0.02 | 1,000 | 16,000 | 0.01 | 0.02 | 900 | 16,000 | 0.01 | 0.01 | 800 | 16,000 |

**備　考 Notes**

※切り込み量は、中仕上げ・仕上げ加工を行う場合の最大値です。機械剛性や要求精度などに合わせて調整してください。
※仕上げ代が加工面に対して均一になるよう、前加工（中仕上げ）時にご注意ください。
※ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。また、主軸回転数が足りない場合も同様に同じ割合で下げてください。
※コーナー部等負荷が高くなる加工箇所では、特に条件設定やツールパスなどに注意してください。
※深い部分を加工する際は、クーラントの給油および切りくずの排出性に十分注意してください。
※オイルミストクーラントをお奨めします。
※Max. Depth of Cut for semi-finishing and finishing. Adjust milling conditions depending on the rigidity of the machine and desired accuracy.
※Obtain uniform stock amount on the cutting surface in the pre-stage cutting (semi-finishing).
※Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.
※Required careful set up of milling conditions, tool path and etc. at cutting parts, such as corners where will become overloaded.
※Coolant supply and chip disposal in the deep portion are very important.
※Oil mist coolant is recommended.

# SSB200

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-008

| 被削材 Work Material | | 調質鋼・焼き入れ鋼 Prehardened Steels・Hardened Steels NAK80・STAVAX・SKD61 (~52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (~62HRC) | | | | ハイス High Speed Tool Steels SKH・HAP (~68HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 有効長 Effective Length | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.1 | 0.3 | 0.005 | 0.005 | 720 | | 0.005 | 0.005 | 540 | | 0.003 | 0.003 | 360 | |
| 0.15 | 0.3 | 0.005 | 0.01 | 1,400 | | 0.005 | 0.01 | 800 | | 0.005 | 0.005 | 500 | |
| | 0.5 | 0.005 | 0.005 | 1,200 | | 0.005 | 0.005 | 640 | | 0.003 | 0.005 | 460 | |
| | 0.75 | 0.005 | 0.005 | 1,000 | | 0.005 | 0.005 | 540 | | 0.003 | 0.005 | 400 | |
| 0.2 | 0.5 | 0.01 | 0.01 | 1,800 | | 0.01 | 0.01 | 1,200 | | 0.005 | 0.01 | 640 | |
| | 0.75 | 0.005 | 0.01 | 1,600 | | 0.005 | 0.01 | 1,000 | | 0.005 | 0.01 | 540 | |
| | 1 | 0.005 | 0.01 | 1,400 | | 0.005 | 0.01 | 900 | | 0.005 | 0.005 | 460 | |
| 0.25 | 1 | 0.015 | 0.015 | 1,800 | 50,000 | 0.01 | 0.015 | 1,500 | 50,000 | 0.01 | 0.01 | 1,100 | 50,000 |
| 0.3 | 1.5 | 0.02 | 0.03 | 2,000 | | 0.01 | 0.02 | 2,000 | | 0.01 | 0.02 | 1,500 | |
| 0.4 | 2 | 0.03 | 0.05 | 2,000 | | 0.02 | 0.03 | 2,000 | | 0.01 | 0.03 | 1,500 | |
| 0.5 | 2.5 | 0.05 | 0.05 | 3,000 | | 0.03 | 0.05 | 3,000 | | 0.02 | 0.03 | 2,000 | |
| 0.6 | 3 | 0.05 | 0.05 | 3,000 | | 0.03 | 0.05 | 3,000 | | 0.02 | 0.03 | 2,000 | |
| 0.75 | 3.8 | 0.05 | 0.1 | 4,000 | | 0.05 | 0.05 | 4,000 | | 0.02 | 0.05 | 3,000 | |
| 1 | 4 | 0.1 | 0.1 | 5,000 | | 0.05 | 0.05 | 5,000 | | 0.03 | 0.05 | 3,000 | |
| | 5 | 0.1 | 0.1 | 5,000 | | 0.05 | 0.05 | 5,000 | | 0.03 | 0.05 | 3,000 | |

**備考 Notes**

※切り込み量は、中仕上げ・仕上げ加工を行う場合の最大値です。
※切り込み量の、ap は深さ方向の切り込み量、ae はピックフィードを示します。
※オイルミストクーラントをご使用ください。
※回転数と送り速度は、同じ割合で調整してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整してください。
※工具突出し量は必要以上に出さないでください。
※Depth of Cut shows the maximum value for semi-finishing and finishing.
※Depth of Cut : ap = Axial Depth of Cut / ae = Radial Depth of Cut.
※We recommend using oil mist coolant.
※Adjust both spindle speed and feed at the same rate.
※Adjust milling conditions according to the volume of depth of cut and rigidity of machine.
※Length of tool overhang must be as short as possible.

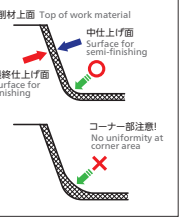
## 使用上のポイント Points on Use

### 加工環境について *Advice on Cutting Environment*

- 刃先振れを極力小さくしてください。
  Minimize the deflection of cutting edge.
- 主軸の伸縮や機械姿勢変形の傾向を把握し、対策を取ってください。
  To understand the nature of the expansion of the main spindle and machine posture transformation, and take measures against them.

### 仕上げ代(取り代)について *Advice on Finishing Allowance (stock amount)*

- 小径CBNエンドミルを使用する際は、**仕上げ代(取り代)を均一にすることが重要**です。
  When using small CBN End Mill, uniform finishing allowance (stock amount) is important.
- 荒取り・中仕上げ加工で使用した工具の摩耗が大きいと、中仕上げ・仕上げ加工時の仕上げ代(取り代)が大きくなり、工具寿命や加工精度に影響しますので、**前加工で均一な仕上げ代を残す事が重要**です。
  When tool is used on roughing and semi-finishing and it has a big abrasion, finishing allowance (stock amount) on semi-finishing and finishing is increasing and it affects tool life and cutting accuracy. Therefore, it is important to get uniform stock amount in the pre-stage cutting.






SEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# SSBL200

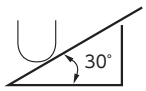
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | 調質鋼・焼き入れ鋼 Prehardened Steels・Hardened Steels NAK80・STAVAX・SKD61 (~52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (~62HRC) | | | | ハイス High Speed Tool Steels SKH (~68HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 有効長 Effective Length | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.05 | 0.3 | 0.005 | 0.005 | 200 | 50,000 | 0.003 | 0.005 | 150 | 50,000 | 0.002 | 0.003 | 120 | 50,000 |
| | 0.5 | 0.003 | 0.003 | 120 | 50,000 | 0.003 | 0.003 | 100 | 50,000 | 0.002 | 0.003 | 80 | 50,000 |
| 0.075 | 0.45 | 0.005 | 0.005 | 300 | 50,000 | 0.003 | 0.005 | 200 | 50,000 | 0.002 | 0.003 | 150 | 50,000 |
| | 0.75 | 0.003 | 0.003 | 200 | 50,000 | 0.003 | 0.003 | 150 | 50,000 | 0.002 | 0.003 | 100 | 50,000 |
| 0.1 | 0.6 | 0.005 | 0.005 | 500 | 50,000 | 0.005 | 0.005 | 380 | 50,000 | 0.003 | 0.003 | 280 | 50,000 |
| | 1 | 0.005 | 0.005 | 300 | 50,000 | 0.005 | 0.005 | 260 | 50,000 | 0.003 | 0.003 | 120 | 50,000 |
| 0.15 | 0.9 | 0.005 | 0.005 | 800 | 50,000 | 0.005 | 0.005 | 460 | 50,000 | 0.003 | 0.005 | 360 | 50,000 |
| | 1.5 | 0.005 | 0.005 | 480 | 50,000 | 0.005 | 0.005 | 320 | 50,000 | 0.003 | 0.005 | 280 | 50,000 |
| 0.2 | 1.2 | 0.005 | 0.01 | 1,200 | 50,000 | 0.005 | 0.01 | 820 | 50,000 | 0.005 | 0.005 | 580 | 50,000 |
| | 2 | 0.005 | 0.01 | 620 | 50,000 | 0.005 | 0.01 | 580 | 50,000 | 0.005 | 0.005 | 380 | 50,000 |
| 0.25 | 1.5 | 0.01 | 0.01 | 1,500 | 50,000 | 0.01 | 0.01 | 1,200 | 50,000 | 0.005 | 0.01 | 860 | 50,000 |
| | 2.5 | 0.01 | 0.01 | 800 | 50,000 | 0.01 | 0.01 | 680 | 50,000 | 0.005 | 0.01 | 540 | 50,000 |
| 0.3 | 3 | 0.01 | 0.02 | 1,600 | 40,000 | 0.01 | 0.02 | 1,200 | 40,000 | 0.01 | 0.01 | 920 | 40,000 |
| | 4 | 0.01 | 0.01 | 1,200 | 30,000 | 0.01 | 0.01 | 960 | 30,000 | 0.005 | 0.01 | 640 | 30,000 |
| | 5 | 0.01 | 0.01 | 800 | 30,000 | 0.005 | 0.01 | 680 | 30,000 | 0.005 | 0.005 | 480 | 30,000 |
| 0.4 | 4 | 0.01 | 0.03 | 1,500 | 30,000 | 0.01 | 0.02 | 1,200 | 30,000 | 0.01 | 0.01 | 920 | 30,000 |
| 0.5 | 4 | 0.03 | 0.05 | 2,400 | 40,000 | 0.02 | 0.03 | 2,400 | 40,000 | 0.02 | 0.02 | 1,500 | 40,000 |
| | 5 | 0.02 | 0.05 | 2,000 | 32,000 | 0.02 | 0.03 | 2,000 | 32,000 | 0.01 | 0.02 | 1,200 | 32,000 |
| | 6 | 0.02 | 0.03 | 1,500 | 25,000 | 0.01 | 0.02 | 1,500 | 25,000 | 0.01 | 0.01 | 1,000 | 25,000 |
| | 8 | 0.01 | 0.03 | 1,200 | 16,000 | 0.01 | 0.02 | 1,000 | 16,000 | 0.01 | 0.01 | 840 | 16,000 |
| | 10 | 0.01 | 0.02 | 800 | 12,000 | 0.005 | 0.01 | 720 | 12,000 | 0.005 | 0.005 | 620 | 12,000 |
| 0.75 | 7.5 | 0.02 | 0.03 | 2,000 | 32,000 | 0.01 | 0.03 | 1,800 | 32,000 | 0.01 | 0.01 | 1,200 | 32,000 |
| 1 | 6 | 0.05 | 0.05 | 4,000 | 40,000 | 0.03 | 0.03 | 4,000 | 40,000 | 0.02 | 0.03 | 2,600 | 40,000 |
| | 8 | 0.03 | 0.05 | 3,000 | 32,000 | 0.02 | 0.03 | 2,600 | 32,000 | 0.01 | 0.02 | 1,800 | 32,000 |
| | 10 | 0.02 | 0.03 | 2,000 | 24,000 | 0.01 | 0.03 | 1,600 | 24,000 | 0.01 | 0.02 | 1,200 | 24,000 |

**備　考 Notes**

※切り込み量は、中仕上げ・仕上げ加工を行う場合の最大値です。
※切り込み量の、ap は深さ方向の切り込み量、ae はピックフィードを示します。
※オイルミストクーラントをご使用ください。
※回転数と送り速度は、同じ割合で調整してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整してください。
※工具突出し量は必要以上に出さないでください。
※Depth of Cut shows the maximum value for semi-finishing and finishing.
※Depth of Cut : ap = Axial Depth of Cut / ae = Radial Depth of Cut.
※We recommend using oil mist coolant.
※Adjust both spindle speed and feed at the same rate.
※Adjust milling conditions according to the volume of depth of cut and rigidity of machine.
※Length of tool overhang must be as short as possible.

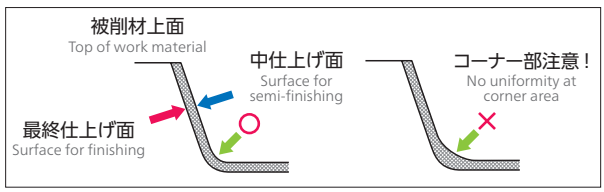
※有効長 5D 以上の加工条件は、加工面の傾斜角 30°以下を目安とした参考条件です。
※Effective length is 5D or more : Values are reference as a target for milling surface inclined at less than 30 degree angle.




### CBNエンドミルをより良くご使用いただくためのポイント
Main points to ensure an effective use of CBN End Mill.

加工面全体が、均一な取り代となるようにしてください（特にコーナー部等ご注意ください）。
これらの事が、加工精度・工具寿命に影響します。

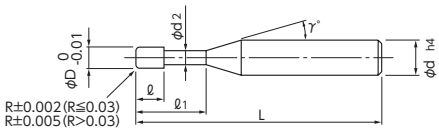
Uniforming removal stock is important for machining accuracy and tool life, especially at corner area.



# SSR200

## CBNスーパースピードラジアスエンドミル

CBN Super Speed Radius End Mill




●CBN の抜群の耐久性にコーナー R の高能率加工を実現。
●切れ刃全体にわたるスムーズな連続刃付！抜群の面精度を実現可能。
●調質（プリハードン）鋼～68HRC の高硬度材まで対応。
●φ0.1 から規格拡大し、全 172 サイズに！

●Realized high efficient machining with radius flute along with excellent wear resistance of CBN.
●Realized excellent surface roughness by introducing smooth tangent on all over flute.
●Applicable for work materials from tempered steel to hardened steel (up to 68 HRC).
●Lineup expansion from Dia.0.1mm. 172 sizes in total.

技術資料 K-013

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ◎ | ◎ | ◎ | | | | | |

◆ New サイズ
★再研磨可能(全長35mm以上のもの。詳細はお問い合わせください。)

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| | コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|
| ◆ | 01-00490-01022 | 0.1 | R0.02 | 0.2 | 0.04 | 0.08 | 15° | 4 | 50 | 40,200 |
| ◆ | 01-00490-01023 | | | 0.3 | 0.04 | 0.08 | 15° | 4 | 50 | 40,800 |
| ◆ | 01-00490-01024 | | | 0.5 | 0.04 | 0.08 | 15° | 4 | 50 | 42,000 |
| ◆ | 01-00490-01032 | | R0.03 | 0.2 | 0.04 | 0.08 | 15° | 4 | 50 | 38,400 |
| ◆ | 01-00490-01033 | | | 0.3 | 0.04 | 0.08 | 15° | 4 | 50 | 39,000 |
| ◆ | 01-00490-01034 | | | 0.5 | 0.04 | 0.08 | 15° | 4 | 50 | 40,200 |
| ◆ | 01-00490-01522 | 0.15 | R0.02 | 0.2 | 0.06 | 0.13 | 15° | 4 | 50 | 40,200 |
| ◆ | 01-00490-01523 | | | 0.3 | 0.06 | 0.13 | 15° | 4 | 50 | 40,800 |
| ◆ | 01-00490-01524 | | | 0.5 | 0.06 | 0.13 | 15° | 4 | 50 | 42,000 |
| ◆ | 01-00490-01532 | | R0.03 | 0.2 | 0.06 | 0.13 | 15° | 4 | 50 | 38,400 |
| ◆ | 01-00490-01533 | | | 0.3 | 0.06 | 0.13 | 15° | 4 | 50 | 39,000 |
| ◆ | 01-00490-01534 | | | 0.5 | 0.06 | 0.13 | 15° | 4 | 50 | 40,200 |
| ◆ | 01-00490-02020 | 0.2 | R0.02 | 0.3 | 0.08 | 0.18 | 15° | 4 | 50 | 30,600 |
| | 01-00490-02021 | | | 0.5 | 0.08 | 0.18 | 15° | 4 | 50 | 30,600 |
| | 01-00490-02022 | | | 1 | 0.08 | 0.18 | 15° | 4 | 50 | 31,500 |
| ◆ | 01-00490-02030 | | R0.03 | 0.3 | 0.08 | 0.18 | 15° | 4 | 50 | 27,500 |
| | 01-00490-02031 | | | 0.5 | 0.08 | 0.18 | 15° | 4 | 50 | 27,500 |
| | 01-00490-02032 | | | 1 | 0.08 | 0.18 | 15° | 4 | 50 | 28,300 |
| ◆ | 01-00490-02050 | | R0.05 | 0.3 | 0.08 | 0.18 | 15° | 4 | 50 | 27,500 |
| | 01-00490-02051 | | | 0.5 | 0.08 | 0.18 | 15° | 4 | 50 | 27,500 |
| | 01-00490-02052 | | | 1 | 0.08 | 0.18 | 15° | 4 | 50 | 28,300 |
| | 01-00490-03021 | 0.3 | R0.02 | 0.5 | 0.13 | 0.28 | 15° | 4 | 50 | 30,200 |
| ◆ | 01-00490-03020 | | | 0.75 | 0.13 | 0.28 | 15° | 4 | 50 | 30,400 |
| | 01-00490-03022 | | | 1 | 0.13 | 0.28 | 15° | 4 | 50 | 30,600 |
| | 01-00490-03023 | | | 1.5 | 0.13 | 0.28 | 15° | 4 | 50 | 31,000 |
| | 01-00490-03024 | | | 2 | 0.13 | 0.28 | 15° | 4 | 50 | 31,500 |
| | 01-00490-03031 | | R0.03 | 0.5 | 0.13 | 0.28 | 15° | 4 | 50 | 27,200 |
| ◆ | 01-00490-03030 | | | 0.75 | 0.13 | 0.28 | 15° | 4 | 50 | 27,400 |
| | 01-00490-03032 | | | 1 | 0.13 | 0.28 | 15° | 4 | 50 | 27,500 |
| | 01-00490-03033 | | | 1.5 | 0.13 | 0.28 | 15° | 4 | 50 | 27,900 |
| | 01-00490-03034 | | | 2 | 0.13 | 0.28 | 15° | 4 | 50 | 28,300 |
| | 01-00490-03051 | | R0.05 | 0.5 | 0.13 | 0.28 | 15° | 4 | 50 | 27,200 |
| ◆ | 01-00490-03050 | | | 0.75 | 0.13 | 0.28 | 15° | 4 | 50 | 27,400 |
| | 01-00490-03052 | | | 1 | 0.13 | 0.28 | 15° | 4 | 50 | 27,500 |
| | 01-00490-03053 | | | 1.5 | 0.13 | 0.28 | 15° | 4 | 50 | 27,900 |
| | 01-00490-03054 | | | 2 | 0.13 | 0.28 | 15° | 4 | 50 | 28,300 |

オーダー方法 SSR200 刃径(D)×コーナー半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate SSR200 (D)×(R)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はB-026に記載
●Recommended Milling Conditions are shown on page B-026.



SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00490-04021 | 0.4 | R0.02 | 0.5 | 0.24 | 0.37 | 15° | 4 | 50 | 28,700 |
| 01-00490-04022 | | | 1 | 0.24 | 0.37 | 15° | 4 | 50 | 28,900 |
| 01-00490-04023 | | | 1.5 | 0.24 | 0.37 | 15° | 4 | 50 | 29,200 |
| 01-00490-04024 | | | 2 | 0.24 | 0.37 | 15° | 4 | 50 | 29,600 |
| 01-00490-04031 | | R0.03 | 0.5 | 0.24 | 0.37 | 15° | 4 | 50 | 25,800 |
| 01-00490-04032 | | | 1 | 0.24 | 0.37 | 15° | 4 | 50 | 26,000 |
| 01-00490-04033 | | | 1.5 | 0.24 | 0.37 | 15° | 4 | 50 | 26,200 |
| 01-00490-04034 | | | 2 | 0.24 | 0.37 | 15° | 4 | 50 | 26,600 |
| 01-00490-04051 | | R0.05 | 0.5 | 0.24 | 0.37 | 15° | 4 | 50 | 25,800 |
| 01-00490-04052 | | | 1 | 0.24 | 0.37 | 15° | 4 | 50 | 26,000 |
| 01-00490-04053 | | | 1.5 | 0.24 | 0.37 | 15° | 4 | 50 | 26,000 |
| 01-00490-04054 | | | 2 | 0.24 | 0.37 | 15° | 4 | 50 | 26,600 |
| 01-00490-04101 | | R0.1 | 0.5 | 0.24 | 0.37 | 15° | 4 | 50 | 25,800 |
| 01-00490-04102 | | | 1 | 0.24 | 0.37 | 15° | 4 | 50 | 26,000 |
| 01-00490-04103 | | | 1.5 | 0.24 | 0.37 | 15° | 4 | 50 | 26,000 |
| 01-00490-04104 | | | 2 | 0.24 | 0.37 | 15° | 4 | 50 | 26,000 |
| ★ 01-00490-05020 | 0.5 | R0.02 | 0.5 | 0.3 | 0.46 | 15° | 4 | 48 | 23,600 |
| ★ 01-00490-05022 | | | 1 | 0.3 | 0.46 | 15° | 4 | 50 | 23,800 |
| ★ 01-00490-05021 | | | 1.5 | 0.3 | 0.46 | 15° | 4 | 50 | 24,000 |
| ★ 01-00490-05023 | | | 2.5 | 0.3 | 0.46 | 15° | 4 | 50 | 26,300 |
| ★ 01-00490-05030 | | R0.03 | 0.5 | 0.3 | 0.46 | 15° | 4 | 48 | 21,200 |
| ★ 01-00490-05032 | | | 1 | 0.3 | 0.46 | 15° | 4 | 50 | 21,400 |
| ★ 01-00490-05031 | | | 1.5 | 0.3 | 0.46 | 15° | 4 | 50 | 21,600 |
| ★ 01-00490-05033 | | | 2.5 | 0.3 | 0.46 | 15° | 4 | 50 | 23,600 |
| ★ 01-00490-05050 | | R0.05 | 0.5 | 0.3 | 0.46 | 15° | 4 | 48 | 21,200 |
| ★ 01-00490-05052 | | | 1 | 0.3 | 0.46 | 15° | 4 | 50 | 21,400 |
| ★ 01-00490-05051 | | | 1.5 | 0.3 | 0.46 | 15° | 4 | 50 | 21,600 |
| ★ 01-00490-05053 | | | 2.5 | 0.3 | 0.46 | 15° | 4 | 50 | 23,600 |
| ★ 01-00490-05100 | | R0.1 | 0.5 | 0.3 | 0.46 | 15° | 4 | 48 | 21,200 |
| ★ 01-00490-05102 | | | 1 | 0.3 | 0.46 | 15° | 4 | 50 | 21,400 |
| ★ 01-00490-05101 | | | 1.5 | 0.3 | 0.46 | 15° | 4 | 50 | 21,600 |
| ★ 01-00490-05103 | | | 2.5 | 0.3 | 0.46 | 15° | 4 | 50 | 23,600 |
| ★ 01-00490-06021 | 0.6 | R0.02 | 0.5 | 0.3 | 0.56 | 15° | 4 | 48 | 23,600 |
| ★ 01-00490-06022 | | | 1 | 0.3 | 0.56 | 15° | 4 | 50 | 23,800 |
| ★ 01-00490-06023 | | | 1.5 | 0.3 | 0.56 | 15° | 4 | 50 | 24,000 |
| ★ 01-00490-06024 | | | 2.5 | 0.3 | 0.56 | 15° | 4 | 50 | 26,300 |
| ★ 01-00490-06031 | | R0.03 | 0.5 | 0.3 | 0.56 | 15° | 4 | 48 | 21,200 |
| ★ 01-00490-06032 | | | 1 | 0.3 | 0.56 | 15° | 4 | 50 | 21,400 |
| ★ 01-00490-06033 | | | 1.5 | 0.3 | 0.56 | 15° | 4 | 50 | 21,600 |
| ★ 01-00490-06034 | | | 2.5 | 0.3 | 0.56 | 15° | 4 | 50 | 23,600 |
| ★ 01-00490-06051 | | R0.05 | 0.5 | 0.3 | 0.56 | 15° | 4 | 48 | 21,200 |
| ★ 01-00490-06052 | | | 1 | 0.3 | 0.56 | 15° | 4 | 50 | 21,400 |
| ★ 01-00490-06053 | | | 1.5 | 0.3 | 0.56 | 15° | 4 | 50 | 21,600 |
| ★ 01-00490-06054 | | | 2.5 | 0.3 | 0.56 | 15° | 4 | 50 | 23,600 |
| ★ 01-00490-06101 | | R0.1 | 0.5 | 0.3 | 0.56 | 15° | 4 | 48 | 21,200 |
| ★ 01-00490-06102 | | | 1 | 0.3 | 0.56 | 15° | 4 | 50 | 21,400 |
| ★ 01-00490-06103 | | | 1.5 | 0.3 | 0.56 | 15° | 4 | 50 | 21,600 |
| ★ 01-00490-06104 | | | 2.5 | 0.3 | 0.56 | 15° | 4 | 50 | 23,600 |
| ★ 01-00490-08021 | 0.8 | R0.02 | 1.5 | 0.56 | 0.76 | 15° | 4 | 50 | 24,000 |
| ★ 01-00490-08022 | | | 2.5 | 0.56 | 0.76 | 15° | 4 | 50 | 26,300 |
| ★ 01-00490-08023 | | | 5 | 0.56 | 0.76 | 15° | 4 | 53 | 27,200 |

# SSR200

## CBNスーパースピードラジアスエンドミル

CBN Super Speed Radius End Mill

◆ New サイズ
★再研磨可能(全長35mm以上のもの。詳細はお問い合わせください。)

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| ★ 01-00490-08031 | 0.8 | R0.03 | 1.5 | 0.56 | 0.76 | 15° | 4 | 50 | 21,600 |
| ★ 01-00490-08032 | | | 2.5 | 0.56 | 0.76 | 15° | 4 | 50 | 23,600 |
| ★ 01-00490-08033 | | | 5 | 0.56 | 0.76 | 15° | 4 | 53 | 24,400 |
| ★ 01-00490-08051 | | R0.05 | 1.5 | 0.56 | 0.76 | 15° | 4 | 50 | 21,600 |
| ★ 01-00490-08052 | | | 2.5 | 0.56 | 0.76 | 15° | 4 | 50 | 23,600 |
| ★ 01-00490-08053 | | | 5 | 0.56 | 0.76 | 15° | 4 | 53 | 24,400 |
| ★ 01-00490-08101 | | R0.1 | 1.5 | 0.56 | 0.76 | 15° | 4 | 50 | 21,600 |
| ★ 01-00490-08102 | | | 2.5 | 0.56 | 0.76 | 15° | 4 | 50 | 23,600 |
| ★ 01-00490-08103 | | | 5 | 0.56 | 0.76 | 15° | 4 | 53 | 24,400 |
| ★ 01-00490-10020 | 1 | R0.02 | 1 | 0.7 | 0.95 | 15° | 4 | 49 | 22,000 |
| ★ 01-00490-10022 | | | 2 | 0.7 | 0.95 | 15° | 4 | 50 | 22,000 |
| ★ 01-00490-10021 | | | 3 | 0.7 | 0.95 | 15° | 4 | 50 | 22,000 |
| ★ 01-00490-10023 | | | 5 | 0.7 | 0.95 | 15° | 4 | 53 | 24,900 |
| ★ 01-00490-10030 | | R0.03 | 1 | 0.7 | 0.95 | 15° | 4 | 49 | 19,800 |
| ★ 01-00490-10032 | | | 2 | 0.7 | 0.95 | 15° | 4 | 50 | 19,800 |
| ★ 01-00490-10031 | | | 3 | 0.7 | 0.95 | 15° | 4 | 50 | 19,800 |
| ★ 01-00490-10033 | | | 5 | 0.7 | 0.95 | 15° | 4 | 53 | 22,400 |
| ★ 01-00490-10050 | | R0.05 | 1 | 0.7 | 0.95 | 15° | 4 | 49 | 19,800 |
| ★ 01-00490-10052 | | | 2 | 0.7 | 0.95 | 15° | 4 | 50 | 19,800 |
| ★ 01-00490-10051 | | | 3 | 0.7 | 0.95 | 15° | 4 | 50 | 19,800 |
| ★ 01-00490-10053 | | | 5 | 0.7 | 0.95 | 15° | 4 | 53 | 22,400 |
| ★ 01-00490-10100 | | R0.1 | 1 | 0.7 | 0.95 | 15° | 4 | 49 | 19,800 |
| ★ 01-00490-10102 | | | 2 | 0.7 | 0.95 | 15° | 4 | 50 | 19,800 |
| ★ 01-00490-10101 | | | 3 | 0.7 | 0.95 | 15° | 4 | 50 | 19,800 |
| ★ 01-00490-10103 | | | 5 | 0.7 | 0.95 | 15° | 4 | 53 | 22,400 |
| ★ 01-00490-10200 | | R0.2 | 1 | 0.7 | 0.95 | 15° | 4 | 49 | 19,800 |
| ★ 01-00490-10202 | | | 2 | 0.7 | 0.95 | 15° | 4 | 50 | 19,800 |
| ★ 01-00490-10201 | | | 3 | 0.7 | 0.95 | 15° | 4 | 50 | 19,800 |
| ★ 01-00490-10203 | | | 5 | 0.7 | 0.95 | 15° | 4 | 53 | 22,400 |
| ★ 01-00490-10300 | | R0.3 | 1 | 0.7 | 0.95 | 15° | 4 | 49 | 19,800 |
| ★ 01-00490-10302 | | | 2 | 0.7 | 0.95 | 15° | 4 | 50 | 19,800 |
| ★ 01-00490-10301 | | | 3 | 0.7 | 0.95 | 15° | 4 | 50 | 19,800 |
| ★ 01-00490-10303 | | | 5 | 0.7 | 0.95 | 15° | 4 | 53 | 22,400 |
| ◆★ 01-00490-15022 | 1.5 | R0.02 | 2 | 1 | 1.45 | 15° | 4 | 52 | 25,900 |
| ★ 01-00490-15020 | | | 3 | 1 | 1.45 | 15° | 4 | 52 | 25,900 |
| ★ 01-00490-15021 | | | 4.5 | 1 | 1.45 | 15° | 4 | 52 | 25,900 |
| ★ 01-00490-15023 | | | 7.5 | 1 | 1.45 | 15° | 4 | 52 | 29,400 |
| ◆★ 01-00490-15032 | | R0.03 | 2 | 1 | 1.45 | 15° | 4 | 52 | 23,300 |
| ★ 01-00490-15030 | | | 3 | 1 | 1.45 | 15° | 4 | 52 | 23,300 |
| ★ 01-00490-15031 | | | 4.5 | 1 | 1.45 | 15° | 4 | 52 | 23,300 |
| ★ 01-00490-15033 | | | 7.5 | 1 | 1.45 | 15° | 4 | 52 | 26,400 |
| ◆★ 01-00490-15052 | | R0.05 | 2 | 1 | 1.45 | 15° | 4 | 52 | 23,300 |
| ★ 01-00490-15050 | | | 3 | 1 | 1.45 | 15° | 4 | 52 | 23,300 |
| ★ 01-00490-15051 | | | 4.5 | 1 | 1.45 | 15° | 4 | 52 | 23,300 |
| ★ 01-00490-15053 | | | 7.5 | 1 | 1.45 | 15° | 4 | 52 | 26,400 |
| ◆★ 01-00490-15102 | | R0.1 | 2 | 1 | 1.45 | 15° | 4 | 52 | 23,300 |
| ★ 01-00490-15100 | | | 3 | 1 | 1.45 | 15° | 4 | 52 | 23,300 |
| ★ 01-00490-15101 | | | 4.5 | 1 | 1.45 | 15° | 4 | 52 | 23,300 |
| ★ 01-00490-15103 | | | 7.5 | 1 | 1.45 | 15° | 4 | 52 | 26,400 |

**オーダー方法**
SSR200 刃径(D)×コーナー半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate SSR200 (D)×(R)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はB-026に記載
●Recommended Milling Conditions are shown on page B-026.

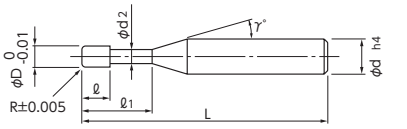


ŞEVKET ÖLÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| ◆★ 01-00490-15202 | 1.5 | R0.2 | 2 | 1 | 1.45 | 15° | 4 | 52 | 23,300 |
| ★ 01-00490-15200 | | | 3 | 1 | 1.45 | 15° | 4 | 52 | 23,300 |
| ★ 01-00490-15201 | | | 4.5 | 1 | 1.45 | 15° | 4 | 52 | 23,300 |
| ★ 01-00490-15203 | | | 7.5 | 1 | 1.45 | 15° | 4 | 52 | 26,400 |
| ◆★ 01-00490-15302 | | R0.3 | 2 | 1 | 1.45 | 15° | 4 | 52 | 23,300 |
| ★ 01-00490-15300 | | | 3 | 1 | 1.45 | 15° | 4 | 52 | 23,300 |
| ★ 01-00490-15301 | | | 4.5 | 1 | 1.45 | 15° | 4 | 52 | 23,300 |
| ★ 01-00490-15303 | | | 7.5 | 1 | 1.45 | 15° | 4 | 52 | 26,400 |
| ◆★ 01-00490-20022 | 2 | R0.02 | 3 | 1.2 | 1.94 | 15° | 4 | 53 | 26,700 |
| ★ 01-00490-20020 | | | 4 | 1.2 | 1.94 | 15° | 4 | 53 | 26,700 |
| ★ 01-00490-20021 | | | 6 | 1.2 | 1.94 | 15° | 4 | 53 | 26,700 |
| ★ 01-00490-20023 | | | 10 | 1.2 | 1.94 | 15° | 4 | 53 | 29,800 |
| ◆★ 01-00490-20032 | | R0.03 | 3 | 1.2 | 1.94 | 15° | 4 | 53 | 24,000 |
| ★ 01-00490-20030 | | | 4 | 1.2 | 1.94 | 15° | 4 | 53 | 24,000 |
| ★ 01-00490-20031 | | | 6 | 1.2 | 1.94 | 15° | 4 | 53 | 24,000 |
| ★ 01-00490-20033 | | | 10 | 1.2 | 1.94 | 15° | 4 | 53 | 26,800 |
| ◆★ 01-00490-20052 | | R0.05 | 3 | 1.2 | 1.94 | 15° | 4 | 53 | 24,000 |
| ★ 01-00490-20050 | | | 4 | 1.2 | 1.94 | 15° | 4 | 53 | 24,000 |
| ★ 01-00490-20051 | | | 6 | 1.2 | 1.94 | 15° | 4 | 53 | 24,000 |
| ★ 01-00490-20053 | | | 10 | 1.2 | 1.94 | 15° | 4 | 53 | 26,800 |
| ◆★ 01-00490-20102 | | R0.1 | 3 | 1.2 | 1.94 | 15° | 4 | 53 | 24,000 |
| ★ 01-00490-20100 | | | 4 | 1.2 | 1.94 | 15° | 4 | 53 | 24,000 |
| ★ 01-00490-20101 | | | 6 | 1.2 | 1.94 | 15° | 4 | 52 | 24,000 |
| ★ 01-00490-20103 | | | 10 | 1.2 | 1.94 | 15° | 4 | 52 | 26,800 |
| ◆★ 01-00490-20202 | | R0.2 | 3 | 1.2 | 1.94 | 15° | 4 | 53 | 24,000 |
| ★ 01-00490-20200 | | | 4 | 1.2 | 1.94 | 15° | 4 | 53 | 24,000 |
| ★ 01-00490-20201 | | | 6 | 1.2 | 1.94 | 15° | 4 | 52 | 24,000 |
| ★ 01-00490-20203 | | | 10 | 1.2 | 1.94 | 15° | 4 | 52 | 26,700 |
| ◆★ 01-00490-20302 | | R0.3 | 3 | 1.2 | 1.94 | 15° | 4 | 53 | 24,000 |
| ★ 01-00490-20300 | | | 4 | 1.2 | 1.94 | 15° | 4 | 53 | 24,000 |
| ★ 01-00490-20301 | | | 6 | 1.2 | 1.94 | 15° | 4 | 52 | 24,000 |
| ★ 01-00490-20303 | | | 10 | 1.2 | 1.94 | 15° | 4 | 52 | 26,700 |
| ◆★ 01-00490-20502 | | R0.5 | 3 | 1.2 | 1.94 | 15° | 4 | 53 | 24,000 |
| ★ 01-00490-20500 | | | 4 | 1.2 | 1.94 | 15° | 4 | 53 | 24,000 |
| ★ 01-00490-20501 | | | 6 | 1.2 | 1.94 | 15° | 4 | 52 | 24,000 |
| ★ 01-00490-20503 | | | 10 | 1.2 | 1.94 | 15° | 4 | 52 | 26,700 |

# SHR320

## CBN高能率ラジアスエンドミル
CBN High Efficient Radius End Mill




●3枚刃採用とスパイラル形状コーナーRにより、高精度・高能率加工を実現。
●Realized high accuracy and high efficiency machining by adopting 3 flutes and corner R with spiral shape.

Slot Face CBN 3 20° ≦68 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ◎ | ◎ | ◎ | | | | | |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00495-05011 | 0.5 | R0.1 | 1.5 | 0.25 | 0.46 | 15° | 4 | 50 | 26,000 |
| 01-00495-05012 | | | 2.5 | 0.25 | 0.46 | 15° | 4 | 50 | 29,000 |
| 01-00495-10011 | 1 | R0.1 | 3 | 0.5 | 0.95 | 15° | 4 | 50 | 24,000 |
| 01-00495-10012 | | | 5 | 0.5 | 0.95 | 15° | 4 | 52 | 27,000 |
| 01-00495-10021 | | R0.2 | 3 | 0.5 | 0.95 | 15° | 4 | 50 | 24,000 |
| 01-00495-10022 | | | 5 | 0.5 | 0.95 | 15° | 4 | 52 | 27,000 |
| 01-00495-15011 | 1.5 | R0.1 | 4.5 | 0.75 | 1.45 | 15° | 4 | 52 | 28,000 |
| 01-00495-15012 | | | 7.5 | 0.75 | 1.45 | 15° | 4 | 52 | 31,000 |
| 01-00495-15021 | | R0.2 | 4.5 | 0.75 | 1.45 | 15° | 4 | 52 | 28,000 |
| 01-00495-15022 | | | 7.5 | 0.75 | 1.45 | 15° | 4 | 52 | 31,000 |
| 01-00495-20011 | 2 | R0.1 | 6 | 1 | 1.94 | 15° | 4 | 52 | 29,000 |
| 01-00495-20012 | | | 10 | 1 | 1.94 | 15° | 4 | 52 | 32,000 |
| 01-00495-20031 | | R0.3 | 6 | 1 | 1.94 | 15° | 4 | 52 | 29,000 |
| 01-00495-20032 | | | 10 | 1 | 1.94 | 15° | 4 | 52 | 32,000 |

**オーダー方法** SHR320 刃径(D)×コーナー半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate SHR320 (D)×(R)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

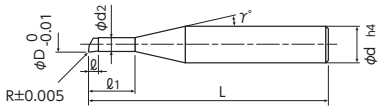
●切削条件表はB-027に記載
●Recommended Milling Conditions are shown on page B-027.



SEVKET GÜLÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# SSF120

## CBNスーパーサーフェイスエンドミル
CBN Super Surface End Mill




●微細加工時の基準面出し加工に最適。
●NS 独自の形状とコーナー R を採用し、安定した加工面を実現。
●Appropriate for datum plane machining on presicion machining.
●NS original design and corner R to realize stable machining surface.

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ◎ | ◎ | ◎ | | | | | |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (ℓ1)有効長 Effective Length | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00470-00020 | 0.2 | R0.05 | 0.1 | 0.5 | 0.18 | 15° | 4 | 50 | 35,000 |
| 01-00470-00030 | 0.3 | R0.05 | 0.15 | 0.75 | 0.28 | 15° | 4 | 50 | 30,000 |
| 01-00470-00040 | 0.4 | R0.05 | 0.2 | 1 | 0.37 | 15° | 4 | 50 | 25,000 |
| 01-00470-00050 | 0.5 | R0.05 | 0.25 | 1.25 | 0.46 | 15° | 4 | 50 | 22,000 |
| 01-00470-00060 | 0.6 | R0.05 | 0.3 | 1.5 | 0.56 | 15° | 4 | 50 | 24,000 |
| 01-00470-00080 | 0.8 | R0.05 | 0.4 | 2 | 0.76 | 15° | 4 | 50 | 23,000 |
| 01-00470-00100 | 1 | R0.1 | 0.5 | 2.5 | 0.95 | 15° | 4 | 50 | 22,000 |
| 01-00470-00150 | 1.5 | R0.1 | 0.75 | 3.8 | 1.45 | 15° | 4 | 52 | 23,000 |
| 01-00470-00200 | 2 | R0.1 | 1 | 5 | 1.94 | 15° | 4 | 52 | 25,000 |

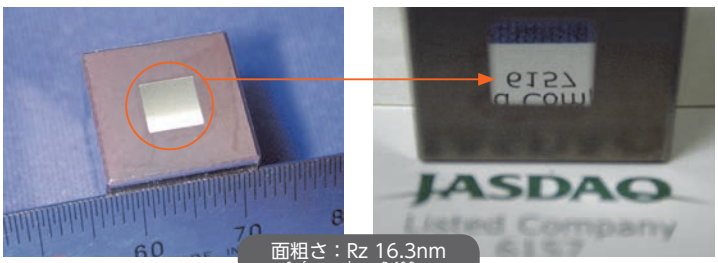
**オーダー方法** SSF120 刃径(D)を指示してください。 ※(γ)は参考値です。
When you order, indicate SSF120 (D). ※(γ) is reference value.

●切削条件表はB-028に記載
●Recommended Milling Conditions are shown on page B-028.

## 加工事例 1 Technical Data 1

被削材 Material DC53(SKD11) 60HRC

使用工具 Tool SSF120 φ0.5




面粗さ：Rz 16.3nm
Surface roughness: Rz16.3nm

(1nm = 0.001μm)

仕上げ加工条件 Conditions (Finishing process)

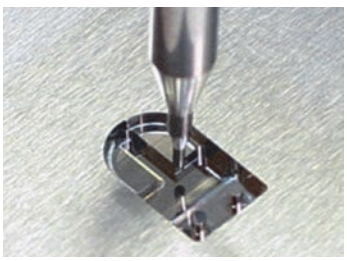
| | |
|---|---|
| 回転数 Spindle speed | 120,000min$^{-1}$ |
| 送り速度 Feed | 300mm/min |
| 切り込み量 Depth of cut | 2μm × 5μm (ap × ae) |
| クーラント Coolant | オイルミスト Oil mist |
| 加工時間 Cutting time | 30 分 30min |

Sodick 社製ナノマシニングセンタ AZ150 使用
Sodick Nano Machining Center AZ150

※テーラーホブソン社製タリサーフ測定
※ Taylor Hobson Talysurf Measurement System

## 加工事例 2 Technical Data 2

被削材 Material DC53(SKD11) 60HRC



使用工具 Tool
SSF120 φ0.8
ワークサイズ
10×6×2mm
Work size
10×6×2mm

面粗さ：Rz 70nm
Surface roughness: Rz70nm

(1nm = 0.001μm)

仕上げ加工条件 Conditions (Finishing process)

| | 底面加工 Bottom face milling | 側面加工 Side face milling |
|---|---|---|
| 回転数 Spindle speed | 35,000min$^{-1}$ | |
| 送り速度 Feed | 150mm/min | |
| 切り込み量 Depth of cut | 3μm × 8μm (ap × ae) | 10μm × 10μm (ap × ae) |
| クーラント Coolant | オイルミスト Oil mist | |
| 加工時間 Cutting time | 1 時間 30 分 1hr 30min | |

※テーラーホブソン社製タリサーフ測定
※ Taylor Hobson Talysurf Measurement System

# SSR200

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-013

| 被削材 Work Material | | | 調質鋼・焼き入れ鋼 Prehardened Steels・Hardened Steels NAK80・SKD61・STAVAX (~52HRC) | | | | 焼き入れ鋼 Hardened Steels DC53・ELMAX・PD613 (~62HRC) | | | | ハイス High Speed Tool Steels DRM3・YXR3 (~68HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | コーナー半径 Corner Radius | 有効長 Effective Length | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.1 | 0.02・0.03 | 0.2 | 0.002 | 0.015 | 200 | 50,000 | 0.002 | 0.01 | 150 | 50,000 | 0.001 | 0.01 | 100 | 50,000 |
| | | 0.3 | 0.002 | 0.015 | 150 | 50,000 | 0.001 | 0.01 | 100 | 50,000 | 0.001 | 0.01 | 50 | 50,000 |
| | | 0.5 | 0.002 | 0.01 | 150 | 50,000 | 0.001 | 0.01 | 100 | 50,000 | 0.001 | 0.01 | 50 | 50,000 |
| 0.15 | 0.02・0.03 | 0.2 | 0.003 | 0.02 | 250 | 50,000 | 0.003 | 0.02 | 200 | 50,000 | 0.002 | 0.015 | 150 | 50,000 |
| | | 0.3 | 0.003 | 0.02 | 200 | 50,000 | 0.003 | 0.02 | 150 | 50,000 | 0.002 | 0.015 | 100 | 50,000 |
| | | 0.5 | 0.002 | 0.02 | 200 | 50,000 | 0.002 | 0.02 | 150 | 50,000 | 0.001 | 0.015 | 100 | 50,000 |
| 0.2 | 0.02・0.03・0.05 | 0.3 | 0.003 | 0.03 | 400 | 50,000 | 0.003 | 0.03 | 350 | 50,000 | 0.002 | 0.02 | 250 | 50,000 |
| | | 0.5 | 0.003 | 0.03 | 300 | 50,000 | 0.003 | 0.03 | 300 | 50,000 | 0.002 | 0.02 | 200 | 50,000 |
| | | 1 | 0.003 | 0.02 | 200 | 50,000 | 0.003 | 0.02 | 200 | 50,000 | 0.002 | 0.01 | 100 | 50,000 |
| 0.3 | 0.02・0.03・0.05 | 0.5・0.75・1 | 0.003 | 0.05 | 500 | 50,000 | 0.003 | 0.05 | 400 | 50,000 | 0.002 | 0.03 | 300 | 50,000 |
| | | 1.5・2 | 0.003 | 0.03 | 400 | 50,000 | 0.003 | 0.03 | 300 | 50,000 | 0.002 | 0.02 | 200 | 50,000 |
| 0.4 | 0.02・0.03・0.05・0.1 | 0.5・1 | 0.005 | 0.1 | 700 | 50,000 | 0.005 | 0.1 | 600 | 50,000 | 0.003 | 0.03 | 400 | 50,000 |
| | | 1.5・2 | 0.005 | 0.05 | 500 | 50,000 | 0.005 | 0.05 | 400 | 50,000 | 0.003 | 0.02 | 300 | 50,000 |
| 0.5 | 0.02・0.03 | 0.5・1・1.5 | 0.005 | 0.2 | 600 | 50,000 | 0.005 | 0.2 | 600 | 50,000 | 0.003 | 0.1 | 500 | 50,000 |
| | | 2.5 | 0.005 | 0.1 | 600 | 50,000 | 0.005 | 0.1 | 600 | 50,000 | 0.003 | 0.05 | 500 | 50,000 |
| | 0.05 | 0.5・1・1.5 | 0.01 | 0.2 | 600 | 50,000 | 0.01 | 0.2 | 600 | 50,000 | 0.005 | 0.2 | 500 | 50,000 |
| | | 2.5 | 0.01 | 0.1 | 600 | 50,000 | 0.01 | 0.1 | 600 | 50,000 | 0.005 | 0.1 | 500 | 50,000 |
| | 0.1 | 0.5・1・1.5 | 0.02 | 0.2 | 800 | 50,000 | 0.02 | 0.2 | 800 | 50,000 | 0.01 | 0.1 | 700 | 50,000 |
| | | 2.5 | 0.01 | 0.1 | 800 | 50,000 | 0.01 | 0.1 | 800 | 50,000 | 0.01 | 0.05 | 700 | 50,000 |
| 0.6 | 0.02・0.03 | 0.5・1・1.5 | 0.005 | 0.2 | 600 | 50,000 | 0.005 | 0.2 | 600 | 50,000 | 0.003 | 0.1 | 500 | 50,000 |
| | | 2.5 | 0.005 | 0.1 | 600 | 50,000 | 0.005 | 0.1 | 600 | 50,000 | 0.003 | 0.05 | 500 | 50,000 |
| | 0.05 | 0.5・1・1.5 | 0.01 | 0.2 | 600 | 50,000 | 0.01 | 0.2 | 600 | 50,000 | 0.005 | 0.2 | 500 | 50,000 |
| | | 2.5 | 0.01 | 0.1 | 600 | 50,000 | 0.01 | 0.1 | 600 | 50,000 | 0.005 | 0.1 | 500 | 50,000 |
| | 0.1 | 0.5・1・1.5 | 0.02 | 0.2 | 1,000 | 50,000 | 0.02 | 0.2 | 1,000 | 50,000 | 0.01 | 0.1 | 700 | 50,000 |
| | | 2.5 | 0.01 | 0.1 | 1,000 | 50,000 | 0.01 | 0.1 | 1,000 | 50,000 | 0.01 | 0.05 | 700 | 50,000 |
| 0.8 | 0.02・0.03 | 1.5・2.5 | 0.005 | 0.2 | 800 | 50,000 | 0.005 | 0.2 | 800 | 50,000 | 0.003 | 0.1 | 600 | 40,000 |
| | | 5 | 0.005 | 0.1 | 800 | 50,000 | 0.005 | 0.1 | 800 | 50,000 | 0.003 | 0.05 | 600 | 40,000 |
| | 0.05 | 1.5・2.5 | 0.02 | 0.3 | 1,000 | 50,000 | 0.02 | 0.2 | 1,000 | 50,000 | 0.01 | 0.1 | 700 | 40,000 |
| | | 5 | 0.01 | 0.2 | 1,000 | 50,000 | 0.01 | 0.1 | 1,000 | 50,000 | 0.01 | 0.05 | 700 | 40,000 |
| | 0.1 | 1.5・2.5 | 0.02 | 0.3 | 1,400 | 50,000 | 0.02 | 0.2 | 1,200 | 50,000 | 0.01 | 0.1 | 1,000 | 40,000 |
| | | 5 | 0.01 | 0.2 | 1,400 | 50,000 | 0.01 | 0.1 | 1,200 | 50,000 | 0.01 | 0.05 | 1,000 | 40,000 |
| 1 | 0.02・0.03 | 1・2 | 0.005 | 0.4 | 800 | 48,000 | 0.005 | 0.3 | 800 | 48,000 | 0.005 | 0.2 | 600 | 32,000 |
| | 0.05 | | 0.01 | 0.4 | 1,000 | 48,000 | 0.01 | 0.3 | 1,000 | 48,000 | 0.01 | 0.2 | 800 | 32,000 |
| | 0.1・0.2・0.3 | | 0.03 | 0.4 | 1,500 | 48,000 | 0.03 | 0.3 | 1,200 | 48,000 | 0.01 | 0.2 | 1,000 | 32,000 |
| | 0.02・0.03 | 3・5 | 0.005 | 0.3 | 800 | 48,000 | 0.005 | 0.2 | 800 | 48,000 | 0.005 | 0.1 | 600 | 32,000 |
| | 0.05 | | 0.01 | 0.3 | 1,000 | 48,000 | 0.01 | 0.2 | 1,000 | 48,000 | 0.01 | 0.1 | 800 | 32,000 |
| | 0.1・0.2・0.3 | | 0.02 | 0.3 | 1,500 | 48,000 | 0.02 | 0.2 | 1,200 | 48,000 | 0.01 | 0.1 | 1,000 | 32,000 |
| 1.5 | 0.02・0.03 | 2 | 0.005 | 0.7 | 1,200 | 32,000 | 0.005 | 0.6 | 1,100 | 32,000 | 0.005 | 0.3 | 900 | 20,000 |
| | 0.05 | | 0.02 | 0.7 | 1,200 | 32,000 | 0.01 | 0.6 | 1,100 | 32,000 | 0.01 | 0.3 | 900 | 20,000 |
| | 0.1・0.2・0.3 | | 0.04 | 0.7 | 2,400 | 32,000 | 0.04 | 0.6 | 1,800 | 32,000 | 0.01 | 0.3 | 1,300 | 20,000 |
| | 0.02・0.03 | 3・4.5 | 0.005 | 0.7 | 1,000 | 32,000 | 0.005 | 0.6 | 1,000 | 32,000 | 0.005 | 0.3 | 800 | 20,000 |
| | 0.05 | | 0.02 | 0.7 | 1,000 | 32,000 | 0.01 | 0.6 | 1,000 | 32,000 | 0.01 | 0.3 | 800 | 20,000 |
| | 0.1・0.2・0.3 | | 0.04 | 0.7 | 2,000 | 32,000 | 0.04 | 0.6 | 1,500 | 32,000 | 0.01 | 0.3 | 1,200 | 20,000 |
| | 0.02・0.03 | 7.5 | 0.005 | 0.5 | 1,000 | 32,000 | 0.005 | 0.4 | 1,000 | 32,000 | 0.005 | 0.2 | 800 | 20,000 |
| | 0.05 | | 0.02 | 0.5 | 1,000 | 32,000 | 0.01 | 0.4 | 1,000 | 32,000 | 0.01 | 0.2 | 800 | 20,000 |
| | 0.1・0.2・0.3 | | 0.03 | 0.5 | 2,000 | 32,000 | 0.03 | 0.4 | 1,500 | 32,000 | 0.01 | 0.2 | 1,200 | 20,000 |
| 2 | 0.02・0.03 | 3 | 0.005 | 0.8 | 1,200 | 24,000 | 0.005 | 0.7 | 1,100 | 24,000 | 0.005 | 0.5 | 900 | 16,000 |
| | 0.05 | | 0.02 | 0.8 | 1,200 | 24,000 | 0.01 | 0.7 | 1,100 | 24,000 | 0.01 | 0.5 | 900 | 16,000 |
| | 0.1・0.2・0.3・0.5 | | 0.05 | 0.8 | 2,400 | 24,000 | 0.05 | 0.7 | 1,800 | 24,000 | 0.01 | 0.5 | 1,300 | 16,000 |
| | 0.02・0.03 | 4・6 | 0.005 | 0.8 | 1,000 | 24,000 | 0.005 | 0.7 | 1,000 | 24,000 | 0.005 | 0.5 | 800 | 16,000 |
| | 0.05 | | 0.02 | 0.8 | 1,000 | 24,000 | 0.01 | 0.7 | 1,000 | 24,000 | 0.01 | 0.5 | 800 | 16,000 |
| | 0.1・0.2・0.3・0.5 | | 0.05 | 0.8 | 2,000 | 24,000 | 0.05 | 0.7 | 1,500 | 24,000 | 0.01 | 0.5 | 1,200 | 16,000 |
| | 0.02・0.03 | 10 | 0.005 | 0.6 | 1,000 | 24,000 | 0.005 | 0.5 | 1,000 | 24,000 | 0.005 | 0.3 | 800 | 16,000 |
| | 0.05 | | 0.02 | 0.6 | 1,000 | 24,000 | 0.01 | 0.5 | 1,000 | 24,000 | 0.01 | 0.3 | 800 | 16,000 |
| | 0.1・0.2・0.3・0.5 | | 0.03 | 0.6 | 2,000 | 24,000 | 0.03 | 0.5 | 1,500 | 24,000 | 0.01 | 0.3 | 1,200 | 16,000 |

**備考 Notes**

※切り込み量は、中仕上げ・仕上げ加工を行う場合の最大値です。機械剛性や要求精度などに合わせて調整してください。
※切り込み量の、ap は深さ方向の切り込み量、ae はピックフィードを示します。
※ Z 切り込み時のアプローチ方法として、ヘリカル（螺旋）及び、ランプ（傾斜）での切削加工をお奨めします。
※オイルミストクーラントをお奨めします。
※回転数と送り速度は、同じ割合で調整してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整してください。
※工具突出し量は必要以上に出さないでください。
※ミーリングチャック、機械は、出来るだけ精度の高いものをお奨めします。

※Depth of Cut shows the maximum value for semi-finishing and finishing. Adjust milling conditions depending on the rigidity of the machine and desired accuracy.
※Depth of Cut : ap = Axial Depth of Cut / ae = Radial Depth of Cut.
※Recommend to apply helical or ramping for approaching into axial direction.
※We recommend using oil mist coolant.
※Adjust both spindle speed and feed at the same rate.
※Adjust milling conditions according to the volume of depth of cut and rigidity of machine.
※Length of tool overhang must be as short as possible.
※Machine, tool chuck must be sufficiently accurate.



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# SHR320

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | | 調質鋼・焼き入れ鋼 Prehardened Steels・Hardened Steels NAK80・STAVAX・SKD61 (～52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・ELMAX (～62HRC) | | | | ハイス High Speed Tool Steels SKH ・HAP (～68HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | コーナー半径 Corner Radius | 有効長 Effective Length | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.5 | 0.1 | 1.5 | 0.008 | 0.2 | 1,500 | 50,000 | 0.005 | 0.15 | 800 | 50,000 | 0.003 | 0.1 | 600 | 50,000 |
| | | 2.5 | 0.006 | 0.15 | 1,000 | 40,000 | 0.005 | 0.1 | 500 | 40,000 | 0.003 | 0.05 | 300 | 40,000 |
| 1 | 0.1<br>0.2 | 3 | 0.012 | 0.4 | 2,000 | 40,000 | 0.007 | 0.25 | 1,000 | 40,000 | 0.006 | 0.15 | 800 | 35,000 |
| | | 5 | 0.008 | 0.3 | 1,500 | 30,000 | 0.005 | 0.15 | 800 | 30,000 | 0.004 | 0.1 | 400 | 25,000 |
| 1.5 | 0.1<br>0.2 | 4.5 | 0.015 | 0.6 | 2,500 | 35,000 | 0.008 | 0.4 | 1,200 | 35,000 | 0.007 | 0.2 | 1,000 | 30,000 |
| | | 7.5 | 0.012 | 0.4 | 1,800 | 25,000 | 0.006 | 0.3 | 1,000 | 25,000 | 0.005 | 0.15 | 500 | 20,000 |
| 2 | 0.1<br>0.3 | 6 | 0.02 | 0.8 | 3,000 | 30,000 | 0.01 | 0.6 | 1,500 | 30,000 | 0.008 | 0.3 | 1,200 | 25,000 |
| | | 10 | 0.015 | 0.6 | 2,000 | 20,000 | 0.008 | 0.4 | 1,000 | 20,000 | 0.006 | 0.2 | 600 | 18,000 |

**備　考 Notes**

※切り込み量は、等高線加工を行う場合の目安です。機械剛性や加工方法などに合わせて調整してください。
※切り込み時は傾斜進入をお奨めします。その際の進入角は 3° 以下に設定してください。
※仕上げ代が加工面に対して均一になるよう、前加工（中仕上げ）時にご注意ください。
※コーナー部など切削負荷が高くなる箇所や複雑な形状を加工する際は、特に条件設定やツールパスなどに注意してください。
※回転数と送り速度は、同じ割合で調整してください。
※オイルミストクーラントをお奨めします。
※Depth of Cut is for contour line milling as the value of reference. Please adjust it depending on machine rigidity and processing method.
※Ramping approach with angle 3° or smaller is recommended.
※Recommend leaving uniform finishing allowance on the machined surface in the pre-stage cutting (semi-finishing).
※When cutting high load sections or complex shapes, it requires attention to condition setting and tool path.
※Adjust both spindle speed and feed at the same rate.
※Oil mist coolant is recommended.

# SSF120

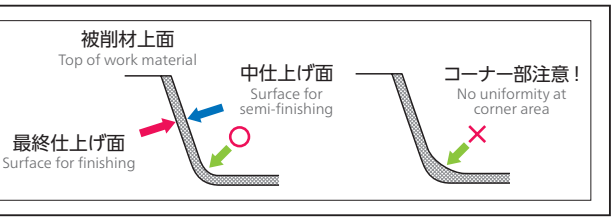
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 焼き入れ鋼・ハイス Hardened Steels・High Speed Tool Steels STAVAX・SKD11・SKH (~68HRC) | | | |
|---|---|---|---|---|
| 刃径 Dia. | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.2 | 0.002 | 0.003 | 50 | 60,000 |
| 0.3 | 0.002 | 0.003 | 100 | 60,000 |
| 0.4 | 0.002 | 0.003 | 150 | 60,000 |
| 0.5 | 0.003 | 0.005 | 200 | 60,000 |
| 0.6 | 0.003 | 0.005 | 240 | 60,000 |
| 0.8 | 0.003 | 0.008 | 280 | 60,000 |
| 1 | 0.005 | 0.01 | 300 | 60,000 |
| 1.5 | 0.005 | 0.02 | 400 | 60,000 |
| 2 | 0.005 | 0.03 | 500 | 60,000 |
| 備　考 Notes | ※切り込み量の、ap は深さ方向の切り込み量、ae はピックフィードを示します。<br>※オイルミストクーラントをご使用ください。<br>※ミーリングチャック、機械は、出来るだけ精度の高いものをお奨めします。<br>※工具突出し量は必要以上に出さないでください。<br>※Depth of Cut: ap=Axial Depth of Cut / ae=Radial Depth of Cut.<br>※We recommend using oil mist coolant.<br>※Machine, tool chuck must be sufficiently accurate.<br>※Length of tool overhang must be as short as possible. | | | |

### CBNエンドミルをより良くご使用いただくためのポイント
Main points to ensure an effective use of CBN End Mill.

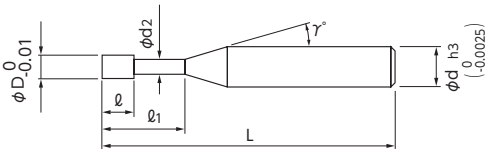
加工面全体が、均一な取り代となるようにしてください（特にコーナー部等ご注意ください）。
これらの事が、加工精度・工具寿命に影響します。

Uniforming removal stock is important for machining accuracy and tool life, especially at corner area.



# PCDSE

## PCDスクエアエンドミル
PCD End Mill




●超硬合金の切削加工において安定した良好な切削面を実現。
●超精密加工で要求されるナノレベルの面粗さを得ることが可能。
●耐摩耗性と耐欠損性の両立を図れる NS 独自の刃形状を採用。
●Fine and stable milling surface realized on cemented carbide material.
●Possible to get the nano-level surface roughness required on ultra-high precision machining.
●NS original flute design of cutting edge enabled a strong resistance against wear and chipping.

技術資料 K-016

Face PCD 2 6 0°

被削材 Work Material

| 超硬合金 Cemented Carbide | その他の硬脆材 Other Hard Brittle Material |
|---|---|
| ◎ | ○ |

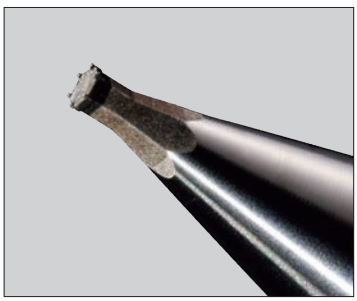
単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (ℓ1)有効長 Effective Length | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 刃数 Number of Flutes | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 04-00300-00100 | 0.1 | 0.02 | 0.1 | 0.09 | 15° | 4 | 48 | 2 | 70,000 |
| 04-00300-00200 | 0.2 | 0.04 | 0.2 | 0.18 | 15° | 4 | 48 | 2 | 70,000 |
| 04-00300-00300 | 0.3 | 0.06 | 0.3 | 0.27 | 15° | 4 | 48 | 2 | 60,000 |
| 04-00300-00400 | 0.4 | 0.08 | 0.4 | 0.36 | 15° | 4 | 48 | 6 | 60,000 |
| 04-00300-00500 | 0.5 | 0.1 | 0.5 | 0.45 | 15° | 4 | 48 | 6 | 60,000 |
| 04-00300-00600 | 0.6 | 0.12 | 0.6 | 0.54 | 15° | 4 | 48 | 6 | 50,000 |
| 04-00300-00800 | 0.8 | 0.16 | 0.8 | 0.72 | 15° | 4 | 48 | 6 | 50,000 |
| 04-00300-01000 | 1 | 0.2 | 1 | 0.9 | 15° | 4 | 48 | 6 | 50,000 |

オーダー方法
PCDSE 刃径(D)を指示してください。
When you order, indicate PCDSE (D).
※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はC-002に記載
●Recommended Milling Conditions are shown on page C-002.

PCDSE



# PCDSE

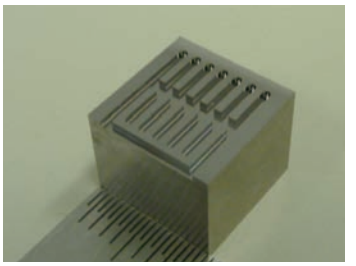
## 切削条件参考表 Recommended Milling Conditions

技術資料 K-016

| 被削材 Work Material | 超硬合金 Cemented Carbide | | |
|---|---|---|---|
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut |
| | $min^{-1}$ | mm/min | ap mm |
| 0.1 | 40,000 | 25 | 0.0002 |
| 0.2 | 40,000 | 25 | 0.0002 |
| 0.3 | 40,000 | 25 | 0.0002 |
| 0.4 | 40,000 | 50 | 0.0005 |
| 0.5 | 40,000 | 50 | 0.0005 |
| 0.6 | 40,000 | 50 | 0.0005 |
| 0.8 | 40,000 | 50 | 0.0005 |
| 1 | 40,000 | 50 | 0.0005 |
| 備考 Notes | ※工具の折損や欠損、加工精度の低下に繋がるため、工具の回転振れ量を最小に抑えてください。<br>※切り込み量 ap が極小のため、加工前に主軸の伸縮量や機械の特性を把握してから加工することをお奨めします。<br>※不水溶性切削油をお奨めします。<br>※切り込み量の ap は深さ方向の切り込み量を示します。<br>※Minimum tool runout is required to avoid the tool breakage and to increase the work accuracy.<br>※Due to infinitesimal Depth of Cut (ap), recommend to assess the machine characters, such as expansion of the spindle and others before using the tool.<br>※Water-insoluble cutting fluid is recommended.<br>※ap : Axial Depth of Cut. | | |

## 加工事例 1 Technical Data 1

コネクタモデル Connector Model



ワークサイズ：10×10mm　加工深さ：0.5mm
Work size : 10×10mm Cutting depth 0.5mm

・被削材：超硬合金 92.5HRA Material : Cemented Carbide 92.5HRA
・クーラント：不水溶性切削油 Coolant : Water-insoluble cutting oil

| 加工工程 Process | 等高線仕上げ Contour line finishing | 底面仕上げ Bottom finishing |
|---|---|---|
| 使用工具 Tool | PCDSE φ0.5 | |
| 回転数 [$min^{-1}$] Spindle speed | 120,000 | |
| 送り速度 [mm/min] Feed | 100 | 50 |
| 切り込み量 ap×ae[mm] Depth of cut | 0.002×0.001 | 0.0005×0.002 |
| 加工距離(m) Cutting length | 64 | |
| 加工時間 Cutting time | 11時間2分 11hr 2min | |

| 側面 Side | Ra0.017μm / Rz0.096μm | 底面 Bottom | Ra0.0007μm / Rz0.008μm |
|---|---|---|---|



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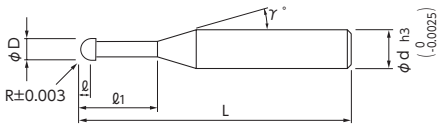
# PCDRB

## PCDボールエンドミル
PCD Ball End Mill




●安定した加工面を得るためのユニークな工具デザイン。
● 3次元仕上げ加工においてナノレベルの面粗さを得られ、磨きレスが可能。
●バージョンアップした刃先デザインが、加工面品位の更なる安定化を実現しました。
●Unique tool geometry makes stable surface.
●Polish-less machining become reality by nano-level roughness on profiling finish.
●Upgraded tool edge design makes stable high quality surface.

技術資料 K-017

3D PCD

被削材 Work Material

| 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | | 超硬合金 Cemented Carbide | その他の硬脆材 Other Hard Brittle Material |
|---|---|---|---|---|
| | ～55HRC | 55HRC～ | | |
| ◎ | ◎ | ◎ | ◎ | ○ |

★再研磨可能(全長35mm以上のもの。詳細はお問い合わせください。)

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 04-00500-00501 | R0.05 | 0.15 | 0.05 | 0.1 | 15° | 4 | 48 | 65,000 |
| 04-00500-00502 | | 0.25 | 0.05 | 0.1 | 15° | 4 | 48 | 65,000 |
| 04-00500-00751 | R0.075 | 0.23 | 0.075 | 0.15 | 15° | 4 | 48 | 65,000 |
| 04-00500-00752 | | 0.38 | 0.075 | 0.15 | 15° | 4 | 48 | 65,000 |
| 04-00500-01001 | R0.1 | 0.5 | 0.1 | 0.2 | 15° | 4 | 48 | 56,000 |
| 04-00500-02001 | R0.2 | 1 | 0.2 | 0.4 | 15° | 4 | 48 | 54,000 |
| 04-00500-03001 | R0.3 | 1.5 | 0.3 | 0.6 | 15° | 4 | 48 | 50,000 |
| ★ 04-00500-05001 | R0.5 | 2.5 | 0.5 | 1 | 15° | 4 | 50 | 56,000 |
| ★ 04-00500-07501 | R0.75 | 3.8 | 0.75 | 1.5 | 15° | 4 | 48 | 60,000 |
| ★ 04-00500-10001 | R1 | 5 | 1 | 2 | 15° | 4 | 48 | 60,000 |

オーダー方法 PCDRB ボール半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate PCDRB (R)X(ℓ1).

※(γ)は参考値です。
※(γ)is reference Value.

●切削条件表はC-004に記載
●Recommended Milling Conditions are shown on page C-004.

PCDRB

# PCDRB

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-017

| 被削材 Work Material | | 調質鋼・焼き入れ鋼・ハイス Prehardened Steels・Hardened Steels・High Speed Tool Steels (～68HRC) | | | | | 超硬合金 Cemented Carbide | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 取り代 Stock | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 取り代 Stock | 切り込み量 Depth of Cut | |
| | | $min^{-1}$ | mm/min | mm | ap mm | ae mm | $min^{-1}$ | mm/min | mm | ap mm | ae mm |
| 0.05 | 0.15 | 40,000 | 50 | 0.001 | 0.001 | 0.001 | 40,000 | 50 | 0.001 | 0.001 | 0.001 |
| | 0.25 | 40,000 | 25 | 0.001 | 0.001 | 0.001 | 40,000 | 25 | 0.001 | 0.001 | 0.001 |
| 0.075 | 0.23 | 40,000 | 100 | 0.001 | 0.001 | 0.001 | 40,000 | 100 | 0.001 | 0.001 | 0.001 |
| | 0.38 | 40,000 | 50 | 0.001 | 0.001 | 0.001 | 40,000 | 50 | 0.001 | 0.001 | 0.001 |
| 0.1 | 0.5 | 40,000 | 100 | 0.001 | 0.001 | 0.001 | 40,000 | 100 | 0.001 | 0.001 | 0.001 |
| 0.2 | 1 | 40,000 | 200 | 0.002 | 0.002 | 0.002 | 40,000 | 150 | 0.002 | 0.001 | 0.002 |
| 0.3 | 1.5 | 40,000 | 400 | 0.003 | 0.003 | 0.003 | 40,000 | 200 | 0.002 | 0.002 | 0.002 |
| 0.5 | 2.5 | 40,000 | 500 | 0.005 | 0.005 | 0.005 | 40,000 | 300 | 0.003 | 0.003 | 0.003 |
| 0.75 | 3.8 | 40,000 | 600 | 0.005 | 0.005 | 0.005 | 40,000 | 400 | 0.004 | 0.004 | 0.004 |
| 1 | 5 | 40,000 | 800 | 0.005 | 0.005 | 0.005 | 40,000 | 500 | 0.005 | 0.005 | 0.005 |

**備考 Notes**

※ 切り込み量の ap は軸方向の切り込み量、ae は半径方向の切り込み量を示します。
※ 切り込み量は最大値になります。機械剛性や主軸剛性、要求精度などに合わせて調整してください。
※ 仕上げ代が加工面に対して均一になるよう、前加工（中仕上げ）時にご注意ください。
※ 加工中の潤滑性、排出性が低下しないよう、クーラントが加工点まで到達するように注意してください。
※ コーナー部、溝加工など、負荷が高くなる加工箇所では、特に条件設定やツールパスに注意してください。
※ 不水溶性切削油をお奨めします。
※ ap: Axial Depth of Cut, ae: Radial Depth of Cut.
※ Described Depth of Cut is max value. Adjust it depending on machine rigidity, main spindle rigidty, and required precision.
※ Obtain uniform stock amount on the cutting surface in the pre-stage cutting (semi-finishing).
※ In order to perform lubricity and chip flow well, coolant must be always reached cutting points.
※ Careful set up for milling condition and tool path are required especially when operate with high cutting load such as corner area and slotting.
※ Water-insoluble cutting fluid is recommended.

## 加工事例 1 Technical Data 1

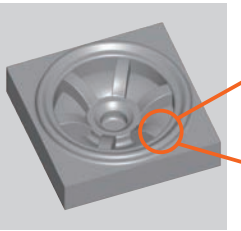
ホイール形状モデル Wheel model

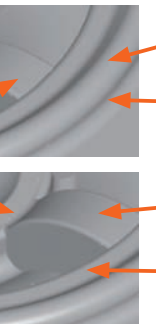
- 被削材：ELMAX 60HRC Material : ELMAX 60HRC
- クーラント：不水溶性切削油 Coolant : Water-insoluble cutting oil
- 総加工時間：50 時間 13 分 Cutting time : 50hr 13min

ワークサイズ：50×50mm
Work size : 50×50mm

| 加工工程 Process | 荒取り① Roughing① | 荒取り② Roughing② | 中仕上げ Semi-finishing | 仕上げ Finishing |
|---|---|---|---|---|
| 使用工具 Tool | MRBH230 R1×6 | MRBH230 R1×6 | SSPB220 R1×5 | PCDRB R1×5 |
| 回転数 [$min^{-1}$] Spindle speed | 25,000 | 25,000 | 40,000 | 40,000 |
| 送り速度 [mm/min] Feed | 2,000 | 1,000 | 800 | 500 |
| 切り込み量[mm] Depth of cut | ap 0.15 ae 0.3 | ap 0.02 ae 0.05 | ap 0.01 ae 0.01 | ap 0.003 ae 0.003 |
| 残し代[mm] Stock | 0.033 | 0.013 | 0.003 | 0 |
| 加工時間 Cutting time | 2時間17分 2hr 17min | 1時間45分 1hr 45min | 7時間12分 7hr 12min | 38時間58分 38hr 58min |

面粗さ Roughness





① フィレット上部（0°付近） Upper fillet
② フィレット下部（90°付近） Lower fillet
③ 平坦部 1 Flat part 1
④ 平坦部 2 Flat part 2

| | Rz[μm] |
|---|---|
| ① | 0.209 |
| ② | 0.212 |
| ③ | 0.159 |
| ④ | 0.330 |

●約39時間の仕上げ加工でも、全面で鏡面のような光沢のある仕上げ面を得られ、面粗さ (Rz) もサブミクロンのレベルです。
●仕上げ工程前に、CBN 工具にて中仕上げを行います。前加工にて取り代の均一化することが、仕上げ工程での結果に大きく影響します。
● PCDRB can realize mirror like finishing on full surface machining and achieve the sub-micro level surface roughness, even for approx. 39hrs finishing process.
● Before finishing, use CBN to process semi-finishing. Leaving constant stock amount on semi-finished surface will have great affects in the finishing process.



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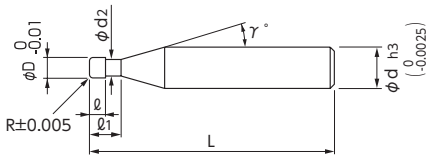
# PCDRS

## PCDラジアスエンドミル
PCD Radius End Mill




●PCD シリーズに待望のラジアスタイプが登場！
●ボール形状の曲面切削性とスクエア形状の平面切削性を併せ持ったラジアス形状で、究極の高面品位を実現！
●Added a much-needed corner radius type in PCD series!
●Ultimate high quality surface is realized in the corner radius shape with superior cutting performance on curved and plane surface!

被削材 Work Material

| 超硬合金 Cemented Carbide | その他の硬脆材 Other Hard Brittle Material |
|---|---|
| ◎ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Conaer Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 刃数 Number of Flutes | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|
| 04-00700-03050 | 0.3 | R0.05 | 0.3 | 0.09 | 0.27 | 15° | 4 | 48 | 2 | 60,000 |
| 04-00700-04050 | 0.4 | R0.05 | 0.4 | 0.12 | 0.36 | 15° | 4 | 48 | 4 | 60,000 |
| 04-00700-05050 | 0.5 | R0.05 | 0.5 | 0.15 | 0.45 | 15° | 4 | 48 | 4 | 60,000 |
| 04-00700-05100 | | R0.1 | 0.5 | 0.15 | 0.45 | 15° | 4 | 48 | 4 | 60,000 |
| 04-00700-06050 | 0.6 | R0.05 | 0.6 | 0.18 | 0.54 | 15° | 4 | 48 | 6 | 50,000 |
| 04-00700-06100 | | R0.1 | 0.6 | 0.18 | 0.54 | 15° | 4 | 48 | 6 | 50,000 |
| 04-00700-08050 | 0.8 | R0.05 | 0.8 | 0.24 | 0.72 | 15° | 4 | 48 | 6 | 50,000 |
| 04-00700-08100 | | R0.1 | 0.8 | 0.24 | 0.72 | 15° | 4 | 48 | 6 | 50,000 |
| 04-00700-10050 | 1 | R0.05 | 1 | 0.3 | 0.9 | 15° | 4 | 48 | 6 | 50,000 |
| 04-00700-10100 | | R0.1 | 1 | 0.3 | 0.9 | 15° | 4 | 48 | 6 | 50,000 |

**オーダー方法** PCDRS 刃径(D)×コーナー半径(R)を指示してください。
When you order, indicate PCDRS (D)X(R).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はC-006に記載
●Recommended Milling Conditions are shown on page C-006.

PCDRS

# PCDRS

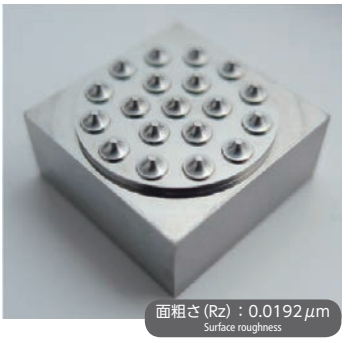
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | 超硬合金 Cemented Carbide | | | |
|---|---|---|---|---|---|
| (D)刃径 Dia. | (R)コーナー半径 Corner Radius | 回転数 Spindle Speed | 送り速度 Feed | 仕上げ切り込み量 Depth of Cut for Finish | |
| | | min$^{-1}$ | mm/min | ap mm | ae mm |
| 0.3 | R0.05 | 50,000 | 50 | 0.001 | 0.005 |
| 0.4 | R0.05 | 50,000 | 100 | 0.001 | 0.01 |
| 0.5 | R0.05 | 50,000 | 100 | 0.001 | 0.01 |
| | R0.1 | 50,000 | 150 | 0.001 | 0.015 |
| 0.6 | R0.05 | 50,000 | 100 | 0.001 | 0.01 |
| | R0.1 | 50,000 | 150 | 0.001 | 0.015 |
| 0.8 | R0.05 | 50,000 | 150 | 0.001 | 0.015 |
| | R0.1 | 50,000 | 200 | 0.001 | 0.03 |
| 1 | R0.05 | 50,000 | 150 | 0.001 | 0.015 |
| | R0.1 | 50,000 | 200 | 0.001 | 0.03 |
| 備　考 Notes | | ※工具の折損や欠損、加工精度の低下に繋がるため、工具の回転振れ量を最小に抑えてください。<br>※切り込み量 ap が極小のため、加工前に主軸の伸縮量や機械の特性を把握してから加工することをお奨めします。<br>※不水溶性切削油をお奨めします。<br>※Minimal tool runout is required to avoid the tool breakage and to increase the work accuracy.<br>※Due to infinitesimal Depth of Cut (ap), recommend to assess the machine characters, such as expansion of the spindle and others before using the tool.<br>※Water-insoluble cutting fluid is recommended. | | | |

## 加工事例 1 Technical Data 1

・被削材：超硬合金　92.5HRA　Material : Cemented Carbide 92.5HRA
・クーラント：不水溶性切削油　Coolant : Water-insoluble cutting oil
・総加工時間：9時間48分　Total cutting time : 9hr 48min

ワークサイズ:φ15mm　Work size : φ15mm
加工深さ:0.924mm　Cutting depth : 0.924mm




| 加工工程 Process | 仕上げ Finishing | |
|---|---|---|
| | 等高線 Contour line milling | 走査線 Scanning line milling |
| 使用工具 Tool | PCDRS φ0.3×R0.05×0.3 | |
| 回転数 [min$^{-1}$] Spindle speed | 40,000 | |
| 送り速度 [mm/min] Feed | 70 | |
| 切り込み量 ap×ae [mm] Depth of cut | 0.002～0.006×0.002 | 0.001×0.005～0.01 |
| 仕上げ代 [mm] Stock allowance | 0.002 | 0.001 |
| 加工距離 Cutting length | 28m | 12m |
| 加工時間 Cutting time | 6時間23分 6hr23min | 3時間25分 3hr25min |



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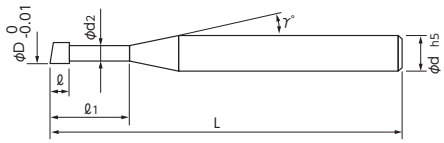
# CED100

## 単結晶ダイヤモンドエンドミル “クリアエッジ”
Monocrystalline Diamond End Mill “CLEAR EDGE”




●超硬合金の直彫り加工を実現。
●脆性材の高精度加工が可能。
●単結晶ダイヤモンドの特性を最大限に引き出すユニークデザイン。
●Direct machining to cemented carbide, hard metal.
●Enable high-accurate machining to brittle materials.
●Unique design to maximize performance of monocrystalline diamond.

Face DIA 0°

### 被削材 Work Material

| 超硬合金 Cemented Carbide | セラミックス Ceramics | 石英ガラス Quartz glass | 単結晶シリコン Monocrystal silicon | アルミニウム合金 Aluminum Alloy | 銅 Copper |
|---|---|---|---|---|---|
| ○ | ◎ | ◎ | ○ | ○ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (ℓ1)有効長 Effective Length | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 04-00100-00100 | 0.1 | 0.05 | 0.2 | 0.09 | 15° | 4 | 40 | 221,000 |
| 04-00100-00200 | 0.2 | 0.1 | 0.4 | 0.18 | 15° | 4 | 40 | 200,000 |
| 04-00100-00300 | 0.3 | 0.15 | 0.6 | 0.27 | 15° | 4 | 40 | 189,000 |
| 04-00100-00400 | 0.4 | 0.2 | 0.8 | 0.36 | 15° | 4 | 40 | 178,000 |
| 04-00100-00500 | 0.5 | 0.25 | 1 | 0.46 | 15° | 4 | 40 | 168,000 |
| 04-00100-01000 | 1 | 0.5 | 2 | 0.9 | 15° | 4 | 40 | 200,000 |
| 04-00100-01200 | 1.2 | 0.6 | 2.4 | 1.08 | 15° | 4 | 40 | 210,000 |
| 04-00100-01500 | 1.5 | 0.75 | 3 | 1.42 | 15° | 4 | 40 | 221,000 |
| 04-00100-02000 | 2 | 1 | 4 | 1.9 | 15° | 4 | 40 | 263,000 |

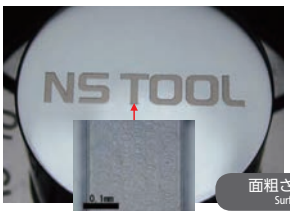
**オーダー方法** CED100 刃径(D)を指示してください。 ※(γ)は参考値です。
When you order, indicate CED100 (D). ※(γ) is reference value.

### 加工事例 1 Technical Data 1

被削材：超硬合金(硬度：95HRA)
Material: Cemented Carbide (95HRA)

工具サイズ：φ0.1
Tool size

ワークサイズ:φ10mm 加工深さ:0.03mm
Work size : φ10mm Cutting depth : 0.03mm




| | |
|---|---|
| 回転数 Spindle speed | 12,000min$^{-1}$ |
| 送り速度 Feed | 6mm/min |
| 切り込み量 Depth of cut | 0.002mm × 0.03mm (ap × ae) |
| 加工距離 Cutting length | 2.7m |
| 加工時間 Cutting time | 7 時間 30 分 7hr 30min |
| クーラント Coolant | オイルミスト Oil mist |

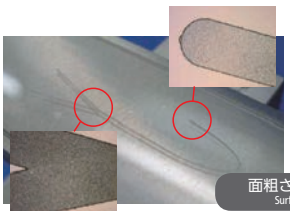
面粗さ(Rz)：1μm Surface roughness

### 加工事例 2 Technical Data 2

被削材：石英ガラス
Material: Quartz glass

工具サイズ：φ0.3
Tool size

ワークサイズ:75×25×1mm 加工深さ:0.05mm
Work size : 75×25×1mm Cutting depth : 0.05mm



| | |
|---|---|
| 回転数 Spindle speed | 40,000min$^{-1}$ |
| 送り速度 Feed | 15mm/min |
| 切り込み量 Depth of cut | 0.001mm ap |
| 加工距離 Cutting length | 3.2m |
| 加工時間 Cutting time | 4 時間 4hr |
| クーラント Coolant | オイルミスト Oil mist |

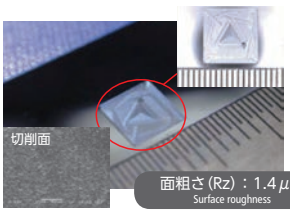
面粗さ(Rz)：2μm Surface roughness

### 加工事例 3 Technical Data 3

被削材：単結晶シリコン
Material: Monocrystal silicon

工具サイズ：φ0.5
Tool size

ワークサイズ:45×20×0.7mm
Work size : 45×20×0.7mm




| | |
|---|---|
| 回転数 Spindle speed | 20,000min$^{-1}$ |
| 送り速度 Feed | 100mm/min |
| 切り込み量 Depth of cut | 0.0025mm × 0.125mm (ap × ae) |
| 加工距離 Cutting length | 21.2m |
| 加工時間 Cutting time | 3 時間 30 分 3hr 30min |
| クーラント Coolant | オイルミスト Oil mist |

面粗さ(Rz)：1.4μm Surface roughness

測定器：KEYENCEVK9500
Measuring instrument: VK9500

### 加工事例 4 Technical Data 4

被削材：ニッケルリン(メッキ層)
Material: No-electrolytic NiP-plated layer

工具サイズ：φ0.1
Tool size

ワークサイズ:30×10mm
Work size : 30×10mm

| | |
|---|---|
| 回転数 Spindle speed | 12,000min$^{-1}$ |
| 送り速度 Feed | 200mm/min |
| 切り込み量 Depth of cut | 0.003mm × 0.1mm (ap × ae) |
| 加工距離 Cutting length | 5.5m |
| 加工時間 Cutting time | 5 時間 5hr |
| クーラント Coolant | オイルミスト Oil mist |

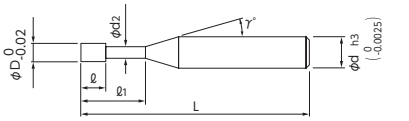
溝切削 底面粗さ(Rz)：1μm Bottom Surface roughness

●ダイヤモンドの特性上、工具のプリセット時に通電式のプリセッターは使用出来ません。
●外周刃を使用する切削は不向きです。
●クリアエッジはライセンスによる生産品です。

●Electro-conductive tool presetter can not be used due to characteristic of the diamond.
●Machining by use of outer flute is not recommended.
●CLEAR EDGE is under lisence production.

# DCMS

## 硬脆材加工用スクエアエンドミル
End Mill for Hard Brittle Materials




●超硬合金やセラミックス等の硬くて脆い材料の直彫り加工が可能。
●密着性の高いダイヤモンドコーティングの採用により長時間加工が可能。
●Machinable on hard brittle materials such as cemented carbide and ceramic.
●High adhered DIAMOND COATING makes tool life long.

Face | MG | DIA | 6 | 8 | 10 | 30°

被削材 Work Material

| 超硬合金 Cemented Carbide | セラミックス Ceramics | ガラス glass | その他の硬脆材 Other Hard Brittle Material |
|---|---|---|---|
| ◎ | ◎ | ◎ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 刃数 Number of Flutes | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 05-00100-03006 | 0.3 | 0.6 | 0.15 | 0.28 | 12° | 4 | 45 | 6 | 32,200 |
| 05-00100-03012 | | 1.2 | 0.15 | 0.28 | 12° | 4 | 45 | 6 | 32,200 |
| 05-00100-04008 | 0.4 | 0.8 | 0.2 | 0.38 | 12° | 4 | 45 | 6 | 31,500 |
| 05-00100-04016 | | 1.6 | 0.2 | 0.38 | 12° | 4 | 45 | 6 | 31,500 |
| 05-00100-05010 | 0.5 | 1 | 0.25 | 0.46 | 12° | 4 | 45 | 8 | 30,800 |
| 05-00100-05020 | | 2 | 0.25 | 0.46 | 12° | 4 | 45 | 8 | 30,800 |
| 05-00100-08016 | 0.8 | 1.6 | 0.4 | 0.76 | 12° | 4 | 45 | 8 | 29,400 |
| 05-00100-08032 | | 3.2 | 0.4 | 0.76 | 12° | 4 | 45 | 8 | 29,400 |
| 05-00100-10020 | 1 | 2 | 0.5 | 0.95 | 12° | 4 | 45 | 10 | 30,800 |
| 05-00100-10040 | | 4 | 0.5 | 0.95 | 12° | 4 | 45 | 10 | 30,800 |
| 05-00100-15030 | 1.5 | 3 | 0.75 | 1.45 | 12° | 4 | 45 | 10 | 30,100 |
| 05-00100-15060 | | 6 | 0.75 | 1.45 | 12° | 4 | 45 | 10 | 30,100 |
| 05-00100-20040 | 2 | 4 | 1 | 1.94 | 12° | 4 | 45 | 10 | 29,400 |
| 05-00100-20080 | | 8 | 1 | 1.94 | 12° | 4 | 45 | 10 | 29,400 |

**オーダー方法**
DCMS　刃径(D)×有効長(ℓ1)を指示してください。
When you order, indicate DCMS (D)×(ℓ1).
※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はC-009に記載
●Recommended Milling Conditions are shown on page C-009.

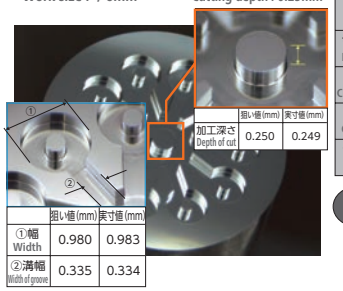
## 加工事例 1　Technical Data 1

被削材：**超硬合金（硬度：92.5HRA）**
Material : Cemented Carbide (92.5HRA)

**工具サイズ：φ0.3**
Tool size

ワークサイズ：φ6mm
Work size : φ6mm

加工深さ：0.25mm
Cutting depth : 0.25mm




| | 狙い値(mm) | 実寸値(mm) |
|---|---|---|
| ①幅 Width | 0.980 | 0.983 |
| ②溝幅 Width of groove | 0.335 | 0.334 |

| | 狙い値(mm) | 実寸値(mm) |
|---|---|---|
| 加工深さ Depth of cut | 0.250 | 0.249 |

| | |
|---|---|
| 回転数 Spindle speed | 40,000min-1 |
| 送り速度 Feed | 80mm/min |
| 切り込み量 Depth of cut | 0.001mm×0.13mm (ap×ae) |
| 加工距離 Cutting length | 39.2m |
| 加工時間 Cutting time | 8時間30分 8hr 30min |
| クーラント Coolant | 不水溶性切削油 Water-insoluble cutting oil |

面粗さ(Rz)：0.12μm
Surface roughness

## 加工事例 2　Technical Data 2

被削材：**アルミナ（96%）**
Material : Aluminium Oxide (96%)

**工具サイズ：φ1**
Tool size

ワークサイズ：φ25mm
Work size : φ25mm

加工深さ：1mm
Cutting depth : 1mm

| | 狙い値(mm) | 実寸値(mm) |
|---|---|---|
| 溝幅 Width of groove | 1.000 | 1.002 |

| | |
|---|---|
| 回転数 Spindle speed | 20,000min-1 |
| 送り速度 Feed | 100mm/min |
| 切り込み量 Depth of cut | 0.002mm×0.6mm (ap×ae) |
| 加工距離 Cutting length | 91.3m |
| 加工時間 Cutting time | 17時間50分 17hr 50min |
| クーラント Coolant | 水溶性切削油 Water-soluble oil |

面粗さ(Rz)：1μm
Surface roughness



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# DCMS

## 切削条件参考表 Recommended Milling Conditions

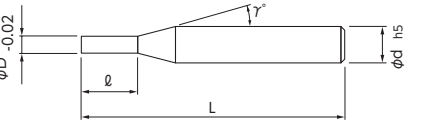
| 被削材 Work Material | | 超硬合金 Cemented Carbide | | | | アルミナ $Al_2O_3$ | | | | 耐熱ガラス Heat-resistance Glass | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | $min^{-1}$ | mm/min | ap mm | ae mm | $min^{-1}$ | mm/min | ap mm | ae mm | $min^{-1}$ | mm/min | ap mm | ae mm |
| 0.3 | 0.6 | 40,000 | 50 | 0.001 | 0.15 | 40,000 | 80 | 0.002 | 0.15 | 40,000 | 80 | 0.002 | 0.15 |
| | 1.2 | 40,000 | 50 | 0.001 | 0.15 | 40,000 | 80 | 0.002 | 0.15 | 40,000 | 80 | 0.002 | 0.15 |
| 0.4 | 0.8 | 30,000 | 50 | 0.001 | 0.25 | 30,000 | 80 | 0.002 | 0.25 | 30,000 | 80 | 0.002 | 0.25 |
| | 1.6 | 30,000 | 50 | 0.001 | 0.25 | 30,000 | 80 | 0.002 | 0.25 | 30,000 | 80 | 0.002 | 0.25 |
| 0.5 | 1 | 20,000 | 80 | 0.001 | 0.3 | 20,000 | 120 | 0.002 | 0.3 | 20,000 | 120 | 0.002 | 0.3 |
| | 2 | 20,000 | 80 | 0.001 | 0.3 | 20,000 | 120 | 0.002 | 0.3 | 20,000 | 120 | 0.002 | 0.3 |
| 0.8 | 1.6 | 20,000 | 80 | 0.001 | 0.5 | 20,000 | 120 | 0.002 | 0.5 | 20,000 | 120 | 0.002 | 0.5 |
| | 3.2 | 20,000 | 80 | 0.001 | 0.5 | 20,000 | 120 | 0.002 | 0.5 | 20,000 | 120 | 0.002 | 0.5 |
| 1 | 2 | 20,000 | 100 | 0.001 | 0.6 | 20,000 | 150 | 0.002 | 0.6 | 20,000 | 150 | 0.002 | 0.6 |
| | 4 | 20,000 | 100 | 0.001 | 0.6 | 20,000 | 150 | 0.002 | 0.6 | 20,000 | 150 | 0.002 | 0.6 |
| 1.5 | 3 | 20,000 | 100 | 0.001 | 0.9 | 20,000 | 150 | 0.002 | 0.9 | 20,000 | 150 | 0.002 | 0.9 |
| | 6 | 15,000 | 100 | 0.001 | 0.9 | 15,000 | 150 | 0.002 | 0.9 | 15,000 | 150 | 0.002 | 0.9 |
| 2 | 4 | 20,000 | 100 | 0.001 | 1.2 | 20,000 | 150 | 0.002 | 1.2 | 20,000 | 150 | 0.002 | 1.2 |
| | 8 | 15,000 | 100 | 0.001 | 1.2 | 15,000 | 150 | 0.002 | 1.2 | 15,000 | 150 | 0.002 | 1.2 |

**備　考 Notes**

※工具の折損や欠損、コーティング膜の剥離の原因となるため切削条件は切削条件表に従って設定してください。
※工具の折損や欠損、加工精度の低下に繋がるため工具の回転振れ量を最小に抑えてください。
※ ap 切り込み量が極小のため、加工前に主軸の伸び縮み量や機械の特性を把握してからの加工をお奨めします。
※不水溶性切削油をお奨めします。
※Follow the recommended milling conditions to prevent possible tool breakage and coating flake.
※Minimize tool rotation runout for machining accuracy and to prevent tool breakage.
※Control characteristic of machine and spindle extension amount for such small cutting depth(ap) process.
※Recommend use water-insoluble cutting oil.

# DCSE235

## ダイヤモンドコーティング2枚刃エンドミル
DIAMOND COATING 2-Flute End Mill




●独自のダイヤモンドコーティングの採用で、グラファイトや高シリコンアルミニウム合金の加工に対して高い耐久性を発揮。
●3倍刃長で狭くて深い加工に適したスクエアタイプ。
●Original DIAMOND COATING realized a long tool life for the machining of graphite, silicon-aluminum alloy and brittle materials.
●Square design of L/D=3 is suited for the machining of narrow and deep area.

Slot Side Face WC DIA 2 35°

### 被削材 Work Material

| グラファイト Graphite | 高Siアルミニウム High Silicon Aluminum Alloy | 繊維入り樹脂 Fiber Reinforced Plastics (FRP) |
|---|---|---|
| ◎ | ○ | ○ |

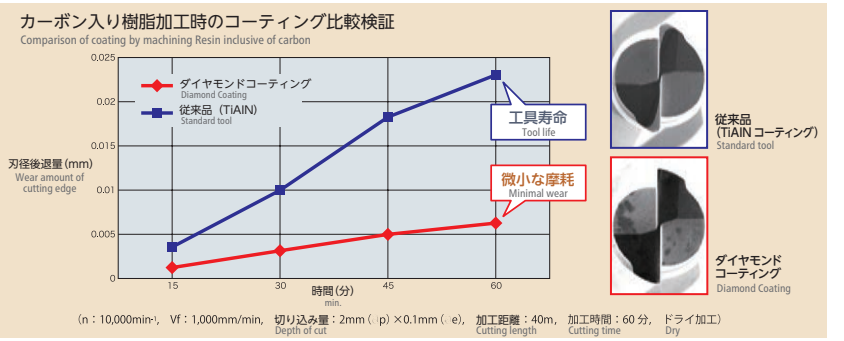
単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 05-00035-00050 | 0.5 | 1.5 | 12° | 4 | 45 | 16,600 |
| 05-00035-00100 | 1 | 3 | 12° | 4 | 45 | 16,600 |
| 05-00035-00150 | 1.5 | 4.5 | 12° | 4 | 45 | 16,600 |
| 05-00035-00200 | 2 | 6 | 12° | 4 | 45 | 16,600 |
| 05-00035-00300 | 3 | 9 | 12° | 6 | 45 | 21,100 |
| 05-00035-00400 | 4 | 12 | 12° | 6 | 50 | 22,500 |
| 05-00035-00500 | 5 | 15 | 12° | 6 | 55 | 24,000 |
| 05-00035-00600 | 6 | 18 | – | 6 | 60 | 24,000 |

**オーダー方法** DCSE235 刃径(D)を指示してください。 ※(γ)は参考値です。
When you order, indicate DCSE235 (D). ※(γ) is reference value.

●切削条件表はC-011に記載
●Recommended Milling Conditions are shown on page C-011.

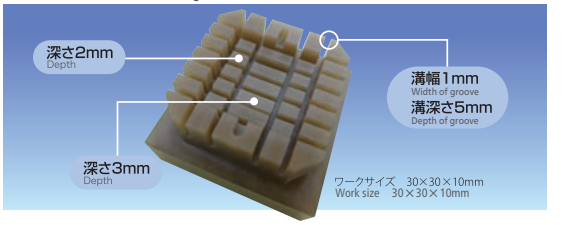
### 寿命比較 Comparison of life




## 加工事例 1 Technical Data 1

**被削材：ガラス繊維入り樹脂（PES材）** Material : Resin inclusive of glass fiber

| 加工工程 Process | 外枠部 Outer profile | 溝部 Slot |
|---|---|---|
| 使用工具 Tool | DCSE235 φ6 | DCHR230 φ1×6 |
| 回転数 Spindle speed | 10,000 min-1 | 10,000 min-1 |
| 送り速度 Feed | 2,000 mm/min | 1,000 mm/min |
| 切り込み量 Depth of cut | 10mm×0.5mm (ap×ae) | 0.1mm(ap) |
| 加工距離 Cutting length | 2.3m | 28m |
| 加工時間 Cutting time | 3分 3min | 50分 50min |



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# DCSE235

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | グラファイト Graphite | | | | | | | アルミ合金ダイカスト Aluminum Alloy Die Casting | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 側面 Side Milling | | | | 溝 Slotting | | | 側面 Side Milling | | | | 溝 Slotting | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut |
| | $min^{-1}$ | mm/min | ∂p mm | ∂e mm | $min^{-1}$ | mm/min | ∂p mm | $min^{-1}$ | mm/min | ∂p mm | ∂e mm | $min^{-1}$ | mm/min | ∂p mm |
| 0.5 | 30,000 | 1,000 | 1.5 | 0.03 | 30,000 | 800 | 0.05 | 20,000 | 600 | 1.5 | 0.01 | 20,000 | 500 | 0.03 |
| 1 | 30,000 | 1,200 | 3 | 0.05 | 30,000 | 1,000 | 0.1 | 20,000 | 1,000 | 3 | 0.02 | 20,000 | 800 | 0.1 |
| 1.5 | 25,000 | 1,500 | 4.5 | 0.07 | 25,000 | 1,200 | 0.2 | 20,000 | 1,000 | 4.5 | 0.05 | 20,000 | 800 | 0.2 |
| 2 | 25,000 | 2,000 | 6 | 0.1 | 25,000 | 1,500 | 0.3 | 20,000 | 1,500 | 6 | 0.07 | 20,000 | 1,200 | 0.3 |
| 3 | 20,000 | 2,500 | 9 | 0.1 | 20,000 | 1,500 | 0.4 | 20,000 | 1,500 | 9 | 0.07 | 20,000 | 1,200 | 0.4 |
| 4 | 18,000 | 2,500 | 12 | 0.2 | 18,000 | 2,000 | 0.5 | 18,000 | 2,000 | 12 | 0.15 | 18,000 | 1,500 | 0.5 |
| 5 | 14,000 | 3,000 | 15 | 0.2 | 14,000 | 2,000 | 0.7 | 14,000 | 2,500 | 15 | 0.15 | 14,000 | 2,000 | 0.7 |
| 6 | 12,000 | 3,000 | 18 | 0.3 | 12,000 | 2,000 | 1 | 12,000 | 2,500 | 18 | 0.2 | 12,000 | 2,000 | 1 |

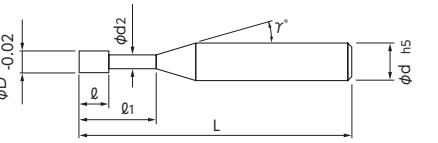
**備　考 Notes**

※グラファイトの加工はグラファイト専用加工機をご使用ください。
　また、加工時や作業時は粉塵の飛散、吸引防止のため、集塵機、防塵マスクをご使用ください。
※グラファイトの加工は乾式をお奨めします。
※ワークへ欠けが発生したり、精度の高い加工が必要な場合、送り速度を下げて調整してください。
※ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。
　また、主軸回転数が足りない場合も同様に同じ割合で下げてください。
※Graphite should be machined by the machining center designed for graphite machining.
　When handling with graphite material, dust collector and respirator are recommended to protect against graphite dust.
※Air blow cooling is recommended for the machining of graphite.
※Slow down the feed for high accurate machining to avoid breakage of work piece.
※Adjust both spindle speed and feed at the same rate when chattering.

# DCHR230

## ダイヤモンドコーティング2枚刃ロングネックエンドミル

DIAMOND COATING 2-Flute Long Neck End Mill




●独自のダイヤモンドコーティングの採用で、グラファイトや高シリコンアルミニウム合金の加工に対して高い耐久性を発揮。
●狭くて深い加工に適した首逃げタイプ。
●Original DIAMOND COATING realized a long tool life for the machining of Graphite, silicon-aluminum alloy and brittle materials.
●Long neck design is suited for the machining of narrow and deep area.

Slot Side Face WC DIA 2 30°

被削材 Work Material

| グラファイト Graphite | 高Siアルミニウム High Silicon Aluminum Alloy | 繊維入り樹脂 Fiber Reinforced Plastics (FRP) |
|---|---|---|
| ◎ | ○ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

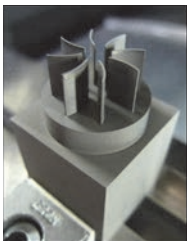
| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 05-00200-00502 | 0.5 | 2 | 1 | 0.46 | 12° | 4 | 45 | 18,000 |
| 05-00200-00504 | | 4 | 1 | 0.46 | 12° | 4 | 45 | 18,000 |
| 05-00200-00506 | | 6 | 1 | 0.46 | 12° | 4 | 45 | 18,000 |
| 05-00200-01004 | 1 | 4 | 2 | 0.95 | 12° | 4 | 50 | 18,000 |
| 05-00200-01006 | | 6 | 2 | 0.95 | 12° | 4 | 50 | 18,000 |
| 05-00200-01008 | | 8 | 2 | 0.95 | 12° | 4 | 50 | 18,000 |
| 05-00200-01010 | | 10 | 2 | 0.95 | 12° | 4 | 50 | 18,000 |
| 05-00200-01506 | 1.5 | 6 | 3 | 1.45 | 12° | 4 | 50 | 18,000 |
| 05-00200-01512 | | 12 | 3 | 1.45 | 12° | 4 | 50 | 18,000 |
| 05-00200-01520 | | 20 | 3 | 1.45 | 12° | 4 | 60 | 18,000 |
| 05-00200-02006 | 2 | 6 | 4 | 1.94 | 12° | 4 | 50 | 18,000 |
| 05-00200-02010 | | 10 | 4 | 1.94 | 12° | 4 | 50 | 18,000 |
| 05-00200-02016 | | 16 | 4 | 1.94 | 12° | 4 | 60 | 18,000 |
| 05-00200-02020 | | 20 | 4 | 1.94 | 12° | 4 | 60 | 18,000 |
| 05-00200-03016 | 3 | 16 | 6 | 2.85 | 12° | 6 | 60 | 22,100 |
| 05-00200-03030 | | 30 | 6 | 2.85 | 12° | 6 | 70 | 25,400 |
| 05-00200-04020 | 4 | 20 | 8 | 3.8 | 12° | 6 | 60 | 24,500 |
| 05-00200-04040 | | 40 | 8 | 3.8 | 12° | 6 | 90 | 27,600 |
| 05-00200-06030 | 6 | 30 | 12 | 5.8 | – | 6 | 90 | 25,400 |

オーダー方法 DCHR230 刃径(D)×有効長(ℓ1)を指示してください。
When you order, indicate DCHR230 (D)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はC-013に記載
●Recommended Milling Conditions are shown on page C-013.

## 加工事例 1 Technical Data 1



プロペラ propeller
・被削材：グラファイト（TTK-5）
Material : Graphite (TTK-5)
・総加工時間：1 時間 20 分
Total cutting time : 1hr 20min
・クーラント：エアーブロー
Coolant : Air blow
・ワークサイズ：φ14mm（羽根高さ：6mm）
Work Size : φ14mm Height of blade : 6mm

| 加工工程 Process | 円柱部荒取り Roughing (Cylinder) | 荒取り Roughing | 中仕上げ Semi-finishing | 仕上げ Finishing |
|---|---|---|---|---|
| 使用工具 Tool | DCSE235 φ6 | DCHR230 φ1×10 | | |
| 回転数 [min⁻¹] Spindle speed | 8,000 | 20,000 | | |
| 送り速度 [mm/min] Feed | 600 | 2,000 | 1,000 | 800 |
| 切り込み量 ap×ae[mm] Depth of cut | 8×0.5 | 0.2×0.6 | 0.05×0.2 | |
| 加工距離 [m] Cutting length | 7 | 67 | | 18 |
| 加工時間 Cutting time | 5分 5min | 1時間5分 1hr 5min | | 10分 10min |



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# DCHR230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | グラファイト Graphite | | | | | | | アルミ合金ダイカスト Aluminum Alloy Die Casting | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 等高線荒取り Contour Line Roughing | | | | 溝切削 Slotting | | | 等高線荒取り Contour Line Roughing | | | | 溝切削 Slotting | | |
| 刃径 Dia. | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut |
| | | min-1 | mm/min | ∂p mm | ∂e mm | min-1 | mm/min | ∂p mm | min-1 | mm/min | ∂p mm | ∂e mm | min-1 | mm/min | ∂p mm |
| 0.5 | 2 | 30,000 | 1,200 | 0.1 | 0.3 | 30,000 | 800 | 0.1 | 20,000 | 1,000 | 0.03 | 0.3 | 20,000 | 500 | 0.03 |
| | 4 | 30,000 | 1,000 | 0.05 | 0.3 | 30,000 | 600 | 0.05 | 20,000 | 800 | 0.01 | 0.3 | 20,000 | 400 | 0.01 |
| | 6 | 25,000 | 800 | 0.03 | 0.3 | 25,000 | 500 | 0.03 | 20,000 | 600 | 0.01 | 0.3 | 20,000 | 300 | 0.01 |
| 1 | 4 | 30,000 | 2,500 | 0.2 | 0.6 | 30,000 | 1,500 | 0.2 | 20,000 | 2,000 | 0.15 | 0.6 | 20,000 | 1,200 | 0.15 |
| | 6 | 25,000 | 2,000 | 0.2 | 0.6 | 25,000 | 1,200 | 0.2 | 20,000 | 1,500 | 0.1 | 0.6 | 20,000 | 1,000 | 0.1 |
| | 8 | 20,000 | 1,500 | 0.1 | 0.6 | 20,000 | 1,000 | 0.1 | 20,000 | 1,000 | 0.07 | 0.6 | 20,000 | 700 | 0.07 |
| | 10 | 20,000 | 1,000 | 0.1 | 0.6 | 20,000 | 600 | 0.1 | 20,000 | 800 | 0.05 | 0.6 | 20,000 | 500 | 0.05 |
| 1.5 | 6 | 25,000 | 2,500 | 0.3 | 1 | 25,000 | 1,600 | 0.3 | 20,000 | 2,000 | 0.2 | 1 | 20,000 | 1,500 | 0.2 |
| | 12 | 16,000 | 1,800 | 0.2 | 1 | 16,000 | 1,000 | 0.2 | 16,000 | 1,500 | 0.05 | 1 | 16,000 | 1,000 | 0.05 |
| | 20 | 12,000 | 1,000 | 0.1 | 1 | 12,000 | 600 | 0.1 | 12,000 | 800 | 0.02 | 1 | 12,000 | 500 | 0.02 |
| 2 | 6 | 20,000 | 3,000 | 0.5 | 1.2 | 20,000 | 2,000 | 0.5 | 20,000 | 2,000 | 0.5 | 1.2 | 20,000 | 1,500 | 0.5 |
| | 10 | 20,000 | 2,500 | 0.5 | 1.2 | 20,000 | 1,600 | 0.5 | 20,000 | 1,500 | 0.3 | 1.2 | 20,000 | 1,000 | 0.3 |
| | 16 | 18,000 | 1,800 | 0.3 | 1.2 | 18,000 | 1,200 | 0.3 | 15,000 | 1,200 | 0.07 | 1.2 | 15,000 | 800 | 0.07 |
| | 20 | 15,000 | 1,200 | 0.2 | 1.2 | 15,000 | 800 | 0.2 | 10,000 | 1,000 | 0.03 | 1.2 | 10,000 | 600 | 0.03 |
| 3 | 16 | 20,000 | 3,000 | 0.5 | 2 | 20,000 | 2,000 | 0.5 | 18,000 | 2,000 | 0.5 | 2 | 18,000 | 1,500 | 0.5 |
| | 30 | 15,000 | 1,500 | 0.3 | 2 | 15,000 | 1,000 | 0.3 | 10,000 | 1,000 | 0.2 | 2 | 10,000 | 600 | 0.2 |
| 4 | 20 | 18,000 | 3,000 | 0.8 | 2.5 | 18,000 | 2,000 | 0.8 | 16,000 | 2,000 | 0.8 | 2.5 | 16,000 | 1,500 | 0.8 |
| | 40 | 9,000 | 1,500 | 0.4 | 2.5 | 9,000 | 1,000 | 0.4 | 8,000 | 1,000 | 0.4 | 2.5 | 8,000 | 600 | 0.4 |
| 6 | 30 | 16,000 | 3,000 | 1 | 4 | 16,000 | 2,000 | 1 | 12,000 | 2,000 | 1 | 4 | 12,000 | 1,500 | 1 |

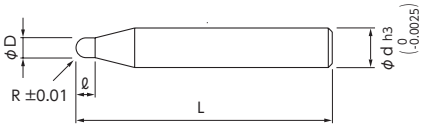
**備　考 Notes**

※グラファイトの加工はグラファイト専用加工機をご使用ください。
　また、加工時や作業時は粉塵の飛散、吸引防止のため、集塵機、防塵マスクをご使用ください。
※グラファイトの加工は乾式をお奨めします。
※ワークへ欠けが発生したり、精度の高い加工が必要な場合、送り速度を下げて調整してください。
※ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。
　また、主軸回転数が足りない場合も同様に同じ割合で下げてください。
※Graphite should be machined by the machining center designed for graphite machining.
　When handling with graphite material, dust collector and respirator are recommended to protect against graphite dust.
※Air blow cooling is recommended for the machining of graphite.
※Slow down the feed for high accurate machining to avoid breakage of work piece.
※Adjust both spindle speed and feed at the same rate when chattering.

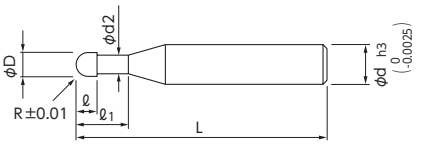
# DCMB

## 硬脆材加工用ボールエンドミル
Ball End Mill for Hard Brittle Material

### Type Ⅰ:全刃長タイプ




### Type Ⅱ:ロングネックタイプ




[首部形状について]
首部干渉角の目安は12°になります。被削材と首部の干渉が心配される時は、必ず実測での確認をお願いします。
〔Neck Profile〕
Reference value of interference angle after length of cut is 12°.
Actual measurement required, in order to avoid interference between tool and work material.

●刃先強度と切れ味を両立したスパイラルボール形状と、密着力を強化した新開発ダイヤモンドコーティングを採用。
●Spiral ball shape with balanced strength and sharpness of cutting edges Adopted newly-developed DIAMOND COATING with enhanced sticking force.

3D WC DIA 2 20°

被削材 Work Material

| 超硬合金 Cemented Carbide | セラミックス Ceramics | ガラス glass | その他の硬脆材 Other Hard Brittle Material |
|---|---|---|---|
| ◎ | ◎ | ◎ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

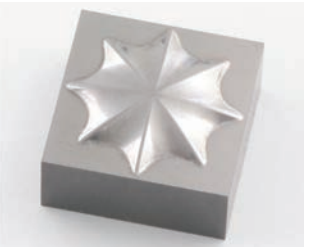
| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | 形状 Type | (d2)首下径 Neck Dia. | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 05-00500-00100 | R0.1 | – | 0.15 | Ⅰ | – | 4 | 45 | 38,000 |
| 05-00500-00101 | | 0.5 | 0.12 | Ⅱ | 0.18 | 4 | 45 | 38,400 |
| 05-00500-00200 | R0.2 | – | 0.3 | Ⅰ | – | 4 | 45 | 35,000 |
| 05-00500-00201 | | 1 | 0.25 | Ⅱ | 0.37 | 4 | 45 | 35,400 |
| 05-00500-00300 | R0.3 | – | 0.45 | Ⅰ | – | 4 | 45 | 31,100 |
| 05-00500-00301 | | 1.5 | 0.35 | Ⅱ | 0.56 | 4 | 45 | 31,500 |
| 05-00500-00500 | R0.5 | – | 0.75 | Ⅰ | – | 4 | 45 | 31,100 |
| 05-00500-00501 | | 2.5 | 0.6 | Ⅱ | 0.95 | 4 | 45 | 31,500 |
| 05-00500-00750 | R0.75 | – | 1.1 | Ⅰ | – | 4 | 45 | 31,100 |
| 05-00500-00751 | | 3.8 | 0.9 | Ⅱ | 1.45 | 4 | 45 | 31,500 |
| 05-00500-01000 | R1 | – | 1.5 | Ⅰ | – | 4 | 45 | 31,100 |
| 05-00500-01001 | | 5 | 1.2 | Ⅱ | 1.94 | 4 | 45 | 31,500 |

**オーダー方法** DCMB ボール半径 (R)［×有効長(ℓ1)］を指示してください。
When you order, indicate DCMB (R)［×(ℓ1)］.

●切削条件表はC-015に記載
●Recommended Milling Conditions are shown on page C-015.

## 加工事例 1 Technical Data 1

**被削材：超硬合金（硬度：89HRA）**
Material : Cemented Carbide (89HRA)



ワークサイズ：20×20×10mm
Work size : 20×20×10mm

**使用工具：DCMB R1**
Tool

**仕上げ加工**
Finishing

| | |
|---|---|
| 回転数 Spindle speed | 20,000min$^{-1}$ |
| 送り速度 Feed | 200mm/min |
| 切り込み量 Depth of cut | 0.005mm×0.01mm (ap×ae) |
| 加工時間 Cutting time | 3時間55分 3hr 55min |
| クーラント Coolant | オイルミスト Oil mist |

面粗さ(Rz)：0.51μm～1.04μm
Surface roughness



SEVKET GÜLÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

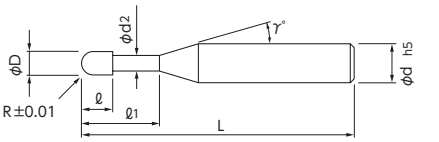
# DCMB

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | 超硬合金 Cemented Carbide | | | |
|---|---|---|---|---|---|
| (R)ボール半径 Radius | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | $min^{-1}$ | mm/min | ap mm | ae mm |
| R0.1 | – | 30,000 | 100 | 0.004 | 0.004 |
| | 0.5 | 30,000 | 30 | 0.002 | 0.003 |
| R0.2 | – | 30,000 | 150 | 0.008 | 0.03 |
| | 1 | 30,000 | 100 | 0.006 | 0.025 |
| R0.3 | – | 30,000 | 200 | 0.01 | 0.05 |
| | 1.5 | 30,000 | 200 | 0.01 | 0.05 |
| R0.5 | – | 30,000 | 300 | 0.02 | 0.10 |
| | 2.5 | 30,000 | 300 | 0.02 | 0.10 |
| R0.75 | – | 30,000 | 300 | 0.03 | 0.15 |
| | 3.8 | 30,000 | 300 | 0.03 | 0.15 |
| R1 | – | 20,000 | 300 | 0.04 | 0.15 |
| | 5 | 20,000 | 300 | 0.04 | 0.15 |
| 備　考 Notes | | ※工具の折損や欠損、コーティング膜の剥離の原因となるため切削条件は切削条件表に従って設定してください。<br>※工具の折損や欠損、加工精度の低下に繋がるため工具の回転振れ量を最小に抑えてください。<br>※加工前に主軸の伸び縮み量や機械の特性を考慮してからの加工をお奨めします。<br>※切削負荷軽減を考慮した精度の良いツールパスの出力を心掛けてください。(アプローチ方法やトレランスの設定など)<br>※Follow the recommended milling conditions to prevent tool breakage and coating peeling.<br>※Minimal tool runout is required to avoid the tool breakage and to increase the work accuracy.<br>※Recommend to assess the machine characters, such as expansion of the spindle and others before using the tool.<br>※Accurate tool path for approach method, tolerance setting and etc. is required to reduce the cutting load. | | | |

# DCRB230

## ダイヤモンドコーティング ロングネックボールエンドミル
DIAMOND COATING 2-Flute Long Neck Ball End Mill




●独自のダイヤモンドコーティングの採用で、グラファイトや高シリコンアルミニウム合金の加工に対して高い耐久性を発揮。
●狭くて深い加工に適した首逃げタイプ。
●Original DIAMOND COATING realized a long tool life for the machining of Graphite, silicon-aluminum alloy and brittle materials.
●Long neck design is suited for the machining of narrow and deep area.

3D WC DIA 2 30°

被削材 Work Material

| グラファイト Graphite | 高Siアルミニウム High Silicon Aluminum Alloy | 繊維入り樹脂 Fiber Reinforced Plastics (FRP) |
|---|---|---|
| ◎ | ○ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 05-00520-00201 | R0.2 | 1 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 14,900 |
| 05-00520-00202 | | 2 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 14,900 |
| 05-00520-00204 | | 4 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 14,900 |
| 05-00520-00206 | | 6 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 14,900 |
| 05-00520-00303 | R0.3 | 3 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 14,900 |
| 05-00520-00306 | | 6 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 14,900 |
| 05-00520-00309 | | 9 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 14,900 |
| 05-00520-00312 | | 12 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 14,900 |
| 05-00520-00504 | R0.5 | 4 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 14,900 |
| 05-00520-00506 | | 6 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 14,900 |
| 05-00520-00510 | | 10 | 0.75 | 1 | 0.95 | 12° | 4 | 50 | 14,900 |
| 05-00520-00516 | | 16 | 0.75 | 1 | 0.95 | 12° | 4 | 50 | 14,900 |
| 05-00520-00520 | | 20 | 0.75 | 1 | 0.95 | 12° | 4 | 55 | 14,900 |
| 05-00520-01006 | R1 | 6 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 14,900 |
| 05-00520-01010 | | 10 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 14,900 |
| 05-00520-01016 | | 16 | 1.5 | 2 | 1.94 | 12° | 4 | 50 | 14,900 |
| 05-00520-01020 | | 20 | 1.5 | 2 | 1.94 | 12° | 4 | 70 | 14,900 |
| 05-00520-01030 | | 30 | 1.5 | 2 | 1.94 | 12° | 4 | 70 | 14,900 |
| 05-00520-01520 | R1.5 | 20 | 2.5 | 3 | 2.85 | 12° | 6 | 65 | 21,100 |
| 05-00520-01540 | | 40 | 2.5 | 3 | 2.85 | 12° | 6 | 90 | 22,900 |
| 05-00520-02015 | R2 | 15 | 3 | 4 | 3.8 | 12° | 6 | 65 | 20,400 |
| 05-00520-02030 | | 30 | 3 | 4 | 3.8 | 12° | 6 | 70 | 20,400 |
| 05-00520-02040 | | 40 | 3 | 4 | 3.8 | 12° | 6 | 90 | 22,900 |
| 05-00520-03030 | R3 | 30 | 6 | 6 | 5.8 | – | 6 | 80 | 21,100 |
| 05-00520-03060 | | 60 | 6 | 6 | 5.8 | – | 6 | 120 | 24,500 |

**オーダー方法** DCRB230 ボール半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate DCRB230 (R)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はC-017に記載
●Recommended Milling Conditions are shown on page C-017.



SEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# DCRB230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | グラファイト Graphite | | | | アルミ合金ダイカスト Aluminum Alloy Die Casting | | | |
|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | ae mm |
| 0.2 | 1 | 40,000 | 1,500 | 0.08 | 0.1 | 20,000 | 800 | 0.05 | 0.08 |
| | 2 | 40,000 | 1,200 | 0.05 | 0.1 | 20,000 | 600 | 0.02 | 0.05 |
| | 4 | 30,000 | 1,000 | 0.05 | 0.1 | 20,000 | 200 | 0.01 | 0.02 |
| | 6 | 30,000 | 800 | 0.03 | 0.1 | 20,000 | 120 | 0.01 | 0.01 |
| 0.3 | 3 | 30,000 | 1,500 | 0.1 | 0.2 | 20,000 | 1,000 | 0.05 | 0.1 |
| | 6 | 30,000 | 1,200 | 0.08 | 0.2 | 20,000 | 600 | 0.03 | 0.05 |
| | 9 | 25,000 | 1,000 | 0.07 | 0.15 | 18,000 | 400 | 0.01 | 0.02 |
| | 12 | 20,000 | 800 | 0.05 | 0.1 | 15,000 | 200 | 0.01 | 0.01 |
| 0.5 | 4 | 30,000 | 2,500 | 0.2 | 0.3 | 20,000 | 2,000 | 0.2 | 0.3 |
| | 6 | 25,000 | 2,000 | 0.15 | 0.3 | 20,000 | 1,500 | 0.1 | 0.3 |
| | 10 | 20,000 | 1,800 | 0.1 | 0.3 | 15,000 | 800 | 0.05 | 0.1 |
| | 16 | 18,000 | 1,200 | 0.08 | 0.2 | 12,000 | 500 | 0.03 | 0.08 |
| | 20 | 15,000 | 1,000 | 0.07 | 0.2 | 8,000 | 300 | 0.02 | 0.05 |
| 1 | 6 | 20,000 | 3,000 | 0.5 | 0.6 | 20,000 | 2,000 | 0.3 | 0.6 |
| | 10 | 20,000 | 2,500 | 0.3 | 0.6 | 20,000 | 1,500 | 0.3 | 0.6 |
| | 16 | 18,000 | 2,000 | 0.2 | 0.6 | 15,000 | 1,200 | 0.2 | 0.5 |
| | 20 | 15,000 | 1,500 | 0.2 | 0.5 | 10,000 | 1,000 | 0.1 | 0.2 |
| | 30 | 12,000 | 1,000 | 0.2 | 0.5 | 8,000 | 500 | 0.05 | 0.1 |
| 1.5 | 20 | 20,000 | 2,500 | 0.5 | 1 | 15,000 | 1,500 | 0.5 | 1 |
| | 40 | 12,000 | 1,400 | 0.3 | 0.7 | 7,000 | 600 | 0.1 | 0.3 |
| 2 | 15 | 20,000 | 3,000 | 0.5 | 1.5 | 16,000 | 2,000 | 0.5 | 1.5 |
| | 30 | 15,000 | 2,500 | 0.5 | 1.5 | 12,000 | 1,500 | 0.5 | 1.2 |
| | 40 | 12,000 | 2,000 | 0.3 | 1 | 8,000 | 1,000 | 0.2 | 0.7 |
| 3 | 30 | 16,000 | 3,000 | 0.6 | 2 | 12,000 | 2,000 | 0.6 | 2 |
| | 60 | 8,000 | 2,000 | 0.4 | 2 | 7,000 | 1,000 | 0.3 | 1 |

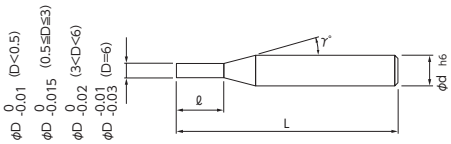
**備　考 Notes**

※グラファイトの加工はグラファイト専用加工機をご使用ください。
　また、加工時や作業時は粉塵の飛散、吸引防止のため、集塵機、防塵マスクをご使用ください。
※グラファイトの加工は乾式をお奨めします。
※ワークへ欠けが発生したり、精度の高い加工が必要な場合、送り速度を下げて調整してください。
※ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。
　また、主軸回転数が足りない場合も同様に同じ割合で下げてください。
※Graphite should be machined by the machining center designed for graphite machining.
　When handling with graphite material, dust collector and respirator are recommended to protect against graphite dust.
※Air blow cooling is recommended for the machining of graphite.
※Reduce the feed for high accurate machining and to avoid breakage of work piece.
※Adjust both spindle speed and feed at the same rate when chattering.

# MXH225

## 無限コーティングプレミアム リード25 エンドミル 2枚刃

MUGEN-COATING PREMIUM 2-Flute LEAD25 End Mill




- ●無限コーティングプレミアムの採用により、ステンレス鋼・チタン等の耐熱合金に対応。
- ●刃長は刃径の等倍で 25° ネジレを採用。
- ●剛性を高めた設計で、溝加工でのビビリと倒れを最小限に抑制。
- ●Applicable for heat resistance alloy such as stainless steels and titanium alloy by MUGEN-COATING PREMIUM.
- ●L/D=1 and helix 25° to increase rigidity and realize high efficient machining.
- ●Suppress chattering and deflection in slotting process.

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|---|
| ○ | ○ | ◎ | ○ | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00005-00010 | 0.1 | 0.1 | 12° | 4 | 45 | 7,200 |
| 08-00005-00020 | 0.2 | 0.2 | 12° | 4 | 45 | 4,600 |
| 08-00005-00030 | 0.3 | 0.3 | 12° | 4 | 45 | 3,700 |
| 08-00005-00040 | 0.4 | 0.4 | 12° | 4 | 45 | 4,100 |
| 08-00005-00050 | 0.5 | 0.5 | 12° | 4 | 45 | 2,500 |
| 08-00005-00060 | 0.6 | 0.6 | 12° | 4 | 45 | 2,500 |
| 08-00005-00070 | 0.7 | 0.7 | 12° | 4 | 45 | 2,500 |
| 08-00005-00080 | 0.8 | 0.8 | 12° | 4 | 45 | 2,500 |
| 08-00005-00090 | 0.9 | 0.9 | 12° | 4 | 45 | 2,500 |
| 08-00005-00100 | 1 | 1 | 12° | 4 | 45 | 2,200 |
| 08-00005-00110 | 1.1 | 1.1 | 12° | 4 | 45 | 2,500 |
| 08-00005-00120 | 1.2 | 1.2 | 12° | 4 | 45 | 2,500 |
| 08-00005-00130 | 1.3 | 1.3 | 12° | 4 | 45 | 2,500 |
| 08-00005-00140 | 1.4 | 1.4 | 12° | 4 | 45 | 2,500 |
| 08-00005-00150 | 1.5 | 1.5 | 12° | 4 | 45 | 2,300 |
| 08-00005-00160 | 1.6 | 1.6 | 12° | 4 | 45 | 2,500 |
| 08-00005-00170 | 1.7 | 1.7 | 12° | 4 | 45 | 2,500 |
| 08-00005-00180 | 1.8 | 1.8 | 12° | 4 | 45 | 2,500 |
| 08-00005-00190 | 1.9 | 1.9 | 12° | 4 | 45 | 2,500 |
| 08-00005-00200 | 2 | 2 | 12° | 4 | 45 | 2,300 |
| 08-00005-00250 | 2.5 | 2.5 | 12° | 4 | 45 | 2,300 |
| 08-00005-00300 | 3 | 3 | 12° | 6 | 45 | 3,200 |
| 08-00005-00400 | 4 | 4 | 12° | 6 | 45 | 3,400 |
| 08-00005-00500 | 5 | 5 | 12° | 6 | 50 | 3,700 |
| 08-00005-00600 | 6 | 6 | – | 6 | 50 | 3,800 |

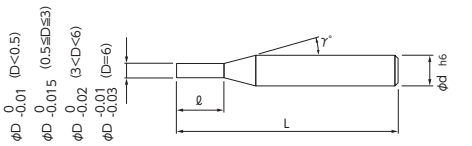
オーダー方法 MXH225 刃径(D)を指示してください。
When you order, indicate MXH225 (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-008に記載
●Recommended Milling Conditions are shown on page D-008.

# MXH230

## 無限コーティングプレミアム リード30 エンドミル 2枚刃
MUGEN-COATING PREMIUM 2-Flute LEAD30 End Mill




- ●無限コーティングプレミアムの採用により、ステンレス鋼・チタン等の耐熱合金に対応。
- ●刃長は刃径の 2 倍で 30° ネジレを採用。
- ●溝・側面を問わずオールマイティに対応する標準タイプ。
- ●Applicable for heat resistance alloy such as stainless steels and titanium alloy by MUGEN-COATING PREMIUM.
- ●L/D=2 and helix 30° standard type, applicable for both slotting and side milling.

Slot Side Face MG ∞ Premium 2 30° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|---|
| ○ | ○ | ◎ | ○ | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00006-00010 | 0.1 | 0.2 | 12° | 4 | 45 | 7,200 |
| 08-00006-00020 | 0.2 | 0.4 | 12° | 4 | 45 | 4,600 |
| 08-00006-00030 | 0.3 | 0.6 | 12° | 4 | 45 | 3,600 |
| 08-00006-00040 | 0.4 | 0.8 | 12° | 4 | 45 | 4,200 |
| 08-00006-00050 | 0.5 | 1 | 12° | 4 | 45 | 2,500 |
| 08-00006-00060 | 0.6 | 1.2 | 12° | 4 | 45 | 3,500 |
| 08-00006-00070 | 0.7 | 1.4 | 12° | 4 | 45 | 3,800 |
| 08-00006-00080 | 0.8 | 1.6 | 12° | 4 | 45 | 2,500 |
| 08-00006-00090 | 0.9 | 1.8 | 12° | 4 | 45 | 3,800 |
| 08-00006-00100 | 1 | 2 | 12° | 4 | 45 | 2,200 |
| 08-00006-00110 | 1.1 | 2.2 | 12° | 4 | 45 | 3,900 |
| 08-00006-00120 | 1.2 | 2.4 | 12° | 4 | 45 | 2,500 |
| 08-00006-00130 | 1.3 | 2.6 | 12° | 4 | 45 | 3,900 |
| 08-00006-00140 | 1.4 | 2.8 | 12° | 4 | 45 | 3,900 |
| 08-00006-00150 | 1.5 | 3 | 12° | 4 | 45 | 2,300 |
| 08-00006-00160 | 1.6 | 3.2 | 12° | 4 | 45 | 3,900 |
| 08-00006-00170 | 1.7 | 3.4 | 12° | 4 | 45 | 3,900 |
| 08-00006-00180 | 1.8 | 3.6 | 12° | 4 | 45 | 2,500 |
| 08-00006-00190 | 1.9 | 3.8 | 12° | 4 | 45 | 3,900 |
| 08-00006-00200 | 2 | 4 | 12° | 4 | 45 | 2,300 |
| 08-00006-00210 | 2.1 | 4.2 | 12° | 4 | 45 | 3,900 |
| 08-00006-00220 | 2.2 | 4.4 | 12° | 4 | 45 | 3,900 |
| 08-00006-00230 | 2.3 | 4.6 | 12° | 4 | 45 | 3,900 |
| 08-00006-00240 | 2.4 | 4.8 | 12° | 4 | 45 | 3,900 |
| 08-00006-00250 | 2.5 | 5 | 12° | 4 | 45 | 2,300 |
| 08-00006-00260 | 2.6 | 5.2 | 12° | 4 | 45 | 5,000 |
| 08-00006-00270 | 2.7 | 5.4 | 12° | 4 | 45 | 5,000 |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00006-00280 | 2.8 | 5.6 | 12° | 4 | 45 | 5,000 |
| 08-00006-00290 | 2.9 | 5.8 | 12° | 4 | 45 | 5,000 |
| 08-00006-00300 | 3 | 6 | 12° | 6 | 45 | 2,900 |
| 08-00006-00350 | 3.5 | 7 | 12° | 6 | 45 | 4,400 |
| 08-00006-00400 | 4 | 8 | 12° | 6 | 45 | 3,200 |
| 08-00006-00450 | 4.5 | 9 | 12° | 6 | 50 | 5,000 |
| 08-00006-00500 | 5 | 10 | 12° | 6 | 50 | 3,400 |
| 08-00006-00550 | 5.5 | 11 | 12° | 6 | 50 | 5,000 |
| 08-00006-00600 | 6 | 12 | – | 6 | 50 | 3,700 |

**オーダー方法** MXH230 刃径 (D) を指示してください。
When you order, indicate MXH230 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-009に記載
●Recommended Milling Conditions are shown on page D-009.



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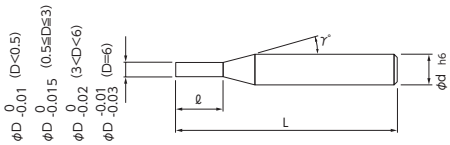
# MXH235

## 無限コーティングプレミアム リード35 エンドミル 2枚刃

MUGEN-COATING PREMIUM 2-Flute LEAD35 End Mill




- 無限コーティングプレミアムの採用により、ステンレス鋼・チタン等の耐熱合金に対応。
- 刃長は刃径の 3 倍で 35° ネジレを採用。
- 2 倍刃長では刃長が足りなく、4 倍刃長では長いといった悩みを解消。
- Applicable for heat resistance alloy such as stainless steels and titanium alloy by MUGEN-COATING PREMIUM.
- L/D=3 and helix 35° for appropriate length of cut to avoid the inconveniences in size selection.

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|---|
| ○ | ○ | ◎ | ○ | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00007-00010 | 0.1 | 0.3 | 12° | 4 | 45 | 7,200 |
| 08-00007-00020 | 0.2 | 0.6 | 12° | 4 | 45 | 4,700 |
| 08-00007-00030 | 0.3 | 0.9 | 12° | 4 | 45 | 3,800 |
| 08-00007-00040 | 0.4 | 1.2 | 12° | 4 | 45 | 4,200 |
| 08-00007-00050 | 0.5 | 1.5 | 12° | 4 | 45 | 2,500 |
| 08-00007-00060 | 0.6 | 1.8 | 12° | 4 | 45 | 3,700 |
| 08-00007-00070 | 0.7 | 2.1 | 12° | 4 | 45 | 4,000 |
| 08-00007-00080 | 0.8 | 2.4 | 12° | 4 | 45 | 2,500 |
| 08-00007-00090 | 0.9 | 2.7 | 12° | 4 | 45 | 4,000 |
| 08-00007-00100 | 1 | 3 | 12° | 4 | 45 | 2,200 |
| 08-00007-00110 | 1.1 | 3.3 | 12° | 4 | 45 | 3,900 |
| 08-00007-00120 | 1.2 | 3.6 | 12° | 4 | 45 | 2,500 |
| 08-00007-00130 | 1.3 | 3.9 | 12° | 4 | 45 | 3,900 |
| 08-00007-00140 | 1.4 | 4.2 | 12° | 4 | 45 | 3,900 |
| 08-00007-00150 | 1.5 | 4.5 | 12° | 4 | 45 | 2,200 |
| 08-00007-00160 | 1.6 | 4.8 | 12° | 4 | 45 | 3,900 |
| 08-00007-00170 | 1.7 | 5.1 | 12° | 4 | 45 | 3,900 |
| 08-00007-00180 | 1.8 | 5.4 | 12° | 4 | 45 | 2,500 |
| 08-00007-00190 | 1.9 | 5.7 | 12° | 4 | 45 | 3,900 |
| 08-00007-00200 | 2 | 6 | 12° | 4 | 45 | 2,300 |
| 08-00007-00210 | 2.1 | 6.3 | 12° | 4 | 45 | 3,900 |
| 08-00007-00220 | 2.2 | 6.6 | 12° | 4 | 45 | 3,900 |
| 08-00007-00230 | 2.3 | 6.9 | 12° | 4 | 45 | 3,900 |
| 08-00007-00240 | 2.4 | 7.2 | 12° | 4 | 45 | 3,900 |
| 08-00007-00250 | 2.5 | 7.5 | 12° | 4 | 45 | 2,300 |
| 08-00007-00260 | 2.6 | 7.8 | 12° | 4 | 45 | 5,000 |
| 08-00007-00270 | 2.7 | 8.1 | 12° | 4 | 45 | 5,000 |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00007-00280 | 2.8 | 8.4 | 12° | 4 | 45 | 5,000 |
| 08-00007-00290 | 2.9 | 8.7 | 12° | 4 | 45 | 5,000 |
| 08-00007-00300 | 3 | 9 | 12° | 6 | 45 | 3,400 |
| 08-00007-00350 | 3.5 | 10.5 | 12° | 6 | 45 | 4,800 |
| 08-00007-00400 | 4 | 12 | 12° | 6 | 50 | 3,600 |
| 08-00007-00450 | 4.5 | 13.5 | 12° | 6 | 50 | 5,000 |
| 08-00007-00500 | 5 | 15 | 12° | 6 | 55 | 3,800 |
| 08-00007-00550 | 5.5 | 16.5 | 12° | 6 | 60 | 5,000 |
| 08-00007-00600 | 6 | 18 | – | 6 | 60 | 4,000 |

**オーダー方法**

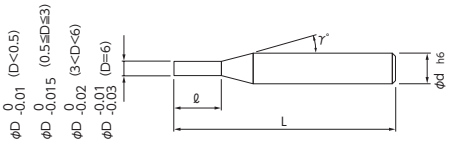
MXH235 刃径(D)を指示してください。
When you order, indicate MXH235 (D).

※(γ)は参考値です。
※(γ) is reference value.

- 切削条件表はD-010に記載
- Recommended Milling Conditions are shown on page D-010.

# MXH240

## 無限コーティングプレミアム リード40 エンドミル 2枚刃
MUGEN-COATING PREMIUM 2-Flute LEAD40 End Mill




- ●無限コーティングプレミアムの採用により、ステンレス鋼・チタン等の耐熱合金に対応。
- ●刃長は刃径の 4 倍で 40° ネジレを採用。
- ●深い加工もスムーズに加工でき、ロング刃でありながら加工面の倒れを最小限に抑制。
- ●Applicable for heat resistance alloy such as stainless steels and titanium alloy by MUGEN-COATING PREMIUM.
- ●L/D=4 and helix 40° is suitable for deep machining with minimum deflection of cutting up-right surface.

Side Face MG ∞ Premium 2 40° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | ステンレス鋼 Stainless Steels |
|---|---|---|---|---|
| ○ | ○ | ◎ | ○ | ◎ |

| チタン合金 Titanium Alloy | 超耐熱合金 Heat Resistance Alloy |
|---|---|
| ◎ | ◎ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00008-00030 | 0.3 | 1.2 | 12° | 4 | 45 | 5,600 |
| 08-00008-00040 | 0.4 | 1.6 | 12° | 4 | 45 | 5,600 |
| 08-00008-00050 | 0.5 | 2 | 12° | 4 | 45 | 3,500 |
| 08-00008-00080 | 0.8 | 3.2 | 12° | 4 | 45 | 3,600 |
| 08-00008-00100 | 1 | 4 | 12° | 4 | 45 | 3,200 |
| 08-00008-00120 | 1.2 | 4.8 | 12° | 4 | 45 | 3,800 |
| 08-00008-00150 | 1.5 | 6 | 12° | 4 | 45 | 3,200 |
| 08-00008-00180 | 1.8 | 7.2 | 12° | 4 | 45 | 3,800 |
| 08-00008-00200 | 2 | 8 | 12° | 4 | 45 | 3,200 |
| 08-00008-00250 | 2.5 | 10 | 12° | 4 | 45 | 3,200 |
| 08-00008-00300 | 3 | 12 | 12° | 6 | 50 | 4,300 |
| 08-00008-00400 | 4 | 16 | 12° | 6 | 55 | 4,300 |
| 08-00008-00500 | 5 | 20 | 12° | 6 | 60 | 5,300 |
| 08-00008-00600 | 6 | 24 | – | 6 | 65 | 5,400 |

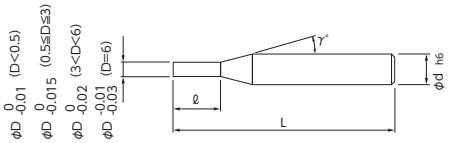
**オーダー方法** MXH240 刃径(D)を指示してください。
When you order, indicate MXH240 (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-011に記載
●Recommended Milling Conditions are shown on page D-011.

# MXH245

## 無限コーティングプレミアム リード45 エンドミル 2枚刃
MUGEN-COATING PREMIUM 2-Flute LEAD45 End Mill




- ●無限コーティングプレミアムの採用により、ステンレス鋼・チタン等の耐熱合金に対応。
- ●刃長は刃径の 5 倍で 45° ネジレを採用。
- ●超ロング刃でありながら加工面の倒れを最小限に抑制。
- ●Applicable for heat resistance alloy such as stainless steels and titanium alloy by MUGEN-COATING PREMIUM.
- ●L/D=5 and helix 45° to minimize the milling deflection even though the long cutting length design.

Side Face MG ∞ Premium 2 45° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | ステンレス鋼 Stainless Steels |
|---|---|---|---|---|
| ○ | ○ | ◎ | ○ | ◎ |

| チタン合金 Titanium Alloy | 超耐熱合金 Heat Resistance Alloy |
|---|---|
| ◎ | ◎ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00009-00030 | 0.3 | 1.5 | 12° | 4 | 45 | 7,800 |
| 08-00009-00040 | 0.4 | 2 | 12° | 4 | 45 | 7,800 |
| 08-00009-00050 | 0.5 | 2.5 | 12° | 4 | 45 | 4,900 |
| 08-00009-00080 | 0.8 | 4 | 12° | 4 | 45 | 4,900 |
| 08-00009-00100 | 1 | 5 | 12° | 4 | 45 | 4,400 |
| 08-00009-00120 | 1.2 | 6 | 12° | 4 | 45 | 4,900 |
| 08-00009-00150 | 1.5 | 7.5 | 12° | 4 | 45 | 4,400 |
| 08-00009-00180 | 1.8 | 9 | 12° | 4 | 50 | 4,900 |
| 08-00009-00200 | 2 | 10 | 12° | 4 | 50 | 4,400 |
| 08-00009-00250 | 2.5 | 12.5 | 12° | 4 | 50 | 4,400 |
| 08-00009-00300 | 3 | 15 | 12° | 6 | 55 | 5,800 |
| 08-00009-00400 | 4 | 20 | 12° | 6 | 60 | 6,100 |
| 08-00009-00500 | 5 | 25 | 12° | 6 | 65 | 6,800 |
| 08-00009-00600 | 6 | 30 | – | 6 | 75 | 7,100 |

**オーダー方法** MXH245 刃径(D)を指示してください。
When you order, indicate MXH245 (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-012に記載
●Recommended Milling Conditions are shown on page D-012.



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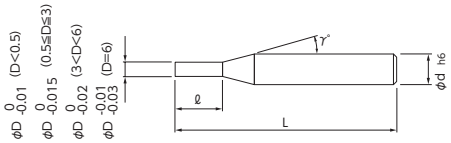
# MXH225P

## 無限コーティングプレミアム ピンカド リード25 エンドミル 2枚刃

MUGEN-COATING PREMIUM 2-Flute Sharp Edge LEAD25 End Mill



●無限コーティングプレミアムの採用により、ステンレス鋼・チタン等の耐熱合金に対応したピンカド。
●刃長は刃径の等倍で 25° ネジレを採用。
●Applicable for heat resistance alloy such as stainless steels and titanium alloy by MUGEN-COATING PREMIUM with sharp edge type.
●L/D=1 and helix 25°.

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|
| ○ | ○ | ◎ | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00015-00010 | 0.1 | 0.1 | 12° | 4 | 45 | 7,200 |
| 08-00015-00020 | 0.2 | 0.2 | 12° | 4 | 45 | 4,600 |
| 08-00015-00030 | 0.3 | 0.3 | 12° | 4 | 45 | 3,700 |
| 08-00015-00040 | 0.4 | 0.4 | 12° | 4 | 45 | 4,100 |
| 08-00015-00050 | 0.5 | 0.5 | 12° | 4 | 45 | 2,500 |
| 08-00015-00060 | 0.6 | 0.6 | 12° | 4 | 45 | 2,500 |
| 08-00015-00070 | 0.7 | 0.7 | 12° | 4 | 45 | 2,500 |
| 08-00015-00080 | 0.8 | 0.8 | 12° | 4 | 45 | 2,500 |
| 08-00015-00090 | 0.9 | 0.9 | 12° | 4 | 45 | 2,500 |
| 08-00015-00100 | 1 | 1 | 12° | 4 | 45 | 2,200 |
| 08-00015-00110 | 1.1 | 1.1 | 12° | 4 | 45 | 2,500 |
| 08-00015-00120 | 1.2 | 1.2 | 12° | 4 | 45 | 2,500 |
| 08-00015-00130 | 1.3 | 1.3 | 12° | 4 | 45 | 2,500 |
| 08-00015-00140 | 1.4 | 1.4 | 12° | 4 | 45 | 2,500 |
| 08-00015-00150 | 1.5 | 1.5 | 12° | 4 | 45 | 2,300 |
| 08-00015-00160 | 1.6 | 1.6 | 12° | 4 | 45 | 2,500 |
| 08-00015-00170 | 1.7 | 1.7 | 12° | 4 | 45 | 2,500 |
| 08-00015-00180 | 1.8 | 1.8 | 12° | 4 | 45 | 2,500 |
| 08-00015-00190 | 1.9 | 1.9 | 12° | 4 | 45 | 2,500 |
| 08-00015-00200 | 2 | 2 | 12° | 4 | 45 | 2,300 |
| 08-00015-00250 | 2.5 | 2.5 | 12° | 4 | 45 | 2,300 |
| 08-00015-00300 | 3 | 3 | 12° | 6 | 45 | 3,200 |
| 08-00015-00400 | 4 | 4 | 12° | 6 | 45 | 3,400 |
| 08-00015-00500 | 5 | 5 | 12° | 6 | 50 | 3,700 |
| 08-00015-00600 | 6 | 6 | – | 6 | 50 | 3,800 |

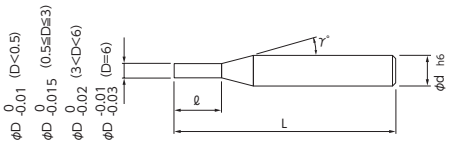
オーダー方法 MXH225P 刃径(D)を指示してください。
When you order, indicate MXH225P (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-013に記載
●Recommended Milling Conditions are shown on page D-013.

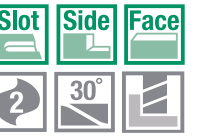
# MXH230P

## 無限コーティングプレミアム ピンカド リード30 エンドミル 2枚刃

MUGEN-COATING PREMIUM 2-Flute Sharp Edge LEAD30 End Mill




- ●無限コーティングプレミアムの採用により、ステンレス鋼・チタン等の耐熱合金に対応したピンカド。
- ●刃長は刃径の 2 倍で 30° ネジレを採用。
- ●Applicable for heat resistance alloy such as stainless steels and titanium alloy by MUGEN-COATING PREMIUM with sharp edge type.
- ●L/D=2 and helix 30°.




### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|
| ○ | ○ | ◎ | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00016-00010 | 0.1 | 0.2 | 12° | 4 | 45 | 7,200 |
| 08-00016-00020 | 0.2 | 0.4 | 12° | 4 | 45 | 4,600 |
| 08-00016-00030 | 0.3 | 0.6 | 12° | 4 | 45 | 3,600 |
| 08-00016-00040 | 0.4 | 0.8 | 12° | 4 | 45 | 4,200 |
| 08-00016-00050 | 0.5 | 1 | 12° | 4 | 45 | 2,500 |
| 08-00016-00060 | 0.6 | 1.2 | 12° | 4 | 45 | 3,500 |
| 08-00016-00070 | 0.7 | 1.4 | 12° | 4 | 45 | 3,800 |
| 08-00016-00080 | 0.8 | 1.6 | 12° | 4 | 45 | 2,500 |
| 08-00016-00090 | 0.9 | 1.8 | 12° | 4 | 45 | 3,800 |
| 08-00016-00100 | 1 | 2 | 12° | 4 | 45 | 2,200 |
| 08-00016-00110 | 1.1 | 2.2 | 12° | 4 | 45 | 3,900 |
| 08-00016-00120 | 1.2 | 2.4 | 12° | 4 | 45 | 2,500 |
| 08-00016-00130 | 1.3 | 2.6 | 12° | 4 | 45 | 3,900 |
| 08-00016-00140 | 1.4 | 2.8 | 12° | 4 | 45 | 3,900 |
| 08-00016-00150 | 1.5 | 3 | 12° | 4 | 45 | 2,300 |
| 08-00016-00160 | 1.6 | 3.2 | 12° | 4 | 45 | 3,900 |
| 08-00016-00170 | 1.7 | 3.4 | 12° | 4 | 45 | 3,900 |
| 08-00016-00180 | 1.8 | 3.6 | 12° | 4 | 45 | 2,500 |
| 08-00016-00190 | 1.9 | 3.8 | 12° | 4 | 45 | 3,900 |
| 08-00016-00200 | 2 | 4 | 12° | 4 | 45 | 2,300 |
| 08-00016-00210 | 2.1 | 4.2 | 12° | 4 | 45 | 3,900 |
| 08-00016-00220 | 2.2 | 4.4 | 12° | 4 | 45 | 3,900 |
| 08-00016-00230 | 2.3 | 4.6 | 12° | 4 | 45 | 3,900 |
| 08-00016-00240 | 2.4 | 4.8 | 12° | 4 | 45 | 3,900 |
| 08-00016-00250 | 2.5 | 5 | 12° | 4 | 45 | 2,300 |
| 08-00016-00260 | 2.6 | 5.2 | 12° | 4 | 45 | 5,000 |
| 08-00016-00270 | 2.7 | 5.4 | 12° | 4 | 45 | 5,000 |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00016-00280 | 2.8 | 5.6 | 12° | 4 | 45 | 5,000 |
| 08-00016-00290 | 2.9 | 5.8 | 12° | 4 | 45 | 5,000 |
| 08-00016-00300 | 3 | 6 | 12° | 6 | 45 | 2,900 |
| 08-00016-00350 | 3.5 | 7 | 12° | 6 | 45 | 4,400 |
| 08-00016-00400 | 4 | 8 | 12° | 6 | 45 | 3,200 |
| 08-00016-00450 | 4.5 | 9 | 12° | 6 | 50 | 5,000 |
| 08-00016-00500 | 5 | 10 | 12° | 6 | 50 | 3,400 |
| 08-00016-00550 | 5.5 | 11 | 12° | 6 | 50 | 5,000 |
| 08-00016-00600 | 6 | 12 | – | 6 | 50 | 3,700 |

**オーダー方法** MXH230P 刃径(D)を指示してください。
When you order, indicate MXH230P (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-014に記載
●Recommended Milling Conditions are shown on page D-014.



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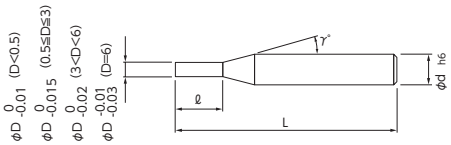
# MXH235P

## 無限コーティングプレミアム ピンカド リード35 エンドミル 2枚刃

MUGEN-COATING PREMIUM 2-Flute Sharp Edge LEAD35 End Mill




●無限コーティングプレミアムの採用により、ステンレス鋼・チタン等の耐熱合金に対応したピンカド。
●刃長は刃径の 3 倍で 35° ネジレを採用。
●Applicable for heat resistance alloy such as stainless steels and titanium alloy by MUGEN-COATING PREMIUM with sharp edge type.
●L/D=3 and helix 35°.

Side Face MG ∞ Premium 2 35°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|
| ○ | ○ | ◎ | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00017-00010 | 0.1 | 0.3 | 12° | 4 | 45 | 7,200 |
| 08-00017-00020 | 0.2 | 0.6 | 12° | 4 | 45 | 4,700 |
| 08-00017-00030 | 0.3 | 0.9 | 12° | 4 | 45 | 3,800 |
| 08-00017-00040 | 0.4 | 1.2 | 12° | 4 | 45 | 4,200 |
| 08-00017-00050 | 0.5 | 1.5 | 12° | 4 | 45 | 2,500 |
| 08-00017-00060 | 0.6 | 1.8 | 12° | 4 | 45 | 3,700 |
| 08-00017-00070 | 0.7 | 2.1 | 12° | 4 | 45 | 4,000 |
| 08-00017-00080 | 0.8 | 2.4 | 12° | 4 | 45 | 2,500 |
| 08-00017-00090 | 0.9 | 2.7 | 12° | 4 | 45 | 4,000 |
| 08-00017-00100 | 1 | 3 | 12° | 4 | 45 | 2,200 |
| 08-00017-00110 | 1.1 | 3.3 | 12° | 4 | 45 | 3,900 |
| 08-00017-00120 | 1.2 | 3.6 | 12° | 4 | 45 | 2,500 |
| 08-00017-00130 | 1.3 | 3.9 | 12° | 4 | 45 | 3,900 |
| 08-00017-00140 | 1.4 | 4.2 | 12° | 4 | 45 | 3,900 |
| 08-00017-00150 | 1.5 | 4.5 | 12° | 4 | 45 | 2,200 |
| 08-00017-00160 | 1.6 | 4.8 | 12° | 4 | 45 | 3,900 |
| 08-00017-00170 | 1.7 | 5.1 | 12° | 4 | 45 | 3,900 |
| 08-00017-00180 | 1.8 | 5.4 | 12° | 4 | 45 | 2,500 |
| 08-00017-00190 | 1.9 | 5.7 | 12° | 4 | 45 | 3,900 |
| 08-00017-00200 | 2 | 6 | 12° | 4 | 45 | 2,300 |
| 08-00017-00210 | 2.1 | 6.3 | 12° | 4 | 45 | 3,900 |
| 08-00017-00220 | 2.2 | 6.6 | 12° | 4 | 45 | 3,900 |
| 08-00017-00230 | 2.3 | 6.9 | 12° | 4 | 45 | 3,900 |
| 08-00017-00240 | 2.4 | 7.2 | 12° | 4 | 45 | 3,900 |
| 08-00017-00250 | 2.5 | 7.5 | 12° | 4 | 45 | 2,300 |
| 08-00017-00260 | 2.6 | 7.8 | 12° | 4 | 45 | 5,000 |
| 08-00017-00270 | 2.7 | 8.1 | 12° | 4 | 45 | 5,000 |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00017-00280 | 2.8 | 8.4 | 12° | 4 | 45 | 5,000 |
| 08-00017-00290 | 2.9 | 8.7 | 12° | 4 | 45 | 5,000 |
| 08-00017-00300 | 3 | 9 | 12° | 6 | 45 | 3,400 |
| 08-00017-00350 | 3.5 | 10.5 | 12° | 6 | 45 | 4,800 |
| 08-00017-00400 | 4 | 12 | 12° | 6 | 50 | 3,600 |
| 08-00017-00450 | 4.5 | 13.5 | 12° | 6 | 50 | 5,000 |
| 08-00017-00500 | 5 | 15 | 12° | 6 | 55 | 3,800 |
| 08-00017-00550 | 5.5 | 16.5 | 12° | 6 | 60 | 5,000 |
| 08-00017-00600 | 6 | 18 | – | 6 | 60 | 4,000 |

**オーダー方法** MXH235P 刃径(D)を指示してください。
When you order, indicate MXH235P (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-015に記載
●Recommended Milling Conditions are shown on page D-015.

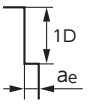
# MXH225

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | ステンレス鋼 Stainless Steels SUS304 | | | チタン合金 Titanium Alloy Ti-6Al-4V | | | 超耐熱合金 Heat Resistance Alloy inconel®718 | | | 焼き入れ鋼 Hardened Steels SKD61 (～52HRC) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting |
| 0.1 | 50,000 | 30 | 15 | 48,000 | 30 | 15 | 25,000 | 10 | 10 | 50,000 | – | 15 |
| 0.2 | 50,000 | 50 | 25 | 48,000 | 50 | 25 | 25,000 | 15 | 10 | 47,700 | – | 20 |
| 0.3 | 50,000 | 90 | 35 | 48,000 | 90 | 35 | 25,000 | 30 | 15 | 31,800 | – | 20 |
| 0.4 | 47,700 | 130 | 50 | 45,000 | 130 | 50 | 23,000 | 40 | 20 | 23,900 | 50 | 25 |
| 0.5 | 38,200 | 130 | 50 | 37,000 | 130 | 50 | 19,000 | 40 | 20 | 19,100 | 60 | 30 |
| 0.6 | 34,000 | 130 | 50 | 33,000 | 130 | 50 | 17,000 | 40 | 20 | 16,000 | 60 | 30 |
| 0.7 | 30,000 | 130 | 50 | 29,000 | 130 | 50 | 15,000 | 40 | 20 | 13,700 | 60 | 30 |
| 0.8 | 26,000 | 140 | 50 | 25,000 | 140 | 50 | 13,000 | 45 | 20 | 12,000 | 60 | 30 |
| 0.9 | 22,000 | 140 | 55 | 21,000 | 140 | 55 | 11,000 | 45 | 25 | 10,700 | 60 | 30 |
| 1 | 19,100 | 150 | 55 | 18,000 | 150 | 55 | 9,500 | 50 | 25 | 9,500 | 75 | 40 |
| 1.1 | 17,500 | 150 | 55 | 16,000 | 150 | 55 | 8,500 | 50 | 25 | 8,700 | 75 | 40 |
| 1.2 | 16,000 | 150 | 55 | 15,000 | 150 | 55 | 8,000 | 50 | 25 | 8,000 | 75 | 40 |
| 1.3 | 14,500 | 150 | 55 | 13,500 | 150 | 55 | 7,200 | 50 | 25 | 7,400 | 75 | 40 |
| 1.4 | 13,000 | 150 | 55 | 12,500 | 150 | 55 | 6,500 | 50 | 25 | 6,900 | 75 | 40 |
| 1.5 | 12,700 | 150 | 55 | 12,000 | 150 | 55 | 6,200 | 50 | 25 | 6,400 | 75 | 40 |
| 1.6 | 11,900 | 150 | 55 | 11,500 | 150 | 55 | 6,000 | 50 | 25 | 6,000 | 75 | 40 |
| 1.7 | 11,300 | 160 | 55 | 10,900 | 160 | 55 | 5,500 | 50 | 25 | 5,700 | 75 | 40 |
| 1.8 | 10,700 | 160 | 55 | 10,300 | 160 | 55 | 5,200 | 50 | 25 | 5,300 | 75 | 40 |
| 1.9 | 10,100 | 170 | 60 | 9,700 | 170 | 60 | 5,000 | 55 | 30 | 5,000 | 75 | 40 |
| 2 | 9,500 | 170 | 60 | 9,100 | 170 | 60 | 4,800 | 55 | 30 | 4,800 | 75 | 40 |
| 2.5 | 7,600 | 180 | 65 | 7,200 | 180 | 65 | 3,800 | 60 | 30 | 3,800 | 75 | 40 |
| 3 | 6,400 | 190 | 70 | 6,000 | 190 | 70 | 3,200 | 65 | 35 | 3,200 | 80 | 40 |
| 4 | 4,800 | 190 | 70 | 4,400 | 190 | 70 | 2,400 | 65 | 35 | 2,400 | 95 | 50 |
| 5 | 3,800 | 230 | 75 | 3,400 | 230 | 75 | 1,900 | 75 | 40 | 1,900 | 95 | 50 |
| 6 | 3,200 | 260 | 85 | 2,800 | 260 | 85 | 1,600 | 80 | 40 | 1,600 | 100 | 50 |

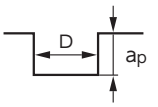
**切り込み量 Depth of Cut** (D:刃径 Dia.)

側面 Side Milling



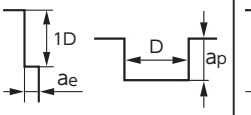

ae
$\phi$0.1～0.9=0.05D
$\phi$1～2.5=0.1D
$\phi$3～6=0.2D

溝 Slotting




ap
$\phi$0.1～0.4=0.05D
$\phi$0.5～1.4=0.2D
$\phi$1.5～3=0.7D
$\phi$4～6=1D

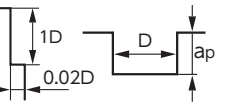
側面 Side Milling 溝 Slotting




ae
$\phi$0.1～0.9=0.01D
$\phi$1～2.5=0.02D
$\phi$3～6=0.04D

ap
$\phi$0.1～0.4=0.01D
$\phi$0.5～1.4=0.1D
$\phi$1.5～3=0.3D
$\phi$4～6=0.5D

側面 Side Milling 溝 Slotting




ap
$\phi$0.1～0.4=0.05D
$\phi$0.5～6=0.2D

**備考 Notes**

※機械剛性や被削材の保持状態等により切削条件を調整してください。
※切削油は発煙性の少ないものを使用してください。
※ミーリングチャック、機械は出来るだけ剛性のあるものを使用してください。
※不水溶性切削油で加工する場合は、切りくずの排出や発煙に考慮し切削条件の調整をしてください。
※Adjust milling condition conforming to machine rigidity and clamping condition.
※Use cutting fluid with smoke retardant.
※Use rigid and precise machine and chuck holder.
※Adjust milling condition with caution for chip evacuation and smoke generation when milling with water-insoluble cutting fluid.



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# MXH230

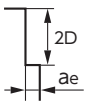
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | ステンレス鋼 Stainless Steels SUS304 | | | チタン合金 Titanium Alloy Ti-6Al-4V | | | 超耐熱合金 Heat Resistance Alloy inconel®718 | | | 焼き入れ鋼 Hardened Steels SKD61 (～52HRC) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting |
| 0.1 | 50,000 | 30 | 15 | 48,000 | 30 | 15 | 25,000 | 10 | 10 | 50,000 | – | 15 |
| 0.2 | 50,000 | 50 | 25 | 48,000 | 50 | 25 | 25,000 | 15 | 10 | 47,700 | – | 20 |
| 0.3 | 50,000 | 90 | 35 | 48,000 | 90 | 35 | 25,000 | 30 | 15 | 31,800 | – | 20 |
| 0.4 | 47,700 | 130 | 50 | 45,000 | 130 | 50 | 23,000 | 40 | 20 | 23,900 | 50 | 25 |
| 0.5 | 38,200 | 130 | 50 | 37,000 | 130 | 50 | 19,000 | 40 | 20 | 19,100 | 60 | 30 |
| 0.6 | 34,500 | 130 | 50 | 32,000 | 130 | 50 | 17,000 | 40 | 20 | 16,000 | 60 | 30 |
| 0.7 | 30,500 | 130 | 50 | 28,000 | 130 | 50 | 15,000 | 40 | 20 | 13,700 | 60 | 30 |
| 0.8 | 26,000 | 140 | 50 | 24,000 | 140 | 50 | 13,000 | 45 | 20 | 12,000 | 60 | 30 |
| 0.9 | 22,000 | 140 | 55 | 20,000 | 140 | 55 | 11,000 | 45 | 25 | 10,700 | 60 | 30 |
| 1 | 19,100 | 150 | 55 | 18,000 | 150 | 55 | 9,500 | 50 | 25 | 9,500 | 75 | 40 |
| 1.1 | 17,500 | 150 | 55 | 16,000 | 150 | 55 | 8,700 | 50 | 25 | 8,700 | 75 | 40 |
| 1.2 | 16,300 | 150 | 55 | 15,000 | 150 | 55 | 8,100 | 50 | 25 | 8,000 | 75 | 40 |
| 1.3 | 15,100 | 150 | 55 | 14,000 | 150 | 55 | 7,500 | 50 | 25 | 7,400 | 75 | 40 |
| 1.4 | 13,900 | 150 | 55 | 13,000 | 150 | 55 | 7,000 | 50 | 25 | 6,900 | 75 | 40 |
| 1.5 | 12,700 | 150 | 55 | 12,000 | 150 | 55 | 6,200 | 50 | 25 | 6,400 | 75 | 40 |
| 1.6 | 12,000 | 150 | 55 | 11,500 | 150 | 55 | 6,000 | 50 | 25 | 6,000 | 75 | 40 |
| 1.7 | 11,300 | 160 | 55 | 10,900 | 160 | 55 | 5,500 | 50 | 25 | 5,700 | 75 | 40 |
| 1.8 | 10,600 | 160 | 55 | 10,200 | 160 | 55 | 5,300 | 50 | 25 | 5,300 | 75 | 40 |
| 1.9 | 9,900 | 170 | 60 | 9,500 | 170 | 60 | 5,000 | 55 | 30 | 5,000 | 75 | 40 |
| 2 | 9,500 | 170 | 60 | 9,100 | 170 | 60 | 4,800 | 55 | 30 | 4,800 | 75 | 40 |
| 2.1 | 9,100 | 170 | 60 | 8,700 | 170 | 60 | 4,500 | 55 | 30 | 4,600 | 75 | 40 |
| 2.2 | 8,700 | 170 | 60 | 8,300 | 170 | 60 | 4,300 | 55 | 30 | 4,400 | 75 | 40 |
| 2.3 | 8,300 | 170 | 60 | 7,900 | 170 | 60 | 4,100 | 55 | 30 | 4,200 | 75 | 40 |
| 2.4 | 7,900 | 180 | 65 | 7,500 | 180 | 65 | 4,000 | 60 | 30 | 4,000 | 75 | 40 |
| 2.5 | 7,600 | 180 | 65 | 7,200 | 180 | 65 | 3,800 | 60 | 30 | 3,800 | 75 | 40 |
| 2.6 | 7,400 | 180 | 65 | 7,000 | 180 | 65 | 3,700 | 60 | 30 | 3,700 | 75 | 40 |
| 2.7 | 7,200 | 180 | 65 | 6,800 | 180 | 65 | 3,600 | 60 | 30 | 3,600 | 75 | 40 |
| 2.8 | 7,000 | 180 | 65 | 6,500 | 180 | 65 | 3,500 | 60 | 30 | 3,500 | 75 | 40 |
| 2.9 | 6,700 | 190 | 70 | 6,200 | 190 | 70 | 3,300 | 60 | 30 | 3,300 | 75 | 40 |
| 3 | 6,400 | 190 | 70 | 6,000 | 190 | 70 | 3,200 | 65 | 35 | 3,200 | 80 | 40 |
| 3.5 | 5,500 | 190 | 70 | 5,100 | 190 | 70 | 2,700 | 65 | 35 | 2,700 | 85 | 45 |
| 4 | 4,800 | 190 | 70 | 4,400 | 190 | 70 | 2,400 | 65 | 35 | 2,400 | 95 | 50 |
| 4.5 | 4,200 | 210 | 75 | 3,800 | 210 | 75 | 2,100 | 70 | 35 | 2,100 | 95 | 50 |
| 5 | 3,800 | 230 | 75 | 3,400 | 230 | 75 | 1,900 | 75 | 40 | 1,900 | 95 | 50 |
| 5.5 | 3,500 | 240 | 80 | 3,100 | 240 | 80 | 1,700 | 75 | 40 | 1,700 | 95 | 50 |
| 6 | 3,200 | 260 | 85 | 2,800 | 260 | 85 | 1,600 | 80 | 40 | 1,600 | 100 | 50 |

切り込み量 Depth of Cut

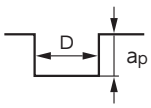
(D:刃径 Dia.)

側面 Side Milling



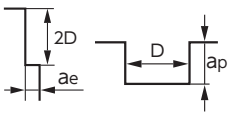

ae
$\phi$0.1～0.9=0.05D
$\phi$1～2.9=0.07D
$\phi$3～6=0.15D

溝 Slotting




ap
$\phi$0.1～0.4=0.05D
$\phi$0.5～1.4=0.15D
$\phi$1.5～3.5=0.5D
$\phi$4～6=0.75D

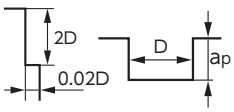
側面 Side Milling 溝 Slotting




ae
$\phi$0.1～0.9=0.01D
$\phi$1～2.9=0.015D
$\phi$3～6=0.03D

ap
$\phi$0.1～0.4=0.02D
$\phi$0.5～1.4=0.07D
$\phi$1.5～3.5=0.2D
$\phi$4～6=0.3D

側面 Side Milling 溝 Slotting




ap
$\phi$0.1～0.4=0.05D
$\phi$0.5～6=0.15D

備考 Notes

※機械剛性や被削材の保持状態等により切削条件を調整してください。
※切削油は発煙性の少ないものを使用してください。
※ミーリングチャック、機械は出来るだけ剛性のあるものを使用してください。
※不水溶性切削油で加工する場合は、切りくずの排出や発煙に考慮し切削条件の調整をしてください。
※Adjust milling condition conforming to machine rigidity and clamping condition.
※Use cutting fluid with smoke retardant.
※Use rigid and precise machine and chuck holder.
※Adjust milling condition with caution for chip evacuation and smoke generation when milling with water-insoluble cutting fluid.

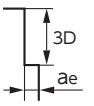
# MXH235

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | ステンレス鋼 Stainless Steels SUS304 | | | チタン合金 Titanium Alloy Ti-6Al-4V | | | 超耐熱合金 Heat Resistance Alloy inconel®718 | | | 焼き入れ鋼 Hardened Steels SKD61 (～52HRC) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting |
| 0.1 | 50,000 | 30 | 15 | 40,000 | 30 | 15 | 25,000 | 10 | 10 | 50,000 | – | 15 |
| 0.2 | 50,000 | 50 | 25 | 40,000 | 50 | 25 | 25,000 | 15 | 10 | 39,800 | – | 20 |
| 0.3 | 50,000 | 90 | 35 | 40,000 | 90 | 35 | 25,000 | 30 | 15 | 26,500 | – | 20 |
| 0.4 | 43,800 | 120 | 50 | 35,000 | 120 | 50 | 22,000 | 40 | 20 | 19,900 | – | 20 |
| 0.5 | 35,000 | 120 | 50 | 28,000 | 120 | 50 | 17,000 | 40 | 20 | 15,900 | 50 | 25 |
| 0.6 | 31,500 | 120 | 50 | 25,000 | 120 | 50 | 15,000 | 40 | 20 | 13,300 | 50 | 25 |
| 0.7 | 28,000 | 120 | 50 | 22,500 | 120 | 50 | 14,000 | 40 | 20 | 11,400 | 50 | 25 |
| 0.8 | 24,500 | 130 | 50 | 19,600 | 130 | 50 | 12,000 | 45 | 20 | 10,000 | 50 | 25 |
| 0.9 | 21,000 | 130 | 50 | 17,000 | 130 | 50 | 10,500 | 45 | 20 | 8,900 | 50 | 25 |
| 1 | 17,500 | 140 | 50 | 14,000 | 140 | 50 | 8,700 | 45 | 20 | 8,000 | 65 | 30 |
| 1.1 | 16,400 | 140 | 50 | 13,000 | 140 | 50 | 8,200 | 45 | 20 | 7,300 | 65 | 30 |
| 1.2 | 15,300 | 140 | 50 | 12,000 | 140 | 50 | 7,500 | 45 | 20 | 6,700 | 65 | 30 |
| 1.3 | 14,100 | 140 | 50 | 11,000 | 140 | 50 | 7,000 | 45 | 20 | 6,200 | 65 | 30 |
| 1.4 | 12,900 | 140 | 50 | 10,000 | 140 | 50 | 6,400 | 45 | 20 | 5,700 | 65 | 30 |
| 1.5 | 11,700 | 140 | 50 | 9,400 | 140 | 50 | 5,800 | 45 | 20 | 5,300 | 65 | 30 |
| 1.6 | 11,200 | 140 | 50 | 8,900 | 140 | 50 | 5,500 | 45 | 20 | 5,000 | 65 | 30 |
| 1.7 | 10,600 | 140 | 50 | 8,500 | 140 | 50 | 5,300 | 45 | 20 | 4,700 | 65 | 30 |
| 1.8 | 10,000 | 150 | 50 | 8,000 | 150 | 50 | 5,000 | 50 | 20 | 4,500 | 65 | 30 |
| 1.9 | 9,400 | 160 | 55 | 7,500 | 160 | 55 | 4,700 | 50 | 25 | 4,200 | 65 | 30 |
| 2 | 8,800 | 160 | 55 | 7,000 | 160 | 55 | 4,400 | 50 | 25 | 4,000 | 65 | 30 |
| 2.1 | 8,500 | 160 | 55 | 6,800 | 160 | 55 | 4,200 | 50 | 25 | 3,800 | 65 | 30 |
| 2.2 | 8,100 | 160 | 55 | 6,500 | 160 | 55 | 4,000 | 50 | 25 | 3,700 | 65 | 30 |
| 2.3 | 7,800 | 160 | 55 | 6,200 | 160 | 55 | 3,900 | 50 | 25 | 3,500 | 65 | 30 |
| 2.4 | 7,400 | 160 | 55 | 5,900 | 160 | 55 | 3,700 | 50 | 25 | 3,300 | 65 | 30 |
| 2.5 | 7,000 | 170 | 60 | 5,600 | 170 | 60 | 3,500 | 55 | 30 | 3,200 | 70 | 35 |
| 2.6 | 6,700 | 170 | 60 | 5,400 | 170 | 60 | 3,300 | 55 | 30 | 3,100 | 70 | 35 |
| 2.7 | 6,400 | 170 | 60 | 5,100 | 170 | 60 | 3,200 | 55 | 30 | 3,000 | 70 | 35 |
| 2.8 | 6,200 | 170 | 60 | 4,900 | 170 | 60 | 3,100 | 55 | 30 | 2,900 | 70 | 35 |
| 2.9 | 6,000 | 170 | 60 | 4,800 | 170 | 60 | 3,000 | 55 | 30 | 2,800 | 70 | 35 |
| 3 | 5,800 | 170 | 60 | 4,600 | 170 | 60 | 2,900 | 55 | 30 | 2,700 | 70 | 35 |
| 3.5 | 5,000 | 180 | 60 | 4,000 | 180 | 60 | 2,500 | 60 | 30 | 2,300 | 75 | 35 |
| 4 | 4,400 | 180 | 60 | 3,500 | 180 | 60 | 2,200 | 60 | 30 | 2,000 | 80 | 40 |
| 4.5 | 3,900 | 200 | 65 | 3,100 | 200 | 65 | 1,900 | 65 | 30 | 1,800 | 80 | 40 |
| 5 | 3,500 | 210 | 70 | 2,800 | 210 | 70 | 1,700 | 70 | 35 | 1,600 | 80 | 40 |
| 5.5 | 3,200 | 220 | 70 | 2,500 | 220 | 70 | 1,600 | 75 | 35 | 1,400 | 80 | 40 |
| 6 | 2,900 | 230 | 75 | 2,300 | 230 | 75 | 1,400 | 75 | 35 | 1,300 | 80 | 40 |

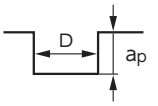
**切り込み量 Depth of Cut** (D:刃径 Dia.)

側面 Side Milling



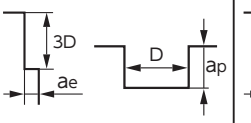

ae
$\phi$0.1～0.9=0.04D
$\phi$1～2.9=0.05D
$\phi$3～6=0.1D

溝 Slotting




ap
$\phi$0.1～0.4=0.05D
$\phi$0.5～1.4=0.08D
$\phi$1.5～3.5=0.25D
$\phi$4～6=0.4D

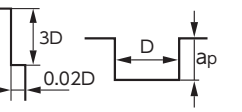
側面 Side Milling 溝 Slotting




ae
$\phi$0.1～0.9=0.01D
$\phi$1～2.9=0.02D
$\phi$3～6=0.05D

ap
$\phi$0.1～0.4=0.02D
$\phi$0.5～1.4=0.04D
$\phi$1.5～3.5=0.1D
$\phi$4～6=0.2D

側面 Side Milling 溝 Slotting




ap
$\phi$0.1～0.4=0.05D
$\phi$0.5～6=0.1D

**備考 Notes**

※機械剛性や被削材の保持状態等により切削条件を調整してください。
※切削油は発煙性の少ないものを使用してください。
※ミーリングチャック、機械は出来るだけ剛性のあるものを使用してください。
※不水溶性切削油で加工する場合は、切りくずの排出や発煙に考慮し切削条件の調整をしてください。
※Adjust milling condition conforming to machine rigidity and clamping condition.
※Use cutting fluid with smoke retardant.
※Use rigid and precise machine and chuck holder.
※Adjust milling condition with caution for chip evacuation and smoke generation when milling with water-insoluble cutting fluid.



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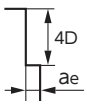
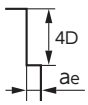
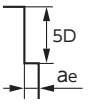
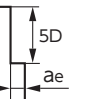
# MXH240

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | ステンレス鋼 Stainless Steels SUS304 | | チタン合金 Titanium Alloy Ti-6Al-4V | | 超耐熱合金 Heat Resistance Alloy inconel®718 | |
|---|---|---|---|---|---|---|
| 刃　径 Dia. | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 0.3 | 21,200 | 40 | 20,000 | 40 | 10,500 | 20 |
| 0.4 | 15,900 | 45 | 14,000 | 40 | 8,000 | 20 |
| 0.5 | 12,700 | 45 | 11,000 | 40 | 6,300 | 20 |
| 0.8 | 9,600 | 45 | 8,000 | 40 | 4,800 | 20 |
| 1 | 6,400 | 50 | 4,400 | 50 | 3,200 | 25 |
| 1.2 | 4,800 | 50 | 3,300 | 50 | 2,400 | 25 |
| 1.5 | 4,200 | 50 | 2,900 | 50 | 2,100 | 25 |
| 1.8 | 3,700 | 55 | 2,600 | 50 | 1,800 | 25 |
| 2 | 3,200 | 60 | 2,200 | 55 | 1,600 | 30 |
| 2.5 | 2,500 | 60 | 1,700 | 55 | 1,200 | 30 |
| 3 | 2,100 | 60 | 1,600 | 60 | 1,000 | 30 |
| 4 | 1,600 | 65 | 1,100 | 65 | 800 | 35 |
| 5 | 1,300 | 80 | 900 | 80 | 750 | 40 |
| 6 | 1,100 | 90 | 700 | 90 | 600 | 45 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   ae<br>φ0.3～0.8＝0.03D<br>φ1～2.5＝0.04D<br>φ3～6＝0.08D | | | | 側面 Side Milling   ae<br>φ0.3～0.8＝0.01D<br>φ1～2.5＝0.015D<br>φ3～6＝0.02D | |
| 備　考 Notes | ※機械剛性や被削材の保持状態等により切削条件を調整してください。<br>※切削油は発煙性の少ないものを使用してください。<br>※ミーリングチャック、機械は出来るだけ剛性のあるものを使用してください。<br>※側面切削でのみ、使用してください。<br>※Adjust milling condition conforming to machine rigidity and clamping condition.<br>※Use cutting fluid with smoke retardant.<br>※Use a rigid and precise machine and chuck holder.<br>※Available only for side cutting. | | | | | |

# MXH245

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | ステンレス鋼 Stainless Steels SUS304 | | チタン合金 Titanium Alloy Ti-6Al-4V | | 超耐熱合金 Heat Resistance Alloy inconel®718 | |
|---|---|---|---|---|---|---|
| 刃 径 Dia. | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 0.3 | 15,900 | 30 | 14,000 | 30 | 8,000 | 15 |
| 0.4 | 11,900 | 35 | 10,000 | 35 | 6,000 | 15 |
| 0.5 | 9,500 | 35 | 8,000 | 35 | 4,700 | 15 |
| 0.8 | 7,100 | 35 | 6,000 | 35 | 3,500 | 15 |
| 1 | 4,800 | 40 | 3,400 | 40 | 2,400 | 20 |
| 1.2 | 4,000 | 40 | 2,800 | 40 | 2,000 | 20 |
| 1.5 | 3,200 | 40 | 2,200 | 40 | 1,600 | 20 |
| 1.8 | 2,800 | 40 | 1,900 | 40 | 1,400 | 20 |
| 2 | 2,400 | 45 | 1,700 | 45 | 1,200 | 20 |
| 2.5 | 1,900 | 45 | 1,300 | 45 | 950 | 20 |
| 3 | 1,600 | 50 | 1,100 | 50 | 800 | 25 |
| 4 | 1,200 | 50 | 840 | 50 | 600 | 25 |
| 5 | 1,000 | 60 | 700 | 60 | 500 | 30 |
| 6 | 800 | 65 | 550 | 65 | 400 | 30 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   ae<br>φ0.3～0.8＝0.02D<br>φ1～2.5＝0.03D<br>φ3～6＝0.06D | | | | 側面 Side Milling   ae<br>φ0.3～0.8＝0.005D<br>φ1～2.5＝0.007D<br>φ3～6＝0.015D | |
| 備 考 Notes | ※機械剛性や被削材の保持状態等により切削条件を調整してください。<br>※切削油は発煙性の少ないものを使用してください。<br>※ミーリングチャック、機械は出来るだけ剛性のあるものを使用してください。<br>※側面切削でのみ、使用してください。<br>※Adjust milling condition conforming to machine rigidity and clamping condition.<br>※Use cutting fluid with smoke retardant.<br>※Use a rigid and precise machine and chuck holder.<br>※Available only for side cutting. | | | | | |



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# MXH225P

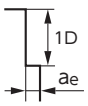
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | ステンレス鋼 Stainless Steels SUS304 | | チタン合金 Titanium Alloy Ti-6Al-4V | | 超耐熱合金 Heat Resistance Alloy inconel®718 | |
|---|---|---|---|---|---|---|
| 刃 径 Dia. | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 0.1 | 50,000 | 30 | 48,000 | 30 | 25,000 | 10 |
| 0.2 | 50,000 | 50 | 48,000 | 50 | 25,000 | 15 |
| 0.3 | 50,000 | 90 | 48,000 | 90 | 25,000 | 30 |
| 0.4 | 47,700 | 130 | 45,000 | 130 | 23,000 | 40 |
| 0.5 | 38,200 | 130 | 37,000 | 130 | 19,000 | 40 |
| 0.6 | 34,000 | 130 | 33,000 | 130 | 17,000 | 40 |
| 0.7 | 30,000 | 130 | 29,000 | 130 | 15,000 | 40 |
| 0.8 | 26,000 | 140 | 25,000 | 140 | 13,000 | 45 |
| 0.9 | 22,000 | 140 | 21,000 | 140 | 11,000 | 45 |
| 1 | 19,100 | 150 | 18,000 | 150 | 9,500 | 50 |
| 1.1 | 17,500 | 150 | 16,000 | 150 | 8,500 | 50 |
| 1.2 | 16,000 | 150 | 15,000 | 150 | 8,000 | 50 |
| 1.3 | 14,500 | 150 | 13,500 | 150 | 7,200 | 50 |
| 1.4 | 13,000 | 150 | 12,500 | 150 | 6,500 | 50 |
| 1.5 | 12,700 | 150 | 12,000 | 150 | 6,200 | 50 |
| 1.6 | 11,900 | 150 | 11,500 | 150 | 6,000 | 50 |
| 1.7 | 11,300 | 160 | 10,900 | 160 | 5,500 | 50 |
| 1.8 | 10,700 | 160 | 10,300 | 160 | 5,200 | 50 |
| 1.9 | 10,100 | 170 | 9,700 | 170 | 5,000 | 55 |
| 2 | 9,500 | 170 | 9,100 | 170 | 4,800 | 55 |
| 2.5 | 7,600 | 180 | 7,200 | 180 | 3,800 | 60 |
| 3 | 6,400 | 190 | 6,000 | 190 | 3,200 | 65 |
| 4 | 4,800 | 190 | 4,400 | 190 | 2,400 | 65 |
| 5 | 3,800 | 230 | 3,400 | 230 | 1,900 | 75 |
| 6 | 3,200 | 260 | 2,800 | 260 | 1,600 | 80 |

**切り込み量 Depth of Cut**

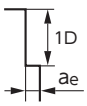
(D:刃径 Dia.)

側面 Side Milling




ae
φ0.1～0.9=0.05D
φ1～2.5=0.1D
φ3～6=0.2D

側面 Side Milling




ae
φ0.1～0.9=0.01D
φ1～2.5=0.02D
φ3～6=0.04D

**備 考 Notes**

※機械剛性や被削材の保持状態等により切削条件を調整してください。
※切削油は発煙性の少ないものを使用してください。
※ミーリングチャック、機械は出来るだけ剛性のあるものを使用してください。
※側面切削でのみ、使用してください。
※Adjust milling condition conforming to machine rigidity and clamping condition.
※Use cutting fluid with smoke retardant.
※Use a rigid and precise machine and chuck holder.
※Available only for side cutting.

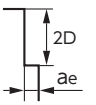
# MXH230P

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | ステンレス鋼 Stainless Steels SUS304 | | チタン合金 Titanium Alloy Ti-6Al-4V | | 超耐熱合金 Heat Resistance Alloy inconel®718 | |
|---|---|---|---|---|---|---|
| 刃 径 Dia. | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 0.1 | 50,000 | 30 | 48,000 | 30 | 25,000 | 10 |
| 0.2 | 50,000 | 50 | 48,000 | 50 | 25,000 | 15 |
| 0.3 | 50,000 | 90 | 48,000 | 90 | 25,000 | 30 |
| 0.4 | 47,700 | 130 | 45,000 | 130 | 23,000 | 40 |
| 0.5 | 38,200 | 130 | 37,000 | 130 | 19,000 | 40 |
| 0.6 | 34,500 | 130 | 32,000 | 130 | 17,000 | 40 |
| 0.7 | 30,500 | 130 | 28,000 | 130 | 15,000 | 40 |
| 0.8 | 26,000 | 140 | 24,000 | 140 | 13,000 | 45 |
| 0.9 | 22,000 | 140 | 20,000 | 140 | 11,000 | 45 |
| 1 | 19,100 | 150 | 18,000 | 150 | 9,500 | 50 |
| 1.1 | 17,500 | 150 | 16,000 | 150 | 8,700 | 50 |
| 1.2 | 16,300 | 150 | 15,000 | 150 | 8,100 | 50 |
| 1.3 | 15,100 | 150 | 14,000 | 150 | 7,500 | 50 |
| 1.4 | 13,900 | 150 | 13,000 | 150 | 7,000 | 50 |
| 1.5 | 12,700 | 150 | 12,000 | 150 | 6,200 | 50 |
| 1.6 | 12,000 | 150 | 11,500 | 150 | 6,000 | 50 |
| 1.7 | 11,300 | 160 | 10,900 | 160 | 5,500 | 50 |
| 1.8 | 10,600 | 160 | 10,200 | 160 | 5,300 | 50 |
| 1.9 | 9,900 | 170 | 9,500 | 170 | 5,000 | 55 |
| 2 | 9,500 | 170 | 9,100 | 170 | 4,800 | 55 |
| 2.1 | 9,100 | 170 | 8,700 | 170 | 4,500 | 55 |
| 2.2 | 8,700 | 170 | 8,300 | 170 | 4,300 | 55 |
| 2.3 | 8,300 | 170 | 7,900 | 170 | 4,100 | 55 |
| 2.4 | 7,900 | 180 | 7,500 | 180 | 4,000 | 60 |
| 2.5 | 7,600 | 180 | 7,200 | 180 | 3,800 | 60 |
| 2.6 | 7,400 | 180 | 7,000 | 180 | 3,700 | 60 |
| 2.7 | 7,200 | 180 | 6,800 | 180 | 3,600 | 60 |
| 2.8 | 7,000 | 180 | 6,500 | 180 | 3,500 | 60 |
| 2.9 | 6,700 | 190 | 6,200 | 190 | 3,300 | 60 |
| 3 | 6,400 | 190 | 6,000 | 190 | 3,200 | 65 |
| 3.5 | 5,500 | 190 | 5,100 | 190 | 2,700 | 65 |
| 4 | 4,800 | 190 | 4,400 | 190 | 2,400 | 65 |
| 4.5 | 4,200 | 210 | 3,800 | 210 | 2,100 | 70 |
| 5 | 3,800 | 230 | 3,400 | 230 | 1,900 | 75 |
| 5.5 | 3,500 | 240 | 3,100 | 240 | 1,700 | 75 |
| 6 | 3,200 | 260 | 2,800 | 260 | 1,600 | 80 |

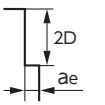
**切り込み量 Depth of Cut**
(D:刃径 Dia.)

側面 Side Milling




ae
φ0.1～0.9=0.05D
φ1～2.9=0.07D
φ3～=0.15D

側面 Side Milling




ae
φ0.1～0.9=0.01D
φ1～2.9=0.015D
φ3～6=0.03D

**備 考 Notes**

※機械剛性や被削材の保持状態等により切削条件を調整してください。
※切削油は発煙性の少ないものを使用してください。
※ミーリングチャック、機械は出来るだけ剛性のあるものを使用してください。
※側面切削でのみ、使用してください。
※Adjust milling condition conforming to machine rigidity and clamping condition.
※Use cutting fluid with smoke retardant.
※Use a rigid and precise machine and chuck holder.
※Available only for side cutting.



ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MXH235P

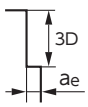
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | ステンレス鋼 Stainless Steels SUS304 | | チタン合金 Titanium Alloy Ti-6Al-4V | | 超耐熱合金 Heat Resistance Alloy inconel®718 | |
|---|---|---|---|---|---|---|
| 刃 径 Dia. | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 0.1 | 50,000 | 30 | 40,000 | 30 | 25,000 | 10 |
| 0.2 | 50,000 | 50 | 40,000 | 50 | 25,000 | 15 |
| 0.3 | 50,000 | 90 | 40,000 | 90 | 25,000 | 30 |
| 0.4 | 43,800 | 120 | 35,000 | 120 | 22,000 | 40 |
| 0.5 | 35,000 | 120 | 28,000 | 120 | 17,000 | 40 |
| 0.6 | 31,500 | 120 | 25,000 | 120 | 15,000 | 40 |
| 0.7 | 28,000 | 120 | 22,500 | 120 | 14,000 | 40 |
| 0.8 | 24,500 | 130 | 19,600 | 130 | 12,000 | 45 |
| 0.9 | 21,000 | 130 | 17,000 | 130 | 10,500 | 45 |
| 1 | 17,500 | 140 | 14,000 | 140 | 8,700 | 45 |
| 1.1 | 16,400 | 140 | 13,000 | 140 | 8,200 | 45 |
| 1.2 | 15,300 | 140 | 12,000 | 140 | 7,500 | 45 |
| 1.3 | 14,100 | 140 | 11,000 | 140 | 7,000 | 45 |
| 1.4 | 12,900 | 140 | 10,000 | 140 | 6,400 | 45 |
| 1.5 | 11,700 | 140 | 9,400 | 140 | 5,800 | 45 |
| 1.6 | 11,200 | 140 | 8,900 | 140 | 5,500 | 45 |
| 1.7 | 10,600 | 140 | 8,500 | 140 | 5,300 | 45 |
| 1.8 | 10,000 | 150 | 8,000 | 150 | 5,000 | 50 |
| 1.9 | 9,400 | 160 | 7,500 | 160 | 4,700 | 50 |
| 2 | 8,800 | 160 | 7,000 | 160 | 4,400 | 50 |
| 2.1 | 8,500 | 160 | 6,800 | 160 | 4,200 | 50 |
| 2.2 | 8,100 | 160 | 6,500 | 160 | 4,000 | 50 |
| 2.3 | 7,800 | 160 | 6,200 | 160 | 3,900 | 50 |
| 2.4 | 7,400 | 160 | 5,900 | 160 | 3,700 | 50 |
| 2.5 | 7,000 | 170 | 5,600 | 170 | 3,500 | 55 |
| 2.6 | 6,700 | 170 | 5,400 | 170 | 3,300 | 55 |
| 2.7 | 6,400 | 170 | 5,100 | 170 | 3,200 | 55 |
| 2.8 | 6,200 | 170 | 4,900 | 170 | 3,100 | 55 |
| 2.9 | 6,000 | 170 | 4,800 | 170 | 3,000 | 55 |
| 3 | 5,800 | 170 | 4,600 | 170 | 2,900 | 55 |
| 3.5 | 5,000 | 180 | 4,000 | 180 | 2,500 | 60 |
| 4 | 4,400 | 180 | 3,500 | 180 | 2,200 | 60 |
| 4.5 | 3,900 | 200 | 3,100 | 200 | 1,900 | 65 |
| 5 | 3,500 | 210 | 2,800 | 210 | 1,700 | 70 |
| 5.5 | 3,200 | 220 | 2,500 | 220 | 1,600 | 75 |
| 6 | 2,900 | 230 | 2,300 | 230 | 1,400 | 75 |

**切り込み量 Depth of Cut**

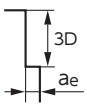
(D:刃径 Dia.)

側面 Side Milling




ae
$\phi$0.1～0.9=0.04D
$\phi$1～2.9=0.05D
$\phi$3～6=0.1D

側面 Side Milling



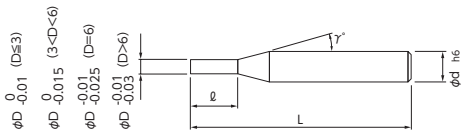

ae
$\phi$0.1～0.9=0.01D
$\phi$1～2.9=0.02D
$\phi$3～6=0.05D

**備 考 Notes**

※機械剛性や被削材の保持状態等により切削条件を調整してください。
※切削油は発煙性の少ないものを使用してください。
※ミーリングチャック、機械は出来るだけ剛性のあるものを使用してください。
※側面切削でのみ、使用してください。
※Adjust milling condition conforming to machine rigidity and clamping condition.
※Use cutting fluid with smoke retardant.
※Use a rigid and precise machine and chuck holder.
※Available only for side cutting.

# MX225

## 無限コーティング リード25 エンドミル 2枚刃
MUGEN-COATING 2-Flute LEAD25 End Mill




- 刃長は刃径の等倍で 25° ネジレを採用。
- 剛性を高めた設計で、溝加工でのビビリと倒れを最小限に抑制。
- L/D=1 and helix 25° to increase rigidity and realize high efficient machining.
- Suppress chattering and deflection in slotting process.

Slot Side Face MG ∞ 2 25° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹 脂 Resin |
| ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

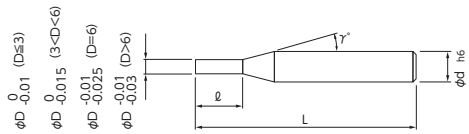
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00025-00030 | 0.3 | 0.3 | 12° | 4 | 45 | 3,400 |
| 08-00025-00040 | 0.4 | 0.4 | 12° | 4 | 45 | 3,800 |
| 08-00025-00050 | 0.5 | 0.5 | 12° | 4 | 45 | 1,900 |
| 08-00025-00080 | 0.8 | 0.8 | 12° | 4 | 45 | 1,900 |
| 08-00025-00100 | 1 | 1 | 12° | 4 | 45 | 1,700 |
| 08-00025-00120 | 1.2 | 1.2 | 12° | 4 | 45 | 1,900 |
| 08-00025-00150 | 1.5 | 1.5 | 12° | 4 | 45 | 1,700 |
| 08-00025-00180 | 1.8 | 1.8 | 12° | 4 | 45 | 1,900 |
| 08-00025-00200 | 2 | 2 | 12° | 4 | 45 | 1,700 |
| 08-00025-00250 | 2.5 | 2.5 | 12° | 4 | 45 | 1,700 |
| 08-00025-00300 | 3 | 3 | 12° | 6 | 45 | 2,200 |
| 08-00025-00400 | 4 | 4 | 12° | 6 | 45 | 2,400 |
| 08-00025-00500 | 5 | 5 | 12° | 6 | 50 | 2,600 |
| 08-00025-00600 | 6 | 6 | – | 6 | 50 | 2,800 |
| 08-00025-00700 | 7 | 7 | 12° | 8 | 65 | 8,700 |
| 08-00025-00800 | 8 | 8 | – | 8 | 65 | 7,200 |
| 08-00025-00900 | 9 | 9 | 12° | 10 | 75 | 12,700 |
| 08-00025-01000 | 10 | 10 | – | 10 | 75 | 9,400 |
| 08-00025-01200 | 12 | 12 | – | 12 | 80 | 12,700 |

**オーダー方法** MX225 刃径(D)を指示してください。
When you order, indicate MX225 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-021に記載
●Recommended Milling Conditions are shown on page D-021.

# MX230

## 無限コーティング リード30 エンドミル 2枚刃
MUGEN-COATING 2-Flute LEAD30 End Mill




- 刃長は刃径の 2 倍で 30° ネジレを採用。
- 溝・側面を問わずオールマイティーに対応する標準タイプ。
- L/D=2 and helix 30° standard type, applicable for both slotting and side milling.

Slot Side Face MG ∞ 2 30° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹 脂 Resin |
| ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00030-00010 | 0.1 | 0.2 | 12° | 4 | 45 | 6,500 |
| 08-00030-00020 | 0.2 | 0.4 | 12° | 4 | 45 | 3,900 |
| 08-00030-00030 | 0.3 | 0.6 | 12° | 4 | 45 | 3,400 |
| 08-00030-00040 | 0.4 | 0.8 | 12° | 4 | 45 | 3,800 |
| 08-00030-00050 | 0.5 | 1 | 12° | 4 | 45 | 1,900 |
| 08-00030-00060 | 0.6 | 1.2 | 12° | 4 | 45 | 2,900 |
| 08-00030-00070 | 0.7 | 1.4 | 12° | 4 | 45 | 3,200 |
| 08-00030-00080 | 0.8 | 1.6 | 12° | 4 | 45 | 1,900 |
| 08-00030-00090 | 0.9 | 1.8 | 12° | 4 | 45 | 3,200 |
| 08-00030-00100 | 1 | 2 | 12° | 4 | 45 | 1,700 |
| 08-00030-00110 | 1.1 | 2.2 | 12° | 4 | 45 | 3,600 |
| 08-00030-00120 | 1.2 | 2.4 | 12° | 4 | 45 | 1,900 |
| 08-00030-00130 | 1.3 | 2.6 | 12° | 4 | 45 | 3,600 |
| 08-00030-00140 | 1.4 | 2.8 | 12° | 4 | 45 | 3,600 |
| 08-00030-00150 | 1.5 | 3 | 12° | 4 | 45 | 1,700 |
| 08-00030-00160 | 1.6 | 3.2 | 12° | 4 | 45 | 3,600 |
| 08-00030-00170 | 1.7 | 3.4 | 12° | 4 | 45 | 3,600 |
| 08-00030-00180 | 1.8 | 3.6 | 12° | 4 | 45 | 1,900 |
| 08-00030-00190 | 1.9 | 3.8 | 12° | 4 | 45 | 3,700 |
| 08-00030-00200 | 2 | 4 | 12° | 4 | 45 | 1,700 |
| 08-00030-00210 | 2.1 | 4.2 | 12° | 4 | 45 | 3,600 |
| 08-00030-00220 | 2.2 | 4.4 | 12° | 4 | 45 | 3,600 |
| 08-00030-00230 | 2.3 | 4.6 | 12° | 4 | 45 | 3,600 |
| 08-00030-00240 | 2.4 | 4.8 | 12° | 4 | 45 | 3,600 |

**オーダー方法** MX230 刃径(D)を指示してください。
When you order, indicate MX230 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-022に記載
●Recommended Milling Conditions are shown on page D-022.



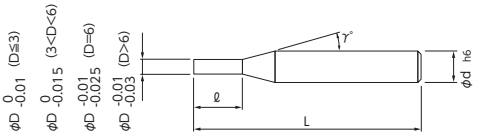
SEVKET OĞLU MAKINA TICARET VE SAN. LTD. ŞTI.

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00030-00250 | 2.5 | 5 | 12° | 4 | 45 | 1,700 |
| 08-00030-00260 | 2.6 | 5.2 | 12° | 4 | 45 | 4,600 |
| 08-00030-00270 | 2.7 | 5.4 | 12° | 4 | 45 | 4,600 |
| 08-00030-00280 | 2.8 | 5.6 | 12° | 4 | 45 | 4,600 |
| 08-00030-00290 | 2.9 | 5.8 | 12° | 4 | 45 | 4,600 |
| 08-00030-00300 | 3 | 6 | 12° | 6 | 45 | 2,200 |
| 08-00030-00310 | 3.1 | 6.2 | 12° | 6 | 45 | 4,800 |
| 08-00030-00320 | 3.2 | 6.4 | 12° | 6 | 45 | 4,800 |
| 08-00030-00330 | 3.3 | 6.6 | 12° | 6 | 45 | 4,800 |
| 08-00030-00340 | 3.4 | 6.8 | 12° | 6 | 45 | 4,800 |
| 08-00030-00350 | 3.5 | 7 | 12° | 6 | 45 | 3,900 |
| 08-00030-00360 | 3.6 | 7.2 | 12° | 6 | 45 | 4,800 |
| 08-00030-00370 | 3.7 | 7.4 | 12° | 6 | 45 | 4,800 |
| 08-00030-00380 | 3.8 | 7.6 | 12° | 6 | 45 | 4,800 |
| 08-00030-00390 | 3.9 | 7.8 | 12° | 6 | 45 | 4,800 |
| 08-00030-00400 | 4 | 8 | 12° | 6 | 45 | 2,400 |
| 08-00030-00410 | 4.1 | 8.2 | 12° | 6 | 45 | 4,800 |
| 08-00030-00420 | 4.2 | 8.4 | 12° | 6 | 45 | 4,800 |
| 08-00030-00430 | 4.3 | 8.6 | 12° | 6 | 45 | 4,800 |
| 08-00030-00440 | 4.4 | 8.8 | 12° | 6 | 45 | 4,800 |
| 08-00030-00450 | 4.5 | 9 | 12° | 6 | 50 | 4,500 |
| 08-00030-00460 | 4.6 | 9.2 | 12° | 6 | 50 | 5,500 |
| 08-00030-00470 | 4.7 | 9.4 | 12° | 6 | 50 | 5,500 |
| 08-00030-00480 | 4.8 | 9.6 | 12° | 6 | 50 | 5,500 |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00030-00490 | 4.9 | 9.8 | 12° | 6 | 50 | 5,500 |
| 08-00030-00500 | 5 | 10 | 12° | 6 | 50 | 2,600 |
| 08-00030-00510 | 5.1 | 10.2 | 12° | 6 | 50 | 5,500 |
| 08-00030-00520 | 5.2 | 10.4 | 12° | 6 | 50 | 5,500 |
| 08-00030-00530 | 5.3 | 10.6 | 12° | 6 | 50 | 5,500 |
| 08-00030-00540 | 5.4 | 10.8 | 12° | 6 | 50 | 5,500 |
| 08-00030-00550 | 5.5 | 11 | 12° | 6 | 50 | 4,700 |
| 08-00030-00560 | 5.6 | 11.2 | 12° | 6 | 50 | 5,700 |
| 08-00030-00570 | 5.7 | 11.4 | 12° | 6 | 50 | 5,700 |
| 08-00030-00580 | 5.8 | 11.6 | 12° | 6 | 50 | 5,700 |
| 08-00030-00590 | 5.9 | 11.8 | 12° | 6 | 50 | 5,700 |
| 08-00030-00600 | 6 | 12 | – | 6 | 50 | 2,800 |
| 08-00030-00700 | 7 | 14 | 12° | 8 | 65 | 8,600 |
| 08-00030-00800 | 8 | 16 | – | 8 | 65 | 7,000 |
| 08-00030-00900 | 9 | 18 | 12° | 10 | 75 | 12,100 |
| 08-00030-01000 | 10 | 20 | – | 10 | 75 | 8,800 |
| 08-00030-01200 | 12 | 24 | – | 12 | 80 | 12,100 |

# MX235

## 無限コーティング リード35エンドミル 2枚刃
MUGEN-COATING 2-Flute LEAD35 End Mill




●刃長は刃径の 3 倍で 35° ネジレを採用。
●2 倍刃長では刃長が足りなく、4 倍刃長では長いといった悩みを解消。
●L/D=3 and helix 35° for appropriate length of cut to avoid the inconveniences in size selection.

Slot Side Face MG ∞ 2 35° ≦55 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹 脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ | | | | | |
| ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00035-00010 | 0.1 | 0.3 | 12° | 4 | 45 | 6,500 |
| 08-00035-00020 | 0.2 | 0.6 | 12° | 4 | 45 | 3,900 |
| 08-00035-00030 | 0.3 | 0.9 | 12° | 4 | 45 | 3,400 |
| 08-00035-00040 | 0.4 | 1.2 | 12° | 4 | 45 | 3,800 |
| 08-00035-00050 | 0.5 | 1.5 | 12° | 4 | 45 | 1,900 |
| 08-00035-00060 | 0.6 | 1.8 | 12° | 4 | 45 | 2,900 |
| 08-00035-00070 | 0.7 | 2.1 | 12° | 4 | 45 | 3,200 |
| 08-00035-00080 | 0.8 | 2.4 | 12° | 4 | 45 | 1,900 |
| 08-00035-00090 | 0.9 | 2.7 | 12° | 4 | 45 | 3,200 |
| 08-00035-00100 | 1 | 3 | 12° | 4 | 45 | 1,700 |
| 08-00035-00110 | 1.1 | 3.3 | 12° | 4 | 45 | 3,600 |
| 08-00035-00120 | 1.2 | 3.6 | 12° | 4 | 45 | 1,900 |
| 08-00035-00130 | 1.3 | 3.9 | 12° | 4 | 45 | 3,600 |
| 08-00035-00140 | 1.4 | 4.2 | 12° | 4 | 45 | 3,600 |
| 08-00035-00150 | 1.5 | 4.5 | 12° | 4 | 45 | 1,700 |
| 08-00035-00160 | 1.6 | 4.8 | 12° | 4 | 45 | 3,600 |
| 08-00035-00170 | 1.7 | 5.1 | 12° | 4 | 45 | 3,600 |
| 08-00035-00180 | 1.8 | 5.4 | 12° | 4 | 45 | 1,900 |
| 08-00035-00190 | 1.9 | 5.7 | 12° | 4 | 45 | 3,600 |
| 08-00035-00200 | 2 | 6 | 12° | 4 | 45 | 1,700 |
| 08-00035-00210 | 2.1 | 6.3 | 12° | 4 | 45 | 3,600 |
| 08-00035-00220 | 2.2 | 6.6 | 12° | 4 | 45 | 3,600 |
| 08-00035-00230 | 2.3 | 6.9 | 12° | 4 | 45 | 3,600 |
| 08-00035-00240 | 2.4 | 7.2 | 12° | 4 | 45 | 3,600 |
| 08-00035-00250 | 2.5 | 7.5 | 12° | 4 | 45 | 1,700 |
| 08-00035-00260 | 2.6 | 7.8 | 12° | 4 | 45 | 4,600 |
| 08-00035-00270 | 2.7 | 8.1 | 12° | 4 | 45 | 4,600 |
| 08-00035-00280 | 2.8 | 8.4 | 12° | 4 | 45 | 4,600 |
| 08-00035-00290 | 2.9 | 8.7 | 12° | 4 | 45 | 4,600 |
| 08-00035-00300 | 3 | 9 | 12° | 6 | 45 | 2,200 |
| 08-00035-00310 | 3.1 | 9.3 | 12° | 6 | 45 | 4,800 |
| 08-00035-00320 | 3.2 | 9.6 | 12° | 6 | 45 | 4,800 |
| 08-00035-00330 | 3.3 | 9.9 | 12° | 6 | 45 | 4,800 |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00035-00340 | 3.4 | 10.2 | 12° | 6 | 45 | 4,800 |
| 08-00035-00350 | 3.5 | 10.5 | 12° | 6 | 45 | 4,000 |
| 08-00035-00360 | 3.6 | 10.8 | 12° | 6 | 45 | 4,800 |
| 08-00035-00370 | 3.7 | 11.1 | 12° | 6 | 45 | 4,800 |
| 08-00035-00380 | 3.8 | 11.4 | 12° | 6 | 45 | 4,800 |
| 08-00035-00390 | 3.9 | 11.7 | 12° | 6 | 45 | 4,800 |
| 08-00035-00400 | 4 | 12 | 12° | 6 | 50 | 2,400 |
| 08-00035-00410 | 4.1 | 12.3 | 12° | 6 | 50 | 4,800 |
| 08-00035-00420 | 4.2 | 12.6 | 12° | 6 | 50 | 4,800 |
| 08-00035-00430 | 4.3 | 12.9 | 12° | 6 | 50 | 4,800 |
| 08-00035-00440 | 4.4 | 13.2 | 12° | 6 | 50 | 4,800 |
| 08-00035-00450 | 4.5 | 13.5 | 12° | 6 | 50 | 4,600 |
| 08-00035-00460 | 4.6 | 13.8 | 12° | 6 | 55 | 5,500 |
| 08-00035-00470 | 4.7 | 14.1 | 12° | 6 | 55 | 5,500 |
| 08-00035-00480 | 4.8 | 14.4 | 12° | 6 | 55 | 5,500 |
| 08-00035-00490 | 4.9 | 14.7 | 12° | 6 | 55 | 5,500 |
| 08-00035-00500 | 5 | 15 | 12° | 6 | 55 | 2,600 |
| 08-00035-00510 | 5.1 | 15.3 | 12° | 6 | 55 | 5,500 |
| 08-00035-00520 | 5.2 | 15.6 | 12° | 6 | 55 | 5,500 |
| 08-00035-00530 | 5.3 | 15.9 | 12° | 6 | 55 | 5,500 |
| 08-00035-00540 | 5.4 | 16.2 | 12° | 6 | 55 | 5,500 |
| 08-00035-00550 | 5.5 | 16.5 | 12° | 6 | 60 | 4,600 |
| 08-00035-00560 | 5.6 | 16.8 | 12° | 6 | 60 | 5,700 |
| 08-00035-00570 | 5.7 | 17.1 | 12° | 6 | 60 | 5,700 |
| 08-00035-00580 | 5.8 | 17.4 | 12° | 6 | 60 | 5,700 |
| 08-00035-00590 | 5.9 | 17.7 | 12° | 6 | 60 | 5,700 |
| 08-00035-00600 | 6 | 18 | – | 6 | 60 | 2,800 |
| 08-00035-00700 | 7 | 21 | 12° | 8 | 65 | 9,400 |
| 08-00035-00800 | 8 | 24 | – | 8 | 65 | 7,700 |
| 08-00035-00900 | 9 | 27 | 12° | 10 | 75 | 13,200 |
| 08-00035-01000 | 10 | 30 | – | 10 | 75 | 9,700 |
| 08-00035-01200 | 12 | 36 | – | 12 | 80 | 13,200 |

オーダー方法
MX235 刃径(D)を指示してください。
When you order, indicate MX235 (D).

※(γ)は参考値です。
※(γ) is reference value.

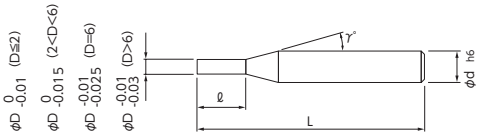
●切削条件表はD-023に記載
●Recommended Milling Conditions are shown on page D-023.



SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

# MX240

## 無限コーティング リード40エンドミル 2枚刃
MUGEN-COATING 2-Flute LEAD40 End Mill




●刃長は刃径の 4 倍で 40° ネジレを採用。
●深い加工もスムーズに加工でき、ロング刃でありながら加工面の倒れを最小限に抑制。
●L/D=4 and helix 40° is suitable for deep machining with minimum deflection of cutting up-right surface.

Side Face MG ∞ 2 40° ≦55 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹 脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ | | | | | |
| ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00040-00030 | 0.3 | 1.2 | 12° | 4 | 45 | 5,100 |
| 08-00040-00040 | 0.4 | 1.6 | 12° | 4 | 45 | 5,100 |
| 08-00040-00050 | 0.5 | 2 | 12° | 4 | 45 | 3,200 |
| 08-00040-00060 | 0.6 | 2.4 | 12° | 4 | 45 | 2,900 |
| 08-00040-00070 | 0.7 | 2.8 | 12° | 4 | 45 | 3,200 |
| 08-00040-00080 | 0.8 | 3.2 | 12° | 4 | 45 | 3,200 |
| 08-00040-00090 | 0.9 | 3.6 | 12° | 4 | 45 | 3,200 |
| 08-00040-00100 | 1 | 4 | 12° | 4 | 45 | 2,900 |
| 08-00040-00110 | 1.1 | 4.4 | 12° | 4 | 45 | 4,300 |
| 08-00040-00120 | 1.2 | 4.8 | 12° | 4 | 45 | 3,500 |
| 08-00040-00130 | 1.3 | 5.2 | 12° | 4 | 45 | 4,400 |
| 08-00040-00140 | 1.4 | 5.6 | 12° | 4 | 45 | 4,400 |
| 08-00040-00150 | 1.5 | 6 | 12° | 4 | 45 | 2,900 |
| 08-00040-00160 | 1.6 | 6.4 | 12° | 4 | 45 | 4,400 |
| 08-00040-00170 | 1.7 | 6.8 | 12° | 4 | 45 | 4,400 |
| 08-00040-00180 | 1.8 | 7.2 | 12° | 4 | 45 | 3,500 |
| 08-00040-00190 | 1.9 | 7.6 | 12° | 4 | 45 | 4,400 |
| 08-00040-00200 | 2 | 8 | 12° | 4 | 45 | 2,900 |
| 08-00040-00210 | 2.1 | 8.4 | 12° | 4 | 45 | 4,400 |
| 08-00040-00220 | 2.2 | 8.8 | 12° | 4 | 45 | 4,400 |
| 08-00040-00230 | 2.3 | 9.2 | 12° | 4 | 45 | 4,400 |
| 08-00040-00240 | 2.4 | 9.6 | 12° | 4 | 45 | 4,400 |
| 08-00040-00250 | 2.5 | 10 | 12° | 4 | 45 | 2,900 |
| 08-00040-00260 | 2.6 | 10.4 | 12° | 4 | 50 | 5,000 |
| 08-00040-00270 | 2.7 | 10.8 | 12° | 4 | 50 | 5,000 |
| 08-00040-00280 | 2.8 | 11.2 | 12° | 4 | 50 | 5,000 |
| 08-00040-00290 | 2.9 | 11.6 | 12° | 4 | 50 | 5,000 |
| 08-00040-00300 | 3 | 12 | 12° | 6 | 50 | 3,600 |
| 08-00040-00310 | 3.1 | 12.4 | 12° | 6 | 50 | 5,300 |
| 08-00040-00320 | 3.2 | 12.8 | 12° | 6 | 50 | 5,300 |
| 08-00040-00330 | 3.3 | 13.2 | 12° | 6 | 50 | 5,300 |
| 08-00040-00340 | 3.4 | 13.6 | 12° | 6 | 50 | 5,300 |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00040-00350 | 3.5 | 14 | 12° | 6 | 50 | 4,700 |
| 08-00040-00360 | 3.6 | 14.4 | 12° | 6 | 50 | 5,300 |
| 08-00040-00370 | 3.7 | 14.8 | 12° | 6 | 50 | 5,300 |
| 08-00040-00380 | 3.8 | 15.2 | 12° | 6 | 50 | 5,300 |
| 08-00040-00390 | 3.9 | 15.6 | 12° | 6 | 50 | 5,300 |
| 08-00040-00400 | 4 | 16 | 12° | 6 | 55 | 3,900 |
| 08-00040-00410 | 4.1 | 16.4 | 12° | 6 | 55 | 5,300 |
| 08-00040-00420 | 4.2 | 16.8 | 12° | 6 | 55 | 5,300 |
| 08-00040-00430 | 4.3 | 17.2 | 12° | 6 | 55 | 5,300 |
| 08-00040-00440 | 4.4 | 17.6 | 12° | 6 | 55 | 5,300 |
| 08-00040-00450 | 4.5 | 18 | 12° | 6 | 55 | 5,400 |
| 08-00040-00460 | 4.6 | 18.4 | 12° | 6 | 55 | 6,000 |
| 08-00040-00470 | 4.7 | 18.8 | 12° | 6 | 55 | 6,000 |
| 08-00040-00480 | 4.8 | 19.2 | 12° | 6 | 55 | 6,000 |
| 08-00040-00490 | 4.9 | 19.6 | 12° | 6 | 55 | 6,000 |
| 08-00040-00500 | 5 | 20 | 12° | 6 | 60 | 4,400 |
| 08-00040-00510 | 5.1 | 20.4 | 12° | 6 | 60 | 6,000 |
| 08-00040-00520 | 5.2 | 20.8 | 12° | 6 | 60 | 6,000 |
| 08-00040-00530 | 5.3 | 21.2 | 12° | 6 | 60 | 6,000 |
| 08-00040-00540 | 5.4 | 21.6 | 12° | 6 | 60 | 6,000 |
| 08-00040-00550 | 5.5 | 22 | 12° | 6 | 65 | 5,400 |
| 08-00040-00560 | 5.6 | 22.4 | 12° | 6 | 65 | 6,300 |
| 08-00040-00570 | 5.7 | 22.8 | 12° | 6 | 65 | 6,300 |
| 08-00040-00580 | 5.8 | 23.2 | 12° | 6 | 65 | 6,300 |
| 08-00040-00590 | 5.9 | 23.6 | 12° | 6 | 65 | 6,300 |
| 08-00040-00600 | 6 | 24 | – | 6 | 65 | 4,500 |
| 08-00040-00700 | 7 | 28 | 12° | 8 | 90 | 11,600 |
| 08-00040-00800 | 8 | 32 | – | 8 | 90 | 10,600 |
| 08-00040-00900 | 9 | 36 | 12° | 10 | 100 | 19,800 |
| 08-00040-01000 | 10 | 40 | – | 10 | 100 | 11,600 |
| 08-00040-01200 | 12 | 48 | – | 12 | 105 | 19,800 |

**オーダー方法**
MX240 刃径(D)を指示してください。
When you order, indicate MX240 (D).

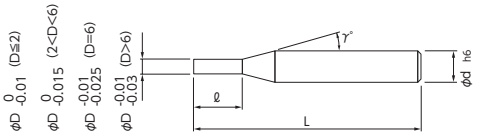
※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-024に記載
●Recommended Milling Conditions are shown on page D-024.

SEVKET ÇELİK MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MX245

## 無限コーティング リード45 エンドミル 2枚刃
MUGEN-COATING 2-Flute LEAD45 End Mill




●刃長は刃径の 5 倍で 45° ネジレを採用。
●超ロング刃でありながら加工面の倒れを最小限に抑制。
●L/D=5 and helix 45° to minimize the milling deflection even though the long cutting length design.

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00045-00030 | 0.3 | 1.5 | 12° | 4 | 45 | 7,100 |
| 08-00045-00040 | 0.4 | 2 | 12° | 4 | 45 | 7,100 |
| 08-00045-00050 | 0.5 | 2.5 | 12° | 4 | 45 | 4,500 |
| 08-00045-00080 | 0.8 | 4 | 12° | 4 | 45 | 4,500 |
| 08-00045-00100 | 1 | 5 | 12° | 4 | 45 | 4,000 |
| 08-00045-00120 | 1.2 | 6 | 12° | 4 | 45 | 4,500 |
| 08-00045-00150 | 1.5 | 7.5 | 12° | 4 | 45 | 4,000 |
| 08-00045-00180 | 1.8 | 9 | 12° | 4 | 50 | 4,500 |
| 08-00045-00200 | 2 | 10 | 12° | 4 | 50 | 4,000 |
| 08-00045-00250 | 2.5 | 12.5 | 12° | 4 | 50 | 4,000 |
| 08-00045-00300 | 3 | 15 | 12° | 6 | 55 | 5,300 |
| 08-00045-00400 | 4 | 20 | 12° | 6 | 60 | 5,600 |
| 08-00045-00500 | 5 | 25 | 12° | 6 | 65 | 6,200 |
| 08-00045-00600 | 6 | 30 | – | 6 | 75 | 6,500 |
| 08-00045-00700 | 7 | 35 | 12° | 8 | 90 | 13,200 |
| 08-00045-00800 | 8 | 40 | – | 8 | 90 | 11,600 |
| 08-00045-00900 | 9 | 45 | 12° | 10 | 100 | 22,000 |
| 08-00045-01000 | 10 | 50 | – | 10 | 100 | 13,200 |
| 08-00045-01200 | 12 | 60 | – | 12 | 105 | 22,000 |

**オーダー方法** MX245 刃径(D)を指示してください。
When you order, indicate MX245 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-025に記載
●Recommended Milling Conditions are shown on page D-025.



SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

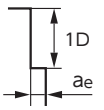
# MX225

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM･SKD･SUS | | | 調質鋼 Prehardened Steels HPM･NAK | | | 焼き入れ鋼 Hardened Steels SKD61 (～52HRC) | | | 銅 Copper | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 50～80m/min | | | 50～70m/min | | | 40～60m/min | | | 20～40m/min | | | 60～80m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min$^{-1}$ | mm/min 側面 Side Milling | 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | 溝 Slotting |
| 0.3 | 50,000 | 100 | 50 | 50,000 | 90 | 35 | 50,000 | 85 | 40 | 31,800 | – | 20 | 50,000 | 150 | 60 |
| 0.4 | 50,000 | 150 | 75 | 47,700 | 130 | 50 | 39,800 | 110 | 55 | 23,900 | 50 | 25 | 50,000 | 200 | 80 |
| 0.5 | 41,400 | 170 | 85 | 38,200 | 130 | 50 | 31,800 | 110 | 55 | 19,100 | 60 | 30 | 44,600 | 220 | 90 |
| 1 | 20,700 | 210 | 100 | 19,100 | 150 | 55 | 15,900 | 130 | 65 | 9,500 | 75 | 40 | 22,300 | 270 | 95 |
| 1.5 | 13,800 | 210 | 100 | 12,700 | 150 | 55 | 10,600 | 130 | 65 | 6,400 | 75 | 40 | 14,900 | 300 | 100 |
| 2 | 10,300 | 210 | 100 | 9,500 | 170 | 60 | 8,000 | 150 | 75 | 4,800 | 75 | 40 | 11,100 | 330 | 120 |
| 2.5 | 8,300 | 250 | 120 | 7,600 | 180 | 65 | 6,400 | 160 | 80 | 3,800 | 75 | 40 | 8,900 | 360 | 120 |
| 3 | 6,900 | 280 | 140 | 6,400 | 190 | 70 | 5,300 | 170 | 85 | 3,200 | 80 | 40 | 7,400 | 370 | 130 |
| 4 | 5,200 | 310 | 160 | 4,800 | 190 | 70 | 4,000 | 170 | 85 | 2,400 | 95 | 50 | 5,600 | 390 | 130 |
| 5 | 4,100 | 330 | 160 | 3,800 | 230 | 75 | 3,200 | 210 | 110 | 1,900 | 95 | 50 | 4,500 | 410 | 130 |
| 6 | 3,400 | 340 | 170 | 3,200 | 260 | 85 | 2,700 | 240 | 120 | 1,600 | 100 | 50 | 3,700 | 410 | 130 |
| 7 | 3,000 | 330 | 170 | 2,700 | 250 | 80 | 2,300 | 230 | 120 | 1,400 | 100 | 50 | 3,200 | 380 | 130 |
| 8 | 2,600 | 320 | 160 | 2,400 | 240 | 75 | 2,000 | 220 | 110 | 1,200 | 100 | 50 | 2,800 | 360 | 120 |
| 9 | 2,300 | 310 | 150 | 2,100 | 230 | 75 | 1,800 | 220 | 110 | 1,100 | 100 | 50 | 2,500 | 350 | 120 |
| 10 | 2,100 | 300 | 150 | 1,900 | 230 | 75 | 1,600 | 210 | 100 | 1,000 | 100 | 50 | 2,200 | 330 | 110 |
| 12 | 1,700 | 270 | 140 | 1,600 | 220 | 70 | 1,300 | 200 | 100 | 800 | 100 | 50 | 1,900 | 320 | 110 |

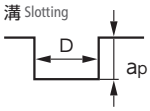
**切り込み量 Depth of Cut**

側面 Side Milling



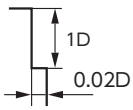

ae
φ0.3～0.8=0.05D
φ1～2.5=0.1D
φ3～6=0.2D
φ7～12=0.25D

溝 Slotting

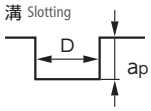



ap
φ0.3～0.4=0.05D
φ0.5～1.2=0.2D
φ1.5～3=0.7D
φ4～12=1D

側面 Side Milling

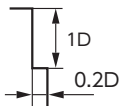



溝 Slotting

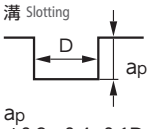



ap
φ0.3～0.4=0.05D
φ0.5～12=0.2D

側面 Side Milling




溝 Slotting




ap
φ0.3～0.4=0.1D
φ0.5～1=0.5D
φ1.5～12=1D

(D:刃径 Dia.)

**備考 Notes**

※切削油を使用してください。
※切削油は発煙性の少ないものを使用してください。
※焼き入れ鋼を切削加工する場合は、オイルミストクーラントの使用をお奨めします。
※回転数と送り速度は、同じ割合で調整してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。
※Use cutting fluid.
※Use cutting fluid with smoke retardant.
※Recommend to use oil mist coolant for machining hardened steels.
※Adjust both spindle speed and feed at the same rate.
※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.

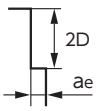
# MX230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM・SKD・SUS | | | 調質鋼 Prehardened Steels HPM・NAK | | | 焼き入れ鋼 Hardened Steels SKD61 (~52HRC) | | | 銅 Copper | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 50~80m/min | | | 50~70m/min | | | 40~60m/min | | | 20~40m/min | | | 60~80m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting |
| 0.1 | 50,000 | – | 25 | 50,000 | – | 15 | 50,000 | – | 20 | 50,000 | – | 15 | 50,000 | 60 | 25 |
| 0.2 | 50,000 | – | 40 | 50,000 | – | 25 | 50,000 | – | 30 | 47,700 | – | 20 | 50,000 | 90 | 35 |
| 0.3 | 50,000 | 100 | 50 | 50,000 | 90 | 35 | 50,000 | 85 | 40 | 31,800 | – | 20 | 50,000 | 150 | 60 |
| 0.4 | 50,000 | 150 | 75 | 47,700 | 130 | 50 | 39,800 | 110 | 55 | 23,900 | 50 | 25 | 50,000 | 200 | 80 |
| 0.5 | 41,400 | 170 | 85 | 38,200 | 130 | 50 | 31,800 | 110 | 55 | 19,100 | 60 | 30 | 44,600 | 220 | 90 |
| 1 | 20,700 | 210 | 100 | 19,100 | 150 | 55 | 15,900 | 130 | 65 | 9,500 | 75 | 40 | 22,300 | 270 | 95 |
| 1.5 | 13,800 | 210 | 100 | 12,700 | 150 | 55 | 10,600 | 130 | 65 | 6,400 | 75 | 40 | 14,900 | 300 | 100 |
| 2 | 10,300 | 210 | 100 | 9,500 | 170 | 60 | 8,000 | 150 | 75 | 4,800 | 75 | 40 | 11,100 | 330 | 120 |
| 2.5 | 8,300 | 250 | 120 | 7,600 | 180 | 65 | 6,400 | 160 | 80 | 3,800 | 75 | 40 | 8,900 | 360 | 120 |
| 3 | 6,900 | 280 | 140 | 6,400 | 190 | 70 | 5,300 | 170 | 85 | 3,200 | 80 | 40 | 7,400 | 370 | 130 |
| 3.5 | 5,900 | 300 | 150 | 5,500 | 190 | 70 | 4,500 | 170 | 85 | 2,700 | 85 | 45 | 6,400 | 380 | 130 |
| 4 | 5,200 | 310 | 160 | 4,800 | 190 | 70 | 4,000 | 170 | 85 | 2,400 | 95 | 50 | 5,600 | 390 | 130 |
| 4.5 | 4,600 | 320 | 160 | 4,200 | 210 | 75 | 3,500 | 190 | 95 | 2,100 | 95 | 50 | 5,000 | 400 | 130 |
| 5 | 4,100 | 330 | 160 | 3,800 | 230 | 75 | 3,200 | 210 | 110 | 1,900 | 95 | 50 | 4,500 | 410 | 130 |
| 5.5 | 3,800 | 330 | 160 | 3,500 | 240 | 80 | 2,900 | 220 | 110 | 1,700 | 95 | 50 | 4,100 | 410 | 130 |
| 6 | 3,400 | 340 | 170 | 3,200 | 260 | 85 | 2,700 | 240 | 120 | 1,600 | 100 | 50 | 3,700 | 410 | 130 |
| 7 | 3,000 | 330 | 170 | 2,700 | 250 | 80 | 2,300 | 230 | 120 | 1,400 | 100 | 50 | 3,200 | 380 | 130 |
| 8 | 2,600 | 320 | 160 | 2,400 | 240 | 75 | 2,000 | 220 | 110 | 1,200 | 100 | 50 | 2,800 | 360 | 120 |
| 9 | 2,300 | 310 | 150 | 2,100 | 230 | 75 | 1,800 | 220 | 110 | 1,100 | 100 | 50 | 2,500 | 350 | 120 |
| 10 | 2,100 | 300 | 150 | 1,900 | 230 | 75 | 1,600 | 210 | 100 | 1,000 | 100 | 50 | 2,200 | 330 | 110 |
| 12 | 1,700 | 270 | 140 | 1,600 | 220 | 70 | 1,300 | 200 | 100 | 800 | 100 | 50 | 1,900 | 320 | 110 |

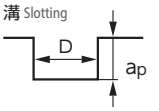
**切り込み量 Depth of Cut** (D:刃径 Dia.)

側面 Side Milling



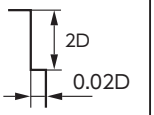

ae
$\phi$0.3~0.9=0.05D
$\phi$1~2.9=0.07D
$\phi$3~12=0.15D

溝 Slotting

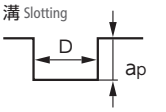



ap
$\phi$0.1~0.4=0.05D
$\phi$0.5~1.4=0.15D
$\phi$1.5~3.9=0.5D
$\phi$4~12=0.75D

側面 Side Milling

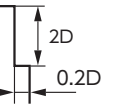



溝 Slotting

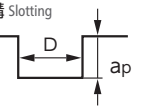



ap
$\phi$0.1~0.4=0.05D
$\phi$0.5~12=0.15D

側面 Side Milling




溝 Slotting




ap
$\phi$0.1~0.4=0.1D
$\phi$0.5~1.4=0.4D
$\phi$1.5~12=0.75D

**備考 Notes**

※切削油を使用してください。
※切削油は発煙性の少ないものを使用してください。
※焼き入れ鋼を切削加工する場合は、オイルミストクーラントの使用をお奨めします。
※回転数と送り速度は、同じ割合で調整してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。
※Use cutting fluid.
※Use cutting fluid with smoke retardant.
※Recommend to use oil mist coolant for machining hardened steels.
※Adjust both spindle speed and feed at the same rate.
※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.



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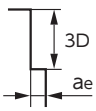
# MX235

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM･SKD･SUS | | | 調質鋼 Prehardened Steels HPM･NAK | | | 焼き入れ鋼 Hardened Steels SKD61 (～52HRC) | | | 銅 Copper | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 45～75m/min | | | 45～65m/min | | | 35～55m/min | | | 15～35m/min | | | 55～75m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting |
| 0.1 | 50,000 | – | 25 | 50,000 | – | 15 | 50,000 | – | 20 | 50,000 | – | 15 | 50,000 | 60 | 25 |
| 0.2 | 50,000 | – | 40 | 50,000 | – | 25 | 50,000 | – | 30 | 39,800 | – | 20 | 50,000 | 90 | 40 |
| 0.3 | 50,000 | 100 | 50 | 50,000 | 90 | 35 | 47,700 | 80 | 40 | 26,500 | – | 20 | 50,000 | 150 | 60 |
| 0.4 | 47,700 | 140 | 70 | 43,800 | 120 | 50 | 35,800 | 100 | 50 | 19,900 | – | 20 | 50,000 | 200 | 80 |
| 0.5 | 38,200 | 150 | 75 | 35,000 | 120 | 50 | 28,600 | 100 | 50 | 15,900 | 50 | 25 | 41,400 | 210 | 85 |
| 1 | 19,100 | 190 | 95 | 17,500 | 140 | 50 | 14,300 | 110 | 60 | 8,000 | 65 | 30 | 20,700 | 250 | 90 |
| 1.5 | 12,700 | 190 | 95 | 11,700 | 140 | 50 | 9,500 | 110 | 60 | 5,300 | 65 | 30 | 13,800 | 280 | 100 |
| 2 | 9,500 | 190 | 95 | 8,800 | 160 | 55 | 7,200 | 140 | 70 | 4,000 | 65 | 30 | 10,300 | 310 | 110 |
| 2.5 | 7,600 | 230 | 110 | 7,000 | 170 | 60 | 5,700 | 140 | 70 | 3,200 | 70 | 35 | 8,300 | 330 | 120 |
| 3 | 6,400 | 260 | 130 | 5,800 | 170 | 60 | 4,800 | 150 | 80 | 2,700 | 70 | 35 | 6,900 | 350 | 120 |
| 3.5 | 5,500 | 270 | 135 | 5,000 | 180 | 60 | 4,100 | 150 | 80 | 2,300 | 75 | 35 | 5,900 | 350 | 120 |
| 4 | 4,800 | 280 | 140 | 4,400 | 180 | 60 | 3,600 | 150 | 80 | 2,000 | 80 | 40 | 5,200 | 360 | 120 |
| 4.5 | 4,200 | 290 | 145 | 3,900 | 200 | 65 | 3,200 | 170 | 90 | 1,800 | 80 | 40 | 4,600 | 360 | 120 |
| 5 | 3,800 | 300 | 150 | 3,500 | 210 | 70 | 2,900 | 190 | 95 | 1,600 | 80 | 40 | 4,100 | 370 | 120 |
| 5.5 | 3,500 | 310 | 155 | 3,200 | 220 | 70 | 2,600 | 200 | 100 | 1,400 | 80 | 40 | 3,800 | 370 | 120 |
| 6 | 3,200 | 320 | 160 | 2,900 | 230 | 75 | 2,400 | 210 | 110 | 1,300 | 80 | 40 | 3,400 | 370 | 120 |
| 7 | 2,700 | 300 | 150 | 2,500 | 220 | 70 | 2,000 | 200 | 100 | 1,100 | 80 | 40 | 3,000 | 360 | 120 |
| 8 | 2,400 | 280 | 140 | 2,200 | 220 | 70 | 1,800 | 200 | 100 | 1,000 | 80 | 40 | 2,600 | 340 | 110 |
| 9 | 2,100 | 270 | 135 | 1,900 | 210 | 65 | 1,600 | 190 | 95 | 900 | 80 | 40 | 2,300 | 330 | 100 |
| 10 | 1,900 | 260 | 130 | 1,800 | 210 | 65 | 1,400 | 180 | 90 | 800 | 80 | 40 | 2,100 | 320 | 100 |
| 12 | 1,600 | 260 | 130 | 1,500 | 210 | 65 | 1,200 | 170 | 85 | 700 | 80 | 40 | 1,700 | 290 | 95 |

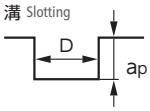
**切り込み量 Depth of Cut** (D:刃径 Dia.)

側面 Side Milling



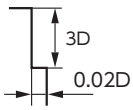

ae
$\phi$0.3～0.9=0.04D
$\phi$1～2.9=0.05D
$\phi$3～12=0.1D

溝 Slotting

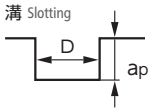



ap
$\phi$0.1～0.4=0.05D
$\phi$0.5～1.4=0.08D
$\phi$1.5～3.9=0.25D
$\phi$4～12=0.4D

側面 Side Milling

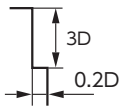



溝 Slotting

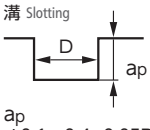



ap
$\phi$0.1～0.4=0.05D
$\phi$0.5～12=0.1D

側面 Side Milling




溝 Slotting



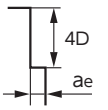
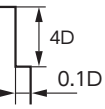

ap
$\phi$0.1～0.4=0.05D
$\phi$0.5～1.4=0.3D
$\phi$1.5～12=0.5D

**備考 Notes**

※切削油を使用してください。
※切削油は発煙性の少ないものを使用してください。
※焼き入れ鋼を切削加工する場合は、オイルミストクーラントの使用をお奨めします。
※回転数と送り速度は、同じ割合で調整してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。
※Use cutting fluid.
※Use cutting fluid with smoke retardant.
※Recommend to use oil mist coolant for machining hardened steels.
※Adjust both spindle speed and feed at the same rate.
※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.

# MX240

## 切削条件参考表 Recommended Milling Conditions

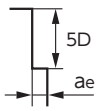
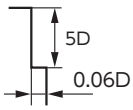
| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM・SKD・SUS | | 調質鋼 Prehardened Steels HPM・NAK | | 銅 Copper | |
|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 20～30m/min | | 15～25m/min | | 15～20m/min | | 20～40m/min | |
| 刃 径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 0.3 | 26,500 | 50 | 21,200 | 40 | 18,600 | 30 | 31,800 | 100 |
| 0.4 | 19,900 | 60 | 15,900 | 45 | 13,900 | 40 | 23,900 | 100 |
| 0.5 | 15,900 | 65 | 12,700 | 45 | 11,100 | 40 | 19,100 | 100 |
| 1 | 8,000 | 80 | 6,400 | 50 | 5,600 | 45 | 9,500 | 110 |
| 1.5 | 5,300 | 80 | 4,200 | 50 | 3,700 | 45 | 6,400 | 130 |
| 2 | 4,000 | 80 | 3,200 | 60 | 2,800 | 50 | 4,800 | 140 |
| 2.5 | 3,200 | 100 | 2,500 | 60 | 2,200 | 55 | 3,800 | 150 |
| 3 | 2,700 | 110 | 2,100 | 60 | 1,900 | 60 | 3,200 | 160 |
| 3.5 | 2,300 | 120 | 1,800 | 60 | 1,600 | 60 | 2,700 | 170 |
| 4 | 2,000 | 120 | 1,600 | 65 | 1,400 | 60 | 2,400 | 170 |
| 4.5 | 1,800 | 130 | 1,400 | 70 | 1,200 | 65 | 2,100 | 170 |
| 5 | 1,600 | 130 | 1,300 | 80 | 1,100 | 70 | 1,900 | 170 |
| 5.5 | 1,400 | 130 | 1,200 | 90 | 1,000 | 80 | 1,700 | 180 |
| 6 | 1,300 | 130 | 1,100 | 90 | 900 | 80 | 1,600 | 180 |
| 7 | 1,100 | 120 | 900 | 90 | 800 | 80 | 1,400 | 170 |
| 8 | 1,000 | 120 | 800 | 80 | 700 | 75 | 1,200 | 160 |
| 9 | 900 | 110 | 700 | 80 | 650 | 75 | 1,100 | 155 |
| 10 | 800 | 110 | 600 | 70 | 600 | 75 | 1,000 | 150 |
| 12 | 700 | 110 | 500 | 70 | 500 | 75 | 800 | 140 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   ae<br>φ0.3～0.9=0.03D<br>φ1～2.9=0.04D<br>φ3～12=0.08D | | | | | | 側面 Side Milling   | |
| 備 考 Notes | ※切削油を使用してください。<br>※切削油は発煙性の少ないものを使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※側面切削でのみ、使用してください。<br>※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。<br>※Use cutting fluid.<br>※Use cutting fluid with smoke retardant.<br>※Adjust both spindle speed and feed at the same rate.<br>※Available only for side cutting.<br>※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. | | | | | | | |



ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

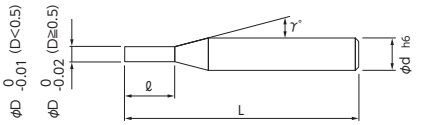
# MX245

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM･SKD･SUS | | 調質鋼 Prehardened Steels HPM･NAK | | 銅 Copper | |
|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 15～25m/min | | 10～20m/min | | 10～15m/min | | 15～35m/min | |
| 刃 径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 0.3 | 21,200 | 40 | 15,900 | 30 | 13,300 | 25 | 26,500 | 80 |
| 0.4 | 15,900 | 50 | 11,900 | 35 | 9,900 | 30 | 19,900 | 80 |
| 0.5 | 12,700 | 50 | 9,500 | 35 | 8,000 | 30 | 15,900 | 80 |
| 1 | 6,400 | 65 | 4,800 | 40 | 4,000 | 35 | 8,000 | 100 |
| 1.5 | 4,200 | 65 | 3,200 | 40 | 2,700 | 35 | 5,300 | 110 |
| 2 | 3,200 | 65 | 2,400 | 45 | 2,000 | 40 | 4,000 | 120 |
| 2.5 | 2,500 | 75 | 1,900 | 45 | 1,600 | 40 | 3,200 | 130 |
| 3 | 2,100 | 85 | 1,600 | 50 | 1,300 | 45 | 2,700 | 140 |
| 4 | 1,600 | 95 | 1,200 | 50 | 1,000 | 45 | 2,000 | 140 |
| 5 | 1,300 | 100 | 1,000 | 60 | 800 | 55 | 1,600 | 140 |
| 6 | 1,100 | 110 | 800 | 65 | 700 | 60 | 1,300 | 140 |
| 7 | 900 | 100 | 700 | 60 | 600 | 55 | 1,100 | 135 |
| 8 | 800 | 95 | 600 | 60 | 500 | 55 | 1,000 | 130 |
| 9 | 700 | 90 | 550 | 60 | 450 | 50 | 900 | 125 |
| 10 | 600 | 85 | 500 | 60 | 400 | 50 | 800 | 120 |
| 12 | 500 | 80 | 400 | 55 | 300 | 45 | 700 | 120 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   ae<br>φ0.3～0.8=0.02D<br>φ1～2.5=0.03D<br>φ3～12=0.06D | | | | | | 側面 Side Milling   | |
| 備 考 Notes | ※切削油を使用してください。<br>※切削油は発煙性の少ないものを使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※側面切削でのみ、使用してください。<br>※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。<br>※Use cutting fluid.<br>※Use cutting fluid with smoke retardant.<br>※Adjust both spindle speed and feed at the same rate.<br>※Available only for side cutting.<br>※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. | | | | | | | |

# MSE230SS

## 無限コーティング 2枚刃スーパーショートエンドミル
MUGEN-COATING 2-Flute Super Short End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

Slot Side Face MG ∞ 2 30° ≦55 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00103-00010 | 0.1 | 0.1 | 9° | 4 | 45 | 12,800 ▌ |
| 08-00103-00015 | 0.15 | 0.15 | 9° | 4 | 45 | 12,800 ▌ |
| 08-00103-00020 | 0.2 | 0.2 | 9° | 4 | 45 | 11,600 ▌ |
| 08-00103-00030 | 0.3 | 0.3 | 9° | 4 | 45 | 10,100 ▌ |
| 08-00103-00040 | 0.4 | 0.4 | 9° | 4 | 45 | 10,100 ▌ |
| 08-00103-00050 | 0.5 | 0.5 | 9° | 4 | 45 | 5,600 ▌ |
| 08-00103-00060 | 0.6 | 0.6 | 9° | 4 | 45 | 8,700 ▌ |
| 08-00103-00070 | 0.7 | 0.7 | 9° | 4 | 45 | 8,700 ▌ |
| 08-00103-00080 | 0.8 | 0.8 | 9° | 4 | 45 | 5,600 ▌ |
| 08-00103-00090 | 0.9 | 0.9 | 9° | 4 | 45 | 8,700 ▌ |
| 08-00103-00100 | 1 | 1 | 9° | 4 | 45 | 5,000 ▌ |
| 08-00103-00110 | 1.1 | 1.1 | 9° | 4 | 45 | 8,700 ▌ |
| 08-00103-00120 | 1.2 | 1.2 | 9° | 4 | 45 | 5,300 ▌ |
| 08-00103-00130 | 1.3 | 1.3 | 9° | 4 | 45 | 8,700 ▌ |
| 08-00103-00140 | 1.4 | 1.4 | 9° | 4 | 45 | 8,700 ▌ |
| 08-00103-00150 | 1.5 | 1.5 | 9° | 4 | 45 | 5,300 ▌ |
| 08-00103-00160 | 1.6 | 1.6 | 9° | 4 | 45 | 8,700 ▌ |
| 08-00103-00170 | 1.7 | 1.7 | 9° | 4 | 45 | 8,700 ▌ |
| 08-00103-00180 | 1.8 | 1.8 | 9° | 4 | 45 | 5,300 ▌ |
| 08-00103-00190 | 1.9 | 1.9 | 9° | 4 | 45 | 8,700 ▌ |
| 08-00103-00200 | 2 | 2 | 9° | 4 | 45 | 5,300 ▌ |
| 08-00103-00210 | 2.1 | 2.1 | 9° | 4 | 45 | 8,700 ▌ |
| 08-00103-00220 | 2.2 | 2.2 | 9° | 4 | 45 | 8,700 ▌ |
| 08-00103-00230 | 2.3 | 2.3 | 9° | 4 | 45 | 8,700 ▌ |
| 08-00103-00240 | 2.4 | 2.4 | 9° | 4 | 45 | 8,700 ▌ |
| 08-00103-00250 | 2.5 | 2.5 | 9° | 4 | 45 | 5,300 ▌ |
| 08-00103-00260 | 2.6 | 2.6 | 9° | 4 | 45 | 8,700 ▌ |
| 08-00103-00270 | 2.7 | 2.7 | 9° | 4 | 45 | 8,700 ▌ |
| 08-00103-00280 | 2.8 | 2.8 | 9° | 4 | 45 | 8,700 ▌ |
| 08-00103-00290 | 2.9 | 2.9 | 9° | 6 | 50 | 8,700 ▌ |
| 08-00103-00300 | 3 | 3 | 9° | 6 | 50 | 6,800 ▌ |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00103-00310 | 3.1 | 3.1 | 9° | 6 | 50 | 10,100 ▌ |
| 08-00103-00320 | 3.2 | 3.2 | 9° | 6 | 50 | 10,100 ▌ |
| 08-00103-00330 | 3.3 | 3.3 | 9° | 6 | 50 | 10,100 ▌ |
| 08-00103-00340 | 3.4 | 3.4 | 9° | 6 | 50 | 10,100 ▌ |
| 08-00103-00350 | 3.5 | 3.5 | 9° | 6 | 50 | 8,700 ▌ |
| 08-00103-00360 | 3.6 | 3.6 | 9° | 6 | 50 | 10,100 ▌ |
| 08-00103-00370 | 3.7 | 3.7 | 9° | 6 | 50 | 10,100 ▌ |
| 08-00103-00380 | 3.8 | 3.8 | 9° | 6 | 50 | 10,100 ▌ |
| 08-00103-00390 | 3.9 | 3.9 | 9° | 6 | 50 | 10,100 ▌ |
| 08-00103-00400 | 4 | 4 | 9° | 6 | 50 | 7,200 ▌ |
| 08-00103-00410 | 4.1 | 4.1 | 9° | 6 | 50 | 10,800 ▌ |
| 08-00103-00420 | 4.2 | 4.2 | 9° | 6 | 50 | 10,800 ▌ |
| 08-00103-00430 | 4.3 | 4.3 | 9° | 6 | 50 | 10,800 ▌ |
| 08-00103-00440 | 4.4 | 4.4 | 9° | 6 | 50 | 10,800 ▌ |
| 08-00103-00450 | 4.5 | 4.5 | 9° | 6 | 55 | 10,100 ▌ |
| 08-00103-00460 | 4.6 | 4.6 | 9° | 6 | 55 | 10,800 ▌ |
| 08-00103-00470 | 4.7 | 4.7 | 9° | 6 | 55 | 10,800 ▌ |
| 08-00103-00480 | 4.8 | 4.8 | 9° | 6 | 55 | 10,800 ▌ |
| 08-00103-00490 | 4.9 | 4.9 | 9° | 6 | 55 | 10,800 ▌ |
| 08-00103-00500 | 5 | 5 | 9° | 6 | 55 | 7,900 ▌ |
| 08-00103-00510 | 5.1 | 5.1 | 9° | 6 | 55 | 11,600 ▌ |
| 08-00103-00520 | 5.2 | 5.2 | 9° | 6 | 55 | 11,600 ▌ |
| 08-00103-00530 | 5.3 | 5.3 | 9° | 6 | 55 | 11,600 ▌ |
| 08-00103-00540 | 5.4 | 5.4 | 9° | 6 | 55 | 11,600 ▌ |
| 08-00103-00550 | 5.5 | 5.5 | 9° | 6 | 55 | 10,100 ▌ |
| 08-00103-00560 | 5.6 | 5.6 | 9° | 6 | 55 | 11,600 ▌ |
| 08-00103-00570 | 5.7 | 5.7 | 9° | 6 | 55 | 11,600 ▌ |
| 08-00103-00580 | 5.8 | 5.8 | 9° | 6 | 55 | 11,600 ▌ |
| 08-00103-00590 | 5.9 | 5.9 | 9° | 6 | 55 | 11,600 ▌ |
| 08-00103-00600 | 6 | 6 | – | 6 | 55 | 8,200 ▌ |

オーダー方法
MSE230SS 刃径(D)を指示してください。
When you order,indicate MSE230SS (D).

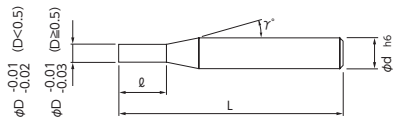
※(γ)は参考値です。
※(γ) is reference value.



ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MSES230P

## 無限コーティング 2枚刃ショート・ピンカドエンドミル
MUGEN-COATING 2-Flute Sharp Edge Short End Mill




●剛性のあるショート刃長を採用。
●ピンカドで切れ味の良い倒れの少ない加工が可能。
●It is very suitable for high speed cutting due to the length of cut is short and rigid.
●Sharp edge profile guarantees high shearing ability.

Slot Side Face MG ∞ 2 30°

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | | |

| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|
| ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

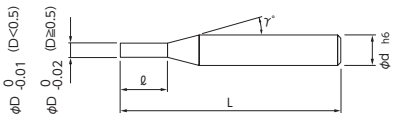
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00102-00010 | 0.1 | 0.15 | 9° | 4 | 45 | 7,600 |
| 08-00102-00015 | 0.15 | 0.2 | 9° | 4 | 45 | 7,900 |
| 08-00102-00020 | 0.2 | 0.3 | 9° | 4 | 45 | 4,800 |
| 08-00102-00025 | 0.25 | 0.3 | 9° | 4 | 45 | 7,900 |
| 08-00102-00030 | 0.3 | 0.4 | 9° | 4 | 45 | 4,200 |
| 08-00102-00035 | 0.35 | 0.4 | 9° | 4 | 45 | 7,900 |
| 08-00102-00040 | 0.4 | 0.6 | 9° | 4 | 45 | 4,600 |
| 08-00102-00045 | 0.45 | 0.6 | 9° | 4 | 45 | 7,900 |
| 08-00102-00050 | 0.5 | 0.7 | 9° | 4 | 45 | 2,400 |
| 08-00102-00060 | 0.6 | 1 | 9° | 4 | 45 | 3,600 |
| 08-00102-00070 | 0.7 | 1.2 | 9° | 4 | 45 | 3,900 |
| 08-00102-00080 | 0.8 | 1.5 | 9° | 4 | 45 | 2,400 |
| 08-00102-00100 | 1 | 2 | 9° | 4 | 45 | 2,000 |
| 08-00102-00120 | 1.2 | 2.5 | 9° | 4 | 45 | 2,400 |
| 08-00102-00150 | 1.5 | 3 | 9° | 4 | 45 | 2,000 |
| 08-00102-00160 | 1.6 | 3 | 9° | 4 | 45 | 2,700 |
| 08-00102-00180 | 1.8 | 3.5 | 9° | 4 | 45 | 2,400 |
| 08-00102-00200 | 2 | 4 | 9° | 4 | 45 | 2,000 |
| 08-00102-00250 | 2.5 | 5 | 9° | 4 | 45 | 2,000 |
| 08-00102-00300 | 3 | 6 | 9° | 4 | 50 | 2,700 |
| 08-00102-00400 | 4 | 8 | – | 4 | 50 | 3,000 |
| 08-00102-00500 | 5 | 10 | 9° | 6 | 55 | 3,200 |
| 08-00102-00600 | 6 | 12 | – | 6 | 55 | 3,500 |
| 08-00102-00800 | 8 | 16 | – | 8 | 65 | 7,500 |
| 08-00102-01000 | 10 | 20 | – | 10 | 75 | 8,500 |
| 08-00102-01200 | 12 | 24 | – | 12 | 80 | 14,000 |

**オーダー方法** MSES230P 刃径(D)を指示してください。
When you order, indicate MSES230P (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-030に記載
●Recommended Milling Conditions are shown on page D-030.

# MSE230

## 無限コーティング 2枚刃エンドミル
MUGEN-COATING 2-Flute End Mill




●2 枚刃エンドミルに NS 独自の無限コーティングを採用。
●荒から仕上げまで万能切削が可能。
●Our original MUGEN-COATING has been put on 2-flute end mill.
●It covers all-round cutting from roughing to finishing.

Slot Side Face MG ∞ 2 30° ≦55 HRC

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | |

| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|
| ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00100-00010 | 0.1 | 0.15 | 9° | 4 | 45 | 7,200 |
| 08-00100-00015 | 0.15 | 0.2 | 9° | 4 | 45 | 7,500 |
| 08-00100-00020 | 0.2 | 0.4 | 9° | 4 | 45 | 4,500 |
| 08-00100-00025 | 0.25 | 0.5 | 9° | 4 | 45 | 10,600 ▌ |
| 08-00100-00030 | 0.3 | 0.6 | 9° | 4 | 45 | 3,900 |
| 08-00100-00035 | 0.35 | 0.7 | 9° | 4 | 45 | 9,200 ▌ |
| 08-00100-00040 | 0.4 | 0.8 | 9° | 4 | 45 | 4,300 |
| 08-00100-00045 | 0.45 | 0.9 | 9° | 4 | 45 | 9,200 ▌ |
| 08-00100-00050 | 0.5 | 1.25 | 9° | 4 | 45 | 2,200 |
| 08-00100-00055 | 0.55 | 1.3 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00060 | 0.6 | 1.5 | 9° | 4 | 45 | 3,400 |
| 08-00100-00065 | 0.65 | 1.5 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00070 | 0.7 | 1.8 | 9° | 4 | 45 | 3,700 |
| 08-00100-00075 | 0.75 | 1.8 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00080 | 0.8 | 2 | 9° | 4 | 45 | 2,200 |
| 08-00100-00085 | 0.85 | 2 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00090 | 0.9 | 2 | 9° | 4 | 45 | 3,700 |
| 08-00100-00095 | 0.95 | 2 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00100 | 1 | 2.5 | 9° | 4 | 45 | 1,900 |
| 08-00100-00105 | 1.05 | 2.5 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00110 | 1.1 | 2.5 | 9° | 4 | 45 | 6,000 |
| 08-00100-00115 | 1.15 | 2.5 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00120 | 1.2 | 3 | 9° | 4 | 45 | 2,200 |
| 08-00100-00125 | 1.25 | 3 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00130 | 1.3 | 3 | 9° | 4 | 45 | 6,000 |
| 08-00100-00135 | 1.35 | 3 | 9° | 4 | 45 | 7,200 ▌ |

**オーダー方法** MSE230 刃径(D)を指示してください。
When you order, indicate MSE230 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-030に記載
●Recommended Milling Conditions are shown on page D-030.
●▌の規格・サイズは特定商社在庫となります。詳しくはお問い合わせください。
●▌ Special standard item, please inquire for price and delivery.

SEVKET GÜLEÇ MAKINA TICARET VE SAN. LTD. ŞTI.

# MSE230

## 無限コーティング 2枚刃エンドミル
MUGEN-COATING 2-Flute End Mill

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00100-00140 | 1.4 | 3.5 | 9° | 4 | 45 | 6,000 |
| 08-00100-00145 | 1.45 | 3.5 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00150 | 1.5 | 4 | 9° | 4 | 45 | 1,900 |
| 08-00100-00155 | 1.55 | 4 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00160 | 1.6 | 4 | 9° | 4 | 45 | 6,000 |
| 08-00100-00165 | 1.65 | 4 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00170 | 1.7 | 4.5 | 9° | 4 | 45 | 6,000 |
| 08-00100-00175 | 1.75 | 4.5 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00180 | 1.8 | 4.5 | 9° | 4 | 45 | 2,200 |
| 08-00100-00185 | 1.85 | 4.5 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00190 | 1.9 | 5 | 9° | 4 | 45 | 6,000 |
| 08-00100-00195 | 1.95 | 5 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00200 | 2 | 5 | 9° | 4 | 45 | 1,900 |
| 08-00100-00205 | 2.05 | 5 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00210 | 2.1 | 5.5 | 9° | 4 | 45 | 6,000 |
| 08-00100-00215 | 2.15 | 5.5 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00220 | 2.2 | 5.5 | 9° | 4 | 45 | 6,000 |
| 08-00100-00225 | 2.25 | 5.5 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00230 | 2.3 | 6 | 9° | 4 | 45 | 6,000 |
| 08-00100-00235 | 2.35 | 6 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00240 | 2.4 | 6 | 9° | 4 | 45 | 6,000 |
| 08-00100-00245 | 2.45 | 6 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00250 | 2.5 | 7 | 9° | 4 | 45 | 1,900 |
| 08-00100-00255 | 2.55 | 7 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00260 | 2.6 | 7 | 9° | 4 | 45 | 6,000 |
| 08-00100-00265 | 2.65 | 7 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00270 | 2.7 | 7 | 9° | 4 | 45 | 6,000 |
| 08-00100-00275 | 2.75 | 7 | 9° | 4 | 45 | 7,200 ▌ |
| 08-00100-00280 | 2.8 | 7 | 9° | 4 | 45 | 6,000 |
| 08-00100-00285 | 2.85 | 8 | 9° | 4 | 50 | 7,200 ▌ |
| 08-00100-00290 | 2.9 | 8 | 9° | 6 | 50 | 6,000 |
| 08-00100-00295 | 2.95 | 8 | 9° | 4 | 50 | 7,200 ▌ |
| 08-00100-00300 | 3 | 8 | 9° | 6 | 50 | 2,500 |
| 08-00100-00310 | 3.1 | 8 | 9° | 6 | 50 | 7,000 |
| 08-00100-00320 | 3.2 | 8 | 9° | 6 | 50 | 7,000 |
| 08-00100-00330 | 3.3 | 9 | 9° | 6 | 50 | 7,000 |
| 08-00100-00340 | 3.4 | 9 | 9° | 6 | 50 | 7,000 |
| 08-00100-00350 | 3.5 | 9 | 9° | 6 | 50 | 4,500 |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00100-00360 | 3.6 | 9 | 9° | 6 | 50 | 7,000 |
| 08-00100-00370 | 3.7 | 10 | 9° | 6 | 50 | 7,000 |
| 08-00100-00380 | 3.8 | 10 | 9° | 6 | 50 | 7,000 |
| 08-00100-00390 | 3.9 | 10 | 9° | 6 | 50 | 7,000 |
| 08-00100-00400 | 4 | 10 | 9° | 6 | 50 | 2,800 |
| 08-00100-00410 | 4.1 | 11 | 9° | 6 | 50 | 7,500 |
| 08-00100-00420 | 4.2 | 11 | 9° | 6 | 50 | 7,500 |
| 08-00100-00430 | 4.3 | 11 | 9° | 6 | 50 | 7,500 |
| 08-00100-00440 | 4.4 | 11 | 9° | 6 | 50 | 7,500 |
| 08-00100-00450 | 4.5 | 12 | 9° | 6 | 55 | 5,200 |
| 08-00100-00460 | 4.6 | 12 | 9° | 6 | 55 | 7,500 |
| 08-00100-00470 | 4.7 | 12 | 9° | 6 | 55 | 7,500 |
| 08-00100-00480 | 4.8 | 12 | 9° | 6 | 55 | 7,500 |
| 08-00100-00490 | 4.9 | 13 | 9° | 6 | 55 | 7,500 |
| 08-00100-00500 | 5 | 13 | 9° | 6 | 55 | 3,000 |
| 08-00100-00510 | 5.1 | 13 | 9° | 6 | 55 | 8,000 |
| 08-00100-00520 | 5.2 | 13 | 9° | 6 | 55 | 8,000 |
| 08-00100-00530 | 5.3 | 14 | 9° | 6 | 55 | 8,000 |
| 08-00100-00540 | 5.4 | 14 | 9° | 6 | 55 | 8,000 |
| 08-00100-00550 | 5.5 | 14 | 9° | 6 | 55 | 5,200 |
| 08-00100-00560 | 5.6 | 14 | 9° | 6 | 55 | 8,000 |
| 08-00100-00570 | 5.7 | 15 | 9° | 6 | 55 | 8,000 |
| 08-00100-00580 | 5.8 | 15 | 9° | 6 | 55 | 8,000 |
| 08-00100-00590 | 5.9 | 15 | 9° | 6 | 55 | 8,000 |
| 08-00100-00600 | 6 | 15 | – | 6 | 55 | 3,300 |
| 08-00100-00650 | 6.5 | 17 | 9° | 8 | 60 | 11,500 |
| 08-00100-00700 | 7 | 18 | 9° | 8 | 65 | 10,700 |
| 08-00100-00750 | 7.5 | 19 | 9° | 8 | 65 | 12,800 |
| 08-00100-00800 | 8 | 20 | – | 8 | 65 | 7,000 |
| 08-00100-00850 | 8.5 | 22 | 9° | 10 | 70 | 15,400 |
| 08-00100-00900 | 9 | 23 | 9° | 10 | 70 | 14,100 |
| 08-00100-00950 | 9.5 | 24 | 9° | 10 | 75 | 16,800 |
| 08-00100-01000 | 10 | 25 | – | 10 | 75 | 8,200 |
| 08-00100-01050 | 10.5 | 27 | 9° | 12 | 80 | 22,000 |
| 08-00100-01100 | 11 | 28 | 9° | 12 | 80 | 21,400 |
| 08-00100-01150 | 11.5 | 29 | 9° | 12 | 80 | 23,500 |
| 08-00100-01200 | 12 | 30 | – | 12 | 80 | 13,500 |

**オーダー方法** MSE230 刃径(D)を指示してください。
When you order, indicate MSE230 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-030に記載
●Recommended Milling Conditions are shown on page D-030.
● ▌の規格・サイズは特定商社在庫となります。詳しくはお問い合わせください。
● ▌:Semi-standard item, please inquire for price and delivery.

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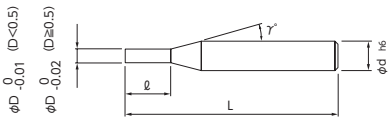
# MSE230M

## 無限コーティング 刃径表示 2枚刃エンドミル
MUGEN-COATING 2-Flute End Mill with measured diameter




●刃径寸法を 1 ミクロン単位で表示。
●Printed actual measurement of diameter in micron.

Slot Side Face MG ∞ 2 30° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

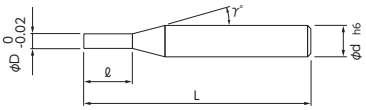
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00105-00010 | 0.1 | 0.15 | 9° | 4 | 45 | 8,200 |
| 08-00105-00020 | 0.2 | 0.4 | 9° | 4 | 45 | 5,500 |
| 08-00105-00030 | 0.3 | 0.6 | 9° | 4 | 45 | 4,900 |
| 08-00105-00040 | 0.4 | 0.8 | 9° | 4 | 45 | 5,300 |
| 08-00105-00050 | 0.5 | 1.25 | 9° | 4 | 45 | 3,200 |
| 08-00105-00080 | 0.8 | 2 | 9° | 4 | 45 | 3,200 |
| 08-00105-00100 | 1 | 2.5 | 9° | 4 | 45 | 2,900 |
| 08-00105-00150 | 1.5 | 4 | 9° | 4 | 45 | 2,900 |
| 08-00105-00200 | 2 | 5 | 9° | 4 | 45 | 2,900 |
| 08-00105-00250 | 2.5 | 7 | 9° | 4 | 45 | 2,900 |
| 08-00105-00300 | 3 | 8 | 9° | 6 | 50 | 3,500 |
| 08-00105-00400 | 4 | 10 | 9° | 6 | 50 | 3,800 |
| 08-00105-00500 | 5 | 13 | 9° | 6 | 55 | 4,000 |
| 08-00105-00600 | 6 | 15 | – | 6 | 55 | 4,300 |

**オーダー方法** MSE230M 刃径(D)を指示してください。
When you order, indicate MSE230M (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-030に記載
●Recommended Milling Conditions are shown on page D-030.
※注 この製品は測定値の寸法指定が出来るものではありません。
※Re) Only to show the mesurement, not to order the specification.

# MSEM230

## 無限コーティング 2枚刃ミディアム エンドミル
MUGEN-COATING 2-Flute Medium End Mill




●刃長は刃径の 4 倍で 30° ネジレを採用。
●L/D=4 and helix 30°.

Side Face MG ∞ 2 30° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00101-00050 | 0.5 | 2 | 9° | 4 | 50 | 4,800 |
| 08-00101-00060 | 0.6 | 2.4 | 9° | 4 | 50 | 4,800 |
| 08-00101-00080 | 0.8 | 3.2 | 9° | 4 | 50 | 4,800 |
| 08-00101-00100 | 1 | 4 | 9° | 4 | 50 | 4,300 |
| 08-00101-00150 | 1.5 | 6 | 9° | 4 | 50 | 4,300 |
| 08-00101-00200 | 2 | 8 | 9° | 4 | 50 | 4,300 |
| 08-00101-00250 | 2.5 | 10 | 9° | 4 | 50 | 4,300 |
| 08-00101-00300 | 3 | 12 | 9° | 6 | 55 | 5,500 |
| 08-00101-00400 | 4 | 16 | 9° | 6 | 60 | 5,900 |
| 08-00101-00500 | 5 | 20 | 9° | 6 | 65 | 6,700 |
| 08-00101-00600 | 6 | 24 | – | 6 | 75 | 6,800 |
| 08-00101-00800 | 8 | 32 | – | 8 | 90 | 13,500 |
| 08-00101-01000 | 10 | 40 | – | 10 | 100 | 15,300 |
| 08-00101-01200 | 12 | 48 | – | 12 | 110 | 25,600 |

**オーダー方法** MSEM230 刃径(D)を指示してください。
When you order, indicate MSEM230 (D).

※(γ)は参考値です。
※(γ) is reference value.

# MSES230P・MSE230・MSE230M

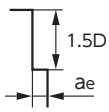
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM・SKD・SUS | | | 調質鋼 Prehardened Steels HPM・NAK | | |
|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 50～80m/min | | | 50～70m/min | | | 40～60m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min$^{-1}$ | mm/min | | min$^{-1}$ | mm/min | | min$^{-1}$ | mm/min | |
| | | 側面 Side Milling | 溝 Slotting | | 側面 Side Milling | 溝 Slotting | | 側面 Side Milling | 溝 Slotting |
| 0.1 | 50,000 | – | 25 | 50,000 | – | 15 | 50,000 | – | 20 |
| 0.2 | 50,000 | – | 40 | 50,000 | – | 25 | 50,000 | – | 30 |
| 0.3 | 50,000 | 100 | 50 | 50,000 | 90 | 35 | 50,000 | 85 | 40 |
| 0.4 | 50,000 | 150 | 75 | 47,700 | 130 | 50 | 39,800 | 110 | 55 |
| 0.5 | 41,400 | 170 | 85 | 38,200 | 130 | 50 | 31,800 | 110 | 55 |
| 0.8 | 25,900 | 210 | 100 | 23,900 | 150 | 55 | 19,900 | 130 | 65 |
| 1 | 20,700 | 210 | 100 | 19,100 | 150 | 55 | 15,900 | 130 | 65 |
| 1.5 | 13,800 | 210 | 100 | 12,700 | 150 | 55 | 10,600 | 130 | 65 |
| 2 | 10,300 | 210 | 100 | 9,500 | 170 | 60 | 8,000 | 150 | 75 |
| 2.5 | 8,300 | 250 | 120 | 7,600 | 180 | 65 | 6,400 | 160 | 80 |
| 3 | 6,900 | 280 | 140 | 6,400 | 190 | 70 | 5,300 | 170 | 85 |
| 3.5 | 5,900 | 300 | 150 | 5,500 | 190 | 70 | 4,500 | 170 | 85 |
| 4 | 5,200 | 310 | 160 | 4,800 | 190 | 70 | 4,000 | 170 | 85 |
| 5 | 4,100 | 330 | 160 | 3,800 | 230 | 75 | 3,200 | 210 | 110 |
| 6 | 3,400 | 340 | 170 | 3,200 | 260 | 85 | 2,700 | 240 | 120 |
| 7 | 3,000 | 330 | 170 | 2,700 | 240 | 80 | 2,300 | 230 | 120 |
| 8 | 2,600 | 310 | 160 | 2,400 | 240 | 80 | 2,000 | 220 | 110 |
| 9 | 2,300 | 300 | 150 | 2,100 | 230 | 80 | 1,800 | 220 | 110 |
| 10 | 2,100 | 290 | 150 | 1,900 | 230 | 75 | 1,600 | 210 | 100 |
| 11 | 1,900 | 290 | 140 | 1,700 | 220 | 75 | 1,400 | 200 | 100 |
| 12 | 1,700 | 270 | 140 | 1,600 | 220 | 75 | 1,300 | 200 | 100 |

**切り込み量 Depth of Cut**

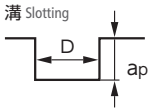
(D:刃径 Dia.)

側面 Side Milling




ae
φ0.3～0.95=0.05D
φ1～2.55=0.07D
φ2.6～6=0.1D
φ6.5～12=0.15D

溝 Slotting




ap
φ0.1～0.45=0.05D
φ0.5～1.45=0.1D
φ1.5～3.9=0.35D
φ4～12=0.5D

**備考 Notes**

※切削油は発煙性の少ないものを使用してください。
※回転数と送り速度は、同じ割合で調整してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。
※Use cutting fluid with smoke retardant.
※Adjust both spindle speed and feed at the same rate.
※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.



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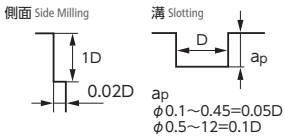
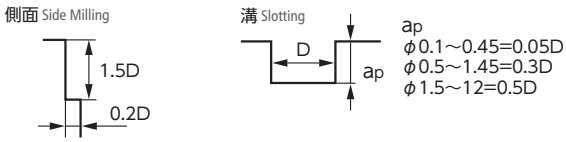
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 焼き入れ鋼 Hardened Steels SKD61 (～52HRC) | | | アルミニウム合金 Aluminum Alloy | | | 銅 Copper | | |
|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 20～40m/min | | | 100～200m/min | | | 60～80m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min$^{-1}$ | mm/min | | min$^{-1}$ | mm/min | | min$^{-1}$ | mm/min | |
| | | 側面 Side Milling | 溝 Slotting | | 側面 Side Milling | 溝 Slotting | | 側面 Side Milling | 溝 Slotting |
| 0.1 | 50,000 | – | 15 | 50,000 | 60 | 25 | 50,000 | 60 | 25 |
| 0.2 | 47,700 | – | 20 | 50,000 | 90 | 35 | 50,000 | 90 | 35 |
| 0.3 | 31,800 | – | 20 | 50,000 | 150 | 60 | 50,000 | 150 | 60 |
| 0.4 | 23,900 | 50 | 25 | 50,000 | 200 | 80 | 50,000 | 200 | 80 |
| 0.5 | 19,100 | 60 | 30 | 50,000 | 250 | 100 | 44,600 | 220 | 90 |
| 0.8 | 11,900 | 70 | 35 | 50,000 | 450 | 180 | 27,900 | 250 | 95 |
| 1 | 9,500 | 75 | 40 | 47,700 | 570 | 200 | 22,300 | 270 | 95 |
| 1.5 | 6,400 | 75 | 40 | 31,800 | 640 | 220 | 14,900 | 300 | 100 |
| 2 | 4,800 | 75 | 40 | 23,900 | 720 | 250 | 11,100 | 330 | 120 |
| 2.5 | 3,800 | 75 | 40 | 19,100 | 760 | 270 | 8,900 | 360 | 120 |
| 3 | 3,200 | 80 | 40 | 15,900 | 800 | 270 | 7,400 | 370 | 130 |
| 3.5 | 2,700 | 85 | 45 | 13,600 | 820 | 270 | 6,400 | 380 | 130 |
| 4 | 2,400 | 95 | 50 | 11,900 | 830 | 270 | 5,600 | 390 | 130 |
| 5 | 1,900 | 95 | 50 | 9,500 | 860 | 280 | 4,500 | 410 | 130 |
| 6 | 1,600 | 100 | 50 | 8,000 | 880 | 290 | 3,700 | 410 | 130 |
| 7 | 1,400 | 100 | 50 | 6,800 | 820 | 270 | 3,200 | 380 | 130 |
| 8 | 1,200 | 100 | 50 | 6,000 | 780 | 260 | 2,800 | 360 | 120 |
| 9 | 1,100 | 100 | 50 | 5,300 | 740 | 240 | 2,500 | 350 | 120 |
| 10 | 1,000 | 100 | 50 | 4,800 | 720 | 240 | 2,200 | 330 | 110 |
| 11 | 900 | 100 | 50 | 4,300 | 690 | 230 | 2,000 | 320 | 110 |
| 12 | 800 | 100 | 50 | 4,000 | 680 | 220 | 1,900 | 320 | 110 |

切り込み量 Depth of Cut

(D:刃径 Dia.)



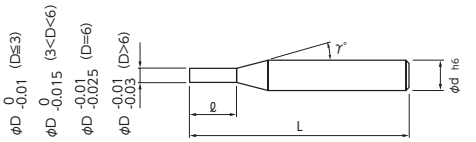




備考 Notes

※切削油は発煙性の少ないものを使用してください。
※焼き入れ鋼を切削加工する場合は、オイルミストクーラントの使用をお奨めします。
※回転数と送り速度は、同じ割合で調整してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。
※Use cutting fluid with smoke retardant.
※Recommend to use oil mist coolant for machining hardened steels.
※Adjust both spindle speed and feed at the same rate.
※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.

# MX425

## 無限コーティング リード25 エンドミル 4枚刃
MUGEN-COATING 4-Flute LEAD25 End Mill




●刃長は刃径の等倍で 25° ネジレを採用。
●剛性を高めた設計で、加工面のビビリと倒れを最小限に抑制。
●L/D=1 and helix 25° type, increased the rigidity to suppress chattering and minimized milling deflection.

Side Face MG ∞ 4 25° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

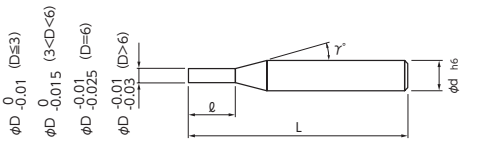
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00075-00100 | 1 | 1 | 12° | 4 | 45 | 4,300 |
| 08-00075-00150 | 1.5 | 1.5 | 12° | 4 | 45 | 4,300 |
| 08-00075-00200 | 2 | 2 | 12° | 4 | 45 | 2,800 |
| 08-00075-00250 | 2.5 | 2.5 | 12° | 4 | 45 | 2,800 |
| 08-00075-00300 | 3 | 3 | 12° | 6 | 45 | 3,200 |
| 08-00075-00350 | 3.5 | 3.5 | 12° | 6 | 45 | 5,800 |
| 08-00075-00400 | 4 | 4 | 12° | 6 | 45 | 3,600 |
| 08-00075-00450 | 4.5 | 4.5 | 12° | 6 | 50 | 7,000 |
| 08-00075-00500 | 5 | 5 | 12° | 6 | 50 | 3,900 |
| 08-00075-00550 | 5.5 | 5.5 | 12° | 6 | 50 | 7,200 |
| 08-00075-00600 | 6 | 6 | – | 6 | 50 | 4,200 |
| 08-00075-00800 | 8 | 8 | – | 8 | 65 | 10,500 |
| 08-00075-01000 | 10 | 10 | – | 10 | 75 | 12,100 |
| 08-00075-01200 | 12 | 12 | – | 12 | 80 | 18,200 |

オーダー方法 MX425 刃径(D)を指示してください。
When you order, indicate MX425 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-035に記載
●Recommended Milling Conditions are shown on page D-035.

# MX430

## 無限コーティング リード30 エンドミル 4枚刃
MUGEN-COATING 4-Flute LEAD30 End Mill




●刃長は刃径の 2 倍で 30° ネジレを採用。
●オールマイティーに対応する標準タイプ。
●L/D=2 and helix 30° standard type, applicable to any milling process.

Side Face MG ∞ 4 30° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00080-00100 | 1 | 2 | 12° | 4 | 45 | 3,000 |
| 08-00080-00150 | 1.5 | 3 | 12° | 4 | 45 | 3,000 |
| 08-00080-00200 | 2 | 4 | 12° | 4 | 45 | 2,500 |
| 08-00080-00250 | 2.5 | 5 | 12° | 4 | 45 | 2,500 |
| 08-00080-00300 | 3 | 6 | 12° | 6 | 45 | 2,600 |
| 08-00080-00350 | 3.5 | 7 | 12° | 6 | 45 | 4,800 |
| 08-00080-00400 | 4 | 8 | 12° | 6 | 45 | 3,000 |
| 08-00080-00450 | 4.5 | 9 | 12° | 6 | 50 | 5,600 |
| 08-00080-00500 | 5 | 10 | 12° | 6 | 50 | 3,000 |
| 08-00080-00550 | 5.5 | 11 | 12° | 6 | 50 | 5,600 |
| 08-00080-00600 | 6 | 12 | – | 6 | 50 | 3,500 |
| 08-00080-00800 | 8 | 16 | – | 8 | 65 | 7,500 |
| 08-00080-01000 | 10 | 20 | – | 10 | 75 | 10,200 |
| 08-00080-01200 | 12 | 24 | – | 12 | 80 | 13,800 |

オーダー方法 MX430 刃径(D)を指示してください。
When you order, indicate MX430 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-036に記載
●Recommended Milling Conditions are shown on page D-036.



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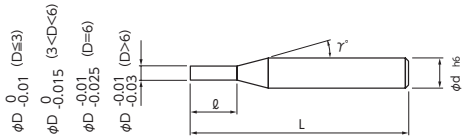
# MX435

## 無限コーティング リード35 エンドミル 4枚刃
MUGEN-COATING 4-Flute LEAD35 End Mill




●刃長は刃径の 3 倍で 35° ネジレを採用。
●2 倍刃長では刃長が足りなく、4 倍刃長では長いといった悩みを解消。
●L/D=3 and helix 35° for appropriate length of cut to avoid the inconveniences in size selection.

Side Face MG ∞ 4 35° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

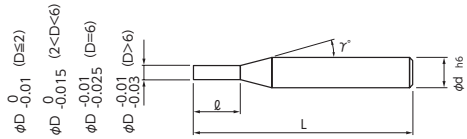
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00085-00100 | 1 | 3 | 12° | 4 | 45 | 4,300 |
| 08-00085-00150 | 1.5 | 4.5 | 12° | 4 | 45 | 4,300 |
| 08-00085-00200 | 2 | 6 | 12° | 4 | 45 | 3,000 |
| 08-00085-00250 | 2.5 | 7.5 | 12° | 4 | 45 | 3,000 |
| 08-00085-00300 | 3 | 9 | 12° | 6 | 45 | 3,300 |
| 08-00085-00350 | 3.5 | 10.5 | 12° | 6 | 45 | 6,000 |
| 08-00085-00400 | 4 | 12 | 12° | 6 | 50 | 3,600 |
| 08-00085-00450 | 4.5 | 13.5 | 12° | 6 | 50 | 7,200 |
| 08-00085-00500 | 5 | 15 | 12° | 6 | 55 | 3,900 |
| 08-00085-00550 | 5.5 | 16.5 | 12° | 6 | 60 | 7,500 |
| 08-00085-00600 | 6 | 18 | – | 6 | 60 | 3,800 |
| 08-00085-00800 | 8 | 24 | – | 8 | 65 | 9,900 |
| 08-00085-01000 | 10 | 30 | – | 10 | 75 | 11,600 |
| 08-00085-01200 | 12 | 36 | – | 12 | 80 | 16,500 |

**オーダー方法** MX435 刃径(D)を指示してください。
When you order, indicate MX435 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-037に記載
●Recommended Milling Conditions are shown on page D-037.

# MX440

## 無限コーティング リード40 エンドミル 4枚刃
MUGEN-COATING 4-Flute LEAD40 End Mill




●刃長は刃径の 4 倍で 40° ネジレを採用。
●深い加工もスムーズに加工でき、ロング刃でありながら加工面の倒れを最小限に抑制。
●L/D=4 and helix 40° is suitable for deep machining with minimum deflection of cutting up-right surface.

Side Face MG ∞ 4 40° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

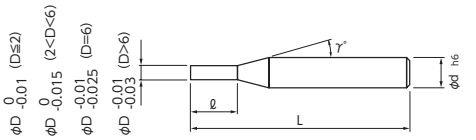
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00090-00100 | 1 | 4 | 12° | 4 | 45 | 4,500 |
| 08-00090-00150 | 1.5 | 6 | 12° | 4 | 45 | 4,500 |
| 08-00090-00200 | 2 | 8 | 12° | 4 | 45 | 3,700 |
| 08-00090-00250 | 2.5 | 10 | 12° | 4 | 45 | 3,700 |
| 08-00090-00300 | 3 | 12 | 12° | 6 | 50 | 4,000 |
| 08-00090-00350 | 3.5 | 14 | 12° | 6 | 50 | 6,500 |
| 08-00090-00400 | 4 | 16 | 12° | 6 | 55 | 4,300 |
| 08-00090-00450 | 4.5 | 18 | 12° | 6 | 55 | 7,600 |
| 08-00090-00500 | 5 | 20 | 12° | 6 | 60 | 4,600 |
| 08-00090-00550 | 5.5 | 22 | 12° | 6 | 65 | 8,000 |
| 08-00090-00600 | 6 | 24 | – | 6 | 65 | 5,000 |
| 08-00090-00800 | 8 | 32 | – | 8 | 90 | 13,800 |
| 08-00090-01000 | 10 | 40 | – | 10 | 100 | 15,200 |
| 08-00090-01200 | 12 | 48 | – | 12 | 105 | 23,100 |

**オーダー方法** MX440 刃径(D)を指示してください。
When you order, indicate MX440 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-038に記載
●Recommended Milling Conditions are shown on page D-038.

# MX445

## 無限コーティング リード45 エンドミル 4枚刃
MUGEN-COATING 4-Flute LEAD45 End Mill




●刃長は刃径の 5 倍で 45° ネジレを採用。
●超ロング刃でありながら加工面の倒れを最小限に抑制。
●L/D=5 and helix 45° to minimize the milling deflection even though the long cutting length design.

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | |
| **ステンレス鋼 Stainless Steels** | **チタン合金 Titanium Alloy** | **アルミニウム合金 Aluminum Alloy** | **銅 Copper** | **樹　脂 Resin** |
| ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00095-00100 | 1 | 5 | 12° | 4 | 45 | 6,000 |
| 08-00095-00150 | 1.5 | 7.5 | 12° | 4 | 45 | 6,000 |
| 08-00095-00200 | 2 | 10 | 12° | 4 | 50 | 5,000 |
| 08-00095-00250 | 2.5 | 12.5 | 12° | 4 | 50 | 5,000 |
| 08-00095-00300 | 3 | 15 | 12° | 6 | 55 | 6,000 |
| 08-00095-00350 | 3.5 | 17.5 | 12° | 6 | 60 | 8,000 |
| 08-00095-00400 | 4 | 20 | 12° | 6 | 60 | 6,600 |
| 08-00095-00450 | 4.5 | 22.5 | 12° | 6 | 65 | 9,000 |
| 08-00095-00500 | 5 | 25 | 12° | 6 | 65 | 6,900 |
| 08-00095-00550 | 5.5 | 27.5 | 12° | 6 | 75 | 9,800 |
| 08-00095-00600 | 6 | 30 | – | 6 | 75 | 7,500 |
| 08-00095-00800 | 8 | 40 | – | 8 | 90 | 16,500 |
| 08-00095-01000 | 10 | 50 | – | 10 | 100 | 18,700 |
| 08-00095-01200 | 12 | 60 | – | 12 | 105 | 26,400 |

**オーダー方法** MX445 刃径(D)を指示してください。
When you order, indicate MX445 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-039に記載
●Recommended Milling Conditions are shown on page D-039.



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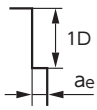
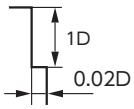
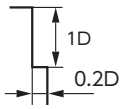
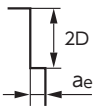
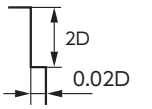
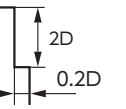
# MX425

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM･SKD･SUS | | 調質鋼 Prehardened Steels HPM･NAK | | 焼き入れ鋼 Hardened Steels SKD61 (～52HRC) | | 銅 Copper | |
|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 50～80m/min | | 50～70m/min | | 40～60m/min | | 20～40m/min | | 60～80m/min | |
| 刃 径 Dia. | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 20,700 | 320 | 19,100 | 230 | 15,900 | 200 | 9,500 | 120 | 22,300 | 410 |
| 1.5 | 13,800 | 320 | 12,700 | 230 | 10,600 | 200 | 6,400 | 120 | 14,900 | 450 |
| 2 | 10,300 | 320 | 9,500 | 260 | 8,000 | 230 | 4,800 | 120 | 11,100 | 500 |
| 2.5 | 8,300 | 380 | 7,600 | 270 | 6,400 | 240 | 3,800 | 120 | 8,900 | 540 |
| 3 | 6,900 | 420 | 6,400 | 290 | 5,300 | 260 | 3,200 | 120 | 7,400 | 560 |
| 3.5 | 5,900 | 450 | 5,500 | 290 | 4,500 | 260 | 2,700 | 130 | 6,400 | 570 |
| 4 | 5,200 | 530 | 4,800 | 320 | 4,000 | 290 | 2,400 | 160 | 5,600 | 660 |
| 4.5 | 4,600 | 540 | 4,200 | 360 | 3,500 | 320 | 2,100 | 160 | 5,000 | 680 |
| 5 | 4,100 | 560 | 3,800 | 390 | 3,200 | 360 | 1,900 | 160 | 4,500 | 700 |
| 5.5 | 3,800 | 560 | 3,500 | 410 | 2,900 | 370 | 1,700 | 160 | 4,100 | 700 |
| 6 | 3,400 | 580 | 3,200 | 440 | 2,700 | 410 | 1,600 | 170 | 3,700 | 700 |
| 8 | 2,600 | 540 | 2,400 | 410 | 2,000 | 370 | 1,200 | 170 | 2,800 | 610 |
| 10 | 2,100 | 510 | 1,900 | 390 | 1,600 | 360 | 1,000 | 170 | 2,200 | 560 |
| 12 | 1,700 | 460 | 1,600 | 370 | 1,300 | 340 | 800 | 170 | 1,900 | 540 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   ae<br>φ1～2.5=0.1D<br>φ3～6=0.2D<br>φ8～12=0.25D | | | | | | 側面 Side Milling   | | 側面 Side Milling   | |
| 備 考 Notes | ※切削油は発煙性の少ないものを使用してください。<br>※焼き入れ鋼を切削加工する場合は、オイルミストクーラントの使用をお奨めします。<br>※側面切削でのみ、使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。<br>※Use cutting fluid with smoke retardant.<br>※Recommend to use oil mist coolant for machining hardened steels.<br>※Available only for side cutting.<br>※Adjust both spindle speed and feed at the same rate.<br>※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. | | | | | | | | | |

# MX430

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM・SKD・SUS | | 調質鋼 Prehardened Steels HPM・NAK | | 焼き入れ鋼 Hardened Steels SKD61 (~52HRC) | | 銅 Copper | |
|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 50~80m/min | | 50~70m/min | | 40~60m/min | | 20~40m/min | | 60~80m/min | |
| 刃 径 Dia. | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 20,700 | 320 | 19,100 | 230 | 15,900 | 200 | 9,500 | 120 | 22,300 | 410 |
| 1.5 | 13,800 | 320 | 12,700 | 230 | 10,600 | 200 | 6,400 | 120 | 14,900 | 450 |
| 2 | 10,300 | 320 | 9,500 | 260 | 8,000 | 230 | 4,800 | 120 | 11,100 | 500 |
| 2.5 | 8,300 | 380 | 7,600 | 270 | 6,400 | 240 | 3,800 | 120 | 8,900 | 540 |
| 3 | 6,900 | 420 | 6,400 | 290 | 5,300 | 260 | 3,200 | 120 | 7,400 | 560 |
| 3.5 | 5,900 | 450 | 5,500 | 290 | 4,500 | 260 | 2,700 | 130 | 6,400 | 570 |
| 4 | 5,200 | 530 | 4,800 | 320 | 4,000 | 290 | 2,400 | 160 | 5,600 | 660 |
| 4.5 | 4,600 | 540 | 4,200 | 360 | 3,500 | 320 | 2,100 | 160 | 5,000 | 680 |
| 5 | 4,100 | 560 | 3,800 | 390 | 3,200 | 360 | 1,900 | 160 | 4,500 | 700 |
| 5.5 | 3,800 | 560 | 3,500 | 410 | 2,900 | 370 | 1,700 | 160 | 4,100 | 700 |
| 6 | 3,400 | 580 | 3,200 | 440 | 2,700 | 410 | 1,600 | 170 | 3,700 | 700 |
| 8 | 2,600 | 540 | 2,400 | 410 | 2,000 | 370 | 1,200 | 170 | 2,800 | 610 |
| 10 | 2,100 | 510 | 1,900 | 390 | 1,600 | 360 | 1,000 | 170 | 2,200 | 560 |
| 12 | 1,700 | 460 | 1,600 | 370 | 1,300 | 340 | 800 | 170 | 1,900 | 540 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   ae<br>φ1~2.5=0.07D<br>φ3~6=0.15D<br>φ8~12=0.2D | | | | | | 側面 Side Milling   | | 側面 Side Milling   | |
| 備 考 Notes | ※切削油は発煙性の少ないものを使用してください。<br>※焼き入れ鋼を切削加工する場合は、オイルミストクーラントの使用をお奨めします。<br>※側面切削でのみ、使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。<br>※Use cutting fluid with smoke retardant.<br>※Recommend to use oil mist coolant for machining hardened steels.<br>※Available only for side cutting.<br>※Adjust both spindle speed and feed at the same rate.<br>※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. | | | | | | | | | |



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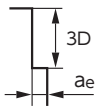
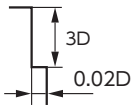
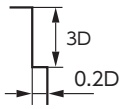
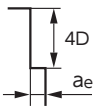
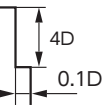
# MX435

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM･SKD･SUS | | 調質鋼 Prehardened Steels HPM･NAK | | 焼き入れ鋼 Hardened Steels SKD61 (～52HRC) | | 銅 Copper | |
|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 45～75m/min | | 45～65m/min | | 35～55m/min | | 15～35m/min | | 55～75m/min | |
| 刃 径 Dia. | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 19,100 | 290 | 17,500 | 210 | 14,300 | 170 | 8,000 | 100 | 20,700 | 380 |
| 1.5 | 12,700 | 290 | 11,700 | 210 | 9,500 | 170 | 5,300 | 100 | 13,800 | 420 |
| 2 | 9,500 | 290 | 8,800 | 240 | 7,200 | 210 | 4,000 | 100 | 10,300 | 470 |
| 2.5 | 7,600 | 350 | 7,000 | 260 | 5,700 | 210 | 3,200 | 110 | 8,300 | 500 |
| 3 | 6,400 | 390 | 5,800 | 260 | 4,800 | 230 | 2,700 | 110 | 6,900 | 530 |
| 3.5 | 5,500 | 410 | 5,000 | 270 | 4,100 | 230 | 2,300 | 120 | 5,900 | 530 |
| 4 | 4,800 | 480 | 4,400 | 310 | 3,600 | 260 | 2,000 | 140 | 5,200 | 610 |
| 4.5 | 4,200 | 490 | 3,900 | 340 | 3,200 | 290 | 1,800 | 140 | 4,600 | 610 |
| 5 | 3,800 | 510 | 3,500 | 360 | 2,900 | 320 | 1,600 | 140 | 4,100 | 630 |
| 5.5 | 3,500 | 530 | 3,200 | 370 | 2,600 | 340 | 1,400 | 140 | 3,800 | 630 |
| 6 | 3,200 | 540 | 2,900 | 390 | 2,400 | 360 | 1,300 | 140 | 3,400 | 630 |
| 8 | 2,400 | 480 | 2,200 | 370 | 1,800 | 340 | 1,000 | 140 | 2,600 | 580 |
| 10 | 1,900 | 440 | 1,800 | 360 | 1,400 | 310 | 800 | 140 | 2,100 | 540 |
| 12 | 1,600 | 440 | 1,500 | 360 | 1,200 | 290 | 700 | 140 | 1,700 | 490 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   ae<br>φ1～2.5=0.05D<br>φ3～6=0.1D<br>φ8～12=0.15D | | | | | | 側面 Side Milling   | | 側面 Side Milling   | |
| 備 考 Notes | ※切削油は発煙性の少ないものを使用してください。<br>※焼き入れ鋼を切削加工する場合は、オイルミストクーラントの使用をお奨めします。<br>※側面切削でのみ、使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。<br>※Use cutting fluid with smoke retardant.<br>※Recommend to use oil mist coolant for machining hardened steels.<br>※Available only for side cutting.<br>※Adjust both spindle speed and feed at the same rate.<br>※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. | | | | | | | | | |

# MX440

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM・SKD・SUS | | 調質鋼 Prehardened Steels HPM・NAK | | 銅 Copper | |
|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 20～30m/min | | 15～25m/min | | 15～20m/min | | 20～40m/min | |
| 刃 径 Dia. | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 8,000 | 120 | 6,400 | 80 | 5,600 | 70 | 9,500 | 170 |
| 1.5 | 5,300 | 120 | 4,200 | 80 | 3,700 | 70 | 6,400 | 200 |
| 2 | 4,000 | 120 | 3,200 | 90 | 2,800 | 75 | 4,800 | 210 |
| 2.5 | 3,200 | 150 | 2,500 | 90 | 2,200 | 85 | 3,800 | 230 |
| 3 | 2,700 | 170 | 2,100 | 90 | 1,900 | 90 | 3,200 | 240 |
| 3.5 | 2,300 | 180 | 1,800 | 90 | 1,600 | 90 | 2,700 | 260 |
| 4 | 2,000 | 200 | 1,600 | 110 | 1,400 | 100 | 2,400 | 290 |
| 4.5 | 1,800 | 220 | 1,400 | 120 | 1,200 | 110 | 2,100 | 290 |
| 5 | 1,600 | 220 | 1,300 | 140 | 1,100 | 120 | 1,900 | 290 |
| 5.5 | 1,400 | 220 | 1,200 | 150 | 1,000 | 140 | 1,700 | 310 |
| 6 | 1,300 | 220 | 1,100 | 150 | 900 | 140 | 1,600 | 310 |
| 8 | 1,000 | 200 | 800 | 140 | 700 | 130 | 1,200 | 270 |
| 10 | 800 | 190 | 600 | 120 | 600 | 130 | 1,000 | 260 |
| 12 | 700 | 190 | 500 | 120 | 500 | 130 | 800 | 240 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   ae<br>φ1～2.5=0.04D<br>φ3～6=0.08D<br>φ8～12=0.1D | | | | | | 側面 Side Milling   | |
| 備 考 Notes | ※切削油は発煙性の少ないものを使用してください。<br>※側面切削でのみ、使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。<br>※Use cutting fluid with smoke retardant.<br>※Available only for side cutting.<br>※Adjust both spindle speed and feed at the same rate.<br>※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. | | | | | | | |



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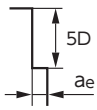
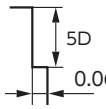
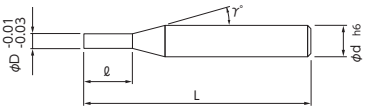
# MX445

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM･SKD･SUS | | 調質鋼 Prehardened Steels HPM･NAK | | 銅 Copper | |
|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 15～25m/min | | 10～20m/min | | 10～15m/min | | 15～35m/min | |
| 刃 径 Dia. | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 6,400 | 100 | 4,800 | 60 | 4,000 | 55 | 8,000 | 150 |
| 1.5 | 4,200 | 100 | 3,200 | 60 | 2,700 | 55 | 5,300 | 170 |
| 2 | 3,200 | 100 | 2,400 | 70 | 2,000 | 60 | 4,000 | 190 |
| 2.5 | 2,500 | 120 | 1,900 | 70 | 1,600 | 60 | 3,200 | 200 |
| 3 | 2,100 | 130 | 1,600 | 75 | 1,300 | 70 | 2,700 | 210 |
| 3.5 | 1,800 | 140 | 1,400 | 75 | 1,100 | 70 | 2,300 | 210 |
| 4 | 1,600 | 160 | 1,200 | 90 | 1,000 | 80 | 2,000 | 240 |
| 4.5 | 1,400 | 170 | 1,100 | 90 | 900 | 85 | 1,800 | 240 |
| 5 | 1,300 | 170 | 1,000 | 100 | 800 | 90 | 1,600 | 240 |
| 5.5 | 1,200 | 170 | 900 | 100 | 700 | 95 | 1,400 | 240 |
| 6 | 1,100 | 190 | 800 | 110 | 700 | 100 | 1,300 | 240 |
| 8 | 800 | 160 | 600 | 100 | 500 | 90 | 1,000 | 220 |
| 10 | 600 | 150 | 500 | 100 | 400 | 85 | 800 | 200 |
| 12 | 500 | 140 | 400 | 90 | 300 | 80 | 700 | 200 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   ae<br>φ1～2.5=0.03D<br>φ3～6=0.06D<br>φ8～12=0.08D | | | | | | 側面 Side Milling   | |
| 備 考 Notes | ※切削油は発煙性の少ないものを使用してください。<br>※側面切削でのみ、使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。<br>※Use cutting fluid with smoke retardant.<br>※Available only for side cutting.<br>※Adjust both spindle speed and feed at the same rate.<br>※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. | | | | | | | |

# MSE430P

## 無限コーティング 4枚刃ピンカドエンドミル
MUGEN-COATING 4-Flute Sharp Edge End Mill




●ピンカドで非鉄から鋼材まで幅広く切削可能。
●倒れの少ない仕上げ加工が可能。
●It can be cut from nonferrous to steels due to the sharp edges.
●Minimize tool deflection for accurate finishing.

Side Face MG ∞ 4 30°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
| ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

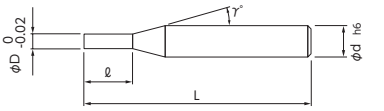
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00112-00100 | 1 | 2.5 | 9° | 4 | 45 | 5,200 |
| 08-00112-00150 | 1.5 | 4 | 9° | 4 | 45 | 5,200 |
| 08-00112-00200 | 2 | 5 | 9° | 4 | 45 | 3,700 |
| 08-00112-00250 | 2.5 | 7 | 9° | 4 | 45 | 3,700 |
| 08-00112-00300 | 3 | 8 | 9° | 4 | 50 | 4,200 |
| 08-00112-00400 | 4 | 10 | – | 4 | 50 | 4,300 |
| 08-00112-00500 | 5 | 13 | 9° | 6 | 55 | 4,500 |
| 08-00112-00600 | 6 | 15 | – | 6 | 55 | 4,700 |
| 08-00112-00800 | 8 | 20 | – | 8 | 65 | 8,100 |
| 08-00112-01000 | 10 | 25 | – | 10 | 75 | 10,700 |
| 08-00112-01200 | 12 | 30 | – | 12 | 80 | 15,100 |

**オーダー方法** MSE430P 刃径(D)を指示してください。
When you order, indicate MSE430P (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-042に記載
●Recommended Milling Conditions are shown on page D-042.

# MSE430

## 無限コーティング 4枚刃エンドミル
MUGEN-COATING 4-Flute End Mill




●4枚刃エンドミルに、NS独自の無限コーティングを採用。
●生材から高硬度材まで幅広く切削が可能。
●▲の規格は在庫が無くなり次第、販売終了となります。
●Our original MUGEN-COATING has been put on 4-flute end mill.
●It can be cut from non-hardened materials to hardened materials.
●▲ : The sizes will no longer be capable being sold after the stock runs out.

Side Face MG ∞ 4 30° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
| ◎ | ○ | ○ | ◎ | ○ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00110-00100 | 1 | 2.5 | 9° | 4 | 45 | 4,900 |
| 08-00110-00150 | 1.5 | 4 | 9° | 4 | 45 | 4,900 |
| 08-00110-00200 | 2 | 5 | 9° | 4 | 45 | 3,000 |
| 08-00110-00250 | 2.5 | 7 | 9° | 4 | 45 | 3,000 |
| 08-00110-00300 | 3 | 8 | 9° | 6 | 50 | 3,100 |
| 08-00110-00350 | 3.5 | 9 | 9° | 6 | 50 | 6,500 |
| 08-00110-00400 | 4 | 10 | 9° | 6 | 50 | 3,500 |
| 08-00110-00450 | 4.5 | 12 | 9° | 6 | 55 | 7,000 |
| 08-00110-00500 | 5 | 13 | 9° | 6 | 55 | 3,600 |
| 08-00110-00550 | 5.5 | 14 | 9° | 6 | 55 | 7,500 |
| 08-00110-00600 | 6 | 15 | – | 6 | 55 | 3,800 |
| 08-00110-00650 | 6.5 | 17 | 9° | 8 | 60 | 12,800 |
| 08-00110-00700 | 7 | 18 | 9° | 8 | 65 | 10,700 |
| 08-00110-00750 | 7.5 | 19 | 9° | 8 | 65 | 13,500 |
| 08-00110-00800 | 8 | 20 | – | 8 | 65 | 7,700 |
| 08-00110-00850 | 8.5 | 22 | 9° | 10 | 70 | 16,800 |
| 08-00110-00900 | 9 | 23 | 9° | 10 | 70 | 16,800 |
| 08-00110-00950 | 9.5 | 24 | 9° | 10 | 75 | 19,400 |
| 08-00110-01000 | 10 | 25 | – | 10 | 75 | 10,300 |
| 08-00110-01200 | 12 | 30 | – | 12 | 80 | 14,100 |
| ▲ 08-00110-01400 | 14 | 35 | – | 12 | 100 | 38,400 |
| ▲ 08-00110-01500 | 15 | 40 | 9° | 16 | 110 | 46,000 |
| ▲ 08-00110-01600 | 16 | 40 | – | 16 | 110 | 46,000 |
| ▲ 08-00110-01800 | 18 | 45 | – | 16 | 120 | 63,900 |
| ▲ 08-00110-02000 | 20 | 50 | – | 20 | 135 | 71,600 |

**オーダー方法** MSE430 刃径(D)を指示してください。
When you order, indicate MSE430 (D).

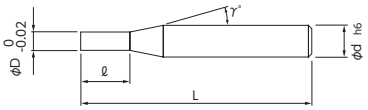
※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-042に記載
●Recommended Milling Conditions are shown on page D-042.



SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

# MSEM430

## 無限コーティング 4枚刃 ミディアムエンドミル
MUGEN-COATING 4-Flute Medium End Mill




●刃長は刃径の４倍で 30° ネジレを採用。
●側面仕上げ加工に最適。
●▲の規格は在庫が無くなり次第、販売終了となります。
●L/D=4 and helix 30°.
●It is very suitable for finishing side milling.
●▲: The sizes will no longer be capable being sold after the stock runs out.

Side Face MG ∞ 4 30° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | |
|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ |
| ◎ | ◎ | ◎ | ○ | |

| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|
| ◎ | ○ | ○ | ◎ | ○ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

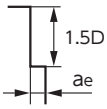
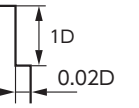
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00111-00100 | 1 | 4 | 9° | 4 | 50 | 8,500 |
| 08-00111-00150 | 1.5 | 6 | 9° | 4 | 50 | 8,500 |
| 08-00111-00200 | 2 | 8 | 9° | 4 | 50 | 6,000 |
| 08-00111-00250 | 2.5 | 10 | 9° | 4 | 50 | 6,000 |
| 08-00111-00300 | 3 | 12 | 9° | 6 | 55 | 6,300 |
| 08-00111-00400 | 4 | 16 | 9° | 6 | 60 | 6,700 |
| 08-00111-00500 | 5 | 20 | 9° | 6 | 65 | 6,900 |
| 08-00111-00600 | 6 | 24 | – | 6 | 75 | 7,300 |
| 08-00111-00800 | 8 | 32 | – | 8 | 90 | 14,900 |
| 08-00111-01000 | 10 | 40 | – | 10 | 100 | 18,300 |
| 08-00111-01200 | 12 | 48 | – | 12 | 110 | 27,500 |
| ▲ 08-00111-01600 | 16 | 64 | – | 16 | 130 | 65,900 |
| ▲ 08-00111-02000 | 20 | 80 | – | 20 | 140 | 102,300 |

**オーダー方法**
MSEM430 刃径(D)を指示してください。
When you order, indicate MSEM430 (D).

※(γ)は参考値です。
※(γ) is reference value.

# MSE430P・MSE430

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM・SKD・SUS | | 調質鋼 Prehardened Steels HPM・NAK | | 焼き入れ鋼 Hardened Steels SKD61 (~52HRC) | |
|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 60~100m/min | | 50~70m/min | | 35~60m/min | | 20~40m/min | |
| 刃 径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 20,700 | 330 | 19,100 | 210 | 14,300 | 150 | 9,600 | 160 |
| 2 | 10,300 | 330 | 9,600 | 270 | 7,200 | 160 | 4,800 | 180 |
| 3 | 6,900 | 440 | 6,400 | 320 | 4,800 | 180 | 3,200 | 210 |
| 4 | 5,200 | 500 | 4,800 | 380 | 3,600 | 180 | 2,400 | 230 |
| 5 | 4,100 | 520 | 3,800 | 380 | 2,900 | 200 | 1,900 | 250 |
| 6 | 3,400 | 540 | 3,200 | 380 | 2,400 | 200 | 1,600 | 250 |
| 7 | 3,000 | 530 | 2,700 | 380 | 2,000 | 200 | 1,400 | 250 |
| 8 | 2,700 | 520 | 2,400 | 380 | 1,800 | 200 | 1,200 | 250 |
| 9 | 2,300 | 480 | 2,100 | 380 | 1,600 | 200 | 1,100 | 250 |
| 10 | 2,100 | 470 | 1,900 | 380 | 1,400 | 200 | 1,000 | 250 |
| 12 | 1,700 | 440 | 1,600 | 380 | 1,200 | 200 | 800 | 250 |
| 14 | 1,500 | 430 | 1,400 | 360 | 1,000 | 190 | 700 | 230 |
| 15 | 1,400 | 430 | 1,300 | 350 | 1,000 | 180 | 600 | 210 |
| 16 | 1,300 | 420 | 1,200 | 330 | 900 | 160 | 600 | 200 |
| 18 | 1,150 | 400 | 1,100 | 330 | 800 | 160 | 500 | 200 |
| 20 | 1,050 | 400 | 1,000 | 330 | 700 | 160 | 500 | 200 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   ae<br>φ1~2=0.05D<br>φ3~6=0.1D<br>φ7~20=0.15D | | | | | | 側面 Side Milling   | |
| 備 考 Notes | ※切削油は発煙性の少ないものを使用してください。<br>※焼き入れ鋼を切削加工する場合は、オイルミストクーラントの使用をお奨めします。<br>※側面切削でのみ、使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。<br>※Use cutting fluid with smoke retardant.<br>※Recommend to use oil mist coolant for machining hardened steels.<br>※Available only for side cutting.<br>※Adjust both spindle speed and feed at the same rate.<br>※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. | | | | | | | |

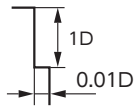


SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

# MSE430P・MSE430

## 高速切削条件参考表 Recommended High Speed Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM・SKD・SUS | | 調質鋼 Prehardened Steels HPM・NAK | | 焼き入れ鋼 Hardened Steels SKD61 (～52HRC) | |
|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 250m/min | | 200m/min | | 160m/min | | 80m/min | |
| 刃 径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 6 | 13,300 | 2,600 | 10,600 | 2,000 | 8,500 | 1,600 | 4,200 | 500 |
| 8 | 10,000 | 2,600 | 8,000 | 2,000 | 6,400 | 1,600 | 3,200 | 500 |
| 10 | 8,000 | 2,600 | 6,400 | 2,000 | 5,100 | 1,600 | 2,500 | 500 |
| 12 | 6,600 | 2,600 | 5,300 | 2,000 | 4,200 | 1,600 | 2,100 | 500 |
| 16 | 5,000 | 2,000 | 4,000 | 1,500 | 3,200 | 1,200 | 1,600 | 380 |
| 20 | 4,000 | 2,000 | 3,200 | 1,500 | 2,500 | 1,200 | 1,300 | 380 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling φ6～9.5 1D 0.01D / φ10～20 1.5D 0.02D | | | | | | 側面 Side Milling 1D 0.01D | |

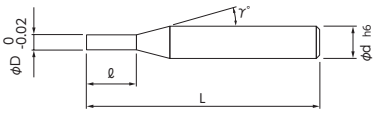



**備 考 Notes**

※切削油は発煙性の少ないものを使用してください。
※焼き入れ鋼を切削加工する場合は、オイルミストクーラントの使用をお奨めします。
※側面切削でのみ、使用してください。
※回転数と送り速度は、同じ割合で調整してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。
※Use cutting fluid with smoke retardant.
※Recommend to use oil mist coolant for machining hardened steels.
※Available only for side cutting.
※Adjust both spindle speed and feed at the same rate.
※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.

# MSE245

## 無限コーティング 2枚刃エンドミル
MUGEN-COATING 2-Flute End Mill




- 2 枚刃エンドミルに、NS 独自の無限コーティングを採用。
- 30° ネジレに比べ切削抵抗を軽減。
- Our original MUGEN-COATING has been put on 2-flute end mill.
- Compared with 30° helix angle, it can be reduced cutting resistance.

Slot Side Face MG ∞ 2 45° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | ステンレス鋼 Stainless Steels |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | ◎ |
| チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin | 超耐熱合金 Heat Resistance Alloy |
| ○ | ○ | ◎ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00120-00200 | 2 | 5 | 9° | 4 | 45 | 4,800 |
| 08-00120-00250 | 2.5 | 7 | 9° | 4 | 45 | 4,800 |
| 08-00120-00300 | 3 | 8 | 9° | 6 | 50 | 6,200 |
| 08-00120-00400 | 4 | 10 | 9° | 6 | 50 | 6,500 |
| 08-00120-00500 | 5 | 13 | 9° | 6 | 55 | 7,000 |
| 08-00120-00600 | 6 | 15 | – | 6 | 55 | 7,200 |
| 08-00120-00800 | 8 | 20 | – | 8 | 65 | 10,900 |
| 08-00120-01000 | 10 | 25 | – | 10 | 75 | 12,800 |
| 08-00120-01200 | 12 | 30 | – | 12 | 80 | 20,800 |

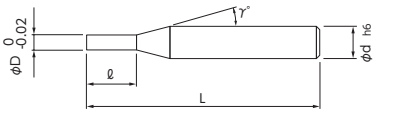
**オーダー方法** MSE245 刃径(D)を指示してください。
When you order, indicate MSE245 (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-046に記載
●Recommended Milling Conditions are shown on page D-046.

# MSE345

## 無限コーティング 3枚刃エンドミル
MUGEN-COATING 3-Flute End Mill




- 3 枚刃エンドミルに、NS 独自の無限コーティングを採用。
- 30° ネジレに比べ切削抵抗を軽減。
- ▲の規格は在庫が無くなり次第、販売終了となります。
- Our original MUGEN-COATING has been put on 3-flute end mill.
- Compared with 30° helix angle, it can be reduced cutting resistance.
- ▲ : The sizes will no longer be capable being sold after the stock runs out.

Slot Side Face MG ∞ 3 45° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | ステンレス鋼 Stainless Steels |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | ◎ |
| チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin | 超耐熱合金 Heat Resistance Alloy |
| ○ | ○ | ◎ | ○ | ○ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00130-00300 | 3 | 8 | 9° | 6 | 50 | 6,200 |
| 08-00130-00400 | 4 | 10 | 9° | 6 | 50 | 6,500 |
| 08-00130-00500 | 5 | 13 | 9° | 6 | 55 | 7,000 |
| 08-00130-00600 | 6 | 15 | – | 6 | 55 | 7,200 |
| 08-00130-00800 | 8 | 20 | – | 8 | 65 | 10,900 |
| 08-00130-01000 | 10 | 25 | – | 10 | 75 | 12,800 |
| 08-00130-01200 | 12 | 30 | – | 12 | 80 | 20,800 |
| ▲ 08-00130-01600 | 16 | 40 | – | 16 | 110 | 48,600 |
| ▲ 08-00130-02000 | 20 | 50 | – | 20 | 135 | 75,500 |

**オーダー方法** MSE345 刃径(D)を指示してください。
When you order, indicate MSE345 (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-048に記載
●Recommended Milling Conditions are shown on page D-048.



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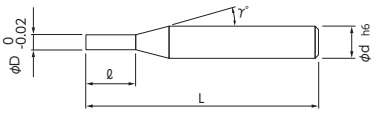
# MSE445

## 無限コーティング 4枚刃エンドミル
MUGEN-COATING 4-Flute End Mill




- 4 枚刃エンドミルに、NS 独自の無限コーティングを採用。
- 30° ネジレに比べ切削抵抗を軽減。
- ▲の規格は在庫が無くなり次第、販売終了となります。
- Our original MUGEN-COATING has been put on 4-flute end mill.
- Compared with 30° helix angle, it can be reduced cutting resistance.
- ▲ : The sizes will no longer be capable being sold after the stock runs out.

Side Face MG ∞ 4 45° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | ステンレス鋼 Stainless Steels |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | ◎ |
| チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin | 超耐熱合金 Heat Resistance Alloy |
| ○ | ○ | ◎ | ○ | ○ |

### ▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00140-00200 | 2 | 5 | 9° | 4 | 45 | 4,800 |
| 08-00140-00250 | 2.5 | 7 | 9° | 4 | 45 | 4,800 |
| 08-00140-00300 | 3 | 8 | 9° | 6 | 50 | 6,200 |
| 08-00140-00400 | 4 | 10 | 9° | 6 | 50 | 6,500 |
| 08-00140-00500 | 5 | 13 | 9° | 6 | 55 | 7,000 |
| 08-00140-00600 | 6 | 15 | – | 6 | 55 | 7,200 |
| 08-00140-00800 | 8 | 20 | – | 8 | 65 | 10,900 |
| 08-00140-01000 | 10 | 25 | – | 10 | 75 | 12,800 |
| 08-00140-01200 | 12 | 30 | – | 12 | 80 | 20,800 |
| ▲ 08-00140-01600 | 16 | 40 | – | 16 | 110 | 48,600 |
| ▲ 08-00140-02000 | 20 | 50 | – | 20 | 135 | 75,500 |

**オーダー方法** MSE445 刃径(D)を指示してください。
When you order, indicate MSE445 (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-050に記載
●Recommended Milling Conditions are shown on page D-050.

# MSE245

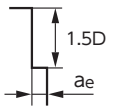
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM・SKD・SUS | | | 調質鋼 Prehardened Steels HPM・NAK | | |
|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 60～100m/min | | | 50～70m/min | | | 40～60m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | $min^{-1}$ | mm/min | | $min^{-1}$ | mm/min | | $min^{-1}$ | mm/min | |
| | | 側面 Side Milling | 溝 Slotting | | 側面 Side Milling | 溝 Slotting | | 側面 Side Milling | 溝 Slotting |
| 2 | 12,700 | 330 | 160 | 9,600 | 250 | 80 | 8,000 | 130 | 65 |
| 2.5 | 10,200 | 400 | 200 | 7,600 | 250 | 80 | 6,400 | 130 | 65 |
| 3 | 8,500 | 440 | 220 | 6,400 | 300 | 100 | 5,300 | 170 | 85 |
| 4 | 6,400 | 500 | 250 | 4,800 | 300 | 100 | 4,000 | 170 | 85 |
| 5 | 5,100 | 530 | 260 | 3,800 | 360 | 120 | 3,200 | 220 | 110 |
| 6 | 4,200 | 550 | 270 | 3,200 | 360 | 120 | 2,700 | 220 | 110 |
| 8 | 3,200 | 500 | 250 | 2,400 | 360 | 120 | 2,000 | 220 | 110 |
| 10 | 2,500 | 460 | 230 | 1,900 | 360 | 120 | 1,600 | 220 | 110 |
| 12 | 2,100 | 440 | 220 | 1,600 | 360 | 120 | 1,300 | 220 | 110 |

切り込み量 Depth of Cut

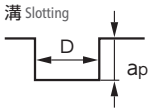
(D:刃径 Dia.)

側面 Side Milling




ae
φ2～2.5=0.1D
φ3～6=0.15D
φ8～12=0.2D

溝 Slotting




ap
φ2～3=0.35D
φ4～12=0.5D

備考 Notes

※切削油は発煙性の少ないものを使用してください。
※回転数と送り速度は、同じ割合で調整してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。
※Use cutting fluid with smoke retardant.
※Adjust both spindle speed and feed at the same rate.
※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.



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| 被削材 Work Material | 焼き入れ鋼 Hardened Steels SKD61 (~52HRC) | | | 耐熱合金 Heat Resistance Alloy | | | アルミニウム合金 Aluminum Alloy | | | 銅 Copper | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 20~40m/min | | | 15~25m/min | | | 100~200m/min | | | 80~150m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting |
| 2 | 4,800 | 100 | 50 | 3,200 | 60 | 30 | 31,800 | 1,300 | 450 | 24,000 | 1,200 | 400 |
| 2.5 | 3,800 | 100 | 50 | 2,500 | 60 | 30 | 25,400 | 1,300 | 450 | 19,000 | 1,200 | 400 |
| 3 | 3,200 | 130 | 65 | 2,100 | 70 | 35 | 21,200 | 1,300 | 450 | 16,000 | 1,200 | 400 |
| 4 | 2,400 | 130 | 65 | 1,600 | 70 | 35 | 16,000 | 1,300 | 450 | 12,000 | 1,200 | 400 |
| 5 | 1,900 | 150 | 75 | 1,300 | 80 | 40 | 12,700 | 1,300 | 450 | 9,600 | 1,200 | 400 |
| 6 | 1,600 | 150 | 75 | 1,100 | 80 | 40 | 10,600 | 1,300 | 450 | 8,000 | 1,200 | 400 |
| 8 | 1,200 | 150 | 75 | 800 | 80 | 40 | 8,000 | 1,100 | 380 | 6,000 | 1,200 | 400 |
| 10 | 1,000 | 150 | 75 | 600 | 80 | 40 | 6,300 | 1,000 | 350 | 4,800 | 1,200 | 400 |
| 12 | 800 | 150 | 75 | 500 | 80 | 40 | 5,300 | 1,000 | 350 | 4,000 | 1,200 | 400 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling 1D 0.02D / 溝 Slotting D 0.1D | | | 側面 Side Milling 1.5D 0.05D / 溝 Slotting D 0.1D | | | 側面 Side Milling 1.5D 0.2D / 溝 Slotting D ap | | | ap φ2~3=0.3D φ4~12=0.5D | | |
| 備考 Notes | ※切削油は発煙性の少ないものを使用してください。<br>※焼き入れ鋼を切削加工する場合は、オイルミストクーラントの使用をお奨めします。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。<br>※Use cutting fluid with smoke retardant.<br>※Recommend to use oil mist coolant for machining hardened steels.<br>※Adjust both spindle speed and feed at the same rate.<br>※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. | | | | | | | | | | | |

# MSE345

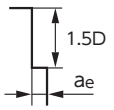
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM・SKD・SUS | | | 調質鋼 Prehardened Steels HPM・NAK | | |
|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 60～100m/min | | | 50～70m/min | | | 40～60m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | $min^{-1}$ | mm/min | | $min^{-1}$ | mm/min | | $min^{-1}$ | mm/min | |
| | | 側面 Side Milling | 溝 Slotting | | 側面 Side Milling | 溝 Slotting | | 側面 Side Milling | 溝 Slotting |
| 3 | 8,500 | 510 | 250 | 6,400 | 340 | 110 | 5,300 | 220 | 100 |
| 4 | 6,400 | 690 | 340 | 4,800 | 340 | 110 | 4,000 | 220 | 100 |
| 5 | 5,100 | 730 | 360 | 3,800 | 410 | 140 | 3,200 | 250 | 115 |
| 6 | 4,200 | 750 | 370 | 3,200 | 410 | 140 | 2,700 | 250 | 115 |
| 8 | 3,200 | 690 | 340 | 2,400 | 410 | 140 | 2,000 | 250 | 115 |
| 10 | 2,500 | 630 | 310 | 1,900 | 410 | 140 | 1,600 | 250 | 115 |
| 12 | 2,100 | 600 | 300 | 1,600 | 410 | 140 | 1,300 | 250 | 115 |
| 16 | 1,600 | 570 | 280 | 1,200 | 340 | 110 | 1,000 | 220 | 100 |
| 20 | 1,300 | 560 | 280 | 1,000 | 340 | 110 | 800 | 220 | 100 |

切り込み量 Depth of Cut

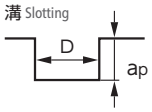
(D:刃径 Dia.)

側面 Side Milling




ae
φ3～6=0.15D
φ8～20=0.2D

溝 Slotting



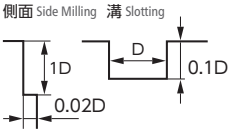
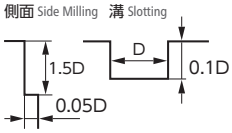
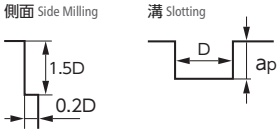

ap
φ3=0.35D
φ4～20=0.5D

備考 Notes

※切削油は発煙性の少ないものを使用してください。
※回転数と送り速度は、同じ割合で調整してください。
※ミーリングチャック、機械はできるだけ剛性のあるものをお奨めします。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。
※Use cutting fluid with smoke retardant.
※Adjust both spindle speed and feed at the same rate.
※Use rigid and precise machine and chuck holder.
※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.

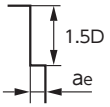
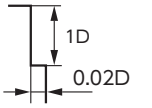
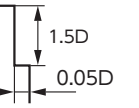


ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| 被削材 Work Material | 焼き入れ鋼 Hardened Steels SKD61 (~52HRC) | | | 耐熱合金 Heat Resistance Alloy | | | アルミニウム合金 Aluminum Alloy | | | 銅 Copper | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 20~40m/min | | | 15~25m/min | | | 150~200m/min | | | 80~150m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | $min^{-1}$ | mm/min | | $min^{-1}$ | mm/min | | $min^{-1}$ | mm/min | | $min^{-1}$ | mm/min | |
| | | 側面 Side Milling | 溝 Slotting | | 側面 Side Milling | 溝 Slotting | | 側面 Side Milling | 溝 Slotting | | 側面 Side Milling | 溝 Slotting |
| 3 | 3,200 | 190 | 85 | 2,100 | 80 | 40 | 21,200 | 1,900 | 650 | 15,900 | 1,500 | 500 |
| 4 | 2,400 | 190 | 85 | 1,600 | 80 | 40 | 16,000 | 1,900 | 650 | 11,900 | 1,500 | 500 |
| 5 | 1,900 | 220 | 110 | 1,300 | 100 | 50 | 12,700 | 1,900 | 650 | 9,600 | 1,500 | 500 |
| 6 | 1,600 | 220 | 110 | 1,100 | 100 | 50 | 10,600 | 1,900 | 650 | 8,000 | 1,500 | 500 |
| 8 | 1,200 | 220 | 110 | 800 | 100 | 50 | 8,000 | 1,700 | 600 | 6,000 | 1,500 | 500 |
| 10 | 1,000 | 220 | 110 | 600 | 100 | 50 | 6,300 | 1,500 | 520 | 4,800 | 1,500 | 500 |
| 12 | 800 | 220 | 110 | 500 | 100 | 50 | 5,300 | 1,400 | 500 | 4,000 | 1,500 | 500 |
| 16 | 600 | 190 | 85 | 400 | 80 | 40 | 4,000 | 1,200 | 420 | 3,000 | 1,500 | 500 |
| 20 | 500 | 190 | 85 | 300 | 80 | 40 | 3,200 | 1,200 | 420 | 2,400 | 1,500 | 500 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling 溝 Slotting   | | | 側面 Side Milling 溝 Slotting   | | | 側面 Side Milling 溝 Slotting   ap<br>φ3=0.3D<br>φ4~20=0.5D | | | | | |
| 備考 Notes | ※切削油は発煙性の少ないものを使用してください。<br>※焼き入れ鋼を切削加工する場合は、オイルミストクーラントの使用をお奨めします。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※ミーリングチャック、機械はできるだけ剛性のあるものをお奨めします。<br>※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。<br>※Use cutting fluid with smoke retardant.<br>※Recommend to use oil mist coolant for machining hardened steels.<br>※Adjust both spindle speed and feed at the same rate.<br>※Use rigid and precise machine and chuck holder.<br>※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. | | | | | | | | | | | |

# MSE445

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM・SKD・SUS | | 調質鋼 Prehardened Steels HPM・NAK | | 焼き入れ鋼 Hardened Steels SKD61 (~52HRC) | | 耐熱合金 Heat Resistance Alloy | |
|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 60~100m/min | | 50~70m/min | | 40~60m/min | | 20~40m/min | | 15~25m/min | |
| 刃 径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 2 | 12,700 | 560 | 9,600 | 325 | 8,000 | 220 | 4,800 | 210 | 3,200 | 100 |
| 2.5 | 10,200 | 670 | 7,600 | 325 | 6,400 | 220 | 3,800 | 210 | 2,500 | 100 |
| 3 | 8,500 | 750 | 6,400 | 390 | 5,300 | 240 | 3,200 | 260 | 2,100 | 130 |
| 4 | 6,400 | 840 | 4,800 | 390 | 4,000 | 240 | 2,400 | 260 | 1,600 | 130 |
| 5 | 5,100 | 900 | 3,800 | 470 | 3,200 | 260 | 1,900 | 300 | 1,300 | 150 |
| 6 | 4,200 | 920 | 3,200 | 470 | 2,700 | 260 | 1,600 | 300 | 1,100 | 150 |
| 8 | 3,200 | 840 | 2,400 | 470 | 2,000 | 260 | 1,200 | 300 | 800 | 150 |
| 10 | 2,500 | 770 | 1,900 | 470 | 1,600 | 260 | 1,000 | 300 | 600 | 150 |
| 12 | 2,100 | 740 | 1,600 | 470 | 1,300 | 260 | 800 | 300 | 500 | 150 |
| 16 | 1,600 | 700 | 1,200 | 390 | 1,000 | 220 | 600 | 260 | 400 | 130 |
| 20 | 1,300 | 690 | 1,000 | 390 | 800 | 220 | 500 | 260 | 300 | 130 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   ae<br>φ2~2.5=0.1D<br>φ3~6=0.15D<br>φ8~20=0.2D | | | | | | 側面 Side Milling   | | 側面 Side Milling   | |
| 備 考 Notes | ※切削油は発煙性の少ないものを使用してください。<br>※焼き入れ鋼を切削加工する場合は、オイルミストクーラントの使用をお奨めします。<br>※側面切削でのみ、使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。<br>※Use cutting fluid with smoke retardant.<br>※Recommend to use oil mist coolant for machining hardened steels.<br>※Available only for side cutting.<br>※Adjust both spindle speed and feed at the same rate.<br>※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. | | | | | | | | | |



ŞEVKET ÖĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MSE445

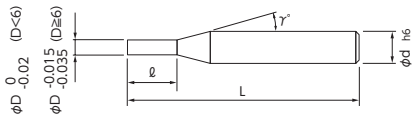
## 高速切削条件参考表 Recommended High Speed Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM･SKD･SUS | | 調質鋼 Prehardened Steels HPM･NAK | | 焼き入れ鋼 Hardened Steels SKD61 (～52HRC) | |
|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 250m/min | | 200m/min | | 160m/min | | 80m/min | |
| 刃 径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 6 | 13,300 | 2,900 | 10,600 | 2,250 | 8,500 | 1,800 | 4,250 | 600 |
| 8 | 10,000 | 2,900 | 8,000 | 2,250 | 6,400 | 1,800 | 3,200 | 600 |
| 10 | 8,000 | 2,900 | 6,400 | 2,250 | 5,100 | 1,800 | 2,550 | 600 |
| 12 | 6,600 | 2,900 | 5,300 | 2,250 | 4,200 | 1,800 | 2,100 | 600 |
| 16 | 5,000 | 2,300 | 4,000 | 1,700 | 3,200 | 1,350 | 1,600 | 450 |
| 20 | 4,000 | 2,300 | 3,200 | 1,700 | 2,500 | 1,350 | 1,300 | 450 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling φ6～8 1D 0.01D φ10～20 1.5D 0.02D | | | | | | 側面 Side Milling 1D 0.01D | |
| 備 考 Notes | ※切削油は発煙性の少ないものを使用してください。<br>※焼き入れ鋼を切削加工する場合は、オイルミストクーラントの使用をお奨めします。<br>※側面切削でのみ、使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。<br>※Use cutting fluid with smoke retardant.<br>※Recommend to use oil mist coolant for machining hardened steels.<br>※Available only for side cutting.<br>※Adjust both spindle speed and feed at the same rate.<br>※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. | | | | | | | |

# MSZ345

特許取得 PAT. No. 3811129

## 無限コーティング パワーZエンドミル
MUGEN-COATING 3-Flute POWER"Z"End Mill




技術資料 K-025

Slot Plunge Side Face MG ∞ 3 45°

●新開発の特殊刃形状で、加工能力が大幅アップ。
●突込み加工から溝加工まで従来にない高能率加工を実現！
●New flute design brought a remarkable shearing ability.
●High efficient machining is realized both for plunge cutting and slotting.

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | | | ○ | | | | |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00133-00100 | 1 | 1.5 | 9° | 4 | 45 | 6,000 |
| 08-00133-00110 | 1.1 | 1.7 | 9° | 4 | 45 | 8,100 ▌ |
| 08-00133-00120 | 1.2 | 1.8 | 9° | 4 | 45 | 8,100 ▌ |
| 08-00133-00130 | 1.3 | 2 | 9° | 4 | 45 | 8,100 ▌ |
| 08-00133-00140 | 1.4 | 2.1 | 9° | 4 | 45 | 8,100 ▌ |
| 08-00133-00150 | 1.5 | 2.3 | 9° | 4 | 45 | 6,000 |
| 08-00133-00160 | 1.6 | 2.4 | 9° | 4 | 45 | 8,100 ▌ |
| 08-00133-00170 | 1.7 | 2.6 | 9° | 4 | 45 | 8,100 ▌ |
| 08-00133-00180 | 1.8 | 2.7 | 9° | 4 | 45 | 8,100 ▌ |
| 08-00133-00190 | 1.9 | 2.9 | 9° | 4 | 45 | 8,100 ▌ |
| 08-00133-00200 | 2 | 3 | 9° | 4 | 45 | 5,800 |
| 08-00133-00210 | 2.1 | 3.2 | 9° | 4 | 45 | 7,800 ▌ |
| 08-00133-00220 | 2.2 | 3.3 | 9° | 4 | 45 | 7,800 ▌ |
| 08-00133-00230 | 2.3 | 3.5 | 9° | 4 | 45 | 7,800 ▌ |
| 08-00133-00240 | 2.4 | 3.6 | 9° | 4 | 45 | 7,800 ▌ |
| 08-00133-00250 | 2.5 | 3.8 | 9° | 4 | 45 | 5,800 |
| 08-00133-00260 | 2.6 | 3.9 | 9° | 4 | 45 | 9,300 ▌ |
| 08-00133-00270 | 2.7 | 4.1 | 9° | 4 | 45 | 9,300 ▌ |
| 08-00133-00280 | 2.8 | 4.2 | 9° | 4 | 45 | 9,300 ▌ |
| 08-00133-00290 | 2.9 | 4.5 | 9° | 4 | 45 | 9,300 ▌ |
| 08-00133-00300 | 3 | 6 | 9° | 6 | 50 | 6,900 |
| 08-00133-00310 | 3.1 | 6.2 | 9° | 6 | 50 | 9,700 ▌ |
| 08-00133-00320 | 3.2 | 6.4 | 9° | 6 | 50 | 9,700 ▌ |
| 08-00133-00330 | 3.3 | 6.6 | 9° | 6 | 50 | 9,700 ▌ |
| 08-00133-00340 | 3.4 | 6.8 | 9° | 6 | 50 | 9,700 ▌ |
| 08-00133-00350 | 3.5 | 7 | 9° | 6 | 50 | 9,700 ▌ |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00133-00360 | 3.6 | 7.2 | 9° | 6 | 50 | 9,700 ▌ |
| 08-00133-00370 | 3.7 | 7.4 | 9° | 6 | 50 | 9,700 ▌ |
| 08-00133-00380 | 3.8 | 7.6 | 9° | 6 | 50 | 9,700 ▌ |
| 08-00133-00390 | 3.9 | 7.8 | 9° | 6 | 50 | 9,700 ▌ |
| 08-00133-00400 | 4 | 8 | 9° | 6 | 50 | 7,200 |
| 08-00133-00410 | 4.1 | 8.2 | 9° | 6 | 50 | 10,300 ▌ |
| 08-00133-00420 | 4.2 | 8.4 | 9° | 6 | 50 | 10,300 ▌ |
| 08-00133-00430 | 4.3 | 8.6 | 9° | 6 | 50 | 10,300 ▌ |
| 08-00133-00440 | 4.4 | 8.8 | 9° | 6 | 50 | 10,300 ▌ |
| 08-00133-00450 | 4.5 | 9 | 9° | 6 | 50 | 10,300 ▌ |
| 08-00133-00460 | 4.6 | 9.2 | 9° | 6 | 50 | 10,300 ▌ |
| 08-00133-00470 | 4.7 | 9.4 | 9° | 6 | 50 | 10,300 ▌ |
| 08-00133-00480 | 4.8 | 9.6 | 9° | 6 | 50 | 10,300 ▌ |
| 08-00133-00490 | 4.9 | 9.8 | 9° | 6 | 50 | 10,300 ▌ |
| 08-00133-00500 | 5 | 10 | 9° | 6 | 50 | 7,700 |
| 08-00133-00510 | 5.1 | 10.2 | 9° | 6 | 55 | 10,800 ▌ |
| 08-00133-00520 | 5.2 | 10.4 | 9° | 6 | 55 | 10,800 ▌ |
| 08-00133-00530 | 5.3 | 10.6 | 9° | 6 | 55 | 10,800 ▌ |
| 08-00133-00540 | 5.4 | 10.8 | 9° | 6 | 55 | 10,800 ▌ |
| 08-00133-00550 | 5.5 | 11.2 | 9° | 6 | 55 | 10,800 ▌ |
| 08-00133-00560 | 5.6 | 11.4 | 9° | 6 | 55 | 10,800 ▌ |
| 08-00133-00570 | 5.7 | 11.6 | 9° | 6 | 55 | 10,800 ▌ |
| 08-00133-00580 | 5.8 | 12 | 9° | 6 | 55 | 10,800 ▌ |
| 08-00133-00590 | 5.9 | 12.4 | 9° | 6 | 55 | 10,800 ▌ |
| 08-00133-00600 | 6 | 13 | – | 6 | 55 | 8,000 |

オーダー方法
MSZ345 刃径(D)を指示してください。
When you order, indicate MSZ345 (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-054に記載
●Recommended Milling Conditions are shown on page D-054.
●▌の規格・サイズは特定商社在庫となります。詳しくはお問い合わせください。
●▌:Semi-standard item, please inquire for price and delivery.



SEVKET GÜLÜ MAKINA TICARET VE SAN. LTD. ŞTI.

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00133-00610 | 6.1 | 13 | 9° | 8 | 65 | 15,400 |
| 08-00133-00620 | 6.2 | 13 | 9° | 8 | 65 | 15,400 |
| 08-00133-00630 | 6.3 | 13.5 | 9° | 8 | 65 | 15,400 |
| 08-00133-00640 | 6.4 | 13.5 | 9° | 8 | 65 | 15,400 |
| 08-00133-00650 | 6.5 | 13.5 | 9° | 8 | 65 | 15,400 |
| 08-00133-00660 | 6.6 | 14 | 9° | 8 | 65 | 15,400 |
| 08-00133-00670 | 6.7 | 14 | 9° | 8 | 65 | 15,400 |
| 08-00133-00680 | 6.8 | 15 | 9° | 8 | 65 | 15,400 |
| 08-00133-00690 | 6.9 | 15 | 9° | 8 | 65 | 15,400 |
| 08-00133-00700 | 7 | 16 | 9° | 8 | 65 | 11,500 |
| 08-00133-00710 | 7.1 | 16 | 9° | 8 | 65 | 15,400 |
| 08-00133-00720 | 7.2 | 16 | 9° | 8 | 65 | 15,400 |
| 08-00133-00730 | 7.3 | 16 | 9° | 8 | 65 | 15,400 |
| 08-00133-00740 | 7.4 | 16 | 9° | 8 | 65 | 15,400 |
| 08-00133-00750 | 7.5 | 16 | 9° | 8 | 65 | 15,400 |
| 08-00133-00760 | 7.6 | 17 | 9° | 8 | 65 | 15,400 |
| 08-00133-00770 | 7.7 | 17 | 9° | 8 | 65 | 15,400 |
| 08-00133-00780 | 7.8 | 17 | 9° | 8 | 65 | 15,400 |
| 08-00133-00790 | 7.9 | 17 | 9° | 8 | 65 | 15,400 |
| 08-00133-00800 | 8 | 19 | – | 8 | 65 | 11,500 |
| 08-00133-00810 | 8.1 | 18 | 9° | 10 | 75 | 18,000 |
| 08-00133-00820 | 8.2 | 18 | 9° | 10 | 75 | 18,000 |
| 08-00133-00830 | 8.3 | 18 | 9° | 10 | 75 | 18,000 |
| 08-00133-00840 | 8.4 | 18 | 9° | 10 | 75 | 18,000 |
| 08-00133-00850 | 8.5 | 18 | 9° | 10 | 75 | 18,000 |
| 08-00133-00860 | 8.6 | 19 | 9° | 10 | 75 | 18,000 |
| 08-00133-00870 | 8.7 | 19 | 9° | 10 | 75 | 18,000 |
| 08-00133-00880 | 8.8 | 19 | 9° | 10 | 75 | 18,000 |
| 08-00133-00890 | 8.9 | 19 | 9° | 10 | 75 | 18,000 |
| 08-00133-00900 | 9 | 19 | 9° | 10 | 75 | 13,400 |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00133-00910 | 9.1 | 20 | 9° | 10 | 75 | 18,000 |
| 08-00133-00920 | 9.2 | 20 | 9° | 10 | 75 | 18,000 |
| 08-00133-00930 | 9.3 | 20 | 9° | 10 | 75 | 18,000 |
| 08-00133-00940 | 9.4 | 20 | 9° | 10 | 75 | 18,000 |
| 08-00133-00950 | 9.5 | 20 | 9° | 10 | 75 | 18,000 |
| 08-00133-00960 | 9.6 | 21 | 9° | 10 | 75 | 18,000 |
| 08-00133-00970 | 9.7 | 21 | 9° | 10 | 75 | 18,000 |
| 08-00133-00980 | 9.8 | 21 | 9° | 10 | 75 | 18,000 |
| 08-00133-00990 | 9.9 | 21 | 9° | 10 | 75 | 18,000 |
| 08-00133-01000 | 10 | 22 | – | 10 | 75 | 13,400 |
| 08-00133-01010 | 10.1 | 22 | 9° | 12 | 80 | 26,400 |
| 08-00133-01020 | 10.2 | 22 | 9° | 12 | 80 | 26,400 |
| 08-00133-01030 | 10.3 | 22 | 9° | 12 | 80 | 26,400 |
| 08-00133-01040 | 10.4 | 22 | 9° | 12 | 80 | 26,400 |
| 08-00133-01050 | 10.5 | 22 | 9° | 12 | 80 | 26,400 |
| 08-00133-01060 | 10.6 | 22 | 9° | 12 | 80 | 26,400 |
| 08-00133-01070 | 10.7 | 22 | 9° | 12 | 80 | 26,400 |
| 08-00133-01080 | 10.8 | 22 | 9° | 12 | 80 | 26,400 |
| 08-00133-01090 | 10.9 | 22 | 9° | 12 | 80 | 26,400 |
| 08-00133-01100 | 11 | 22 | 9° | 12 | 80 | 19,600 |
| 08-00133-01110 | 11.1 | 25 | 9° | 12 | 80 | 26,400 |
| 08-00133-01120 | 11.2 | 25 | 9° | 12 | 80 | 26,400 |
| 08-00133-01130 | 11.3 | 25 | 9° | 12 | 80 | 26,400 |
| 08-00133-01140 | 11.4 | 25 | 9° | 12 | 80 | 26,400 |
| 08-00133-01150 | 11.5 | 25 | 9° | 12 | 80 | 26,400 |
| 08-00133-01160 | 11.6 | 25 | 9° | 12 | 80 | 26,400 |
| 08-00133-01170 | 11.7 | 25 | 9° | 12 | 80 | 26,400 |
| 08-00133-01180 | 11.8 | 25 | 9° | 12 | 80 | 26,400 |
| 08-00133-01190 | 11.9 | 25 | 9° | 12 | 80 | 26,400 |
| 08-00133-01200 | 12 | 26 | – | 12 | 80 | 19,600 |

# MSZ345

## 切削条件参考表 Recommended Milling Conditions

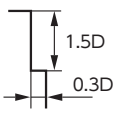
技術資料 K-025

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | | 合金鋼 Alloy Steels SKD・SCM | | | | ステンレス鋼 Stainless Steels SUS304 | | | | 調質鋼 Prehardened Steels HPM・NAK(～40HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 90m/min | | | | 50m/min | | | | 35m/min | | | | 55m/min | | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed 突込み Drilling | 送り速度 Feed 溝 Slotting | 送り速度 Feed 側面 Side Milling | 回転数 Spindle Speed | 送り速度 Feed 突込み Drilling | 送り速度 Feed 溝 Slotting | 送り速度 Feed 側面 Side Milling | 回転数 Spindle Speed | 送り速度 Feed 突込み Drilling | 送り速度 Feed 溝 Slotting | 送り速度 Feed 側面 Side Milling | 回転数 Spindle Speed | 送り速度 Feed 突込み Drilling | 送り速度 Feed 溝 Slotting | 送り速度 Feed 側面 Side Milling |
| | $min^{-1}$ | mm/min | | | $min^{-1}$ | mm/min | | | $min^{-1}$ | mm/min | | | $min^{-1}$ | mm/min | | |
| 1 | 15,000 | 70 | 200 | 400 | 15,000 | 40 | 100 | 210 | 10,000 | 20 | 70 | 200 | 15,000 | 50 | 100 | 200 |
| 1.5 | 13,000 | 70 | 250 | 500 | 13,000 | 40 | 120 | 270 | 7,000 | 20 | 70 | 250 | 13,000 | 50 | 130 | 250 |
| 2 | 11,000 | 100 | 300 | 600 | 8,000 | 50 | 140 | 290 | 5,000 | 20 | 75 | 250 | 10,000 | 70 | 150 | 300 |
| 2.5 | 10,000 | 100 | 400 | 700 | 7,000 | 60 | 160 | 330 | 4,000 | 20 | 75 | 250 | 8,000 | 90 | 170 | 350 |
| 3 | 9,600 | 200 | 550 | 800 | 5,300 | 80 | 200 | 400 | 3,600 | 20 | 100 | 250 | 5,800 | 100 | 250 | 400 |
| 4 | 7,200 | 210 | 650 | 900 | 4,000 | 100 | 250 | 400 | 2,800 | 30 | 100 | 250 | 4,400 | 110 | 250 | 400 |
| 5 | 5,700 | 260 | 700 | 1,000 | 3,200 | 100 | 250 | 450 | 2,200 | 40 | 120 | 300 | 3,500 | 120 | 300 | 500 |
| 6 | 4,800 | 300 | 720 | 1,200 | 2,700 | 130 | 300 | 450 | 1,800 | 40 | 120 | 300 | 3,000 | 130 | 330 | 600 |
| 7 | 4,100 | 300 | 740 | 1,100 | 2,300 | 120 | 300 | 450 | 1,600 | 40 | 120 | 300 | 2,500 | 110 | 330 | 600 |
| 8 | 3,600 | 300 | 760 | 1,000 | 2,000 | 100 | 300 | 400 | 1,400 | 30 | 120 | 300 | 2,200 | 100 | 330 | 600 |
| 9 | 3,200 | 300 | 770 | 900 | 1,800 | 80 | 250 | 380 | 1,200 | 20 | 100 | 300 | 1,900 | 90 | 250 | 500 |
| 10 | 3,000 | 300 | 800 | 900 | 1,600 | 80 | 200 | 350 | 1,100 | 20 | 100 | 300 | 1,700 | 80 | 200 | 400 |
| 11 | 2,800 | 300 | 760 | 850 | 1,500 | 80 | 200 | 350 | 1,000 | 20 | 100 | 280 | 1,600 | 80 | 200 | 400 |
| 12 | 2,600 | 280 | 740 | 850 | 1,400 | 70 | 180 | 340 | 900 | 20 | 100 | 270 | 1,500 | 70 | 180 | 340 |

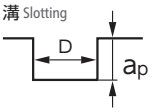
**切り込み量 Depth of Cut**

(D:刃径 Dia.)

側面 Side Milling




溝 Slotting




ap
φ1～2.9=0.5D (SKD・SCM・SUS304=0.25D)
φ3～12=1D (SKD・SCM・SUS304=0.5D)

**備考 Notes**

※機械剛性によって切り込み量を調整してください。
　また実際の加工では加工形状、目的、使用機械等により条件を調整してください。
※回転数と送り速度は同じ割合で調整してください。
※エアーブローの使用をお奨めします。
※ステンレス鋼の場合には、不水溶性切削油をお奨めします。
※ステンレス鋼の突込み加工時はステップ加工をお奨めします。
※切りくずの排出に注意してください。
※ミーリングチャック、機械は出来るだけ剛性のあるものをお奨めします。
※工具突出し量は出来るだけ短くしてください。
※Adjust Depth of Cut according to machine rigidity.
　Final milling conditions are subject to machining profile, purpose and machine status.
※Adjust both spindle speed and feed at the same rate.
※Air blow is recommended.
※Non-water cutting fluid is recommended for cutting stainless steels.
※Step machining is recommended for drilling stainless steels.
※Chip disposal is important.
※Use a rigid and precise machine and chuck holder.
※Overhang of end mill should be as short as possible from spindle nose.



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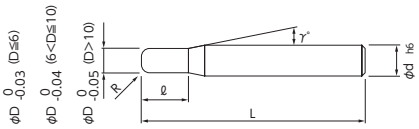
# MSX440

## 無限コーティング パワーエンドミル
MUGEN-COATING 4-Flute POWER End Mill




●不等リードの採用により、ステンレス鋼・難削材の中・荒加工に最適。
●前加工の時間短縮に貢献。
●▲の規格は在庫が無くなり次第、販売終了となります。
●It is very suitable for roughing and semi-finishing on stainless steels and tough materials by unequal flute design.
●High performance for reducing roughing time.
●▲: The sizes will no longer be capable being sold after the stock runs out.

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | ◎ |

| 超耐熱合金 Heat Resistance Alloy |
|---|
| ◎ |

### ▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (R)コーナー半径 Corner Radius | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 08-00144-00300 | 3 | 8 | R0.2 | 12° | 6 | 55 | 6,200 |
| 08-00144-00400 | 4 | 11 | R0.2 | 12° | 6 | 55 | 6,500 |
| 08-00144-00500 | 5 | 13 | R0.2 | 12° | 6 | 55 | 7,100 |
| 08-00144-00600 | 6 | 13 | R0.3 | – | 6 | 55 | 7,200 |
| 08-00144-00700 | 7 | 19 | R0.3 | 12° | 8 | 60 | 10,400 |
| 08-00144-00800 | 8 | 19 | R0.3 | – | 8 | 60 | 10,400 |
| 08-00144-00900 | 9 | 22 | R0.3 | 12° | 10 | 70 | 12,100 |
| 08-00144-01000 | 10 | 22 | R0.3 | – | 10 | 70 | 12,100 |
| 08-00144-01100 | 11 | 26 | R0.3 | 12° | 12 | 80 | 19,800 |
| 08-00144-01200 | 12 | 26 | R0.3 | – | 12 | 80 | 17,900 |
| ▲ 08-00144-01300 | 13 | 26 | R0.7 | 12° | 16 | 90 | 35,700 |
| ▲ 08-00144-01400 | 14 | 26 | R0.7 | 12° | 16 | 90 | 35,700 |
| ▲ 08-00144-01500 | 15 | 32 | R1 | 12° | 16 | 90 | 35,700 |
| ▲ 08-00144-01600 | 16 | 32 | R1 | – | 16 | 90 | 35,700 |
| ▲ 08-00144-01800 | 18 | 32 | R1 | 12° | 20 | 105 | 59,900 |
| ▲ 08-00144-02000 | 20 | 38 | R1 | – | 20 | 105 | 58,700 |

**オーダー方法** MSX440 刃径(D)を指示してください。
When you order, indicate MSX440 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-056に記載
●Recommended Milling Conditions are shown on page D-056.

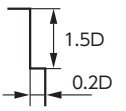
# MSX440

## 切削条件参考表 Recommended Milling Conditions

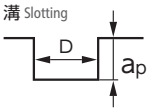
| 被削材 Work Material | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK55・NAK80・HPM-1 | | | | ステンレス鋼 Stainless Steels SUS304 | | | |
|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 100～150m/min | | 50～70m/min | | 50～70m/min | | 30～55m/min | |
| 刃 径 Dia. | 側面 Side Milling | | 溝 Slotting | | 側面 Side Milling | | 溝 Slotting | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 3 | 16,000 | 1,300 | 7,000 | 300 | 8,500 | 680 | 5,600 | 100 |
| 4 | 12,000 | 1,400 | 5,300 | 300 | 6,400 | 770 | 4,000 | 100 |
| 5 | 9,500 | 1,500 | 4,200 | 300 | 5,000 | 800 | 3,000 | 100 |
| 6 | 8,000 | 2,200 | 3,500 | 400 | 4,200 | 840 | 2,800 | 100 |
| 8 | 6,000 | 1,800 | 2,600 | 400 | 3,200 | 630 | 1,800 | 150 |
| 10 | 4,800 | 1,300 | 2,000 | 400 | 2,500 | 560 | 1,600 | 150 |
| 12 | 4,000 | 1,000 | 1,700 | 400 | 2,100 | 470 | 1,200 | 150 |
| 14 | 3,400 | 900 | 1,500 | 300 | 1,800 | 400 | 1,000 | 120 |
| 16 | 3,000 | 800 | 1,400 | 300 | 1,600 | 390 | 800 | 120 |
| 18 | 2,600 | 700 | 950 | 250 | 1,400 | 350 | 800 | 100 |
| 20 | 2,400 | 650 | 950 | 250 | 1,200 | 330 | 700 | 100 |

**切り込み量 Depth of Cut**
(D:刃径 Dia.)

側面 Side Milling




溝 Slotting




ap
φ3～5=0.5D (SUS:φ3～6=0.5D)
φ6～12=1D (SUS:φ8～12=1D)
φ13～16=0.5D
φ18～20=0.3D

**備 考 Notes**

※機械剛性によって切り込み量を調整してください。
　また実際の加工では加工形状、目的、使用機械等により条件を調整してください。
※回転数と送り速度は同じ割合で調整してください。
※ステンレス鋼の場合には、不水溶性切削油をお奨めします。
※溝切削時は、切りくずの排出に注意してください。
※ミーリングチャック、機械は出来るだけ剛性のあるものをお奨めします。
※工具突出し量は出来るだけ短くしてください。
※Adjust Depth of Cut according to machine rigidity.
　Final milling conditions are subject to machining profile, purpose and machine status.
※Adjust both spindle speed and feed at the same rate.
※Non-water cutting fluid is recommended for cutting stainless steels.
※Chip disposal is important for slotting.
※Use a rigid and precise machine and chuck holder.
※Overhang of end mill should be as short as possible from spindle nose.



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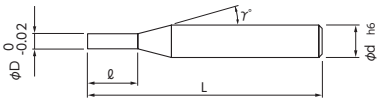
# MHDH445

## 無限コーティングプレミアム 高硬度用 4枚刃スクエアエンドミル
MUGEN-COATING PREMIUM 4-Flute Square End Mill for Hardened Steel




●高硬度領域 (48 ～ 65HRC) の長時間の加工でも、安定した長寿命を実現。
●刃形状を追求し、倒れ量と加工精度を改善。
●Realized stably long tool life against high hardened steels (48～65HRC).
●Improved milling deflection and accuracy by advanced flute design.

Slot Side Face MG ∞ Premium 4 45° ≦65 HRC

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～ 55HRC | 焼き入れ鋼 Hardened Steels 55HRC ～ |
|---|---|---|---|---|
| | | | ◎ | ◎ |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹 脂 Resin |
| | | | | |

★再研磨可能(詳細はお問い合わせください。)

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

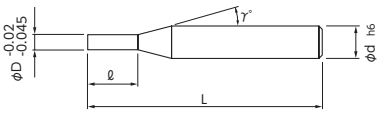
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00427-00100 | 1 | 2 | 12° | 6 | 60 | 6,300 |
| 08-00427-00150 | 1.5 | 3 | 12° | 6 | 60 | 6,300 |
| 08-00427-00200 | 2 | 4 | 12° | 6 | 60 | 6,300 |
| ★ 08-00427-00300 | 3 | 6 | 12° | 6 | 60 | 7,300 |
| ★ 08-00427-00400 | 4 | 8 | 12° | 6 | 60 | 7,900 |

**オーダー方法** MHDH445 刃径(D)を指示してください。
When you order, indicate MHDH445 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-058に記載
●Recommended Milling Conditions are shown on page D-058.

# MHDH645

## 無限コーティングプレミアム 高硬度用 6枚刃スクエアエンドミル
MUGEN-COATING PREMIUM 6-Flute Square End Mill for Hardened Steel




●刃長は 2D タイプと 3D タイプをラインナップ。
●高硬度領域 (48 ～ 65HRC) の長時間の加工でも、安定した長寿命を実現。
●刃形状を追求し、倒れ量と加工精度を改善。
●L/D=2 and L/D=3 length of cut selection.
●Realized stably long tool life against high hardened steels (48～65HRC).
●Improved milling deflection and accuracy by advanced flute design.

Slot Side Face MG ∞ Premium 6 45° ≦65 HRC

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～ 55HRC | 焼き入れ鋼 Hardened Steels 55HRC ～ |
|---|---|---|---|---|
| | | | ◎ | ◎ |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹 脂 Resin |
| | | | | |

★再研磨可能(詳細はお問い合わせください。)

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| ★ 08-00428-00500 | 5 | 10 | 12° | 6 | 60 | 8,400 |
| ★ 08-00428-00501 | | 15 | 12° | 6 | 65 | 9,300 |
| ★ 08-00428-00600 | 6 | 12 | – | 6 | 60 | 9,100 |
| ★ 08-00428-00601 | | 18 | – | 6 | 65 | 10,100 |
| ★ 08-00428-00800 | 8 | 16 | – | 8 | 65 | 12,400 |
| ★ 08-00428-00801 | | 24 | – | 8 | 70 | 13,800 |
| ★ 08-00428-01000 | 10 | 20 | – | 10 | 75 | 16,500 |
| ★ 08-00428-01001 | | 30 | – | 10 | 80 | 18,400 |
| ★ 08-00428-01200 | 12 | 24 | – | 12 | 80 | 21,100 |
| ★ 08-00428-01201 | | 36 | – | 12 | 90 | 23,400 |

**オーダー方法** MHDH645 刃径(D)×刃長(ℓ)を指示してください。
When you order, indicate MHDH645 (D)×(ℓ).

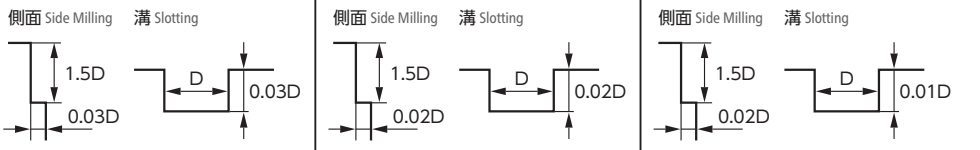
※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-058に記載
●Recommended Milling Conditions are shown on page D-058.

# MHDH445・MHDH645

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | 焼き入れ鋼 Hardened Steels HPM-38・STAVAX・SKD61 (~55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (~62HRC) | | | | ハイス High Speed Tool Steels SKH (~65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 刃長 Length of Cut | 側面 Side Milling | | 溝 Slotting | | 側面 Side Milling | | 溝 Slotting | | 側面 Side Milling | | 溝 Slotting | |
| | | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 2 | 30,000 | 800 | 24,000 | 400 | 25,000 | 500 | 20,000 | 300 | 20,000 | 240 | 16,000 | 120 |
| 1.5 | 3 | 20,000 | 860 | 16,000 | 460 | 16,000 | 560 | 12,000 | 380 | 14,000 | 330 | 10,000 | 160 |
| 2 | 4 | 15,000 | 920 | 12,000 | 500 | 12,000 | 630 | 10,000 | 420 | 10,000 | 480 | 8,000 | 240 |
| 3 | 6 | 10,000 | 1,000 | 8,000 | 580 | 8,000 | 700 | 7,500 | 500 | 7,000 | 560 | 6,000 | 280 |
| 4 | 8 | 8,500 | 1,200 | 7,500 | 620 | 7,000 | 800 | 6,000 | 540 | 6,000 | 600 | 5,000 | 300 |
| 5 | 10 | 7,600 | 1,600 | 6,800 | 900 | 6,200 | 1,200 | 5,600 | 600 | 5,300 | 800 | 4,800 | 350 |
| | 15 | 6,800 | 1,400 | 6,000 | 600 | 5,600 | 1,000 | 5,000 | 400 | 4,800 | 600 | 4,200 | 200 |
| 6 | 12 | 6,400 | 1,800 | 5,800 | 950 | 5,300 | 1,200 | 4,800 | 600 | 4,600 | 800 | 4,200 | 350 |
| | 18 | 5,800 | 1,600 | 5,000 | 600 | 4,800 | 1,000 | 4,200 | 400 | 4,200 | 600 | 3,600 | 200 |
| 8 | 16 | 4,800 | 2,000 | 4,300 | 1,000 | 4,000 | 1,400 | 3,600 | 700 | 3,400 | 1,000 | 3,000 | 400 |
| | 24 | 4,300 | 1,800 | 3,800 | 700 | 3,600 | 1,200 | 3,200 | 500 | 3,000 | 800 | 2,700 | 250 |
| 10 | 20 | 3,800 | 2,000 | 3,400 | 1,000 | 3,200 | 1,600 | 2,800 | 800 | 2,600 | 1,000 | 2,300 | 500 |
| | 30 | 3,400 | 1,800 | 3,000 | 800 | 2,800 | 1,400 | 2,500 | 600 | 2,300 | 800 | 2,000 | 300 |
| 12 | 24 | 3,200 | 2,000 | 2,800 | 1,000 | 2,600 | 1,600 | 2,300 | 800 | 2,200 | 1,000 | 2,000 | 500 |
| | 36 | 2,800 | 1,800 | 2,500 | 800 | 2,300 | 1,400 | 2,000 | 600 | 2,000 | 800 | 1,800 | 300 |

切り込み量 Depth of Cut (D:刃径 Dia.)




備考 Notes

※機械、チャックは剛性のある精度の高い物を使用してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整してください。
※回転数と送り速度は、同じ割合で調整してください。
※エアーブローまたはオイルミストの使用をお奨めします。
※Use a rigid and precise machine and chuck holder.
※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.
※Adjust both spindle speed and feed at the same rate.
※Use oilmist coolant or air blow.



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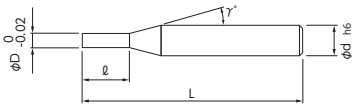
# MHD445

## 無限コーティング 高硬度加工用4枚刃エンドミル
MUGEN-COATING 4-Flute End Mill for Hardened Steel




●高硬度領域（48 ～ 65HRC）の仕上げ加工に最適。
●倒れの少ない精密仕上加工を実現。
●Machineable to high hardened steels (48～65HRC).
●Realized high precision finishing without the deflection.

Slot Side Face MG ∞ 4 45° ≦65 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| | | | ◎ | ◎ |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹 脂 Resin |
| | | | | |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

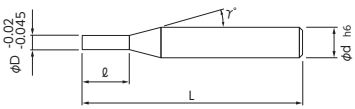
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00400-00100 | 1 | 1.5 | 12° | 6 | 60 | 6,300 |
| 08-00400-00150 | 1.5 | 2.5 | 12° | 6 | 60 | 6,300 |
| 08-00400-00200 | 2 | 4 | 12° | 6 | 60 | 6,300 |
| 08-00400-00300 | 3 | 6 | 12° | 6 | 60 | 8,200 |
| 08-00400-00400 | 4 | 8 | 12° | 6 | 60 | 8,500 |

オーダー方法 MHD445 刃径(D)を指示してください。
When you order, indicate MHD445 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-060に記載
●Recommended Milling Conditions are shown on page D-060.

# MHD645

## 無限コーティング 高硬度加工用6枚刃エンドミル
MUGEN-COATING 6-Flute End Mill for Hardened Steel




●高硬度領域（48 ～ 65HRC）の仕上げ加工に最適。
●倒れの少ない精密仕上加工を実現。
●Machineable to high hardened steels (48～65HRC).
●Realized high precision finishing without the deflection.

Slot Side Face MG ∞ 6 45° ≦65 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| | | | ◎ | ◎ |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹 脂 Resin |
| | | | | |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00410-00500 | 5 | 10 | 12° | 6 | 60 | 9,300 |
| 08-00410-00600 | 6 | 15 | – | 6 | 60 | 9,500 |
| 08-00410-00800 | 8 | 20 | – | 8 | 65 | 14,300 |
| 08-00410-01000 | 10 | 25 | – | 10 | 75 | 16,900 |
| 08-00410-01200 | 12 | 30 | – | 12 | 80 | 27,200 |

オーダー方法 MHD645 刃径(D)を指示してください。
When you order, indicate MHD645 (D).

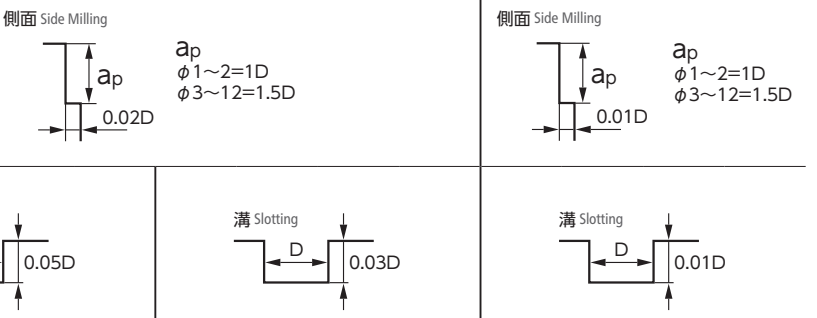
※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-060に記載
●Recommended Milling Conditions are shown on page D-060.

# MHD445・MHD645

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 焼き入れ鋼 Hardened Steels SKD61 (45～50HRC) | | | | 焼き入れ鋼 Hardened Steels SKD61・STAVAX・HPM-38 (50～55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (55～62HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 側面 Side Milling | | 溝 Slotting | | 側面 Side Milling | | 溝 Slotting | | 側面 Side Milling | | 溝 Slotting | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 6,400 | 280 | 3,200 | 140 | 5,400 | 240 | 2,700 | 120 | 4,800 | 200 | 2,400 | 100 |
| 1.5 | 4,200 | 300 | 2,100 | 150 | 3,600 | 230 | 1,800 | 120 | 3,200 | 180 | 1,600 | 90 |
| 2 | 3,200 | 320 | 1,600 | 160 | 2,700 | 230 | 1,400 | 120 | 2,400 | 180 | 1,200 | 90 |
| 3 | 3,700 | 520 | 1,900 | 260 | 3,200 | 380 | 1,600 | 140 | 2,600 | 260 | 1,300 | 130 |
| 4 | 2,800 | 450 | 1,400 | 230 | 2,400 | 360 | 1,200 | 180 | 2,000 | 260 | 1,000 | 130 |
| 5 | 5,100 | 1,200 | 2,600 | 600 | 4,500 | 1,000 | 2,300 | 500 | 3,800 | 800 | 1,900 | 400 |
| 6 | 4,200 | 1,300 | 2,500 | 780 | 3,700 | 1,100 | 2,200 | 660 | 3,200 | 680 | 1,600 | 340 |
| 8 | 3,200 | 1,500 | 1,900 | 900 | 2,800 | 1,300 | 1,700 | 780 | 2,400 | 750 | 1,200 | 380 |
| 10 | 2,600 | 1,500 | 1,600 | 900 | 2,200 | 1,300 | 1,300 | 780 | 1,900 | 900 | 950 | 450 |
| 12 | 2,100 | 1,300 | 1,300 | 780 | 1,900 | 1,100 | 1,150 | 660 | 1,600 | 960 | 800 | 480 |

切り込み量 Depth of Cut




(D:刃径 Dia.)

備考 Notes

※機械、チャックは剛性のある精度の高い物を使用してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整してください。
※回転数と送り速度は、同じ割合で調整してください。
※エアーブローまたはオイルミストの使用をお奨めします。
※Use a rigid and precise machine and chuck holder.
※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.
※Adjust both spindle speed and feed at the same rate.
※Use oilmist coolant or air blow.



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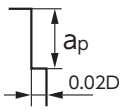
# MHD445・MHD645

## 高速切削条件参考表 Recommended High Speed Milling Conditions

| 被削材 Work Material | 焼き入れ鋼 Hardened Steels SKD61 (45～50HRC) | | | | 焼き入れ鋼 Hardened Steels SKD61・STAVAX・HPM-38 (50～55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (55～62HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 側面 Side Milling | | 溝 Slotting | | 側面 Side Milling | | 溝 Slotting | | 側面 Side Milling | | 溝 Slotting | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 20,000 | 950 | 10,000 | 480 | 17,500 | 770 | 8,800 | 390 | 12,700 | 510 | 6,400 | 260 |
| 1.5 | 13,800 | 1,000 | 6,900 | 500 | 11,700 | 750 | 5,900 | 380 | 8,500 | 480 | 4,300 | 240 |
| 2 | 10,400 | 1,000 | 5,200 | 500 | 8,700 | 730 | 4,400 | 370 | 6,400 | 460 | 3,200 | 230 |
| 3 | 10,600 | 1,500 | 5,300 | 750 | 9,500 | 1,100 | 4,800 | 550 | 7,400 | 740 | 3,700 | 370 |
| 4 | 8,000 | 1,300 | 4,000 | 650 | 7,200 | 1,100 | 3,600 | 550 | 5,600 | 740 | 2,800 | 370 |
| 5 | 8,900 | 2,100 | 4,500 | 1,100 | 7,600 | 1,800 | 3,800 | 900 | 5,100 | 1,100 | 2,600 | 550 |
| 6 | 7,400 | 2,200 | 4,500 | 1,320 | 6,400 | 1,900 | 3,900 | 1,150 | 5,300 | 1,100 | 2,700 | 550 |
| 8 | 5,600 | 2,600 | 3,400 | 1,560 | 4,800 | 2,200 | 2,900 | 1,320 | 4,000 | 1,300 | 2,000 | 650 |
| 10 | 4,500 | 2,600 | 2,700 | 1,560 | 3,800 | 2,200 | 2,300 | 1,320 | 3,200 | 1,500 | 1,600 | 750 |
| 12 | 3,700 | 2,200 | 2,200 | 1,320 | 3,200 | 1,900 | 2,000 | 1,150 | 2,600 | 1,600 | 1,300 | 800 |

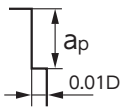
切り込み量 Depth of Cut

側面 Side Milling



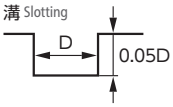

ap
φ1～2=1D
φ3～12=1.5D

側面 Side Milling

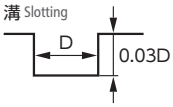



ap
φ1～2=1D
φ3～12=1.5D

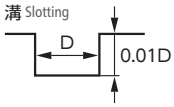
溝 Slotting




溝 Slotting




溝 Slotting



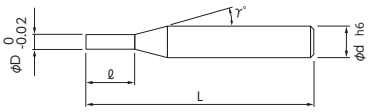

(D:刃径 Dia.)

**備考 Notes**

※機械、チャックは剛性のある精度の高い物を使用してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整してください。
※回転数と送り速度は、同じ割合で調整してください。
※エアーブローまたはオイルミストの使用をお奨めします。
※Use a rigid and precise machine and chuck holder.
※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.
※Adjust both spindle speed and feed at the same rate.
※Use oilmist coolant or air blow.

# NX-30X

## Xコーティング リード30エンドミル
X-COATING 2-Flute End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

Slot Side Face MG X 2 30°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | | |

| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|
| ○ | | ○ | ○ | ○ |

### ▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00031-00100 | 1 | 2 | 9° | 4 | 40 | 4,000 ▌ |
| 01-00031-00150 | 1.5 | 3 | 9° | 4 | 40 | 4,000 ▌ |
| 01-00031-00200 | 2 | 4 | 9° | 4 | 40 | 4,000 ▌ |
| 01-00031-00250 | 2.5 | 5 | 9° | 4 | 40 | 4,000 ▌ |
| 01-00031-00300 | 3 | 6 | 9° | 6 | 45 | 5,300 ▌ |
| 01-00031-00400 | 4 | 8 | 9° | 6 | 45 | 5,500 ▌ |
| 01-00031-00500 | 5 | 10 | 9° | 6 | 50 | 5,700 ▌ |
| 01-00031-00600 | 6 | 12 | – | 6 | 50 | 5,900 ▌ |
| ▲ 01-00031-00800 | 8 | 16 | – | 8 | 60 | 8,500 ▌ |
| ▲ 01-00031-01000 | 10 | 20 | – | 10 | 70 | 10,400 ▌ |
| ▲ 01-00031-01200 | 12 | 24 | – | 12 | 75 | 16,300 ▌ |

**オーダー方法** NX-30X 刃径(D)を指示してください。
When you order, indicate NX-30X (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-063に記載
●Recommended Milling Conditions are shown on page D-063.



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# NX-30X

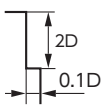
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM･SKD･SUS | | | 調質鋼 Prehardened Steels HPM･NAK | | | アルミニウム合金 Aluminum Alloy | | | 銅 Copper | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 40～50m/min | | | 35～45m/min | | | 25～35m/min | | | 60～100m/min | | | 40～80m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min$^{-1}$ | mm/min 側面 Side Milling | 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | 溝 Slotting |
| 1 | 14,300 | 150 | 60 | 12,700 | 100 | 50 | 9,600 | 90 | 45 | 25,500 | 300 | 120 | 19,100 | 220 | 100 |
| 1.5 | 9,600 | 150 | 60 | 8,500 | 100 | 50 | 6,400 | 90 | 45 | 17,000 | 300 | 120 | 12,700 | 220 | 100 |
| 2 | 7,200 | 150 | 60 | 6,400 | 100 | 50 | 4,800 | 90 | 45 | 12,700 | 300 | 120 | 9,600 | 220 | 100 |
| 2.5 | 5,700 | 150 | 60 | 5,100 | 100 | 50 | 3,800 | 90 | 45 | 10,200 | 300 | 120 | 7,600 | 220 | 100 |
| 3 | 4,800 | 180 | 70 | 4,200 | 130 | 55 | 3,200 | 100 | 50 | 8,500 | 350 | 150 | 6,400 | 250 | 110 |
| 4 | 3,600 | 180 | 70 | 3,200 | 130 | 55 | 2,400 | 100 | 50 | 6,400 | 350 | 150 | 4,800 | 250 | 110 |
| 5 | 2,900 | 200 | 80 | 2,500 | 150 | 60 | 1,900 | 120 | 55 | 5,100 | 400 | 180 | 3,800 | 300 | 130 |
| 6 | 2,400 | 200 | 80 | 2,100 | 150 | 60 | 1,600 | 120 | 55 | 4,200 | 400 | 180 | 3,200 | 300 | 130 |
| 8 | 1,800 | 200 | 80 | 1,600 | 150 | 60 | 1,200 | 120 | 55 | 3,200 | 400 | 180 | 2,400 | 300 | 130 |
| 10 | 1,400 | 200 | 80 | 1,300 | 150 | 60 | 1,000 | 120 | 55 | 2,500 | 400 | 180 | 1,900 | 300 | 130 |
| 12 | 1,200 | 200 | 80 | 1,100 | 150 | 60 | 800 | 120 | 55 | 2,100 | 400 | 180 | 1,600 | 300 | 130 |

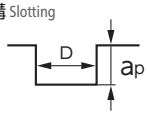
切り込み量 Depth of Cut

(D:刃径 Dia.)

側面 Side Milling




溝 Slotting



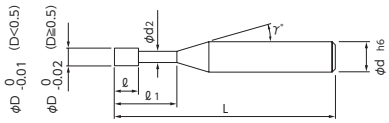

ap
φ1～2.5=0.5D
φ3～12=1D

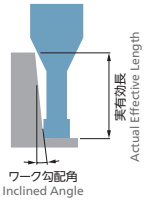
備考 Notes

※切削油の使用をお奨めします。
※回転数と送り速度は同じ割合で調整してください。
※Use cutting fluid.
※Adjust both spindle speed and feed at the same rate.

# MHRH230

## 無限コーティングプレミアム 高硬度用2枚刃ロングネックエンドミル
MUGEN-COATING PREMIUM 2-Flute Long Neck End Mill for Hardened Steel




●無限コーティングプレミアムの採用により、高硬度材の加工に長寿命！
加工精度も向上！
●全134 サイズ！
●MUGEN-COATING PREMIUM to improve accuracy and tool life on machining hardened steels!
●Total 134 sizes!

Slot Side Face MG ∞ Premium 2 30° ≦65 HRC

### 被削材 Work Material

| 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | ○ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00207-01003 | 0.1 | 0.3 | 0.08 | 0.085 | 12° | 4 | 45 | 10,500 | 0.35 | 0.37 | 0.38 | 0.40 | 0.45 |
| 08-00207-01005 | | 0.5 | | | | | 45 | 11,400 | 0.56 | 0.58 | 0.61 | 0.64 | 0.71 |
| 08-00207-01007 | | 0.75 | | | | | 45 | 12,500 | 0.82 | 0.86 | 0.90 | 0.94 | 1.05 |
| 08-00207-01010 | | 1 | | | | | 45 | 14,000 | 1.08 | 1.13 | 1.18 | 1.24 | 1.38 |
| 08-00207-01503 | 0.15 | 0.3 | 0.12 | 0.13 | 12° | 4 | 45 | 9,700 | 0.36 | 0.38 | 0.40 | 0.42 | 0.46 |
| 08-00207-01505 | | 0.5 | | | | | 45 | 10,500 | 0.57 | 0.60 | 0.62 | 0.66 | 0.73 |
| 08-00207-01507 | | 0.75 | | | | | 45 | 11,500 | 0.83 | 0.87 | 0.91 | 0.96 | 1.06 |
| 08-00207-01510 | | 1 | | | | | 45 | 11,500 | 1.09 | 1.14 | 1.20 | 1.25 | 1.39 |
| 08-00207-01515 | | 1.5 | | | | | 45 | 12,500 | 1.61 | 1.69 | 1.77 | 1.85 | 2.06 |
| 08-00207-02005 | 0.2 | 0.5 | 0.15 | 0.18 | 12° | 4 | 45 | 7,200 | 0.57 | 0.60 | 0.62 | 0.66 | 0.73 |
| 08-00207-02007 | | 0.75 | | | | | 45 | 7,400 | 0.83 | 0.87 | 0.91 | 0.96 | 1.06 |
| 08-00207-02010 | | 1 | | | | | 45 | 7,800 | 1.09 | 1.14 | 1.20 | 1.25 | 1.39 |
| 08-00207-02015 | | 1.5 | | | | | 45 | 9,400 | 1.61 | 1.69 | 1.77 | 1.85 | 2.06 |
| 08-00207-02020 | | 2 | | | | | 45 | 10,600 | 2.13 | 2.23 | 2.34 | 2.45 | 2.72 |
| 08-00207-02025 | | 2.5 | | | | | 45 | 10,600 | 2.66 | 2.78 | 2.91 | 3.05 | 3.39 |
| 08-00207-02030 | | 3 | | | | | 45 | 11,000 | 3.18 | 3.32 | 3.48 | 3.65 | 4.06 |
| 08-00207-03010 | 0.3 | 1 | 0.25 | 0.28 | 12° | 4 | 45 | 6,300 | 1.09 | 1.14 | 1.20 | 1.25 | 1.39 |
| 08-00207-03015 | | 1.5 | | | | | 45 | 6,300 | 1.61 | 1.69 | 1.77 | 1.85 | 2.06 |
| 08-00207-03020 | | 2 | | | | | 45 | 7,800 | 2.13 | 2.23 | 2.34 | 2.45 | 2.72 |
| 08-00207-03025 | | 2.5 | | | | | 45 | 8,100 | 2.66 | 2.78 | 2.91 | 3.05 | 3.39 |
| 08-00207-03030 | | 3 | | | | | 45 | 8,100 | 3.18 | 3.32 | 3.48 | 3.65 | 4.06 |
| 08-00207-04010 | 0.4 | 1 | 0.3 | 0.37 | 12° | 4 | 45 | 4,600 | 1.12 | 1.17 | 1.22 | 1.28 | 1.43 |
| 08-00207-04015 | | 1.5 | | | | | 45 | 4,600 | 1.64 | 1.71 | 1.79 | 1.88 | 2.09 |
| 08-00207-04020 | | 2 | | | | | 45 | 4,600 | 2.16 | 2.26 | 2.36 | 2.48 | 2.76 |
| 08-00207-04025 | | 2.5 | | | | | 45 | 4,600 | 2.68 | 2.80 | 2.93 | 3.08 | 3.42 |
| 08-00207-04030 | | 3 | | | | | 45 | 4,600 | 3.20 | 3.35 | 3.50 | 3.68 | 4.09 |
| 08-00207-04035 | | 3.5 | | | | | 45 | 4,600 | 3.72 | 3.89 | 4.08 | 4.28 | 4.75 |
| 08-00207-04040 | | 4 | | | | | 45 | 4,600 | 4.25 | 4.44 | 4.65 | 4.88 | 5.42 |
| 08-00207-04050 | | 5 | | | | | 45 | 4,600 | 5.29 | 5.53 | 5.79 | 6.08 | 6.75 |
| 08-00207-04060 | | 6 | | | | | 45 | 5,700 | 6.33 | 6.62 | 6.93 | 7.27 | 8.08 |
| 08-00207-04080 | | 8 | | | | | 45 | 10,000 | 8.42 | 8.80 | 9.21 | 9.67 | 10.74 |
| 08-00207-04100 | | 10 | | | | | 45 | 11,000 | 10.50 | 10.98 | 11.49 | 12.07 | 13.40 |
| 08-00207-05010 | 0.5 | 1 | 0.4 | 0.46 | 12° | 4 | 45 | 3,300 | 1.14 | 1.19 | 1.25 | 1.31 | 1.46 |
| 08-00207-05015 | | 1.5 | | | | | 45 | 3,300 | 1.66 | 1.74 | 1.82 | 1.91 | 2.12 |
| 08-00207-05020 | | 2 | | | | | 45 | 3,300 | 2.18 | 2.28 | 2.39 | 2.51 | 2.79 |
| 08-00207-05025 | | 2.5 | | | | | 45 | 3,300 | 2.71 | 2.83 | 2.96 | 3.11 | 3.45 |

**オーダー方法** MHRH230 刃径(D)×有効長(ℓ1)を指示してください。
When you order, indicate MHRH230 (D)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-069に記載
●Recommended Milling Conditions are shown on page D-069.



SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30´ | 1° | 1°30´ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00207-05030 | 0.5 | 3 | 0.4 | 0.46 | 12° | 4 | 45 | 3,300 | 3.23 | 3.37 | 3.53 | 3.71 | 4.12 |
| 08-00207-05035 | | 3.5 | | | | | 45 | 3,300 | 3.75 | 3.92 | 4.10 | 4.31 | 4.78 |
| 08-00207-05040 | | 4 | | | | | 45 | 3,300 | 4.27 | 4.46 | 4.67 | 4.91 | 5.45 |
| 08-00207-05045 | | 4.5 | | | | | 45 | 3,300 | 4.79 | 5.01 | 5.24 | 5.50 | 6.12 |
| 08-00207-05050 | | 5 | | | | | 45 | 3,300 | 5.31 | 5.55 | 5.81 | 6.10 | 6.78 |
| 08-00207-05060 | | 6 | | | | | 45 | 3,300 | 6.36 | 6.64 | 6.96 | 7.30 | 8.11 |
| 08-00207-05070 | | 7 | | | | | 45 | 5,500 | 7.40 | 7.73 | 8.10 | 8.50 | 9.44 |
| 08-00207-05080 | | 8 | | | | | 50 | 5,500 | 8.44 | 8.82 | 9.24 | 9.70 | 10.77 |
| 08-00207-05090 | | 9 | | | | | 50 | 5,500 | 9.48 | 9.91 | 10.38 | 10.90 | 12.10 |
| 08-00207-05100 | | 10 | | | | | 50 | 5,500 | 10.53 | 11.00 | 11.52 | 12.09 | 13.44 |
| 08-00207-06015 | 0.6 | 1.5 | 0.5 | 0.56 | 12° | 4 | 45 | 3,500 | 1.66 | 1.74 | 1.82 | 1.91 | 2.12 |
| 08-00207-06020 | | 2 | | | | | 45 | 3,500 | 2.18 | 2.28 | 2.39 | 2.51 | 2.79 |
| 08-00207-06030 | | 3 | | | | | 45 | 3,500 | 3.23 | 3.37 | 3.53 | 3.71 | 4.12 |
| 08-00207-06040 | | 4 | | | | | 45 | 3,500 | 4.27 | 4.46 | 4.67 | 4.91 | 5.45 |
| 08-00207-06050 | | 5 | | | | | 45 | 3,500 | 5.31 | 5.55 | 5.81 | 6.10 | 6.78 |
| 08-00207-06060 | | 6 | | | | | 45 | 3,500 | 6.36 | 6.64 | 6.96 | 7.30 | 8.11 |
| 08-00207-07020 | 0.7 | 2 | 0.55 | 0.66 | 12° | 4 | 45 | 4,000 | 2.18 | 2.28 | 2.39 | 2.51 | 2.79 |
| 08-00207-07040 | | 4 | | | | | 45 | 4,000 | 4.27 | 4.46 | 4.67 | 4.91 | 5.45 |
| 08-00207-07060 | | 6 | | | | | 45 | 4,000 | 6.36 | 6.64 | 6.96 | 7.30 | 8.11 |
| 08-00207-07080 | | 8 | | | | | 50 | 6,500 | 8.44 | 8.82 | 9.24 | 9.70 | 10.77 |
| 08-00207-07100 | | 10 | | | | | 50 | 8,600 | 10.53 | 11.00 | 11.52 | 12.09 | 13.44 |
| 08-00207-08030 | 0.8 | 3 | 0.65 | 0.76 | 12° | 4 | 45 | 3,900 | 3.23 | 3.37 | 3.53 | 3.71 | 4.12 |
| 08-00207-08040 | | 4 | | | | | 45 | 3,900 | 4.27 | 4.46 | 4.67 | 4.91 | 5.45 |
| 08-00207-08050 | | 5 | | | | | 45 | 3,900 | 5.31 | 5.55 | 5.81 | 6.10 | 6.78 |
| 08-00207-08060 | | 6 | | | | | 45 | 3,900 | 6.36 | 6.64 | 6.96 | 7.30 | 8.11 |
| 08-00207-08080 | | 8 | | | | | 50 | 3,900 | 8.44 | 8.82 | 9.24 | 9.70 | 10.77 |
| 08-00207-08100 | | 10 | | | | | 50 | 5,700 | 10.53 | 11.00 | 11.52 | 12.09 | 13.44 |
| 08-00207-08120 | | 12 | | | | | 50 | 6,500 | 12.61 | 13.18 | 13.80 | 14.49 | 16.10 |
| 08-00207-10020 | 1 | 2 | 0.8 | 0.95 | 12° | 4 | 50 | 3,500 | 2.21 | 2.31 | 2.42 | 2.54 | 2.82 |
| 08-00207-10030 | | 3 | | | | | 50 | 3,500 | 3.25 | 3.40 | 3.56 | 3.74 | 4.15 |
| 08-00207-10040 | | 4 | | | | | 50 | 3,500 | 4.29 | 4.49 | 4.70 | 4.93 | 5.48 |
| 08-00207-10050 | | 5 | | | | | 50 | 3,500 | 5.34 | 5.58 | 5.84 | 6.13 | 6.81 |
| 08-00207-10060 | | 6 | | | | | 50 | 3,500 | 6.38 | 6.67 | 6.98 | 7.33 | 8.14 |
| 08-00207-10070 | | 7 | | | | | 50 | 3,500 | 7.42 | 7.76 | 8.12 | 8.53 | 9.47 |
| 08-00207-10080 | | 8 | | | | | 50 | 3,500 | 8.47 | 8.85 | 9.27 | 9.73 | 10.80 |
| 08-00207-10090 | | 9 | | | | | 50 | 3,500 | 9.51 | 9.94 | 10.41 | 10.92 | 12.14 |
| 08-00207-10100 | | 10 | | | | | 50 | 3,500 | 10.55 | 11.03 | 11.55 | 12.12 | 13.47 |
| 08-00207-10120 | | 12 | | | | | 50 | 3,500 | 12.64 | 13.21 | 13.83 | 14.52 | 16.13 |
| 08-00207-10140 | | 14 | | | | | 50 | 3,500 | 14.72 | 15.39 | 16.11 | 16.91 | 18.79 |
| 08-00207-10160 | | 16 | | | | | 60 | 5,700 | 16.81 | 17.57 | 18.40 | 19.31 | 21.45 |
| 08-00207-10180 | | 18 | | | | | 60 | 5,700 | 18.89 | 19.74 | 20.68 | 21.71 | 24.11 |
| 08-00207-10200 | | 20 | | | | | 60 | 5,700 | 20.98 | 21.92 | 22.96 | 24.10 | 26.78 |
| 08-00207-10220 | | 22 | | | | | 60 | 6,600 | 23.07 | 24.10 | 25.24 | 26.50 | Free |
| 08-00207-12060 | 1.2 | 6 | 1 | 1.15 | 12° | 4 | 50 | 3,700 | 6.38 | 6.67 | 6.98 | 7.33 | 8.14 |
| 08-00207-12080 | | 8 | | | | | 50 | 3,700 | 8.47 | 8.85 | 9.27 | 9.73 | 10.80 |
| 08-00207-12100 | | 10 | | | | | 50 | 3,700 | 10.55 | 11.03 | 11.55 | 12.12 | 13.47 |
| 08-00207-12120 | | 12 | | | | | 50 | 3,700 | 12.64 | 13.21 | 13.83 | 14.52 | 16.13 |
| 08-00207-12160 | | 16 | | | | | 60 | 5,900 | 16.81 | 17.57 | 18.40 | 19.31 | 21.45 |
| 08-00207-14060 | 1.4 | 6 | 1.1 | 1.35 | 12° | 4 | 50 | 3,800 | 6.38 | 6.67 | 6.98 | 7.33 | 8.14 |
| 08-00207-14120 | | 12 | | | | | 50 | 3,800 | 12.64 | 13.21 | 13.83 | 14.52 | 16.13 |

# MHRH230

## 無限コーティングプレミアム 高硬度用2枚刃ロングネックエンドミル

MUGEN-COATING PREMIUM 2-Flute Long Neck End Mill for Hardened Steel

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30´ | 1° | 1°30´ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00207-15040 | 1.5 | 4 | 1.2 | 1.45 | 12° | 4 | 50 | 3,700 | 4.29 | 4.49 | 4.70 | 4.93 | 5.48 |
| 08-00207-15060 | | 6 | | | | | 50 | 3,700 | 6.38 | 6.67 | 6.98 | 7.33 | 8.14 |
| 08-00207-15080 | | 8 | | | | | 50 | 3,700 | 8.47 | 8.85 | 9.27 | 9.73 | 10.80 |
| 08-00207-15100 | | 10 | | | | | 50 | 3,700 | 10.55 | 11.03 | 11.55 | 12.12 | 13.47 |
| 08-00207-15120 | | 12 | | | | | 50 | 3,700 | 12.64 | 13.21 | 13.83 | 14.52 | 16.13 |
| 08-00207-15140 | | 14 | | | | | 60 | 3,800 | 14.72 | 15.39 | 16.11 | 16.91 | 18.79 |
| 08-00207-15160 | | 16 | | | | | 60 | 3,800 | 16.81 | 17.57 | 18.40 | 19.31 | 21.45 |
| 08-00207-15180 | | 18 | | | | | 60 | 3,800 | 18.89 | 19.74 | 20.68 | 21.71 | 24.11 |
| 08-00207-15200 | | 20 | | | | | 60 | 3,800 | 20.98 | 21.92 | 22.96 | 24.10 | Free |
| 08-00207-15250 | | 25 | | | | | 70 | 5,700 | 26.20 | 27.37 | 28.67 | 30.09 | Free |
| 08-00207-15300 | | 30 | | | | | 70 | 5,700 | 31.41 | 32.82 | 34.37 | 36.08 | Free |
| 08-00207-15350 | | 35 | | | | | 80 | 6,500 | 36.62 | 38.27 | 40.08 | Free | Free |
| 08-00207-16060 | 1.6 | 6 | 1.3 | 1.55 | 12° | 4 | 50 | 3,800 | 6.38 | 6.67 | 6.98 | 7.33 | 8.14 |
| 08-00207-16080 | | 8 | | | | | 50 | 3,800 | 8.47 | 8.85 | 9.27 | 9.73 | 10.80 |
| 08-00207-18060 | 1.8 | 6 | 1.4 | 1.75 | 12° | 4 | 50 | 3,800 | 6.38 | 6.67 | 6.98 | 7.33 | 8.14 |
| 08-00207-18080 | | 8 | | | | | 50 | 3,800 | 8.47 | 8.85 | 9.27 | 9.73 | 10.80 |
| 08-00207-18100 | | 10 | | | | | 50 | 3,800 | 10.55 | 11.03 | 11.55 | 12.12 | 13.47 |
| 08-00207-18120 | | 12 | | | | | 50 | 3,800 | 12.64 | 13.21 | 13.83 | 14.52 | 16.13 |
| 08-00207-18140 | | 14 | | | | | 50 | 3,800 | 14.72 | 15.39 | 16.11 | 16.91 | 18.79 |
| 08-00207-18160 | | 16 | | | | | 60 | 3,800 | 16.81 | 17.57 | 18.40 | 19.31 | 21.45 |
| 08-00207-18180 | | 18 | | | | | 60 | 3,800 | 18.89 | 19.74 | 20.68 | 21.71 | 24.11 |
| 08-00207-20040 | 2 | 4 | 1.6 | 1.94 | 12° | 4 | 50 | 3,700 | 4.32 | 4.51 | 4.73 | 4.96 | 5.51 |
| 08-00207-20060 | | 6 | | | | | 50 | 3,700 | 6.40 | 6.69 | 7.01 | 7.36 | 8.17 |
| 08-00207-20080 | | 8 | | | | | 50 | 3,700 | 8.49 | 8.87 | 9.29 | 9.75 | 10.84 |
| 08-00207-20100 | | 10 | | | | | 50 | 3,700 | 10.58 | 11.05 | 11.57 | 12.15 | 13.50 |
| 08-00207-20120 | | 12 | | | | | 50 | 3,700 | 12.66 | 13.23 | 13.86 | 14.55 | 16.16 |
| 08-00207-20140 | | 14 | | | | | 60 | 3,700 | 14.75 | 15.41 | 16.14 | 16.94 | 18.82 |
| 08-00207-20160 | | 16 | | | | | 60 | 3,700 | 16.83 | 17.59 | 18.42 | 19.34 | Free |
| 08-00207-20180 | | 18 | | | | | 60 | 3,700 | 18.92 | 19.77 | 20.71 | 21.73 | Free |
| 08-00207-20200 | | 20 | | | | | 60 | 3,700 | 21.01 | 21.95 | 22.99 | 24.13 | Free |
| 08-00207-20250 | | 25 | | | | | 70 | 3,700 | 26.22 | 27.40 | 28.69 | Free | Free |
| 08-00207-20300 | | 30 | | | | | 70 | 4,600 | 31.43 | 32.85 | 34.40 | Free | Free |
| 08-00207-20350 | | 35 | | | | | 80 | 5,500 | 36.65 | 38.30 | Free | Free | Free |
| 08-00207-20400 | | 40 | | | | | 90 | 6,900 | 41.86 | 43.75 | Free | Free | Free |
| 08-00207-20500 | | 50 | | | | | 100 | 8,300 | 52.29 | 54.64 | Free | Free | Free |
| 08-00207-25080 | 2.5 | 8 | 2 | 2.4 | 12° | 4 | 50 | 3,900 | 8.59 | 8.98 | 9.40 | 9.87 | 10.96 |
| 08-00207-25120 | | 12 | | | | | 50 | 3,900 | 12.76 | 13.33 | 13.97 | 14.66 | Free |
| 08-00207-25160 | | 16 | | | | | 60 | 3,900 | 16.93 | 17.69 | 18.53 | 19.45 | Free |
| 08-00207-25200 | | 20 | | | | | 60 | 3,900 | 21.10 | 22.05 | 23.10 | Free | Free |
| 08-00207-25300 | | 30 | | | | | 70 | 4,200 | 31.53 | 32.95 | Free | Free | Free |
| 08-00207-25400 | | 40 | | | | | 90 | 5,900 | 41.96 | 43.85 | Free | Free | Free |
| 08-00207-25500 | | 50 | | | | | 100 | 7,300 | 52.39 | 54.75 | Free | Free | Free |
| 08-00207-30080 | 3 | 8 | 4.5 | 2.85 | 12° | 6 | 50 | 5,000 | 8.71 | 9.10 | 9.53 | 10.01 | 11.12 |
| 08-00207-30120 | | 12 | | | | | 50 | 5,000 | 12.88 | 13.46 | 14.10 | 14.80 | 16.44 |
| 08-00207-30160 | | 16 | | | | | 60 | 5,000 | 17.05 | 17.82 | 18.67 | 19.59 | 21.77 |
| 08-00207-30200 | | 20 | | | | | 60 | 5,000 | 21.23 | 22.18 | 23.23 | 24.39 | 27.09 |
| 08-00207-30250 | | 25 | | | | | 70 | 5,000 | 26.44 | 27.63 | 28.94 | 30.38 | Free |
| 08-00207-30300 | | 30 | | | | | 70 | 6,000 | 31.66 | 33.08 | 34.64 | 36.37 | Free |

**オーダー方法** MHRH230 刃径(D)×有効長(ℓ1)を指示してください。
When you order, indicate MHRH230 (D)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

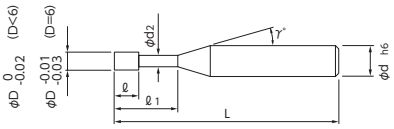
●切削条件表はD-069に記載
●Recommended Milling Conditions are shown on page D-069.



SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

# MHRH430

## 無限コーティングプレミアム 高硬度用4枚刃ロングネックエンドミル
MUGEN-COATING PREMIUM 4-Flute Long Neck End Mill for Hardened Steel




●無限コーティングプレミアムの採用により、高硬度材の加工に長寿命！
加工精度も向上！
●微細加工時の工具剛性がアップ！
●全 55 サイズ！
●MUGEN-COATING PREMIUM to improve accuracy and tool life on machining hardened steels!
●Improve tool rigidity for precision machining!
●Total 55 sizes!

Slot Side Face MG ∞ Premium 4 30° ≦65 HRC

被削材 Work Material

| 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | ○ | ○ |

★再研磨可能(詳細はお問い合わせください。)

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00217-01004 | 1 | 4 | 0.8 | 0.95 | 12° | 4 | 50 | 4,950 | 4.29 | 4.49 | 4.70 | 4.93 | 5.47 |
| 08-00217-01006 | | 6 | | | | | 50 | 4,950 | 6.38 | 6.66 | 6.98 | 7.32 | 8.12 |
| 08-00217-01008 | | 8 | | | | | 50 | 4,950 | 8.47 | 8.84 | 9.26 | 9.71 | 10.77 |
| 08-00217-01010 | | 10 | | | | | 50 | 4,950 | 10.55 | 11.02 | 11.54 | 12.11 | 13.43 |
| 08-00217-01206 | 1.2 | 6 | 1 | 1.15 | 12° | 4 | 50 | 4,950 | 6.38 | 6.66 | 6.98 | 7.32 | 8.12 |
| 08-00217-01208 | | 8 | | | | | 50 | 4,950 | 8.47 | 8.84 | 9.26 | 9.71 | 10.77 |
| 08-00217-01210 | | 10 | | | | | 50 | 4,950 | 10.55 | 11.02 | 11.54 | 12.11 | 13.43 |
| 08-00217-01212 | | 12 | | | | | 50 | 4,950 | 12.64 | 13.20 | 13.82 | 14.50 | 16.08 |
| 08-00217-01506 | 1.5 | 6 | 1.2 | 1.45 | 12° | 4 | 50 | 4,950 | 6.38 | 6.66 | 6.98 | 7.32 | 8.12 |
| 08-00217-01508 | | 8 | | | | | 50 | 4,950 | 8.47 | 8.84 | 9.26 | 9.71 | 10.77 |
| 08-00217-01510 | | 10 | | | | | 50 | 4,950 | 10.55 | 11.02 | 11.54 | 12.11 | 13.43 |
| 08-00217-01512 | | 12 | | | | | 50 | 4,950 | 12.64 | 13.20 | 13.82 | 14.50 | 16.08 |
| 08-00217-01514 | | 14 | | | | | 60 | 4,950 | 14.72 | 15.38 | 16.10 | 16.89 | 18.74 |
| 08-00217-01516 | | 16 | | | | | 60 | 4,950 | 16.81 | 17.56 | 18.38 | 19.29 | 21.39 |
| 08-00217-01806 | 1.8 | 6 | 1.4 | 1.74 | 12° | 4 | 50 | 4,950 | 6.40 | 6.69 | 7.00 | 7.35 | 8.15 |
| 08-00217-01808 | | 8 | | | | | 50 | 4,950 | 8.49 | 8.87 | 9.29 | 9.74 | 10.81 |
| 08-00217-01810 | | 10 | | | | | 50 | 4,950 | 10.58 | 11.05 | 11.57 | 12.13 | 13.46 |
| 08-00217-01812 | | 12 | | | | | 50 | 4,950 | 12.66 | 13.23 | 13.85 | 14.53 | 16.11 |
| 08-00217-01814 | | 14 | | | | | 60 | 4,950 | 14.75 | 15.41 | 16.13 | 16.92 | 18.77 |
| 08-00217-01816 | | 16 | | | | | 60 | 4,950 | 16.83 | 17.59 | 18.41 | 19.31 | Free |
| 08-00217-01818 | | 18 | | | | | 60 | 4,950 | 18.92 | 19.76 | 20.69 | 21.71 | Free |
| 08-00217-02006 | 2 | 6 | 1.6 | 1.94 | 12° | 4 | 50 | 4,950 | 6.40 | 6.69 | 7.00 | 7.35 | 8.15 |
| 08-00217-02008 | | 8 | | | | | 50 | 4,950 | 8.49 | 8.87 | 9.29 | 9.74 | 10.81 |
| 08-00217-02010 | | 10 | | | | | 50 | 4,950 | 10.58 | 11.05 | 11.57 | 12.13 | 13.46 |
| 08-00217-02012 | | 12 | | | | | 50 | 4,950 | 12.66 | 13.23 | 13.85 | 14.53 | 16.11 |
| 08-00217-02014 | | 14 | | | | | 60 | 4,950 | 14.75 | 15.41 | 16.13 | 16.92 | 18.77 |
| 08-00217-02016 | | 16 | | | | | 60 | 4,950 | 16.83 | 17.59 | 18.41 | 19.31 | Free |
| 08-00217-02018 | | 18 | | | | | 60 | 4,950 | 18.92 | 19.76 | 20.69 | 21.71 | Free |
| 08-00217-02020 | | 20 | | | | | 60 | 4,950 | 21.00 | 21.94 | 22.97 | 24.10 | Free |

オーダー方法 MHRH430 刃径(D)×有効長(ℓ1)を指示してください。
When you order, indicate MHRH430 (D)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-072に記載
●Recommended Milling Conditions are shown on page D-072.

ŞEVKET ÖĞÜ® MAKINA TİCARET VE SAN. LTD. ŞTİ.

# MHRH430

## 無限コーティングプレミアム 高硬度用4枚刃ロングネックエンドミル
MUGEN-COATING PREMIUM 4-Flute Long Neck End Mill for Hardened Steel

★再研磨可能(詳細はお問い合わせください。)

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30´ | 1° | 1°30´ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00217-02508 | 2.5 | 8 | 2 | 2.4 | 12° | 4 | 50 | 4,950 | 8.59 | 8.97 | 9.39 | 9.85 | 10.93 |
| 08-00217-02512 | | 12 | | | | | 50 | 4,950 | 12.76 | 13.33 | 13.95 | 14.64 | Free |
| 08-00217-02516 | | 16 | | | | | 60 | 4,950 | 16.93 | 17.69 | 18.52 | 19.43 | Free |
| 08-00217-02520 | | 20 | | | | | 60 | 4,950 | 21.10 | 22.05 | 23.08 | Free | Free |
| 08-00217-02525 | | 25 | | | | | 70 | 5,300 | 26.32 | 27.49 | Free | Free | Free |
| 08-00217-03008 | 3 | 8 | 4.5 | 2.85 | 12° | 6 | 50 | 7,000 | 8.71 | 9.10 | 9.53 | 9.99 | 11.09 |
| 08-00217-03012 | | 12 | | | | | 50 | 7,000 | 12.88 | 13.46 | 14.09 | 14.78 | 16.40 |
| 08-00217-03016 | | 16 | | | | | 60 | 7,000 | 17.05 | 17.82 | 18.65 | 19.57 | 21.70 |
| 08-00217-03020 | | 20 | | | | | 60 | 7,000 | 21.22 | 22.17 | 23.21 | 24.35 | 27.01 |
| 08-00217-03025 | | 25 | | | | | 70 | 7,400 | 26.44 | 27.62 | 28.92 | 30.34 | Free |
| 08-00217-03030 | | 30 | | | | | 70 | 8,000 | 31.65 | 33.07 | 34.62 | 36.32 | Free |
| ★08-00217-04012 | 4 | 12 | 6 | 3.8 | 12° | 6 | 50 | 7,300 | 13.00 | 13.59 | 14.22 | 14.92 | 16.55 |
| ★08-00217-04016 | | 16 | | | | | 60 | 7,300 | 17.18 | 17.94 | 18.78 | 19.71 | Free |
| ★08-00217-04020 | | 20 | | | | | 60 | 7,300 | 21.35 | 22.30 | 23.35 | 24.49 | Free |
| ★08-00217-04025 | | 25 | | | | | 70 | 7,700 | 26.56 | 27.75 | 29.05 | Free | Free |
| ★08-00217-04030 | | 30 | | | | | 70 | 8,500 | 31.78 | 33.20 | 34.75 | Free | Free |
| ★08-00217-04035 | | 35 | | | | | 80 | 9,200 | 36.99 | 38.64 | Free | Free | Free |
| ★08-00217-04040 | | 40 | | | | | 90 | 9,700 | 42.20 | 44.09 | Free | Free | Free |
| ★08-00217-05016 | 5 | 16 | 7.5 | 4.8 | 12° | 6 | 60 | 9,200 | 17.18 | 17.94 | 18.78 | Free | Free |
| ★08-00217-05025 | | 25 | | | | | 70 | 9,600 | 26.56 | 27.75 | Free | Free | Free |
| ★08-00217-05035 | | 35 | | | | | 80 | 10,000 | 36.99 | Free | Free | Free | Free |
| ★08-00217-05050 | | 50 | | | | | 110 | 14,000 | 52.63 | Free | Free | Free | Free |
| ★08-00217-06020 | 6 | 20 | 9 | 5.8 | – | 6 | 80 | 9,200 | Free | Free | Free | Free | Free |
| ★08-00217-06030 | | 30 | | | | | 90 | 9,600 | Free | Free | Free | Free | Free |
| ★08-00217-06040 | | 40 | | | | | 100 | 10,000 | Free | Free | Free | Free | Free |
| ★08-00217-06050 | | 50 | | | | | 110 | 14,000 | Free | Free | Free | Free | Free |

オーダー方法

MHRH430 刃径(D)×有効長(ℓ1)を指示してください。
When you order, indicate MHRH430 (D)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-072に記載
●Recommended Milling Conditions are shown on page D-072.



SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

# MHRH230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK55・NAK80・HPM-1 (～43HRC) | | | | 焼き入れ鋼 Hardened Steels HPM-38・STAVAX・SKD61 (～55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・PD613 (～62HRC) | | | | ハイス High Speed Tool Steels SKH (～65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | $min^{-1}$ | mm/min | ∂p mm | ∂e mm | $min^{-1}$ | mm/min | ∂p mm | ∂e mm | $min^{-1}$ | mm/min | ∂p mm | ∂e mm | $min^{-1}$ | mm/min | ∂p mm | ∂e mm |
| 0.1 | 0.3 | 40,000 | 150 | 0.005 | 0.06 | 40,000 | 120 | 0.003 | 0.05 | 40,000 | 100 | 0.002 | 0.04 | 40,000 | 70 | 0.002 | 0.03 |
| | 0.5 | 40,000 | 100 | 0.005 | 0.06 | 40,000 | 80 | 0.003 | 0.05 | 40,000 | 60 | 0.002 | 0.04 | 40,000 | 50 | 0.002 | 0.03 |
| | 0.75 | 40,000 | 80 | 0.003 | 0.06 | 40,000 | 70 | 0.002 | 0.05 | 40,000 | 50 | 0.001 | 0.04 | 40,000 | 30 | 0.001 | 0.03 |
| | 1 | 40,000 | 60 | 0.002 | 0.06 | 40,000 | 50 | 0.001 | 0.05 | 40,000 | 40 | 0.001 | 0.04 | 40,000 | 20 | 0.001 | 0.03 |
| 0.15 | 0.3 | 40,000 | 180 | 0.005 | 0.09 | 40,000 | 150 | 0.003 | 0.07 | 40,000 | 120 | 0.002 | 0.06 | 40,000 | 100 | 0.002 | 0.04 |
| | 0.5 | 40,000 | 150 | 0.005 | 0.09 | 40,000 | 120 | 0.003 | 0.07 | 40,000 | 100 | 0.002 | 0.06 | 40,000 | 80 | 0.002 | 0.04 |
| | 0.75 | 40,000 | 120 | 0.003 | 0.09 | 40,000 | 100 | 0.002 | 0.07 | 40,000 | 80 | 0.001 | 0.06 | 40,000 | 60 | 0.001 | 0.04 |
| | 1 | 40,000 | 100 | 0.002 | 0.09 | 40,000 | 80 | 0.001 | 0.07 | 40,000 | 60 | 0.001 | 0.06 | 40,000 | 40 | 0.001 | 0.04 |
| | 1.5 | 40,000 | 80 | 0.002 | 0.09 | 40,000 | 60 | 0.001 | 0.07 | 40,000 | 40 | 0.001 | 0.06 | 40,000 | 20 | 0.001 | 0.04 |
| 0.2 | 0.5 | 30,000 | 240 | 0.005 | 0.12 | 30,000 | 200 | 0.003 | 0.1 | 30,000 | 160 | 0.003 | 0.08 | 30,000 | 120 | 0.003 | 0.06 |
| | 0.75 | 30,000 | 200 | 0.005 | 0.12 | 30,000 | 180 | 0.003 | 0.1 | 30,000 | 140 | 0.003 | 0.08 | 30,000 | 100 | 0.003 | 0.06 |
| | 1 | 30,000 | 180 | 0.005 | 0.12 | 30,000 | 150 | 0.003 | 0.1 | 30,000 | 120 | 0.003 | 0.08 | 30,000 | 80 | 0.003 | 0.06 |
| | 1.5 | 30,000 | 120 | 0.003 | 0.12 | 30,000 | 100 | 0.002 | 0.1 | 30,000 | 80 | 0.002 | 0.08 | 30,000 | 60 | 0.002 | 0.06 |
| | 2 | 30,000 | 80 | 0.003 | 0.12 | 30,000 | 50 | 0.002 | 0.1 | 30,000 | 40 | 0.002 | 0.08 | 30,000 | 30 | 0.002 | 0.06 |
| | 2.5 | 30,000 | 60 | 0.002 | 0.12 | 30,000 | 50 | 0.001 | 0.1 | 25,000 | 40 | 0.001 | 0.08 | 25,000 | 30 | 0.001 | 0.06 |
| | 3 | 30,000 | 40 | 0.002 | 0.12 | 25,000 | 40 | 0.001 | 0.1 | 25,000 | 30 | 0.001 | 0.08 | 22,000 | 20 | 0.001 | 0.06 |
| 0.3 | 1 | 30,000 | 350 | 0.007 | 0.18 | 30,000 | 300 | 0.003 | 0.15 | 30,000 | 250 | 0.003 | 0.12 | 30,000 | 200 | 0.003 | 0.09 |
| | 1.5 | 30,000 | 260 | 0.007 | 0.18 | 30,000 | 200 | 0.003 | 0.15 | 30,000 | 160 | 0.003 | 0.12 | 30,000 | 120 | 0.003 | 0.09 |
| | 2 | 30,000 | 180 | 0.005 | 0.18 | 30,000 | 150 | 0.003 | 0.15 | 30,000 | 120 | 0.003 | 0.12 | 25,000 | 100 | 0.003 | 0.09 |
| | 2.5 | 30,000 | 150 | 0.004 | 0.18 | 25,000 | 100 | 0.002 | 0.15 | 25,000 | 80 | 0.002 | 0.12 | 20,000 | 60 | 0.002 | 0.09 |
| | 3 | 30,000 | 70 | 0.004 | 0.18 | 25,000 | 50 | 0.002 | 0.15 | 25,000 | 40 | 0.002 | 0.12 | 20,000 | 30 | 0.002 | 0.09 |
| 0.4 | 1 | 30,000 | 450 | 0.01 | 0.24 | 30,000 | 400 | 0.005 | 0.2 | 30,000 | 350 | 0.005 | 0.16 | 25,000 | 300 | 0.005 | 0.12 |
| | 1.5 | 30,000 | 400 | 0.01 | 0.24 | 30,000 | 360 | 0.005 | 0.2 | 30,000 | 330 | 0.005 | 0.16 | 25,000 | 250 | 0.005 | 0.12 |
| | 2 | 30,000 | 360 | 0.01 | 0.24 | 30,000 | 320 | 0.005 | 0.2 | 25,000 | 280 | 0.005 | 0.16 | 25,000 | 220 | 0.005 | 0.12 |
| | 2.5 | 30,000 | 340 | 0.008 | 0.24 | 25,000 | 280 | 0.005 | 0.2 | 25,000 | 250 | 0.004 | 0.16 | 20,000 | 200 | 0.004 | 0.12 |
| | 3 | 30,000 | 320 | 0.008 | 0.24 | 25,000 | 260 | 0.004 | 0.2 | 20,000 | 220 | 0.003 | 0.16 | 18,000 | 180 | 0.003 | 0.12 |
| | 3.5 | 30,000 | 280 | 0.007 | 0.24 | 25,000 | 220 | 0.004 | 0.2 | 20,000 | 180 | 0.003 | 0.16 | 18,000 | 150 | 0.002 | 0.12 |
| | 4 | 30,000 | 250 | 0.006 | 0.24 | 25,000 | 200 | 0.003 | 0.2 | 20,000 | 160 | 0.002 | 0.16 | 18,000 | 120 | 0.002 | 0.12 |
| | 5 | 25,000 | 250 | 0.005 | 0.24 | 22,000 | 180 | 0.003 | 0.2 | 20,000 | 150 | 0.002 | 0.16 | 18,000 | 90 | 0.002 | 0.12 |
| | 6 | 25,000 | 200 | 0.004 | 0.24 | 22,000 | 150 | 0.002 | 0.2 | 18,000 | 130 | 0.002 | 0.16 | 16,000 | 70 | 0.001 | 0.12 |
| | 8 | 20,000 | 150 | 0.002 | 0.24 | 16,000 | 120 | 0.001 | 0.2 | 14,000 | 90 | 0.001 | 0.16 | 12,000 | 40 | 0.001 | 0.12 |
| | 10 | 16,000 | 100 | 0.002 | 0.24 | 13,000 | 80 | 0.001 | 0.2 | 12,000 | 50 | 0.001 | 0.16 | 10,000 | 20 | 0.001 | 0.12 |
| 0.5 | 1 | 30,000 | 550 | 0.02 | 0.3 | 25,000 | 500 | 0.01 | 0.25 | 23,000 | 450 | 0.007 | 0.2 | 20,000 | 400 | 0.005 | 0.15 |
| | 1.5 | 30,000 | 520 | 0.02 | 0.3 | 25,000 | 450 | 0.01 | 0.25 | 23,000 | 400 | 0.007 | 0.2 | 20,000 | 360 | 0.005 | 0.15 |
| | 2 | 30,000 | 500 | 0.02 | 0.3 | 25,000 | 420 | 0.01 | 0.25 | 23,000 | 380 | 0.007 | 0.2 | 20,000 | 320 | 0.005 | 0.15 |
| | 2.5 | 30,000 | 480 | 0.015 | 0.3 | 25,000 | 400 | 0.008 | 0.25 | 23,000 | 360 | 0.006 | 0.2 | 20,000 | 300 | 0.004 | 0.15 |
| | 3 | 30,000 | 420 | 0.015 | 0.3 | 25,000 | 350 | 0.007 | 0.25 | 23,000 | 320 | 0.005 | 0.2 | 20,000 | 280 | 0.003 | 0.15 |
| | 3.5 | 25,000 | 400 | 0.012 | 0.3 | 25,000 | 320 | 0.006 | 0.25 | 23,000 | 280 | 0.003 | 0.2 | 20,000 | 240 | 0.003 | 0.15 |
| | 4 | 25,000 | 380 | 0.01 | 0.3 | 25,000 | 280 | 0.005 | 0.25 | 23,000 | 240 | 0.003 | 0.2 | 20,000 | 200 | 0.002 | 0.15 |
| | 4.5 | 25,000 | 350 | 0.008 | 0.3 | 25,000 | 230 | 0.004 | 0.25 | 20,000 | 200 | 0.003 | 0.2 | 18,000 | 160 | 0.002 | 0.15 |
| | 5 | 25,000 | 320 | 0.007 | 0.3 | 20,000 | 200 | 0.003 | 0.25 | 18,000 | 150 | 0.003 | 0.2 | 16,000 | 100 | 0.002 | 0.15 |
| | 6 | 25,000 | 300 | 0.005 | 0.3 | 20,000 | 200 | 0.003 | 0.25 | 18,000 | 150 | 0.002 | 0.2 | 16,000 | 100 | 0.002 | 0.15 |
| | 7 | 20,000 | 250 | 0.005 | 0.3 | 16,000 | 180 | 0.003 | 0.25 | 14,000 | 140 | 0.002 | 0.2 | 14,000 | 80 | 0.002 | 0.15 |
| | 8 | 20,000 | 200 | 0.005 | 0.3 | 16,000 | 160 | 0.002 | 0.25 | 14,000 | 130 | 0.002 | 0.2 | 12,000 | 60 | 0.001 | 0.15 |
| | 9 | 20,000 | 200 | 0.003 | 0.3 | 16,000 | 150 | 0.002 | 0.25 | 14,000 | 120 | 0.001 | 0.2 | 12,000 | 50 | 0.001 | 0.15 |
| | 10 | 16,000 | 170 | 0.003 | 0.3 | 13,000 | 130 | 0.002 | 0.25 | 12,000 | 110 | 0.001 | 0.2 | 10,000 | 40 | 0.001 | 0.15 |
| 0.6 | 1.5 | 30,000 | 650 | 0.02 | 0.35 | 25,000 | 550 | 0.01 | 0.3 | 23,000 | 450 | 0.007 | 0.25 | 20,000 | 400 | 0.005 | 0.18 |
| | 2 | 30,000 | 550 | 0.02 | 0.35 | 25,000 | 500 | 0.01 | 0.3 | 23,000 | 400 | 0.007 | 0.25 | 20,000 | 350 | 0.005 | 0.18 |
| | 3 | 30,000 | 500 | 0.015 | 0.35 | 25,000 | 450 | 0.007 | 0.3 | 23,000 | 350 | 0.005 | 0.25 | 20,000 | 300 | 0.003 | 0.18 |
| | 4 | 25,000 | 450 | 0.01 | 0.35 | 25,000 | 400 | 0.005 | 0.3 | 23,000 | 300 | 0.003 | 0.25 | 20,000 | 250 | 0.002 | 0.18 |

# MHRH230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK55・NAK80・HPM-1 (~43HRC) | | | | 焼き入れ鋼 Hardened Steels HPM-38・STAVAX・SKD61 (~55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・PD613 (~62HRC) | | | | ハイス High Speed Tool Steels SKH (~65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | min$^{-1}$ | mm/min | ∂p mm | ∂e mm | min$^{-1}$ | mm/min | ∂p mm | ∂e mm | min$^{-1}$ | mm/min | ∂p mm | ∂e mm | min$^{-1}$ | mm/min | ∂p mm | ∂e mm |
| 0.6 | 5 | 25,000 | 400 | 0.007 | 0.35 | 20,000 | 350 | 0.003 | 0.3 | 18,000 | 250 | 0.003 | 0.25 | 16,000 | 200 | 0.002 | 0.18 |
| | 6 | 25,000 | 350 | 0.001 | 0.35 | 20,000 | 300 | 0.002 | 0.3 | 18,000 | 200 | 0.002 | 0.25 | 16,000 | 150 | 0.001 | 0.18 |
| 0.7 | 2 | 30,000 | 750 | 0.04 | 0.4 | 25,000 | 600 | 0.03 | 0.35 | 23,000 | 450 | 0.02 | 0.28 | 20,000 | 400 | 0.012 | 0.21 |
| | 4 | 25,000 | 690 | 0.03 | 0.4 | 25,000 | 560 | 0.02 | 0.35 | 23,000 | 400 | 0.015 | 0.28 | 20,000 | 320 | 0.007 | 0.21 |
| | 6 | 25,000 | 550 | 0.02 | 0.4 | 20,000 | 410 | 0.015 | 0.35 | 18,000 | 300 | 0.012 | 0.28 | 16,000 | 240 | 0.007 | 0.21 |
| | 8 | 20,000 | 430 | 0.012 | 0.4 | 16,000 | 330 | 0.01 | 0.35 | 14,000 | 230 | 0.007 | 0.28 | 12,000 | 180 | 0.005 | 0.21 |
| | 10 | 16,000 | 300 | 0.008 | 0.4 | 13,000 | 200 | 0.005 | 0.35 | 12,000 | 180 | 0.003 | 0.28 | 10,000 | 120 | 0.002 | 0.21 |
| 0.8 | 3 | 25,000 | 850 | 0.04 | 0.45 | 25,000 | 780 | 0.03 | 0.4 | 23,000 | 650 | 0.02 | 0.32 | 20,000 | 550 | 0.012 | 0.24 |
| | 4 | 25,000 | 800 | 0.03 | 0.45 | 25,000 | 700 | 0.025 | 0.4 | 23,000 | 600 | 0.015 | 0.32 | 20,000 | 500 | 0.007 | 0.24 |
| | 5 | 25,000 | 700 | 0.03 | 0.45 | 23,000 | 630 | 0.02 | 0.4 | 20,000 | 530 | 0.012 | 0.32 | 18,000 | 450 | 0.006 | 0.24 |
| | 6 | 20,000 | 620 | 0.025 | 0.45 | 20,000 | 550 | 0.02 | 0.4 | 18,000 | 450 | 0.01 | 0.32 | 16,000 | 350 | 0.005 | 0.24 |
| | 8 | 16,000 | 500 | 0.015 | 0.45 | 16,000 | 400 | 0.007 | 0.4 | 14,000 | 300 | 0.005 | 0.32 | 12,000 | 200 | 0.003 | 0.24 |
| | 10 | 16,000 | 400 | 0.012 | 0.45 | 16,000 | 350 | 0.007 | 0.4 | 12,000 | 180 | 0.005 | 0.32 | 10,000 | 150 | 0.003 | 0.24 |
| | 12 | 16,000 | 300 | 0.007 | 0.45 | 13,000 | 220 | 0.005 | 0.4 | 12,000 | 120 | 0.003 | 0.32 | 10,000 | 120 | 0.002 | 0.24 |
| 1 | 2 | 25,000 | 1,200 | 0.07 | 0.6 | 23,000 | 1,000 | 0.06 | 0.5 | 18,000 | 900 | 0.05 | 0.4 | 14,000 | 600 | 0.035 | 0.3 |
| | 3 | 25,000 | 1,200 | 0.06 | 0.6 | 23,000 | 1,000 | 0.05 | 0.5 | 18,000 | 900 | 0.04 | 0.4 | 14,000 | 600 | 0.03 | 0.3 |
| | 4 | 25,000 | 1,000 | 0.05 | 0.6 | 23,000 | 900 | 0.04 | 0.5 | 18,000 | 800 | 0.03 | 0.4 | 14,000 | 500 | 0.02 | 0.3 |
| | 5 | 22,000 | 1,000 | 0.04 | 0.6 | 20,000 | 800 | 0.03 | 0.5 | 16,000 | 700 | 0.02 | 0.4 | 12,000 | 450 | 0.012 | 0.3 |
| | 6 | 20,000 | 900 | 0.03 | 0.6 | 18,000 | 700 | 0.02 | 0.5 | 14,000 | 600 | 0.01 | 0.4 | 10,000 | 400 | 0.007 | 0.3 |
| | 7 | 20,000 | 900 | 0.03 | 0.6 | 18,000 | 650 | 0.02 | 0.5 | 14,000 | 550 | 0.01 | 0.4 | 10,000 | 370 | 0.006 | 0.3 |
| | 8 | 18,000 | 800 | 0.03 | 0.6 | 16,000 | 600 | 0.02 | 0.5 | 12,000 | 500 | 0.01 | 0.4 | 8,000 | 340 | 0.005 | 0.3 |
| | 9 | 18,000 | 700 | 0.02 | 0.6 | 16,000 | 550 | 0.015 | 0.5 | 12,000 | 450 | 0.007 | 0.4 | 8,000 | 300 | 0.005 | 0.3 |
| | 10 | 16,000 | 600 | 0.02 | 0.6 | 14,000 | 500 | 0.01 | 0.5 | 10,000 | 400 | 0.007 | 0.4 | 6,000 | 250 | 0.005 | 0.3 |
| | 12 | 16,000 | 500 | 0.02 | 0.6 | 13,000 | 400 | 0.01 | 0.5 | 10,000 | 300 | 0.005 | 0.4 | 6,000 | 180 | 0.004 | 0.3 |
| | 14 | 16,000 | 450 | 0.015 | 0.6 | 13,000 | 360 | 0.008 | 0.5 | 10,000 | 280 | 0.005 | 0.4 | 5,500 | 160 | 0.004 | 0.3 |
| | 16 | 14,000 | 400 | 0.012 | 0.6 | 12,000 | 320 | 0.006 | 0.5 | 9,000 | 250 | 0.004 | 0.4 | 5,500 | 150 | 0.003 | 0.3 |
| | 18 | 14,000 | 300 | 0.01 | 0.6 | 12,000 | 240 | 0.006 | 0.5 | 8,000 | 200 | 0.004 | 0.4 | 5,000 | 120 | 0.002 | 0.3 |
| | 20 | 12,000 | 200 | 0.007 | 0.6 | 10,000 | 160 | 0.005 | 0.5 | 7,000 | 130 | 0.003 | 0.4 | 4,500 | 90 | 0.001 | 0.3 |
| | 22 | 12,000 | 180 | 0.005 | 0.6 | 10,000 | 150 | 0.003 | 0.5 | 6,000 | 100 | 0.002 | 0.4 | 4,200 | 60 | 0.001 | 0.3 |
| 1.2 | 6 | 20,000 | 900 | 0.04 | 0.7 | 18,000 | 700 | 0.03 | 0.6 | 14,000 | 600 | 0.02 | 0.5 | 10,000 | 400 | 0.01 | 0.4 |
| | 8 | 18,000 | 800 | 0.04 | 0.7 | 16,000 | 600 | 0.02 | 0.6 | 12,000 | 500 | 0.01 | 0.5 | 8,000 | 340 | 0.007 | 0.4 |
| | 10 | 16,000 | 600 | 0.03 | 0.7 | 12,000 | 500 | 0.02 | 0.6 | 10,000 | 430 | 0.01 | 0.5 | 8,000 | 300 | 0.005 | 0.4 |
| | 12 | 14,000 | 600 | 0.02 | 0.7 | 10,000 | 500 | 0.01 | 0.6 | 9,000 | 400 | 0.007 | 0.5 | 7,000 | 250 | 0.005 | 0.4 |
| | 16 | 12,000 | 400 | 0.018 | 0.7 | 9,000 | 300 | 0.01 | 0.6 | 8,000 | 260 | 0.005 | 0.5 | 6,000 | 180 | 0.003 | 0.4 |
| 1.4 | 6 | 22,000 | 1,000 | 0.06 | 0.8 | 20,000 | 800 | 0.04 | 0.7 | 18,000 | 700 | 0.03 | 0.56 | 12,000 | 450 | 0.02 | 0.42 |
| | 12 | 16,000 | 700 | 0.03 | 0.8 | 13,000 | 500 | 0.01 | 0.7 | 11,000 | 400 | 0.007 | 0.56 | 8,000 | 280 | 0.005 | 0.42 |
| 1.5 | 4 | 23,000 | 1,200 | 0.07 | 0.9 | 20,000 | 900 | 0.05 | 0.75 | 18,000 | 800 | 0.04 | 0.6 | 14,000 | 600 | 0.03 | 0.45 |
| | 6 | 23,000 | 1,000 | 0.06 | 0.9 | 20,000 | 800 | 0.04 | 0.75 | 18,000 | 700 | 0.03 | 0.6 | 14,000 | 500 | 0.02 | 0.45 |
| | 8 | 20,000 | 900 | 0.06 | 0.9 | 18,000 | 600 | 0.03 | 0.75 | 14,000 | 600 | 0.03 | 0.6 | 10,000 | 380 | 0.01 | 0.45 |
| | 10 | 20,000 | 800 | 0.04 | 0.9 | 16,000 | 500 | 0.03 | 0.75 | 14,000 | 500 | 0.02 | 0.6 | 10,000 | 350 | 0.01 | 0.45 |
| | 12 | 16,000 | 700 | 0.04 | 0.9 | 14,000 | 500 | 0.02 | 0.75 | 12,000 | 430 | 0.02 | 0.6 | 8,000 | 310 | 0.007 | 0.45 |
| | 14 | 14,000 | 600 | 0.03 | 0.9 | 12,000 | 400 | 0.02 | 0.75 | 10,000 | 380 | 0.01 | 0.6 | 7,500 | 250 | 0.007 | 0.45 |
| | 16 | 12,000 | 500 | 0.02 | 0.9 | 10,000 | 360 | 0.01 | 0.75 | 9,000 | 300 | 0.007 | 0.6 | 6,800 | 200 | 0.005 | 0.45 |
| | 18 | 10,000 | 400 | 0.02 | 0.9 | 9,000 | 330 | 0.008 | 0.75 | 8,000 | 260 | 0.005 | 0.6 | 6,000 | 170 | 0.004 | 0.45 |
| | 20 | 9,000 | 320 | 0.014 | 0.9 | 8,000 | 280 | 0.005 | 0.75 | 7,000 | 200 | 0.004 | 0.6 | 5,500 | 150 | 0.003 | 0.45 |
| | 25 | 8,000 | 250 | 0.01 | 0.9 | 7,000 | 200 | 0.004 | 0.75 | 6,000 | 150 | 0.003 | 0.6 | 4,500 | 100 | 0.002 | 0.45 |
| | 30 | 7,000 | 200 | 0.005 | 0.9 | 6,000 | 150 | 0.003 | 0.75 | 5,000 | 110 | 0.002 | 0.6 | 4,000 | 80 | 0.002 | 0.45 |
| | 35 | 6,000 | 150 | 0.003 | 0.9 | 5,000 | 110 | 0.002 | 0.75 | 4,500 | 90 | 0.002 | 0.6 | 3,500 | 60 | 0.002 | 0.45 |
| 1.6 | 6 | 22,000 | 1,000 | 0.06 | 0.96 | 19,000 | 850 | 0.04 | 0.8 | 17,000 | 750 | 0.03 | 0.64 | 13,000 | 600 | 0.025 | 0.48 |
| | 8 | 20,000 | 900 | 0.06 | 0.96 | 17,000 | 750 | 0.03 | 0.8 | 14,000 | 600 | 0.03 | 0.64 | 10,000 | 430 | 0.015 | 0.48 |



ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| 被削材 Work Material | | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK55・NAK80・HPM-1 (～43HRC) | | | | 焼き入れ鋼 Hardened Steels HPM-38・STAVAX・SKD61 (～55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・PD613 (～62HRC) | | | | ハイス High Speed Tool Steels SKH (～65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | $min^{-1}$ | mm/min | ap mm | ae mm | $min^{-1}$ | mm/min | ap mm | ae mm | $min^{-1}$ | mm/min | ap mm | ae mm | $min^{-1}$ | mm/min | ap mm | ae mm |
| 1.8 | 6 | 20,000 | 1,000 | 0.07 | 1 | 18,000 | 900 | 0.05 | 0.9 | 15,000 | 750 | 0.04 | 0.7 | 12,000 | 600 | 0.03 | 0.5 |
| | 8 | 18,000 | 900 | 0.06 | 1 | 16,000 | 800 | 0.04 | 0.9 | 12,000 | 600 | 0.03 | 0.7 | 9,500 | 500 | 0.02 | 0.5 |
| | 10 | 16,000 | 800 | 0.06 | 1 | 14,000 | 700 | 0.04 | 0.9 | 12,000 | 500 | 0.03 | 0.7 | 9,500 | 450 | 0.02 | 0.5 |
| | 12 | 14,000 | 700 | 0.05 | 1 | 12,000 | 600 | 0.03 | 0.9 | 10,000 | 500 | 0.02 | 0.7 | 8,200 | 400 | 0.01 | 0.5 |
| | 14 | 14,000 | 700 | 0.05 | 1 | 12,000 | 600 | 0.03 | 0.9 | 10,000 | 430 | 0.02 | 0.7 | 8,200 | 360 | 0.01 | 0.5 |
| | 16 | 12,000 | 600 | 0.04 | 1 | 10,000 | 500 | 0.02 | 0.9 | 9,200 | 400 | 0.01 | 0.7 | 7,500 | 340 | 0.007 | 0.5 |
| | 18 | 10,000 | 500 | 0.04 | 1 | 9,200 | 410 | 0.02 | 0.9 | 8,500 | 370 | 0.01 | 0.7 | 6,000 | 320 | 0.007 | 0.5 |
| 2 | 4 | 20,000 | 1,200 | 0.1 | 1.2 | 18,000 | 1,000 | 0.08 | 1 | 15,000 | 800 | 0.06 | 0.8 | 12,000 | 600 | 0.04 | 0.6 |
| | 6 | 20,000 | 1,000 | 0.08 | 1.2 | 18,000 | 900 | 0.06 | 1 | 15,000 | 750 | 0.05 | 0.8 | 12,000 | 600 | 0.03 | 0.6 |
| | 8 | 18,000 | 900 | 0.07 | 1.2 | 16,000 | 800 | 0.05 | 1 | 12,000 | 600 | 0.04 | 0.8 | 9,500 | 500 | 0.02 | 0.6 |
| | 10 | 16,000 | 800 | 0.06 | 1.2 | 14,000 | 700 | 0.05 | 1 | 12,000 | 500 | 0.04 | 0.8 | 9,500 | 450 | 0.02 | 0.6 |
| | 12 | 14,000 | 700 | 0.05 | 1.2 | 12,000 | 600 | 0.04 | 1 | 10,000 | 500 | 0.03 | 0.8 | 8,200 | 400 | 0.01 | 0.6 |
| | 14 | 14,000 | 700 | 0.04 | 1.2 | 12,000 | 600 | 0.03 | 1 | 10,000 | 430 | 0.02 | 0.8 | 8,200 | 360 | 0.007 | 0.6 |
| | 16 | 12,000 | 600 | 0.04 | 1.2 | 10,000 | 500 | 0.03 | 1 | 9,200 | 400 | 0.02 | 0.8 | 7,500 | 340 | 0.007 | 0.6 |
| | 18 | 10,000 | 500 | 0.03 | 1.2 | 9,200 | 410 | 0.02 | 1 | 8,500 | 370 | 0.01 | 0.8 | 6,000 | 320 | 0.005 | 0.6 |
| | 20 | 10,000 | 400 | 0.03 | 1.2 | 9,200 | 380 | 0.02 | 1 | 8,500 | 340 | 0.01 | 0.8 | 6,000 | 260 | 0.005 | 0.6 |
| | 25 | 9,000 | 350 | 0.02 | 1.2 | 8,500 | 330 | 0.015 | 1 | 8,000 | 300 | 0.008 | 0.8 | 5,000 | 180 | 0.004 | 0.6 |
| | 30 | 8,000 | 300 | 0.015 | 1.2 | 7,500 | 280 | 0.01 | 1 | 7,000 | 250 | 0.006 | 0.8 | 4,500 | 150 | 0.004 | 0.6 |
| | 35 | 7,000 | 250 | 0.012 | 1.2 | 6,500 | 230 | 0.008 | 1 | 6,000 | 200 | 0.005 | 0.8 | 4,000 | 120 | 0.003 | 0.6 |
| | 40 | 6,000 | 200 | 0.008 | 1.2 | 5,500 | 180 | 0.005 | 1 | 5,000 | 150 | 0.004 | 0.8 | 3,500 | 100 | 0.003 | 0.6 |
| | 50 | 5,000 | 120 | 0.005 | 1.2 | 4,500 | 100 | 0.004 | 1 | 4,000 | 80 | 0.003 | 0.8 | 3,000 | 55 | 0.002 | 0.6 |
| 2.5 | 8 | 16,000 | 1,000 | 0.08 | 1.5 | 14,000 | 800 | 0.07 | 1.25 | 10,000 | 700 | 0.05 | 1 | 8,000 | 500 | 0.03 | 0.75 |
| | 12 | 14,000 | 800 | 0.07 | 1.5 | 12,000 | 700 | 0.06 | 1.25 | 9,600 | 600 | 0.04 | 1 | 7,500 | 480 | 0.02 | 0.75 |
| | 16 | 12,000 | 700 | 0.06 | 1.5 | 10,000 | 600 | 0.05 | 1.25 | 8,500 | 500 | 0.02 | 1 | 7,000 | 400 | 0.01 | 0.75 |
| | 20 | 10,000 | 600 | 0.06 | 1.5 | 8,200 | 500 | 0.05 | 1.25 | 7,500 | 500 | 0.02 | 1 | 5,000 | 400 | 0.01 | 0.75 |
| | 30 | 8,000 | 400 | 0.03 | 1.5 | 7,000 | 300 | 0.025 | 1.25 | 6,000 | 250 | 0.015 | 1 | 4,000 | 150 | 0.008 | 0.75 |
| | 40 | 6,000 | 250 | 0.015 | 1.5 | 5,500 | 200 | 0.012 | 1.25 | 5,000 | 180 | 0.01 | 1 | 3,500 | 110 | 0.005 | 0.75 |
| | 50 | 5,000 | 150 | 0.01 | 1.5 | 4,500 | 120 | 0.008 | 1.25 | 4,000 | 100 | 0.005 | 1 | 3,000 | 70 | 0.004 | 0.75 |
| 3 | 8 | 16,000 | 1,000 | 0.15 | 1.8 | 14,000 | 900 | 0.1 | 1.5 | 10,000 | 800 | 0.07 | 1.2 | 8,000 | 600 | 0.05 | 0.9 |
| | 12 | 14,000 | 900 | 0.1 | 1.8 | 12,000 | 800 | 0.08 | 1.5 | 9,200 | 700 | 0.06 | 1.2 | 7,200 | 500 | 0.04 | 0.9 |
| | 16 | 12,000 | 800 | 0.08 | 1.8 | 10,000 | 700 | 0.07 | 1.5 | 8,500 | 600 | 0.05 | 1.2 | 6,500 | 400 | 0.03 | 0.9 |
| | 20 | 10,000 | 800 | 0.08 | 1.8 | 9,000 | 700 | 0.07 | 1.5 | 7,800 | 600 | 0.04 | 1.2 | 5,800 | 400 | 0.02 | 0.9 |
| | 25 | 9,000 | 700 | 0.07 | 1.8 | 8,200 | 600 | 0.06 | 1.5 | 7,000 | 500 | 0.03 | 1.2 | 5,000 | 360 | 0.01 | 0.9 |
| | 30 | 8,000 | 700 | 0.05 | 1.8 | 7,000 | 600 | 0.03 | 1.5 | 6,500 | 500 | 0.02 | 1.2 | 4,500 | 330 | 0.007 | 0.9 |

**備　考 Notes**

※本切削条件は参考値です。実際の加工形状および使用機械等にて切削条件を調整してください。
※切り込み量の、ap は切り込み深さ、ae は切り込み幅を示します。
※焼き入れ鋼を切削加工する場合は、オイルミストクーラントをお奨めします。
※ Z 切り込み時のアプローチ方法として、ヘリカル（螺旋）及びランプ（傾斜）での切削加工をお奨めします。
※ L(有効長)/D(刃径)が8倍を超える場合は立ち壁付近の送り速度を50%以下、切り込み量:aeを30%以下に調整してください。
※溝切削は、切削条件表を参考に切り込み量：ap 及び送り速度を 50%以下に設定し、往復切削をお奨めします。
※ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。また、主軸回転数が足りない場合も同様に同じ割合で下げてください。
※ L(有効長)/D(刃径)が5以上の場合、有効長の短い工具でのガイド溝加工をお奨めします。
※ φ0.5 未満あるいは L(有効長)/D(刃径)が 15 以上の場合、加工形状・使用機械等により、大幅な条件調整を必要とする場合があります。

※These recommended cutting conditions indicate just reference. It should be adjusted according to milling shape and machine type.
※ap:Axial Depth of Cut, ae:Radial Depth of Cut.
※Recommend to use oil mist coolant for machining hardened steel.
※Recommend to apply herical or ramping for approaching into axial direction.
※Adjust feed rate 50% lower and cutting depth(ae) 30% lower for milling deep wall area. When L/D exceeds 8 for stable milling.
※For slotting, recommend reciprocating milling by adjusting feed & ap in below 50% of recommended milling condition.
※Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.
※Recommend guide slotting process with short neck tool before milling with L/D 5 time or longer neck tool.
※Major adjustment of milling conditions appropriately on milling profile, machine tool and etc. required for the tools smaller than Dia. 0.5mm, or L/D 15 times longer.

# MHRH430

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK55・NAK80・HPM-1 (~43HRC) | | | | 焼き入れ鋼 Hardened Steels HPM-38・STAVAX・SKD61 (~55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・PD613 (~62HRC) | | | | ハイス High Speed Tool Steels SKH (~65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | min$^{-1}$ | mm/min | ∂p mm | ∂e mm | min$^{-1}$ | mm/min | ∂p mm | ∂e mm | min$^{-1}$ | mm/min | ∂p mm | ∂e mm | min$^{-1}$ | mm/min | ∂p mm | ∂e mm |
| 1 | 4 | 25,000 | 2,000 | 0.05 | 0.6 | 23,000 | 1,800 | 0.04 | 0.5 | 18,000 | 1,600 | 0.03 | 0.4 | 14,000 | 1,000 | 0.02 | 0.3 |
| | 6 | 20,000 | 1,800 | 0.03 | 0.6 | 18,000 | 1,400 | 0.02 | 0.5 | 14,000 | 1,200 | 0.01 | 0.4 | 10,000 | 800 | 0.007 | 0.3 |
| | 8 | 18,000 | 1,600 | 0.03 | 0.6 | 16,000 | 1,200 | 0.02 | 0.5 | 12,000 | 1,000 | 0.01 | 0.4 | 8,000 | 680 | 0.005 | 0.3 |
| | 10 | 16,000 | 1,200 | 0.02 | 0.6 | 14,000 | 1,000 | 0.01 | 0.5 | 10,000 | 800 | 0.007 | 0.4 | 6,000 | 500 | 0.005 | 0.3 |
| 1.2 | 6 | 20,000 | 1,800 | 0.04 | 0.7 | 18,000 | 1,400 | 0.03 | 0.6 | 14,000 | 1,200 | 0.02 | 0.5 | 10,000 | 800 | 0.01 | 0.4 |
| | 8 | 18,000 | 1,600 | 0.04 | 0.7 | 16,000 | 1,200 | 0.02 | 0.6 | 12,000 | 1,000 | 0.01 | 0.5 | 8,000 | 680 | 0.007 | 0.4 |
| | 10 | 16,000 | 1,200 | 0.03 | 0.7 | 12,000 | 1,000 | 0.02 | 0.6 | 10,000 | 850 | 0.01 | 0.5 | 8,000 | 600 | 0.005 | 0.4 |
| | 12 | 14,000 | 1,200 | 0.02 | 0.7 | 10,000 | 1,000 | 0.01 | 0.6 | 9,000 | 800 | 0.007 | 0.5 | 7,000 | 500 | 0.005 | 0.4 |
| 1.5 | 6 | 23,000 | 2,000 | 0.06 | 0.9 | 20,000 | 1,600 | 0.04 | 0.75 | 18,000 | 1,400 | 0.03 | 0.6 | 14,000 | 1,000 | 0.02 | 0.45 |
| | 8 | 20,000 | 1,800 | 0.06 | 0.9 | 18,000 | 1,200 | 0.03 | 0.75 | 14,000 | 1,200 | 0.03 | 0.6 | 10,000 | 750 | 0.01 | 0.45 |
| | 10 | 20,000 | 1,600 | 0.04 | 0.9 | 16,000 | 1,000 | 0.03 | 0.75 | 14,000 | 1,000 | 0.02 | 0.6 | 10,000 | 700 | 0.01 | 0.45 |
| | 12 | 16,000 | 1,400 | 0.04 | 0.9 | 14,000 | 1,000 | 0.02 | 0.75 | 12,000 | 850 | 0.02 | 0.6 | 8,000 | 620 | 0.007 | 0.45 |
| | 14 | 14,000 | 1,200 | 0.03 | 0.9 | 12,000 | 800 | 0.02 | 0.75 | 10,000 | 750 | 0.01 | 0.6 | 7,500 | 500 | 0.007 | 0.45 |
| | 16 | 12,000 | 1,000 | 0.02 | 0.9 | 10,000 | 720 | 0.01 | 0.75 | 9,000 | 600 | 0.007 | 0.6 | 6,800 | 400 | 0.005 | 0.45 |
| 1.8 | 6 | 20,000 | 2,000 | 0.07 | 1 | 18,000 | 1,800 | 0.05 | 0.9 | 15,000 | 1,500 | 0.04 | 0.7 | 12,000 | 1,200 | 0.03 | 0.5 |
| | 8 | 18,000 | 1,800 | 0.06 | 1 | 16,000 | 1,600 | 0.04 | 0.9 | 12,000 | 1,200 | 0.03 | 0.7 | 9,500 | 1,000 | 0.02 | 0.5 |
| | 10 | 16,000 | 1,600 | 0.06 | 1 | 14,000 | 1,400 | 0.04 | 0.9 | 12,000 | 1,000 | 0.03 | 0.7 | 9,500 | 900 | 0.02 | 0.5 |
| | 12 | 14,000 | 1,400 | 0.05 | 1 | 12,000 | 1,200 | 0.03 | 0.9 | 10,000 | 1,000 | 0.02 | 0.7 | 8,200 | 800 | 0.01 | 0.5 |
| | 14 | 14,000 | 1,400 | 0.05 | 1 | 12,000 | 1,200 | 0.03 | 0.9 | 10,000 | 860 | 0.02 | 0.7 | 8,200 | 720 | 0.01 | 0.5 |
| | 16 | 12,000 | 1,200 | 0.04 | 1 | 10,000 | 1,000 | 0.02 | 0.9 | 9,200 | 800 | 0.01 | 0.7 | 7,500 | 680 | 0.007 | 0.5 |
| | 18 | 10,000 | 1,000 | 0.04 | 1 | 9,200 | 820 | 0.02 | 0.9 | 8,500 | 740 | 0.01 | 0.7 | 6,000 | 640 | 0.007 | 0.5 |
| 2 | 6 | 20,000 | 2,000 | 0.08 | 1.2 | 18,000 | 1,800 | 0.06 | 1 | 15,000 | 1,500 | 0.05 | 0.8 | 12,000 | 1,200 | 0.03 | 0.6 |
| | 8 | 18,000 | 1,800 | 0.07 | 1.2 | 16,000 | 1,600 | 0.05 | 1 | 12,000 | 1,200 | 0.04 | 0.8 | 9,500 | 1,000 | 0.02 | 0.6 |
| | 10 | 16,000 | 1,600 | 0.06 | 1.2 | 14,000 | 1,400 | 0.05 | 1 | 12,000 | 1,000 | 0.04 | 0.8 | 9,500 | 900 | 0.02 | 0.6 |
| | 12 | 14,000 | 1,400 | 0.05 | 1.2 | 12,000 | 1,200 | 0.04 | 1 | 10,000 | 1,000 | 0.03 | 0.8 | 8,200 | 800 | 0.01 | 0.6 |
| | 14 | 14,000 | 1,400 | 0.04 | 1.2 | 12,000 | 1,200 | 0.03 | 1 | 10,000 | 860 | 0.02 | 0.8 | 8,200 | 720 | 0.007 | 0.6 |
| | 16 | 12,000 | 1,200 | 0.04 | 1.2 | 10,000 | 1,000 | 0.03 | 1 | 9,200 | 800 | 0.02 | 0.8 | 7,500 | 680 | 0.007 | 0.6 |
| | 18 | 10,000 | 1,000 | 0.03 | 1.2 | 9,200 | 820 | 0.02 | 1 | 8,500 | 740 | 0.01 | 0.8 | 6,000 | 640 | 0.005 | 0.6 |
| | 20 | 10,000 | 800 | 0.03 | 1.2 | 9,200 | 760 | 0.02 | 1 | 8,500 | 680 | 0.01 | 0.8 | 6,000 | 520 | 0.005 | 0.6 |
| 2.5 | 8 | 16,000 | 2,000 | 0.08 | 1.5 | 14,000 | 1,600 | 0.07 | 1.25 | 10,000 | 1,400 | 0.05 | 1 | 8,000 | 1,000 | 0.03 | 0.75 |
| | 12 | 14,000 | 1,600 | 0.07 | 1.5 | 12,000 | 1,400 | 0.06 | 1.25 | 9,600 | 1,200 | 0.04 | 1 | 7,500 | 960 | 0.02 | 0.75 |
| | 16 | 12,000 | 1,400 | 0.06 | 1.5 | 10,000 | 1,200 | 0.05 | 1.25 | 8,500 | 1,000 | 0.02 | 1 | 7,000 | 800 | 0.01 | 0.75 |
| | 20 | 10,000 | 1,200 | 0.06 | 1.5 | 8,200 | 1,000 | 0.05 | 1.25 | 7,500 | 1,000 | 0.02 | 1 | 5,000 | 800 | 0.01 | 0.75 |
| | 25 | 8,000 | 1,000 | 0.05 | 1.5 | 7,000 | 800 | 0.03 | 1.25 | 6,500 | 680 | 0.01 | 1 | 4,500 | 550 | 0.005 | 0.75 |



ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| 被削材 Work Material | | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK55・NAK80 HPM-1 (～43HRC) | | | | 焼き入れ鋼 Hardened Steels HPM-38・STAVAX・SKD61 (～55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・PD613 (～62HRC) | | | | ハイス High Speed Tool Steels SKH (～65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | $min^{-1}$ | mm/min | ap mm | ae mm | $min^{-1}$ | mm/min | ap mm | ae mm | $min^{-1}$ | mm/min | ap mm | ae mm | $min^{-1}$ | mm/min | ap mm | ae mm |
| 3 | 8 | 16,000 | 2,000 | 0.15 | 1.8 | 14,000 | 1,800 | 0.1 | 1.5 | 10,000 | 1,600 | 0.07 | 1.2 | 8,000 | 1.200 | 0.05 | 0.9 |
| | 12 | 14,000 | 1,800 | 0.1 | 1.8 | 12,000 | 1,600 | 0.08 | 1.5 | 9,200 | 1,400 | 0.06 | 1.2 | 7,200 | 1,000 | 0.04 | 0.9 |
| | 16 | 12,000 | 1,600 | 0.08 | 1.8 | 10,000 | 1,400 | 0.07 | 1.5 | 8,500 | 1,200 | 0.05 | 1.2 | 6,500 | 800 | 0.03 | 0.9 |
| | 20 | 10,000 | 1,600 | 0.08 | 1.8 | 9,000 | 1,400 | 0.07 | 1.5 | 7,800 | 1,200 | 0.04 | 1.2 | 5,800 | 800 | 0.02 | 0.9 |
| | 25 | 9,000 | 1,400 | 0.07 | 1.8 | 8,200 | 1,200 | 0.06 | 1.5 | 7,000 | 1,000 | 0.03 | 1.2 | 5,000 | 720 | 0.01 | 0.9 |
| | 30 | 8,000 | 1,400 | 0.05 | 1.8 | 7,000 | 1,200 | 0.03 | 1.5 | 6,500 | 1,000 | 0.02 | 1.2 | 4,500 | 650 | 0.007 | 0.9 |
| 4 | 12 | 12,000 | 2,000 | 0.2 | 2.5 | 9,500 | 2,000 | 0.15 | 2 | 8,000 | 1,600 | 0.08 | 1.6 | 7,000 | 1,000 | 0.06 | 1.2 |
| | 16 | 10,000 | 2,000 | 0.15 | 2.5 | 8,000 | 1,800 | 0.1 | 2 | 7,000 | 1,400 | 0.06 | 1.6 | 6,000 | 1,200 | 0.05 | 1.2 |
| | 20 | 8,500 | 1,800 | 0.12 | 2.5 | 7,000 | 1,600 | 0.08 | 2 | 6,500 | 1,200 | 0.05 | 1.6 | 5,500 | 1,000 | 0.04 | 1.2 |
| | 25 | 8,000 | 1,600 | 0.1 | 2.5 | 6,000 | 1,400 | 0.07 | 2 | 5,200 | 1,200 | 0.04 | 1.6 | 4,500 | 1,000 | 0.03 | 1.2 |
| | 30 | 6,800 | 1,400 | 0.08 | 2.5 | 4,800 | 1,000 | 0.05 | 2 | 4,200 | 850 | 0.03 | 1.6 | 3,500 | 620 | 0.02 | 1.2 |
| | 35 | 5,500 | 1,000 | 0.07 | 2.5 | 4,200 | 880 | 0.04 | 2 | 3,800 | 720 | 0.02 | 1.6 | 3,000 | 550 | 0.01 | 1.2 |
| | 40 | 4,000 | 860 | 0.05 | 2.5 | 3,600 | 720 | 0.03 | 2 | 3,000 | 600 | 0.01 | 1.6 | 2,500 | 400 | 0.007 | 1.2 |
| 5 | 16 | 10,000 | 2,000 | 0.2 | 3 | 7,000 | 1,800 | 0.12 | 2.5 | 5,500 | 1,600 | 0.08 | 2 | 4,500 | 1,000 | 0.06 | 1.5 |
| | 25 | 8,000 | 1,600 | 0.15 | 3 | 5,800 | 1,400 | 0.07 | 2.5 | 4,200 | 1,200 | 0.05 | 2 | 3,000 | 800 | 0.03 | 1.5 |
| | 35 | 6,000 | 1,200 | 0.1 | 3 | 4,200 | 900 | 0.05 | 2.5 | 3,500 | 800 | 0.03 | 2 | 2,500 | 600 | 0.02 | 1.5 |
| | 50 | 3,500 | 750 | 0.07 | 3 | 2,800 | 620 | 0.03 | 2.5 | 2,500 | 500 | 0.02 | 2 | 1,500 | 350 | 0.01 | 1.5 |
| 6 | 20 | 8,000 | 2,000 | 0.25 | 4 | 6,500 | 1,600 | 0.18 | 3 | 4,500 | 1,400 | 0.08 | 2.4 | 3,500 | 920 | 0.06 | 1.8 |
| | 30 | 7,000 | 1,600 | 0.2 | 4 | 4,500 | 1,200 | 0.12 | 3 | 3,500 | 1,000 | 0.06 | 2.4 | 2,500 | 660 | 0.04 | 1.8 |
| | 40 | 4,500 | 1,200 | 0.15 | 4 | 3,000 | 1,000 | 0.08 | 3 | 2,500 | 800 | 0.03 | 2.4 | 2,000 | 550 | 0.02 | 1.8 |
| | 50 | 3,000 | 850 | 0.1 | 4 | 2,500 | 700 | 0.05 | 3 | 2,000 | 500 | 0.02 | 2.4 | 1,500 | 380 | 0.01 | 1.8 |

**備　考 Notes**

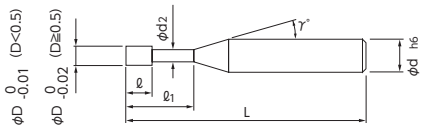
※本切削条件は参考値です。実際の加工形状および使用機械等にて切削条件を調整してください。
※切り込み量の、ap は切り込み深さ、ae は切り込み幅を示します。
※焼き入れ鋼を切削加工する場合は、オイルミストクーラントをお奨めします。
※ Z 切り込み時のアプローチ方法として、ヘリカル（螺旋）及びランプ（傾斜）での切削加工をお奨めします。
※ L（有効長）/D（刃径）が 8 倍を超える場合は立ち壁付近の送り速度を 50%以下、切り込み量：ae を 30%以下に調整してください。
※溝切削は、切削条件表を参考に切り込み量：ap 及び送り速度を 50%以下に設定し、往復切削をお奨めします。
※ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。また、主軸回転数が足りない場合も同様に同じ割合で下げてください。

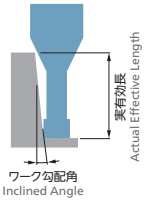
※These recommended cutting conditions indicate just reference. It should be adjusted according to milling shape and machine type.
※ap:Axial Depth of Cut, ae:Radial Depth of Cut.
※Recommend to use oil mist coolant for machining hardened steel.
※Recommend to apply herical or ramping for approaching into axial direction.
※Adjust feed rate 50% lower and cutting depth (ae) 30% lower for milling deep wall area. When L/D exceeds 8 for stable milling.
※For slotting, recommend reciprocating milling by adjusting feed & ap in below 50% of recommended milling condition.
※Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.

# MHR230

## 無限コーティング 2枚刃ロングネックエンドミル（深リブ用）

MUGEN-COATING 2 -Flute Long Neck End Mill




●NS オリジナルの深リブ用エンドミルに、無限コーティングを採用。
●狭くて深い加工に適した首逃げタイプ。
●全217 サイズ！
●MUGEN-COATING has been put on our original end mill for deep rib.
●It is very suitable for cutting on narrow and deep rib by long neck end mill.
●Total 217 sizes!

Slot Side Face MG ∞ 2 30° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D) 刃径 Dia. | (ℓ1) 有効長 Effective Length | (ℓ) 刃長 Length of Cut | (d2) 首下径 Neck Dia. | (γ) 首角 Neck Taper Angle | (d) シャンク径 Shank Dia. | (L) 全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00200-01003 | 0.1 | 0.3 | 0.15 | 0.085 | 12° | 4 | 45 | 9,300 | 0.34 | 0.36 | 0.38 | 0.40 | 0.44 |
| 08-00200-01005 | | 0.5 | | | | | 45 | 10,200 | 0.55 | 0.58 | 0.61 | 0.64 | 0.71 |
| 08-00200-01007 | | 0.75 | | | | | 45 | 11,300 | 0.82 | 0.86 | 0.90 | 0.94 | 1.05 |
| 08-00200-01010 | | 1 | | | | | 45 | 12,700 | 1.07 | 1.12 | 1.18 | 1.23 | 1.37 |
| 08-00200-01503 | 0.15 | 0.3 | 0.2 | 0.13 | 12° | 4 | 45 | 8,700 | 0.36 | 0.38 | 0.40 | 0.42 | 0.46 |
| 08-00200-01505 | | 0.5 | | | | | 45 | 9,500 | 0.57 | 0.60 | 0.62 | 0.66 | 0.73 |
| 08-00200-01507 | | 0.75 | | | | | 45 | 10,500 | 0.83 | 0.87 | 0.91 | 0.96 | 1.06 |
| 08-00200-01510 | | 1 | | | | | 45 | 10,500 | 1.09 | 1.14 | 1.20 | 1.25 | 1.39 |
| 08-00200-01515 | | 1.5 | | | | | 45 | 11,500 | 1.61 | 1.69 | 1.77 | 1.85 | 2.06 |
| 08-00200-02005 | 0.2 | 0.5 | 0.3 | 0.18 | 12° | 4 | 45 | 6,100 | 0.57 | 0.59 | 0.62 | 0.65 | 0.72 |
| 08-00200-02007 | | 0.75 | | | | | 45 | 6,100 | 0.83 | 0.87 | 0.91 | 0.96 | 1.06 |
| 08-00200-02010 | | 1 | | | | | 45 | 6,600 | 1.09 | 1.14 | 1.19 | 1.25 | 1.38 |
| 08-00200-02015 | | 1.5 | | | | | 45 | 8,000 | 1.61 | 1.68 | 1.76 | 1.85 | 2.05 |
| 08-00200-02020 | | 2 | | | | | 45 | 9,000 | 2.13 | 2.23 | 2.33 | 2.44 | 2.71 |
| 08-00200-02025 | | 2.5 | | | | | 45 | 9,000 | 2.65 | 2.77 | 2.90 | 3.04 | 3.38 |
| 08-00200-02030 | | 3 | | | | | 45 | 9,300 | 3.17 | 3.31 | 3.47 | 3.64 | 4.04 |
| 08-00200-02035 | | 3.5 | | | | | 45 | 10,300 | 3.69 | 3.86 | 4.04 | 4.24 | 4.70 |
| 08-00200-02040 | | 4 | | | | | 45 | 11,200 | 4.22 | 4.40 | 4.61 | 4.84 | 5.37 |
| 08-00200-03010 | 0.3 | 1 | 0.4 | 0.28 | 12° | 4 | 45 | 5,400 | 1.09 | 1.14 | 1.19 | 1.25 | 1.38 |
| 08-00200-03015 | | 1.5 | | | | | 45 | 5,400 | 1.61 | 1.68 | 1.76 | 1.85 | 2.05 |
| 08-00200-03020 | | 2 | | | | | 45 | 6,600 | 2.13 | 2.23 | 2.33 | 2.44 | 2.71 |
| 08-00200-03025 | | 2.5 | | | | | 45 | 6,900 | 2.65 | 2.77 | 2.90 | 3.04 | 3.38 |
| 08-00200-03030 | | 3 | | | | | 45 | 6,900 | 3.17 | 3.31 | 3.47 | 3.64 | 4.04 |
| 08-00200-03040 | | 4 | | | | | 45 | 7,900 | 4.22 | 4.40 | 4.61 | 4.84 | 5.37 |
| 08-00200-03050 | | 5 | | | | | 45 | 7,900 | 5.26 | 5.49 | 5.75 | 6.03 | 6.69 |
| 08-00200-03060 | | 6 | | | | | 45 | 8,800 | 6.30 | 6.58 | 6.89 | 7.23 | 8.02 |
| 08-00200-03090 | | 9 | | | | | 45 | 9,300 | 9.43 | 9.85 | 10.31 | 10.82 | 12.00 |
| 08-00200-04010 | 0.4 | 1 | 0.6 | 0.37 | 12° | 4 | 45 | 3,900 | 1.11 | 1.16 | 1.22 | 1.28 | 1.42 |
| 08-00200-04015 | | 1.5 | | | | | 45 | 3,900 | 1.64 | 1.71 | 1.79 | 1.88 | 2.09 |
| 08-00200-04020 | | 2 | | | | | 45 | 3,900 | 2.15 | 2.25 | 2.36 | 2.47 | 2.74 |
| 08-00200-04025 | | 2.5 | | | | | 45 | 3,900 | 2.68 | 2.80 | 2.93 | 3.08 | 3.42 |
| 08-00200-04030 | | 3 | | | | | 45 | 3,900 | 3.20 | 3.34 | 3.50 | 3.67 | 4.07 |

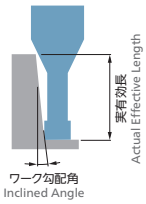
**オーダー方法** MHR230刃径(D)×有効長(ℓ1)を指示してください。
When you order, indicate MHR230 (D)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-085に記載
●Recommended Milling Conditions are shown on page D-085.



ŞEVKET ÖĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

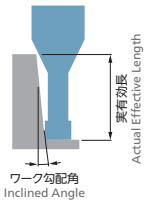



| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00200-04035 | | 3.5 | | | | | 45 | 3,900 | 3.72 | 3.89 | 4.08 | 4.28 | 4.75 |
| 08-00200-04040 | | 4 | | | | | 45 | 3,900 | 4.24 | 4.43 | 4.64 | 4.87 | 5.40 |
| 08-00200-04050 | | 5 | | | | | 45 | 3,900 | 5.28 | 5.52 | 5.78 | 6.06 | 6.72 |
| 08-00200-04060 | | 6 | | | | | 45 | 4,900 | 6.33 | 6.61 | 6.92 | 7.26 | 8.05 |
| 08-00200-04070 | 0.4 | 7 | 0.6 | 0.37 | 12° | 4 | 45 | 6,000 | 7.37 | 7.70 | 8.06 | 8.46 | 9.38 |
| 08-00200-04080 | | 8 | | | | | 45 | 8,500 | 8.41 | 8.79 | 9.20 | 9.65 | 10.71 |
| 08-00200-04090 | | 9 | | | | | 45 | 8,500 | 9.45 | 9.88 | 10.34 | 10.85 | 12.03 |
| 08-00200-04100 | | 10 | | | | | 45 | 9,300 | 10.50 | 10.97 | 11.48 | 12.05 | 13.36 |
| 08-00200-04120 | | 12 | | | | | 45 | 9,300 | 12.58 | 13.15 | 13.76 | 14.44 | 16.02 |
| 08-00200-05010 | | 1 | | | | | 45 | 2,800 | 1.14 | 1.19 | 1.24 | 1.30 | 1.45 |
| 08-00200-05015 | | 1.5 | | | | | 45 | 2,800 | 1.66 | 1.74 | 1.82 | 1.91 | 2.12 |
| 08-00200-05020 | | 2 | | | | | 45 | 2,800 | 2.18 | 2.28 | 2.38 | 2.50 | 2.77 |
| 08-00200-05025 | | 2.5 | | | | | 45 | 2,800 | 2.71 | 2.83 | 2.96 | 3.11 | 3.45 |
| 08-00200-05030 | | 3 | | | | | 45 | 2,800 | 3.22 | 3.37 | 3.52 | 3.70 | 4.10 |
| 08-00200-05035 | | 3.5 | | | | | 45 | 2,800 | 3.75 | 3.92 | 4.10 | 4.31 | 4.78 |
| 08-00200-05040 | | 4 | | | | | 45 | 2,800 | 4.26 | 4.46 | 4.66 | 4.89 | 5.43 |
| 08-00200-05045 | 0.5 | 4.5 | 0.7 | 0.46 | 12° | 4 | 45 | 2,800 | 4.79 | 5.01 | 5.24 | 5.50 | 6.12 |
| 08-00200-05050 | | 5 | | | | | 45 | 2,800 | 5.31 | 5.54 | 5.80 | 6.09 | 6.76 |
| 08-00200-05060 | | 6 | | | | | 45 | 2,800 | 6.35 | 6.63 | 6.95 | 7.29 | 8.08 |
| 08-00200-05070 | | 7 | | | | | 45 | 4,700 | 7.39 | 7.72 | 8.09 | 8.48 | 9.41 |
| 08-00200-05080 | | 8 | | | | | 50 | 4,700 | 8.44 | 8.81 | 9.23 | 9.68 | 10.74 |
| 08-00200-05090 | | 9 | | | | | 50 | 4,700 | 9.48 | 9.90 | 10.37 | 10.88 | 12.07 |
| 08-00200-05100 | | 10 | | | | | 50 | 4,700 | 10.52 | 10.99 | 11.51 | 12.07 | 13.39 |
| 08-00200-05120 | | 12 | | | | | 50 | 5,600 | 12.61 | 13.17 | 13.79 | 14.47 | 16.05 |
| 08-00200-05150 | | 15 | | | | | 50 | 6,000 | 15.74 | 16.44 | 17.21 | 18.06 | 20.03 |
| 08-00200-06015 | | 1.5 | | | | | 45 | 3,000 | 1.66 | 1.74 | 1.82 | 1.91 | 2.12 |
| 08-00200-06020 | | 2 | | | | | 45 | 3,000 | 2.18 | 2.28 | 2.38 | 2.50 | 2.77 |
| 08-00200-06030 | | 3 | | | | | 45 | 3,000 | 3.22 | 3.37 | 3.52 | 3.70 | 4.10 |
| 08-00200-06040 | 0.6 | 4 | 0.9 | 0.56 | 12° | 4 | 45 | 3,000 | 4.26 | 4.46 | 4.66 | 4.89 | 5.43 |
| 08-00200-06050 | | 5 | | | | | 45 | 3,000 | 5.31 | 5.54 | 5.80 | 6.09 | 6.76 |
| 08-00200-06060 | | 6 | | | | | 45 | 3,000 | 6.35 | 6.63 | 6.95 | 7.29 | 8.08 |
| 08-00200-06070 | | 7 | | | | | 45 | 3,800 | 7.39 | 7.72 | 8.09 | 8.48 | 9.41 |

# MHR230

## 無限コーティング 2枚刃ロングネックエンドミル（深リブ用）

MUGEN-COATING 2 -Flute Long Neck End Mill




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D) 刃径 Dia. | (ℓ1) 有効長 Effective Length | (ℓ) 刃長 Length of Cut | (d2) 首下径 Neck Dia. | (γ) 首角 Neck Taper Angle | (d) シャンク径 Shank Dia. | (L) 全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30´ | 1° | 1°30´ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00200-06080 | 0.6 | 8 | 0.9 | 0.56 | 12° | 4 | 50 | 4,900 | 8.44 | 8.81 | 9.23 | 9.68 | 10.74 |
| 08-00200-06090 | | 9 | | | | | 50 | 5,600 | 9.48 | 9.91 | 10.38 | 10.90 | 12.10 |
| 08-00200-06100 | | 10 | | | | | 50 | 5,600 | 10.52 | 10.99 | 11.51 | 12.07 | 13.39 |
| 08-00200-06120 | | 12 | | | | | 50 | 6,300 | 12.61 | 13.17 | 13.79 | 14.47 | 16.05 |
| 08-00200-06150 | | 15 | | | | | 50 | 7,200 | 15.74 | 16.44 | 17.21 | 18.06 | 20.03 |
| 08-00200-06180 | | 18 | | | | | 50 | 7,600 | 18.86 | 19.71 | 20.63 | 21.65 | 24.01 |
| 08-00200-07020 | 0.7 | 2 | 1 | 0.66 | 12° | 4 | 45 | 3,400 | 2.18 | 2.28 | 2.38 | 2.50 | 2.77 |
| 08-00200-07040 | | 4 | | | | | 45 | 3,400 | 4.26 | 4.46 | 4.66 | 4.89 | 5.43 |
| 08-00200-07060 | | 6 | | | | | 45 | 3,400 | 6.35 | 6.63 | 6.95 | 7.29 | 8.08 |
| 08-00200-07080 | | 8 | | | | | 50 | 5,500 | 8.44 | 8.81 | 9.23 | 9.68 | 10.74 |
| 08-00200-07100 | | 10 | | | | | 50 | 7,200 | 10.52 | 10.99 | 11.51 | 12.07 | 13.39 |
| 08-00200-08030 | 0.8 | 3 | 1.2 | 0.76 | 12° | 4 | 45 | 3,300 | 3.23 | 3.37 | 3.53 | 3.71 | 4.12 |
| 08-00200-08040 | | 4 | | | | | 45 | 3,300 | 4.26 | 4.46 | 4.66 | 4.89 | 5.43 |
| 08-00200-08050 | | 5 | | | | | 45 | 3,300 | 5.31 | 5.55 | 5.81 | 6.10 | 6.78 |
| 08-00200-08060 | | 6 | | | | | 45 | 3,300 | 6.35 | 6.63 | 6.95 | 7.29 | 8.08 |
| 08-00200-08080 | | 8 | | | | | 50 | 3,300 | 8.44 | 8.81 | 9.23 | 9.68 | 10.74 |
| 08-00200-08100 | | 10 | | | | | 50 | 4,900 | 10.52 | 10.99 | 11.51 | 12.07 | 13.39 |
| 08-00200-08120 | | 12 | | | | | 50 | 5,500 | 12.61 | 13.17 | 13.79 | 14.47 | 16.05 |
| 08-00200-08140 | | 14 | | | | | 50 | 6,300 | 14.69 | 15.35 | 16.07 | 16.86 | 18.70 |
| 08-00200-08160 | | 16 | | | | | 50 | 6,300 | 16.78 | 17.53 | 18.35 | 19.25 | 21.36 |
| 08-00200-08200 | | 20 | | | | | 60 | 7,000 | 20.95 | 21.89 | 22.91 | 24.04 | 26.66 |
| 08-00200-08240 | | 24 | | | | | 60 | 7,700 | 25.12 | 26.24 | 27.47 | 28.83 | Free |
| 08-00200-09040 | 0.9 | 4 | 1.4 | 0.86 | 12° | 4 | 45 | 3,800 | 4.26 | 4.46 | 4.66 | 4.89 | 5.43 |
| 08-00200-09060 | | 6 | | | | | 45 | 3,800 | 6.35 | 6.63 | 6.95 | 7.29 | 8.08 |
| 08-00200-09080 | | 8 | | | | | 50 | 3,800 | 8.44 | 8.81 | 9.23 | 9.68 | 10.74 |
| 08-00200-09100 | | 10 | | | | | 50 | 3,800 | 10.52 | 10.99 | 11.51 | 12.07 | 13.39 |
| 08-00200-09120 | | 12 | | | | | 50 | 4,400 | 12.61 | 13.18 | 13.80 | 14.49 | 16.10 |
| 08-00200-09150 | | 15 | | | | | 60 | 7,200 | 15.74 | 16.44 | 17.21 | 18.06 | 20.03 |
| 08-00200-10020 | 1 | 2 | 1.5 | 0.95 | 12° | 4 | 50 | 3,000 | 2.21 | 2.31 | 2.42 | 2.54 | 2.82 |
| 08-00200-10030 | | 3 | | | | | 50 | 3,000 | 3.25 | 3.39 | 3.55 | 3.73 | 4.13 |
| 08-00200-10040 | | 4 | | | | | 50 | 3,000 | 4.29 | 4.48 | 4.69 | 4.92 | 5.46 |
| 08-00200-10050 | | 5 | | | | | 50 | 3,000 | 5.33 | 5.57 | 5.83 | 6.12 | 6.79 |

**オーダー方法**

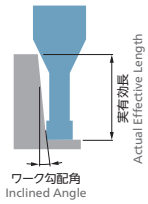
MHR230刃径(D)×有効長(ℓ1)を指示してください。
When you order, indicate MHR230 (D)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-085に記載
●Recommended Milling Conditions are shown on page D-085.



SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

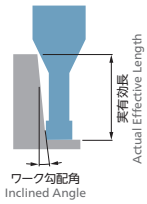



| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00200-10060 | | 6 | | | | | 50 | 3,000 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00200-10070 | | 7 | | | | | 50 | 3,000 | 7.42 | 7.75 | 8.11 | 8.51 | 9.44 |
| 08-00200-10080 | | 8 | | | | | 50 | 3,000 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00200-10090 | | 9 | | | | | 50 | 3,000 | 9.50 | 9.93 | 10.39 | 10.91 | 12.10 |
| 08-00200-10100 | | 10 | | | | | 50 | 3,000 | 10.55 | 11.02 | 11.53 | 12.10 | 13.42 |
| 08-00200-10120 | | 12 | | | | | 50 | 3,000 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |
| 08-00200-10140 | 1 | 14 | 1.5 | 0.95 | 12° | 4 | 50 | 3,000 | 14.72 | 15.38 | 16.10 | 16.89 | 18.73 |
| 08-00200-10160 | | 16 | | | | | 60 | 4,900 | 16.80 | 17.55 | 18.38 | 19.28 | 21.39 |
| 08-00200-10180 | | 18 | | | | | 60 | 4,900 | 18.89 | 19.73 | 20.66 | 21.67 | 24.04 |
| 08-00200-10200 | | 20 | | | | | 60 | 4,900 | 20.97 | 21.91 | 22.94 | 24.07 | 26.70 |
| 08-00200-10220 | | 22 | | | | | 60 | 5,600 | 23.06 | 24.09 | 25.22 | 26.46 | Free |
| 08-00200-10250 | | 25 | | | | | 70 | 5,600 | 26.19 | 27.36 | 28.64 | 30.05 | Free |
| 08-00200-10300 | | 30 | | | | | 70 | 6,300 | 31.40 | 32.81 | 34.34 | 36.03 | Free |
| 08-00200-12040 | | 4 | | | | | 50 | 3,200 | 4.29 | 4.48 | 4.69 | 4.92 | 5.46 |
| 08-00200-12060 | | 6 | | | | | 50 | 3,200 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00200-12080 | | 8 | | | | | 50 | 3,200 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00200-12100 | 1.2 | 10 | 1.8 | 1.15 | 12° | 4 | 50 | 3,200 | 10.55 | 11.02 | 11.53 | 12.10 | 13.42 |
| 08-00200-12120 | | 12 | | | | | 50 | 3,200 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |
| 08-00200-12160 | | 16 | | | | | 60 | 5,000 | 16.80 | 17.55 | 18.38 | 19.28 | 21.39 |
| 08-00200-12200 | | 20 | | | | | 60 | 5,000 | 20.97 | 21.91 | 22.94 | 24.07 | 26.70 |
| 08-00200-14060 | | 6 | | | | | 50 | 3,300 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00200-14080 | | 8 | | | | | 50 | 3,300 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00200-14100 | | 10 | | | | | 50 | 3,300 | 10.55 | 11.02 | 11.53 | 12.10 | 13.42 |
| 08-00200-14120 | 1.4 | 12 | 2.1 | 1.35 | 12° | 4 | 50 | 3,300 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |
| 08-00200-14140 | | 14 | | | | | 60 | 3,300 | 14.72 | 15.38 | 16.10 | 16.89 | 18.73 |
| 08-00200-14160 | | 16 | | | | | 60 | 3,800 | 16.80 | 17.55 | 18.38 | 19.28 | 21.39 |
| 08-00200-14220 | | 22 | | | | | 60 | 5,100 | 23.06 | 24.09 | 25.22 | 26.46 | Free |
| 08-00200-15040 | | 4 | | | | | 50 | 3,200 | 4.29 | 4.48 | 4.69 | 4.92 | 5.46 |
| 08-00200-15060 | | 6 | | | | | 50 | 3,200 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00200-15080 | 1.5 | 8 | 2.3 | 1.45 | 12° | 4 | 50 | 3,200 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00200-15100 | | 10 | | | | | 50 | 3,200 | 10.55 | 11.02 | 11.53 | 12.10 | 13.42 |
| 08-00200-15120 | | 12 | | | | | 50 | 3,200 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |

# MHR230

## 無限コーティング 2枚刃ロングネックエンドミル（深リブ用）

MUGEN-COATING 2 -Flute Long Neck End Mill




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D) 刃径 Dia. | (ℓ1) 有効長 Effective Length | (ℓ) 刃長 Length of Cut | (d2) 首下径 Neck Dia. | (γ) 首角 Neck Taper Angle | (d) シャンク径 Shank Dia. | (L) 全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00200-15140 | 1.5 | 14 | 2.3 | 1.45 | 12° | 4 | 60 | 3,300 | 14.72 | 15.38 | 16.10 | 16.89 | 18.73 |
| 08-00200-15160 | | 16 | | | | | 60 | 3,300 | 16.80 | 17.55 | 18.38 | 19.28 | 21.39 |
| 08-00200-15180 | | 18 | | | | | 60 | 3,300 | 18.89 | 19.73 | 20.66 | 21.67 | 24.04 |
| 08-00200-15200 | | 20 | | | | | 60 | 3,300 | 20.97 | 21.91 | 22.94 | 24.07 | Free |
| 08-00200-15250 | | 25 | | | | | 70 | 4,900 | 26.19 | 27.36 | 28.64 | 30.05 | Free |
| 08-00200-15300 | | 30 | | | | | 70 | 4,900 | 31.40 | 32.81 | 34.34 | 36.03 | Free |
| 08-00200-15350 | | 35 | | | | | 80 | 5,500 | 36.62 | 38.25 | 40.05 | Free | Free |
| 08-00200-15380 | | 38 | | | | | 80 | 5,600 | 39.74 | 41.52 | 43.47 | Free | Free |
| 08-00200-15400 | | 40 | | | | | 80 | 6,200 | 41.83 | 43.70 | 45.75 | Free | Free |
| 08-00200-15450 | | 45 | | | | | 80 | 6,200 | 47.04 | 49.15 | Free | Free | Free |
| 08-00200-16060 | 1.6 | 6 | 2.4 | 1.55 | 12° | 4 | 50 | 3,300 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00200-16080 | | 8 | | | | | 50 | 3,300 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00200-16100 | | 10 | | | | | 50 | 3,300 | 10.55 | 11.02 | 11.53 | 12.10 | 13.42 |
| 08-00200-16120 | | 12 | | | | | 50 | 3,300 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |
| 08-00200-16140 | | 14 | | | | | 60 | 3,300 | 14.72 | 15.38 | 16.10 | 16.89 | 18.73 |
| 08-00200-16160 | | 16 | | | | | 60 | 3,300 | 16.80 | 17.55 | 18.38 | 19.28 | 21.39 |
| 08-00200-16180 | | 18 | | | | | 60 | 3,300 | 18.89 | 19.73 | 20.66 | 21.67 | Free |
| 08-00200-16200 | | 20 | | | | | 60 | 3,300 | 20.97 | 21.91 | 22.94 | 24.07 | Free |
| 08-00200-16260 | | 26 | | | | | 60 | 5,100 | 27.23 | 28.45 | 29.78 | 31.25 | Free |
| 08-00200-18060 | 1.8 | 6 | 2.7 | 1.75 | 12° | 4 | 50 | 3,300 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00200-18080 | | 8 | | | | | 50 | 3,300 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00200-18100 | | 10 | | | | | 50 | 3,300 | 10.55 | 11.02 | 11.53 | 12.10 | 13.42 |
| 08-00200-18120 | | 12 | | | | | 50 | 3,300 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |
| 08-00200-18140 | | 14 | | | | | 50 | 3,300 | 14.72 | 15.38 | 16.10 | 16.89 | 18.73 |
| 08-00200-18160 | | 16 | | | | | 60 | 3,300 | 16.80 | 17.55 | 18.38 | 19.28 | 21.39 |
| 08-00200-18180 | | 18 | | | | | 60 | 3,300 | 18.89 | 19.73 | 20.66 | 21.67 | Free |
| 08-00200-18200 | | 20 | | | | | 60 | 3,300 | 20.97 | 21.91 | 22.94 | 24.07 | Free |
| 08-00200-18250 | | 25 | | | | | 70 | 4,600 | 26.19 | 27.36 | 28.64 | 30.05 | Free |
| 08-00200-20040 | 2 | 4 | 3 | 1.94 | 12° | 4 | 50 | 3,200 | 4.32 | 4.51 | 4.73 | 4.96 | 5.51 |
| 08-00200-20060 | | 6 | | | | | 50 | 3,200 | 6.40 | 6.69 | 7.00 | 7.34 | 8.15 |
| 08-00200-20080 | | 8 | | | | | 50 | 3,200 | 8.48 | 8.86 | 9.28 | 9.74 | 10.80 |
| 08-00200-20100 | | 10 | | | | | 50 | 3,200 | 10.57 | 11.04 | 11.56 | 12.13 | 13.45 |

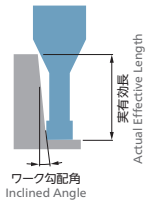
**オーダー方法** MHR230刃径(D)×有効長(ℓ1)を指示してください。
When you order, indicate MHR230 (D)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-085に記載
●Recommended Milling Conditions are shown on page D-085.



SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

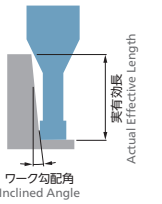



| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00200-20120 | 2 | 12 | 3 | 1.94 | 12° | 4 | 50 | 3,200 | 12.66 | 13.22 | 13.84 | 14.52 | 16.11 |
| 08-00200-20140 | | 14 | | | | | 60 | 3,200 | 14.74 | 15.40 | 16.12 | 16.92 | 18.76 |
| 08-00200-20160 | | 16 | | | | | 60 | 3,200 | 16.83 | 17.58 | 18.40 | 19.31 | Free |
| 08-00200-20180 | | 18 | | | | | 60 | 3,200 | 18.91 | 19.76 | 20.69 | 21.70 | Free |
| 08-00200-20200 | | 20 | | | | | 60 | 3,200 | 21.00 | 21.94 | 22.97 | 24.10 | Free |
| 08-00200-20250 | | 25 | | | | | 70 | 3,200 | 26.21 | 27.39 | 28.67 | Free | Free |
| 08-00200-20300 | | 30 | | | | | 70 | 3,900 | 31.43 | 32.83 | 34.37 | Free | Free |
| 08-00200-20350 | | 35 | | | | | 80 | 4,700 | 36.64 | 38.28 | Free | Free | Free |
| 08-00200-20400 | | 40 | | | | | 90 | 5,900 | 41.85 | 43.73 | Free | Free | Free |
| 08-00200-20500 | | 50 | | | | | 100 | 7,100 | 52.28 | 54.62 | Free | Free | Free |
| 08-00200-20600 | | 60 | | | | | 110 | 8,500 | 62.71 | Free | Free | Free | Free |
| 08-00200-25080 | 2.5 | 8 | 3.7 | 2.4 | 12° | 4 | 50 | 3,300 | 8.58 | 8.97 | 9.39 | 9.85 | 10.93 |
| 08-00200-25100 | | 10 | | | | | 50 | 3,300 | 10.67 | 11.15 | 11.67 | 12.24 | 13.58 |
| 08-00200-25120 | | 12 | | | | | 50 | 3,300 | 12.75 | 13.32 | 13.95 | 14.64 | Free |
| 08-00200-25140 | | 14 | | | | | 50 | 3,300 | 14.84 | 15.50 | 16.23 | 17.03 | Free |
| 08-00200-25160 | | 16 | | | | | 60 | 3,300 | 16.93 | 17.68 | 18.51 | 19.42 | Free |
| 08-00200-25180 | | 18 | | | | | 60 | 3,300 | 19.01 | 19.86 | 20.79 | 21.82 | Free |
| 08-00200-25200 | | 20 | | | | | 60 | 3,300 | 21.10 | 22.04 | 23.07 | Free | Free |
| 08-00200-25250 | | 25 | | | | | 70 | 3,600 | 26.31 | 27.49 | 28.78 | Free | Free |
| 08-00200-25300 | | 30 | | | | | 70 | 3,600 | 31.52 | 32.94 | Free | Free | Free |
| 08-00200-25400 | | 40 | | | | | 90 | 5,000 | 41.95 | 43.83 | Free | Free | Free |
| 08-00200-25500 | | 50 | | | | | 100 | 6,200 | 52.38 | Free | Free | Free | Free |
| 08-00200-30080 | 3 | 8 | 4.5 | 2.85 | 12° | 6 | 50 | 4,300 | 8.71 | 9.10 | 9.52 | 9.99 | 11.08 |
| 08-00200-30100 | | 10 | | | | | 50 | 4,300 | 10.79 | 11.27 | 11.80 | 12.38 | 13.74 |
| 08-00200-30120 | | 12 | | | | | 50 | 4,300 | 12.88 | 13.45 | 14.08 | 14.78 | 16.39 |
| 08-00200-30140 | | 14 | | | | | 50 | 4,300 | 14.96 | 15.63 | 16.36 | 17.17 | 19.04 |
| 08-00200-30160 | | 16 | | | | | 60 | 4,300 | 17.05 | 17.81 | 18.65 | 19.56 | 21.70 |
| 08-00200-30180 | | 18 | | | | | 60 | 4,300 | 19.13 | 19.99 | 20.93 | 21.96 | 24.35 |
| 08-00200-30200 | | 20 | | | | | 60 | 4,300 | 21.22 | 22.17 | 23.21 | 24.35 | 27.01 |
| 08-00200-30250 | | 25 | | | | | 70 | 4,300 | 26.43 | 27.62 | 28.91 | 30.33 | Free |
| 08-00200-30300 | | 30 | | | | | 70 | 5,100 | 31.65 | 33.06 | 34.61 | 36.31 | Free |
| 08-00200-30350 | | 35 | | | | | 80 | 5,300 | 36.86 | 38.51 | 40.32 | 42.30 | Free |

# MHR230

## 無限コーティング 2枚刃ロングネックエンドミル（深リブ用）

MUGEN-COATING 2 -Flute Long Neck End Mill




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30´ | 1° | 1°30´ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00200-30400 | 3 | 40 | 4.5 | 2.85 | 12° | 6 | 90 | 5,300 | 42.08 | 43.96 | 46.02 | Free | Free |
| 08-00200-30500 | | 50 | | | | | 100 | 7,400 | 52.50 | 54.85 | 57.42 | Free | Free |
| 08-00200-40120 | 4 | 12 | 6 | 3.8 | 12° | 6 | 50 | 4,900 | 13.00 | 13.58 | 14.22 | 14.92 | 16.55 |
| 08-00200-40160 | | 16 | | | | | 60 | 4,900 | 17.17 | 17.94 | 18.78 | 19.70 | Free |
| 08-00200-40200 | | 20 | | | | | 60 | 4,900 | 21.34 | 22.30 | 23.34 | 24.49 | Free |
| 08-00200-40250 | | 25 | | | | | 70 | 4,900 | 26.56 | 27.74 | 29.04 | Free | Free |
| 08-00200-40300 | | 30 | | | | | 70 | 4,900 | 31.77 | 33.19 | 34.75 | Free | Free |
| 08-00200-40350 | | 35 | | | | | 80 | 4,900 | 36.98 | 38.64 | Free | Free | Free |
| 08-00200-40400 | | 40 | | | | | 90 | 6,200 | 42.20 | 44.09 | Free | Free | Free |
| 08-00200-40450 | | 45 | | | | | 90 | 7,500 | 47.41 | 49.53 | Free | Free | Free |
| 08-00200-40500 | | 50 | | | | | 100 | 9,200 | 52.63 | 54.98 | Free | Free | Free |
| 08-00200-40600 | | 60 | | | | | 110 | 11,400 | 63.05 | Free | Free | Free | Free |
| 08-00200-50160 | 5 | 16 | 7.5 | 4.8 | 12° | 6 | 60 | 6,200 | 17.17 | 17.94 | 18.78 | Free | Free |
| 08-00200-50200 | | 20 | | | | | 60 | 6,200 | 21.34 | 22.30 | Free | Free | Free |
| 08-00200-50250 | | 25 | | | | | 70 | 6,200 | 26.56 | 27.74 | Free | Free | Free |
| 08-00200-50300 | | 30 | | | | | 80 | 6,200 | 31.77 | Free | Free | Free | Free |
| 08-00200-50350 | | 35 | | | | | 80 | 6,200 | 36.98 | Free | Free | Free | Free |
| 08-00200-50400 | | 40 | | | | | 90 | 6,200 | 42.20 | Free | Free | Free | Free |
| 08-00200-50500 | | 50 | | | | | 110 | 9,800 | 52.63 | Free | Free | Free | Free |
| 08-00200-50600 | | 60 | | | | | 120 | 12,000 | Free | Free | Free | Free | Free |
| 08-00200-60200 | 6 | 20 | 9 | 5.8 | – | 6 | 80 | 6,400 | Free | Free | Free | Free | Free |
| 08-00200-60300 | | 30 | | | | | 90 | 6,600 | Free | Free | Free | Free | Free |
| 08-00200-60400 | | 40 | | | | | 100 | 7,700 | Free | Free | Free | Free | Free |
| 08-00200-60500 | | 50 | | | | | 110 | 9,800 | Free | Free | Free | Free | Free |
| 08-00200-60600 | | 60 | | | | | 120 | 12,500 | Free | Free | Free | Free | Free |

**オーダー方法**

MHR230刃径(D)×有効長(ℓ1)を指示してください。
When you order, indicate MHR230 (D)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

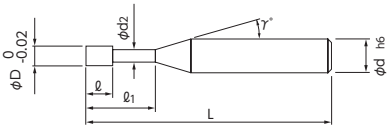
●切削条件表はD-085に記載
●Recommended Milling Conditions are shown on page D-085.

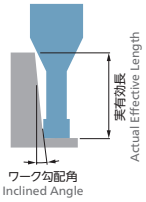


ŞEVKET ÖLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

# MHR430

## 無限コーティング 4枚刃ロングネックエンドミル（深リブ用）
MUGEN-COATING 4-Flute Long Neck End Mill




Slot Side Face

MG ∞ 4 30° ≦55 HRC

●NS オリジナルの深リブ用エンドミルに、無限コーティングを採用。
●狭くて深い加工に適した首逃げタイプ。
●MUGEN-COATING has been put on our original end mill for deep rib.
●It is very suitable for cutting on narrow and deep rib by long neck end mill.

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00210-01004 | 1 | 4 | 1.5 | 0.95 | 12° | 4 | 50 | 4,000 | 4.29 | 4.48 | 4.69 | 4.92 | 5.46 |
| 08-00210-01006 | | 6 | | | | | 50 | 4,000 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00210-01008 | | 8 | | | | | 50 | 4,000 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00210-01010 | | 10 | | | | | 50 | 4,000 | 10.55 | 11.02 | 11.53 | 12.10 | 13.42 |
| 08-00210-01012 | | 12 | | | | | 50 | 4,000 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |
| 08-00210-01016 | | 16 | | | | | 50 | 6,400 | 16.80 | 17.55 | 18.38 | 19.28 | 21.39 |
| 08-00210-01106 | 1.1 | 6 | 1.7 | 1.05 | 12° | 4 | 50 | 7,000 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00210-01110 | | 10 | | | | | 50 | 7,000 | 10.55 | 11.02 | 11.53 | 12.10 | 13.42 |
| 08-00210-01116 | | 16 | | | | | 60 | 9,000 | 16.80 | 17.55 | 18.38 | 19.28 | 21.39 |
| 08-00210-01206 | 1.2 | 6 | 1.8 | 1.15 | 12° | 4 | 50 | 4,000 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00210-01208 | | 8 | | | | | 50 | 4,000 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00210-01210 | | 10 | | | | | 50 | 4,000 | 10.55 | 11.02 | 11.53 | 12.10 | 13.42 |
| 08-00210-01212 | | 12 | | | | | 50 | 4,000 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |
| 08-00210-01216 | | 16 | | | | | 60 | 5,600 | 16.80 | 17.55 | 18.38 | 19.28 | 21.39 |
| 08-00210-01306 | 1.3 | 6 | 1.9 | 1.25 | 12° | 4 | 50 | 7,000 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00210-01312 | | 12 | | | | | 50 | 7,000 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |
| 08-00210-01318 | | 18 | | | | | 60 | 9,000 | 18.89 | 19.73 | 20.66 | 21.67 | 24.04 |
| 08-00210-01406 | 1.4 | 6 | 2.1 | 1.35 | 12° | 4 | 50 | 4,000 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00210-01408 | | 8 | | | | | 50 | 4,000 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00210-01410 | | 10 | | | | | 50 | 4,000 | 10.55 | 11.02 | 11.53 | 12.10 | 13.42 |
| 08-00210-01412 | | 12 | | | | | 50 | 4,000 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |
| 08-00210-01414 | | 14 | | | | | 60 | 4,000 | 14.72 | 15.38 | 16.10 | 16.89 | 18.73 |
| 08-00210-01416 | | 16 | | | | | 60 | 5,600 | 16.80 | 17.55 | 18.38 | 19.28 | 21.39 |
| 08-00210-01422 | | 22 | | | | | 60 | 7,200 | 23.06 | 24.09 | 25.22 | 26.46 | Free |
| 08-00210-01506 | 1.5 | 6 | 2.3 | 1.45 | 12° | 4 | 50 | 4,000 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00210-01508 | | 8 | | | | | 50 | 4,000 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00210-01510 | | 10 | | | | | 50 | 4,000 | 10.55 | 11.02 | 11.53 | 12.10 | 13.42 |
| 08-00210-01512 | | 12 | | | | | 50 | 4,000 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |
| 08-00210-01514 | | 14 | | | | | 60 | 4,000 | 14.72 | 15.38 | 16.10 | 16.89 | 18.73 |
| 08-00210-01516 | | 16 | | | | | 60 | 4,000 | 16.80 | 17.55 | 18.38 | 19.28 | 21.39 |
| 08-00210-01518 | | 18 | | | | | 60 | 4,000 | 18.89 | 19.73 | 20.66 | 21.67 | 24.04 |
| 08-00210-01520 | | 20 | | | | | 60 | 4,000 | 20.97 | 21.91 | 22.94 | 24.07 | Free |

**オーダー方法** MHR430 刃径(D)×有効長(ℓ1)を指示してください。
When you order, indicate MHR430 (D)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

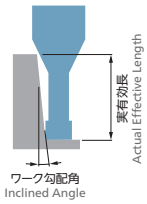
●切削条件表はD-090に記載
●Recommended Milling Conditions are shown on page D-090.

ŞEVKET ÖĞÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

# MHR430

## 無限コーティング 4枚刃ロングネックエンドミル（深リブ用）

MUGEN-COATING 4-Flute Long Neck End Mill




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30´ | 1° | 1°30´ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00210-01606 | 1.6 | 6 | 2.4 | 1.55 | 12° | 4 | 50 | 4,000 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00210-01608 | | 8 | | | | | 50 | 4,000 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00210-01610 | | 10 | | | | | 50 | 4,000 | 10.55 | 11.02 | 11.53 | 12.10 | 13.42 |
| 08-00210-01612 | | 12 | | | | | 50 | 4,000 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |
| 08-00210-01614 | | 14 | | | | | 60 | 4,000 | 14.72 | 15.38 | 16.10 | 16.89 | 18.73 |
| 08-00210-01616 | | 16 | | | | | 60 | 4,000 | 16.80 | 17.55 | 18.38 | 19.28 | 21.39 |
| 08-00210-01618 | | 18 | | | | | 60 | 4,000 | 18.89 | 19.73 | 20.66 | 21.67 | Free |
| 08-00210-01620 | | 20 | | | | | 60 | 4,000 | 20.97 | 21.91 | 22.94 | 24.07 | Free |
| 08-00210-01626 | | 26 | | | | | 70 | 9,200 | 27.23 | 28.45 | 29.78 | 31.25 | Free |
| 08-00210-01706 | 1.7 | 6 | 2.5 | 1.65 | 12° | 4 | 50 | 5,000 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00210-01714 | | 14 | | | | | 60 | 5,000 | 14.72 | 15.38 | 16.10 | 16.89 | 18.73 |
| 08-00210-01724 | | 24 | | | | | 70 | 12,000 | 25.15 | 26.27 | 27.50 | 28.85 | Free |
| 08-00210-01806 | 1.8 | 6 | 2.7 | 1.74 | 12° | 4 | 50 | 4,000 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00210-01808 | | 8 | | | | | 50 | 4,000 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00210-01810 | | 10 | | | | | 50 | 4,000 | 10.55 | 11.02 | 11.53 | 12.10 | 13.42 |
| 08-00210-01812 | | 12 | | | | | 50 | 4,000 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |
| 08-00210-01814 | | 14 | | | | | 60 | 4,000 | 14.72 | 15.38 | 16.10 | 16.89 | 18.73 |
| 08-00210-01816 | | 16 | | | | | 60 | 4,000 | 16.80 | 17.55 | 18.38 | 19.28 | 21.39 |
| 08-00210-01818 | | 18 | | | | | 60 | 4,000 | 18.89 | 19.73 | 20.66 | 21.67 | Free |
| 08-00210-01820 | | 20 | | | | | 60 | 4,000 | 20.97 | 21.91 | 22.94 | 24.07 | Free |
| 08-00210-01825 | | 25 | | | | | 70 | 5,600 | 26.19 | 27.36 | 28.64 | 30.05 | Free |
| 08-00210-01906 | 1.9 | 6 | 2.8 | 1.84 | 12° | 4 | 50 | 7,000 | 6.40 | 6.69 | 7.00 | 7.34 | 8.15 |
| 08-00210-01916 | | 16 | | | | | 60 | 7,000 | 16.83 | 17.58 | 18.40 | 19.31 | Free |
| 08-00210-01928 | | 28 | | | | | 70 | 9,000 | 29.34 | 30.65 | 32.09 | Free | Free |
| 08-00210-02006 | 2 | 6 | 3 | 1.94 | 12° | 4 | 50 | 4,000 | 6.40 | 6.69 | 7.00 | 7.34 | 8.15 |
| 08-00210-02008 | | 8 | | | | | 50 | 4,000 | 8.48 | 8.86 | 9.28 | 9.74 | 10.80 |
| 08-00210-02010 | | 10 | | | | | 50 | 4,000 | 10.57 | 11.04 | 11.56 | 12.13 | 13.45 |
| 08-00210-02012 | | 12 | | | | | 50 | 4,000 | 12.66 | 13.22 | 13.84 | 14.52 | 16.11 |
| 08-00210-02014 | | 14 | | | | | 60 | 4,000 | 14.74 | 15.40 | 16.12 | 16.92 | 18.76 |
| 08-00210-02016 | | 16 | | | | | 60 | 4,000 | 16.83 | 17.58 | 18.40 | 19.31 | Free |
| 08-00210-02018 | | 18 | | | | | 60 | 4,000 | 18.91 | 19.76 | 20.69 | 21.70 | Free |
| 08-00210-02020 | | 20 | | | | | 60 | 4,000 | 21.00 | 21.94 | 22.97 | 24.10 | Free |

**オーダー方法**

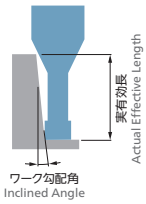
MHR430 刃径(D)×有効長(ℓ1)を指示してください。
When you order, indicate MHR430 (D)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-090に記載
●Recommended Milling Conditions are shown on page D-090.



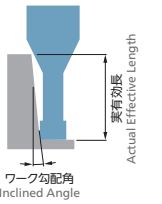
ŞEVKET ÖĞLÜ® MAKINA TİCARET VE SAN. LTD. ŞTİ.




| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00210-02025 | 2 | 25 | 3 | 1.94 | 12° | 4 | 70 | 4,400 | 26.21 | 27.39 | 28.67 | Free | Free |
| 08-00210-02030 | | 30 | | | | | 70 | 5,600 | 31.43 | 32.83 | 34.37 | Free | Free |
| 08-00210-02508 | 2.5 | 8 | 3.7 | 2.4 | 12° | 4 | 50 | 4,000 | 8.58 | 8.97 | 9.39 | 9.85 | 10.93 |
| 08-00210-02512 | | 12 | | | | | 50 | 4,000 | 12.75 | 13.32 | 13.95 | 14.64 | Free |
| 08-00210-02516 | | 16 | | | | | 60 | 4,000 | 16.93 | 17.68 | 18.51 | 19.42 | Free |
| 08-00210-02520 | | 20 | | | | | 60 | 4,000 | 21.10 | 22.04 | 23.07 | Free | Free |
| 08-00210-02525 | | 25 | | | | | 70 | 4,400 | 26.31 | 27.49 | 28.78 | Free | Free |
| 08-00210-03008 | 3 | 8 | 4.5 | 2.85 | 12° | 6 | 50 | 5,600 | 8.71 | 9.10 | 9.52 | 9.99 | 11.08 |
| 08-00210-03012 | | 12 | | | | | 50 | 5,600 | 12.88 | 13.45 | 14.08 | 14.78 | 16.39 |
| 08-00210-03016 | | 16 | | | | | 60 | 5,600 | 17.05 | 17.81 | 18.65 | 19.56 | 21.70 |
| 08-00210-03020 | | 20 | | | | | 60 | 5,600 | 21.22 | 22.17 | 23.21 | 24.35 | 27.01 |
| 08-00210-03025 | | 25 | | | | | 70 | 5,600 | 26.43 | 27.62 | 28.91 | 30.33 | Free |
| 08-00210-03030 | | 30 | | | | | 70 | 7,200 | 31.65 | 33.06 | 34.61 | 36.31 | Free |
| 08-00210-03515 | 3.5 | 15 | 5.5 | 3.35 | 12° | 6 | 60 | 6,300 | 16.01 | 16.72 | 17.50 | 18.37 | 20.37 |
| 08-00210-03525 | | 25 | | | | | 70 | 6,300 | 26.43 | 27.62 | 28.91 | 30.33 | Free |
| 08-00210-03535 | | 35 | | | | | 80 | 8,000 | 36.86 | 38.51 | 40.32 | Free | Free |
| 08-00210-04012 | 4 | 12 | 6 | 3.8 | 12° | 6 | 50 | 6,300 | 13.00 | 13.58 | 14.22 | 14.92 | 16.55 |
| 08-00210-04016 | | 16 | | | | | 60 | 6,300 | 17.17 | 17.94 | 18.78 | 19.70 | Free |
| 08-00210-04020 | | 20 | | | | | 60 | 6,300 | 21.34 | 22.30 | 23.34 | 24.49 | Free |
| 08-00210-04025 | | 25 | | | | | 70 | 6,300 | 26.56 | 27.74 | 29.04 | Free | Free |
| 08-00210-04030 | | 30 | | | | | 70 | 6,300 | 31.77 | 33.19 | 34.75 | Free | Free |
| 08-00210-04035 | | 35 | | | | | 80 | 6,300 | 36.98 | 38.64 | Free | Free | Free |
| 08-00210-04040 | | 40 | | | | | 90 | 8,000 | 42.20 | 44.09 | Free | Free | Free |
| 08-00210-04045 | | 45 | | | | | 90 | 9,600 | 47.41 | 49.53 | Free | Free | Free |
| 08-00210-04050 | | 50 | | | | | 100 | 12,100 | 52.63 | 54.98 | Free | Free | Free |
| 08-00210-05016 | 5 | 16 | 7.5 | 4.8 | 12° | 6 | 60 | 8,000 | 17.17 | 17.94 | 18.78 | Free | Free |
| 08-00210-05025 | | 25 | | | | | 70 | 8,000 | 26.56 | 27.74 | Free | Free | Free |
| 08-00210-05035 | | 35 | | | | | 80 | 8,000 | 36.98 | Free | Free | Free | Free |
| 08-00210-05050 | | 50 | | | | | 110 | 12,100 | 52.63 | Free | Free | Free | Free |
| 08-00210-06020 | 6 | 20 | 9 | 5.8 | – | 6 | 80 | 8,000 | Free | Free | Free | Free | Free |
| 08-00210-06030 | | 30 | | | | | 90 | 8,000 | Free | Free | Free | Free | Free |
| 08-00210-06040 | | 40 | | | | | 100 | 9,600 | Free | Free | Free | Free | Free |

# MHR430

## 無限コーティング 4枚刃ロングネックエンドミル（深リブ用）
MUGEN-COATING 4-Flute Long Neck End Mill




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D) 刃径 Dia. | (ℓ1) 有効長 Effective Length | (ℓ) 刃長 Length of Cut | (d2) 首下径 Neck Dia. | (γ) 首角 Neck Taper Angle | (d) シャンク径 Shank Dia. | (L) 全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00210-06050 | 6 | 50 | 9 | 5.8 | – | 6 | 110 | 12,100 | Free | Free | Free | Free | Free |
| 08-00210-08030 | 8 | 30 | 12 | 7.8 | – | 8 | 100 | 14,000 | Free | Free | Free | Free | Free |
| 08-00210-08050 | | 50 | | | | | 120 | 17,400 | Free | Free | Free | Free | Free |
| 08-00210-08060 | | 60 | | | | | 130 | 18,600 | Free | Free | Free | Free | Free |
| 08-00210-10040 | 10 | 40 | 15 | 9.8 | – | 10 | 110 | 15,100 | Free | Free | Free | Free | Free |
| 08-00210-10060 | | 60 | | | | | 130 | 20,900 | Free | Free | Free | Free | Free |
| 08-00210-10080 | | 80 | | | | | 150 | 23,300 | Free | Free | Free | Free | Free |

**オーダー方法**
MHR430 刃径(D)×有効長(ℓ1)を指示してください。
When you order, indicate MHR430 (D)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-090に記載
●Recommended Milling Conditions are shown on page D-090.



ŞEVKET ÖĞLÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MHR230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | 炭素鋼・合金鋼*1・ステンレス鋼*1 Carbon Steels・Alloy Steels*1・Stainless Steels*1 S50C・SCM*1・SKD*1・SUS*1 | | | 調質鋼 Prehardened Steels NAK55・NAK80・HPM-1 (~43HRC) | | | 銅・アルミニウム合金 Copper・Aluminum Alloy | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut |
| | | $min^{-1}$ | mm/min | ap mm | $min^{-1}$ | mm/min | ap mm | $min^{-1}$ | mm/min | ap mm |
| 0.1 | 0.3 | 40,000 | 150 | 0.005 | 40,000 | 120 | 0.004 | 40,000 | 150 | 0.006 |
| | 0.5 | 40,000 | 100 | 0.004 | 40,000 | 75 | 0.003 | 40,000 | 100 | 0.005 |
| | 0.75 | 40,000 | 60 | 0.003 | 40,000 | 50 | 0.002 | 40,000 | 60 | 0.003 |
| | 1 | 40,000 | 40 | 0.002 | 40,000 | 30 | 0.002 | 40,000 | 40 | 0.002 |
| 0.15 | 0.3 | 40,000 | 200 | 0.005 | 40,000 | 150 | 0.004 | 40,000 | 200 | 0.008 |
| | 0.5 | 40,000 | 150 | 0.005 | 40,000 | 120 | 0.004 | 40,000 | 150 | 0.008 |
| | 0.75 | 40,000 | 100 | 0.004 | 40,000 | 90 | 0.003 | 40,000 | 100 | 0.006 |
| | 1 | 40,000 | 80 | 0.003 | 40,000 | 60 | 0.002 | 40,000 | 80 | 0.004 |
| | 1.5 | 40,000 | 50 | 0.002 | 35,000 | 40 | 0.002 | 40,000 | 50 | 0.003 |
| 0.2 | 0.5 | 40,000 | 330 | 0.01 | 40,000 | 250 | 0.007 | 40,000 | 330 | 0.012 |
| | 0.75 | 40,000 | 280 | 0.008 | 40,000 | 220 | 0.006 | 40,000 | 280 | 0.01 |
| | 1 | 40,000 | 250 | 0.007 | 40,000 | 180 | 0.005 | 40,000 | 250 | 0.008 |
| | 1.5 | 40,000 | 180 | 0.005 | 35,000 | 120 | 0.004 | 40,000 | 180 | 0.006 |
| | 2 | 40,000 | 100 | 0.003 | 35,000 | 65 | 0.002 | 40,000 | 100 | 0.004 |
| | 2.5 | 35,000 | 80 | 0.003 | 30,000 | 50 | 0.002 | 40,000 | 90 | 0.003 |
| | 3 | 30,000 | 60 | 0.002 | 25,000 | 40 | 0.002 | 35,000 | 70 | 0.002 |
| | 3.5 | 25,000 | 40 | 0.002 | 22,000 | 30 | 0.002 | 30,000 | 50 | 0.002 |
| | 4 | 23,000 | 30 | 0.001 | 20,000 | 20 | 0.001 | 25,000 | 35 | 0.001 |
| 0.3 | 1 | 40,000 | 400 | 0.02 | 35,000 | 260 | 0.015 | 40,000 | 400 | 0.024 |
| | 1.5 | 40,000 | 350 | 0.015 | 35,000 | 230 | 0.01 | 40,000 | 350 | 0.018 |
| | 2 | 35,000 | 300 | 0.01 | 30,000 | 180 | 0.007 | 40,000 | 320 | 0.012 |
| | 2.5 | 30,000 | 250 | 0.007 | 25,000 | 160 | 0.005 | 35,000 | 280 | 0.008 |
| | 3 | 30,000 | 200 | 0.005 | 25,000 | 130 | 0.004 | 35,000 | 250 | 0.006 |
| | 4 | 25,000 | 120 | 0.004 | 22,000 | 80 | 0.003 | 30,000 | 150 | 0.004 |
| | 5 | 22,000 | 80 | 0.003 | 20,000 | 55 | 0.002 | 25,000 | 90 | 0.003 |
| | 6 | 20,000 | 60 | 0.002 | 18,000 | 40 | 0.002 | 22,000 | 65 | 0.002 |
| | 9 | 18,000 | 30 | 0.001 | 16,000 | 20 | 0.001 | 20,000 | 35 | 0.001 |
| 0.4 | 1 | 35,000 | 500 | 0.025 | 30,000 | 330 | 0.018 | 40,000 | 600 | 0.03 |
| | 1.5 | 35,000 | 450 | 0.02 | 30,000 | 280 | 0.014 | 40,000 | 500 | 0.026 |
| | 2 | 35,000 | 400 | 0.02 | 30,000 | 260 | 0.014 | 40,000 | 450 | 0.024 |
| | 2.5 | 30,000 | 350 | 0.015 | 25,000 | 230 | 0.01 | 40,000 | 400 | 0.02 |
| | 3 | 30,000 | 300 | 0.015 | 25,000 | 190 | 0.01 | 35,000 | 350 | 0.018 |
| | 3.5 | 25,000 | 250 | 0.01 | 25,000 | 160 | 0.008 | 35,000 | 280 | 0.015 |
| | 4 | 25,000 | 200 | 0.01 | 22,000 | 140 | 0.007 | 30,000 | 240 | 0.012 |
| | 5 | 22,000 | 160 | 0.008 | 20,000 | 110 | 0.005 | 25,000 | 180 | 0.01 |
| | 6 | 20,000 | 120 | 0.005 | 18,000 | 80 | 0.003 | 22,000 | 130 | 0.006 |
| | 7 | 18,000 | 100 | 0.003 | 16,000 | 70 | 0.002 | 20,000 | 110 | 0.003 |
| | 8 | 18,000 | 80 | 0.002 | 16,000 | 60 | 0.002 | 20,000 | 85 | 0.002 |
| | 9 | 18,000 | 70 | 0.002 | 16,000 | 50 | 0.002 | 20,000 | 75 | 0.002 |
| | 10 | 18,000 | 60 | 0.002 | 16,000 | 40 | 0.002 | 20,000 | 65 | 0.002 |
| | 12 | 18,000 | 40 | 0.002 | 16,000 | 30 | 0.002 | 20,000 | 45 | 0.002 |
| 0.5 | 1 | 30,000 | 550 | 0.03 | 25,000 | 350 | 0.022 | 35,000 | 650 | 0.036 |
| | 1.5 | 30,000 | 520 | 0.028 | 25,000 | 330 | 0.02 | 35,000 | 630 | 0.033 |
| | 2 | 30,000 | 500 | 0.025 | 25,000 | 320 | 0.018 | 35,000 | 600 | 0.03 |
| | 2.5 | 30,000 | 470 | 0.023 | 25,000 | 290 | 0.016 | 35,000 | 580 | 0.027 |
| | 3 | 30,000 | 450 | 0.02 | 25,000 | 280 | 0.014 | 35,000 | 550 | 0.024 |
| | 3.5 | 30,000 | 420 | 0.018 | 22,000 | 250 | 0.012 | 30,000 | 500 | 0.021 |
| | 4 | 25,000 | 350 | 0.015 | 22,000 | 230 | 0.01 | 30,000 | 420 | 0.018 |
| | 4.5 | 25,000 | 320 | 0.013 | 20,000 | 200 | 0.008 | 30,000 | 380 | 0.015 |
| | 5 | 25,000 | 300 | 0.01 | 20,000 | 180 | 0.007 | 30,000 | 350 | 0.012 |

＊1 合金鋼・ステンレス鋼切削時は、回転数・送り速度を 80%まで下げた値を参考値としてください。
＊1 Reference value for Alloy and Stainless Steels are 80% of recommended cutting conditions.

# MHR230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | 炭素鋼・合金鋼＊1・ステンレス鋼＊1 Carbon Steels・Alloy Steels＊1・Stainless Steels＊1 S50C・SCM＊1・SKD＊1・SUS＊1 | | | 調質鋼 Prehardened Steels NAK55・NAK80・HPM-1 (～43HRC) | | | 銅・アルミニウム合金 Copper・Aluminum Alloy | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut |
| | | min-1 | mm/min | ap mm | min-1 | mm/min | ap mm | min-1 | mm/min | ap mm |
| 0.5 | 6 | 20,000 | 200 | 0.008 | 18,000 | 140 | 0.005 | 25,000 | 250 | 0.01 |
| | 7 | 20,000 | 180 | 0.005 | 16,000 | 110 | 0.003 | 22,000 | 200 | 0.006 |
| | 8 | 18,000 | 150 | 0.003 | 14,000 | 90 | 0.002 | 20,000 | 160 | 0.003 |
| | 9 | 16,000 | 120 | 0.003 | 14,000 | 80 | 0.002 | 18,000 | 135 | 0.003 |
| | 10 | 16,000 | 100 | 0.002 | 14,000 | 65 | 0.002 | 18,000 | 110 | 0.002 |
| | 12 | 16,000 | 80 | 0.002 | 14,000 | 50 | 0.002 | 18,000 | 90 | 0.002 |
| | 15 | 16,000 | 50 | 0.002 | 14,000 | 35 | 0.002 | 18,000 | 55 | 0.002 |
| 0.6 | 1.5 | 30,000 | 600 | 0.035 | 25,000 | 400 | 0.025 | 35,000 | 700 | 0.04 |
| | 2 | 30,000 | 600 | 0.035 | 25,000 | 380 | 0.025 | 35,000 | 700 | 0.04 |
| | 3 | 30,000 | 550 | 0.03 | 25,000 | 350 | 0.02 | 35,000 | 650 | 0.035 |
| | 4 | 25,000 | 450 | 0.025 | 22,000 | 300 | 0.018 | 30,000 | 550 | 0.03 |
| | 5 | 25,000 | 400 | 0.02 | 20,000 | 240 | 0.014 | 30,000 | 480 | 0.024 |
| | 6 | 20,000 | 300 | 0.015 | 18,000 | 200 | 0.01 | 25,000 | 380 | 0.018 |
| | 7 | 20,000 | 250 | 0.012 | 16,000 | 150 | 0.008 | 22,000 | 280 | 0.014 |
| | 8 | 18,000 | 200 | 0.01 | 15,000 | 130 | 0.007 | 20,000 | 230 | 0.012 |
| | 9 | 18,000 | 180 | 0.008 | 15,000 | 110 | 0.005 | 20,000 | 200 | 0.009 |
| | 10 | 16,000 | 150 | 0.005 | 14,000 | 100 | 0.003 | 18,000 | 170 | 0.006 |
| | 12 | 14,000 | 120 | 0.003 | 12,000 | 80 | 0.002 | 16,000 | 130 | 0.003 |
| | 15 | 14,000 | 90 | 0.002 | 12,000 | 60 | 0.002 | 16,000 | 100 | 0.002 |
| | 18 | 14,000 | 60 | 0.002 | 12,000 | 40 | 0.002 | 16,000 | 70 | 0.002 |
| 0.7 | 2 | 30,000 | 650 | 0.04 | 25,000 | 400 | 0.03 | 35,000 | 750 | 0.05 |
| | 4 | 25,000 | 500 | 0.03 | 22,000 | 330 | 0.02 | 30,000 | 600 | 0.04 |
| | 6 | 20,000 | 350 | 0.02 | 18,000 | 240 | 0.015 | 25,000 | 450 | 0.03 |
| | 8 | 18,000 | 280 | 0.015 | 15,000 | 180 | 0.01 | 22,000 | 350 | 0.02 |
| | 10 | 16,000 | 220 | 0.008 | 14,000 | 150 | 0.005 | 20,000 | 280 | 0.01 |
| 0.8 | 3 | 25,000 | 700 | 0.05 | 22,000 | 500 | 0.03 | 35,000 | 850 | 0.06 |
| | 4 | 25,000 | 600 | 0.045 | 22,000 | 400 | 0.03 | 30,000 | 720 | 0.055 |
| | 5 | 22,000 | 500 | 0.035 | 20,000 | 350 | 0.025 | 30,000 | 650 | 0.05 |
| | 6 | 20,000 | 450 | 0.03 | 18,000 | 300 | 0.02 | 25,000 | 560 | 0.04 |
| | 8 | 18,000 | 350 | 0.02 | 15,000 | 240 | 0.015 | 22,000 | 430 | 0.025 |
| | 10 | 16,000 | 300 | 0.01 | 14,000 | 200 | 0.007 | 20,000 | 380 | 0.012 |
| | 12 | 14,000 | 250 | 0.008 | 12,000 | 170 | 0.005 | 16,000 | 290 | 0.01 |
| | 14 | 12,000 | 200 | 0.005 | 10,000 | 140 | 0.003 | 14,000 | 230 | 0.006 |
| | 16 | 12,000 | 150 | 0.003 | 10,000 | 110 | 0.002 | 14,000 | 170 | 0.003 |
| | 20 | 12,000 | 120 | 0.002 | 10,000 | 80 | 0.002 | 14,000 | 140 | 0.002 |
| | 24 | 12,000 | 80 | 0.002 | 10,000 | 50 | 0.002 | 14,000 | 90 | 0.002 |
| 0.9 | 4 | 25,000 | 900 | 0.05 | 22,000 | 600 | 0.035 | 30,000 | 1,000 | 0.06 |
| | 6 | 20,000 | 600 | 0.04 | 18,000 | 400 | 0.03 | 25,000 | 750 | 0.05 |
| | 8 | 18,000 | 500 | 0.03 | 16,000 | 330 | 0.02 | 22,000 | 620 | 0.04 |
| | 10 | 16,000 | 400 | 0.02 | 14,000 | 260 | 0.015 | 20,000 | 500 | 0.025 |
| | 12 | 14,000 | 300 | 0.01 | 12,000 | 200 | 0.008 | 16,000 | 400 | 0.015 |
| | 15 | 12,000 | 250 | 0.008 | 10,000 | 160 | 0.005 | 14,000 | 300 | 0.01 |
| 1 | 2 | 25,000 | 1,500 | 0.07 | 22,000 | 1,000 | 0.06 | 30,000 | 1,800 | 0.08 |
| | 3 | 25,000 | 1,200 | 0.06 | 22,000 | 800 | 0.05 | 30,000 | 1,500 | 0.07 |
| | 4 | 25,000 | 1,100 | 0.055 | 22,000 | 700 | 0.045 | 30,000 | 1,300 | 0.065 |
| | 5 | 22,000 | 900 | 0.05 | 20,000 | 600 | 0.04 | 27,000 | 1,100 | 0.06 |
| | 6 | 20,000 | 800 | 0.045 | 18,000 | 500 | 0.035 | 25,000 | 1,000 | 0.055 |
| | 7 | 20,000 | 800 | 0.04 | 18,000 | 500 | 0.03 | 25,000 | 1,000 | 0.05 |
| | 8 | 18,000 | 700 | 0.035 | 15,000 | 400 | 0.025 | 22,000 | 850 | 0.045 |
| | 9 | 18,000 | 700 | 0.03 | 15,000 | 400 | 0.02 | 22,000 | 850 | 0.04 |

＊1 合金鋼・ステンレス鋼切削時は、回転数・送り速度を 80%まで下げた値を参考値としてください。
＊1 Reference value for Alloy and Stainless Steels are 80% of recommended cutting conditions.



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| 被削材 Work Material | | 炭素鋼・合金鋼*1・ステンレス鋼*1 Carbon Steels・Alloy Steels*1・Stainless Steels*1 S50C・SCM*1・SKD*1・SUS*1 | | | 調質鋼 Prehardened Steels NAK55・NAK80・HPM-1 (~43HRC) | | | 銅・アルミニウム合金 Copper・Aluminum Alloy | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut |
| | | $min^{-1}$ | mm/min | ap mm | $min^{-1}$ | mm/min | ap mm | $min^{-1}$ | mm/min | ap mm |
| 1 | 10 | 16,000 | 600 | 0.025 | 14,000 | 350 | 0.018 | 20,000 | 750 | 0.03 |
| | 12 | 14,000 | 500 | 0.02 | 12,000 | 300 | 0.014 | 18,000 | 650 | 0.025 |
| | 14 | 13,000 | 400 | 0.015 | 11,000 | 250 | 0.01 | 15,000 | 450 | 0.018 |
| | 16 | 12,000 | 300 | 0.01 | 10,000 | 200 | 0.007 | 14,000 | 350 | 0.012 |
| | 18 | 12,000 | 250 | 0.008 | 10,000 | 150 | 0.005 | 14,000 | 300 | 0.01 |
| | 20 | 11,000 | 200 | 0.005 | 9,000 | 120 | 0.003 | 13,000 | 230 | 0.006 |
| | 22 | 11,000 | 160 | 0.003 | 9,000 | 100 | 0.002 | 13,000 | 190 | 0.003 |
| | 25 | 10,000 | 120 | 0.002 | 8,500 | 80 | 0.002 | 12,000 | 140 | 0.002 |
| | 30 | 10,000 | 80 | 0.002 | 8,500 | 50 | 0.002 | 12,000 | 100 | 0.002 |
| 1.2 | 4 | 23,000 | 1,200 | 0.06 | 20,000 | 800 | 0.05 | 27,000 | 1,400 | 0.07 |
| | 6 | 20,000 | 900 | 0.05 | 18,000 | 600 | 0.04 | 25,000 | 1,200 | 0.06 |
| | 8 | 18,000 | 800 | 0.04 | 15,000 | 500 | 0.03 | 22,000 | 1,000 | 0.05 |
| | 10 | 16,000 | 700 | 0.03 | 14,000 | 450 | 0.02 | 20,000 | 850 | 0.04 |
| | 12 | 14,000 | 600 | 0.025 | 12,000 | 350 | 0.018 | 17,000 | 700 | 0.03 |
| | 16 | 12,000 | 400 | 0.015 | 10,000 | 250 | 0.01 | 14,000 | 450 | 0.02 |
| | 20 | 10,000 | 300 | 0.01 | 8,000 | 180 | 0.007 | 12,000 | 360 | 0.012 |
| 1.4 | 6 | 20,000 | 1,200 | 0.07 | 16,000 | 720 | 0.06 | 24,000 | 1,500 | 0.08 |
| | 8 | 18,000 | 1,000 | 0.06 | 14,000 | 580 | 0.05 | 22,000 | 1,300 | 0.07 |
| | 10 | 16,000 | 850 | 0.05 | 13,000 | 520 | 0.04 | 20,000 | 1,100 | 0.06 |
| | 12 | 14,000 | 700 | 0.04 | 12,000 | 450 | 0.03 | 17,000 | 850 | 0.05 |
| | 14 | 13,000 | 600 | 0.035 | 11,000 | 350 | 0.025 | 15,000 | 700 | 0.04 |
| | 16 | 12,000 | 500 | 0.025 | 10,000 | 300 | 0.018 | 13,000 | 550 | 0.03 |
| | 22 | 10,000 | 350 | 0.015 | 8,000 | 210 | 0.01 | 10,000 | 350 | 0.012 |
| 1.5 | 4 | 22,000 | 1,400 | 0.09 | 18,000 | 860 | 0.08 | 26,000 | 1,700 | 0.1 |
| | 6 | 20,000 | 1,200 | 0.08 | 16,000 | 720 | 0.07 | 24,000 | 1,500 | 0.09 |
| | 8 | 18,000 | 1,000 | 0.07 | 14,000 | 580 | 0.06 | 22,000 | 1,300 | 0.08 |
| | 10 | 16,000 | 850 | 0.06 | 13,000 | 520 | 0.05 | 20,000 | 1,100 | 0.07 |
| | 12 | 14,000 | 700 | 0.05 | 12,000 | 450 | 0.04 | 17,000 | 850 | 0.06 |
| | 14 | 13,000 | 600 | 0.04 | 11,000 | 380 | 0.03 | 16,000 | 750 | 0.05 |
| | 16 | 12,000 | 500 | 0.035 | 10,000 | 320 | 0.025 | 15,000 | 650 | 0.04 |
| | 18 | 11,000 | 450 | 0.03 | 9,000 | 280 | 0.02 | 13,000 | 530 | 0.035 |
| | 20 | 10,000 | 400 | 0.02 | 8,000 | 240 | 0.014 | 12,000 | 480 | 0.025 |
| | 25 | 9,000 | 350 | 0.015 | 7,000 | 200 | 0.01 | 9,000 | 350 | 0.018 |
| | 30 | 8,000 | 300 | 0.008 | 6,000 | 170 | 0.005 | 8,000 | 300 | 0.01 |
| | 35 | 7,000 | 200 | 0.005 | 5,500 | 130 | 0.003 | 7,000 | 200 | 0.006 |
| | 38 | 6,700 | 170 | 0.003 | 5,200 | 110 | 0.002 | 6,700 | 170 | 0.003 |
| | 40 | 6,500 | 150 | 0.002 | 5,000 | 90 | 0.002 | 6,500 | 150 | 0.002 |
| | 45 | 6,000 | 100 | 0.002 | 4,500 | 60 | 0.002 | 6,000 | 100 | 0.002 |
| 1.6 | 6 | 20,000 | 1,200 | 0.09 | 16,000 | 720 | 0.08 | 24,000 | 1,500 | 0.1 |
| | 8 | 18,000 | 1,000 | 0.08 | 14,000 | 580 | 0.07 | 22,000 | 1,300 | 0.09 |
| | 10 | 16,000 | 850 | 0.07 | 13,000 | 520 | 0.06 | 20,000 | 1,100 | 0.08 |
| | 12 | 14,000 | 700 | 0.06 | 12,000 | 450 | 0.05 | 18,000 | 900 | 0.07 |
| | 14 | 13,000 | 600 | 0.05 | 11,000 | 380 | 0.04 | 16,000 | 750 | 0.06 |
| | 16 | 12,000 | 500 | 0.04 | 10,000 | 320 | 0.03 | 14,000 | 620 | 0.05 |
| | 18 | 11,000 | 450 | 0.03 | 9,000 | 280 | 0.025 | 13,000 | 530 | 0.035 |
| | 20 | 10,000 | 400 | 0.025 | 8,000 | 240 | 0.018 | 12,000 | 480 | 0.03 |
| | 26 | 9,000 | 350 | 0.02 | 7,000 | 200 | 0.014 | 9,000 | 350 | 0.025 |

＊1 合金鋼・ステンレス鋼切削時は、回転数・送り速度を 80%まで下げた値を参考値としてください。
＊1 Reference value for Alloy and Stainless Steels are 80% of recommended cutting conditions.

# MHR230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | 炭素鋼・合金鋼＊1・ステンレス鋼＊1 Carbon Steels・Alloy Steels＊1・Stainless Steels＊1 S50C・SCM＊1・SKD＊1・SUS＊1 | | | 調質鋼 Prehardened Steels NAK55・NAK80・HPM-1 (～43HRC) | | | 銅・アルミニウム合金 Copper・Aluminum Alloy | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut |
| | | $min^{-1}$ | mm/min | ap mm | $min^{-1}$ | mm/min | ap mm | $min^{-1}$ | mm/min | ap mm |
| 1.8 | 6 | 18,000 | 1,300 | 0.1 | 14,000 | 760 | 0.09 | 22,000 | 1,600 | 0.12 |
| | 8 | 18,000 | 1,100 | 0.09 | 14,000 | 640 | 0.08 | 22,000 | 1,400 | 0.11 |
| | 10 | 16,000 | 900 | 0.08 | 13,000 | 550 | 0.07 | 20,000 | 1,200 | 0.1 |
| | 12 | 14,000 | 750 | 0.07 | 12,000 | 480 | 0.06 | 17,000 | 900 | 0.085 |
| | 14 | 13,000 | 650 | 0.06 | 11,000 | 420 | 0.05 | 16,000 | 800 | 0.07 |
| | 16 | 12,000 | 550 | 0.05 | 10,000 | 350 | 0.04 | 15,000 | 700 | 0.06 |
| | 18 | 11,000 | 500 | 0.04 | 9,000 | 310 | 0.03 | 13,000 | 600 | 0.05 |
| | 20 | 10,000 | 450 | 0.035 | 8,000 | 270 | 0.025 | 12,000 | 540 | 0.04 |
| | 25 | 9,000 | 400 | 0.025 | 7,000 | 230 | 0.018 | 11,000 | 480 | 0.03 |
| 2 | 4 | 16,000 | 1,500 | 0.13 | 13,000 | 900 | 0.12 | 20,000 | 1,850 | 0.15 |
| | 6 | 16,000 | 1,400 | 0.12 | 13,000 | 850 | 0.1 | 20,000 | 1,750 | 0.14 |
| | 8 | 16,000 | 1,300 | 0.11 | 13,000 | 800 | 0.09 | 20,000 | 1,650 | 0.13 |
| | 10 | 16,000 | 1,200 | 0.1 | 13,000 | 750 | 0.08 | 20,000 | 1,500 | 0.12 |
| | 12 | 14,000 | 1,000 | 0.09 | 12,000 | 650 | 0.07 | 17,000 | 1,200 | 0.11 |
| | 14 | 13,000 | 900 | 0.08 | 11,000 | 570 | 0.06 | 16,000 | 1,100 | 0.1 |
| | 16 | 12,000 | 800 | 0.07 | 10,000 | 500 | 0.05 | 15,000 | 1,000 | 0.085 |
| | 18 | 11,000 | 700 | 0.06 | 9,000 | 430 | 0.04 | 13,000 | 800 | 0.07 |
| | 20 | 10,000 | 600 | 0.05 | 8,000 | 360 | 0.035 | 12,000 | 720 | 0.06 |
| | 25 | 9,000 | 500 | 0.03 | 7,000 | 300 | 0.02 | 11,000 | 600 | 0.035 |
| | 30 | 8,000 | 400 | 0.02 | 6,000 | 220 | 0.014 | 9,000 | 450 | 0.025 |
| | 35 | 7,000 | 300 | 0.01 | 5,500 | 180 | 0.007 | 7,000 | 300 | 0.012 |
| | 40 | 6,000 | 200 | 0.005 | 5,000 | 140 | 0.003 | 6,000 | 200 | 0.006 |
| | 50 | 5,000 | 150 | 0.003 | 4,000 | 90 | 0.002 | 5,000 | 150 | 0.003 |
| | 60 | 4,500 | 100 | 0.002 | 3,500 | 60 | 0.002 | 4,500 | 100 | 0.002 |
| 2.5 | 8 | 13,000 | 1,400 | 0.15 | 11,000 | 900 | 0.12 | 16,000 | 1,700 | 0.18 |
| | 10 | 13,000 | 1,300 | 0.14 | 11,000 | 800 | 0.11 | 16,000 | 1,600 | 0.17 |
| | 12 | 13,000 | 1,200 | 0.13 | 11,000 | 750 | 0.1 | 16,000 | 1,500 | 0.16 |
| | 14 | 12,000 | 1,000 | 0.12 | 10,000 | 650 | 0.09 | 14,000 | 1,200 | 0.15 |
| | 16 | 11,000 | 900 | 0.1 | 9,000 | 550 | 0.07 | 13,000 | 1,100 | 0.12 |
| | 18 | 10,000 | 800 | 0.09 | 8,000 | 480 | 0.06 | 12,000 | 950 | 0.11 |
| | 20 | 9,000 | 700 | 0.08 | 7,000 | 400 | 0.05 | 11,000 | 850 | 0.1 |
| | 25 | 8,000 | 600 | 0.05 | 6,000 | 330 | 0.035 | 10,000 | 750 | 0.06 |
| | 30 | 7,000 | 500 | 0.03 | 5,500 | 280 | 0.02 | 8,500 | 600 | 0.035 |
| | 40 | 6,000 | 300 | 0.015 | 4,500 | 180 | 0.01 | 6,000 | 300 | 0.018 |
| | 50 | 5,000 | 200 | 0.01 | 4,000 | 120 | 0.007 | 5,000 | 200 | 0.012 |
| 3 | 8 | 11,000 | 1,500 | 0.2 | 9,000 | 1,000 | 0.16 | 13,000 | 1,800 | 0.24 |
| | 10 | 11,000 | 1,400 | 0.18 | 9,000 | 900 | 0.14 | 13,000 | 1,700 | 0.22 |
| | 12 | 11,000 | 1,300 | 0.16 | 9,000 | 800 | 0.12 | 13,000 | 1,600 | 0.2 |
| | 14 | 11,000 | 1,200 | 0.14 | 9,000 | 700 | 0.1 | 13,000 | 1,400 | 0.17 |
| | 16 | 10,000 | 1,000 | 0.12 | 8,000 | 600 | 0.09 | 12,000 | 1,200 | 0.15 |
| | 18 | 10,000 | 900 | 0.11 | 8,000 | 550 | 0.08 | 12,000 | 1,100 | 0.13 |
| | 20 | 9,000 | 800 | 0.1 | 7,000 | 450 | 0.07 | 11,000 | 1,000 | 0.12 |
| | 25 | 8,000 | 700 | 0.08 | 6,000 | 380 | 0.06 | 10,000 | 900 | 0.1 |
| | 30 | 7,000 | 600 | 0.06 | 5,000 | 300 | 0.045 | 8,500 | 730 | 0.07 |
| | 35 | 6,000 | 500 | 0.03 | 4,500 | 260 | 0.02 | 7,200 | 600 | 0.035 |
| | 40 | 5,000 | 400 | 0.025 | 4,000 | 220 | 0.018 | 6,000 | 480 | 0.03 |
| | 50 | 4,500 | 300 | 0.015 | 3,500 | 180 | 0.01 | 4,500 | 300 | 0.018 |

＊1 合金鋼・ステンレス鋼切削時は、回転数・送り速度を 80%まで下げた値を参考値としてください。
＊1 Reference value for Alloy and Stainless Steels are 80% of recommended cutting conditions.



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| 被削材 Work Material | | 炭素鋼・合金鋼＊1・ステンレス鋼＊1 Carbon Steels・Alloy Steels＊1・Stainless Steels＊1 S50C・SCM＊1・SKD＊1・SUS＊1 | | | 調質鋼 Prehardened Steels NAK55・NAK80・HPM-1 (～43HRC) | | | 銅・アルミニウム合金 Copper・Aluminum Alloy | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut |
| | | $min^{-1}$ | mm/min | ap mm | $min^{-1}$ | mm/min | ap mm | $min^{-1}$ | mm/min | ap mm |
| 4 | 12 | 8,000 | 1,500 | 0.3 | 6,000 | 850 | 0.25 | 10,000 | 1,900 | 0.36 |
| | 16 | 8,000 | 1,400 | 0.25 | 6,000 | 800 | 0.2 | 10,000 | 1,800 | 0.3 |
| | 20 | 8,000 | 1,300 | 0.2 | 6,000 | 730 | 0.15 | 10,000 | 1,600 | 0.24 |
| | 25 | 7,000 | 1,100 | 0.15 | 5,000 | 600 | 0.1 | 8,500 | 1,300 | 0.18 |
| | 30 | 7,000 | 1,000 | 0.12 | 5,000 | 540 | 0.08 | 8,500 | 1,200 | 0.15 |
| | 35 | 6,000 | 800 | 0.1 | 4,500 | 450 | 0.07 | 7,200 | 1,000 | 0.12 |
| | 40 | 5,000 | 600 | 0.08 | 4,000 | 360 | 0.06 | 6,000 | 720 | 0.1 |
| | 45 | 4,500 | 500 | 0.06 | 3,500 | 300 | 0.04 | 5,400 | 600 | 0.07 |
| | 50 | 4,000 | 400 | 0.04 | 3,000 | 220 | 0.03 | 4,800 | 480 | 0.05 |
| | 60 | 3,500 | 300 | 0.02 | 2,500 | 160 | 0.014 | 4,200 | 360 | 0.025 |
| 5 | 16 | 6,000 | 1,400 | 0.35 | 4,500 | 800 | 0.3 | 7,200 | 1,700 | 0.42 |
| | 20 | 6,000 | 1,300 | 0.3 | 4,500 | 730 | 0.25 | 7,200 | 1,600 | 0.36 |
| | 25 | 6,000 | 1,200 | 0.25 | 4,500 | 680 | 0.2 | 7,200 | 1,500 | 0.3 |
| | 30 | 5,000 | 900 | 0.2 | 4,000 | 540 | 0.15 | 6,000 | 1,100 | 0.24 |
| | 35 | 5,000 | 800 | 0.15 | 3,500 | 420 | 0.1 | 6,000 | 1,000 | 0.18 |
| | 40 | 4,000 | 600 | 0.1 | 3,000 | 340 | 0.07 | 4,800 | 720 | 0.12 |
| | 50 | 3,500 | 450 | 0.07 | 2,500 | 240 | 0.05 | 4,200 | 540 | 0.085 |
| | 60 | 3,000 | 350 | 0.04 | 2,200 | 200 | 0.03 | 3,600 | 420 | 0.05 |
| 6 | 20 | 5,000 | 1,200 | 0.4 | 3,500 | 630 | 0.35 | 6,000 | 1,500 | 0.48 |
| | 30 | 4,000 | 900 | 0.35 | 3,000 | 500 | 0.3 | 4,800 | 1,100 | 0.42 |
| | 40 | 3,500 | 650 | 0.25 | 2,700 | 380 | 0.2 | 4,200 | 780 | 0.3 |
| | 50 | 3,000 | 500 | 0.15 | 2,200 | 280 | 0.1 | 3,600 | 600 | 0.18 |
| | 60 | 2,700 | 400 | 0.05 | 2,000 | 220 | 0.04 | 3,200 | 480 | 0.06 |

**備　考 Notes**

＊1 合金鋼・ステンレス鋼切削時は、回転数・送り速度を 80%まで下げた値を参考値としてください。
＊1 Reference value for Alloy and Stainless Steels are 80% of recommended cutting conditions.

※本切削条件は参考値です。実際の加工形状および使用機械等にて切削条件を調整してください。
※切り込み量の ap は切り込み深さを示します。
※切削油は、被削材・加工形状等を考慮し、適切なものを使用してください。
※深い部分を加工する際は、切削油の給油および切りくずの排出に十分注意してください。
※ Z 切り込み時のアプローチ方法として、ランプ（傾斜）での切削加工をお奨めします。
※往復切削をお奨めします。
※ L(有効長)/D(刃径)が 5 以上の場合、有効長の短い工具でのガイド溝加工をお奨めします。
※ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。また、主軸回転数が足りない場合も同様に同じ割合で下げてください。
※φ0.5 未満あるいは L(有効長)/D(刃径)が 15 以上の場合、加工形状・使用機械等により、大幅な条件調整を必要とする場合があります。
※工具突出し量がシャンク径の 5 倍を越える場合、ミーリングチャックの振れ精度等の影響で、大幅な条件調整を必要とする場合があります。その際は、回転数と送り速度を同じ割合で下げるなどして、切削条件を調整してください。

※These recommended cutting conditions indicate just reference. It should be adjusted according to milling shape and machine type.
※ap:Axial Depth of Cut.
※Select a cutting fluid appropriate to work material, milling shape and machining content.
※Coolant supply and chip disposal in the deep portion are very important.
※Recommend to apply ramping for approaching into axial direction.
※Recommend reciprocating cutting.
※Recommend guide slotting process with short neck tool before milling with L/D 5 time or longer neck tool.
※Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.
※Major adjustment of milling conditions appropriately on milling profile, machine tool and etc. required for the tools smaller than Dia. 0.5mm, or L/D 15 times longer.
※Major adjustment of milling conditions, e.g. adjust spindle and feed speed at same rate, required on condition of a tool overhang length exceeding a shank diameter 5 times due to possible accuracy impact by chuck runout etc.

# MHR430

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | 炭素鋼・合金鋼＊1・ステンレス鋼＊1 Carbon Steels・Alloy Steels＊1・Stainless Steels＊1 S50C・SCM＊1・SKD＊1・SUS＊1 | | | | 調質鋼 Prehardened Steels NAK55・NAK80・HPM-1 (～43HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | ae mm |
| 1 | 4 | 25,000 | 1,700 | 0.055 | 0.6 | 22,000 | 1,100 | 0.045 | 0.6 |
| | 6 | 20,000 | 1,200 | 0.045 | 0.6 | 18,000 | 750 | 0.035 | 0.6 |
| | 8 | 18,000 | 1,050 | 0.035 | 0.6 | 15,000 | 600 | 0.025 | 0.6 |
| | 10 | 16,000 | 900 | 0.025 | 0.6 | 14,000 | 520 | 0.018 | 0.6 |
| | 12 | 14,000 | 750 | 0.02 | 0.6 | 12,000 | 450 | 0.014 | 0.6 |
| | 16 | 12,000 | 450 | 0.01 | 0.6 | 10,000 | 300 | 0.007 | 0.6 |
| 1.1 | 6 | 20,000 | 1,300 | 0.05 | 0.66 | 18,000 | 820 | 0.04 | 0.66 |
| | 10 | 16,000 | 1,000 | 0.03 | 0.66 | 14,000 | 600 | 0.02 | 0.66 |
| | 16 | 12,000 | 550 | 0.015 | 0.66 | 10,000 | 330 | 0.01 | 0.66 |
| 1.2 | 6 | 20,000 | 1,400 | 0.05 | 0.72 | 18,000 | 900 | 0.04 | 0.72 |
| | 8 | 18,000 | 1,200 | 0.04 | 0.72 | 15,000 | 750 | 0.03 | 0.72 |
| | 10 | 16,000 | 1,050 | 0.03 | 0.72 | 14,000 | 670 | 0.02 | 0.72 |
| | 12 | 14,000 | 900 | 0.025 | 0.72 | 12,000 | 530 | 0.018 | 0.72 |
| | 16 | 12,000 | 600 | 0.015 | 0.72 | 10,000 | 380 | 0.01 | 0.72 |
| 1.3 | 6 | 20,000 | 1,500 | 0.06 | 0.78 | 17,000 | 1,000 | 0.05 | 0.78 |
| | 12 | 14,000 | 1,000 | 0.03 | 0.78 | 12,000 | 600 | 0.025 | 0.78 |
| | 18 | 11,000 | 600 | 0.015 | 0.78 | 9,000 | 380 | 0.01 | 0.78 |
| 1.4 | 6 | 20,000 | 1,800 | 0.07 | 0.84 | 16,000 | 1,100 | 0.06 | 0.84 |
| | 8 | 18,000 | 1,500 | 0.06 | 0.84 | 14,000 | 900 | 0.05 | 0.84 |
| | 10 | 16,000 | 1,300 | 0.05 | 0.84 | 13,000 | 780 | 0.04 | 0.84 |
| | 12 | 14,000 | 1,050 | 0.04 | 0.84 | 12,000 | 670 | 0.03 | 0.84 |
| | 14 | 13,000 | 900 | 0.035 | 0.84 | 11,000 | 530 | 0.025 | 0.84 |
| | 16 | 12,000 | 750 | 0.025 | 0.84 | 10,000 | 450 | 0.018 | 0.84 |
| | 22 | 10,000 | 550 | 0.015 | 0.84 | 8,000 | 320 | 0.01 | 0.84 |
| 1.5 | 6 | 20,000 | 1,800 | 0.08 | 0.9 | 16,000 | 1,100 | 0.07 | 0.9 |
| | 8 | 18,000 | 1,500 | 0.07 | 0.9 | 14,000 | 900 | 0.06 | 0.9 |
| | 10 | 16,000 | 1,300 | 0.06 | 0.9 | 13,000 | 780 | 0.05 | 0.9 |
| | 12 | 14,000 | 1,050 | 0.05 | 0.9 | 12,000 | 670 | 0.04 | 0.9 |
| | 14 | 13,000 | 900 | 0.04 | 0.9 | 11,000 | 570 | 0.03 | 0.9 |
| | 16 | 12,000 | 750 | 0.035 | 0.9 | 10,000 | 480 | 0.025 | 0.9 |
| | 18 | 11,000 | 680 | 0.03 | 0.9 | 9,000 | 420 | 0.02 | 0.9 |
| | 20 | 10,000 | 600 | 0.02 | 0.9 | 8,000 | 360 | 0.014 | 0.9 |
| 1.6 | 6 | 20,000 | 1,800 | 0.09 | 0.96 | 16,000 | 1,100 | 0.08 | 0.96 |
| | 8 | 18,000 | 1,500 | 0.08 | 0.96 | 14,000 | 900 | 0.07 | 0.96 |
| | 10 | 16,000 | 1,300 | 0.07 | 0.96 | 13,000 | 780 | 0.06 | 0.96 |
| | 12 | 14,000 | 1,050 | 0.06 | 0.96 | 12,000 | 670 | 0.05 | 0.96 |
| | 14 | 13,000 | 900 | 0.05 | 0.96 | 11,000 | 570 | 0.04 | 0.96 |
| | 16 | 12,000 | 750 | 0.04 | 0.96 | 10,000 | 480 | 0.03 | 0.96 |
| | 18 | 11,000 | 680 | 0.03 | 0.96 | 9,000 | 420 | 0.025 | 0.96 |
| | 20 | 10,000 | 600 | 0.025 | 0.96 | 8,000 | 360 | 0.018 | 0.96 |
| | 26 | 9,000 | 530 | 0.02 | 0.96 | 7,000 | 300 | 0.014 | 0.96 |
| 1.7 | 6 | 19,000 | 1,900 | 0.095 | 1.02 | 15,000 | 1,150 | 0.085 | 1.02 |
| | 14 | 13,000 | 950 | 0.055 | 1.02 | 11,000 | 630 | 0.045 | 1.02 |
| | 24 | 9,000 | 550 | 0.025 | 1.02 | 7,000 | 330 | 0.018 | 1.02 |

＊1 合金鋼・ステンレス鋼切削時は、回転数・送り速度を 80%まで下げた値を参考値としてください。
＊1 Reference value for Alloy and Stainless Steels are 80% of recommended cutting conditions.



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| 被削材 Work Material | | 炭素鋼・合金鋼＊1・ステンレス鋼＊1 Carbon Steels・Alloy Steels＊1・Stainless Steels＊1 S50C・SCM＊1・SKD＊1・SUS＊1 | | | | 調質鋼 Prehardened Steels NAK55・NAK80・HPM-1 (～43HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | $min^{-1}$ | mm/min | ap mm | ae mm | $min^{-1}$ | mm/min | ap mm | ae mm |
| 1.8 | 6 | 18,000 | 2,000 | 0.1 | 1.08 | 14,000 | 1,200 | 0.09 | 1.08 |
| | 8 | 18,000 | 1,700 | 0.09 | 1.08 | 14,000 | 1,000 | 0.08 | 1.08 |
| | 10 | 16,000 | 1,400 | 0.08 | 1.08 | 13,000 | 850 | 0.07 | 1.08 |
| | 12 | 14,000 | 1,100 | 0.07 | 1.08 | 12,000 | 720 | 0.06 | 1.08 |
| | 14 | 13,000 | 1,000 | 0.06 | 1.08 | 11,000 | 630 | 0.05 | 1.08 |
| | 16 | 12,000 | 850 | 0.05 | 1.08 | 10,000 | 530 | 0.04 | 1.08 |
| | 18 | 11,000 | 750 | 0.04 | 1.08 | 9,000 | 470 | 0.03 | 1.08 |
| | 20 | 10,000 | 680 | 0.035 | 1.08 | 8,000 | 400 | 0.025 | 1.08 |
| | 25 | 9,000 | 600 | 0.025 | 1.08 | 7,000 | 340 | 0.018 | 1.08 |
| 1.9 | 6 | 17,000 | 2,100 | 0.11 | 1.14 | 14,000 | 1,250 | 0.095 | 1.14 |
| | 16 | 12,000 | 1,000 | 0.06 | 1.14 | 10,000 | 630 | 0.045 | 1.14 |
| | 28 | 8,000 | 550 | 0.02 | 1.14 | 6,000 | 300 | 0.014 | 1.14 |
| 2 | 6 | 16,000 | 2,100 | 0.12 | 1.2 | 13,000 | 1,300 | 0.1 | 1.2 |
| | 8 | 16,000 | 2,000 | 0.11 | 1.2 | 13,000 | 1,200 | 0.09 | 1.2 |
| | 10 | 16,000 | 1,800 | 0.1 | 1.2 | 13,000 | 1,100 | 0.08 | 1.2 |
| | 12 | 14,000 | 1,500 | 0.09 | 1.2 | 12,000 | 1,000 | 0.07 | 1.2 |
| | 14 | 13,000 | 1,350 | 0.08 | 1.2 | 11,000 | 850 | 0.06 | 1.2 |
| | 16 | 12,000 | 1,200 | 0.07 | 1.2 | 10,000 | 750 | 0.05 | 1.2 |
| | 18 | 11,000 | 1,000 | 0.06 | 1.2 | 9,000 | 650 | 0.04 | 1.2 |
| | 20 | 10,000 | 900 | 0.05 | 1.2 | 8,000 | 550 | 0.035 | 1.2 |
| | 25 | 9,000 | 750 | 0.03 | 1.2 | 7,000 | 450 | 0.02 | 1.2 |
| | 30 | 8,000 | 600 | 0.02 | 1.2 | 6,000 | 330 | 0.014 | 1.2 |
| 2.5 | 8 | 13,000 | 2,100 | 0.15 | 1.5 | 11,000 | 1,400 | 0.12 | 1.5 |
| | 12 | 13,000 | 1,800 | 0.13 | 1.5 | 11,000 | 1,100 | 0.1 | 1.5 |
| | 16 | 11,000 | 1,400 | 0.1 | 1.5 | 9,000 | 850 | 0.07 | 1.5 |
| | 20 | 9,000 | 1,100 | 0.08 | 1.5 | 7,000 | 600 | 0.05 | 1.5 |
| | 25 | 8,000 | 900 | 0.05 | 1.5 | 6,000 | 500 | 0.035 | 1.5 |
| 3 | 8 | 11,000 | 2,300 | 0.2 | 1.8 | 9,000 | 1,500 | 0.16 | 1.8 |
| | 12 | 11,000 | 2,000 | 0.16 | 1.8 | 9,000 | 1,200 | 0.12 | 1.8 |
| | 16 | 10,000 | 1,500 | 0.12 | 1.8 | 8,000 | 900 | 0.09 | 1.8 |
| | 20 | 9,000 | 1,200 | 0.1 | 1.8 | 7,000 | 680 | 0.07 | 1.8 |
| | 25 | 8,000 | 1,050 | 0.08 | 1.8 | 6,000 | 570 | 0.06 | 1.8 |
| | 30 | 7,000 | 900 | 0.06 | 1.8 | 5,000 | 450 | 0.045 | 1.8 |
| 3.5 | 15 | 9,000 | 2,000 | 0.18 | 2.1 | 7,000 | 1,200 | 0.15 | 2.1 |
| | 25 | 7,500 | 1,500 | 0.12 | 2.1 | 6,000 | 850 | 0.08 | 2.1 |
| | 35 | 6,000 | 1,000 | 0.07 | 2.1 | 4,500 | 520 | 0.05 | 2.1 |
| 4 | 12 | 8,000 | 2,200 | 0.3 | 2.4 | 6,000 | 1,300 | 0.25 | 2.4 |
| | 16 | 8,000 | 2,100 | 0.25 | 2.4 | 6,000 | 1,200 | 0.2 | 2.4 |
| | 20 | 8,000 | 2,000 | 0.2 | 2.4 | 6,000 | 1,100 | 0.15 | 2.4 |
| | 25 | 7,000 | 1,700 | 0.15 | 2.4 | 5,000 | 900 | 0.1 | 2.4 |
| | 30 | 7,000 | 1,500 | 0.12 | 2.4 | 5,000 | 800 | 0.08 | 2.4 |
| | 35 | 6,000 | 1,200 | 0.1 | 2.4 | 4,500 | 670 | 0.07 | 2.4 |
| | 40 | 5,000 | 900 | 0.08 | 2.4 | 4,000 | 540 | 0.06 | 2.4 |
| | 45 | 4,500 | 750 | 0.06 | 2.4 | 3,500 | 450 | 0.04 | 2.4 |
| | 50 | 4,000 | 600 | 0.04 | 2.4 | 3,000 | 330 | 0.03 | 2.4 |
| 5 | 16 | 6,000 | 2,100 | 0.35 | 3 | 4,500 | 1,200 | 0.3 | 3 |
| | 25 | 6,000 | 1,800 | 0.25 | 3 | 4,500 | 1,000 | 0.2 | 3 |
| | 35 | 5,000 | 1,200 | 0.15 | 3 | 3,500 | 630 | 0.1 | 3 |
| | 50 | 3,500 | 680 | 0.07 | 3 | 2,500 | 360 | 0.05 | 3 |

＊1 合金鋼・ステンレス鋼切削時は、回転数・送り速度を 80%まで下げた値を参考値としてください。
＊1 Reference value for Alloy and Stainless Steels are 80% of recommended cutting conditions.

# MHR430

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | 炭素鋼・合金鋼*1・ステンレス鋼*1 Carbon Steels・Alloy Steels*1・Stainless Steels*1 S50C・SCM*1・SKD*1・SUS*1 | | | | 調質鋼 Prehardened Steels NAK55・NAK80・HPM-1 (~43HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | $min^{-1}$ | mm/min | ap mm | ae mm | $min^{-1}$ | mm/min | ap mm | ae mm |
| 6 | 20 | 5,000 | 1,800 | 0.4 | 3.6 | 3,500 | 1,000 | 0.35 | 3.6 |
| | 30 | 4,000 | 1,400 | 0.35 | 3.6 | 3,000 | 750 | 0.3 | 3.6 |
| | 40 | 3,500 | 1,000 | 0.25 | 3.6 | 2,700 | 570 | 0.2 | 3.6 |
| | 50 | 3,000 | 750 | 0.15 | 3.6 | 2,200 | 420 | 0.1 | 3.6 |
| 8 | 30 | 3,800 | 1,400 | 0.6 | 4.8 | 2,800 | 900 | 0.45 | 4.8 |
| | 50 | 2,800 | 820 | 0.4 | 4.8 | 2,100 | 600 | 0.3 | 4.8 |
| | 60 | 2,400 | 680 | 0.3 | 4.8 | 1,800 | 450 | 0.2 | 4.8 |
| 10 | 40 | 3,000 | 1,200 | 0.8 | 6 | 2,200 | 750 | 0.55 | 6 |
| | 60 | 2,200 | 750 | 0.6 | 6 | 1,600 | 520 | 0.45 | 6 |
| | 80 | 1,800 | 520 | 0.4 | 6 | 1,300 | 360 | 0.3 | 6 |

**備　考 Notes**

※1 合金鋼・ステンレス鋼切削時は、回転数・送り速度を 80%まで下げた値を参考値としてください。
※1 Reference value for Alloy and Stainless Steels are 80% of recommended cutting conditions.

※本切削条件は参考値です。実際の加工形状および使用機械等にて切削条件を調整してください。
※切り込み量の ap は切り込み深さ、ae は切り込み幅を示します。
※切削油は、被削材・加工形状等を考慮し、適切なものを使用してください。
※深い部分を加工する際は、切削油の給油および切りくずの排出に十分注意してください。
※ Z 切り込み時のアプローチ方法として、ヘリカル（螺旋）及びランプ（傾斜）での切削加工をお奨めします。
※立ち壁付近では工具への負荷が増大するため、送り速度・切り込み量を下げてください。
※溝切削は、切削条件表の切り込み量を 80%まで下げた値を参考値とし、往復切削をお奨めします。
また、L(有効長)/D(刃径)が 5 以上の場合、有効長の短い工具でのガイド溝加工をお奨めします。
※ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。また、主軸回転数が足りない場合も同様に同じ割合で下げてください。
※工具突出し量がシャンク径の 5 倍を越える場合、ミーリングチャックの振れ精度等の影響で、大幅な条件調整を必要とする場合があります。その際は、回転数と送り速度を同じ割合で下げるなどして、切削条件を調整してください。

※These recommended cutting conditions indicate just reference. It should be adjusted according to milling shape and machine type.
※ap:Axial Depth of Cut, ae:Radial Depth of Cut.
※Select a cutting fluid appropriate to work material, milling shape and machining content.
※Coolant supply and chip disposal in the deep portion are very important.
※Recommend to apply herical or ramping for approaching into axial direction.
※Reduction of feed and Depth of Cut to reduce machining load around side wall.
※For slotting, recommend reciprocating milling by adjusting feed at 80% of recommended milling conditions as a reference value.
Recommend guide slotting process with short neck tool before milling with L/D 5 time or longer neck tool.
※Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.
※Major adjustment of milling conditions, e.g. adjust spindle and feed speed at same rate, required on condition of a tool overhang length exceeding a shank diameter 5 times due to possible accuracy impact by chuck runout etc.



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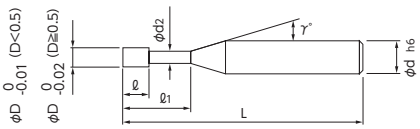
# MHRLN230-6

## 無限コーティング ロングネックエンドミルφ6シャンクタイプ（深リブ用）
MUGEN-COATING 2-Flute Long Neck End Mill (Shank Dia. 6)




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

Slot Side Face MG ∞ 2 30° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | |

| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|
| ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 08-00202-03030 | 0.3 | 3 | 0.4 | 0.28 | 15° | 6 | 60 | 18,400 ▌ |
| 08-00202-04030 | 0.4 | 3 | 0.6 | 0.37 | 15° | 6 | 60 | 15,000 ▌ |
| 08-00202-04040 | | 4 | 0.6 | 0.37 | 15° | 6 | 60 | 15,000 ▌ |
| 08-00202-04050 | | 5 | 0.6 | 0.37 | 15° | 6 | 60 | 15,900 ▌ |
| 08-00202-05040 | 0.5 | 4 | 0.7 | 0.46 | 15° | 6 | 60 | 9,900 ▌ |
| 08-00202-05050 | | 5 | 0.7 | 0.46 | 15° | 6 | 60 | 9,900 ▌ |
| 08-00202-05060 | | 6 | 0.7 | 0.46 | 15° | 6 | 60 | 10,500 ▌ |
| 08-00202-06040 | 0.6 | 4 | 0.9 | 0.56 | 15° | 6 | 60 | 9,900 ▌ |
| 08-00202-06060 | | 6 | 0.9 | 0.56 | 15° | 6 | 60 | 9,900 ▌ |
| 08-00202-08080 | 0.8 | 8 | 1.2 | 0.76 | 15° | 6 | 60 | 9,900 ▌ |
| 08-00202-10030 | 1 | 3 | 1.5 | 0.95 | 15° | 6 | 60 | 9,900 ▌ |
| 08-00202-10060 | | 6 | 1.5 | 0.95 | 15° | 6 | 60 | 9,900 ▌ |
| 08-00202-10080 | | 8 | 1.5 | 0.95 | 15° | 6 | 60 | 9,900 ▌ |
| 08-00202-10100 | | 10 | 1.5 | 0.95 | 15° | 6 | 60 | 9,900 ▌ |
| 08-00202-15030 | 1.5 | 3 | 2.3 | 1.45 | 15° | 6 | 60 | 9,500 ▌ |
| 08-00202-15050 | | 5 | 2.3 | 1.45 | 15° | 6 | 60 | 9,500 ▌ |
| 08-00202-15100 | | 10 | 2.3 | 1.45 | 15° | 6 | 60 | 9,500 ▌ |
| 08-00202-15150 | | 15 | 2.3 | 1.45 | 15° | 6 | 60 | 9,900 ▌ |
| 08-00202-20200 | 2 | 20 | 3 | 1.94 | 15° | 6 | 60 | 9,900 ▌ |

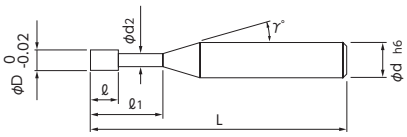
**オーダー方法** MHRLN230-6 刃径(D)×有効長(ℓ1)を指示してください。
When you order, indicate MHRLN230-6 (D)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

# NHR-2X

## Xコーティング 2枚刃 ロングネックエンドミル（深リブ用）

X-COATING 2-Flute Long Neck End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

Slot Side Face MG X 2 (φD<2.5) 30° (φD≧2.5) 45°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | | | ○ | | ○ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00413-00502 | 0.5 | 2 | 0.7 | 0.46 | 12° | 3 | 35 | 11,400 ▌ |
| 01-00413-00504 | | 4 | 0.7 | 0.46 | 12° | 3 | 35 | 11,400 ▌ |
| 01-00413-00506 | | 6 | 0.7 | 0.46 | 12° | 3 | 35 | 11,400 ▌ |
| 01-00413-00602 | 0.6 | 2 | 0.9 | 0.56 | 12° | 3 | 35 | 10,500 ▌ |
| 01-00413-00604 | | 4 | 0.9 | 0.56 | 12° | 3 | 35 | 10,500 ▌ |
| 01-00413-00606 | | 6 | 0.9 | 0.56 | 12° | 3 | 35 | 10,500 ▌ |
| 01-00413-00702 | 0.7 | 2 | 1 | 0.66 | 12° | 4 | 45 | 10,500 ▌ |
| 01-00413-00704 | | 4 | 1 | 0.66 | 12° | 4 | 45 | 10,500 ▌ |
| 01-00413-00706 | | 6 | 1 | 0.66 | 12° | 4 | 45 | 10,500 ▌ |
| 01-00413-00804 | 0.8 | 4 | 1.2 | 0.76 | 12° | 4 | 45 | 7,000 ▌ |
| 01-00413-00806 | | 6 | 1.2 | 0.76 | 12° | 4 | 45 | 7,000 ▌ |
| 01-00413-00808 | | 8 | 1.2 | 0.76 | 12° | 4 | 45 | 7,000 ▌ |
| 01-00413-00906 | 0.9 | 6 | 1.35 | 0.86 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-00908 | | 8 | 1.35 | 0.86 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-00910 | | 10 | 1.35 | 0.86 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-01006 | 1 | 6 | 1.5 | 0.95 | 12° | 4 | 45 | 6,400 ▌ |
| 01-00413-01008 | | 8 | 1.5 | 0.95 | 12° | 4 | 45 | 6,400 ▌ |
| 01-00413-01010 | | 10 | 1.5 | 0.95 | 12° | 4 | 45 | 6,400 ▌ |
| 01-00413-01012 | | 12 | 1.5 | 0.95 | 12° | 4 | 45 | 6,400 ▌ |
| 01-00413-01206 | 1.2 | 6 | 1.8 | 1.15 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-01208 | | 8 | 1.8 | 1.15 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-01210 | | 10 | 1.8 | 1.15 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-01212 | | 12 | 1.8 | 1.15 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-01406 | 1.4 | 6 | 2.1 | 1.35 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-01408 | | 8 | 2.1 | 1.35 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-01410 | | 10 | 2.1 | 1.35 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-01412 | | 12 | 2.1 | 1.35 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-01414 | | 14 | 2.1 | 1.35 | 12° | 4 | 50 | 8,800 ▌ |
| 01-00413-01416 | | 16 | 2.1 | 1.35 | 12° | 4 | 50 | 8,800 ▌ |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00413-01506 | 1.5 | 6 | 2.3 | 1.45 | 12° | 4 | 45 | 6,600 ▌ |
| 01-00413-01508 | | 8 | 2.3 | 1.45 | 12° | 4 | 45 | 6,600 ▌ |
| 01-00413-01510 | | 10 | 2.3 | 1.45 | 12° | 4 | 45 | 6,600 ▌ |
| 01-00413-01512 | | 12 | 2.3 | 1.45 | 12° | 4 | 45 | 6,600 ▌ |
| 01-00413-01514 | | 14 | 2.3 | 1.45 | 12° | 4 | 50 | 6,600 ▌ |
| 01-00413-01516 | | 16 | 2.3 | 1.45 | 12° | 4 | 50 | 6,600 ▌ |
| 01-00413-01518 | | 18 | 2.3 | 1.45 | 12° | 4 | 55 | 6,800 ▌ |
| 01-00413-01520 | | 20 | 2.3 | 1.45 | 12° | 4 | 55 | 6,800 ▌ |
| 01-00413-01606 | 1.6 | 6 | 2.4 | 1.55 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-01608 | | 8 | 2.4 | 1.55 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-01610 | | 10 | 2.4 | 1.55 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-01612 | | 12 | 2.4 | 1.55 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-01614 | | 14 | 2.4 | 1.55 | 12° | 4 | 50 | 8,800 ▌ |
| 01-00413-01616 | | 16 | 2.4 | 1.55 | 12° | 4 | 50 | 8,800 ▌ |
| 01-00413-01618 | | 18 | 2.4 | 1.55 | 12° | 4 | 55 | 8,800 ▌ |
| 01-00413-01620 | | 20 | 2.4 | 1.55 | 12° | 4 | 55 | 8,800 ▌ |
| 01-00413-01806 | 1.8 | 6 | 2.7 | 1.75 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-01808 | | 8 | 2.7 | 1.75 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-01810 | | 10 | 2.7 | 1.75 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-01812 | | 12 | 2.7 | 1.75 | 12° | 4 | 45 | 8,800 ▌ |
| 01-00413-01814 | | 14 | 2.7 | 1.75 | 12° | 4 | 50 | 8,800 ▌ |
| 01-00413-01816 | | 16 | 2.7 | 1.75 | 12° | 4 | 50 | 8,800 ▌ |
| 01-00413-01818 | | 18 | 2.7 | 1.75 | 12° | 4 | 55 | 8,800 ▌ |
| 01-00413-01820 | | 20 | 2.7 | 1.75 | 12° | 4 | 55 | 8,800 ▌ |
| 01-00413-02006 | 2 | 6 | 3 | 1.94 | 12° | 4 | 45 | 6,600 ▌ |
| 01-00413-02008 | | 8 | 3 | 1.94 | 12° | 4 | 45 | 6,600 ▌ |
| 01-00413-02010 | | 10 | 3 | 1.94 | 12° | 4 | 45 | 6,600 ▌ |
| 01-00413-02012 | | 12 | 3 | 1.94 | 12° | 4 | 45 | 6,600 ▌ |
| 01-00413-02014 | | 14 | 3 | 1.94 | 12° | 4 | 50 | 6,600 ▌ |

**オーダー方法** NHR-2X 刃径(D)×有効長(ℓ1)を指示してください。
When you order, indicate NHR-2X (D)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-096に記載
●Recommended Milling Conditions are shown on page D-096.



ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00413-02016 | 2 | 16 | 3 | 1.94 | 12° | 4 | 50 | 6,600 |
| 01-00413-02018 | | 18 | 3 | 1.94 | 12° | 4 | 55 | 6,800 |
| 01-00413-02020 | | 20 | 3 | 1.94 | 12° | 4 | 55 | 6,800 |
| 01-00413-02508 | 2.5 | 8 | 3.7 | 2.4 | 12° | 4 | 45 | 7,700 |
| 01-00413-02512 | | 12 | 3.7 | 2.4 | 12° | 4 | 45 | 7,700 |
| 01-00413-02516 | | 16 | 3.7 | 2.4 | 12° | 4 | 55 | 7,700 |
| 01-00413-02520 | | 20 | 3.7 | 2.4 | 12° | 4 | 60 | 8,000 |
| 01-00413-03008 | 3 | 8 | 4.5 | 2.85 | 12° | 6 | 45 | 8,200 |
| 01-00413-03012 | | 12 | 4.5 | 2.85 | 12° | 6 | 45 | 8,200 |
| 01-00413-03016 | | 16 | 4.5 | 2.85 | 12° | 6 | 55 | 8,200 |
| 01-00413-03020 | | 20 | 4.5 | 2.85 | 12° | 6 | 60 | 8,200 |
| 01-00413-03025 | | 25 | 4.5 | 2.85 | 12° | 6 | 65 | 8,500 |
| 01-00413-03512 | 3.5 | 12 | 5.25 | 3.35 | 12° | 6 | 45 | 10,700 |
| 01-00413-03516 | | 16 | 5.25 | 3.35 | 12° | 6 | 55 | 10,700 |
| 01-00413-03520 | | 20 | 5.25 | 3.35 | 12° | 6 | 60 | 10,700 |
| 01-00413-03525 | | 25 | 5.25 | 3.35 | 12° | 6 | 65 | 10,700 |
| 01-00413-03530 | | 30 | 5.25 | 3.35 | 12° | 6 | 75 | 10,700 |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00413-04012 | 4 | 12 | 6 | 3.8 | 12° | 6 | 45 | 10,700 |
| 01-00413-04016 | | 16 | 6 | 3.8 | 12° | 6 | 55 | 10,700 |
| 01-00413-04020 | | 20 | 6 | 3.8 | 12° | 6 | 60 | 10,700 |
| 01-00413-04025 | | 25 | 6 | 3.8 | 12° | 6 | 65 | 10,700 |
| 01-00413-04030 | | 30 | 6 | 3.8 | 12° | 6 | 70 | 10,700 |
| 01-00413-04035 | | 35 | 6 | 3.8 | 12° | 6 | 75 | 10,700 |
| 01-00413-05016 | 5 | 16 | 7.5 | 4.8 | 12° | 6 | 55 | 12,000 |
| 01-00413-05020 | | 20 | 7.5 | 4.8 | 12° | 6 | 60 | 12,000 |
| 01-00413-05025 | | 25 | 7.5 | 4.8 | 12° | 6 | 65 | 12,000 |
| 01-00413-05030 | | 30 | 7.5 | 4.8 | 12° | 6 | 75 | 12,000 |
| 01-00413-05035 | | 35 | 7.5 | 4.8 | 12° | 6 | 80 | 12,000 |
| 01-00413-05040 | | 40 | 7.5 | 4.8 | 12° | 6 | 90 | 12,000 |

# NHR-2X

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | 炭素鋼・合金鋼・調質鋼 Carbon Steels・Alloy Steels・Prehardened Steels S50C・SCM・SKD・SUS・HPM・NAK | | アルミニウム合金 Aluminum Alloy | | 銅 Copper | | 樹脂 Resin | |
|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | | 30～50m/min | | 100～200m/min | | 50～150m/min | | 50～80m/min | |
| 刃径 Dia. | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | mm | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 0.5 | 0.003~0.05 | 19,100~31,800 | 200~500 | 50,000~ | 200~1,000 | 31,800~ | 200~1,000 | 31,800~ | 200~400 |
| 0.6 | 0.006~0.06 | 15,900~26,500 | 200~500 | 50,000~ | 200~1,250 | 26,500~ | 200~1,000 | 26,500~42,500 | 200~400 |
| 0.7 | 0.01 ~0.07 | 13,600~22,700 | 200~500 | 45,500~ | 200~1,250 | 22,700~ | 200~1,000 | 22,700~36,400 | 200~400 |
| 0.8 | 0.01 ~0.06 | 11,900~19,900 | 200~500 | 39,800~ | 200~1,500 | 19,900~ | 200~1,250 | 19,900~31,800 | 200~400 |
| 0.9 | 0.009~0.03 | 10,600~17,700 | 200~500 | 35,400~ | 200~2,000 | 17,700~ | 200~1,500 | 17,700~28,300 | 200~400 |
| 1 | 0.01 ~0.06 | 9,600~15,900 | 200~650 | 31,800~ | 200~2,600 | 15,900~47,800 | 200~1,950 | 15,900~25,500 | 200~400 |
| 1.2 | 0.016~0.12 | 8,000~13,300 | 200~550 | 26,500~ | 200~2,200 | 13,300~39,800 | 200~1,650 | 13,300~21,200 | 200~400 |
| 1.4 | 0.012~0.15 | 6,800~11,400 | 200~450 | 22,700~45,500 | 200~1,800 | 11,400~34,100 | 200~1,350 | 11,400~18,200 | 200~400 |
| 1.5 | 0.008~0.17 | 6,400~10,600 | 200~450 | 21,200~42,500 | 200~1,800 | 10,600~31,800 | 200~1,350 | 10,600~17,000 | 200~400 |
| 1.6 | 0.012~0.2 | 6,000~10,000 | 200~450 | 19,900~39,800 | 200~1,800 | 10,000~29,900 | 200~1,350 | 10,000~15,900 | 200~400 |
| 1.8 | 0.02 ~0.22 | 5,300~ 8,800 | 200~350 | 17,700~35,400 | 200~1,400 | 8,800~26,500 | 200~1,050 | 8,800~14,200 | 200~400 |
| 2 | 0.03 ~0.25 | 4,800~ 8,000 | 200~350 | 15,900~31,800 | 200~1,400 | 8,000~23,900 | 200~1,050 | 8,000~12,700 | 200~400 |
| 2.5 | 0.08 ~0.25 | 3,800~ 6,400 | 150~250 | 12,700~25,500 | 150~1,000 | 6,400~19,100 | 150~ 750 | 6,400~10,200 | 150~300 |
| 3 | 0.09 ~0.25 | 3,200~ 5,300 | 130~250 | 10,600~21,200 | 130~1,000 | 5,300~15,900 | 130~ 750 | 5,300~ 8,500 | 130~260 |
| 3.5 | 0.09 ~0.25 | 2,700~ 4,500 | 110~220 | 9,100~18,200 | 110~ 900 | 4,500~13,600 | 110~ 650 | 4,500~ 7,300 | 110~220 |
| 4 | 0.1 ~0.25 | 2,400~ 4,000 | 100~200 | 8,000~15,900 | 100~ 800 | 4,000~11,900 | 100~ 600 | 4,000~ 6,400 | 100~200 |
| 5 | 0.18 ~0.25 | 1,900~ 3,200 | 80~200 | 6,400~12,700 | 80~ 800 | 3,200~ 9,600 | 80~ 600 | 3,200~ 5,100 | 80~160 |
| 備　考 Notes | | ※工具の有効長によって、切り込み量及び回転数・送り速度を調整してください。<br>※切削油は発煙性の少ないものを使用してください。<br>※往復切削をお奨めします。<br>※Adjust depth of cut, spindle speed and feed according to effective length.<br>※Use cutting fluid with smoke retardant.<br>※Recommend reciprocating cutting. | | | | | | | |

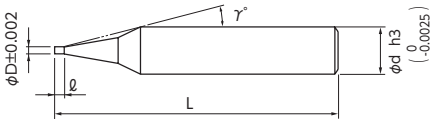


ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# NSME100

## 超微細加工用エンドミル “マイクロエッジ”

Micro End Mill “MICRO EDGE”




●超高精度仕様、刃径公差±2μm、シャンク公差 h3（真円度 0.1μm）。
●1 枚刃直刃タイプ、φ0.01 ～φ0.05 まで 5 アイテムを用意。
●Ultra-high-precision accuracy is guaranteed with ±2μm tolerance of flute diameter and h3 tolerance of shank diameter (circularity 0.1μm).
●One straight flute, 5 items from 0.01 to 0.05mm diameter.

Slot Face SMG 1 0°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | |
|---|---|---|---|---|
| | | | ～ 55HRC | 55HRC ～ |
| ○ | ○ | ○ | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| ○ | ○ | ◎ | ◎ | ◎ |

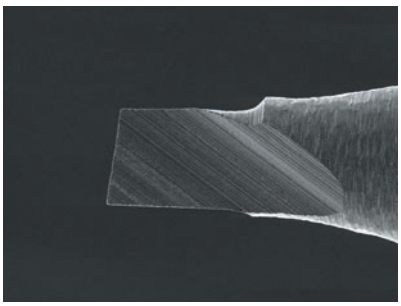
単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00001-00010 | 0.01 | 0.01 | 15° | 4 | 45 | 35,000 |
| 01-00001-00020 | 0.02 | 0.02 | 15° | 4 | 45 | 28,000 |
| 01-00001-00030 | 0.03 | 0.03 | 15° | 4 | 45 | 24,000 |
| 01-00001-00040 | 0.04 | 0.04 | 15° | 4 | 45 | 20,000 |
| 01-00001-00050 | 0.05 | 0.05 | 15° | 4 | 45 | 18,000 |

**オーダー方法**

NSME100 刃径(D)を指示してください。
When you order, indicate NSME100 (D).
※(γ)は参考値です。
※(γ) is reference value.

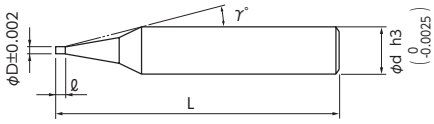
走査電子顕微鏡(SEM) 写真(600 倍)



# NSME230

## 超微細加工用エンドミル “マイクロエッジ”

Micro End Mill “MICRO EDGE”




●超高精度仕様、刃径公差±2μm、シャンク公差 h3（真円度 0.1μm）。
●2 枚刃 30°ネジレタイプ、φ0.03 ～φ0.09 まで 7 アイテムを用意。
●Ultra-high-precision accuracy is guaranteed with ±2μm tolerance of flute diameter and h3 tolerance of shank diameter (circularity 0.1μm).
●Two flutes in 30 deg. 7 items from 0.03 to 0.09mm diameter.

Slot Face SMG 2 30°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | |
|---|---|---|---|---|
| | | | ～ 55HRC | 55HRC ～ |
| ○ | ○ | ○ | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| ○ | ○ | ◎ | ◎ | ◎ |

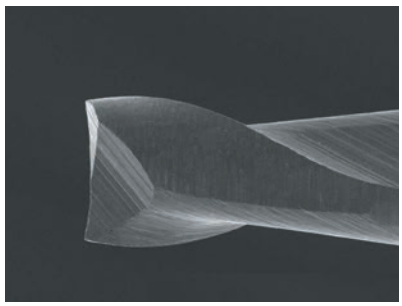
単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00002-00030 | 0.03 | 0.045 | 15° | 4 | 45 | 24,000 |
| 01-00002-00040 | 0.04 | 0.060 | 15° | 4 | 45 | 20,000 |
| 01-00002-00050 | 0.05 | 0.075 | 15° | 4 | 45 | 18,000 |
| 01-00002-00060 | 0.06 | 0.090 | 15° | 4 | 45 | 16,000 |
| 01-00002-00070 | 0.07 | 0.105 | 15° | 4 | 45 | 14,000 |
| 01-00002-00080 | 0.08 | 0.120 | 15° | 4 | 45 | 12,000 |
| 01-00002-00090 | 0.09 | 0.135 | 15° | 4 | 45 | 11,000 |

**オーダー方法**

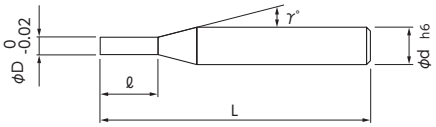
NSME230 刃径(D)を指示してください。
When you order, indicate NSME230 (D).
※(γ)は参考値です。
※(γ) is reference value.

走査電子顕微鏡(SEM) 写真(600 倍)



# NX-25

## リード25エンドミル
LEAD 25 End Mill




●刃長は刃径の等倍で 25° ネジレを採用。
●ネジレ角が弱い為、ワークの倒れを最小限に抑制。
●L/D=1 and helix angle 25°, Low helix angle minimize the milling deflection of work piece.

Slot Side Face MG 2 25°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00025-00050 | 0.5 | 0.5 | 9° | 4 | 40 | 6,500 ▌ |
| 01-00025-00060 | 0.6 | 0.6 | 9° | 4 | 40 | 6,500 ▌ |
| 01-00025-00070 | 0.7 | 0.7 | 9° | 4 | 40 | 6,000 ▌ |
| 01-00025-00080 | 0.8 | 0.8 | 9° | 4 | 40 | 6,000 ▌ |
| 01-00025-00090 | 0.9 | 0.9 | 9° | 4 | 40 | 6,000 ▌ |
| 01-00025-00100 | 1 | 1 | 9° | 4 | 40 | 4,200 |
| 01-00025-00110 | 1.1 | 1.1 | 9° | 4 | 40 | 4,900 ▌ |
| 01-00025-00120 | 1.2 | 1.2 | 9° | 4 | 40 | 4,900 ▌ |
| 01-00025-00130 | 1.3 | 1.3 | 9° | 4 | 40 | 4,900 ▌ |
| 01-00025-00140 | 1.4 | 1.4 | 9° | 4 | 40 | 4,900 ▌ |
| 01-00025-00150 | 1.5 | 1.5 | 9° | 4 | 40 | 4,200 |
| 01-00025-00160 | 1.6 | 1.6 | 9° | 4 | 40 | 4,900 ▌ |
| 01-00025-00170 | 1.7 | 1.7 | 9° | 4 | 40 | 4,900 ▌ |
| 01-00025-00180 | 1.8 | 1.8 | 9° | 4 | 40 | 4,900 ▌ |
| 01-00025-00190 | 1.9 | 1.9 | 9° | 4 | 40 | 4,900 ▌ |
| 01-00025-00200 | 2 | 2 | 9° | 4 | 40 | 4,200 |
| 01-00025-00210 | 2.1 | 2.1 | 9° | 4 | 40 | 4,900 ▌ |
| 01-00025-00220 | 2.2 | 2.2 | 9° | 4 | 40 | 4,900 ▌ |
| 01-00025-00230 | 2.3 | 2.3 | 9° | 4 | 40 | 4,900 ▌ |
| 01-00025-00240 | 2.4 | 2.4 | 9° | 4 | 40 | 4,900 ▌ |
| 01-00025-00250 | 2.5 | 2.5 | 9° | 4 | 40 | 4,200 |
| 01-00025-00260 | 2.6 | 2.6 | 9° | 6 | 40 | 6,400 ▌ |
| 01-00025-00270 | 2.7 | 2.7 | 9° | 6 | 40 | 6,400 ▌ |
| 01-00025-00280 | 2.8 | 2.8 | 9° | 6 | 40 | 6,400 ▌ |
| 01-00025-00290 | 2.9 | 2.9 | 9° | 6 | 40 | 6,400 ▌ |
| 01-00025-00300 | 3 | 3 | 9° | 6 | 40 | 5,400 |
| 01-00025-00310 | 3.1 | 3.1 | 9° | 6 | 40 | 7,000 ▌ |
| 01-00025-00320 | 3.2 | 3.2 | 9° | 6 | 40 | 7,000 ▌ |
| 01-00025-00330 | 3.3 | 3.3 | 9° | 6 | 40 | 7,000 ▌ |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00025-00340 | 3.4 | 3.4 | 9° | 6 | 40 | 7,000 ▌ |
| 01-00025-00350 | 3.5 | 3.5 | 9° | 6 | 40 | 7,000 ▌ |
| 01-00025-00360 | 3.6 | 3.6 | 9° | 6 | 40 | 7,000 ▌ |
| 01-00025-00370 | 3.7 | 3.7 | 9° | 6 | 40 | 7,000 ▌ |
| 01-00025-00380 | 3.8 | 3.8 | 9° | 6 | 40 | 7,000 ▌ |
| 01-00025-00390 | 3.9 | 3.9 | 9° | 6 | 40 | 7,000 ▌ |
| 01-00025-00400 | 4 | 4 | 9° | 6 | 40 | 5,800 |
| 01-00025-00410 | 4.1 | 4.1 | 9° | 6 | 45 | 7,400 ▌ |
| 01-00025-00420 | 4.2 | 4.2 | 9° | 6 | 45 | 7,400 ▌ |
| 01-00025-00430 | 4.3 | 4.3 | 9° | 6 | 45 | 7,400 ▌ |
| 01-00025-00440 | 4.4 | 4.4 | 9° | 6 | 45 | 7,400 ▌ |
| 01-00025-00450 | 4.5 | 4.5 | 9° | 6 | 45 | 7,400 ▌ |
| 01-00025-00460 | 4.6 | 4.6 | 9° | 6 | 45 | 7,400 ▌ |
| 01-00025-00470 | 4.7 | 4.7 | 9° | 6 | 45 | 7,400 ▌ |
| 01-00025-00480 | 4.8 | 4.8 | 9° | 6 | 45 | 7,400 ▌ |
| 01-00025-00490 | 4.9 | 4.9 | 9° | 6 | 45 | 7,400 ▌ |
| 01-00025-00500 | 5 | 5 | 9° | 6 | 45 | 6,100 |
| 01-00025-00510 | 5.1 | 5.1 | 9° | 6 | 50 | 8,200 ▌ |
| 01-00025-00520 | 5.2 | 5.2 | 9° | 6 | 50 | 8,200 ▌ |
| 01-00025-00530 | 5.3 | 5.3 | 9° | 6 | 50 | 8,200 ▌ |
| 01-00025-00540 | 5.4 | 5.4 | 9° | 6 | 50 | 8,200 ▌ |
| 01-00025-00550 | 5.5 | 5.5 | 9° | 6 | 50 | 8,200 ▌ |
| 01-00025-00560 | 5.6 | 5.6 | 9° | 6 | 50 | 8,200 ▌ |
| 01-00025-00570 | 5.7 | 5.7 | 9° | 6 | 50 | 8,200 ▌ |
| 01-00025-00580 | 5.8 | 5.8 | 9° | 6 | 50 | 8,200 ▌ |
| 01-00025-00590 | 5.9 | 5.9 | 9° | 6 | 50 | 8,200 ▌ |
| 01-00025-00600 | 6 | 6 | – | 6 | 50 | 6,400 |
| 01-00025-00610 | 6.1 | 6.1 | 9° | 8 | 55 | 13,500 ▌ |
| 01-00025-00620 | 6.2 | 6.2 | 9° | 8 | 55 | 13,500 ▌ |

**オーダー方法**
NX-25 刃径(D)を指示してください。
When you order, indicate NX-25 (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-108に記載
●Recommended Milling Conditions are shown on page D-108.
● ▌の規格・サイズは特定商社在庫となります。詳しくはお問い合わせください。
● ▌:Semi-standard item, please inquire for price and delivery.



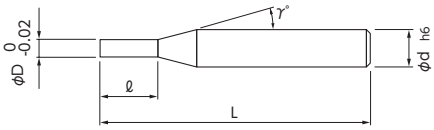
ŞEVKET ÖĞÜ® MAKINA TİCARET VE SAN. LTD. ŞTİ.

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00025-00630 | 6.3 | 6.3 | 9° | 8 | 55 | 13,500 |
| 01-00025-00640 | 6.4 | 6.4 | 9° | 8 | 55 | 13,500 |
| 01-00025-00650 | 6.5 | 6.5 | 9° | 8 | 55 | 13,500 |
| 01-00025-00660 | 6.6 | 6.6 | 9° | 8 | 55 | 13,500 |
| 01-00025-00670 | 6.7 | 6.7 | 9° | 8 | 55 | 13,500 |
| 01-00025-00680 | 6.8 | 6.8 | 9° | 8 | 55 | 13,500 |
| 01-00025-00690 | 6.9 | 6.9 | 9° | 8 | 55 | 13,500 |
| 01-00025-00700 | 7 | 7 | 9° | 8 | 55 | 13,500 |
| 01-00025-00710 | 7.1 | 7.1 | 9° | 8 | 55 | 13,500 |
| 01-00025-00720 | 7.2 | 7.2 | 9° | 8 | 55 | 13,500 |
| 01-00025-00730 | 7.3 | 7.3 | 9° | 8 | 55 | 13,500 |
| 01-00025-00740 | 7.4 | 7.4 | 9° | 8 | 55 | 13,500 |
| 01-00025-00750 | 7.5 | 7.5 | 9° | 8 | 55 | 13,500 |
| 01-00025-00760 | 7.6 | 7.6 | 9° | 8 | 55 | 13,500 |
| 01-00025-00770 | 7.7 | 7.7 | 9° | 8 | 55 | 13,500 |
| 01-00025-00780 | 7.8 | 7.8 | 9° | 8 | 55 | 13,500 |
| 01-00025-00790 | 7.9 | 7.9 | 9° | 8 | 55 | 13,500 |
| 01-00025-00800 | 8 | 8 | – | 8 | 55 | 10,100 |
| 01-00025-00810 | 8.1 | 8.1 | 9° | 10 | 65 | 16,500 |
| 01-00025-00820 | 8.2 | 8.2 | 9° | 10 | 65 | 16,500 |
| 01-00025-00830 | 8.3 | 8.3 | 9° | 10 | 65 | 16,500 |
| 01-00025-00840 | 8.4 | 8.4 | 9° | 10 | 65 | 16,500 |
| 01-00025-00850 | 8.5 | 8.5 | 9° | 10 | 65 | 16,500 |
| 01-00025-00860 | 8.6 | 8.6 | 9° | 10 | 65 | 16,500 |
| 01-00025-00870 | 8.7 | 8.7 | 9° | 10 | 65 | 16,500 |
| 01-00025-00880 | 8.8 | 8.8 | 9° | 10 | 65 | 16,500 |
| 01-00025-00890 | 8.9 | 8.9 | 9° | 10 | 65 | 16,500 |
| 01-00025-00900 | 9 | 9 | 9° | 10 | 65 | 16,500 |
| 01-00025-00910 | 9.1 | 9.1 | 9° | 10 | 65 | 16,500 |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00025-00920 | 9.2 | 9.2 | 9° | 10 | 65 | 16,500 |
| 01-00025-00930 | 9.3 | 9.3 | 9° | 10 | 65 | 16,500 |
| 01-00025-00940 | 9.4 | 9.4 | 9° | 10 | 65 | 16,500 |
| 01-00025-00950 | 9.5 | 9.5 | 9° | 10 | 65 | 16,500 |
| 01-00025-00960 | 9.6 | 9.6 | 9° | 10 | 65 | 16,500 |
| 01-00025-00970 | 9.7 | 9.7 | 9° | 10 | 65 | 16,500 |
| 01-00025-00980 | 9.8 | 9.8 | 9° | 10 | 65 | 16,500 |
| 01-00025-00990 | 9.9 | 9.9 | 9° | 10 | 65 | 16,500 |
| 01-00025-01000 | 10 | 10 | – | 10 | 65 | 12,300 |
| 01-00025-01010 | 10.1 | 10.1 | 9° | 12 | 70 | 22,400 |
| 01-00025-01020 | 10.2 | 10.2 | 9° | 12 | 70 | 22,400 |
| 01-00025-01030 | 10.3 | 10.3 | 9° | 12 | 70 | 22,400 |
| 01-00025-01040 | 10.4 | 10.4 | 9° | 12 | 70 | 22,400 |
| 01-00025-01050 | 10.5 | 10.5 | 9° | 12 | 70 | 22,400 |
| 01-00025-01060 | 10.6 | 10.6 | 9° | 12 | 70 | 22,400 |
| 01-00025-01070 | 10.7 | 10.7 | 9° | 12 | 70 | 22,400 |
| 01-00025-01080 | 10.8 | 10.8 | 9° | 12 | 70 | 22,400 |
| 01-00025-01090 | 10.9 | 10.9 | 9° | 12 | 70 | 22,400 |
| 01-00025-01100 | 11 | 11 | 9° | 12 | 70 | 22,400 |
| 01-00025-01110 | 11.1 | 11.1 | 9° | 12 | 70 | 22,400 |
| 01-00025-01120 | 11.2 | 11.2 | 9° | 12 | 70 | 22,400 |
| 01-00025-01130 | 11.3 | 11.3 | 9° | 12 | 70 | 22,400 |
| 01-00025-01140 | 11.4 | 11.4 | 9° | 12 | 70 | 22,400 |
| 01-00025-01150 | 11.5 | 11.5 | 9° | 12 | 70 | 22,400 |
| 01-00025-01160 | 11.6 | 11.6 | 9° | 12 | 70 | 22,400 |
| 01-00025-01170 | 11.7 | 11.7 | 9° | 12 | 70 | 22,400 |
| 01-00025-01180 | 11.8 | 11.8 | 9° | 12 | 70 | 22,400 |
| 01-00025-01190 | 11.9 | 11.9 | 9° | 12 | 70 | 22,400 |
| 01-00025-01200 | 12 | 12 | – | 12 | 70 | 18,900 |

# NX-30

## リード30エンドミル
LEAD 30 End Mill




●刃長は刃径の 2 倍で 30° ネジレを採用。
●荒から仕上げまで万能切削が可能。
●L/D=2 and helix angle 30° Standard type applicable from roughing to finishing process.

Slot Side Face MG 2 30°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00030-00050 | 0.5 | 1 | 9° | 4 | 40 | 7,000 ▮ |
| 01-00030-00060 | 0.6 | 1.2 | 9° | 4 | 40 | 7,000 ▮ |
| 01-00030-00070 | 0.7 | 1.4 | 9° | 4 | 40 | 6,400 ▮ |
| 01-00030-00080 | 0.8 | 1.6 | 9° | 4 | 40 | 6,400 ▮ |
| 01-00030-00090 | 0.9 | 1.8 | 9° | 4 | 40 | 6,400 ▮ |
| 01-00030-00100 | 1 | 2 | 9° | 4 | 40 | 3,300 |
| 01-00030-00110 | 1.1 | 2.2 | 9° | 4 | 40 | 5,400 ▮ |
| 01-00030-00120 | 1.2 | 2.4 | 9° | 4 | 40 | 5,400 ▮ |
| 01-00030-00130 | 1.3 | 2.6 | 9° | 4 | 40 | 5,400 ▮ |
| 01-00030-00140 | 1.4 | 2.8 | 9° | 4 | 40 | 5,400 ▮ |
| 01-00030-00150 | 1.5 | 3 | 9° | 4 | 40 | 3,300 |
| 01-00030-00160 | 1.6 | 3.2 | 9° | 4 | 40 | 5,400 ▮ |
| 01-00030-00170 | 1.7 | 3.4 | 9° | 4 | 40 | 5,400 ▮ |
| 01-00030-00180 | 1.8 | 3.6 | 9° | 4 | 40 | 5,400 ▮ |
| 01-00030-00190 | 1.9 | 3.8 | 9° | 4 | 40 | 5,400 ▮ |
| 01-00030-00200 | 2 | 4 | 9° | 4 | 40 | 3,300 |
| 01-00030-00210 | 2.1 | 4.2 | 9° | 4 | 40 | 5,400 ▮ |
| 01-00030-00220 | 2.2 | 4.4 | 9° | 4 | 40 | 5,400 ▮ |
| 01-00030-00230 | 2.3 | 4.6 | 9° | 4 | 40 | 5,400 ▮ |
| 01-00030-00240 | 2.4 | 4.8 | 9° | 4 | 40 | 5,400 ▮ |
| 01-00030-00250 | 2.5 | 5 | 9° | 4 | 40 | 3,300 |
| 01-00030-00260 | 2.6 | 5.2 | 9° | 6 | 45 | 6,700 ▮ |
| 01-00030-00270 | 2.7 | 5.4 | 9° | 6 | 45 | 6,700 ▮ |
| 01-00030-00280 | 2.8 | 5.6 | 9° | 6 | 45 | 6,700 ▮ |
| 01-00030-00290 | 2.9 | 5.8 | 9° | 6 | 45 | 6,700 ▮ |
| 01-00030-00300 | 3 | 6 | 9° | 6 | 45 | 4,300 |
| 01-00030-00310 | 3.1 | 6.2 | 9° | 6 | 45 | 7,200 ▮ |
| 01-00030-00320 | 3.2 | 6.4 | 9° | 6 | 45 | 7,200 ▮ |
| 01-00030-00330 | 3.3 | 6.6 | 9° | 6 | 45 | 7,200 ▮ |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00030-00340 | 3.4 | 6.8 | 9° | 6 | 45 | 7,200 ▮ |
| 01-00030-00350 | 3.5 | 7 | 9° | 6 | 45 | 7,200 ▮ |
| 01-00030-00360 | 3.6 | 7.2 | 9° | 6 | 45 | 7,200 ▮ |
| 01-00030-00370 | 3.7 | 7.4 | 9° | 6 | 45 | 7,200 ▮ |
| 01-00030-00380 | 3.8 | 7.6 | 9° | 6 | 45 | 7,200 ▮ |
| 01-00030-00390 | 3.9 | 7.8 | 9° | 6 | 45 | 7,200 ▮ |
| 01-00030-00400 | 4 | 8 | 9° | 6 | 45 | 4,600 |
| 01-00030-00410 | 4.1 | 8.2 | 9° | 6 | 50 | 7,500 ▮ |
| 01-00030-00420 | 4.2 | 8.4 | 9° | 6 | 50 | 7,500 ▮ |
| 01-00030-00430 | 4.3 | 8.6 | 9° | 6 | 50 | 7,500 ▮ |
| 01-00030-00440 | 4.4 | 8.8 | 9° | 6 | 50 | 7,500 ▮ |
| 01-00030-00450 | 4.5 | 9 | 9° | 6 | 50 | 7,500 ▮ |
| 01-00030-00460 | 4.6 | 9.2 | 9° | 6 | 50 | 7,500 ▮ |
| 01-00030-00470 | 4.7 | 9.4 | 9° | 6 | 50 | 7,500 ▮ |
| 01-00030-00480 | 4.8 | 9.6 | 9° | 6 | 50 | 7,500 ▮ |
| 01-00030-00490 | 4.9 | 9.8 | 9° | 6 | 50 | 7,500 ▮ |
| 01-00030-00500 | 5 | 10 | 9° | 6 | 50 | 4,800 |
| 01-00030-00510 | 5.1 | 10.2 | 9° | 6 | 50 | 7,800 ▮ |
| 01-00030-00520 | 5.2 | 10.4 | 9° | 6 | 50 | 7,800 ▮ |
| 01-00030-00530 | 5.3 | 10.6 | 9° | 6 | 50 | 7,800 ▮ |
| 01-00030-00540 | 5.4 | 10.8 | 9° | 6 | 50 | 7,800 ▮ |
| 01-00030-00550 | 5.5 | 11 | 9° | 6 | 50 | 7,800 ▮ |
| 01-00030-00560 | 5.6 | 11.2 | 9° | 6 | 50 | 7,800 ▮ |
| 01-00030-00570 | 5.7 | 11.4 | 9° | 6 | 50 | 7,800 ▮ |
| 01-00030-00580 | 5.8 | 11.6 | 9° | 6 | 50 | 7,800 ▮ |
| 01-00030-00590 | 5.9 | 11.8 | 9° | 6 | 50 | 7,800 ▮ |
| 01-00030-00600 | 6 | 12 | – | 6 | 50 | 5,000 |
| 01-00030-00610 | 6.1 | 12.2 | 9° | 8 | 60 | 14,100 ▮ |
| 01-00030-00620 | 6.2 | 12.4 | 9° | 8 | 60 | 14,100 ▮ |

**オーダー方法**
NX-30 刃径(D)を指示してください。
When you order, indicate NX-30 (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-109に記載
●Recommended Milling Conditions are shown on page D-109.
● ▮の規格・サイズは特定商社在庫となります。詳しくはお問い合わせください。
● ▮:Semi-standard item, please inquire for price and delivery.



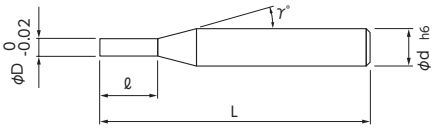
ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00030-00630 | 6.3 | 12.6 | 9° | 8 | 60 | 14,100 |
| 01-00030-00640 | 6.4 | 12.8 | 9° | 8 | 60 | 14,100 |
| 01-00030-00650 | 6.5 | 13 | 9° | 8 | 60 | 14,100 |
| 01-00030-00660 | 6.6 | 13.2 | 9° | 8 | 60 | 14,100 |
| 01-00030-00670 | 6.7 | 13.4 | 9° | 8 | 60 | 14,100 |
| 01-00030-00680 | 6.8 | 13.6 | 9° | 8 | 60 | 14,100 |
| 01-00030-00690 | 6.9 | 13.8 | 9° | 8 | 60 | 14,100 |
| 01-00030-00700 | 7 | 14 | 9° | 8 | 60 | 14,100 |
| 01-00030-00710 | 7.1 | 14.2 | 9° | 8 | 60 | 14,100 |
| 01-00030-00720 | 7.2 | 14.4 | 9° | 8 | 60 | 14,100 |
| 01-00030-00730 | 7.3 | 14.6 | 9° | 8 | 60 | 14,100 |
| 01-00030-00740 | 7.4 | 14.8 | 9° | 8 | 60 | 14,100 |
| 01-00030-00750 | 7.5 | 15 | 9° | 8 | 60 | 14,100 |
| 01-00030-00760 | 7.6 | 15.2 | 9° | 8 | 60 | 14,100 |
| 01-00030-00770 | 7.7 | 15.4 | 9° | 8 | 60 | 14,100 |
| 01-00030-00780 | 7.8 | 15.6 | 9° | 8 | 60 | 14,100 |
| 01-00030-00790 | 7.9 | 15.8 | 9° | 8 | 60 | 14,100 |
| 01-00030-00800 | 8 | 16 | – | 8 | 60 | 8,200 |
| 01-00030-00810 | 8.1 | 16.2 | 9° | 10 | 70 | 18,000 |
| 01-00030-00820 | 8.2 | 16.4 | 9° | 10 | 70 | 18,000 |
| 01-00030-00830 | 8.3 | 16.6 | 9° | 10 | 70 | 18,000 |
| 01-00030-00840 | 8.4 | 16.8 | 9° | 10 | 70 | 18,000 |
| 01-00030-00850 | 8.5 | 17 | 9° | 10 | 70 | 18,000 |
| 01-00030-00860 | 8.6 | 17.2 | 9° | 10 | 70 | 18,000 |
| 01-00030-00870 | 8.7 | 17.4 | 9° | 10 | 70 | 18,000 |
| 01-00030-00880 | 8.8 | 17.6 | 9° | 10 | 70 | 18,000 |
| 01-00030-00890 | 8.9 | 17.8 | 9° | 10 | 70 | 18,000 |
| 01-00030-00900 | 9 | 18 | 9° | 10 | 70 | 18,000 |
| 01-00030-00910 | 9.1 | 18.2 | 9° | 10 | 70 | 18,000 |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00030-00920 | 9.2 | 18.4 | 9° | 10 | 70 | 18,000 |
| 01-00030-00930 | 9.3 | 18.6 | 9° | 10 | 70 | 18,000 |
| 01-00030-00940 | 9.4 | 18.8 | 9° | 10 | 70 | 18,000 |
| 01-00030-00950 | 9.5 | 19 | 9° | 10 | 70 | 18,000 |
| 01-00030-00960 | 9.6 | 19.2 | 9° | 10 | 70 | 18,000 |
| 01-00030-00970 | 9.7 | 19.4 | 9° | 10 | 70 | 18,000 |
| 01-00030-00980 | 9.8 | 19.6 | 9° | 10 | 70 | 18,000 |
| 01-00030-00990 | 9.9 | 19.8 | 9° | 10 | 70 | 18,000 |
| 01-00030-01000 | 10 | 20 | – | 10 | 70 | 9,700 |
| 01-00030-01010 | 10.1 | 20.2 | 9° | 12 | 75 | 24,600 |
| 01-00030-01020 | 10.2 | 20.4 | 9° | 12 | 75 | 24,600 |
| 01-00030-01030 | 10.3 | 20.6 | 9° | 12 | 75 | 24,600 |
| 01-00030-01040 | 10.4 | 20.8 | 9° | 12 | 75 | 24,600 |
| 01-00030-01050 | 10.5 | 21 | 9° | 12 | 75 | 24,600 |
| 01-00030-01060 | 10.6 | 21.2 | 9° | 12 | 75 | 24,600 |
| 01-00030-01070 | 10.7 | 21.4 | 9° | 12 | 75 | 24,600 |
| 01-00030-01080 | 10.8 | 21.6 | 9° | 12 | 75 | 24,600 |
| 01-00030-01090 | 10.9 | 21.8 | 9° | 12 | 75 | 24,600 |
| 01-00030-01100 | 11 | 22 | 9° | 12 | 75 | 24,600 |
| 01-00030-01110 | 11.1 | 22.2 | 9° | 12 | 75 | 24,600 |
| 01-00030-01120 | 11.2 | 22.4 | 9° | 12 | 75 | 24,600 |
| 01-00030-01130 | 11.3 | 22.6 | 9° | 12 | 75 | 24,600 |
| 01-00030-01140 | 11.4 | 22.8 | 9° | 12 | 75 | 24,600 |
| 01-00030-01150 | 11.5 | 23 | 9° | 12 | 75 | 24,600 |
| 01-00030-01160 | 11.6 | 23.2 | 9° | 12 | 75 | 24,600 |
| 01-00030-01170 | 11.7 | 23.4 | 9° | 12 | 75 | 24,600 |
| 01-00030-01180 | 11.8 | 23.6 | 9° | 12 | 75 | 24,600 |
| 01-00030-01190 | 11.9 | 23.8 | 9° | 12 | 75 | 24,600 |
| 01-00030-01200 | 12 | 24 | – | 12 | 75 | 16,100 |

# NX-35

## リード35エンドミル
LEAD 35 End Mill




●刃長は刃径の 3 倍で 35° ネジレを採用。
●少し強めのネジレ角で標準ネジレに比べ、高能率加工が可能。
●L/D=3 and helix angle 35°, Higher efficient cutting is possible compared with standard helix angle.

Slot Side Face MG 2 35°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00035-00050 | 0.5 | 1.5 | 9° | 4 | 40 | 7,500 ▮ |
| 01-00035-00060 | 0.6 | 1.8 | 9° | 4 | 40 | 7,500 ▮ |
| 01-00035-00070 | 0.7 | 2.1 | 9° | 4 | 40 | 7,000 ▮ |
| 01-00035-00080 | 0.8 | 2.4 | 9° | 4 | 40 | 7,000 ▮ |
| 01-00035-00090 | 0.9 | 2.7 | 9° | 4 | 40 | 7,000 ▮ |
| 01-00035-00100 | 1 | 3 | 9° | 4 | 45 | 4,400 |
| 01-00035-00110 | 1.1 | 3.3 | 9° | 4 | 45 | 5,900 ▮ |
| 01-00035-00120 | 1.2 | 3.6 | 9° | 4 | 45 | 5,900 ▮ |
| 01-00035-00130 | 1.3 | 3.9 | 9° | 4 | 45 | 5,900 ▮ |
| 01-00035-00140 | 1.4 | 4.2 | 9° | 4 | 45 | 5,900 ▮ |
| 01-00035-00150 | 1.5 | 4.5 | 9° | 4 | 45 | 4,400 |
| 01-00035-00160 | 1.6 | 4.8 | 9° | 4 | 45 | 5,900 ▮ |
| 01-00035-00170 | 1.7 | 5.1 | 9° | 4 | 45 | 5,900 ▮ |
| 01-00035-00180 | 1.8 | 5.4 | 9° | 4 | 45 | 5,900 ▮ |
| 01-00035-00190 | 1.9 | 5.7 | 9° | 4 | 45 | 5,900 ▮ |
| 01-00035-00200 | 2 | 6 | 9° | 4 | 45 | 4,400 |
| 01-00035-00210 | 2.1 | 6.3 | 9° | 4 | 45 | 5,900 ▮ |
| 01-00035-00220 | 2.2 | 6.6 | 9° | 4 | 45 | 5,900 ▮ |
| 01-00035-00230 | 2.3 | 6.9 | 9° | 4 | 45 | 5,900 ▮ |
| 01-00035-00240 | 2.4 | 7.2 | 9° | 4 | 45 | 5,900 ▮ |
| 01-00035-00250 | 2.5 | 7.5 | 9° | 4 | 45 | 4,400 |
| 01-00035-00260 | 2.6 | 7.8 | 9° | 6 | 45 | 7,400 ▮ |
| 01-00035-00270 | 2.7 | 8.1 | 9° | 6 | 45 | 7,400 ▮ |
| 01-00035-00280 | 2.8 | 8.4 | 9° | 6 | 45 | 7,400 ▮ |
| 01-00035-00290 | 2.9 | 8.7 | 9° | 6 | 45 | 7,400 ▮ |
| 01-00035-00300 | 3 | 9 | 9° | 6 | 45 | 5,600 |
| 01-00035-00310 | 3.1 | 9.3 | 9° | 6 | 50 | 7,700 ▮ |
| 01-00035-00320 | 3.2 | 9.6 | 9° | 6 | 50 | 7,700 ▮ |
| 01-00035-00330 | 3.3 | 9.9 | 9° | 6 | 50 | 7,700 ▮ |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00035-00340 | 3.4 | 10.2 | 9° | 6 | 50 | 7,700 ▮ |
| 01-00035-00350 | 3.5 | 10.5 | 9° | 6 | 50 | 7,700 ▮ |
| 01-00035-00360 | 3.6 | 10.8 | 9° | 6 | 50 | 7,700 ▮ |
| 01-00035-00370 | 3.7 | 11.1 | 9° | 6 | 50 | 7,700 ▮ |
| 01-00035-00380 | 3.8 | 11.4 | 9° | 6 | 50 | 7,700 ▮ |
| 01-00035-00390 | 3.9 | 11.7 | 9° | 6 | 50 | 7,700 ▮ |
| 01-00035-00400 | 4 | 12 | 9° | 6 | 50 | 5,800 |
| 01-00035-00410 | 4.1 | 12.3 | 9° | 6 | 55 | 8,100 ▮ |
| 01-00035-00420 | 4.2 | 12.6 | 9° | 6 | 55 | 8,100 ▮ |
| 01-00035-00430 | 4.3 | 12.9 | 9° | 6 | 55 | 8,100 ▮ |
| 01-00035-00440 | 4.4 | 13.2 | 9° | 6 | 55 | 8,100 ▮ |
| 01-00035-00450 | 4.5 | 13.5 | 9° | 6 | 55 | 8,100 ▮ |
| 01-00035-00460 | 4.6 | 13.8 | 9° | 6 | 55 | 8,100 ▮ |
| 01-00035-00470 | 4.7 | 14.1 | 9° | 6 | 55 | 8,100 ▮ |
| 01-00035-00480 | 4.8 | 14.4 | 9° | 6 | 55 | 8,100 ▮ |
| 01-00035-00490 | 4.9 | 14.7 | 9° | 6 | 55 | 8,100 ▮ |
| 01-00035-00500 | 5 | 15 | 9° | 6 | 55 | 6,200 |
| 01-00035-00510 | 5.1 | 15.3 | 9° | 6 | 60 | 8,600 ▮ |
| 01-00035-00520 | 5.2 | 15.6 | 9° | 6 | 60 | 8,600 ▮ |
| 01-00035-00530 | 5.3 | 15.9 | 9° | 6 | 60 | 8,600 ▮ |
| 01-00035-00540 | 5.4 | 16.2 | 9° | 6 | 60 | 8,600 ▮ |
| 01-00035-00550 | 5.5 | 16.5 | 9° | 6 | 60 | 8,600 ▮ |
| 01-00035-00560 | 5.6 | 16.8 | 9° | 6 | 60 | 8,600 ▮ |
| 01-00035-00570 | 5.7 | 17.1 | 9° | 6 | 60 | 8,600 ▮ |
| 01-00035-00580 | 5.8 | 17.4 | 9° | 6 | 60 | 8,600 ▮ |
| 01-00035-00590 | 5.9 | 17.7 | 9° | 6 | 60 | 8,600 ▮ |
| 01-00035-00600 | 6 | 18 | – | 6 | 60 | 6,400 |
| 01-00035-00610 | 6.1 | 18.3 | 9° | 8 | 70 | 15,300 ▮ |
| 01-00035-00620 | 6.2 | 18.6 | 9° | 8 | 70 | 15,300 ▮ |

**オーダー方法**
NX-35 刃径(D)を指示してください。
When you order, indicate NX-35 (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-110に記載
●Recommended Milling Conditions are shown on page D-110.
● ▮の規格・サイズは特定商社在庫となります。詳しくはお問い合わせください。
● ▮:Semi-standard item, please inquire for price and delivery.



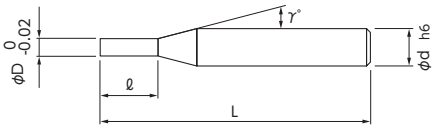
SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00035-00630 | 6.3 | 18.9 | 9° | 8 | 70 | 15,300 |
| 01-00035-00640 | 6.4 | 19.2 | 9° | 8 | 70 | 15,300 |
| 01-00035-00650 | 6.5 | 19.5 | 9° | 8 | 70 | 15,300 |
| 01-00035-00660 | 6.6 | 19.8 | 9° | 8 | 70 | 15,300 |
| 01-00035-00670 | 6.7 | 20.1 | 9° | 8 | 70 | 15,300 |
| 01-00035-00680 | 6.8 | 20.4 | 9° | 8 | 70 | 15,300 |
| 01-00035-00690 | 6.9 | 20.7 | 9° | 8 | 70 | 15,300 |
| 01-00035-00700 | 7 | 21 | 9° | 8 | 70 | 15,300 |
| 01-00035-00710 | 7.1 | 21.3 | 9° | 8 | 70 | 15,300 |
| 01-00035-00720 | 7.2 | 21.6 | 9° | 8 | 70 | 15,300 |
| 01-00035-00730 | 7.3 | 21.9 | 9° | 8 | 70 | 15,300 |
| 01-00035-00740 | 7.4 | 22.2 | 9° | 8 | 70 | 15,300 |
| 01-00035-00750 | 7.5 | 22.5 | 9° | 8 | 70 | 15,300 |
| 01-00035-00760 | 7.6 | 22.8 | 9° | 8 | 70 | 15,300 |
| 01-00035-00770 | 7.7 | 23.1 | 9° | 8 | 70 | 15,300 |
| 01-00035-00780 | 7.8 | 23.4 | 9° | 8 | 70 | 15,300 |
| 01-00035-00790 | 7.9 | 23.7 | 9° | 8 | 70 | 15,300 |
| 01-00035-00800 | 8 | 24 | – | 8 | 70 | 10,900 |
| 01-00035-00810 | 8.1 | 24.3 | 9° | 10 | 80 | 20,200 |
| 01-00035-00820 | 8.2 | 24.6 | 9° | 10 | 80 | 20,200 |
| 01-00035-00830 | 8.3 | 24.9 | 9° | 10 | 80 | 20,200 |
| 01-00035-00840 | 8.4 | 25.2 | 9° | 10 | 80 | 20,200 |
| 01-00035-00850 | 8.5 | 25.5 | 9° | 10 | 80 | 20,200 |
| 01-00035-00860 | 8.6 | 25.8 | 9° | 10 | 80 | 20,200 |
| 01-00035-00870 | 8.7 | 26.1 | 9° | 10 | 80 | 20,200 |
| 01-00035-00880 | 8.8 | 26.4 | 9° | 10 | 80 | 20,200 |
| 01-00035-00890 | 8.9 | 26.7 | 9° | 10 | 80 | 20,200 |
| 01-00035-00900 | 9 | 27 | 9° | 10 | 80 | 20,200 |
| 01-00035-00910 | 9.1 | 27.3 | 9° | 10 | 80 | 20,200 |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00035-00920 | 9.2 | 27.6 | 9° | 10 | 80 | 20,200 |
| 01-00035-00930 | 9.3 | 27.9 | 9° | 10 | 80 | 20,200 |
| 01-00035-00940 | 9.4 | 28.2 | 9° | 10 | 80 | 20,200 |
| 01-00035-00950 | 9.5 | 28.5 | 9° | 10 | 80 | 20,200 |
| 01-00035-00960 | 9.6 | 28.8 | 9° | 10 | 80 | 20,200 |
| 01-00035-00970 | 9.7 | 29.1 | 9° | 10 | 80 | 20,200 |
| 01-00035-00980 | 9.8 | 29.4 | 9° | 10 | 80 | 20,200 |
| 01-00035-00990 | 9.9 | 29.7 | 9° | 10 | 80 | 20,200 |
| 01-00035-01000 | 10 | 30 | – | 10 | 80 | 14,600 |
| 01-00035-01010 | 10.1 | 30.3 | 9° | 12 | 80 | 29,300 |
| 01-00035-01020 | 10.2 | 30.6 | 9° | 12 | 80 | 29,300 |
| 01-00035-01030 | 10.3 | 30.9 | 9° | 12 | 80 | 29,300 |
| 01-00035-01040 | 10.4 | 31.2 | 9° | 12 | 80 | 29,300 |
| 01-00035-01050 | 10.5 | 31.5 | 9° | 12 | 80 | 29,300 |
| 01-00035-01060 | 10.6 | 31.8 | 9° | 12 | 80 | 29,300 |
| 01-00035-01070 | 10.7 | 32.1 | 9° | 12 | 80 | 29,300 |
| 01-00035-01080 | 10.8 | 32.4 | 9° | 12 | 80 | 29,300 |
| 01-00035-01090 | 10.9 | 32.7 | 9° | 12 | 80 | 29,300 |
| 01-00035-01100 | 11 | 33 | 9° | 12 | 80 | 29,300 |
| 01-00035-01110 | 11.1 | 33.3 | 9° | 12 | 80 | 29,300 |
| 01-00035-01120 | 11.2 | 33.6 | 9° | 12 | 80 | 29,300 |
| 01-00035-01130 | 11.3 | 33.9 | 9° | 12 | 80 | 29,300 |
| 01-00035-01140 | 11.4 | 34.2 | 9° | 12 | 80 | 29,300 |
| 01-00035-01150 | 11.5 | 34.5 | 9° | 12 | 80 | 29,300 |
| 01-00035-01160 | 11.6 | 34.8 | 9° | 12 | 80 | 29,300 |
| 01-00035-01170 | 11.7 | 35.1 | 9° | 12 | 80 | 29,300 |
| 01-00035-01180 | 11.8 | 35.4 | 9° | 12 | 80 | 29,300 |
| 01-00035-01190 | 11.9 | 35.7 | 9° | 12 | 80 | 29,300 |
| 01-00035-01200 | 12 | 36 | – | 12 | 85 | 22,500 |

# NX-40

## リード40エンドミル
LEAD 40 End Mill




●刃長は刃径の 4 倍で 40° ネジレを採用。
●ネジレ角が強い為、切りくずの排出がスムーズ。
●L/D=4 and helix angle 40°, Chips are easily removed by high helix angle.

Side Face MG 2 40°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00040-00050 | 0.5 | 2 | 9° | 4 | 40 | 9,400 ▮ |
| 01-00040-00060 | 0.6 | 2.4 | 9° | 4 | 40 | 9,400 ▮ |
| 01-00040-00070 | 0.7 | 2.8 | 9° | 4 | 40 | 8,700 ▮ |
| 01-00040-00080 | 0.8 | 3.2 | 9° | 4 | 40 | 8,700 ▮ |
| 01-00040-00090 | 0.9 | 3.6 | 9° | 4 | 40 | 8,700 ▮ |
| 01-00040-00100 | 1 | 4 | 9° | 4 | 45 | 6,200 |
| 01-00040-00110 | 1.1 | 4.4 | 9° | 4 | 45 | 8,400 ▮ |
| 01-00040-00120 | 1.2 | 4.8 | 9° | 4 | 45 | 8,400 ▮ |
| 01-00040-00130 | 1.3 | 5.2 | 9° | 4 | 45 | 8,400 ▮ |
| 01-00040-00140 | 1.4 | 5.6 | 9° | 4 | 45 | 8,400 ▮ |
| 01-00040-00150 | 1.5 | 6 | 9° | 4 | 45 | 6,200 |
| 01-00040-00160 | 1.6 | 6.4 | 9° | 4 | 50 | 8,400 ▮ |
| 01-00040-00170 | 1.7 | 6.8 | 9° | 4 | 50 | 8,400 ▮ |
| 01-00040-00180 | 1.8 | 7.2 | 9° | 4 | 50 | 8,400 ▮ |
| 01-00040-00190 | 1.9 | 7.6 | 9° | 4 | 50 | 8,400 ▮ |
| 01-00040-00200 | 2 | 8 | 9° | 4 | 50 | 6,200 |
| 01-00040-00210 | 2.1 | 8.4 | 9° | 4 | 50 | 8,400 ▮ |
| 01-00040-00220 | 2.2 | 8.8 | 9° | 4 | 50 | 8,400 ▮ |
| 01-00040-00230 | 2.3 | 9.2 | 9° | 4 | 50 | 8,400 ▮ |
| 01-00040-00240 | 2.4 | 9.6 | 9° | 4 | 50 | 8,400 ▮ |
| 01-00040-00250 | 2.5 | 10 | 9° | 4 | 50 | 6,200 |
| 01-00040-00260 | 2.6 | 10.4 | 9° | 6 | 50 | 10,000 ▮ |
| 01-00040-00270 | 2.7 | 10.8 | 9° | 6 | 50 | 10,000 ▮ |
| 01-00040-00280 | 2.8 | 11.2 | 9° | 6 | 50 | 10,000 ▮ |
| 01-00040-00290 | 2.9 | 11.6 | 9° | 6 | 50 | 10,000 ▮ |
| 01-00040-00300 | 3 | 12 | 9° | 6 | 50 | 7,600 |
| 01-00040-00310 | 3.1 | 12.4 | 9° | 6 | 55 | 11,700 ▮ |
| 01-00040-00320 | 3.2 | 12.8 | 9° | 6 | 55 | 11,700 ▮ |
| 01-00040-00330 | 3.3 | 13.2 | 9° | 6 | 55 | 11,700 ▮ |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00040-00340 | 3.4 | 13.6 | 9° | 6 | 55 | 11,700 ▮ |
| 01-00040-00350 | 3.5 | 14 | 9° | 6 | 55 | 11,700 ▮ |
| 01-00040-00360 | 3.6 | 14.4 | 9° | 6 | 55 | 11,700 ▮ |
| 01-00040-00370 | 3.7 | 14.8 | 9° | 6 | 55 | 11,700 ▮ |
| 01-00040-00380 | 3.8 | 15.2 | 9° | 6 | 55 | 11,700 ▮ |
| 01-00040-00390 | 3.9 | 15.6 | 9° | 6 | 55 | 11,700 ▮ |
| 01-00040-00400 | 4 | 16 | 9° | 6 | 55 | 9,000 |
| 01-00040-00410 | 4.1 | 16.4 | 9° | 6 | 60 | 12,400 ▮ |
| 01-00040-00420 | 4.2 | 16.8 | 9° | 6 | 60 | 12,400 ▮ |
| 01-00040-00430 | 4.3 | 17.2 | 9° | 6 | 60 | 12,400 ▮ |
| 01-00040-00440 | 4.4 | 17.6 | 9° | 6 | 60 | 12,400 ▮ |
| 01-00040-00450 | 4.5 | 18 | 9° | 6 | 60 | 12,400 ▮ |
| 01-00040-00460 | 4.6 | 18.4 | 9° | 6 | 60 | 12,400 ▮ |
| 01-00040-00470 | 4.7 | 18.8 | 9° | 6 | 60 | 12,400 ▮ |
| 01-00040-00480 | 4.8 | 19.2 | 9° | 6 | 60 | 12,400 ▮ |
| 01-00040-00490 | 4.9 | 19.6 | 9° | 6 | 60 | 12,400 ▮ |
| 01-00040-00500 | 5 | 20 | 9° | 6 | 60 | 9,600 |
| 01-00040-00510 | 5.1 | 20.4 | 9° | 6 | 65 | 13,100 ▮ |
| 01-00040-00520 | 5.2 | 20.8 | 9° | 6 | 65 | 13,100 ▮ |
| 01-00040-00530 | 5.3 | 21.2 | 9° | 6 | 65 | 13,100 ▮ |
| 01-00040-00540 | 5.4 | 21.6 | 9° | 6 | 65 | 13,100 ▮ |
| 01-00040-00550 | 5.5 | 22 | 9° | 6 | 65 | 13,100 ▮ |
| 01-00040-00560 | 5.6 | 22.4 | 9° | 6 | 65 | 13,100 ▮ |
| 01-00040-00570 | 5.7 | 22.8 | 9° | 6 | 65 | 13,100 ▮ |
| 01-00040-00580 | 5.8 | 23.2 | 9° | 6 | 65 | 13,100 ▮ |
| 01-00040-00590 | 5.9 | 23.6 | 9° | 6 | 65 | 13,100 ▮ |
| 01-00040-00600 | 6 | 24 | – | 6 | 65 | 10,300 |
| 01-00040-00610 | 6.1 | 24.4 | 9° | 8 | 80 | 20,800 ▮ |
| 01-00040-00620 | 6.2 | 24.8 | 9° | 8 | 80 | 20,800 ▮ |

**オーダー方法** NX-40 刃径(D)を指示してください。
When you order, indicate NX-40 (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-111に記載
●Recommended Milling Conditions are shown on page D-111.
● ▮の規格・サイズは特定商社在庫となります。詳しくはお問い合わせください。
● ▮:Semi-standard item, please inquire for price and delivery.



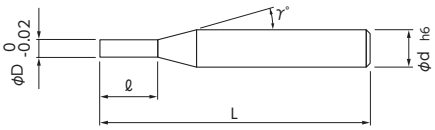
ŞEVKET ÖĞÜ® MAKINA TİCARET VE SAN. LTD. ŞTİ.

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00040-00630 | 6.3 | 25.2 | 9° | 8 | 80 | 20,800 |
| 01-00040-00640 | 6.4 | 25.6 | 9° | 8 | 80 | 20,800 |
| 01-00040-00650 | 6.5 | 26 | 9° | 8 | 80 | 20,800 |
| 01-00040-00660 | 6.6 | 26.4 | 9° | 8 | 80 | 20,800 |
| 01-00040-00670 | 6.7 | 26.8 | 9° | 8 | 80 | 20,800 |
| 01-00040-00680 | 6.8 | 27.2 | 9° | 8 | 80 | 20,800 |
| 01-00040-00690 | 6.9 | 27.6 | 9° | 8 | 80 | 20,800 |
| 01-00040-00700 | 7 | 28 | 9° | 8 | 80 | 20,800 |
| 01-00040-00710 | 7.1 | 28.4 | 9° | 8 | 80 | 20,800 |
| 01-00040-00720 | 7.2 | 28.8 | 9° | 8 | 80 | 20,800 |
| 01-00040-00730 | 7.3 | 29.2 | 9° | 8 | 80 | 20,800 |
| 01-00040-00740 | 7.4 | 29.6 | 9° | 8 | 80 | 20,800 |
| 01-00040-00750 | 7.5 | 30 | 9° | 8 | 80 | 20,800 |
| 01-00040-00760 | 7.6 | 30.4 | 9° | 8 | 80 | 20,800 |
| 01-00040-00770 | 7.7 | 30.8 | 9° | 8 | 80 | 20,800 |
| 01-00040-00780 | 7.8 | 31.2 | 9° | 8 | 80 | 20,800 |
| 01-00040-00790 | 7.9 | 31.6 | 9° | 8 | 80 | 20,800 |
| 01-00040-00800 | 8 | 32 | – | 8 | 80 | 14,800 |
| 01-00040-00810 | 8.1 | 32.4 | 9° | 10 | 100 | 30,100 |
| 01-00040-00820 | 8.2 | 32.8 | 9° | 10 | 100 | 30,100 |
| 01-00040-00830 | 8.3 | 33.2 | 9° | 10 | 100 | 30,100 |
| 01-00040-00840 | 8.4 | 33.6 | 9° | 10 | 100 | 30,100 |
| 01-00040-00850 | 8.5 | 34 | 9° | 10 | 100 | 30,100 |
| 01-00040-00860 | 8.6 | 34.4 | 9° | 10 | 100 | 30,100 |
| 01-00040-00870 | 8.7 | 34.8 | 9° | 10 | 100 | 30,100 |
| 01-00040-00880 | 8.8 | 35.2 | 9° | 10 | 100 | 30,100 |
| 01-00040-00890 | 8.9 | 35.6 | 9° | 10 | 100 | 30,100 |
| 01-00040-00900 | 9 | 36 | 9° | 10 | 100 | 30,100 |
| 01-00040-00910 | 9.1 | 36.4 | 9° | 10 | 100 | 30,100 |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00040-00920 | 9.2 | 36.8 | 9° | 10 | 100 | 30,100 |
| 01-00040-00930 | 9.3 | 37.2 | 9° | 10 | 100 | 30,100 |
| 01-00040-00940 | 9.4 | 37.6 | 9° | 10 | 100 | 30,100 |
| 01-00040-00950 | 9.5 | 38 | 9° | 10 | 100 | 30,100 |
| 01-00040-00960 | 9.6 | 38.4 | 9° | 10 | 100 | 30,100 |
| 01-00040-00970 | 9.7 | 38.8 | 9° | 10 | 100 | 30,100 |
| 01-00040-00980 | 9.8 | 39.2 | 9° | 10 | 100 | 30,100 |
| 01-00040-00990 | 9.9 | 39.6 | 9° | 10 | 100 | 30,100 |
| 01-00040-01000 | 10 | 40 | – | 10 | 100 | 20,900 |
| 01-00040-01010 | 10.1 | 40.4 | 9° | 12 | 105 | 40,500 |
| 01-00040-01020 | 10.2 | 40.8 | 9° | 12 | 105 | 40,500 |
| 01-00040-01030 | 10.3 | 41.2 | 9° | 12 | 105 | 40,500 |
| 01-00040-01040 | 10.4 | 41.6 | 9° | 12 | 105 | 40,500 |
| 01-00040-01050 | 10.5 | 42 | 9° | 12 | 105 | 40,500 |
| 01-00040-01060 | 10.6 | 42.4 | 9° | 12 | 105 | 40,500 |
| 01-00040-01070 | 10.7 | 42.8 | 9° | 12 | 105 | 40,500 |
| 01-00040-01080 | 10.8 | 43.2 | 9° | 12 | 105 | 40,500 |
| 01-00040-01090 | 10.9 | 43.6 | 9° | 12 | 105 | 40,500 |
| 01-00040-01100 | 11 | 44 | 9° | 12 | 105 | 40,500 |
| 01-00040-01110 | 11.1 | 44.4 | 9° | 12 | 105 | 40,500 |
| 01-00040-01120 | 11.2 | 44.8 | 9° | 12 | 105 | 40,500 |
| 01-00040-01130 | 11.3 | 45.2 | 9° | 12 | 105 | 40,500 |
| 01-00040-01140 | 11.4 | 45.6 | 9° | 12 | 105 | 40,500 |
| 01-00040-01150 | 11.5 | 46 | 9° | 12 | 105 | 40,500 |
| 01-00040-01160 | 11.6 | 46.4 | 9° | 12 | 105 | 40,500 |
| 01-00040-01170 | 11.7 | 46.8 | 9° | 12 | 105 | 40,500 |
| 01-00040-01180 | 11.8 | 47.2 | 9° | 12 | 105 | 40,500 |
| 01-00040-01190 | 11.9 | 47.6 | 9° | 12 | 105 | 40,500 |
| 01-00040-01200 | 12 | 48 | – | 12 | 105 | 30,600 |

# NX-45

## リード45エンドミル
LEAD 45 End Mill




●刃長は刃径の 5 倍で 45° ネジレを採用。
●深い側面切削も鋭い切れ味で加工可能。
●L/D=5 and helix angle 45 °, Deep side milling is available by sharp cutting edge.

Side Face MG 2 45°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00045-00050 | 0.5 | 2.5 | 9° | 4 | 40 | 13,900 ▌ |
| 01-00045-00060 | 0.6 | 3 | 9° | 4 | 40 | 13,900 ▌ |
| 01-00045-00070 | 0.7 | 3.5 | 9° | 4 | 40 | 12,600 ▌ |
| 01-00045-00080 | 0.8 | 4 | 9° | 4 | 40 | 12,600 ▌ |
| 01-00045-00090 | 0.9 | 4.5 | 9° | 4 | 40 | 12,600 ▌ |
| 01-00045-00100 | 1 | 5 | 9° | 4 | 45 | 8,800 |
| 01-00045-00110 | 1.1 | 5.5 | 9° | 4 | 50 | 12,100 ▌ |
| 01-00045-00120 | 1.2 | 6 | 9° | 4 | 50 | 12,100 ▌ |
| 01-00045-00130 | 1.3 | 6.5 | 9° | 4 | 50 | 12,100 ▌ |
| 01-00045-00140 | 1.4 | 7 | 9° | 4 | 50 | 12,100 ▌ |
| 01-00045-00150 | 1.5 | 7.5 | 9° | 4 | 50 | 9,500 |
| 01-00045-00160 | 1.6 | 8 | 9° | 4 | 50 | 12,800 ▌ |
| 01-00045-00170 | 1.7 | 8.5 | 9° | 4 | 50 | 12,800 ▌ |
| 01-00045-00180 | 1.8 | 9 | 9° | 4 | 50 | 12,800 ▌ |
| 01-00045-00190 | 1.9 | 9.5 | 9° | 4 | 50 | 12,800 ▌ |
| 01-00045-00200 | 2 | 10 | 9° | 4 | 50 | 10,000 |
| 01-00045-00210 | 2.1 | 10.5 | 9° | 4 | 50 | 13,400 ▌ |
| 01-00045-00220 | 2.2 | 11 | 9° | 4 | 50 | 13,400 ▌ |
| 01-00045-00230 | 2.3 | 11.5 | 9° | 4 | 50 | 13,400 ▌ |
| 01-00045-00240 | 2.4 | 12 | 9° | 4 | 50 | 13,400 ▌ |
| 01-00045-00250 | 2.5 | 12.5 | 9° | 4 | 50 | 11,000 |
| 01-00045-00260 | 2.6 | 13 | 9° | 6 | 55 | 14,500 ▌ |
| 01-00045-00270 | 2.7 | 13.5 | 9° | 6 | 55 | 14,500 ▌ |
| 01-00045-00280 | 2.8 | 14 | 9° | 6 | 55 | 14,500 ▌ |
| 01-00045-00290 | 2.9 | 14.5 | 9° | 6 | 55 | 14,500 ▌ |
| 01-00045-00300 | 3 | 15 | 9° | 6 | 55 | 11,200 |
| 01-00045-00310 | 3.1 | 15.5 | 9° | 6 | 60 | 15,300 ▌ |
| 01-00045-00320 | 3.2 | 16 | 9° | 6 | 60 | 15,300 ▌ |
| 01-00045-00330 | 3.3 | 16.5 | 9° | 6 | 60 | 15,300 ▌ |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00045-00340 | 3.4 | 17 | 9° | 6 | 60 | 15,300 ▌ |
| 01-00045-00350 | 3.5 | 17.5 | 9° | 6 | 60 | 15,300 ▌ |
| 01-00045-00360 | 3.6 | 18 | 9° | 6 | 60 | 15,300 ▌ |
| 01-00045-00370 | 3.7 | 18.5 | 9° | 6 | 60 | 15,300 ▌ |
| 01-00045-00380 | 3.8 | 19 | 9° | 6 | 60 | 15,300 ▌ |
| 01-00045-00390 | 3.9 | 19.5 | 9° | 6 | 60 | 15,300 ▌ |
| 01-00045-00400 | 4 | 20 | 9° | 6 | 60 | 12,300 |
| 01-00045-00410 | 4.1 | 20.5 | 9° | 6 | 65 | 16,000 ▌ |
| 01-00045-00420 | 4.2 | 21 | 9° | 6 | 65 | 16,000 ▌ |
| 01-00045-00430 | 4.3 | 21.5 | 9° | 6 | 65 | 16,000 ▌ |
| 01-00045-00440 | 4.4 | 22 | 9° | 6 | 65 | 16,000 ▌ |
| 01-00045-00450 | 4.5 | 22.5 | 9° | 6 | 65 | 16,000 ▌ |
| 01-00045-00460 | 4.6 | 23 | 9° | 6 | 65 | 16,000 ▌ |
| 01-00045-00470 | 4.7 | 23.5 | 9° | 6 | 65 | 16,000 ▌ |
| 01-00045-00480 | 4.8 | 24 | 9° | 6 | 65 | 16,000 ▌ |
| 01-00045-00490 | 4.9 | 24.5 | 9° | 6 | 65 | 16,000 ▌ |
| 01-00045-00500 | 5 | 25 | 9° | 6 | 65 | 13,000 |
| 01-00045-00510 | 5.1 | 25.5 | 9° | 6 | 75 | 16,900 ▌ |
| 01-00045-00520 | 5.2 | 26 | 9° | 6 | 75 | 16,900 ▌ |
| 01-00045-00530 | 5.3 | 26.5 | 9° | 6 | 75 | 16,900 ▌ |
| 01-00045-00540 | 5.4 | 27 | 9° | 6 | 75 | 16,900 ▌ |
| 01-00045-00550 | 5.5 | 27.5 | 9° | 6 | 75 | 16,900 ▌ |
| 01-00045-00560 | 5.6 | 28 | 9° | 6 | 75 | 16,900 ▌ |
| 01-00045-00570 | 5.7 | 28.5 | 9° | 6 | 75 | 16,900 ▌ |
| 01-00045-00580 | 5.8 | 29 | 9° | 6 | 75 | 16,900 ▌ |
| 01-00045-00590 | 5.9 | 29.5 | 9° | 6 | 75 | 16,900 ▌ |
| 01-00045-00600 | 6 | 30 | – | 6 | 75 | 13,400 |
| 01-00045-00610 | 6.1 | 30.5 | 9° | 8 | 90 | 28,100 ▌ |
| 01-00045-00620 | 6.2 | 31 | 9° | 8 | 90 | 28,100 ▌ |

**オーダー方法**
NX-45 刃径(D)を指示してください。
When you order, indicate NX-45 (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-112に記載
●Recommended Milling Conditions are shown on page D-112.
● ▌の規格・サイズは特定商社在庫となります。詳しくはお問い合わせください。
● ▌:Semi-standard item, please inquire for price and delivery.



ŞEVKET ÖĞÜ® MAKINA TİCARET VE SAN. LTD. ŞTİ.

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00045-00630 | 6.3 | 31.5 | 9° | 8 | 90 | 28,100 |
| 01-00045-00640 | 6.4 | 32 | 9° | 8 | 90 | 28,100 |
| 01-00045-00650 | 6.5 | 32.5 | 9° | 8 | 90 | 28,100 |
| 01-00045-00660 | 6.6 | 33 | 9° | 8 | 90 | 28,100 |
| 01-00045-00670 | 6.7 | 33.5 | 9° | 8 | 90 | 28,100 |
| 01-00045-00680 | 6.8 | 34 | 9° | 8 | 90 | 28,100 |
| 01-00045-00690 | 6.9 | 34.5 | 9° | 8 | 90 | 28,100 |
| 01-00045-00700 | 7 | 35 | 9° | 8 | 90 | 28,100 |
| 01-00045-00710 | 7.1 | 35.5 | 9° | 8 | 90 | 28,100 |
| 01-00045-00720 | 7.2 | 36 | 9° | 8 | 90 | 28,100 |
| 01-00045-00730 | 7.3 | 36.5 | 9° | 8 | 90 | 28,100 |
| 01-00045-00740 | 7.4 | 37 | 9° | 8 | 90 | 28,100 |
| 01-00045-00750 | 7.5 | 37.5 | 9° | 8 | 90 | 28,100 |
| 01-00045-00760 | 7.6 | 38 | 9° | 8 | 90 | 28,100 |
| 01-00045-00770 | 7.7 | 38.5 | 9° | 8 | 90 | 28,100 |
| 01-00045-00780 | 7.8 | 39 | 9° | 8 | 90 | 28,100 |
| 01-00045-00790 | 7.9 | 39.5 | 9° | 8 | 90 | 28,100 |
| 01-00045-00800 | 8 | 40 | – | 8 | 90 | 20,400 |
| 01-00045-00810 | 8.1 | 40.5 | 9° | 10 | 100 | 36,100 |
| 01-00045-00820 | 8.2 | 41 | 9° | 10 | 100 | 36,100 |
| 01-00045-00830 | 8.3 | 41.5 | 9° | 10 | 100 | 36,100 |
| 01-00045-00840 | 8.4 | 42 | 9° | 10 | 100 | 36,100 |
| 01-00045-00850 | 8.5 | 42.5 | 9° | 10 | 100 | 36,100 |
| 01-00045-00860 | 8.6 | 43 | 9° | 10 | 100 | 36,100 |
| 01-00045-00870 | 8.7 | 43.5 | 9° | 10 | 100 | 36,100 |
| 01-00045-00880 | 8.8 | 44 | 9° | 10 | 100 | 36,100 |
| 01-00045-00890 | 8.9 | 44.5 | 9° | 10 | 100 | 36,100 |
| 01-00045-00900 | 9 | 45 | 9° | 10 | 100 | 36,100 |
| 01-00045-00910 | 9.1 | 45.5 | 9° | 10 | 100 | 36,100 |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00045-00920 | 9.2 | 46 | 9° | 10 | 100 | 36,100 |
| 01-00045-00930 | 9.3 | 46.5 | 9° | 10 | 100 | 36,100 |
| 01-00045-00940 | 9.4 | 47 | 9° | 10 | 100 | 36,100 |
| 01-00045-00950 | 9.5 | 47.5 | 9° | 10 | 100 | 36,100 |
| 01-00045-00960 | 9.6 | 48 | 9° | 10 | 100 | 36,100 |
| 01-00045-00970 | 9.7 | 48.5 | 9° | 10 | 100 | 36,100 |
| 01-00045-00980 | 9.8 | 49 | 9° | 10 | 100 | 36,100 |
| 01-00045-00990 | 9.9 | 49.5 | 9° | 10 | 100 | 36,100 |
| 01-00045-01000 | 10 | 50 | – | 10 | 100 | 26,100 |
| 01-00045-01010 | 10.1 | 50.5 | 9° | 12 | 110 | 48,200 |
| 01-00045-01020 | 10.2 | 51 | 9° | 12 | 110 | 48,200 |
| 01-00045-01030 | 10.3 | 51.5 | 9° | 12 | 110 | 48,200 |
| 01-00045-01040 | 10.4 | 52 | 9° | 12 | 110 | 48,200 |
| 01-00045-01050 | 10.5 | 52.5 | 9° | 12 | 110 | 48,200 |
| 01-00045-01060 | 10.6 | 53 | 9° | 12 | 110 | 48,200 |
| 01-00045-01070 | 10.7 | 53.5 | 9° | 12 | 110 | 48,200 |
| 01-00045-01080 | 10.8 | 54 | 9° | 12 | 110 | 48,200 |
| 01-00045-01090 | 10.9 | 54.5 | 9° | 12 | 110 | 48,200 |
| 01-00045-01100 | 11 | 55 | 9° | 12 | 110 | 48,200 |
| 01-00045-01110 | 11.1 | 55.5 | 9° | 12 | 110 | 48,200 |
| 01-00045-01120 | 11.2 | 56 | 9° | 12 | 110 | 48,200 |
| 01-00045-01130 | 11.3 | 56.5 | 9° | 12 | 110 | 48,200 |
| 01-00045-01140 | 11.4 | 57 | 9° | 12 | 110 | 48,200 |
| 01-00045-01150 | 11.5 | 57.5 | 9° | 12 | 110 | 48,200 |
| 01-00045-01160 | 11.6 | 58 | 9° | 12 | 110 | 48,200 |
| 01-00045-01170 | 11.7 | 58.5 | 9° | 12 | 110 | 48,200 |
| 01-00045-01180 | 11.8 | 59 | 9° | 12 | 110 | 48,200 |
| 01-00045-01190 | 11.9 | 59.5 | 9° | 12 | 110 | 48,200 |
| 01-00045-01200 | 12 | 60 | – | 12 | 110 | 36,700 |

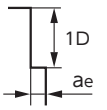
# NX-25

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM・SKD・SUS | | | 調質鋼 Prehardened Steels HPM・NAK | | | アルミニウム合金 Aluminum Alloy | | | 銅 Copper | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 40～50m/min | | | 35～45m/min | | | 25～35m/min | | | 100～200m/min | | | 60～80m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting |
| 1 | 14,300 | 140 | 70 | 12,700 | 100 | 35 | 9,500 | 80 | 40 | 47,700 | 570 | 200 | 22,300 | 270 | 95 |
| 1.5 | 9,500 | 140 | 70 | 8,500 | 100 | 35 | 6,400 | 80 | 40 | 31,800 | 640 | 220 | 14,900 | 300 | 100 |
| 2 | 7,200 | 140 | 70 | 6,400 | 120 | 40 | 4,800 | 90 | 45 | 23,900 | 720 | 250 | 11,100 | 330 | 120 |
| 2.5 | 5,700 | 170 | 85 | 5,100 | 120 | 45 | 3,800 | 95 | 50 | 19,100 | 760 | 270 | 8,900 | 360 | 120 |
| 3 | 4,800 | 190 | 95 | 4,200 | 130 | 45 | 3,200 | 100 | 50 | 15,900 | 800 | 270 | 7,400 | 370 | 130 |
| 4 | 3,600 | 220 | 110 | 3,200 | 130 | 45 | 2,400 | 100 | 50 | 11,900 | 830 | 270 | 5,600 | 390 | 130 |
| 5 | 2,900 | 230 | 120 | 2,500 | 150 | 50 | 1,900 | 130 | 65 | 9,500 | 860 | 280 | 4,500 | 410 | 130 |
| 6 | 2,400 | 240 | 120 | 2,100 | 170 | 55 | 1,600 | 140 | 70 | 8,000 | 880 | 290 | 3,700 | 410 | 130 |
| 8 | 1,800 | 220 | 110 | 1,600 | 160 | 50 | 1,200 | 130 | 65 | 6,000 | 780 | 260 | 2,800 | 360 | 120 |
| 10 | 1,400 | 200 | 100 | 1,300 | 160 | 50 | 1,000 | 130 | 65 | 4,800 | 720 | 240 | 2,200 | 330 | 110 |
| 12 | 1,200 | 190 | 95 | 1,100 | 150 | 50 | 800 | 120 | 60 | 4,000 | 680 | 220 | 1,900 | 320 | 110 |

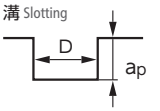
切り込み量 Depth of Cut

側面 Side Milling



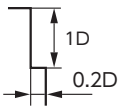

ae
$\phi$1～2.9=0.1D
$\phi$3～7.9=0.2D
$\phi$8～12=0.25D

溝 Slotting

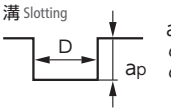



ap
$\phi$1～1.4=0.2D
$\phi$1.5～3.9=0.7D
$\phi$4～12=1D

側面 Side Milling




溝 Slotting




ap
$\phi$1～1.4=0.5D
$\phi$1.5～12=1D

(D:刃径 Dia.)

備考 Notes

※切削油を使用してください。
※回転数と送り速度は、同じ割合で調整してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。
※Use cutting fluid.
※Adjust both spindle speed and feed at the same rate.
※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.



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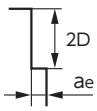
# NX-30

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM･SKD･SUS | | | 調質鋼 Prehardened Steels HPM･NAK | | | アルミニウム合金 Aluminum Alloy | | | 銅 Copper | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 40～50m/min | | | 35～45m/min | | | 25～35m/min | | | 100～200m/min | | | 60～80m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting |
| 1 | 14,300 | 140 | 70 | 12,700 | 100 | 35 | 9,500 | 80 | 40 | 47,700 | 570 | 200 | 22,300 | 270 | 95 |
| 1.5 | 9,500 | 140 | 70 | 8,500 | 100 | 35 | 6,400 | 80 | 40 | 31,800 | 640 | 220 | 14,900 | 300 | 100 |
| 2 | 7,200 | 140 | 70 | 6,400 | 120 | 40 | 4,800 | 90 | 45 | 23,900 | 720 | 250 | 11,100 | 330 | 120 |
| 2.5 | 5,700 | 170 | 85 | 5,100 | 120 | 40 | 3,800 | 95 | 50 | 19,100 | 760 | 270 | 8,900 | 360 | 120 |
| 3 | 4,800 | 190 | 95 | 4,200 | 130 | 45 | 3,200 | 100 | 50 | 15,900 | 800 | 270 | 7,400 | 370 | 130 |
| 4 | 3,600 | 220 | 110 | 3,200 | 130 | 45 | 2,400 | 100 | 50 | 11,900 | 830 | 270 | 5,600 | 390 | 130 |
| 5 | 2,900 | 230 | 120 | 2,500 | 150 | 50 | 1,900 | 130 | 65 | 9,500 | 860 | 280 | 4,500 | 410 | 130 |
| 6 | 2,400 | 240 | 120 | 2,100 | 170 | 55 | 1,600 | 140 | 70 | 8,000 | 880 | 290 | 3,700 | 410 | 130 |
| 8 | 1,800 | 220 | 110 | 1,600 | 160 | 50 | 1,200 | 130 | 65 | 6,000 | 780 | 260 | 2,800 | 360 | 120 |
| 10 | 1,400 | 200 | 100 | 1,300 | 160 | 50 | 1,000 | 130 | 65 | 4,800 | 720 | 240 | 2,200 | 330 | 110 |
| 12 | 1,200 | 190 | 95 | 1,100 | 150 | 50 | 800 | 120 | 60 | 4,000 | 680 | 220 | 1,900 | 320 | 110 |

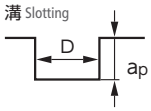
切り込み量 Depth of Cut

側面 Side Milling



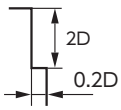

ae
φ1～2.9=0.07D
φ3～12=0.15D

溝 Slotting

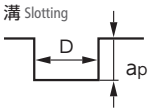



ap
φ1～1.4=0.15D
φ1.5～3.9=0.5D
φ4～12=0.75D

側面 Side Milling




溝 Slotting




ap
φ1～1.4=0.4D
φ1.5～12=0.75D

(D:刃径 Dia.)

備考 Notes

※切削油を使用してください。
※回転数と送り速度は、同じ割合で調整してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。
※Use cutting fluid.
※Adjust both spindle speed and feed at the same rate.
※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.

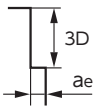
# NX-35

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM・SKD・SUS | | | 調質鋼 Prehardened Steels HPM・NAK | | | アルミニウム合金 Aluminum Alloy | | | 銅 Copper | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 35～45m/min | | | 30～40m/min | | | 20～30m/min | | | 70～150m/min | | | 55～75m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting |
| 1 | 12,700 | 130 | 65 | 11,100 | 90 | 30 | 8,000 | 65 | 30 | 38,200 | 460 | 160 | 20,700 | 250 | 90 |
| 1.5 | 8,500 | 130 | 65 | 7,400 | 90 | 30 | 5,300 | 65 | 30 | 25,500 | 510 | 180 | 13,800 | 280 | 100 |
| 2 | 6,400 | 130 | 65 | 5,600 | 100 | 35 | 4,000 | 75 | 40 | 19,100 | 570 | 200 | 10,300 | 310 | 110 |
| 2.5 | 5,100 | 150 | 75 | 4,500 | 110 | 40 | 3,200 | 80 | 40 | 15,300 | 610 | 210 | 8,300 | 330 | 120 |
| 3 | 4,200 | 170 | 85 | 3,700 | 110 | 40 | 2,700 | 85 | 40 | 12,700 | 640 | 220 | 6,900 | 350 | 120 |
| 4 | 3,200 | 190 | 95 | 2,800 | 110 | 40 | 2,000 | 85 | 40 | 9,500 | 670 | 220 | 5,200 | 360 | 120 |
| 5 | 2,500 | 200 | 100 | 2,200 | 130 | 45 | 1,600 | 110 | 50 | 7,600 | 680 | 230 | 4,100 | 370 | 120 |
| 6 | 2,100 | 210 | 110 | 1,900 | 150 | 50 | 1,300 | 110 | 60 | 6,400 | 700 | 230 | 3,400 | 370 | 120 |
| 8 | 1,600 | 190 | 95 | 1,400 | 140 | 45 | 1,000 | 110 | 55 | 4,800 | 620 | 210 | 2,600 | 340 | 110 |
| 10 | 1,300 | 180 | 90 | 1,100 | 130 | 40 | 800 | 100 | 50 | 3,800 | 570 | 190 | 2,100 | 320 | 100 |
| 12 | 1,100 | 180 | 90 | 900 | 130 | 40 | 700 | 100 | 50 | 3,200 | 540 | 180 | 1,700 | 290 | 95 |

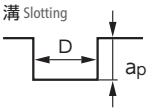
**切り込み量 Depth of Cut**

側面 Side Milling



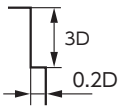

ae
$\phi$1～2.9=0.05D
$\phi$3～12=0.1D

溝 Slotting

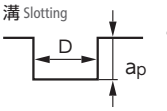



ap
$\phi$1～1.4=0.08D
$\phi$1.5～3.9=0.25D
$\phi$4～12=0.4D

側面 Side Milling




溝 Slotting




ap
$\phi$1～1.4=0.3D
$\phi$1.5～12=0.5D

(D:刃径 Dia.)

**備考 Notes**

※切削油を使用してください。
※回転数と送り速度は、同じ割合で調整してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。
※Use cutting fluid.
※Adjust both spindle speed and feed at the same rate.
※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.



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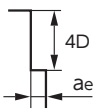
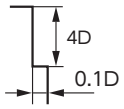
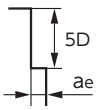
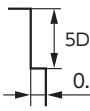
# NX-40

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM･SKD･SUS | | 調質鋼 Prehardened Steels HPM･NAK | | アルミニウム合金 Aluminum Alloy | | 銅 Copper | |
|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 20～30m/min | | 15～25m/min | | 15～20m/min | | 60～80m/min | | 20～40m/min | |
| 刃 径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 8,000 | 80 | 6,400 | 50 | 5,600 | 45 | 22,300 | 270 | 9,500 | 110 |
| 1.5 | 5,300 | 80 | 4,200 | 50 | 3,700 | 45 | 14,900 | 300 | 6,400 | 130 |
| 2 | 4,000 | 80 | 3,200 | 60 | 2,800 | 50 | 11,100 | 330 | 4,800 | 140 |
| 2.5 | 3,200 | 100 | 2,500 | 60 | 2,200 | 55 | 8,900 | 360 | 3,800 | 150 |
| 3 | 2,700 | 110 | 2,100 | 60 | 1,900 | 60 | 7,400 | 370 | 3,200 | 160 |
| 4 | 2,000 | 120 | 1,600 | 65 | 1,400 | 60 | 5,600 | 390 | 2,400 | 170 |
| 5 | 1,600 | 130 | 1,300 | 80 | 1,100 | 70 | 4,500 | 410 | 1,900 | 170 |
| 6 | 1,300 | 130 | 1,100 | 90 | 900 | 80 | 3,700 | 410 | 1,600 | 180 |
| 8 | 1,000 | 120 | 800 | 80 | 700 | 75 | 2,800 | 360 | 1,200 | 160 |
| 10 | 800 | 110 | 600 | 70 | 600 | 75 | 2,200 | 330 | 1,000 | 150 |
| 12 | 700 | 110 | 500 | 70 | 500 | 75 | 1,900 | 320 | 800 | 140 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   ae<br>φ1～2.9=0.04D<br>φ3～12=0.08D | | | | | | 側面 Side Milling   | | | |
| 備 考 Notes | ※切削油を使用してください。<br>※側面切削でのみ、使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。<br>※Use cutting fluid.<br>※It is available only for side milling.<br>※Adjust both spindle speed and feed at the same rate.<br>※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. | | | | | | | | | |

# NX-45

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM・SKD・SUS | | 調質鋼 Prehardened Steels HPM・NAK | | アルミニウム合金 Aluminum Alloy | | 銅 Copper | |
|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 15～25m/min | | 10～20m/min | | 10～15m/min | | 55～65m/min | | 15～35m/min | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 6,400 | 65 | 4,800 | 40 | 4,000 | 35 | 19,100 | 230 | 8,000 | 100 |
| 1.5 | 4,200 | 65 | 3,200 | 40 | 2,700 | 35 | 12,700 | 250 | 5,300 | 110 |
| 2 | 3,200 | 65 | 2,400 | 45 | 2,000 | 40 | 9,500 | 290 | 4,000 | 120 |
| 2.5 | 2,500 | 75 | 1,900 | 45 | 1,600 | 40 | 7,600 | 300 | 3,200 | 130 |
| 3 | 2,100 | 85 | 1,600 | 50 | 1,300 | 45 | 6,400 | 320 | 2,700 | 140 |
| 4 | 1,600 | 95 | 1,200 | 50 | 1,000 | 45 | 4,800 | 340 | 2,000 | 140 |
| 5 | 1,300 | 100 | 1,000 | 60 | 800 | 55 | 3,800 | 340 | 1,600 | 140 |
| 6 | 1,100 | 110 | 800 | 65 | 700 | 60 | 3,200 | 350 | 1,300 | 140 |
| 8 | 800 | 95 | 600 | 60 | 500 | 55 | 2,400 | 310 | 1,000 | 130 |
| 10 | 600 | 85 | 500 | 60 | 400 | 50 | 1,900 | 290 | 800 | 120 |
| 12 | 500 | 80 | 400 | 55 | 300 | 45 | 1,600 | 270 | 700 | 120 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   ae<br>φ1～2.9=0.03D<br>φ3～12=0.06D | | | | | | 側面 Side Milling   | | | |
| 備考 Notes | ※切削油を使用してください。<br>※側面切削でのみ、使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※切り込み量、機械剛性により条件が異なることがあります。その都度調整し使用してください。<br>※Use cutting fluid.<br>※It is available only for side milling.<br>※Adjust both spindle speed and feed at the same rate.<br>※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. | | | | | | | | | |



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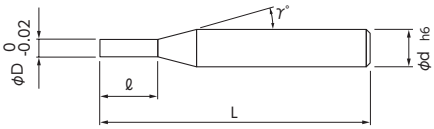
# NC-2

## チャンピオンソリッドエンドミル
CHAMPION SOLID 2-Flute End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00212-00050 | 0.5 | 1 | 9° | 3 | 35 | 7,000 ▌ |
| 01-00212-00060 | 0.6 | 1.2 | 9° | 3 | 35 | 7,000 ▌ |
| 01-00212-00070 | 0.7 | 1.4 | 9° | 3 | 35 | 7,000 ▌ |
| 01-00212-00080 | 0.8 | 1.6 | 9° | 3 | 35 | 7,000 ▌ |
| 01-00212-00090 | 0.9 | 1.8 | 9° | 3 | 35 | 7,000 ▌ |
| 01-00212-00100 | 1 | 2 | 9° | 4 | 45 | 5,900 ▌ |
| 01-00212-00110 | 1.1 | 2 | 9° | 4 | 45 | 6,000 ▌ |
| 01-00212-00120 | 1.2 | 2.5 | 9° | 4 | 45 | 6,000 ▌ |
| 01-00212-00130 | 1.3 | 2.5 | 9° | 4 | 45 | 6,000 ▌ |
| 01-00212-00140 | 1.4 | 3 | 9° | 4 | 45 | 6,000 ▌ |
| 01-00212-00150 | 1.5 | 3 | 9° | 4 | 45 | 6,000 ▌ |
| 01-00212-00160 | 1.6 | 3 | 9° | 4 | 45 | 6,000 ▌ |
| 01-00212-00170 | 1.7 | 4 | 9° | 4 | 45 | 6,000 ▌ |
| 01-00212-00180 | 1.8 | 4 | 9° | 4 | 45 | 6,000 ▌ |
| 01-00212-00190 | 1.9 | 4 | 9° | 4 | 45 | 6,000 ▌ |
| 01-00212-00200 | 2 | 4 | 9° | 4 | 45 | 6,000 ▌ |
| 01-00212-00250 | 2.5 | 5 | 9° | 4 | 45 | 6,000 ▌ |
| 01-00212-00300 | 3 | 6 | 9° | 6 | 45 | 6,400 ▌ |
| 01-00212-00350 | 3.5 | 7 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00212-00400 | 4 | 8 | 9° | 6 | 45 | 6,400 ▌ |

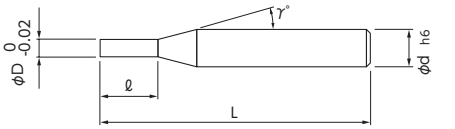
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00212-00450 | 4.5 | 9 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00212-00500 | 5 | 10 | 9° | 6 | 50 | 7,000 ▌ |
| 01-00212-00550 | 5.5 | 11 | 9° | 6 | 50 | 8,400 ▌ |
| 01-00212-00600 | 6 | 12 | – | 6 | 55 | 7,000 ▌ |
| ▲ 01-00212-00650 | 6.5 | 13 | – | 6 | 55 | 12,200 ▌ |
| ▲ 01-00212-00700 | 7 | 14 | 9° | 8 | 60 | 12,200 ▌ |
| ▲ 01-00212-00750 | 7.5 | 15 | 9° | 8 | 60 | 12,200 ▌ |
| ▲ 01-00212-00800 | 8 | 16 | – | 8 | 60 | 9,000 ▌ |
| ▲ 01-00212-00850 | 8.5 | 17 | – | 8 | 60 | 16,400 ▌ |
| ▲ 01-00212-00900 | 9 | 18 | 9° | 10 | 65 | 16,400 ▌ |
| ▲ 01-00212-00950 | 9.5 | 19 | 9° | 10 | 65 | 16,400 ▌ |
| ▲ 01-00212-01000 | 10 | 20 | – | 10 | 70 | 12,400 ▌ |
| ▲ 01-00212-01100 | 11 | 22 | 9° | 12 | 75 | 24,300 ▌ |
| ▲ 01-00212-01200 | 12 | 24 | – | 12 | 75 | 20,900 ▌ |
| ▲ 01-00212-01400 | 14 | 28 | – | 12 | 85 | 35,800 ▌ |
| ▲ 01-00212-01500 | 15 | 30 | 9° | 16 | 100 | 44,800 ▌ |
| ▲ 01-00212-01600 | 16 | 32 | – | 16 | 100 | 44,800 ▌ |
| ▲ 01-00212-01800 | 18 | 36 | 9° | 20 | 110 | 74,200 ▌ |
| ▲ 01-00212-02000 | 20 | 40 | – | 20 | 115 | 74,200 ▌ |

オーダー方法 NC-2 刃径(D)を指示してください。
When you order, indicate NC-2 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-116に記載
●Recommended Milling Conditions are shown on page D-116.

# NCM-2

## チャンピオンソリッドセミロング刃エンドミル
CHAMPION SOLID 2-Flute Medium End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
●▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

Slot Side Face MG 2 30°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ |

### ▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00232-00050 | 0.5 | 1.5 | 9° | 3 | 35 | 7,600 ▌ |
| 01-00232-00060 | 0.6 | 1.8 | 9° | 3 | 35 | 7,600 ▌ |
| 01-00232-00070 | 0.7 | 2.1 | 9° | 3 | 35 | 7,600 ▌ |
| 01-00232-00080 | 0.8 | 2.4 | 9° | 3 | 35 | 7,600 ▌ |
| 01-00232-00090 | 0.9 | 2.7 | 9° | 3 | 35 | 7,600 ▌ |
| 01-00232-00100 | 1 | 3 | 9° | 4 | 45 | 6,600 ▌ |
| 01-00232-00110 | 1.1 | 3.5 | 9° | 4 | 45 | 6,700 ▌ |
| 01-00232-00120 | 1.2 | 3.5 | 9° | 4 | 45 | 6,700 ▌ |
| 01-00232-00130 | 1.3 | 4 | 9° | 4 | 45 | 6,700 ▌ |
| 01-00232-00140 | 1.4 | 4.5 | 9° | 4 | 45 | 6,700 ▌ |
| 01-00232-00150 | 1.5 | 4.5 | 9° | 4 | 45 | 6,700 ▌ |
| 01-00232-00160 | 1.6 | 5 | 9° | 4 | 45 | 6,700 ▌ |
| 01-00232-00170 | 1.7 | 5 | 9° | 4 | 45 | 6,700 ▌ |
| 01-00232-00180 | 1.8 | 5.5 | 9° | 4 | 45 | 6,700 ▌ |
| 01-00232-00190 | 1.9 | 6 | 9° | 4 | 45 | 6,700 ▌ |
| 01-00232-00200 | 2 | 6 | 9° | 4 | 45 | 6,700 ▌ |
| 01-00232-00250 | 2.5 | 8 | 9° | 4 | 45 | 6,700 ▌ |
| 01-00232-00300 | 3 | 10 | 9° | 6 | 45 | 7,600 ▌ |
| 01-00232-00350 | 3.5 | 11 | 9° | 6 | 50 | 9,400 ▌ |
| 01-00232-00400 | 4 | 12 | 9° | 6 | 50 | 7,600 ▌ |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00232-00450 | 4.5 | 14 | 9° | 6 | 55 | 9,400 ▌ |
| 01-00232-00500 | 5 | 15 | 9° | 6 | 55 | 7,700 ▌ |
| 01-00232-00550 | 5.5 | 17 | 9° | 6 | 55 | 9,400 ▌ |
| 01-00232-00600 | 6 | 18 | – | 6 | 60 | 7,700 ▌ |
| ▲ 01-00232-00650 | 6.5 | 20 | – | 6 | 65 | 13,400 ▌ |
| ▲ 01-00232-00700 | 7 | 21 | 9° | 8 | 65 | 13,400 ▌ |
| ▲ 01-00232-00750 | 7.5 | 23 | 9° | 8 | 70 | 13,400 ▌ |
| ▲ 01-00232-00800 | 8 | 24 | – | 8 | 70 | 11,600 ▌ |
| ▲ 01-00232-00850 | 8.5 | 25 | – | 8 | 70 | 19,900 ▌ |
| ▲ 01-00232-00900 | 9 | 27 | 9° | 10 | 75 | 19,900 ▌ |
| ▲ 01-00232-00950 | 9.5 | 28 | 9° | 10 | 75 | 19,900 ▌ |
| ▲ 01-00232-01000 | 10 | 30 | – | 10 | 80 | 15,800 ▌ |
| ▲ 01-00232-01100 | 11 | 33 | 9° | 12 | 80 | 29,500 ▌ |
| ▲ 01-00232-01200 | 12 | 36 | – | 12 | 85 | 25,500 ▌ |
| ▲ 01-00232-01400 | 14 | 42 | – | 12 | 100 | 40,600 ▌ |
| ▲ 01-00232-01500 | 15 | 45 | 9° | 16 | 110 | 53,700 ▌ |
| ▲ 01-00232-01600 | 16 | 50 | – | 16 | 110 | 53,700 ▌ |
| ▲ 01-00232-01800 | 18 | 55 | 9° | 20 | 130 | 86,900 ▌ |
| ▲ 01-00232-02000 | 20 | 60 | – | 20 | 135 | 86,900 ▌ |

**オーダー方法** NCM-2 刃径(D)を指示してください。
When you order, indicate NCM-2 (D).

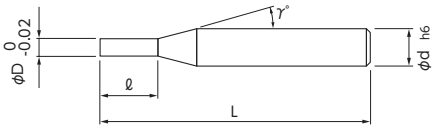
※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-117に記載
●Recommended Milling Conditions are shown on page D-117.



SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

# NCL-2

## チャンピオンソリッドロング刃エンドミル
CHAMPION SOLID 2-Flute Long End Mill

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詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

Side Face MG 2 30°

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ○ | ○ | ○ | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| ○ | | ◎ | ◎ | ◎ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

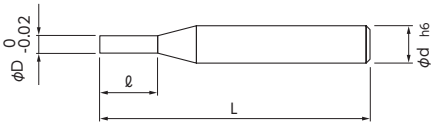
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00222-00100 | 1 | 4 | 9° | 4 | 45 | 7,800 ▌ |
| 01-00222-00150 | 1.5 | 6 | 9° | 4 | 45 | 7,800 ▌ |
| 01-00222-00200 | 2 | 10 | 9° | 4 | 50 | 10,300 ▌ |
| 01-00222-00250 | 2.5 | 12 | 9° | 4 | 50 | 11,400 ▌ |
| 01-00222-00300 | 3 | 18 | 9° | 6 | 60 | 13,000 ▌ |
| 01-00222-00400 | 4 | 22 | 9° | 6 | 60 | 13,000 ▌ |
| 01-00222-00500 | 5 | 25 | 9° | 6 | 65 | 14,200 ▌ |
| 01-00222-00600 | 6 | 25 | – | 6 | 65 | 15,300 ▌ |
| ▲ 01-00222-00800 | 8 | 35 | – | 8 | 80 | 22,200 ▌ |
| ▲ 01-00222-01000 | 10 | 42 | – | 10 | 100 | 32,000 ▌ |
| ▲ 01-00222-01200 | 12 | 45 | – | 12 | 100 | 41,700 ▌ |

**オーダー方法** NCL-2 刃径(D)を指示してください。
When you order, indicate NCL-2 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-118に記載
●Recommended Milling Conditions are shown on page D-118.

# NC-LS-2

## チャンピオンソリッドロングシャンクエンドミル
CHAMPION SOLID 2-Flute Long Shank End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

Side Face MG 2 30°

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ○ | ○ | ○ | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| ○ | | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|
| 01-00242-00100 | 1 | 2 | 4 | 100 | 8,300 ▌ |
| 01-00242-00150 | 1.5 | 3 | 4 | 100 | 8,300 ▌ |
| 01-00242-00200 | 2 | 4 | 4 | 100 | 8,300 ▌ |
| 01-00242-00250 | 2.5 | 5 | 4 | 100 | 8,300 ▌ |
| 01-00242-00300 | 3 | 6 | 6 | 120 | 10,000 ▌ |
| 01-00242-00400 | 4 | 8 | 6 | 120 | 10,000 ▌ |
| 01-00242-00500 | 5 | 10 | 6 | 130 | 10,700 ▌ |
| 01-00242-00600 | 6 | 12 | 6 | 130 | 10,700 ▌ |
| 01-00242-00700 | 7 | 14 | 8 | 140 | 18,100 ▌ |
| 01-00242-00800 | 8 | 16 | 8 | 140 | 15,700 ▌ |
| 01-00242-00900 | 9 | 18 | 10 | 150 | 22,500 ▌ |
| 01-00242-01000 | 10 | 20 | 10 | 150 | 19,400 ▌ |
| 01-00242-01100 | 11 | 22 | 12 | 170 | 31,400 ▌ |
| 01-00242-01200 | 12 | 24 | 12 | 170 | 30,000 ▌ |

**オーダー方法** NC-LS-2 刃径(D)を指示してください。
When you order, indicate NC-LS-2 (D).

※(γ)は参考値です。
※(γ) is reference value.

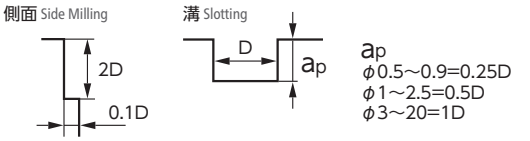
# NC-2

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM・SKD・SUS | | | 調質鋼 Prehardened Steels HPM・NAK | | | アルミニウム合金 Aluminum Alloy | | | 銅 Copper | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 40～50m/min | | | 35～45m/min | | | 25～35m/min | | | 60～100m/min | | | 40～80m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting |
| 0.5 | 28,700 | 130 | 60 | 25,500 | 100 | 50 | 19,100 | 90 | 45 | 50,000 | 250 | 100 | 38,200 | 180 | 80 |
| 0.8 | 17,900 | 130 | 60 | 15,900 | 100 | 50 | 11,900 | 90 | 45 | 50,000 | 250 | 100 | 23,900 | 180 | 80 |
| 1 | 14,300 | 150 | 60 | 12,700 | 100 | 50 | 9,600 | 90 | 45 | 25,500 | 300 | 120 | 19,100 | 220 | 100 |
| 1.5 | 9,600 | 150 | 60 | 8,500 | 100 | 50 | 6,400 | 90 | 45 | 17,000 | 300 | 120 | 12,700 | 220 | 100 |
| 2 | 7,200 | 150 | 60 | 6,400 | 100 | 50 | 4,800 | 90 | 45 | 12,700 | 300 | 120 | 9,600 | 220 | 100 |
| 3 | 4,800 | 180 | 70 | 4,200 | 130 | 55 | 3,200 | 100 | 50 | 8,500 | 350 | 150 | 6,400 | 250 | 110 |
| 4 | 3,600 | 180 | 70 | 3,200 | 130 | 55 | 2,400 | 100 | 50 | 6,400 | 350 | 150 | 4,800 | 250 | 110 |
| 5 | 2,900 | 200 | 80 | 2,500 | 150 | 60 | 1,900 | 120 | 55 | 5,100 | 400 | 180 | 3,800 | 300 | 130 |
| 6 | 2,400 | 200 | 80 | 2,100 | 150 | 60 | 1,600 | 120 | 55 | 4,200 | 400 | 180 | 3,200 | 300 | 130 |
| 7 | 2,000 | 200 | 80 | 1,800 | 150 | 60 | 1,400 | 120 | 55 | 3,600 | 400 | 180 | 2,700 | 300 | 130 |
| 8 | 1,800 | 200 | 80 | 1,600 | 150 | 60 | 1,200 | 120 | 55 | 3,200 | 400 | 180 | 2,400 | 300 | 130 |
| 9 | 1,600 | 200 | 80 | 1,400 | 150 | 60 | 1,100 | 120 | 55 | 2,800 | 400 | 180 | 2,100 | 300 | 130 |
| 10 | 1,400 | 200 | 80 | 1,300 | 150 | 60 | 1,000 | 120 | 55 | 2,500 | 400 | 180 | 1,900 | 300 | 130 |
| 11 | 1,300 | 200 | 80 | 1,200 | 150 | 60 | 870 | 120 | 55 | 2,300 | 400 | 180 | 1,700 | 300 | 130 |
| 12 | 1,200 | 200 | 80 | 1,100 | 150 | 60 | 800 | 120 | 55 | 2,100 | 400 | 180 | 1,600 | 300 | 130 |
| 14 | 1,020 | 200 | 80 | 910 | 150 | 60 | 680 | 120 | 55 | 1,800 | 400 | 180 | 1,400 | 300 | 130 |
| 15 | 960 | 200 | 80 | 850 | 150 | 60 | 640 | 120 | 55 | 1,700 | 400 | 180 | 1,300 | 300 | 130 |
| 16 | 900 | 200 | 80 | 800 | 150 | 60 | 600 | 120 | 55 | 1,600 | 400 | 180 | 1,200 | 300 | 130 |
| 18 | 800 | 200 | 80 | 710 | 150 | 60 | 530 | 120 | 55 | 1,400 | 400 | 180 | 1,100 | 300 | 130 |
| 20 | 720 | 200 | 80 | 640 | 150 | 60 | 480 | 120 | 55 | 1,300 | 400 | 180 | 1,000 | 300 | 130 |

切り込み量 Depth of Cut

(D:刃径 Dia.)




ap
φ0.5～0.9=0.25D
φ1～2.5=0.5D
φ3～20=1D

備考 Notes

※切削油を使用してください。
※回転数と送り速度は同じ割合で調整してください。
※Use cutting fluid.
※Adjust both spindle speed and feed at the same rate.



ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# NCM-2

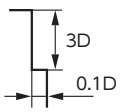
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM･SKD･SUS | | | 調質鋼 Prehardened Steels HPM･NAK | | | アルミニウム合金 Aluminum Alloy | | | 銅 Copper | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 40～50m/min | | | 35～45m/min | | | 25～35m/min | | | 60～100m/min | | | 40～80m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting |
| 0.5 | 28,700 | 130 | 50 | 25,500 | 90 | 40 | 19,100 | 80 | 35 | 50,000 | 200 | 80 | 38,200 | 150 | 60 |
| 0.8 | 17,900 | 130 | 50 | 15,900 | 90 | 40 | 11,900 | 80 | 35 | 50,000 | 200 | 80 | 23,900 | 150 | 60 |
| 1 | 14,300 | 130 | 50 | 12,700 | 90 | 40 | 9,600 | 80 | 35 | 25,500 | 250 | 100 | 19,100 | 180 | 80 |
| 1.5 | 9,600 | 130 | 50 | 8,500 | 90 | 40 | 6,400 | 80 | 35 | 17,000 | 250 | 100 | 12,700 | 180 | 80 |
| 2 | 7,200 | 130 | 50 | 6,400 | 90 | 40 | 4,800 | 80 | 35 | 12,700 | 250 | 100 | 9,600 | 180 | 80 |
| 3 | 4,800 | 150 | 60 | 4,200 | 120 | 50 | 3,200 | 90 | 40 | 8,500 | 250 | 100 | 6,400 | 180 | 80 |
| 4 | 3,600 | 150 | 60 | 3,200 | 120 | 50 | 2,400 | 90 | 40 | 6,400 | 300 | 130 | 4,800 | 220 | 100 |
| 5 | 2,900 | 170 | 70 | 2,500 | 140 | 55 | 1,900 | 110 | 45 | 5,100 | 300 | 130 | 3,800 | 220 | 100 |
| 6 | 2,400 | 170 | 70 | 2,100 | 140 | 55 | 1,600 | 110 | 45 | 4,200 | 350 | 150 | 3,200 | 250 | 120 |
| 7 | 2,000 | 170 | 70 | 1,800 | 140 | 55 | 1,400 | 110 | 45 | 3,600 | 350 | 150 | 2,700 | 250 | 120 |
| 8 | 1,800 | 170 | 70 | 1,600 | 140 | 55 | 1,200 | 110 | 45 | 3,200 | 350 | 150 | 2,400 | 250 | 120 |
| 9 | 1,600 | 170 | 70 | 1,400 | 140 | 55 | 1,100 | 110 | 45 | 2,800 | 350 | 150 | 2,100 | 250 | 120 |
| 10 | 1,400 | 170 | 70 | 1,300 | 140 | 55 | 1,000 | 110 | 45 | 2,500 | 350 | 150 | 1,900 | 250 | 120 |
| 11 | 1,300 | 170 | 70 | 1,200 | 140 | 55 | 900 | 110 | 45 | 2,300 | 350 | 150 | 1,700 | 250 | 120 |
| 12 | 1,200 | 170 | 70 | 1,100 | 140 | 55 | 800 | 110 | 45 | 2,100 | 350 | 150 | 1,600 | 250 | 120 |
| 14 | 1,020 | 170 | 70 | 910 | 140 | 55 | 680 | 110 | 45 | 1,800 | 350 | 150 | 1,400 | 250 | 120 |
| 15 | 960 | 170 | 70 | 850 | 140 | 55 | 640 | 110 | 45 | 1,700 | 350 | 150 | 1,300 | 250 | 120 |
| 16 | 900 | 170 | 70 | 800 | 140 | 55 | 600 | 110 | 45 | 1,600 | 350 | 150 | 1,200 | 250 | 120 |
| 18 | 800 | 170 | 70 | 710 | 140 | 55 | 530 | 110 | 45 | 1,400 | 350 | 150 | 1,100 | 250 | 120 |
| 20 | 720 | 170 | 70 | 640 | 140 | 55 | 480 | 110 | 45 | 1,300 | 350 | 150 | 1,000 | 250 | 120 |

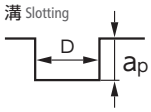
切り込み量 Depth of Cut

(D:刃径 Dia.)

側面 Side Milling




溝 Slotting



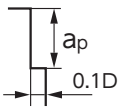

ap
φ0.5～0.9=0.25D
φ1～2.5=0.5D
φ3～20=1D

備考 Notes

※切削油を使用してください。
※回転数と送り速度は同じ割合で調整してください。
※Use cutting fluid.
※Adjust both spindle speed and feed at the same rate.

# NCL-2

## 切削条件参考表 Recommended Milling Conditions

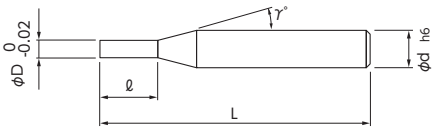
| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM・SKD・SUS | | 調質鋼 Prehardened Steels HPM・NAK | | アルミニウム合金 Aluminum Alloy | | 銅 Copper | |
|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 20～30m/min | | 15～25m/min | | 15～20m/min | | 50～70m/min | | 40～60m/min | |
| 刃 径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 8,000 | 100 | 6,400 | 85 | 5,600 | 60 | 19,100 | 200 | 15,900 | 150 |
| 1.5 | 5,300 | 100 | 4,200 | 85 | 3,700 | 60 | 12,700 | 200 | 10,600 | 150 |
| 2 | 4,000 | 100 | 3,200 | 85 | 2,800 | 60 | 9,600 | 200 | 8,000 | 150 |
| 2.5 | 3,200 | 100 | 2,500 | 85 | 2,200 | 60 | 7,600 | 200 | 6,400 | 170 |
| 3 | 2,700 | 110 | 2,100 | 90 | 1,900 | 65 | 6,400 | 220 | 5,300 | 170 |
| 4 | 2,000 | 110 | 1,600 | 90 | 1,400 | 65 | 4,800 | 220 | 4,000 | 170 |
| 5 | 1,600 | 120 | 1,300 | 95 | 1,100 | 70 | 3,800 | 250 | 3,200 | 200 |
| 6 | 1,300 | 120 | 1,100 | 95 | 930 | 70 | 3,200 | 250 | 2,700 | 200 |
| 8 | 1,000 | 120 | 800 | 95 | 700 | 70 | 2,400 | 250 | 2,000 | 200 |
| 10 | 800 | 120 | 640 | 95 | 560 | 70 | 1,900 | 250 | 1,600 | 200 |
| 12 | 660 | 120 | 530 | 95 | 460 | 70 | 1,600 | 250 | 1,300 | 200 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   ap<br>φ1～10=4D<br>φ12=45mm | | | | | | | | | |
| 備 考 Notes | ※切削油を使用してください。<br>※回転数と送り速度は同じ割合で調整してください。<br>※Use cutting fluid.<br>※Adjust both spindle speed and feed at the same rate. | | | | | | | | | |



ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# NC-4

## チャンピオンソリッドエンドミル
CHAMPION SOLID 4-Flute End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

Side Face MG 4 30°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00244-00100 | 1 | 2 | 9° | 4 | 45 | 7,700 ▌ |
| 01-00244-00110 | 1.1 | 2.2 | 9° | 4 | 45 | 10,700 ▌ |
| 01-00244-00120 | 1.2 | 2.4 | 9° | 4 | 45 | 10,700 ▌ |
| 01-00244-00130 | 1.3 | 2.6 | 9° | 4 | 45 | 10,700 ▌ |
| 01-00244-00140 | 1.4 | 2.8 | 9° | 4 | 45 | 10,700 ▌ |
| 01-00244-00150 | 1.5 | 3 | 9° | 4 | 45 | 7,700 ▌ |
| 01-00244-00160 | 1.6 | 3.2 | 9° | 4 | 45 | 10,700 ▌ |
| 01-00244-00170 | 1.7 | 3.4 | 9° | 4 | 45 | 10,700 ▌ |
| 01-00244-00180 | 1.8 | 3.6 | 9° | 4 | 45 | 10,700 ▌ |
| 01-00244-00190 | 1.9 | 3.8 | 9° | 4 | 45 | 10,700 ▌ |
| 01-00244-00200 | 2 | 4 | 9° | 4 | 45 | 6,000 ▌ |
| 01-00244-00210 | 2.1 | 4.2 | 9° | 4 | 45 | 7,700 ▌ |
| 01-00244-00220 | 2.2 | 4.4 | 9° | 4 | 45 | 7,700 ▌ |
| 01-00244-00230 | 2.3 | 4.6 | 9° | 4 | 45 | 7,700 ▌ |
| 01-00244-00240 | 2.4 | 4.8 | 9° | 4 | 45 | 7,700 ▌ |
| 01-00244-00250 | 2.5 | 5 | 9° | 4 | 45 | 6,000 ▌ |
| 01-00244-00260 | 2.6 | 5.2 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00244-00270 | 2.7 | 5.4 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00244-00280 | 2.8 | 5.6 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00244-00290 | 2.9 | 5.8 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00244-00300 | 3 | 6 | 9° | 6 | 45 | 6,400 ▌ |
| 01-00244-00310 | 3.1 | 6.2 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00244-00320 | 3.2 | 6.4 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00244-00330 | 3.3 | 6.6 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00244-00340 | 3.4 | 6.8 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00244-00350 | 3.5 | 7 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00244-00360 | 3.6 | 7.2 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00244-00370 | 3.7 | 7.4 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00244-00380 | 3.8 | 7.6 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00244-00390 | 3.9 | 7.8 | 9° | 6 | 45 | 8,000 ▌ |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00244-00400 | 4 | 8 | 9° | 6 | 45 | 6,400 ▌ |
| 01-00244-00410 | 4.1 | 8.2 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00244-00420 | 4.2 | 8.4 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00244-00430 | 4.3 | 8.6 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00244-00440 | 4.4 | 8.8 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00244-00450 | 4.5 | 9 | 9° | 6 | 45 | 8,000 ▌ |
| 01-00244-00460 | 4.6 | 9.2 | 9° | 6 | 50 | 8,500 ▌ |
| 01-00244-00470 | 4.7 | 9.4 | 9° | 6 | 50 | 8,500 ▌ |
| 01-00244-00480 | 4.8 | 9.6 | 9° | 6 | 50 | 8,500 ▌ |
| 01-00244-00490 | 4.9 | 9.8 | 9° | 6 | 50 | 8,500 ▌ |
| 01-00244-00500 | 5 | 10 | 9° | 6 | 50 | 7,000 ▌ |
| 01-00244-00510 | 5.1 | 10.2 | 9° | 6 | 50 | 8,500 ▌ |
| 01-00244-00520 | 5.2 | 10.4 | 9° | 6 | 50 | 8,500 ▌ |
| 01-00244-00530 | 5.3 | 10.6 | 9° | 6 | 50 | 8,500 ▌ |
| 01-00244-00540 | 5.4 | 10.8 | 9° | 6 | 50 | 8,500 ▌ |
| 01-00244-00550 | 5.5 | 11 | 9° | 6 | 50 | 8,400 ▌ |
| 01-00244-00560 | 5.6 | 11.2 | 9° | 6 | 55 | 9,000 ▌ |
| 01-00244-00570 | 5.7 | 11.4 | 9° | 6 | 55 | 9,000 ▌ |
| 01-00244-00580 | 5.8 | 11.6 | 9° | 6 | 55 | 9,000 ▌ |
| 01-00244-00590 | 5.9 | 11.8 | 9° | 6 | 55 | 9,000 ▌ |
| 01-00244-00600 | 6 | 12 | – | 6 | 55 | 7,000 ▌ |
| 01-00244-00610 | 6.1 | 12.2 | – | 6 | 55 | 12,100 ▌ |
| 01-00244-00620 | 6.2 | 12.4 | – | 6 | 55 | 12,100 ▌ |
| 01-00244-00630 | 6.3 | 12.6 | – | 6 | 55 | 12,100 ▌ |
| 01-00244-00640 | 6.4 | 12.8 | – | 6 | 55 | 12,100 ▌ |
| 01-00244-00650 | 6.5 | 13 | – | 6 | 55 | 13,500 ▌ |
| 01-00244-00660 | 6.6 | 13.2 | 9° | 8 | 60 | 16,500 ▌ |
| 01-00244-00670 | 6.7 | 13.4 | 9° | 8 | 60 | 16,500 ▌ |
| 01-00244-00680 | 6.8 | 13.6 | 9° | 8 | 60 | 16,500 ▌ |
| 01-00244-00690 | 6.9 | 13.8 | 9° | 8 | 60 | 16,500 ▌ |

**オーダー方法**
NC-4 刃径(D)を指示してください。
When you order, indicate NC-4 (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-122に記載
●Recommended Milling Conditions are shown on page D-122.

# NC-4

## チャンピオンソリッドエンドミル
CHAMPION SOLID 4-Flute End Mill

●▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
●▲の規格は在庫が無くなり次第、販売終了となります。
●▌: Semi-standard item, please inquire for price and delivery.
●▲: The sizes will no longer be capable being sold after the stock runs out.

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00244-00700 | 7 | 14 | 9° | 8 | 60 | 13,500 ▌ |
| 01-00244-00710 | 7.1 | 14.2 | 9° | 8 | 60 | 16,500 ▌ |
| 01-00244-00720 | 7.2 | 14.4 | 9° | 8 | 60 | 16,500 ▌ |
| 01-00244-00730 | 7.3 | 14.6 | 9° | 8 | 60 | 16,500 ▌ |
| 01-00244-00740 | 7.4 | 14.8 | 9° | 8 | 60 | 16,500 ▌ |
| 01-00244-00750 | 7.5 | 15 | 9° | 8 | 60 | 13,500 ▌ |
| 01-00244-00760 | 7.6 | 15.2 | 9° | 8 | 60 | 16,500 ▌ |
| 01-00244-00770 | 7.7 | 15.4 | 9° | 8 | 60 | 16,500 ▌ |
| 01-00244-00780 | 7.8 | 15.6 | 9° | 8 | 60 | 16,500 ▌ |
| 01-00244-00790 | 7.9 | 15.8 | 9° | 8 | 60 | 16,500 ▌ |
| 01-00244-00800 | 8 | 16 | – | 8 | 60 | 9,900 ▌ |
| 01-00244-00810 | 8.1 | 16.2 | – | 8 | 60 | 16,500 ▌ |
| 01-00244-00820 | 8.2 | 16.4 | – | 8 | 60 | 16,500 ▌ |
| 01-00244-00830 | 8.3 | 16.6 | – | 8 | 60 | 16,500 ▌ |
| 01-00244-00840 | 8.4 | 16.8 | – | 8 | 60 | 16,500 ▌ |
| 01-00244-00850 | 8.5 | 17 | – | 8 | 60 | 18,100 ▌ |
| 01-00244-00860 | 8.6 | 17.2 | 9° | 10 | 65 | 24,600 ▌ |
| 01-00244-00870 | 8.7 | 17.4 | 9° | 10 | 65 | 24,600 ▌ |
| 01-00244-00880 | 8.8 | 17.6 | 9° | 10 | 65 | 24,600 ▌ |
| 01-00244-00890 | 8.9 | 17.8 | 9° | 10 | 65 | 24,600 ▌ |
| 01-00244-00900 | 9 | 18 | 9° | 10 | 65 | 18,100 ▌ |
| 01-00244-00910 | 9.1 | 18.2 | 9° | 10 | 65 | 24,600 ▌ |
| 01-00244-00920 | 9.2 | 18.4 | 9° | 10 | 65 | 24,600 ▌ |
| 01-00244-00930 | 9.3 | 18.6 | 9° | 10 | 65 | 24,600 ▌ |
| 01-00244-00940 | 9.4 | 18.8 | 9° | 10 | 65 | 24,600 ▌ |
| 01-00244-00950 | 9.5 | 19 | 9° | 10 | 65 | 18,100 ▌ |
| 01-00244-00960 | 9.6 | 19.2 | 9° | 10 | 70 | 24,600 ▌ |
| 01-00244-00970 | 9.7 | 19.4 | 9° | 10 | 70 | 24,600 ▌ |
| 01-00244-00980 | 9.8 | 19.6 | 9° | 10 | 70 | 24,600 ▌ |
| 01-00244-00990 | 9.9 | 19.8 | 9° | 10 | 70 | 24,600 ▌ |

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00244-01000 | 10 | 20 | – | 10 | 70 | 13,700 ▌ |
| 01-00244-01010 | 10.1 | 20.2 | 9° | 12 | 75 | 32,500 ▌ |
| 01-00244-01020 | 10.2 | 20.4 | 9° | 12 | 75 | 32,500 ▌ |
| 01-00244-01030 | 10.3 | 20.6 | 9° | 12 | 75 | 32,500 ▌ |
| 01-00244-01040 | 10.4 | 20.8 | 9° | 12 | 75 | 32,500 ▌ |
| 01-00244-01050 | 10.5 | 21 | 9° | 12 | 75 | 32,500 ▌ |
| 01-00244-01060 | 10.6 | 21.2 | 9° | 12 | 75 | 32,500 ▌ |
| 01-00244-01070 | 10.7 | 21.4 | 9° | 12 | 75 | 32,500 ▌ |
| 01-00244-01080 | 10.8 | 21.6 | 9° | 12 | 75 | 32,500 ▌ |
| 01-00244-01090 | 10.9 | 21.8 | 9° | 12 | 75 | 32,500 ▌ |
| 01-00244-01100 | 11 | 22 | 9° | 12 | 75 | 26,800 ▌ |
| 01-00244-01110 | 11.1 | 22.2 | 9° | 12 | 75 | 32,500 ▌ |
| 01-00244-01120 | 11.2 | 22.4 | 9° | 12 | 75 | 32,500 ▌ |
| 01-00244-01130 | 11.3 | 22.6 | 9° | 12 | 75 | 32,500 ▌ |
| 01-00244-01140 | 11.4 | 22.8 | 9° | 12 | 75 | 32,500 ▌ |
| 01-00244-01150 | 11.5 | 23 | 9° | 12 | 75 | 32,500 ▌ |
| 01-00244-01160 | 11.6 | 23.2 | 9° | 12 | 75 | 32,500 ▌ |
| 01-00244-01170 | 11.7 | 23.4 | 9° | 12 | 75 | 32,500 ▌ |
| 01-00244-01180 | 11.8 | 23.6 | 9° | 12 | 75 | 32,500 ▌ |
| 01-00244-01190 | 11.9 | 23.8 | 9° | 12 | 75 | 32,500 ▌ |
| 01-00244-01200 | 12 | 24 | – | 12 | 75 | 23,000 ▌ |
| ▲ 01-00244-01400 | 14 | 28 | – | 12 | 85 | 35,800 ▌ |
| ▲ 01-00244-01500 | 15 | 30 | 9° | 16 | 100 | 44,800 ▌ |
| ▲ 01-00244-01600 | 16 | 32 | – | 16 | 100 | 44,800 ▌ |
| ▲ 01-00244-01800 | 18 | 36 | 9° | 20 | 110 | 74,200 ▌ |
| ▲ 01-00244-02000 | 20 | 40 | – | 20 | 115 | 74,200 ▌ |

オーダー方法 NC-4 刃径(D)を指示してください。
When you order, indicate NC-4 (D).

※(γ)は参考値です。
※(γ) is reference value.

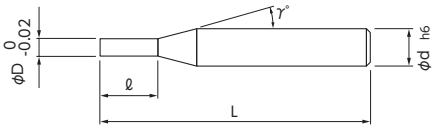
●切削条件表はD-122に記載
●Recommended Milling Conditions are shown on page D-122.



ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# NCM-4

## チャンピオンソリッドセミロング刃エンドミル
CHAMPION SOLID 4-Flute Medium End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

Side Face MG 4 30°

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ○ | ○ | ○ | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| ○ | | ◎ | ◎ | ◎ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00234-00100 | 1 | 3 | 9° | 4 | 45 | 8,700 ▌ |
| 01-00234-00150 | 1.5 | 4.5 | 9° | 4 | 45 | 8,700 ▌ |
| 01-00234-00200 | 2 | 6 | 9° | 4 | 45 | 7,300 ▌ |
| 01-00234-00250 | 2.5 | 8 | 9° | 4 | 45 | 7,300 ▌ |
| 01-00234-00300 | 3 | 10 | 9° | 6 | 45 | 7,600 ▌ |
| 01-00234-00350 | 3.5 | 11 | 9° | 6 | 50 | 9,400 ▌ |
| 01-00234-00400 | 4 | 12 | 9° | 6 | 50 | 7,600 ▌ |
| 01-00234-00450 | 4.5 | 14 | 9° | 6 | 55 | 9,400 ▌ |
| 01-00234-00500 | 5 | 15 | 9° | 6 | 55 | 8,000 ▌ |
| 01-00234-00550 | 5.5 | 17 | 9° | 6 | 55 | 9,700 ▌ |
| 01-00234-00600 | 6 | 18 | – | 6 | 60 | 8,000 ▌ |
| ▲ 01-00234-00650 | 6.5 | 20 | – | 6 | 65 | 13,700 ▌ |
| ▲ 01-00234-00700 | 7 | 21 | 9° | 8 | 65 | 13,700 ▌ |
| ▲ 01-00234-00750 | 7.5 | 23 | 9° | 8 | 70 | 13,700 ▌ |
| ▲ 01-00234-00800 | 8 | 24 | – | 8 | 70 | 11,900 ▌ |
| ▲ 01-00234-00850 | 8.5 | 25 | – | 8 | 70 | 20,500 ▌ |
| ▲ 01-00234-00900 | 9 | 27 | 9° | 10 | 75 | 20,500 ▌ |
| ▲ 01-00234-00950 | 9.5 | 28 | 9° | 10 | 75 | 20,500 ▌ |
| ▲ 01-00234-01000 | 10 | 30 | – | 10 | 80 | 16,500 ▌ |
| ▲ 01-00234-01100 | 11 | 33 | 9° | 12 | 80 | 30,400 ▌ |
| ▲ 01-00234-01200 | 12 | 36 | – | 12 | 85 | 26,700 ▌ |
| ▲ 01-00234-01400 | 14 | 42 | – | 12 | 100 | 42,300 ▌ |
| ▲ 01-00234-01500 | 15 | 45 | 9° | 16 | 110 | 55,600 ▌ |
| ▲ 01-00234-01600 | 16 | 50 | – | 16 | 110 | 55,600 ▌ |
| ▲ 01-00234-01800 | 18 | 55 | 9° | 20 | 130 | 89,500 ▌ |
| ▲ 01-00234-02000 | 20 | 60 | – | 20 | 135 | 89,500 ▌ |

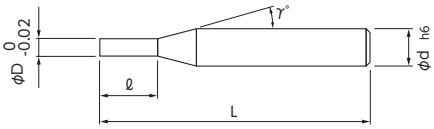
**オーダー方法** NCM-4 刃径(D)を指示してください。
When you order, indicate NCM-4 (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-123に記載
●Recommended Milling Conditions are shown on page D-123.

# NCL-4

## チャンピオンソリッドロング刃エンドミル
CHAMPION SOLID 4-Flute Long End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

Side Face MG 4 30°

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ○ | ○ | ○ | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| ○ | | ◎ | ◎ | ◎ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00224-00200 | 2 | 10 | 9° | 4 | 50 | 11,300 ▌ |
| 01-00224-00300 | 3 | 18 | 9° | 6 | 60 | 13,700 ▌ |
| 01-00224-00400 | 4 | 22 | 9° | 6 | 60 | 13,700 ▌ |
| 01-00224-00500 | 5 | 25 | 9° | 6 | 65 | 15,000 ▌ |
| 01-00224-00600 | 6 | 25 | – | 6 | 65 | 16,300 ▌ |
| ▲ 01-00224-00800 | 8 | 35 | – | 8 | 80 | 23,000 ▌ |
| ▲ 01-00224-01000 | 10 | 42 | – | 10 | 100 | 33,000 ▌ |
| ▲ 01-00224-01200 | 12 | 45 | – | 12 | 100 | 44,000 ▌ |

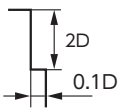
**オーダー方法** NCL-4 刃径(D)を指示してください。
When you order, indicate NCL-4 (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-124に記載
●Recommended Milling Conditions are shown on page D-124.

# NC-4

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM・SKD・SUS | | 調質鋼 Prehardened Steels HPM・NAK | |
|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 40～50m/min | | 35～45m/min | | 25～35m/min | |
| 刃 径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 14,300 | 250 | 12,700 | 220 | 9,600 | 190 |
| 2 | 7,200 | 250 | 6,400 | 220 | 4,800 | 190 |
| 3 | 4,800 | 270 | 4,200 | 240 | 3,200 | 210 |
| 4 | 3,600 | 270 | 3,200 | 240 | 2,400 | 210 |
| 5 | 2,900 | 300 | 2,500 | 260 | 1,900 | 230 |
| 6 | 2,400 | 300 | 2,100 | 260 | 1,600 | 230 |
| 7 | 2,000 | 300 | 1,800 | 260 | 1,400 | 230 |
| 8 | 1,800 | 300 | 1,600 | 260 | 1,200 | 230 |
| 9 | 1,600 | 300 | 1,400 | 260 | 1,100 | 230 |
| 10 | 1,400 | 300 | 1,300 | 260 | 1,000 | 230 |
| 11 | 1,300 | 300 | 1,200 | 260 | 870 | 230 |
| 12 | 1,200 | 300 | 1,100 | 260 | 800 | 230 |
| 14 | 1,020 | 300 | 910 | 260 | 680 | 230 |
| 15 | 960 | 300 | 850 | 260 | 640 | 230 |
| 16 | 900 | 300 | 800 | 260 | 600 | 230 |
| 18 | 800 | 300 | 710 | 260 | 530 | 230 |
| 20 | 720 | 300 | 640 | 260 | 480 | 230 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   | | | | | |
| 備 考 Notes | ※切削油を使用してください。<br>※側面切削でのみ、使用してください。<br>※回転数と送り速度は同じ割合で調整してください。<br>※Use cutting fluid.<br>※It is available only for side milling.<br>※Adjust both spindle speed and feed at the same rate. | | | | | |



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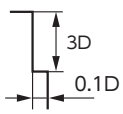
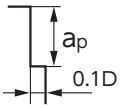
# NCM-4

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM・SKD・SUS | | 調質鋼 Prehardened Steels HPM・NAK | |
|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 40～50m/min | | 35～45m/min | | 25～35m/min | |
| 刃　径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 14,300 | 180 | 12,700 | 160 | 9,600 | 140 |
| 2 | 7,200 | 180 | 6,400 | 160 | 4,800 | 140 |
| 3 | 4,800 | 190 | 4,200 | 170 | 3,200 | 150 |
| 4 | 3,600 | 190 | 3,200 | 170 | 2,400 | 150 |
| 5 | 2,900 | 210 | 2,500 | 190 | 1,900 | 170 |
| 6 | 2,400 | 210 | 2,100 | 190 | 1,600 | 170 |
| 7 | 2,000 | 210 | 1,800 | 190 | 1,400 | 170 |
| 8 | 1,800 | 210 | 1,600 | 190 | 1,200 | 170 |
| 9 | 1,600 | 210 | 1,400 | 190 | 1,100 | 170 |
| 10 | 1,400 | 210 | 1,300 | 190 | 1,000 | 170 |
| 11 | 1,300 | 210 | 1,200 | 190 | 870 | 170 |
| 12 | 1,200 | 210 | 1,100 | 190 | 800 | 170 |
| 14 | 1,020 | 210 | 910 | 190 | 680 | 170 |
| 15 | 960 | 210 | 850 | 190 | 640 | 170 |
| 16 | 900 | 210 | 800 | 190 | 600 | 170 |
| 18 | 800 | 210 | 710 | 190 | 530 | 170 |
| 20 | 720 | 210 | 640 | 190 | 480 | 170 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   | | | | | |
| 備　考 Notes | ※切削油を使用してください。<br>※側面切削でのみ、使用してください。<br>※回転数と送り速度は同じ割合で調整してください。<br>※Use cutting fluid.<br>※It is available only for side milling.<br>※Adjust both spindle speed and feed at the same rate. | | | | | |

# NCL-4

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM・SKD・SUS | | 調質鋼 Prehardened Steels HPM・NAK | |
|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 20～25m/min | | 15～20m/min | | 10～15m/min | |
| 刃 径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 2 | 3,200 | 120 | 2,800 | 100 | 2,400 | 90 |
| 3 | 2,100 | 130 | 1,900 | 110 | 1,600 | 100 |
| 4 | 1,600 | 130 | 1,400 | 110 | 1,200 | 100 |
| 5 | 1,300 | 140 | 1,100 | 120 | 1,000 | 110 |
| 6 | 1,100 | 140 | 930 | 120 | 800 | 110 |
| 8 | 800 | 140 | 700 | 120 | 600 | 110 |
| 10 | 640 | 140 | 560 | 120 | 480 | 110 |
| 12 | 530 | 140 | 460 | 120 | 400 | 110 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   ap<br>φ2～10=4D<br>φ12=45mm | | | | | |
| 備 考 Notes | ※切削油を使用してください。<br>※側面切削でのみ、使用してください。<br>※回転数と送り速度は同じ割合で調整してください。<br>※Use cutting fluid.<br>※It is available only for side milling.<br>※Adjust both spindle speed and feed at the same rate. | | | | | |



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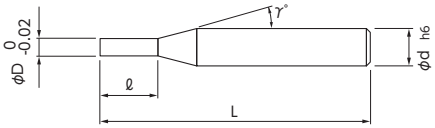
# NE-2

## パワーソリッドエンドミル
POWER SOLID 2-Flute End Mill

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詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

Slot Side Face MG 2 45°

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ○ | ○ | ○ | | |

| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|
| ○ | | ◎ | ◎ | ◎ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

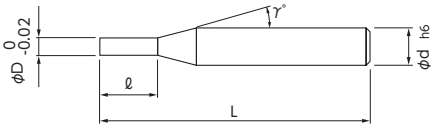
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00112-00100 | 1 | 2.5 | 9° | 4 | 45 | 6,700 ▌ |
| 01-00112-00150 | 1.5 | 3 | 9° | 4 | 45 | 6,700 ▌ |
| 01-00112-00200 | 2 | 6 | 9° | 4 | 45 | 6,700 ▌ |
| 01-00112-00250 | 2.5 | 8 | 9° | 4 | 45 | 6,700 ▌ |
| 01-00112-00300 | 3 | 8 | 9° | 6 | 45 | 7,800 ▌ |
| 01-00112-00350 | 3.5 | 9 | 9° | 6 | 45 | 9,400 ▌ |
| 01-00112-00400 | 4 | 10 | 9° | 6 | 45 | 7,800 ▌ |
| 01-00112-00450 | 4.5 | 13 | 9° | 6 | 50 | 9,400 ▌ |
| 01-00112-00500 | 5 | 13 | 9° | 6 | 50 | 7,800 ▌ |
| 01-00112-00550 | 5.5 | 13 | 9° | 6 | 50 | 9,800 ▌ |
| 01-00112-00600 | 6 | 13 | – | 6 | 50 | 8,200 ▌ |
| 01-00112-00650 | 6.5 | 18 | 9° | 8 | 60 | 19,300 ▌ |
| 01-00112-00700 | 7 | 18 | 9° | 8 | 60 | 16,100 ▌ |
| 01-00112-00750 | 7.5 | 18 | 9° | 8 | 60 | 19,300 ▌ |
| 01-00112-00800 | 8 | 18 | – | 8 | 60 | 14,000 ▌ |
| 01-00112-00850 | 8.5 | 20 | 9° | 10 | 65 | 28,000 ▌ |
| 01-00112-00900 | 9 | 20 | 9° | 10 | 65 | 23,100 ▌ |
| 01-00112-00950 | 9.5 | 20 | 9° | 10 | 65 | 28,000 ▌ |
| 01-00112-01000 | 10 | 20 | – | 10 | 65 | 20,200 ▌ |
| 01-00112-01100 | 11 | 23 | 9° | 12 | 70 | 32,500 ▌ |
| 01-00112-01200 | 12 | 23 | – | 12 | 70 | 31,200 ▌ |
| ▲ 01-00112-01400 | 14 | 30 | 9° | 16 | 85 | 51,200 ▌ |
| ▲ 01-00112-01500 | 15 | 35 | 9° | 16 | 90 | 51,200 ▌ |
| ▲ 01-00112-01600 | 16 | 35 | – | 16 | 90 | 51,200 ▌ |
| ▲ 01-00112-01800 | 18 | 40 | 9° | 20 | 100 | 89,500 ▌ |
| ▲ 01-00112-02000 | 20 | 45 | – | 20 | 110 | 89,500 ▌ |

**オーダー方法** NE-2 刃径(D)を指示してください。
When you order, indicate NE-2 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-127に記載
●Recommended Milling Conditions are shown on page D-127.

# NE-3

## パワーソリッドエンドミル
POWER SOLID 3-Flute End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

Slot Side Face MG 3 45°

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ○ | ○ | ○ | | |

| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|
| ○ | | ◎ | ◎ | ◎ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00113-00300 | 3 | 8 | 9° | 6 | 45 | 9,800 ▌ |
| 01-00113-00350 | 3.5 | 10 | 9° | 6 | 45 | 9,800 ▌ |
| 01-00113-00400 | 4 | 10 | 9° | 6 | 45 | 9,800 ▌ |
| 01-00113-00450 | 4.5 | 13 | 9° | 6 | 50 | 9,800 ▌ |
| 01-00113-00500 | 5 | 13 | 9° | 6 | 50 | 9,800 ▌ |
| 01-00113-00550 | 5.5 | 13 | 9° | 6 | 50 | 9,800 ▌ |
| 01-00113-00600 | 6 | 13 | – | 6 | 50 | 8,200 ▌ |
| 01-00113-00650 | 6.5 | 18 | 9° | 8 | 60 | 19,300 ▌ |
| 01-00113-00700 | 7 | 18 | 9° | 8 | 60 | 19,300 ▌ |
| 01-00113-00750 | 7.5 | 18 | 9° | 8 | 60 | 19,300 ▌ |
| 01-00113-00800 | 8 | 18 | – | 8 | 60 | 14,000 ▌ |
| 01-00113-00850 | 8.5 | 20 | 9° | 10 | 65 | 28,000 ▌ |
| 01-00113-00900 | 9 | 20 | 9° | 10 | 65 | 28,000 ▌ |
| 01-00113-00950 | 9.5 | 20 | 9° | 10 | 65 | 28,000 ▌ |
| 01-00113-01000 | 10 | 20 | – | 10 | 65 | 20,200 ▌ |
| 01-00113-01100 | 11 | 23 | 9° | 12 | 70 | 34,400 ▌ |
| 01-00113-01200 | 12 | 23 | – | 12 | 70 | 31,200 ▌ |
| 01-00113-01300 | 13 | 30 | 9° | 16 | 85 | 58,900 ▌ |
| ▲ 01-00113-01400 | 14 | 30 | 9° | 16 | 85 | 51,200 ▌ |
| ▲ 01-00113-01500 | 15 | 35 | 9° | 16 | 90 | 51,200 ▌ |
| ▲ 01-00113-01600 | 16 | 35 | – | 16 | 90 | 51,200 ▌ |
| ▲ 01-00113-01800 | 18 | 40 | 9° | 20 | 100 | 89,500 ▌ |
| ▲ 01-00113-02000 | 20 | 45 | – | 20 | 110 | 89,500 ▌ |

**オーダー方法** NE-3 刃径(D)を指示してください。
When you order, indicate NE-3 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-128に記載
●Recommended Milling Conditions are shown on page D-128.

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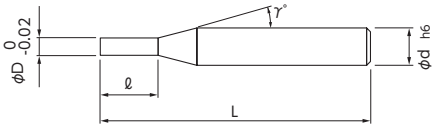
# NE-4

## パワーソリッドエンドミル
POWER SOLID 4-Flute End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
●▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
●▲: The sizes will no longer be capable being sold after the stock runs out.

Side Face MG 4 45°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | |
|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ |
| ○ | ○ | ○ | | |

| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|
| ○ | | ◎ | ◎ | ◎ |

### ▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

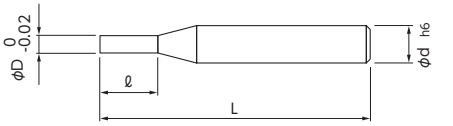
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00114-00300 | 3 | 8 | 9° | 6 | 45 | 7,800 ▌ |
| 01-00114-00400 | 4 | 10 | 9° | 6 | 45 | 7,800 ▌ |
| 01-00114-00450 | 4.5 | 13 | 9° | 6 | 50 | 8,400 ▌ |
| 01-00114-00500 | 5 | 13 | 9° | 6 | 50 | 7,800 ▌ |
| 01-00114-00600 | 6 | 13 | – | 6 | 50 | 8,100 ▌ |
| 01-00114-00700 | 7 | 18 | 9° | 8 | 60 | 17,300 ▌ |
| ▲ 01-00114-00800 | 8 | 18 | – | 8 | 60 | 12,700 ▌ |
| ▲ 01-00114-01000 | 10 | 20 | – | 10 | 65 | 18,300 ▌ |
| ▲ 01-00114-01200 | 12 | 23 | – | 12 | 70 | 28,300 ▌ |
| ▲ 01-00114-01400 | 14 | 30 | 9° | 16 | 85 | 51,200 ▌ |
| ▲ 01-00114-01500 | 15 | 35 | 9° | 16 | 90 | 51,200 ▌ |
| ▲ 01-00114-01600 | 16 | 35 | – | 16 | 90 | 51,200 ▌ |
| ▲ 01-00114-01800 | 18 | 40 | 9° | 20 | 100 | 89,500 ▌ |
| ▲ 01-00114-02000 | 20 | 45 | – | 20 | 110 | 89,500 ▌ |

**オーダー方法** NE-4 刃径(D)を指示してください。
When you order, indicate NE-4 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-129に記載
●Recommended Milling Conditions are shown on page D-129.

# NEL-3

## パワーソリッドロング刃エンドミル
POWER SOLID 3-Flute Long End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

Side Face MG 3 45°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | |
|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ |
| ○ | ○ | ○ | | |

| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|
| ○ | | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|
| 01-00116-00600 | 6 | 25 | 6 | 75 | 15,700 ▌ |
| 01-00116-00800 | 8 | 35 | 8 | 90 | 25,900 ▌ |
| 01-00116-01000 | 10 | 45 | 10 | 110 | 37,300 ▌ |
| 01-00116-01200 | 12 | 55 | 12 | 120 | 57,000 ▌ |
| 01-00116-01400 | 14 | 65 | 16 | 140 | 131,900 ▌ |
| 01-00116-01600 | 16 | 65 | 16 | 140 | 138,100 ▌ |
| 01-00116-01800 | 18 | 75 | 20 | 155 | 187,000 ▌ |
| 01-00116-02000 | 20 | 85 | 20 | 165 | 200,700 ▌ |

**オーダー方法** NEL-3 刃径(D)を指示してください。
When you order, indicate NEL-3 (D).



SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

# NE-2

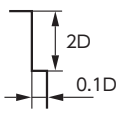
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM･SKD･SUS | | | 調質鋼 Prehardened Steels HPM･NAK | | | アルミニウム合金 Aluminum Alloy | | | 銅 Copper | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 40～50m/min | | | 35～45m/min | | | 25～35m/min | | | 60～100m/min | | | 40～80m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting | min-1 | mm/min 側面 Side Milling | mm/min 溝 Slotting |
| 1 | 14,300 | 200 | 80 | 12,700 | 150 | 60 | 9,600 | 110 | 40 | 25,500 | 400 | 150 | 19,100 | 250 | 130 |
| 1.5 | 9,600 | 200 | 80 | 8,500 | 150 | 60 | 6,400 | 110 | 40 | 17,000 | 400 | 150 | 12,700 | 250 | 130 |
| 2 | 7,200 | 200 | 80 | 6,400 | 150 | 60 | 4,800 | 110 | 40 | 12,700 | 400 | 150 | 9,600 | 250 | 130 |
| 2.5 | 5,700 | 200 | 80 | 5,100 | 150 | 60 | 3,800 | 110 | 40 | 10,200 | 400 | 150 | 7,600 | 250 | 130 |
| 3 | 4,800 | 230 | 90 | 4,200 | 180 | 70 | 3,200 | 130 | 50 | 8,500 | 450 | 180 | 6,400 | 300 | 160 |
| 4 | 3,600 | 230 | 90 | 3,200 | 180 | 70 | 2,400 | 130 | 50 | 6,400 | 450 | 180 | 4,800 | 300 | 160 |
| 5 | 2,900 | 250 | 100 | 2,500 | 200 | 80 | 1,900 | 150 | 60 | 5,100 | 500 | 220 | 3,800 | 350 | 180 |
| 6 | 2,400 | 250 | 100 | 2,100 | 200 | 80 | 1,600 | 150 | 60 | 4,200 | 500 | 220 | 3,200 | 350 | 180 |
| 7 | 2,000 | 250 | 100 | 1,800 | 200 | 80 | 1,400 | 150 | 60 | 3,600 | 500 | 220 | 2,700 | 350 | 180 |
| 8 | 1,800 | 250 | 100 | 1,600 | 200 | 80 | 1,200 | 150 | 60 | 3,200 | 500 | 220 | 2,400 | 350 | 180 |
| 9 | 1,600 | 250 | 100 | 1,400 | 200 | 80 | 1,100 | 150 | 60 | 2,800 | 500 | 220 | 2,100 | 350 | 180 |
| 10 | 1,400 | 250 | 100 | 1,300 | 200 | 80 | 1,000 | 150 | 60 | 2,500 | 500 | 220 | 1,900 | 350 | 180 |
| 11 | 1,300 | 250 | 100 | 1,200 | 200 | 80 | 870 | 150 | 60 | 2,300 | 500 | 220 | 1,700 | 350 | 180 |
| 12 | 1,200 | 250 | 100 | 1,100 | 200 | 80 | 800 | 150 | 60 | 2,100 | 500 | 220 | 1,600 | 350 | 180 |
| 14 | 1,020 | 250 | 100 | 910 | 200 | 80 | 680 | 150 | 60 | 1,800 | 500 | 220 | 1,400 | 350 | 180 |
| 15 | 960 | 250 | 100 | 850 | 200 | 80 | 640 | 150 | 60 | 1,700 | 500 | 220 | 1,300 | 350 | 180 |
| 16 | 900 | 250 | 100 | 800 | 200 | 80 | 600 | 150 | 60 | 1,600 | 500 | 220 | 1,200 | 350 | 180 |
| 18 | 800 | 250 | 100 | 710 | 200 | 80 | 530 | 150 | 60 | 1,400 | 500 | 220 | 1,100 | 350 | 180 |
| 20 | 720 | 250 | 100 | 640 | 200 | 80 | 480 | 150 | 60 | 1,300 | 500 | 220 | 1,000 | 350 | 180 |

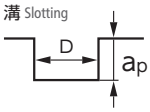
切り込み量 Depth of Cut

(D:刃径 Dia.)

側面 Side Milling




溝 Slotting




ap
φ1～2.5=0.5D
φ3～20=1D

備考 Notes

※切削油の使用をお奨めします。
※回転数と送り速度は同じ割合で調整してください。
※剛性の高いミーリングチャックを使用してください。
※Use cutting fluid.
※Adjust both spindle speed and feed at the same rate.
※Use high rigid holder.

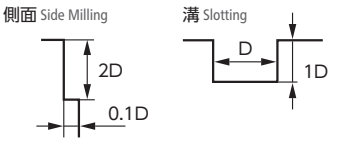
# NE-3

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM・SKD・SUS | | | 調質鋼 Prehardened Steels HPM・NAK | | | アルミニウム合金 Aluminum Alloy | | | 銅 Copper | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 40～50m/min | | | 35～45m/min | | | 25～35m/min | | | 60～100m/min | | | 40～80m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min$^{-1}$ | mm/min | | min$^{-1}$ | mm/min | | min$^{-1}$ | mm/min | | min$^{-1}$ | mm/min | | min$^{-1}$ | mm/min | |
| | | 側面 Side Milling | 溝 Slotting | | 側面 Side Milling | 溝 Slotting | | 側面 Side Milling | 溝 Slotting | | 側面 Side Milling | 溝 Slotting | | 側面 Side Milling | 溝 Slotting |
| 6 | 2,400 | 330 | 110 | 2,100 | 260 | 90 | 1,600 | 200 | 70 | 4,200 | 600 | 250 | 3,200 | 450 | 200 |
| 8 | 1,800 | 330 | 110 | 1,600 | 260 | 90 | 1,200 | 200 | 70 | 3,200 | 600 | 250 | 2,400 | 450 | 200 |
| 10 | 1,400 | 330 | 110 | 1,300 | 260 | 90 | 1,000 | 200 | 70 | 2,500 | 600 | 250 | 1,900 | 450 | 200 |
| 12 | 1,200 | 330 | 110 | 1,100 | 260 | 90 | 800 | 200 | 70 | 2,100 | 600 | 250 | 1,600 | 450 | 200 |
| 14 | 1,020 | 330 | 110 | 910 | 260 | 90 | 680 | 200 | 70 | 1,800 | 600 | 250 | 1,400 | 450 | 200 |
| 15 | 960 | 330 | 110 | 850 | 260 | 90 | 640 | 200 | 70 | 1,700 | 600 | 250 | 1,300 | 450 | 200 |
| 16 | 900 | 330 | 110 | 800 | 260 | 90 | 600 | 200 | 70 | 1,600 | 600 | 250 | 1,200 | 450 | 200 |
| 18 | 800 | 330 | 110 | 710 | 260 | 90 | 530 | 200 | 70 | 1,400 | 600 | 250 | 1,100 | 450 | 200 |
| 20 | 720 | 330 | 110 | 640 | 260 | 90 | 480 | 200 | 70 | 1,300 | 600 | 250 | 1,000 | 450 | 200 |

切り込み量 Depth of Cut

(D:刃径 Dia.)




備考 Notes

※切削油の使用をお奨めします。
※回転数と送り速度は同じ割合で調整してください。
※剛性の高いミーリングチャックを使用してください。
※Use cutting fluid.
※Adjust both spindle speed and feed at the same rate.
※Use high rigid holder.



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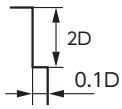
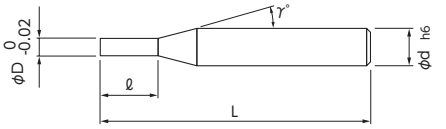
# NE-4

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM・SKD・SUS | | 調質鋼 Prehardened Steels HPM・NAK | |
|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 40～50m/min | | 35～45m/min | | 25～35m/min | |
| 刃 径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 3 | 4,800 | 340 | 4,200 | 270 | 3,200 | 250 |
| 4 | 3,600 | 340 | 3,200 | 270 | 2,400 | 250 |
| 5 | 2,900 | 370 | 2,500 | 300 | 1,900 | 280 |
| 6 | 2,400 | 370 | 2,100 | 300 | 1,600 | 280 |
| 8 | 1,800 | 370 | 1,600 | 300 | 1,200 | 280 |
| 10 | 1,400 | 370 | 1,300 | 300 | 1,000 | 280 |
| 12 | 1,200 | 370 | 1,100 | 300 | 800 | 280 |
| 14 | 1,020 | 370 | 910 | 300 | 680 | 280 |
| 15 | 960 | 370 | 850 | 300 | 640 | 280 |
| 16 | 900 | 370 | 800 | 300 | 600 | 280 |
| 18 | 800 | 370 | 710 | 300 | 530 | 280 |
| 20 | 720 | 370 | 640 | 300 | 480 | 280 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   | | | | | |
| 備 考 Notes | ※切削油の使用をお奨めします。<br>※側面切削でのみ、使用してください。<br>※回転数と送り速度は同じ割合で調整してください。<br>※剛性の高いミーリングチャックを使用してください。<br>※Use cutting fluid.<br>※It is available only for side cutting.<br>※Adjust both spindle speed and feed at the same rate.<br>※Use high rigid holder. | | | | | |

# NSL-2

## 直刃エンドミル
Straight End Mill for Reforming




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ○ | ○ | ○ | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| | | | | |

### ▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00812-00100 | 1 | 2 | 9° | 4 | 45 | 9,000 ▌ |
| 01-00812-00150 | 1.5 | 3 | 9° | 4 | 45 | 9,000 ▌ |
| 01-00812-00200 | 2 | 4 | 9° | 4 | 45 | 9,000 ▌ |
| 01-00812-00250 | 2.5 | 5 | 9° | 4 | 45 | 9,000 ▌ |
| 01-00812-00300 | 3 | 6 | 9° | 6 | 45 | 10,300 ▌ |
| 01-00812-00400 | 4 | 8 | 9° | 6 | 45 | 10,300 ▌ |
| 01-00812-00500 | 5 | 10 | 9° | 6 | 50 | 10,300 ▌ |
| 01-00812-00600 | 6 | 12 | – | 6 | 55 | 10,300 ▌ |
| ▲ 01-00812-00700 | 7 | 14 | 9° | 8 | 60 | 20,400 ▌ |
| ▲ 01-00812-00800 | 8 | 16 | – | 8 | 60 | 17,600 ▌ |
| ▲ 01-00812-00900 | 9 | 18 | 9° | 10 | 65 | 29,500 ▌ |
| ▲ 01-00812-01000 | 10 | 20 | – | 10 | 70 | 25,600 ▌ |
| ▲ 01-00812-01100 | 11 | 22 | 9° | 12 | 75 | 36,400 ▌ |
| ▲ 01-00812-01200 | 12 | 24 | – | 12 | 75 | 34,800 ▌ |

**オーダー方法**
NSL-2 刃径(D)を指示してください。
When you order, indicate NSL-2 (D).

※(γ)は参考値です。
※(γ) is reference value.



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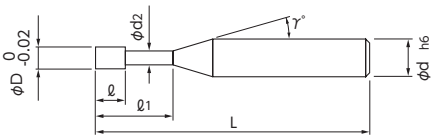
# NHR-2

## ロングネックエンドミル（深リブ用）
2-Flute Long Neck End Mill




(φD<2.5) (φD≧2.5)

Slot Side Face MG 2 30° 45°

●狭くて深い加工に適した首逃げタイプ。
●Suitable for cutting in narrow and deep part by long neck end mill.

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ | | | | | |
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00412-00502 | 0.5 | 2 | 0.7 | 0.46 | 12° | 3 | 35 | 7,300 |
| 01-00412-00504 | | 4 | 0.7 | 0.46 | 12° | 3 | 35 | 7,300 |
| 01-00412-00506 | | 6 | 0.7 | 0.46 | 12° | 3 | 35 | 7,300 |
| 01-00412-00602 | 0.6 | 2 | 0.9 | 0.56 | 12° | 3 | 35 | 7,700 |
| 01-00412-00604 | | 4 | 0.9 | 0.56 | 12° | 3 | 35 | 7,700 |
| 01-00412-00606 | | 6 | 0.9 | 0.56 | 12° | 3 | 35 | 7,700 |
| 01-00412-00702 | 0.7 | 2 | 1 | 0.66 | 12° | 4 | 45 | 7,700 |
| 01-00412-00704 | | 4 | 1 | 0.66 | 12° | 4 | 45 | 7,700 |
| 01-00412-00706 | | 6 | 1 | 0.66 | 12° | 4 | 45 | 7,700 |
| 01-00412-00804 | 0.8 | 4 | 1.2 | 0.76 | 12° | 4 | 45 | 6,000 |
| 01-00412-00806 | | 6 | 1.2 | 0.76 | 12° | 4 | 45 | 6,000 |
| 01-00412-00808 | | 8 | 1.2 | 0.76 | 12° | 4 | 45 | 6,000 |
| 01-00412-00906 | 0.9 | 6 | 1.35 | 0.86 | 12° | 4 | 45 | 7,800 |
| 01-00412-00908 | | 8 | 1.35 | 0.86 | 12° | 4 | 45 | 7,800 |
| 01-00412-00910 | | 10 | 1.35 | 0.86 | 12° | 4 | 45 | 7,800 |
| 01-00412-01006 | 1 | 6 | 1.5 | 0.95 | 12° | 4 | 45 | 5,400 |
| 01-00412-01008 | | 8 | 1.5 | 0.95 | 12° | 4 | 45 | 5,400 |
| 01-00412-01010 | | 10 | 1.5 | 0.95 | 12° | 4 | 45 | 5,400 |
| 01-00412-01012 | | 12 | 1.5 | 0.95 | 12° | 4 | 45 | 5,400 |
| 01-00412-01206 | 1.2 | 6 | 1.8 | 1.15 | 12° | 4 | 45 | 6,300 |
| 01-00412-01208 | | 8 | 1.8 | 1.15 | 12° | 4 | 45 | 6,300 |
| 01-00412-01210 | | 10 | 1.8 | 1.15 | 12° | 4 | 45 | 6,300 |
| 01-00412-01212 | | 12 | 1.8 | 1.15 | 12° | 4 | 45 | 6,300 |
| 01-00412-01406 | 1.4 | 6 | 2.1 | 1.35 | 12° | 4 | 45 | 6,400 |
| 01-00412-01408 | | 8 | 2.1 | 1.35 | 12° | 4 | 45 | 6,400 |
| 01-00412-01410 | | 10 | 2.1 | 1.35 | 12° | 4 | 45 | 6,400 |
| 01-00412-01412 | | 12 | 2.1 | 1.35 | 12° | 4 | 45 | 6,400 |
| 01-00412-01414 | | 14 | 2.1 | 1.35 | 12° | 4 | 50 | 6,400 |
| 01-00412-01416 | | 16 | 2.1 | 1.35 | 12° | 4 | 50 | 6,400 |
| 01-00412-01506 | 1.5 | 6 | 2.3 | 1.45 | 12° | 4 | 45 | 5,600 |

オーダー方法
NHR-2 刃径(D)×有効長(ℓ1)を指示してください。
When you order, indicate NHR-2 (D)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-134に記載
●Recommended Milling Conditions are shown on page D-134.

# NHR-2

## ロングネックエンドミル（深リブ用）
2-Flute Long Neck End Mill

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00412-01508 | 1.5 | 8 | 2.3 | 1.45 | 12° | 4 | 45 | 5,600 |
| 01-00412-01510 | | 10 | 2.3 | 1.45 | 12° | 4 | 45 | 5,600 |
| 01-00412-01512 | | 12 | 2.3 | 1.45 | 12° | 4 | 45 | 5,600 |
| 01-00412-01514 | | 14 | 2.3 | 1.45 | 12° | 4 | 50 | 5,600 |
| 01-00412-01516 | | 16 | 2.3 | 1.45 | 12° | 4 | 50 | 5,600 |
| 01-00412-01518 | | 18 | 2.3 | 1.45 | 12° | 4 | 55 | 5,800 |
| 01-00412-01520 | | 20 | 2.3 | 1.45 | 12° | 4 | 55 | 5,800 |
| 01-00412-01606 | 1.6 | 6 | 2.4 | 1.55 | 12° | 4 | 45 | 6,700 |
| 01-00412-01608 | | 8 | 2.4 | 1.55 | 12° | 4 | 45 | 6,700 |
| 01-00412-01610 | | 10 | 2.4 | 1.55 | 12° | 4 | 45 | 6,700 |
| 01-00412-01612 | | 12 | 2.4 | 1.55 | 12° | 4 | 45 | 6,700 |
| 01-00412-01614 | | 14 | 2.4 | 1.55 | 12° | 4 | 50 | 6,700 |
| 01-00412-01616 | | 16 | 2.4 | 1.55 | 12° | 4 | 50 | 6,700 |
| 01-00412-01618 | | 18 | 2.4 | 1.55 | 12° | 4 | 55 | 6,900 |
| 01-00412-01620 | | 20 | 2.4 | 1.55 | 12° | 4 | 55 | 6,900 |
| 01-00412-01806 | 1.8 | 6 | 2.7 | 1.75 | 12° | 4 | 45 | 6,700 |
| 01-00412-01808 | | 8 | 2.7 | 1.75 | 12° | 4 | 45 | 6,700 |
| 01-00412-01810 | | 10 | 2.7 | 1.75 | 12° | 4 | 45 | 6,700 |
| 01-00412-01812 | | 12 | 2.7 | 1.75 | 12° | 4 | 45 | 6,700 |
| 01-00412-01814 | | 14 | 2.7 | 1.75 | 12° | 4 | 50 | 6,700 |
| 01-00412-01816 | | 16 | 2.7 | 1.75 | 12° | 4 | 50 | 6,700 |
| 01-00412-01818 | | 18 | 2.7 | 1.75 | 12° | 4 | 55 | 6,900 |
| 01-00412-01820 | | 20 | 2.7 | 1.75 | 12° | 4 | 55 | 6,900 |
| 01-00412-02006 | 2 | 6 | 3 | 1.94 | 12° | 4 | 45 | 5,600 |
| 01-00412-02008 | | 8 | 3 | 1.94 | 12° | 4 | 45 | 5,600 |
| 01-00412-02010 | | 10 | 3 | 1.94 | 12° | 4 | 45 | 5,600 |
| 01-00412-02012 | | 12 | 3 | 1.94 | 12° | 4 | 45 | 5,600 |
| 01-00412-02014 | | 14 | 3 | 1.94 | 12° | 4 | 50 | 5,600 |
| 01-00412-02016 | | 16 | 3 | 1.94 | 12° | 4 | 50 | 5,600 |
| 01-00412-02018 | | 18 | 3 | 1.94 | 12° | 4 | 55 | 5,800 |

オーダー方法
NHR-2 刃径(D)×有効長(ℓ1)を指示してください。
When you order, indicate NHR-2 (D)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-134に記載
●Recommended Milling Conditions are shown on page D-134.



ŞEVKET ÖĞÜT® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00412-02020 | 2 | 20 | 3 | 1.94 | 12° | 4 | 55 | 5,800 |
| 01-00412-02508 | 2.5 | 8 | 3.7 | 2.4 | 12° | 4 | 45 | 6,800 |
| 01-00412-02512 | | 12 | 3.7 | 2.4 | 12° | 4 | 45 | 6,800 |
| 01-00412-02516 | | 16 | 3.7 | 2.4 | 12° | 4 | 55 | 6,800 |
| 01-00412-02520 | | 20 | 3.7 | 2.4 | 12° | 4 | 60 | 7,000 |
| 01-00412-03008 | 3 | 8 | 4.5 | 2.85 | 12° | 6 | 45 | 6,800 |
| 01-00412-03012 | | 12 | 4.5 | 2.85 | 12° | 6 | 45 | 6,800 |
| 01-00412-03016 | | 16 | 4.5 | 2.85 | 12° | 6 | 55 | 6,800 |
| 01-00412-03020 | | 20 | 4.5 | 2.85 | 12° | 6 | 60 | 6,800 |
| 01-00412-03025 | | 25 | 4.5 | 2.85 | 12° | 6 | 65 | 7,000 |
| 01-00412-03512 | 3.5 | 12 | 5.25 | 3.35 | 12° | 6 | 45 | 7,200 |
| 01-00412-03516 | | 16 | 5.25 | 3.35 | 12° | 6 | 55 | 7,200 |
| 01-00412-03520 | | 20 | 5.25 | 3.35 | 12° | 6 | 60 | 7,200 |
| 01-00412-03525 | | 25 | 5.25 | 3.35 | 12° | 6 | 65 | 7,200 |
| 01-00412-03530 | | 30 | 5.25 | 3.35 | 12° | 6 | 75 | 7,400 |
| 01-00412-04012 | 4 | 12 | 6 | 3.8 | 12° | 6 | 45 | 6,900 |
| 01-00412-04016 | | 16 | 6 | 3.8 | 12° | 6 | 55 | 6,900 |
| 01-00412-04020 | | 20 | 6 | 3.8 | 12° | 6 | 60 | 6,900 |
| 01-00412-04025 | | 25 | 6 | 3.8 | 12° | 6 | 65 | 6,900 |
| 01-00412-04030 | | 30 | 6 | 3.8 | 12° | 6 | 70 | 6,900 |
| 01-00412-04035 | | 35 | 6 | 3.8 | 12° | 6 | 75 | 7,100 |
| 01-00412-05016 | 5 | 16 | 7.5 | 4.8 | 12° | 6 | 55 | 8,000 |
| 01-00412-05020 | | 20 | 7.5 | 4.8 | 12° | 6 | 60 | 8,000 |
| 01-00412-05025 | | 25 | 7.5 | 4.8 | 12° | 6 | 65 | 8,000 |
| 01-00412-05030 | | 30 | 7.5 | 4.8 | 12° | 6 | 75 | 8,000 |
| 01-00412-05035 | | 35 | 7.5 | 4.8 | 12° | 6 | 80 | 8,000 |
| 01-00412-05040 | | 40 | 7.5 | 4.8 | 12° | 6 | 90 | 8,200 |

# NHR-2

## 切削条件参考表 Recommended Milling Conditions

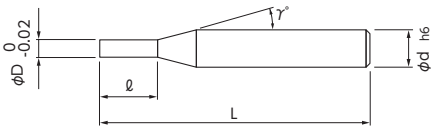
| 被削材 Work Material | | 炭素鋼・合金鋼・調質鋼 Carbon Steels・Alloy Steels・Prehardened Steels S50C・SCM・SKD・SUS・HPM・NAK | | アルミニウム合金 Aluminum Alloy | | 銅 Copper | | 樹　脂 Resin | |
|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | | 30～50m/min | | 100～200m/min | | 50～150m/min | | 50～80m/min | |
| 刃径 Dia. | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | mm | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 0.5 | 0.003～0.05 | 19,100～31,800 | 200～500 | 50,000～ | 200～1,000 | 31,800～ | 200～1,000 | 31,800～ | 200～400 |
| 0.6 | 0.006～0.06 | 15,900～26,500 | 200～500 | 50,000～ | 200～1,250 | 26,500～ | 200～1,000 | 26,500～42,500 | 200～400 |
| 0.7 | 0.01～0.07 | 13,600～22,700 | 200～500 | 45,500～ | 200～1,250 | 22,700～ | 200～1,000 | 22,700～36,400 | 200～400 |
| 0.8 | 0.01～0.06 | 11,900～19,900 | 200～500 | 39,800～ | 200～1,500 | 19,900～ | 200～1,250 | 19,900～31,800 | 200～400 |
| 0.9 | 0.009～0.03 | 10,600～17,700 | 200～500 | 35,400～ | 200～2,000 | 17,700～ | 200～1,500 | 17,700～28,300 | 200～400 |
| 1 | 0.01～0.06 | 9,600～15,900 | 200～650 | 31,800～ | 200～2,600 | 15,900～47,800 | 200～1,950 | 15,900～25,500 | 200～400 |
| 1.2 | 0.016～0.12 | 8,000～13,300 | 200～550 | 26,500～ | 200～2,200 | 13,300～39,800 | 200～1,650 | 13,300～21,200 | 200～400 |
| 1.4 | 0.012～0.15 | 6,800～11,400 | 200～450 | 22,700～45,500 | 200～1,800 | 11,400～34,100 | 200～1,350 | 11,400～18,200 | 200～400 |
| 1.5 | 0.008～0.17 | 6,400～10,600 | 200～450 | 21,200～42,500 | 200～1,800 | 10,600～31,800 | 200～1,350 | 10,600～17,000 | 200～400 |
| 1.6 | 0.012～0.2 | 6,000～10,000 | 200～450 | 19,900～39,800 | 200～1,800 | 10,000～29,900 | 200～1,350 | 10,000～15,900 | 200～400 |
| 1.8 | 0.02～0.22 | 5,300～ 8,800 | 200～350 | 17,700～35,400 | 200～1,400 | 8,800～26,500 | 200～1,050 | 8,800～14,200 | 200～400 |
| 2 | 0.03～0.25 | 4,800～ 8,000 | 200～350 | 15,900～31,800 | 200～1,400 | 8,000～23,900 | 200～1,050 | 8,000～12,700 | 200～400 |
| 2.5 | 0.08～0.25 | 3,800～ 6,400 | 150～250 | 12,700～25,500 | 150～1,000 | 6,400～19,100 | 150～ 750 | 6,400～10,200 | 150～300 |
| 3 | 0.09～0.25 | 3,200～ 5,300 | 130～250 | 10,600～21,200 | 130～1,000 | 5,300～15,900 | 130～ 750 | 5,300～ 8,500 | 130～260 |
| 3.5 | 0.09～0.25 | 2,700～ 4,500 | 110～220 | 9,100～18,200 | 110～ 900 | 4,500～13,600 | 110～ 650 | 4,500～ 7,300 | 110～220 |
| 4 | 0.1～0.25 | 2,400～ 4,000 | 100～200 | 8,000～15,900 | 100～ 800 | 4,000～11,900 | 100～ 600 | 4,000～ 6,400 | 100～200 |
| 5 | 0.18～0.25 | 1,900～ 3,200 | 80～200 | 6,400～12,700 | 80～ 800 | 3,200～ 9,600 | 80～ 600 | 3,200～ 5,100 | 80～160 |
| 備　考 Notes | | ※工具の有効長によって、切り込み量及び回転数・送り速度を調整してください。<br>※切削油は発煙性の少ないものを使用してください。<br>※往復切削をお奨めします。<br>※Adjust depth of cut, spindle speed and feed according to effective length.<br>※Use cutting fluid with smoke retardant.<br>※Recommend reciprocating cutting. | | | | | | | |



ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# AL2D-2

## アルミ専用エンドミル 2倍刃長タイプ
2-Flute End Mill for Aluminum




●NS の AL シリーズは、あらゆる条件で安定した高能率加工を実現。
●コストパフォーマンスに優れた高剛性。2 倍刃長タイプ。
●AL-series realized a stable and high efficient machining.
●L/D=2 to increase rigidity and realize best cost performance.

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹 脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ | | | | | |
| | | | | | | | ◎ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00631-00050 | 0.5 | 1 | 9° | 4 | 45 | 3,800 |
| 01-00631-00060 | 0.6 | 1.2 | 9° | 4 | 45 | 4,600 |
| 01-00631-00070 | 0.7 | 1.4 | 9° | 4 | 45 | 4,600 |
| 01-00631-00080 | 0.8 | 1.6 | 9° | 4 | 45 | 4,600 |
| 01-00631-00090 | 0.9 | 1.8 | 9° | 4 | 45 | 4,600 |
| 01-00631-00100 | 1 | 2 | 9° | 4 | 45 | 2,900 |
| 01-00631-00110 | 1.1 | 2.2 | 9° | 4 | 45 | 4,600 |
| 01-00631-00120 | 1.2 | 2.4 | 9° | 4 | 45 | 4,600 |
| 01-00631-00130 | 1.3 | 2.6 | 9° | 4 | 45 | 4,600 |
| 01-00631-00140 | 1.4 | 2.8 | 9° | 4 | 45 | 4,600 |
| 01-00631-00150 | 1.5 | 3 | 9° | 4 | 45 | 2,900 |
| 01-00631-00160 | 1.6 | 3.2 | 9° | 4 | 45 | 4,600 |
| 01-00631-00170 | 1.7 | 3.4 | 9° | 4 | 45 | 4,600 |
| 01-00631-00180 | 1.8 | 3.6 | 9° | 4 | 45 | 4,600 |
| 01-00631-00190 | 1.9 | 3.8 | 9° | 4 | 45 | 4,600 |
| 01-00631-00200 | 2 | 4 | 9° | 4 | 45 | 2,900 |
| 01-00631-00210 | 2.1 | 4.2 | 9° | 4 | 45 | 5,300 |
| 01-00631-00220 | 2.2 | 4.4 | 9° | 4 | 45 | 5,300 |
| 01-00631-00230 | 2.3 | 4.6 | 9° | 4 | 45 | 5,300 |
| 01-00631-00240 | 2.4 | 4.8 | 9° | 4 | 45 | 5,300 |
| 01-00631-00250 | 2.5 | 5 | 9° | 4 | 45 | 3,800 |
| 01-00631-00260 | 2.6 | 5.2 | 9° | 4 | 45 | 5,300 |
| 01-00631-00270 | 2.7 | 5.4 | 9° | 4 | 45 | 5,300 |
| 01-00631-00280 | 2.8 | 5.6 | 9° | 4 | 45 | 5,300 |
| 01-00631-00290 | 2.9 | 5.8 | 9° | 6 | 50 | 5,300 |
| 01-00631-00300 | 3 | 6 | 9° | 6 | 50 | 3,800 |
| 01-00631-00350 | 3.5 | 7 | 9° | 6 | 50 | 4,600 |

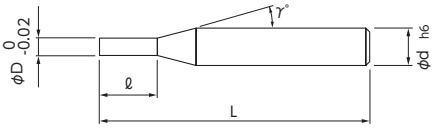
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00631-00400 | 4 | 8 | 9° | 6 | 50 | 3,900 |
| 01-00631-00450 | 4.5 | 9 | 9° | 6 | 55 | 5,100 |
| 01-00631-00500 | 5 | 10 | 9° | 6 | 55 | 4,300 |
| 01-00631-00550 | 5.5 | 11 | 9° | 6 | 55 | 5,300 |
| 01-00631-00600 | 6 | 12 | – | 6 | 55 | 4,500 |
| 01-00631-00700 | 7 | 14 | 9° | 8 | 70 | 8,400 |
| 01-00631-00800 | 8 | 16 | – | 8 | 70 | 8,400 |
| 01-00631-00900 | 9 | 18 | 9° | 10 | 75 | 10,900 |
| 01-00631-01000 | 10 | 20 | – | 10 | 75 | 10,900 |
| 01-00631-01100 | 11 | 22 | 9° | 12 | 80 | 15,900 |
| 01-00631-01200 | 12 | 24 | – | 12 | 80 | 15,900 |

オーダー方法 AL2D-2 刃径(D)を指示してください。
When you order, indicate AL2D-2 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-145に記載
●Recommended Milling Conditions are shown on page D-145.

# AL3D-2

## アルミ専用エンドミル 3倍刃長タイプ
2-Flute Medium End Mill for Aluminum




●NS の AL シリーズは、あらゆる条件で安定した高能率加工を実現。
●幅広い領域で安定した加工面精度が得られ、高速加工でもビビリを抑制。
●AL-series realized a stable and high efficient machining.
●It exhibits stable excellent surface on a wide area and no chattering occurs even during high speed cutting.

技術資料 K-027

Slot Side Face WC 2 45°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | |
|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ |
| | | | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| | | ◎ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

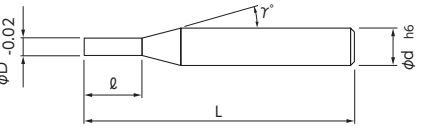
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00632-00100 | 1 | 3 | 9° | 4 | 45 | 4,600 |
| 01-00632-00150 | 1.5 | 4.5 | 9° | 4 | 45 | 4,600 |
| 01-00632-00200 | 2 | 6 | 9° | 4 | 45 | 4,600 |
| 01-00632-00250 | 2.5 | 7.5 | 9° | 4 | 45 | 4,600 |
| 01-00632-00300 | 3 | 9 | 9° | 6 | 50 | 5,600 |
| 01-00632-00400 | 4 | 12 | 9° | 6 | 50 | 5,800 |
| 01-00632-00500 | 5 | 15 | 9° | 6 | 55 | 6,200 |
| 01-00632-00600 | 6 | 18 | – | 6 | 60 | 6,500 |
| 01-00632-00700 | 7 | 21 | 9° | 8 | 70 | 10,500 |
| 01-00632-00800 | 8 | 24 | – | 8 | 70 | 10,500 |
| 01-00632-00900 | 9 | 27 | 9° | 10 | 75 | 13,200 |
| 01-00632-01000 | 10 | 30 | – | 10 | 75 | 13,200 |
| 01-00632-01100 | 11 | 33 | 9° | 12 | 90 | 18,200 |
| 01-00632-01200 | 12 | 36 | – | 12 | 90 | 18,200 |

オーダー方法 AL3D-2 刃径(D)を指示してください。
When you order, indicate AL3D-2 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-146に記載
●Recommended Milling Conditions are shown on page D-146.

# AL4D-2

## アルミ専用エンドミル 4倍刃長タイプ
2-Flute Medium End Mill for Aluminum




●幅広い領域で安定した加工面精度が得られ、高速加工でもビビリを抑制。
●It exhibits stable excellent surface on a wide area and no chattering occurs even during high speed cutting.

Side Face WC 2 45°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | |
|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ |
| | | | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| | | ◎ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00633-00100 | 1 | 4 | 9° | 4 | 50 | 6,000 |
| 01-00633-00150 | 1.5 | 6 | 9° | 4 | 50 | 6,000 |
| 01-00633-00200 | 2 | 8 | 9° | 4 | 50 | 6,000 |
| 01-00633-00250 | 2.5 | 10 | 9° | 4 | 50 | 6,000 |
| 01-00633-00300 | 3 | 12 | 9° | 6 | 55 | 7,000 |
| 01-00633-00400 | 4 | 16 | 9° | 6 | 60 | 7,300 |
| 01-00633-00500 | 5 | 20 | 9° | 6 | 65 | 7,800 |
| 01-00633-00600 | 6 | 24 | – | 6 | 75 | 8,700 |
| 01-00633-00700 | 7 | 28 | 9° | 8 | 90 | 13,200 |
| 01-00633-00800 | 8 | 32 | – | 8 | 90 | 13,200 |
| 01-00633-00900 | 9 | 36 | 9° | 10 | 100 | 18,000 |
| 01-00633-01000 | 10 | 40 | – | 10 | 100 | 18,000 |
| 01-00633-01100 | 11 | 44 | 9° | 12 | 110 | 22,800 |
| 01-00633-01200 | 12 | 48 | – | 12 | 110 | 22,800 |

オーダー方法 AL4D-2 刃径(D)を指示してください。
When you order, indicate AL4D-2 (D).

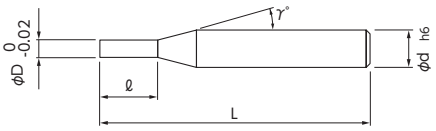
※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-147に記載
●Recommended Milling Conditions are shown on page D-147.



ŞEVKET ÖLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

# AL5D-2

## アルミ専用エンドミル 5倍刃長タイプ
2-Flute Long End Mill for Aluminum




●NS の AL シリーズは、あらゆる条件で安定した高能率加工を実現。
●幅広い領域で安定した加工面精度が得られ、高速加工でもビビリを抑制。
●AL-series realized a stable and high efficient machining.
●It exhibits stable excellent surface on a wide area and no chattering occurs even during high speed cutting.

技術資料 K-026

Side Face WC 2 45°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| | | | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| | | ◎ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00634-00100 | 1 | 5 | 9° | 4 | 50 | 7,400 |
| 01-00634-00150 | 1.5 | 7.5 | 9° | 4 | 50 | 7,400 |
| 01-00634-00200 | 2 | 10 | 9° | 4 | 50 | 7,400 |
| 01-00634-00250 | 2.5 | 12.5 | 9° | 4 | 50 | 7,400 |
| 01-00634-00300 | 3 | 15 | 9° | 6 | 55 | 8,300 |
| 01-00634-00400 | 4 | 20 | 9° | 6 | 60 | 8,700 |
| 01-00634-00500 | 5 | 25 | 9° | 6 | 65 | 9,200 |
| 01-00634-00600 | 6 | 30 | – | 6 | 75 | 10,800 |
| 01-00634-00700 | 7 | 35 | 9° | 8 | 90 | 16,000 |
| 01-00634-00800 | 8 | 40 | – | 8 | 90 | 16,000 |
| 01-00634-00900 | 9 | 45 | 9° | 10 | 100 | 22,600 |
| 01-00634-01000 | 10 | 50 | – | 10 | 100 | 22,600 |
| 01-00634-01100 | 11 | 55 | 9° | 12 | 110 | 27,300 |
| 01-00634-01200 | 12 | 60 | – | 12 | 110 | 27,300 |

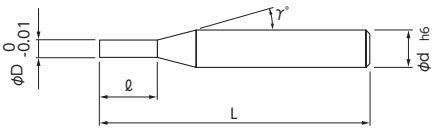
オーダー方法 AL5D-2 刃径(D)を指示してください。
When you order, indicate AL5D-2 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-148に記載
●Recommended Milling Conditions are shown on page D-148.

# AL3D-345

New

## アルミ専用エンドミル 3枚刃3倍刃長タイプ
3-Flute Medium End Mill for Aluminum




●NS の AL シリーズは、あらゆる条件で安定した高能率加工を実現。
●幅広い領域で安定した加工面精度が得られ、高速加工でもビビリを抑制。
●３枚刃の採用で、加工能率が向上！
●AL-series realized a stable and high efficient machining.
●It exhibits stable excellent surface on a wide area and no chattering occurs even during high speed cutting.
●Realized high efficiency machining by adopting 3 flutes.

Plunge Slot Side Face WC 3 45°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| | | | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| | | ◎ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

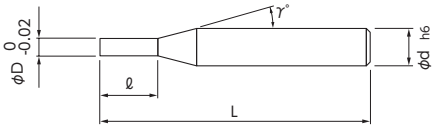
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00639-00100 | 1 | 3 | 12° | 4 | 60 | 6,400 |
| 01-00639-00200 | 2 | 6 | 12° | 4 | 60 | 6,400 |
| 01-00639-00300 | 3 | 9 | 12° | 6 | 60 | 7,700 |
| 01-00639-00400 | 4 | 12 | 12° | 6 | 70 | 8,900 |
| 01-00639-00500 | 5 | 15 | 12° | 6 | 80 | 9,600 |
| 01-00639-00600 | 6 | 18 | – | 6 | 80 | 10,000 |
| 01-00639-00800 | 8 | 24 | – | 8 | 90 | 15,800 |
| 01-00639-01000 | 10 | 30 | – | 10 | 100 | 21,600 |
| 01-00639-01200 | 12 | 36 | – | 12 | 110 | 25,600 |

オーダー方法 AL3D-345 刃径(D)を指示してください。
When you order, indicate AL3D-345 (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-149に記載
●Recommended Milling Conditions are shown on page D-149.

# AL2D-2DLC

## アルミ専用エンドミル（DLCコーティング）2倍刃長タイプ
DLC COATING 2-Flute End Mill for Aluminum




●NS 独自の密着性が高い DLC コーティングを採用し、長時間加工に適しています。
●Our original DLC COATING are adopted, it is suitable for cutting for long time.

Slot Side Face WC DLC 2 45°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| | | | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| | | ◎ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

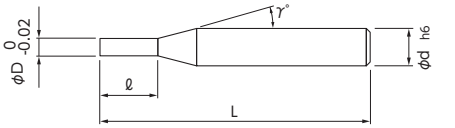
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00661-00050 | 0.5 | 1 | 9° | 4 | 45 | 4,600 |
| 01-00661-00060 | 0.6 | 1.2 | 9° | 4 | 45 | 5,600 |
| 01-00661-00070 | 0.7 | 1.4 | 9° | 4 | 45 | 5,600 |
| 01-00661-00080 | 0.8 | 1.6 | 9° | 4 | 45 | 5,600 |
| 01-00661-00090 | 0.9 | 1.8 | 9° | 4 | 45 | 5,600 |
| 01-00661-00100 | 1 | 2 | 9° | 4 | 45 | 3,500 |
| 01-00661-00150 | 1.5 | 3 | 9° | 4 | 45 | 3,500 |
| 01-00661-00200 | 2 | 4 | 9° | 4 | 45 | 3,500 |
| 01-00661-00250 | 2.5 | 5 | 9° | 4 | 45 | 4,600 |
| 01-00661-00300 | 3 | 6 | 9° | 6 | 50 | 4,600 |
| 01-00661-00350 | 3.5 | 7 | 9° | 6 | 50 | 5,600 |
| 01-00661-00400 | 4 | 8 | 9° | 6 | 50 | 4,700 |
| 01-00661-00450 | 4.5 | 9 | 9° | 6 | 55 | 6,200 |
| 01-00661-00500 | 5 | 10 | 9° | 6 | 55 | 5,200 |
| 01-00661-00550 | 5.5 | 11 | 9° | 6 | 55 | 6,400 |
| 01-00661-00600 | 6 | 12 | – | 6 | 55 | 5,400 |
| 01-00661-00700 | 7 | 14 | 9° | 8 | 70 | 10,200 |
| 01-00661-00800 | 8 | 16 | – | 8 | 70 | 10,200 |
| 01-00661-00900 | 9 | 18 | 9° | 10 | 75 | 13,100 |
| 01-00661-01000 | 10 | 20 | – | 10 | 75 | 13,100 |
| 01-00661-01100 | 11 | 22 | 9° | 12 | 80 | 19,100 |
| 01-00661-01200 | 12 | 24 | – | 12 | 80 | 19,100 |

**オーダー方法** AL2D-2DLC 刃径(D)を指示してください。
When you order, indicate AL2D-2DLC (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-145に記載
●Recommended Milling Conditions are shown on page D-145.

# AL3D-2DLC

## アルミ専用エンドミル（DLCコーティング）3倍刃長タイプ
DLC COATING 2-Flute Medium End Mill for Aluminum




●NS の AL シリーズは、あらゆる条件で安定した高能率加工を実現。
●NS 独自の密着性が高い DLC コーティングを採用し、長時間加工に適しています。
●AL-series realized a stable and high efficient machining.
●Our original DLC COATING are adopted, it is suitable for cutting for long time.

Slot Side Face WC DLC 2 45°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| | | | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| | | ◎ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00635-00100 | 1 | 3 | 9° | 4 | 45 | 5,600 |
| 01-00635-00150 | 1.5 | 4.5 | 9° | 4 | 45 | 5,600 |
| 01-00635-00200 | 2 | 6 | 9° | 4 | 45 | 5,600 |
| 01-00635-00250 | 2.5 | 7.5 | 9° | 4 | 45 | 5,600 |
| 01-00635-00300 | 3 | 9 | 9° | 6 | 50 | 6,800 |
| 01-00635-00400 | 4 | 12 | 9° | 6 | 50 | 7,000 |
| 01-00635-00500 | 5 | 15 | 9° | 6 | 55 | 7,500 |
| 01-00635-00600 | 6 | 18 | – | 6 | 60 | 7,800 |
| 01-00635-00700 | 7 | 21 | 9° | 8 | 70 | 12,600 |
| 01-00635-00800 | 8 | 24 | – | 8 | 70 | 12,600 |
| 01-00635-00900 | 9 | 27 | 9° | 10 | 75 | 15,900 |
| 01-00635-01000 | 10 | 30 | – | 10 | 75 | 15,900 |
| 01-00635-01100 | 11 | 33 | 9° | 12 | 90 | 21,800 |
| 01-00635-01200 | 12 | 36 | – | 12 | 90 | 21,800 |

**オーダー方法** AL3D-2DLC 刃径(D)を指示してください。
When you order, indicate AL3D-2DLC (D).

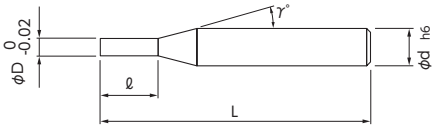
※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-146に記載
●Recommended Milling Conditions are shown on page D-146.



ŞEVKET ÖLÜ MAKINA TİCARET VE SAN. LTD. ŞTİ.

# AL4D-2DLC

## アルミ専用エンドミル（DLCコーティング）4倍刃長タイプ
DLC COATING 2-Flute Medium End Mill for Aluminum




●NS 独自の密着性が高い DLC コーティングを採用し、長時間加工に適しています。
●Our original DLC COATING are adopted, it is suitable for cutting for long time.

Side Face WC DLC 2 45°

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| | | | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| | | ◎ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

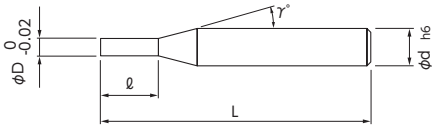
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00663-00100 | 1 | 4 | 9° | 4 | 50 | 7,200 |
| 01-00663-00150 | 1.5 | 6 | 9° | 4 | 50 | 7,200 |
| 01-00663-00200 | 2 | 8 | 9° | 4 | 50 | 7,200 |
| 01-00663-00250 | 2.5 | 10 | 9° | 4 | 50 | 7,200 |
| 01-00663-00300 | 3 | 12 | 9° | 6 | 55 | 8,400 |
| 01-00663-00400 | 4 | 16 | 9° | 6 | 60 | 8,800 |
| 01-00663-00500 | 5 | 20 | 9° | 6 | 65 | 9,400 |
| 01-00663-00600 | 6 | 24 | – | 6 | 75 | 10,500 |
| 01-00663-00700 | 7 | 28 | 9° | 8 | 90 | 15,900 |
| 01-00663-00800 | 8 | 32 | – | 8 | 90 | 15,900 |
| 01-00663-00900 | 9 | 36 | 9° | 10 | 100 | 21,600 |
| 01-00663-01000 | 10 | 40 | – | 10 | 100 | 21,600 |
| 01-00663-01100 | 11 | 44 | 9° | 12 | 110 | 27,400 |
| 01-00663-01200 | 12 | 48 | – | 12 | 110 | 27,400 |

**オーダー方法**
AL4D-2DLC 刃径(D)を指示してください。
When you order, indicate AL4D-2DLC (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-147に記載
●Recommended Milling Conditions are shown on page D-147.

# AL5D-2DLC

## アルミ専用エンドミル（DLCコーティング）5倍刃長タイプ
DLC COATING 2-Flute Long End Mill for Aluminum




●NS 独自の密着性が高い DLC コーティングを採用し、長時間加工に適しています。
●Our original DLC COATING are adopted, it is suitable for cutting for long time.

Side Face WC DLC 2 45°

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| | | | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| | | ◎ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00664-00100 | 1 | 5 | 9° | 4 | 50 | 8,900 |
| 01-00664-00150 | 1.5 | 7.5 | 9° | 4 | 50 | 8,900 |
| 01-00664-00200 | 2 | 10 | 9° | 4 | 50 | 8,900 |
| 01-00664-00250 | 2.5 | 12.5 | 9° | 4 | 50 | 8,900 |
| 01-00664-00300 | 3 | 15 | 9° | 6 | 55 | 10,000 |
| 01-00664-00400 | 4 | 20 | 9° | 6 | 60 | 10,500 |
| 01-00664-00500 | 5 | 25 | 9° | 6 | 65 | 11,100 |
| 01-00664-00600 | 6 | 30 | – | 6 | 75 | 13,000 |
| 01-00664-00700 | 7 | 35 | 9° | 8 | 90 | 19,200 |
| 01-00664-00800 | 8 | 40 | – | 8 | 90 | 19,200 |
| 01-00664-00900 | 9 | 45 | 9° | 10 | 100 | 27,100 |
| 01-00664-01000 | 10 | 50 | – | 10 | 100 | 27,100 |
| 01-00664-01100 | 11 | 55 | 9° | 12 | 110 | 32,800 |
| 01-00664-01200 | 12 | 60 | – | 12 | 110 | 32,800 |

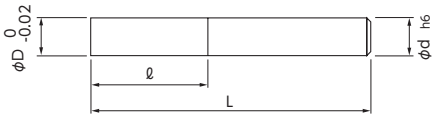
**オーダー方法**
AL5D-2DLC 刃径(D)を指示してください。
When you order, indicate AL5D-2DLC (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-148に記載
●Recommended Milling Conditions are shown on page D-148.

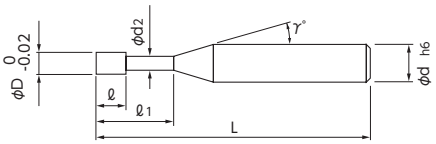
# ALZ345

## アルミ用高能率エンドミル
3-Flute Power "Z" End Mill for Aluminum

### Type Ⅰ:全刃長タイプ




### Type Ⅱ:ロングネックタイプ




- NS の AL シリーズは、あらゆる条件で安定した高能率加工を実現。
- 突っ込み性能が大幅アップ！
- 切りくずの排出性を高めた高能率タイプ。
- 新たに有効長 5D タイプ・ロングシャンクタイプが加わり 124 サイズに！
- AL-series realized a stable and high efficient machining.
- Improved drilling capacity!
- High performance with better chip disposal.
- Add new 5D effective length type and long shank type to become 124 sizes.

技術資料 K-026

Plunge Slot Side Face WC 3 45°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ◎ | ○ | ○ |

◆ New サイズ

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | 形状 Type | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00636-00100 | 1 | 3 | 1.5 | Ⅱ | 0.95 | 12° | 4 | 45 | 4,900 |
| ◆ 01-00636-00102 | 1 | 5 | 1.5 | | 0.95 | 12° | 4 | 60 | 5,600 |
| 01-00636-00110 | 1.1 | 3.3 | 1.7 | | 1.05 | 12° | 4 | 45 | 6,700 ▮ |
| 01-00636-00120 | 1.2 | 3.6 | 1.8 | | 1.15 | 12° | 4 | 45 | 6,700 ▮ |
| 01-00636-00130 | 1.3 | 3.9 | 2 | | 1.25 | 12° | 4 | 45 | 6,700 ▮ |
| 01-00636-00140 | 1.4 | 4.2 | 2.1 | | 1.35 | 12° | 4 | 45 | 6,700 ▮ |
| 01-00636-00150 | 1.5 | 4.5 | 2.3 | | 1.45 | 12° | 4 | 45 | 4,900 |
| 01-00636-00160 | 1.6 | 4.8 | 2.4 | | 1.55 | 12° | 4 | 45 | 6,700 ▮ |
| 01-00636-00170 | 1.7 | 5.1 | 2.6 | | 1.65 | 12° | 4 | 45 | 6,700 ▮ |
| 01-00636-00180 | 1.8 | 5.4 | 2.7 | | 1.74 | 12° | 4 | 45 | 6,700 ▮ |
| 01-00636-00190 | 1.9 | 5.7 | 2.9 | | 1.84 | 12° | 4 | 45 | 6,700 ▮ |
| 01-00636-00200 | 2 | 6 | 3 | | 1.94 | 12° | 4 | 45 | 4,900 |
| ◆ 01-00636-00202 | 2 | 10 | 3 | | 1.94 | 12° | 4 | 60 | 5,600 |
| 01-00636-00210 | 2.1 | 6.3 | 3.2 | | 2 | 12° | 4 | 45 | 6,700 ▮ |
| 01-00636-00220 | 2.2 | 6.6 | 3.3 | | 2.1 | 12° | 4 | 45 | 6,700 ▮ |
| 01-00636-00230 | 2.3 | 6.9 | 3.5 | | 2.2 | 12° | 4 | 45 | 6,700 ▮ |
| 01-00636-00240 | 2.4 | 7.2 | 3.6 | | 2.3 | 12° | 4 | 45 | 6,700 ▮ |
| 01-00636-00250 | 2.5 | 7.5 | 3.8 | | 2.4 | 12° | 4 | 45 | 4,900 |
| 01-00636-00260 | 2.6 | 7.8 | 3.9 | | 2.45 | 12° | 6 | 55 | 8,200 ▮ |
| 01-00636-00270 | 2.7 | 8.1 | 4.1 | | 2.55 | 12° | 6 | 55 | 8,200 ▮ |
| 01-00636-00280 | 2.8 | 8.4 | 4.2 | | 2.65 | 12° | 6 | 55 | 8,200 ▮ |
| 01-00636-00290 | 2.9 | 8.7 | 4.4 | | 2.75 | 12° | 6 | 55 | 8,200 ▮ |
| 01-00636-00300 | 3 | 9 | 4.5 | | 2.85 | 12° | 6 | 55 | 5,900 |
| ◆ 01-00636-00302 | 3 | 15 | 4.5 | | 2.85 | 12° | 6 | 60 | 6,800 |
| 01-00636-00310 | 3.1 | 9.3 | 4.7 | | 2.95 | 12° | 6 | 55 | 8,200 ▮ |
| 01-00636-00320 | 3.2 | 9.6 | 4.8 | | 3.05 | 12° | 6 | 55 | 8,200 ▮ |

オーダー方法

ALZ345 刃径(D)を指示してください。
When you order, indicate ALZ345 (D).

※(γ)は参考値です。
※(γ) is reference value.

- 切削条件表はD-150に記載
- Recommended Milling Conditions are shown on page D-150.
- ▮の規格・サイズは特定商社在庫となります。詳しくはお問い合わせください。
- ▮:Semi-standard item, please inquire for price and delivery.



ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | 形状 Type | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00636-00330 | 3.3 | 9.9 | 5 | | 3.15 | 12° | 6 | 55 | 8,200 |
| 01-00636-00340 | 3.4 | 10.2 | 5.1 | | 3.25 | 12° | 6 | 55 | 8,200 |
| 01-00636-00350 | 3.5 | 10.5 | 5.3 | | 3.35 | 12° | 6 | 55 | 7,200 |
| 01-00636-00360 | 3.6 | 10.8 | 5.4 | | 3.45 | 12° | 6 | 55 | 8,200 |
| 01-00636-00370 | 3.7 | 11.1 | 5.6 | | 3.55 | 12° | 6 | 55 | 8,200 |
| 01-00636-00380 | 3.8 | 11.4 | 5.7 | | 3.65 | 12° | 6 | 55 | 8,200 |
| 01-00636-00390 | 3.9 | 11.7 | 5.9 | | 3.75 | 12° | 6 | 55 | 8,200 |
| 01-00636-00400 | 4 | 12 | 6 | | 3.8 | 12° | 6 | 55 | 6,100 |
| ◆ 01-00636-00402 | 4 | 20 | 6 | | 3.8 | 12° | 6 | 70 | 7,600 |
| 01-00636-00410 | 4.1 | 12.3 | 6.2 | | 3.9 | 12° | 6 | 55 | 8,600 |
| 01-00636-00420 | 4.2 | 12.6 | 6.3 | | 4 | 12° | 6 | 55 | 8,600 |
| 01-00636-00430 | 4.3 | 12.9 | 6.5 | | 4.1 | 12° | 6 | 55 | 8,600 |
| 01-00636-00440 | 4.4 | 13.2 | 6.6 | | 4.2 | 12° | 6 | 55 | 8,600 |
| 01-00636-00450 | 4.5 | 13.5 | 6.8 | | 4.3 | 12° | 6 | 55 | 7,600 |
| 01-00636-00460 | 4.6 | 13.8 | 6.9 | Ⅱ | 4.4 | 12° | 6 | 55 | 8,600 |
| 01-00636-00470 | 4.7 | 14.1 | 7.1 | | 4.5 | 12° | 6 | 55 | 8,600 |
| 01-00636-00480 | 4.8 | 14.4 | 7.2 | | 4.6 | 12° | 6 | 55 | 8,600 |
| 01-00636-00490 | 4.9 | 14.7 | 7.4 | | 4.7 | 12° | 6 | 55 | 8,600 |
| 01-00636-00500 | 5 | 15 | 7.5 | | 4.8 | 12° | 6 | 55 | 6,600 |
| ◆ 01-00636-00502 | 5 | 25 | 7.5 | | 4.8 | 12° | 6 | 80 | 8,400 |
| 01-00636-00510 | 5.1 | 15.3 | 7.7 | | 4.9 | 12° | 6 | 55 | 9,300 |
| 01-00636-00520 | 5.2 | 15.6 | 7.8 | | 5 | 12° | 6 | 55 | 9,300 |
| 01-00636-00530 | 5.3 | 15.9 | 8 | | 5.1 | 12° | 6 | 55 | 9,300 |
| 01-00636-00540 | 5.4 | 16.2 | 8.1 | | 5.2 | 12° | 6 | 55 | 9,300 |
| 01-00636-00550 | 5.5 | 16.5 | 8.3 | | 5.3 | 12° | 6 | 55 | 8,300 |
| 01-00636-00560 | 5.6 | 16.8 | 8.4 | | 5.4 | 12° | 6 | 55 | 9,300 |
| 01-00636-00570 | 5.7 | 17.1 | 8.6 | | 5.5 | 12° | 6 | 55 | 9,300 |
| 01-00636-00580 | 5.8 | 17.4 | 8.7 | | 5.6 | 12° | 6 | 55 | 9,300 |
| 01-00636-00590 | 5.9 | 17.7 | 8.9 | | 5.7 | 12° | 6 | 55 | 9,300 |
| ◆ 01-00636-00603 | 6 | – | 9 | Ⅰ | – | – | 6 | 110 | 9,600 |
| 01-00636-00600 | 6 | 18 | 9 | | 5.8 | – | 6 | 60 | 6,900 |
| ◆ 01-00636-00602 | 6 | 30 | 9 | | 5.8 | – | 6 | 80 | 8,800 |
| 01-00636-00610 | 6.1 | 18.3 | 9.2 | | 5.9 | 12° | 8 | 70 | 14,100 |
| 01-00636-00620 | 6.2 | 18.6 | 9.3 | | 6 | 12° | 8 | 70 | 14,100 |
| 01-00636-00630 | 6.3 | 18.9 | 9.5 | | 6.1 | 12° | 8 | 70 | 14,100 |
| 01-00636-00640 | 6.4 | 19.2 | 9.6 | | 6.2 | 12° | 8 | 70 | 14,100 |
| 01-00636-00650 | 6.5 | 19.5 | 9.8 | | 6.3 | 12° | 8 | 70 | 14,100 |
| 01-00636-00660 | 6.6 | 19.8 | 9.9 | | 6.4 | 12° | 8 | 70 | 14,100 |
| 01-00636-00670 | 6.7 | 20.1 | 10.1 | | 6.5 | 12° | 8 | 70 | 14,100 |
| 01-00636-00680 | 6.8 | 20.4 | 10.2 | | 6.6 | 12° | 8 | 70 | 14,100 |
| 01-00636-00690 | 6.9 | 20.7 | 10.4 | Ⅱ | 6.7 | 12° | 8 | 70 | 14,100 |
| 01-00636-00700 | 7 | 21 | 10.5 | | 6.8 | 12° | 8 | 70 | 10,200 |
| 01-00636-00710 | 7.1 | 21.3 | 10.7 | | 6.9 | 12° | 8 | 70 | 14,100 |
| 01-00636-00720 | 7.2 | 21.6 | 10.8 | | 7 | 12° | 8 | 70 | 14,100 |
| 01-00636-00730 | 7.3 | 21.9 | 11 | | 7.1 | 12° | 8 | 70 | 14,100 |
| 01-00636-00740 | 7.4 | 22.2 | 11.1 | | 7.2 | 12° | 8 | 70 | 14,100 |
| 01-00636-00750 | 7.5 | 22.5 | 11.3 | | 7.3 | 12° | 8 | 70 | 14,100 |
| 01-00636-00760 | 7.6 | 22.8 | 11.4 | | 7.4 | 12° | 8 | 70 | 14,100 |
| 01-00636-00770 | 7.7 | 23.1 | 11.6 | | 7.5 | 12° | 8 | 70 | 14,100 |
| 01-00636-00780 | 7.8 | 23.4 | 11.7 | | 7.6 | 12° | 8 | 70 | 14,100 |

# ALZ345

New

## アルミ用高能率エンドミル
3-Flute Power "Z" End Mill for Aluminum

◆ New サイズ

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | 形状 Type | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00636-00790 | 7.9 | 23.7 | 11.9 | Ⅱ | 7.7 | 12° | 8 | 70 | 14,100 ▌ |
| ◆ 01-00636-00803 | 8 | – | 12 | Ⅰ | – | – | 8 | 120 | 15,300 |
| 01-00636-00800 | 8 | 24 | 12 | Ⅱ | 7.8 | – | 8 | 70 | 10,200 |
| ◆ 01-00636-00802 | 8 | 40 | 12 | Ⅱ | 7.8 | – | 8 | 90 | 13,200 |
| 01-00636-00810 | 8.1 | 24.3 | 12.2 | Ⅱ | 7.9 | 12° | 10 | 75 | 17,900 ▌ |
| 01-00636-00820 | 8.2 | 24.6 | 12.3 | Ⅱ | 8 | 12° | 10 | 75 | 17,900 ▌ |
| 01-00636-00830 | 8.3 | 24.9 | 12.5 | Ⅱ | 8.1 | 12° | 10 | 75 | 17,900 ▌ |
| 01-00636-00840 | 8.4 | 25.2 | 12.6 | Ⅱ | 8.2 | 12° | 10 | 75 | 17,900 ▌ |
| 01-00636-00850 | 8.5 | 25.5 | 12.8 | Ⅱ | 8.3 | 12° | 10 | 75 | 17,900 ▌ |
| 01-00636-00860 | 8.6 | 25.8 | 12.9 | Ⅱ | 8.4 | 12° | 10 | 75 | 17,900 ▌ |
| 01-00636-00870 | 8.7 | 26.1 | 13.1 | Ⅱ | 8.5 | 12° | 10 | 75 | 17,900 ▌ |
| 01-00636-00880 | 8.8 | 26.4 | 13.2 | Ⅱ | 8.6 | 12° | 10 | 75 | 17,900 ▌ |
| 01-00636-00890 | 8.9 | 26.7 | 13.4 | Ⅱ | 8.7 | 12° | 10 | 75 | 17,900 ▌ |
| 01-00636-00900 | 9 | 27 | 13.5 | Ⅱ | 8.8 | 12° | 10 | 75 | 12,800 |
| 01-00636-00910 | 9.1 | 27.3 | 13.7 | Ⅱ | 8.9 | 12° | 10 | 75 | 17,900 ▌ |
| 01-00636-00920 | 9.2 | 27.6 | 13.8 | Ⅱ | 9 | 12° | 10 | 75 | 17,900 ▌ |
| 01-00636-00930 | 9.3 | 27.9 | 14 | Ⅱ | 9.1 | 12° | 10 | 75 | 17,900 ▌ |
| 01-00636-00940 | 9.4 | 28.2 | 14.1 | Ⅱ | 9.2 | 12° | 10 | 75 | 17,900 ▌ |
| 01-00636-00950 | 9.5 | 28.5 | 14.3 | Ⅱ | 9.3 | 12° | 10 | 75 | 17,900 ▌ |
| 01-00636-00960 | 9.6 | 28.8 | 14.4 | Ⅱ | 9.4 | 12° | 10 | 75 | 17,900 ▌ |
| 01-00636-00970 | 9.7 | 29.1 | 14.6 | Ⅱ | 9.5 | 12° | 10 | 75 | 17,900 ▌ |
| 01-00636-00980 | 9.8 | 29.4 | 14.7 | Ⅱ | 9.6 | 12° | 10 | 75 | 17,900 ▌ |
| 01-00636-00990 | 9.9 | 29.7 | 14.9 | Ⅱ | 9.7 | 12° | 10 | 75 | 17,900 ▌ |
| ◆ 01-00636-01003 | 10 | – | 15 | Ⅰ | – | – | 10 | 130 | 22,300 |
| 01-00636-01000 | 10 | 30 | 15 | Ⅱ | 9.8 | – | 10 | 75 | 12,800 |
| ◆ 01-00636-01002 | 10 | 50 | 15 | Ⅱ | 9.8 | – | 10 | 100 | 16,700 |
| 01-00636-01010 | 10.1 | 30.3 | 15.2 | Ⅱ | 9.9 | 12° | 12 | 80 | 25,300 ▌ |
| 01-00636-01020 | 10.2 | 30.6 | 15.3 | Ⅱ | 10 | 12° | 12 | 80 | 25,300 ▌ |
| 01-00636-01030 | 10.3 | 30.9 | 15.5 | Ⅱ | 10.1 | 12° | 12 | 80 | 25,300 ▌ |
| 01-00636-01040 | 10.4 | 31.2 | 15.6 | Ⅱ | 10.2 | 12° | 12 | 80 | 25,300 ▌ |
| 01-00636-01050 | 10.5 | 31.5 | 15.8 | Ⅱ | 10.3 | 12° | 12 | 80 | 25,300 ▌ |
| 01-00636-01060 | 10.6 | 31.8 | 15.9 | Ⅱ | 10.4 | 12° | 12 | 80 | 25,300 ▌ |
| 01-00636-01070 | 10.7 | 32.1 | 16.1 | Ⅱ | 10.5 | 12° | 12 | 80 | 25,300 ▌ |
| 01-00636-01080 | 10.8 | 32.4 | 16.2 | Ⅱ | 10.6 | 12° | 12 | 80 | 25,300 ▌ |
| 01-00636-01090 | 10.9 | 32.7 | 16.4 | Ⅱ | 10.7 | 12° | 12 | 80 | 25,300 ▌ |
| 01-00636-01100 | 11 | 33 | 16.5 | Ⅱ | 10.8 | 12° | 12 | 80 | 18,000 |
| 01-00636-01110 | 11.1 | 33.3 | 16.7 | Ⅱ | 10.9 | 12° | 12 | 80 | 25,300 ▌ |
| 01-00636-01120 | 11.2 | 33.6 | 16.8 | Ⅱ | 11 | 12° | 12 | 80 | 25,300 ▌ |
| 01-00636-01130 | 11.3 | 33.9 | 17 | Ⅱ | 11.1 | 12° | 12 | 80 | 25,300 ▌ |
| 01-00636-01140 | 11.4 | 34.2 | 17.1 | Ⅱ | 11.2 | 12° | 12 | 80 | 25,300 ▌ |
| 01-00636-01150 | 11.5 | 34.5 | 17.3 | Ⅱ | 11.3 | 12° | 12 | 80 | 25,300 ▌ |
| 01-00636-01160 | 11.6 | 34.8 | 17.4 | Ⅱ | 11.4 | 12° | 12 | 80 | 25,300 ▌ |
| 01-00636-01170 | 11.7 | 35.1 | 17.6 | Ⅱ | 11.5 | 12° | 12 | 80 | 25,300 ▌ |
| 01-00636-01180 | 11.8 | 35.4 | 17.7 | Ⅱ | 11.6 | 12° | 12 | 80 | 25,300 ▌ |
| 01-00636-01190 | 11.9 | 35.7 | 17.9 | Ⅱ | 11.7 | 12° | 12 | 80 | 25,300 ▌ |
| ◆ 01-00636-01203 | 12 | – | 18 | Ⅰ | – | – | 12 | 150 | 29,800 |
| 01-00636-01200 | 12 | 36 | 18 | Ⅱ | 11.8 | – | 12 | 80 | 18,000 |
| ◆ 01-00636-01202 | 12 | 60 | 18 | Ⅱ | 11.8 | – | 12 | 110 | 22,400 |

**オーダー方法** ALZ345 刃径(D)を指示してください。
When you order, indicate ALZ345 (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-150に記載
●Recommended Milling Conditions are shown on page D-150.

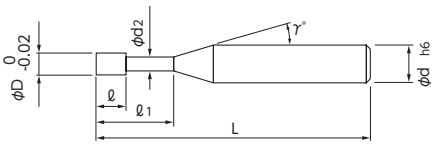
● ▌の規格・サイズは特定商社在庫となります。詳しくはお問い合わせください。
● ▌:Semi-standard item, please inquire for price and delivery.



SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

# ALZ345-DLC

## アルミ用高能率エンドミル（DLCコーティング）
DLC COATING 3-Flute Power "Z" End Mill for Aluminum




●NS 独自の密着性が高い DLC コーティングを採用し、長時間加工に適しています。
●Our original DLC COATING are adopted, it is suitable for cutting for long time.

Plunge Slot Side Face WC DLC 3 45°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ◎ | ○ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (ℓ1)有効長 Effective Length | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00666-00100 | 1 | 1.5 | 3 | 0.95 | 12° | 4 | 45 | 5,900 |
| 01-00666-00150 | 1.5 | 2.3 | 4.5 | 1.45 | 12° | 4 | 45 | 5,900 |
| 01-00666-00200 | 2 | 3 | 6 | 1.94 | 12° | 4 | 45 | 5,900 |
| 01-00666-00250 | 2.5 | 3.8 | 7.5 | 2.4 | 12° | 4 | 45 | 5,900 |
| 01-00666-00300 | 3 | 4.5 | 9 | 2.85 | 12° | 6 | 55 | 7,100 |
| 01-00666-00350 | 3.5 | 5.3 | 10.5 | 3.35 | 12° | 6 | 55 | 8,700 |
| 01-00666-00400 | 4 | 6 | 12 | 3.8 | 12° | 6 | 55 | 7,400 |
| 01-00666-00450 | 4.5 | 6.8 | 13.5 | 4.3 | 12° | 6 | 55 | 9,200 |
| 01-00666-00500 | 5 | 7.5 | 15 | 4.8 | 12° | 6 | 55 | 8,000 |
| 01-00666-00550 | 5.5 | 8.3 | 16.5 | 5.3 | 12° | 6 | 55 | 10,000 |
| 01-00666-00600 | 6 | 9 | 18 | 5.8 | – | 6 | 60 | 8,300 |
| 01-00666-00700 | 7 | 10.5 | 21 | 6.8 | 12° | 8 | 70 | 12,300 |
| 01-00666-00800 | 8 | 12 | 24 | 7.8 | – | 8 | 70 | 12,300 |
| 01-00666-00900 | 9 | 13.5 | 27 | 8.8 | 12° | 10 | 75 | 15,400 |
| 01-00666-01000 | 10 | 15 | 30 | 9.8 | – | 10 | 75 | 15,400 |
| 01-00666-01100 | 11 | 16.5 | 33 | 10.8 | 12° | 12 | 80 | 21,600 |
| 01-00666-01200 | 12 | 18 | 36 | 11.8 | – | 12 | 80 | 23,700 |

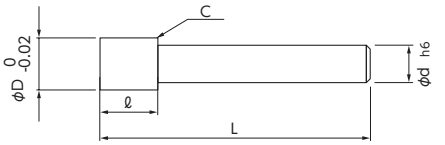
**オーダー方法** ALZ345-DLC 刃径(D)を指示してください。
When you order, indicate ALZ345-DLC (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-151に記載
●Recommended Milling Conditions are shown on page D-151.

# AL-3LS

## アルミ用ロングシャンクエンドミル（アンダーシャンク）

3-Flute Long Shank End Mill for Alminum




●刃径よりシャンク部が細いスリムタイプで、立ち壁加工に対応。
●刃部後端にC面付けを施し、ステップ加工時の段差が最小になる設計。
●Slimmed shank suits side milling.
●Corner-C at flute end effects an accurate side step milling.

Slot Side Face WC 3 45°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| | | | | |

| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|
| | | ◎ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|
| 01-00637-00500 | 5 | 7.5 | 4 | 80 | 8,500 |
| 01-00637-00600 | 6 | 9 | 4 | 80 | 8,500 |
| 01-00637-00800 | 8 | 12 | 6 | 110 | 17,600 |
| 01-00637-01000 | 10 | 15 | 8 | 130 | 21,500 |
| 01-00637-01200 | 12 | 18 | 10 | 150 | 31,900 |

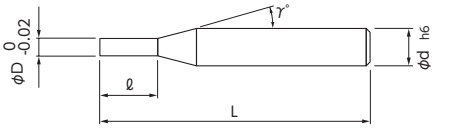
**オーダー方法** AL-3LS 刃径(D)を指示してください。
When you order, indicate AL-3LS (D).

●切削条件表はD-152に記載
●Recommended Milling Conditions are shown on page D-152.

# NEA-2

## アルミ用（非鉄用）エンドミル

2-Flute End Mill for Aluminum




●▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
●▲の規格は在庫が無くなり次第、販売終了となります。
●▌: Semi-standard item, please inquire for price and delivery.
●▲: The sizes will no longer be capable being sold after the stock runs out.

Slot Side Face WC 2 45°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| | | | | |

| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|
| | | ◎ | ◎ | ◎ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00622-00310 | 3 | 10 | 9° | 6 | 50 | 7,000 ▌ |
| 01-00622-00315 | | 15 | 9° | 6 | 55 | 8,300 ▌ |
| 01-00622-00320 | | 20 | 9° | 6 | 60 | 9,200 ▌ |
| 01-00622-00412 | 4 | 12 | 9° | 6 | 50 | 7,500 ▌ |
| 01-00622-00416 | | 16 | 9° | 6 | 55 | 8,300 ▌ |
| 01-00622-00422 | | 22 | 9° | 6 | 60 | 9,200 ▌ |
| 01-00622-00514 | 5 | 14 | 9° | 6 | 55 | 8,300 ▌ |
| 01-00622-00522 | | 22 | 9° | 6 | 60 | 9,200 ▌ |
| 01-00622-00528 | | 28 | 9° | 6 | 65 | 10,300 ▌ |
| 01-00622-00616 | 6 | 16 | – | 6 | 55 | 8,700 ▌ |
| 01-00622-00622 | | 22 | – | 6 | 60 | 9,300 ▌ |
| 01-00622-00630 | | 30 | – | 6 | 70 | 10,800 ▌ |
| ▲ 01-00622-00822 | 8 | 22 | – | 8 | 70 | 13,400 ▌ |
| ▲ 01-00622-00828 | | 28 | – | 8 | 75 | 16,200 ▌ |
| ▲ 01-00622-00836 | | 36 | – | 8 | 90 | 19,000 ▌ |
| ▲ 01-00622-01026 | 10 | 26 | – | 10 | 75 | 17,700 ▌ |
| ▲ 01-00622-01036 | | 36 | – | 10 | 85 | 21,700 ▌ |
| ▲ 01-00622-01046 | | 46 | – | 10 | 95 | 24,300 ▌ |
| ▲ 01-00622-01228 | 12 | 28 | – | 12 | 80 | 26,700 ▌ |
| ▲ 01-00622-01238 | | 38 | – | 12 | 90 | 32,700 ▌ |
| ▲ 01-00622-01248 | | 48 | – | 12 | 100 | 34,800 ▌ |
| ▲ 01-00622-01640 | 16 | 40 | – | 16 | 100 | 57,800 ▌ |
| ▲ 01-00622-01665 | | 65 | – | 16 | 130 | 80,000 ▌ |
| ▲ 01-00622-02045 | 20 | 45 | – | 20 | 110 | 90,000 ▌ |
| ▲ 01-00622-02080 | | 80 | – | 20 | 140 | 122,300 ▌ |
| ▲ 01-00622-02550 | 25 | 50 | – | 25 | 120 | 148,900 ▌ |

**オーダー方法** NEA-2 刃径(D)×刃長(ℓ)を指示してください。
When you order, indicate NEA-2 (D)×(ℓ).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-153に記載
●Recommended Milling Conditions are shown on page D-153.



ŞEVKET OĞLU MAKINA TICARET VE SAN. LTD. ŞTİ.

# AL2D-2・AL2D-2DLC

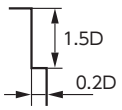
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | アルミニウム Aluminum A1070 | | | | アルミニウム合金 Aluminum Alloy A2017・A5052・A7075 | | | | 鋳造アルミニウム Aluminum Cast AC8C | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 340m/min | | 270m/min | | 380m/min | | 300m/min | | 280m/min | | 200m/min | |
| 刃径 Dia. | 側面 Side Milling | | 溝 Slotting | | 側面 Side Milling | | 溝 Slotting | | 側面 Side Milling | | 溝 Slotting | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 0.5 | 20,000 | 400 | 20,000 | 200 | 20,000 | 400 | 20,000 | 300 | 20,000 | 400 | 20,000 | 300 |
| 1 | 20,000 | 700 | 20,000 | 400 | 20,000 | 700 | 20,000 | 400 | 20,000 | 700 | 20,000 | 400 |
| 1.5 | 20,000 | 800 | 20,000 | 500 | 20,000 | 800 | 20,000 | 500 | 20,000 | 800 | 20,000 | 500 |
| 2 | 20,000 | 1,000 | 20,000 | 600 | 20,000 | 1,000 | 20,000 | 600 | 20,000 | 1,000 | 20,000 | 600 |
| 2.5 | 20,000 | 1,200 | 20,000 | 700 | 20,000 | 1,200 | 20,000 | 700 | 20,000 | 1,200 | 20,000 | 700 |
| 3 | 20,000 | 1,300 | 20,000 | 800 | 20,000 | 1,500 | 20,000 | 900 | 20,000 | 1,500 | 20,000 | 800 |
| 4 | 20,000 | 1,500 | 20,000 | 900 | 20,000 | 1,700 | 20,000 | 1,100 | 20,000 | 1,700 | 15,900 | 800 |
| 5 | 20,000 | 1,700 | 17,200 | 900 | 20,000 | 2,000 | 19,100 | 1,300 | 17,800 | 1,700 | 12,700 | 800 |
| 6 | 18,000 | 1,800 | 14,300 | 900 | 20,000 | 2,200 | 15,900 | 1,300 | 14,900 | 1,700 | 10,600 | 800 |
| 7 | 15,500 | 1,800 | 12,300 | 900 | 17,300 | 2,300 | 13,600 | 1,300 | 12,700 | 1,700 | 9,100 | 800 |
| 8 | 13,500 | 1,800 | 10,700 | 1,000 | 15,100 | 2,400 | 11,900 | 1,300 | 11,100 | 1,800 | 8,000 | 800 |
| 9 | 12,000 | 1,800 | 9,600 | 1,000 | 13,400 | 2,400 | 10,600 | 1,300 | 9,900 | 1,800 | 7,100 | 800 |
| 10 | 10,800 | 1,800 | 8,600 | 1,000 | 12,100 | 2,400 | 9,600 | 1,300 | 8,900 | 1,800 | 6,400 | 800 |
| 11 | 9,800 | 1,900 | 7,800 | 1,000 | 11,000 | 2,500 | 8,700 | 1,300 | 8,100 | 1,800 | 5,800 | 800 |
| 12 | 9,000 | 2,000 | 7,200 | 1,100 | 10,100 | 2,500 | 8,000 | 1,400 | 7,400 | 1,800 | 5,300 | 900 |

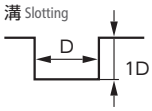
切り込み量 Depth of Cut

(D:刃径 Dia.)

側面 Side Milling




溝 Slotting




備考 Notes

※回転数と送り速度は、同じ割合で調整してください。
（主軸回転数を 20,000 回転以上で使用する場合も同様に調整してください。）
※機械、チャックは剛性のある精度の高い物を使用してください。
※ワークや機械、ミーリングチャックにより振動、または異音が発生する場合は切削条件を変更してください。
※水溶性切削油のご使用をお奨めします。
※ Adjust both the spindle speed and feed at the same rate.
(When using spindle speed 20,000 or more, the same adjustment is required.)
※ Use a rigid and precise machine and chuck holder.
※ Adjust milling conditions when vibration and abnormal sounds occur according to the rigidity of the machine and the chuck holder, or work clamping condition.
※ Water soluble cutting fluid is recommended.

# AL3D-2・AL3D-2DLC

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-027

| 被削材 Work Material | アルミニウム Aluminum A1070 | | | | アルミニウム合金 Aluminum Alloy A2017・A5052・A7075 | | | | 鋳造アルミニウム Aluminum Cast AC8C | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 300m/min | | 220m/min | | 330m/min | | 240m/min | | 250m/min | | 160m/min | |
| 刃径 Dia. | 側面 Side Milling | | 溝 Slotting | | 側面 Side Milling | | 溝 Slotting | | 側面 Side Milling | | 溝 Slotting | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 20,000 | 400 | 20,000 | 300 | 20,000 | 400 | 20,000 | 300 | 20,000 | 400 | 20,000 | 300 |
| 1.5 | 20,000 | 500 | 20,000 | 400 | 20,000 | 500 | 20,000 | 400 | 20,000 | 500 | 20,000 | 400 |
| 2 | 20,000 | 600 | 20,000 | 400 | 20,000 | 600 | 20,000 | 400 | 20,000 | 600 | 20,000 | 400 |
| 2.5 | 20,000 | 700 | 20,000 | 500 | 20,000 | 700 | 20,000 | 500 | 20,000 | 700 | 20,000 | 500 |
| 3 | 20,000 | 900 | 20,000 | 600 | 20,000 | 900 | 20,000 | 600 | 20,000 | 900 | 17,000 | 500 |
| 4 | 20,000 | 1,000 | 17,500 | 700 | 20,000 | 1,000 | 19,000 | 750 | 20,000 | 1,000 | 13,000 | 500 |
| 5 | 19,000 | 1,000 | 14,000 | 700 | 20,000 | 1,200 | 15,500 | 750 | 16,000 | 1,000 | 10,000 | 500 |
| 6 | 16,000 | 1,100 | 11,500 | 700 | 17,500 | 1,400 | 12,500 | 750 | 13,500 | 1,000 | 8,500 | 500 |
| 7 | 13,500 | 1,100 | 10,000 | 750 | 15,000 | 1,500 | 11,000 | 800 | 11,500 | 1,100 | 7,300 | 500 |
| 8 | 12,000 | 1,100 | 8,800 | 750 | 13,000 | 1,600 | 9,600 | 800 | 9,900 | 1,200 | 6,400 | 500 |
| 9 | 11,000 | 1,100 | 7,800 | 750 | 11,700 | 1,600 | 8,500 | 800 | 8,800 | 1,200 | 5,700 | 500 |
| 10 | 9,600 | 1,100 | 7,000 | 800 | 10,500 | 1,700 | 7,600 | 850 | 8,000 | 1,300 | 5,100 | 550 |
| 11 | 8,700 | 1,100 | 6,400 | 800 | 9,600 | 1,700 | 6,900 | 850 | 7,200 | 1,300 | 4,600 | 550 |
| 12 | 8,000 | 1,200 | 5,800 | 800 | 8,800 | 1,700 | 6,400 | 900 | 6,600 | 1,300 | 4,200 | 600 |

切り込み量 Depth of Cut (D:刃径 Dia.)

備考 Notes

※回転数と送り速度は、同じ割合で調整してください。
(主軸回転数を 20,000 回転以上で使用する場合も同様に調整してください。)
※機械、チャックは剛性のある精度の高い物を使用してください。
※ワークや機械、ミーリングチャックにより振動、または異音が発生する場合は切削条件を変更してください。
※水溶性切削油のご使用をお奨めします。

※ Adjust both spindle speed and feed at the same rate.
(When using spindle speed 20,000 or more, the same adjustment is required.)
※ Use a rigid and precise machine and chuck holder.
※ Adjust milling conditions when vibration and abnormal sounds occur by the conditions of the machine, chuck holder and work clamping.
※ Water soluble cutting fluid is recommended.



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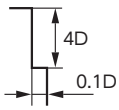
# AL4D-2・AL4D-2DLC

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | アルミニウム Aluminum A1070 | | アルミニウム合金 Aluminum Alloy A2017・A5052・A7075 | | 鋳造アルミニウム Aluminum Cast AC8C | |
|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 190m/min | | 280m/min | | 150m/min | |
| 刃径 Dia. | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 20,000 | 220 | 20,000 | 220 | 20,000 | 220 |
| 1.5 | 20,000 | 270 | 20,000 | 270 | 20,000 | 320 |
| 2 | 20,000 | 320 | 20,000 | 320 | 20,000 | 340 |
| 2.5 | 20,000 | 430 | 20,000 | 430 | 18,500 | 400 |
| 3 | 20,000 | 570 | 20,000 | 570 | 15,000 | 520 |
| 4 | 15,500 | 650 | 20,000 | 840 | 11,500 | 520 |
| 5 | 12,000 | 840 | 17,500 | 900 | 9,100 | 520 |
| 6 | 10,200 | 840 | 14,500 | 1,050 | 7,700 | 520 |
| 7 | 8,800 | 840 | 12,600 | 1,150 | 6,600 | 580 |
| 8 | 7,700 | 840 | 11,000 | 1,150 | 5,800 | 650 |
| 9 | 6,800 | 900 | 9,700 | 1,300 | 5,200 | 720 |
| 10 | 6,100 | 900 | 8,800 | 1,300 | 4,600 | 720 |
| 11 | 5,500 | 980 | 8,000 | 1,450 | 4,200 | 720 |
| 12 | 5,200 | 1,050 | 7,300 | 1,450 | 3,800 | 780 |

切り込み量 Depth of Cut (D:刃径 Dia.)

側面 Side Milling



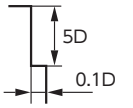

備考 Notes

※回転数と送り速度は、同じ割合で調整してください。
（主軸回転数を 20,000 回転以上で使用する場合も同様に調整してください。）
※機械、チャックは剛性のある精度の高い物を使用してください。
※ワークや機械、ミーリングチャックにより振動、または異音が発生する場合は切削条件を変更してください。
※水溶性切削油のご使用をお奨めします。
※ Adjust both spindle speed and feed at the same rate.
(When using spindle speed 20,000 or more, the same adjustment is required.)
※ Use a rigid and precise machine and chuck holder.
※ Adjust milling conditions when vibration and abnormal sounds occur by the conditions of the machine, chuck holder and work clamping.
※ Water soluble cutting fluid is recommended.

# AL5D-2・AL5D-2DLC

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-026

| 被削材 Work Material | アルミニウム Aluminum A1070 | | アルミニウム合金 Aluminum Alloy A2017・A5052・A7075 | | 鋳造アルミニウム Aluminum Cast AC8C | |
|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 160m/min | | 230m/min | | 120m/min | |
| 刃径 Dia. | 側面 Side Milling | | 側面 Side Milling | | 側面 Side Milling | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 20,000 | 200 | 20,000 | 200 | 20,000 | 200 |
| 1.5 | 20,000 | 250 | 20,000 | 250 | 20,000 | 300 |
| 2 | 20,000 | 300 | 20,000 | 300 | 19,000 | 300 |
| 2.5 | 20,000 | 400 | 20,000 | 400 | 15,300 | 300 |
| 3 | 17,000 | 450 | 20,000 | 450 | 12,700 | 400 |
| 4 | 12,700 | 500 | 18,000 | 700 | 9,600 | 400 |
| 5 | 10,000 | 650 | 14,600 | 700 | 7,600 | 400 |
| 6 | 8,500 | 650 | 12,000 | 800 | 6,400 | 400 |
| 7 | 7,300 | 650 | 10,500 | 900 | 5,500 | 450 |
| 8 | 6,400 | 650 | 9,100 | 900 | 4,800 | 500 |
| 9 | 5,700 | 700 | 8,100 | 1,000 | 4,300 | 550 |
| 10 | 5,100 | 700 | 7,300 | 1,000 | 3,800 | 550 |
| 11 | 4,600 | 750 | 6,700 | 1,100 | 3,500 | 550 |
| 12 | 4,300 | 800 | 6,100 | 1,100 | 3,200 | 600 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   | | | | | |
| 備考 Notes | ※回転数と送り速度は、同じ割合で調整してください。<br>(主軸回転数を 20,000 回転以上で使用する場合も同様に調整してください。)<br>※機械、チャックは剛性のある精度の高い物を使用してください。<br>※ワークや機械、ミーリングチャックにより振動、または異音が発生する場合は切削条件を変更してください。<br>※水溶性切削油のご使用をお奨めします。<br>※ Adjust both spindle speed and feed at the same rate.<br>(When using spindle speed 20,000 or more, the same adjustment is required.)<br>※ Use a rigid and precise machine and chuck holder.<br>※ Adjust milling conditions when vibration and abnormal sounds occur by the conditions of the machine, chuck holder and work clamping.<br>※ Water soluble cutting fluid is recommended. | | | | | |



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# AL3D-345

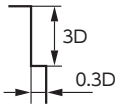
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | アルミニウム Aluminum A1070 | | | | | | アルミニウム合金 Aluminum Alloy A2017･A5052･A7075 | | | | | | 鋳造アルミニウム Aluminum Cast AC8C | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 300m/min | | 220m/min | | 220m/min | | 330m/min | | 240m/min | | 240m/min | | 250m/min | | 160m/min | | 160m/min | |
| 刃径 Dia. | 側面 Side Milling | | 溝 Slotting | | 突込み Drilling | | 側面 Side Milling | | 溝 Slotting | | 突込み Drilling | | 側面 Side Milling | | 溝 Slotting | | 突込み Drilling | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 20,000 | 1,200 | 20,000 | 500 | 20,000 | 100 | 20,000 | 1,200 | 20,000 | 500 | 20,000 | 100 | 20,000 | 1,200 | 20,000 | 500 | 20,000 | 80 |
| 2 | 20,000 | 1,800 | 20,000 | 700 | 20,000 | 150 | 20,000 | 1,800 | 20,000 | 700 | 20,000 | 150 | 20,000 | 1,800 | 20,000 | 700 | 20,000 | 130 |
| 3 | 20,000 | 2,000 | 20,000 | 1,000 | 20,000 | 150 | 20,000 | 2,000 | 20,000 | 1,000 | 20,000 | 150 | 20,000 | 2,000 | 17,000 | 850 | 17,000 | 130 |
| 4 | 20,000 | 2,200 | 17,500 | 1,100 | 17,500 | 150 | 20,000 | 2,200 | 19,000 | 1,100 | 19,000 | 200 | 20,000 | 2,200 | 13,000 | 850 | 13,000 | 100 |
| 5 | 19,000 | 2,200 | 14,000 | 1,100 | 14,000 | 150 | 20,000 | 2,700 | 15,500 | 1,200 | 15,500 | 200 | 16,000 | 2,200 | 10,000 | 850 | 10,000 | 80 |
| 6 | 16,000 | 2,200 | 11,500 | 1,100 | 11,500 | 150 | 17,500 | 3,000 | 12,500 | 1,300 | 12,500 | 200 | 13,500 | 2,200 | 8,500 | 850 | 8,500 | 80 |
| 8 | 12,000 | 2,200 | 9,000 | 1,200 | 9,000 | 100 | 13,000 | 3,000 | 9,500 | 1,400 | 9,500 | 200 | 10,000 | 2,300 | 6,500 | 850 | 6,500 | 60 |
| 10 | 9,500 | 2,200 | 7,000 | 1,300 | 7,000 | 70 | 10,500 | 3,250 | 7,500 | 1,500 | 7,500 | 150 | 8,000 | 2,500 | 5,000 | 900 | 5,000 | 50 |
| 12 | 8,000 | 2,400 | 6,000 | 1,400 | 6,000 | 70 | 9,000 | 3,350 | 6,500 | 1,600 | 6,500 | 150 | 6,500 | 2,600 | 4,000 | 1,000 | 4,000 | 50 |

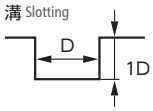
切り込み量 Depth of Cut

(D:刃径 Dia.)

側面 Side Milling




溝 Slotting




備考 Notes

※回転数と送り速度は、同じ割合で調整してください。
(主軸回転数を 20,000 回転以上で使用する場合も同様に調整してください。)
※機械、チャックは剛性のある精度の高い物を使用してください。
※ワークや機械、ミーリングチャックにより振動、または異音が発生する場合は切削条件を変更してください。
※突込み加工時に切りくずが詰まりやすい場合は、ステップ送りをしてください。
※水溶性切削油のご使用をお奨めします。
※ Adjust both spindle speed and feed at the same rate.
(When using spindle speed 20,000 or more, the same adjustment is required.)
※ Use a rigid and precise machine and chuck holder.
※ Adjust milling conditions when vibration and abnormal sounds occur by the conditions of the machine, chuck holder and work clamping.
※ When tending to have chip packing during drilling, step milling is recommended.
※ Water soluble cutting fluid is recommended.

# ALZ345

## 切削条件参考表 Recommended Milling Conditions

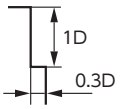
技術資料 K-026

| 被削材 Work Material | | アルミニウム Aluminum A1070 | | | | アルミニウム合金 Aluminum Alloy A2017・A5052・A7075 | | | | 鋳造アルミニウム Aluminum Cast AC8C | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | | 310m/min | | | | 350m/min | | | | 230m/min | | | |
| 刃径 Dia. | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed 突込み Drilling | 送り速度 Feed 溝 Slotting | 送り速度 Feed 側面 Side Milling | 回転数 Spindle Speed | 送り速度 Feed 突込み Drilling | 送り速度 Feed 溝 Slotting | 送り速度 Feed 側面 Side Milling | 回転数 Spindle Speed | 送り速度 Feed 突込み Drilling | 送り速度 Feed 溝 Slotting | 送り速度 Feed 側面 Side Milling |
| | | $min^{-1}$ | mm/min | | | $min^{-1}$ | mm/min | | | $min^{-1}$ | mm/min | | |
| 1 | 3 | 20,000 | 200 | 600 | 1,100 | 20,000 | 200 | 600 | 1,100 | 20,000 | 150 | 600 | 1,100 |
| | 5 | 16,000 | 160 | 500 | 900 | 16,000 | 160 | 500 | 900 | 16,000 | 120 | 500 | 900 |
| 2 | 6 | 20,000 | 300 | 900 | 1,500 | 20,000 | 300 | 900 | 1,500 | 20,000 | 250 | 900 | 1,500 |
| | 10 | 16,000 | 240 | 800 | 1,200 | 16,000 | 240 | 800 | 1,200 | 16,000 | 200 | 800 | 1,200 |
| 3 | 9 | 20,000 | 300 | 1,200 | 2,000 | 20,000 | 300 | 1,400 | 2,200 | 20,000 | 250 | 1,200 | 2,200 |
| | 15 | 16,000 | 240 | 1,000 | 1,600 | 16,000 | 240 | 1,200 | 1,800 | 16,000 | 200 | 1,000 | 1,800 |
| 4 | 12 | 20,000 | 300 | 1,400 | 2,200 | 20,000 | 400 | 1,800 | 2,500 | 18,300 | 200 | 1,400 | 2,300 |
| | 20 | 16,000 | 240 | 1,200 | 1,800 | 16,000 | 320 | 1,500 | 2,000 | 14,600 | 160 | 1,200 | 1,900 |
| 5 | 15 | 19,700 | 300 | 1,500 | 2,500 | 20,000 | 400 | 2,200 | 3,100 | 14,600 | 150 | 1,400 | 2,100 |
| | 25 | 15,700 | 240 | 1,200 | 2,000 | 16,000 | 320 | 1,800 | 2,500 | 11,700 | 120 | 1,200 | 1,700 |
| 6 | – | 16,500 | 300 | 1,600 | 2,500 | 18,600 | 400 | 2,500 | 3,500 | 12,200 | 150 | 1,400 | 2,100 |
| | 18 | 16,500 | 300 | 1,600 | 2,500 | 18,600 | 400 | 2,500 | 3,500 | 12,200 | 150 | 1,400 | 2,100 |
| | 30 | 13,200 | 240 | 1,300 | 2,000 | 14,800 | 320 | 2,000 | 2,800 | 9,700 | 120 | 1,200 | 1,700 |
| 7 | 21 | 14,100 | 200 | 1,600 | 2,500 | 15,900 | 400 | 2,500 | 3,500 | 10,500 | 140 | 1,400 | 2,100 |
| 8 | – | 12,300 | 200 | 1,700 | 2,500 | 13,900 | 400 | 2,600 | 3,500 | 9,200 | 120 | 1,400 | 2,200 |
| | 24 | 12,300 | 200 | 1,700 | 2,500 | 13,900 | 400 | 2,600 | 3,500 | 9,200 | 120 | 1,400 | 2,200 |
| | 40 | 9,800 | 160 | 1,400 | 2,000 | 11,100 | 320 | 2,100 | 2,800 | 7,300 | 100 | 1,200 | 1,800 |
| 9 | 27 | 11,000 | 200 | 1,700 | 2,500 | 12,400 | 300 | 2,600 | 3,500 | 8,100 | 120 | 1,400 | 2,200 |
| 10 | – | 9,900 | 100 | 1,700 | 2,500 | 11,100 | 300 | 2,600 | 3,800 | 7,300 | 80 | 1,400 | 2,200 |
| | 30 | 9,900 | 100 | 1,700 | 2,500 | 11,100 | 300 | 2,600 | 3,800 | 7,300 | 80 | 1,400 | 2,200 |
| | 50 | 7,900 | 80 | 1,400 | 2,000 | 8,800 | 240 | 2,100 | 3,000 | 5,800 | 70 | 1,200 | 1,800 |
| 11 | 33 | 9,000 | 100 | 1,800 | 2,600 | 10,100 | 300 | 2,600 | 4,100 | 6,700 | 80 | 1,400 | 2,200 |
| 12 | – | 8,200 | 100 | 1,900 | 2,700 | 9,300 | 300 | 2,600 | 4,100 | 6,100 | 60 | 1,500 | 2,200 |
| | 36 | 8,200 | 100 | 1,900 | 2,700 | 9,300 | 300 | 2,600 | 4,100 | 6,100 | 60 | 1,500 | 2,200 |
| | 60 | 6,500 | 80 | 1,500 | 2,200 | 7,400 | 240 | 2,100 | 3,200 | 4,800 | 50 | 1,200 | 1,800 |

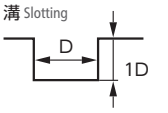
切り込み量 Depth of Cut

(D:刃径 Dia.)

側面 Side Milling




溝 Slotting




備考 Notes

※回転数と送り速度は、同じ割合で調整してください。
(主軸回転数を 20,000 回転以上で使用する場合も同様に調整してください。)
※TYPE 1：全刃長タイプは、突出し量が 3D の場合の参考条件です。突出し量が 5D の場合は上記回転数と送り速度を 80%、7D の場合は 50%の割合で調整してください。
※機械、チャックは剛性のある精度の高い物を使用してください。
※ワークや機械、ミーリングチャックにより振動、または異音が発生する場合は切削条件を変更してください。
※突込み加工時に切りくずが詰まりやすい場合は、ステップ送りをしてください。
※水溶性切削油のご使用をお奨めします。
※Adjust both spindle speed and feed at the same rate.
(When using spindle speed 20,000 or more, the same adjustment is required.)
※TYPE 1 : Recommended milling conditions for full length of cut type are at overhang 3D. Adjust spindle speed and feed rate at 80% for overhang 5D, and 50% for 7D.
※Use a rigid and precise machine and chuck holder.
※Adjust milling conditions when vibration and abnormal sounds occur by the conditions of the machine, chuck holder and work clamping.
※When tending to have chip packing during drilling, step milling is recommended.
※Water soluble cutting fluid is recommended.

SEVKET OGLU® MAKINA TICARET VE SAN. LTD. ŞTI.

# ALZ345-DLC

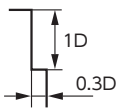
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | アルミニウム Aluminum A1070 | | | | アルミニウム合金 Aluminum Alloy A2017･A5052･A7075 | | | | 鋳造アルミニウム Aluminum Cast AC8C | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 310m/min | | | | 350m/min | | | | 230m/min | | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | | 回転数 Spindle Speed | 送り速度 Feed | | | 回転数 Spindle Speed | 送り速度 Feed | | |
| | | 突込み Drilling | 溝 Slotting | 側面 Side Milling | | 突込み Drilling | 溝 Slotting | 側面 Side Milling | | 突込み Drilling | 溝 Slotting | 側面 Side Milling |
| | $min^{-1}$ | mm/min | | | $min^{-1}$ | mm/min | | | $min^{-1}$ | mm/min | | |
| 1 | 20,000 | 200 | 600 | 1,100 | 20,000 | 200 | 600 | 1,100 | 20,000 | 150 | 600 | 1,100 |
| 2 | 20,000 | 300 | 900 | 1,500 | 20,000 | 300 | 900 | 1,500 | 20,000 | 250 | 900 | 1,500 |
| 3 | 20,000 | 300 | 1,200 | 2,000 | 20,000 | 300 | 1,400 | 2,200 | 20,000 | 250 | 1,200 | 2,200 |
| 4 | 20,000 | 300 | 1,400 | 2,200 | 20,000 | 400 | 1,800 | 2,500 | 18,300 | 200 | 1,400 | 2,300 |
| 5 | 19,700 | 300 | 1,500 | 2,500 | 20,000 | 400 | 2,200 | 3,100 | 14,600 | 150 | 1,400 | 2,100 |
| 6 | 16,500 | 300 | 1,600 | 2,500 | 18,600 | 400 | 2,500 | 3,500 | 12,200 | 150 | 1,400 | 2,100 |
| 7 | 14,100 | 200 | 1,600 | 2,500 | 15,900 | 400 | 2,500 | 3,500 | 10,500 | 140 | 1,400 | 2,100 |
| 8 | 12,300 | 200 | 1,700 | 2,500 | 13,900 | 400 | 2,600 | 3,500 | 9,200 | 120 | 1,400 | 2,200 |
| 9 | 11,000 | 200 | 1,700 | 2,500 | 12,400 | 300 | 2,600 | 3,500 | 8,100 | 120 | 1,400 | 2,200 |
| 10 | 9,900 | 100 | 1,700 | 2,500 | 11,100 | 300 | 2,600 | 3,800 | 7,300 | 80 | 1,400 | 2,200 |
| 11 | 9,000 | 100 | 1,800 | 2,600 | 10,100 | 300 | 2,600 | 4,100 | 6,700 | 80 | 1,400 | 2,200 |
| 12 | 8,200 | 100 | 1,900 | 2,700 | 9,300 | 300 | 2,600 | 4,100 | 6,100 | 60 | 1,500 | 2,200 |

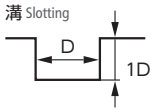
切り込み量 Depth of Cut

(D:刃径 Dia.)

側面 Side Milling




溝 Slotting




備考 Notes

※回転数と送り速度は、同じ割合で調整してください。
（主軸回転数を 20,000 回転以上で使用する場合も同様に調整してください。）
※機械、チャックは剛性のある精度の高い物を使用してください。
※ワークや機械、ミーリングチャックにより振動、または異音が発生する場合は切削条件を変更してください。
※突込み加工時に切りくずが詰まりやすい場合は、ステップ送りをしてください。
※水溶性切削油のご使用をお奨めします。
※Adjust both spindle speed and feed at the same rate.
(When using spindle speed 20,000 or more, the same adjustment is required.)
※Use a rigid and precise machine and chuck holder.
※Adjust milling conditions when vibration and abnormal sounds occur by the conditions of the machine, chuck holder and work clamping.
※When tending to have chip packing during drilling, step milling is recommended.
※Water soluble cutting fluid is recommended.

# AL-3LS

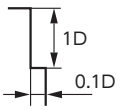
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | アルミニウム Aluminum A1070 | | | アルミニウム合金 Aluminum Alloy A2017・A5052・A7075 | | | 鋳造アルミニウム Aluminum Cast AC8C | | |
|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 100～250m/min | | | 150～300m/min | | | 100～200m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed 溝 Slotting | 送り速度 Feed 側面 Side Milling | 回転数 Spindle Speed | 送り速度 Feed 溝 Slotting | 送り速度 Feed 側面 Side Milling | 回転数 Spindle Speed | 送り速度 Feed 溝 Slotting | 送り速度 Feed 側面 Side Milling |
| | $min^{-1}$ | mm/min | | $min^{-1}$ | mm/min | | $min^{-1}$ | mm/min | |
| 5 | 16,000 | 1,200 | 1,700 | 19,000 | 1,700 | 2,300 | 13,000 | 1,200 | 1,600 |
| 6 | 13,000 | 1,000 | 1,400 | 16,000 | 1,400 | 1,900 | 10,600 | 900 | 1,100 |
| 8 | 10,000 | 1,350 | 1,800 | 12,000 | 2,000 | 2,500 | 8,000 | 1,200 | 1,500 |
| 10 | 8,000 | 1,450 | 1,900 | 9,500 | 1,850 | 2,500 | 6,300 | 1,200 | 1,700 |
| 12 | 6,600 | 1,400 | 1,700 | 7,900 | 1,750 | 2,800 | 5,300 | 1,200 | 1,600 |

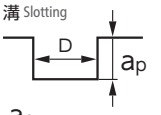
**切り込み量 Depth of Cut**

(D:刃径 Dia.)

側面 Side Milling




溝 Slotting




ap
φ5、6=0.1D
φ8=0.2D
φ10、12=0.3D

この条件表は、エンドミルの突出し量が 4D を基準としたものです。
突出し量が基準より長くなる場合は、下記数値を参考にしてください。
Above recommended milling conditions are based on 4D overhang.
In case of more than 4D overhang, refer to the below table.

| 突出し量 Overhang | 回転数 Spindle Speed | 送り速度 Feed 溝 Slotting | 送り速度 Feed 側面 Side Milling | 切り込み量 Depth of Cut 溝 Slotting | 切り込み量 Depth of Cut 側面 Side Milling |
|---|---|---|---|---|---|
| 5D | 70% | 70% | | 60% | ap 1D × ae 0.05D |
| 6D | 50% | 50% | | 40% | ap 1D × ae 0.03D |
| 7D | 30% | 30% | | 20% | ap 1D × ae 0.015D |

**備考 Notes**

※回転数と送り速度は、同じ割合で調整してください。
※機械、チャックは剛性のある精度の高い物を使用してください。
※ワークや機械、ミーリングチャックにより振動、または異音が発生する場合は切削条件を変更してください。
※水溶性切削油のご使用をお奨めします。
※Adjust both spindle speed and feed at the same rate.
※Use a rigid and precise machine and chuck holder.
※Adjust milling conditions when vibration and abnormal sounds occur by the conditions of the machine, chuck holder and work clamping.
※Water soluble cutting fluid is recommended.



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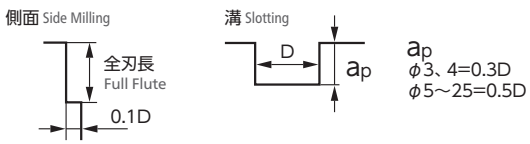
# NEA-2

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | アルミニウム合金 Aluminum Alloy | | | 銅合金 Copper Alloy | | |
|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | | 60～150m/min | | | 40～60m/min | | |
| 刃径 Dia. | 刃長 Length of Cut | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | | min-1 | mm/min | | min-1 | mm/min | |
| | | | 側面 Side Milling | 溝 Slotting | | 側面 Side Milling | 溝 Slotting |
| 3 | 10 | 16,000 | 800 | 330 | 8,500 | 250 | 100 |
| | 15 | 10,600 | 600 | 270 | 6,400 | 250 | 100 |
| | 20 | 6,400 | 600 | 270 | 4,200 | 250 | 100 |
| 4 | 12 | 12,000 | 800 | 330 | 6,400 | 250 | 100 |
| | 16 | 8,000 | 600 | 270 | 4,800 | 250 | 100 |
| | 22 | 4,800 | 600 | 270 | 3,200 | 250 | 100 |
| 5 | 14 | 9,600 | 800 | 330 | 5,100 | 300 | 130 |
| | 22 | 6,400 | 600 | 270 | 3,800 | 300 | 130 |
| | 28 | 3,800 | 600 | 270 | 2,500 | 300 | 130 |
| 6 | 16 | 8,000 | 800 | 330 | 4,200 | 300 | 130 |
| | 22 | 5,300 | 600 | 270 | 3,200 | 300 | 130 |
| | 30 | 3,200 | 600 | 270 | 2,700 | 300 | 130 |
| 8 | 22 | 6,000 | 800 | 330 | 3,200 | 300 | 130 |
| | 28 | 4,000 | 600 | 270 | 2,400 | 300 | 130 |
| | 36 | 2,400 | 600 | 270 | 2,000 | 300 | 130 |
| 10 | 26 | 4,800 | 800 | 330 | 2,500 | 300 | 130 |
| | 36 | 3,200 | 600 | 270 | 1,900 | 300 | 130 |
| | 46 | 1,900 | 600 | 270 | 1,600 | 300 | 130 |
| 12 | 28 | 4,000 | 800 | 330 | 2,100 | 300 | 130 |
| | 38 | 2,700 | 600 | 270 | 1,600 | 300 | 130 |
| | 48 | 1,600 | 600 | 270 | 1,300 | 300 | 130 |
| 16 | 40 | 2,000 | 800 | 330 | 1,600 | 300 | 130 |
| | 65 | 1,200 | 600 | 270 | 1,200 | 300 | 130 |
| 20 | 45 | 1,600 | 800 | 330 | 1,300 | 300 | 130 |
| | 80 | 1,000 | 600 | 270 | 960 | 300 | 130 |
| 25 | 50 | 1,300 | 800 | 330 | 760 | 300 | 130 |

切り込み量 Depth of Cut

(D:刃径 Dia.)




備考 Notes

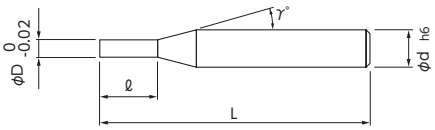
※水溶性切削油のご使用をお奨めします。
※回転数と送り速度は同じ割合で調整してください。
※Water soluble cutting fluid is recommended.
※Adjust both spindle speed and feed at the same rate.

# RSES230

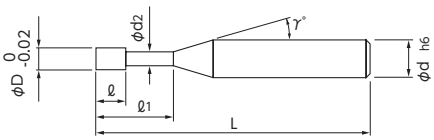
## 樹脂用エンドミル“クリアカット”

Short Flute End Mill for Resin

### Type Ⅰ:全刃長タイプ




### Type Ⅱ:ロングネックタイプ




技術資料 K-031

●アルミ・銅などの非鉄にも使用可能。
●ショート刃長採用により、従来品では刃長が長いという悩みを解消。
●Applicable to nonferrous material such as Aluminum and Copper.
●Eliminate the conventional problem of the long flute length.

Slot Side Face MG 2 30°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (ℓ1)有効長 Effective Length | 形状 Type | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00640-01000 | 0.1 | 0.15 | – | Ⅰ | – | 9° | 4 | 50 | 7,000 |
| 01-00640-01003 | | | 0.3 | Ⅱ | 0.085 | 12° | 4 | 50 | 7,600 |
| 01-00640-01005 | | | 0.5 | | 0.085 | 12° | 4 | 50 | 8,000 |
| 01-00640-01008 | | | 0.8 | | 0.085 | 12° | 4 | 50 | 8,800 |
| 01-00640-01010 | | | 1 | | 0.085 | 12° | 4 | 50 | 11,000 |
| 01-00640-01500 | 0.15 | 0.23 | – | Ⅰ | – | 9° | 4 | 50 | 6,400 |
| 01-00640-01505 | | | 0.5 | Ⅱ | 0.13 | 12° | 4 | 50 | 6,800 |
| 01-00640-01508 | | | 0.8 | | 0.13 | 12° | 4 | 50 | 7,500 |
| 01-00640-01510 | | | 1 | | 0.13 | 12° | 4 | 50 | 8,000 |
| 01-00640-01515 | | | 1.5 | | 0.13 | 12° | 4 | 50 | 10,000 |
| 01-00640-02000 | 0.2 | 0.3 | – | Ⅰ | – | 9° | 4 | 50 | 6,100 |
| 01-00640-02006 | | | 0.6 | Ⅱ | 0.18 | 12° | 4 | 50 | 7,000 |
| 01-00640-02010 | | | 1 | | 0.18 | 12° | 4 | 50 | 7,400 |
| 01-00640-02015 | | | 1.5 | | 0.18 | 12° | 4 | 50 | 9,000 |
| 01-00640-02020 | | | 2 | | 0.18 | 12° | 4 | 50 | 12,000 |
| 01-00640-02025 | | | 2.5 | | 0.18 | 12° | 4 | 50 | 16,000 ▮ |
| 01-00640-02030 | | | 3 | | 0.18 | 12° | 4 | 50 | 16,000 ▮ |
| 01-00640-02035 | | | 3.5 | | 0.18 | 12° | 4 | 50 | 18,500 ▮ |
| 01-00640-02040 | | | 4 | | 0.18 | 12° | 4 | 50 | 18,500 ▮ |
| 01-00640-03000 | 0.3 | 0.45 | – | Ⅰ | – | 9° | 4 | 50 | 5,400 |
| 01-00640-03010 | | | 1 | Ⅱ | 0.28 | 12° | 4 | 50 | 6,300 |
| 01-00640-03015 | | | 1.5 | | 0.28 | 12° | 4 | 50 | 6,500 |

オーダー方法 RSES230 刃径(D)×刃長(ℓ)[×有効長(ℓ1)]を指示してください。(φ4のType Ⅰ(全刃長タイプ)のみシャンク径を指示してください。)
When you order, indicate RSES230 (D)×(ℓ) [×(ℓ1)]. Choose Shank Dia. (d) for Type I of Dia. 4.

※(γ)は参考値です。
※(γ) is reference value.
▮の規格・サイズは特定商社在庫となります。詳しくはお問い合わせください。
▮:Semi-standard item, please inquire for price and delivery.



SEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (ℓ1)有効長 Effective Length | 形状 Type | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00640-03020 | 0.3 | 0.45 | 2 | Ⅱ | 0.28 | 12° | 4 | 50 | 7,200 |
| 01-00640-03025 | | | 2.5 | | 0.28 | 12° | 4 | 50 | 8,800 |
| 01-00640-03030 | | | 3 | | 0.28 | 12° | 4 | 50 | 11,000 |
| 01-00640-03040 | | | 4 | | 0.28 | 12° | 4 | 50 | 14,500 ▮ |
| 01-00640-03050 | | | 5 | | 0.28 | 12° | 4 | 50 | 14,500 ▮ |
| 01-00640-03060 | | | 6 | | 0.28 | 12° | 4 | 50 | 17,500 ▮ |
| 01-00640-03090 | | | 9 | | 0.28 | 12° | 4 | 50 | 17,500 ▮ |
| 01-00640-04000 | 0.4 | 0.6 | – | Ⅰ | – | 9° | 4 | 60 | 5,900 |
| 01-00640-04015 | | | 1.5 | Ⅱ | 0.37 | 12° | 4 | 60 | 6,500 |
| 01-00640-04020 | | | 2 | | 0.37 | 12° | 4 | 60 | 6,500 |
| 01-00640-04025 | | | 2.5 | | 0.37 | 12° | 4 | 60 | 6,500 |
| 01-00640-04030 | | | 3 | | 0.37 | 12° | 4 | 60 | 7,000 |
| 01-00640-04035 | | | 3.5 | | 0.37 | 12° | 4 | 60 | 7,000 |
| 01-00640-04040 | | | 4 | | 0.37 | 12° | 4 | 60 | 8,000 |
| 01-00640-04060 | | | 6 | | 0.37 | 12° | 4 | 60 | 12,000 ▮ |
| 01-00640-04080 | | | 8 | | 0.37 | 12° | 4 | 60 | 12,000 ▮ |
| 01-00640-04100 | | | 10 | | 0.37 | 12° | 4 | 60 | 14,500 ▮ |
| 01-00640-04120 | | | 12 | | 0.37 | 12° | 4 | 60 | 14,500 ▮ |
| 01-00640-05000 | 0.5 | 0.75 | – | Ⅰ | – | 9° | 4 | 60 | 4,300 |
| 01-00640-05020 | | | 2 | Ⅱ | 0.46 | 12° | 4 | 60 | 4,500 |
| 01-00640-05030 | | | 3 | | 0.46 | 12° | 4 | 60 | 4,500 |
| 01-00640-05040 | | | 4 | | 0.46 | 12° | 4 | 60 | 4,500 |
| 01-00640-05060 | | | 6 | | 0.46 | 12° | 4 | 60 | 4,500 |
| 01-00640-05080 | | | 8 | | 0.46 | 12° | 4 | 60 | 6,800 |
| 01-00640-05100 | | | 10 | | 0.46 | 12° | 4 | 60 | 8,000 |
| 01-00640-05120 | | | 12 | | 0.46 | 12° | 4 | 60 | 8,500 |
| 01-00640-05150 | | | 15 | | 0.46 | 12° | 4 | 60 | 12,600 ▮ |
| 01-00640-05180 | | | 18 | | 0.46 | 12° | 4 | 60 | 13,700 ▮ |
| 01-00640-05200 | | | 20 | | 0.46 | 12° | 4 | 60 | 14,700 ▮ |
| 01-00640-06000 | 0.6 | 0.9 | – | Ⅰ | – | 9° | 4 | 60 | 4,900 |
| 01-00640-06030 | | | 3 | Ⅱ | 0.56 | 12° | 4 | 60 | 5,000 |
| 01-00640-06040 | | | 4 | | 0.56 | 12° | 4 | 60 | 5,000 |
| 01-00640-06060 | | | 6 | | 0.56 | 12° | 4 | 60 | 5,300 |
| 01-00640-06080 | | | 8 | | 0.56 | 12° | 4 | 60 | 7,500 |

# RSES230

## 樹脂用エンドミル“クリアカット”

Short Flute End Mill for Resin

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (ℓ1)有効長 Effective Length | 形状 Type | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00640-06100 | 0.6 | 0.9 | 10 | Ⅱ | 0.56 | 12° | 4 | 60 | 8,100 |
| 01-00640-06120 | | | 12 | | 0.56 | 12° | 4 | 60 | 12,600 ▮ |
| 01-00640-06150 | | | 15 | | 0.56 | 12° | 4 | 60 | 12,600 ▮ |
| 01-00640-06180 | | | 18 | | 0.56 | 12° | 4 | 60 | 13,700 ▮ |
| 01-00640-07000 | 0.7 | 1.05 | – | Ⅰ | – | 9° | 4 | 60 | 4,900 |
| 01-00640-07040 | | | 4 | Ⅱ | 0.66 | 12° | 4 | 60 | 5,000 |
| 01-00640-07060 | | | 6 | | 0.66 | 12° | 4 | 60 | 5,000 |
| 01-00640-07080 | | | 8 | | 0.66 | 12° | 4 | 60 | 8,400 ▮ |
| 01-00640-07100 | | | 10 | | 0.66 | 12° | 4 | 60 | 10,500 ▮ |
| 01-00640-07120 | | | 12 | | 0.66 | 12° | 4 | 60 | 11,900 ▮ |
| 01-00640-07140 | | | 14 | | 0.66 | 12° | 4 | 60 | 12,600 ▮ |
| 01-00640-08000 | 0.8 | 1.2 | – | Ⅰ | – | 9° | 4 | 60 | 4,900 |
| 01-00640-08040 | | | 4 | Ⅱ | 0.76 | 12° | 4 | 60 | 5,000 |
| 01-00640-08060 | | | 6 | | 0.76 | 12° | 4 | 60 | 5,000 |
| 01-00640-08080 | | | 8 | | 0.76 | 12° | 4 | 60 | 5,200 |
| 01-00640-08100 | | | 10 | | 0.76 | 12° | 4 | 60 | 5,700 |
| 01-00640-08120 | | | 12 | | 0.76 | 12° | 4 | 60 | 6,400 |
| 01-00640-08140 | | | 14 | | 0.76 | 12° | 4 | 60 | 6,400 |
| 01-00640-08160 | | | 16 | | 0.76 | 12° | 4 | 60 | 6,400 |
| 01-00640-08180 | | | 18 | | 0.76 | 12° | 4 | 60 | 10,100 ▮ |
| 01-00640-08200 | | | 20 | | 0.76 | 12° | 4 | 60 | 11,900 ▮ |
| 01-00640-08240 | | | 24 | | 0.76 | 12° | 4 | 60 | 12,600 ▮ |
| 01-00640-09000 | 0.9 | 1.35 | – | Ⅰ | – | 9° | 4 | 60 | 4,900 |
| 01-00640-09060 | | | 6 | Ⅱ | 0.86 | 12° | 4 | 60 | 5,000 |
| 01-00640-09080 | | | 8 | | 0.86 | 12° | 4 | 60 | 5,000 |
| 01-00640-09100 | | | 10 | | 0.86 | 12° | 4 | 60 | 7,700 ▮ |
| 01-00640-09120 | | | 12 | | 0.86 | 12° | 4 | 60 | 9,000 ▮ |
| 01-00640-09160 | | | 16 | | 0.86 | 12° | 4 | 60 | 9,000 ▮ |
| 01-00640-09180 | | | 18 | | 0.86 | 12° | 4 | 60 | 10,100 ▮ |
| 01-00640-10000 | 1 | 1.5 | – | Ⅰ | – | 9° | 4 | 70 | 4,000 |
| 01-00640-10040 | | | 4 | Ⅱ | 0.95 | 12° | 4 | 70 | 4,200 |
| 01-00640-10060 | | | 6 | | 0.95 | 12° | 4 | 70 | 4,200 |
| 01-00640-10080 | | | 8 | | 0.95 | 12° | 4 | 70 | 4,200 |
| 01-00640-10100 | | | 10 | | 0.95 | 12° | 4 | 70 | 4,800 |

**オーダー方法**

RSES230 刃径(D)×刃長(ℓ)[×有効長(ℓ1)]を指示してください。(φ4のType Ⅰ(全刃長タイプ)のみシャンク径を指示してください。)
When you order, indicate RSES230 (D)×(ℓ) [×(ℓ1)]. Choose Shank Dia. (d) for Type I of Dia. 4.

※(γ)は参考値です。
※(γ) is reference value.
▮の規格・サイズは特定商社在庫となります。詳しくはお問い合わせください。
▮:Semi-standard item, please inquire for price and delivery.



ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (ℓ1)有効長 Effective Length | 形状 Type | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00640-10120 | 1 | 1.5 | 12 | Ⅱ | 0.95 | 12° | 4 | 70 | 4,800 |
| 01-00640-10140 | | | 14 | | 0.95 | 12° | 4 | 70 | 4,800 |
| 01-00640-10150 | | | 15 | | 0.95 | 12° | 4 | 70 | 4,800 |
| 01-00640-10180 | | | 18 | | 0.95 | 12° | 4 | 70 | 5,400 |
| 01-00640-10200 | | | 20 | | 0.95 | 12° | 4 | 70 | 6,000 |
| 01-00640-10250 | | | 25 | | 0.95 | 12° | 4 | 70 | 8,400 ▮ |
| 01-00640-10300 | | | 30 | | 0.95 | 12° | 4 | 70 | 10,500 ▮ |
| 01-00640-10350 | | | 35 | | 0.95 | 12° | 4 | 70 | 13,300 ▮ |
| 01-00640-15000 | 1.5 | 2.25 | – | Ⅰ | – | 9° | 4 | 70 | 4,000 |
| 01-00640-15060 | | | 6 | Ⅱ | 1.45 | 12° | 4 | 70 | 4,500 |
| 01-00640-15080 | | | 8 | | 1.45 | 12° | 4 | 70 | 4,500 |
| 01-00640-15100 | | | 10 | | 1.45 | 12° | 4 | 70 | 4,900 |
| 01-00640-15120 | | | 12 | | 1.45 | 12° | 4 | 70 | 4,900 |
| 01-00640-15150 | | | 15 | | 1.45 | 12° | 4 | 70 | 4,900 |
| 01-00640-15180 | | | 18 | | 1.45 | 12° | 4 | 70 | 4,900 |
| 01-00640-15200 | | | 20 | | 1.45 | 12° | 4 | 70 | 5,800 |
| 01-00640-15230 | | | 23 | | 1.45 | 12° | 4 | 70 | 5,800 |
| 01-00640-15250 | | | 25 | | 1.45 | 12° | 4 | 70 | 7,000 |
| 01-00640-15300 | | | 30 | | 1.45 | 12° | 4 | 70 | 7,000 |
| 01-00640-15350 | | | 35 | | 1.45 | 12° | 4 | 70 | 11,900 ▮ |
| 01-00640-15400 | | | 40 | | 1.45 | 12° | 4 | 100 | 13,300 ▮ |
| 01-00640-15450 | | | 45 | | 1.45 | 12° | 4 | 100 | 15,400 ▮ |
| 01-00640-15530 | | | 53 | | 1.45 | 12° | 4 | 100 | 16,800 ▮ |
| 01-00640-20000 | 2 | 3 | – | Ⅰ | – | 9° | 4 | 60 | 3,500 |
| 01-00640-20060 | | | 6 | Ⅱ | 1.94 | 12° | 4 | 60 | 3,800 |
| 01-00640-20080 | | | 8 | | 1.94 | 12° | 4 | 60 | 3,800 |
| 01-00640-20100 | | | 10 | | 1.94 | 12° | 4 | 60 | 3,800 |
| 01-00640-20120 | | | 12 | | 1.94 | 12° | 4 | 60 | 3,800 |
| 01-00640-20150 | | | 15 | | 1.94 | 12° | 4 | 60 | 3,800 |
| 01-00640-20200 | | | 20 | | 1.94 | 12° | 4 | 80 | 4,800 |
| 01-00640-20240 | | | 24 | | 1.94 | 12° | 4 | 80 | 5,100 |
| 01-00640-20300 | | | 30 | | 1.94 | 12° | 4 | 80 | 5,100 |
| 01-00640-20400 | | | 40 | | 1.94 | 12° | 4 | 100 | 8,500 |
| 01-00640-20500 | | | 50 | | 1.94 | 12° | 4 | 100 | 13,200 ▮ |

# RSES230

## 樹脂用エンドミル“クリアカット”

Short Flute End Mill for Resin

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (ℓ1)有効長 Effective Length | 形状 Type | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00640-20600 | 2 | 3 | 60 | Ⅱ | 1.94 | 12° | 4 | 120 | 16,900 ▮ |
| 01-00640-20700 | | | 70 | | 1.94 | 12° | 4 | 150 | 18,600 ▮ |
| 01-00640-30000 | 3 | 4.5 | – | Ⅰ | – | – | 3 | 80 | 6,000 |
| 01-00640-30100 | | | 10 | Ⅱ | 2.85 | 12° | 6 | 80 | 5,500 |
| 01-00640-30120 | | | 12 | | 2.85 | 12° | 6 | 80 | 5,500 |
| 01-00640-30150 | | | 15 | | 2.85 | 12° | 6 | 80 | 5,500 |
| 01-00640-30200 | | | 20 | | 2.85 | 12° | 6 | 80 | 6,000 |
| 01-00640-30240 | | | 24 | | 2.85 | 12° | 6 | 80 | 6,500 |
| 01-00640-30300 | | | 30 | | 2.85 | 12° | 6 | 80 | 6,500 |
| 01-00640-30360 | | | 36 | | 2.85 | 12° | 6 | 80 | 6,500 |
| 01-00640-30450 | | | 45 | | 2.85 | 12° | 6 | 100 | 11,500 ▮ |
| 01-00640-30600 | | | 60 | | 2.85 | 12° | 6 | 120 | 16,200 ▮ |
| 01-00640-30750 | | | 75 | | 2.85 | 12° | 6 | 150 | 20,300 ▮ |
| 01-00640-40000 | 4 | 6 | – | Ⅰ | – | – | 4 | 80 | 7,400 |
| 01-00640-40001 | | | – | | – | 9° | 6 | 80 | 6,000 |
| 01-00640-40100 | | | 10 | Ⅱ | 3.8 | 12° | 6 | 80 | 6,000 |
| 01-00640-40150 | | | 15 | | 3.8 | 12° | 6 | 80 | 6,000 |
| 01-00640-40200 | | | 20 | | 3.8 | 12° | 6 | 80 | 6,000 |
| 01-00640-40300 | | | 30 | | 3.8 | 12° | 6 | 80 | 6,500 |
| 01-00640-40400 | | | 40 | | 3.8 | 12° | 6 | 100 | 7,300 |
| 01-00640-40550 | | | 55 | | 3.8 | 12° | 6 | 120 | 16,200 ▮ |
| 01-00640-40700 | | | 70 | | 3.8 | 12° | 6 | 150 | 20,300 ▮ |
| 01-00640-50000 | 5 | 7.5 | – | Ⅰ | – | 9° | 6 | 80 | 5,800 |
| 01-00640-50300 | | | 30 | Ⅱ | 4.8 | 12° | 6 | 80 | 6,500 |
| 01-00640-50400 | | | 40 | | 4.8 | 12° | 6 | 100 | 6,800 |
| 01-00640-50550 | | | 55 | | 4.8 | 12° | 6 | 120 | 13,500 ▮ |
| 01-00640-50700 | | | 70 | | 4.8 | 12° | 6 | 150 | 21,000 ▮ |
| 01-00640-60000 | 6 | 9 | – | Ⅰ | – | – | 6 | 90 | 5,800 |
| 01-00640-60400 | | | 40 | Ⅱ | 5.8 | – | 6 | 90 | 7,300 |
| 01-00640-60600 | | | 60 | | 5.8 | – | 6 | 120 | 9,600 |
| 01-00640-60800 | | | 80 | | 5.8 | – | 6 | 150 | 16,000 |

**オーダー方法**

RSES230 刃径(D)×刃長(ℓ)[×有効長(ℓ1)]を指示してください。(φ4のType Ⅰ(全刃長タイプ)のみシャンク径を指示してください。)
When you order, indicate RSES230 (D)×(ℓ) [×(ℓ1)]. Choose Shank Dia. (d) for Type Ⅰ of Dia. 4.

※(γ)は参考値です。
※(γ) is reference value.
▮の規格・サイズは特定商社在庫となります。詳しくはお問い合わせください。
▮:Semi-standard item, please inquire for price and delivery.

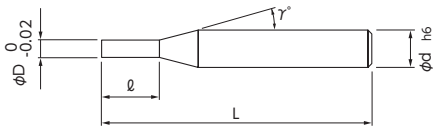


ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

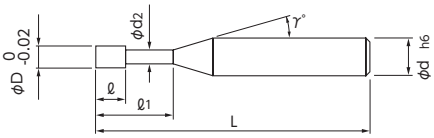
# RSE230

## 樹脂用エンドミル“クリアカット”
End Mill for Resin

### Type Ⅰ:全刃長タイプ




### Type Ⅱ:ロングネックタイプ




- 3 倍刃長・5 倍刃長・10 倍刃長・超ロングネック・同径タイプ - 加工形状に合わせて選択可能！
- アルミ・銅などの非鉄にも使用可能。
- 全135 サイズ！
- Available for the suitable L/D (3D, 5D and 10D) and with or without Effective Length!
- Applicable to nonferrous material such as Aluminum and Copper.
- Total 135 size!

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹 脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (ℓ1)有効長 Effective Length | 形状 Type | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00644-00100 | 0.1 | 0.3 | – | Ⅰ | – | 9° | 4 | 45 | 7,000 |
| 01-00644-00108 | | | 0.8 | Ⅱ | 0.085 | 12° | 4 | 45 | 8,400 |
| 01-00644-00110 | | | 1 | | 0.085 | 12° | 4 | 45 | 11,000 |
| 01-00644-00150 | 0.15 | 0.45 | – | Ⅰ | – | 9° | 4 | 45 | 6,400 |
| 01-00644-00151 | | | 1 | Ⅱ | 0.13 | 12° | 4 | 45 | 8,000 |
| 01-00644-00152 | | | 1.5 | | 0.13 | 12° | 4 | 45 | 10,000 |
| 01-00644-00200 | 0.2 | 0.6 | – | Ⅰ | – | 9° | 4 | 45 | 6,100 |
| 01-00644-00201 | | 1 | – | | – | 10° | 4 | 45 | 7,000 |
| 01-00644-00203 | | 0.6 | 1 | Ⅱ | 0.18 | 12° | 4 | 45 | 7,400 |
| 01-00644-00204 | | | 1.5 | | 0.18 | 12° | 4 | 45 | 9,000 |
| 01-00644-00202 | | | 2 | | 0.18 | 12° | 4 | 45 | 12,000 |
| 01-00644-00300 | 0.3 | 0.9 | – | Ⅰ | – | 9° | 4 | 45 | 5,400 |
| 01-00644-00301 | | 1.5 | – | | – | 9° | 4 | 45 | 6,000 |
| 01-00644-00302 | | 2 | – | | – | 9° | 4 | 45 | 6,700 |
| 01-00644-00304 | | 0.9 | 1.5 | Ⅱ | 0.28 | 12° | 4 | 45 | 6,500 |
| 01-00644-00305 | | | 2 | | 0.28 | 12° | 4 | 45 | 7,200 |
| 01-00644-00306 | | | 2.5 | | 0.28 | 12° | 4 | 45 | 8,800 |
| 01-00644-00303 | | | 3 | | 0.28 | 12° | 4 | 45 | 11,500 |
| 01-00644-00400 | 0.4 | 1.2 | – | Ⅰ | – | 9° | 4 | 45 | 5,900 |
| 01-00644-00401 | | 2 | – | | – | 10° | 4 | 45 | 7,000 |
| 01-00644-00402 | | 3 | – | | – | 9° | 4 | 45 | 8,000 |
| 01-00644-00403 | | 1.2 | 2 | Ⅱ | 0.37 | 12° | 4 | 45 | 6,200 |

**オーダー方法**

RSE230 刃径(D)×刃長(ℓ)［×有効長(ℓ1)］を指示してください。(Type Ⅰ (全刃長タイプ)のφ3刃長9･15及びφ4刃長12･20のみシャンク径を指示してください。)
When you order, indicate RSE230 (D)×(ℓ) [×(ℓ1)]. Choose Shank Dia. (d) for Type Ⅰ of Dia. 3×9ℓ･15ℓ and Dia. 4×12ℓ･20ℓ.

※(γ)は参考値です。
※(γ) is reference value.

# RSE230

## 樹脂用エンドミル“クリアカット”
End Mill for Resin

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (ℓ1)有効長 Effective Length | 形状 Type | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00644-00406 | 0.4 | 1.2 | 2.5 | Ⅱ | 0.37 | 12° | 4 | 45 | 6,200 |
| 01-00644-00407 | | | 3 | | 0.37 | 12° | 4 | 45 | 6,200 |
| 01-00644-00404 | | | 4 | | 0.37 | 12° | 4 | 45 | 6,800 |
| 01-00644-00405 | | | 5 | | 0.37 | 12° | 4 | 45 | 7,500 |
| 01-00644-00500 | 0.5 | 1.5 | – | Ⅰ | – | 9° | 4 | 45 | 4,000 |
| 01-00644-00501 | | 2.5 | – | | – | 9° | 4 | 45 | 4,800 |
| 01-00644-00502 | | 5 | – | | – | 9° | 4 | 45 | 6,000 |
| 01-00644-00503 | | 1.5 | 3 | Ⅱ | 0.46 | 12° | 4 | 45 | 4,200 |
| 01-00644-00504 | | | 4 | | 0.46 | 12° | 4 | 45 | 4,200 |
| 01-00644-00506 | | | 6 | | 0.46 | 12° | 4 | 45 | 4,200 |
| 01-00644-00508 | | | 8 | | 0.46 | 12° | 4 | 50 | 6,500 |
| 01-00644-00510 | | | 10 | | 0.46 | 12° | 4 | 50 | 8,000 |
| 01-00644-00512 | | | 12 | | 0.46 | 12° | 4 | 50 | 8,500 |
| 01-00644-00515 | | | 15 | | 0.46 | 12° | 4 | 50 | 9,000 |
| 01-00644-00520 | | | 20 | | 0.46 | 12° | 4 | 50 | 10,500 |
| 01-00644-00600 | 0.6 | 1.8 | – | Ⅰ | – | 9° | 4 | 45 | 4,600 |
| 01-00644-00601 | | 3 | – | | – | 9° | 4 | 45 | 5,600 |
| 01-00644-00602 | | 4 | – | | – | 9° | 4 | 45 | 6,000 |
| 01-00644-00604 | | 1.8 | 4 | Ⅱ | 0.56 | 12° | 4 | 45 | 4,700 |
| 01-00644-00606 | | | 6 | | 0.56 | 12° | 4 | 45 | 5,000 |
| 01-00644-00608 | | | 8 | | 0.56 | 12° | 4 | 50 | 7,200 |
| 01-00644-00610 | | | 10 | | 0.56 | 12° | 4 | 50 | 7,800 |
| 01-00644-00612 | | | 12 | | 0.56 | 12° | 4 | 50 | 8,500 |
| 01-00644-00800 | 0.8 | 2.4 | – | Ⅰ | – | 9° | 4 | 45 | 4,600 |
| 01-00644-00801 | | 4 | – | | – | 9° | 4 | 45 | 5,600 |
| 01-00644-00802 | | 6 | – | | – | 9° | 4 | 45 | 6,000 |
| 01-00644-00806 | | 2.4 | 6 | Ⅱ | 0.76 | 12° | 4 | 45 | 4,700 |
| 01-00644-00808 | | | 8 | | 0.76 | 12° | 4 | 50 | 4,900 |
| 01-00644-00810 | | | 10 | | 0.76 | 12° | 4 | 50 | 5,400 |
| 01-00644-00812 | | | 12 | | 0.76 | 12° | 4 | 50 | 5,900 |
| 01-00644-00816 | | | 16 | | 0.76 | 12° | 4 | 60 | 6,400 |
| 01-00644-01000 | 1 | 3 | – | Ⅰ | – | 9° | 4 | 45 | 3,200 |
| 01-00644-01001 | | 5 | – | | – | 9° | 4 | 50 | 4,000 |
| 01-00644-01003 | | 7.5 | – | | – | 9° | 4 | 50 | 4,600 |

**オーダー方法**

RSE230 刃径(D)×刃長(ℓ)［×有効長(ℓ1)］を指示してください。(Type Ⅰ (全刃長タイプ)のφ3刃長9・15及びφ4刃長12・20のみシャンク径を指示してください。)
When you order, indicate RSE230 (D)×(ℓ) [×(ℓ1)]. Choose Shank Dia. (d) for Type I of Dia. 3×9ℓ・15ℓ and Dia. 4×12ℓ・20ℓ.

※(γ)は参考値です。
※(γ) is reference value.



SEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (ℓ1)有効長 Effective Length | 形状 Type | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00644-01002 | 1 | 10 | – | Ⅰ | – | 9° | 4 | 50 | 7,600 |
| 01-00644-01006 | | 3 | 6 | Ⅱ | 0.95 | 12° | 4 | 50 | 3,600 |
| 01-00644-01008 | | | 8 | | 0.95 | 12° | 4 | 50 | 3,600 |
| 01-00644-01010 | | | 10 | | 0.95 | 12° | 4 | 50 | 4,200 |
| 01-00644-01012 | | | 12 | | 0.95 | 12° | 4 | 50 | 4,200 |
| 01-00644-01015 | | | 15 | | 0.95 | 12° | 4 | 60 | 4,200 |
| 01-00644-01020 | | | 20 | | 0.95 | 12° | 4 | 60 | 5,000 |
| 01-00644-01025 | | | 25 | | 0.95 | 12° | 4 | 70 | 6,000 |
| 01-00644-01030 | | | 30 | | 0.95 | 12° | 4 | 70 | 7,500 |
| 01-00644-01035 | | | 35 | | 0.95 | 12° | 4 | 80 | 10,000 |
| 01-00644-01500 | 1.5 | 4.5 | – | Ⅰ | – | 9° | 4 | 45 | 3,500 |
| 01-00644-01501 | | 7.5 | – | | – | 9° | 4 | 50 | 4,200 |
| 01-00644-01502 | | 15 | – | | – | 9° | 4 | 60 | 7,800 |
| 01-00644-01510 | | 4.5 | 10 | Ⅱ | 1.45 | 12° | 4 | 50 | 3,800 |
| 01-00644-01512 | | | 12 | | 1.45 | 12° | 4 | 50 | 3,800 |
| 01-00644-01515 | | | 15 | | 1.45 | 12° | 4 | 60 | 4,300 |
| 01-00644-01518 | | | 18 | | 1.45 | 12° | 4 | 60 | 4,300 |
| 01-00644-01523 | | | 23 | | 1.45 | 12° | 4 | 70 | 5,800 |
| 01-00644-01530 | | | 30 | | 1.45 | 12° | 4 | 70 | 7,000 |
| 01-00644-01538 | | | 38 | | 1.45 | 12° | 4 | 80 | 8,500 |
| 01-00644-01545 | | | 45 | | 1.45 | 12° | 4 | 90 | 10,000 |
| 01-00644-01553 | | | 53 | | 1.45 | 12° | 4 | 90 | 11,000 |
| 01-00644-02000 | 2 | 6 | – | Ⅰ | – | 9° | 4 | 50 | 3,500 |
| 01-00644-02001 | | 10 | – | | – | 9° | 4 | 50 | 4,200 |
| 01-00644-02003 | | 15 | – | | – | 9° | 4 | 60 | 6,600 |
| 01-00644-02002 | | 20 | – | | – | 9° | 4 | 60 | 7,800 |
| 01-00644-02012 | | 6 | 12 | Ⅱ | 1.94 | 12° | 4 | 60 | 3,800 |
| 01-00644-02015 | | | 15 | | 1.94 | 12° | 4 | 60 | 3,800 |
| 01-00644-02020 | | | 20 | | 1.94 | 12° | 4 | 60 | 4,200 |
| 01-00644-02024 | | | 24 | | 1.94 | 12° | 4 | 70 | 5,000 |
| 01-00644-02030 | | | 30 | | 1.94 | 12° | 4 | 80 | 5,100 |
| 01-00644-02040 | | | 40 | | 1.94 | 12° | 4 | 90 | 7,900 |
| 01-00644-02050 | | | 50 | | 1.94 | 12° | 4 | 110 | 9,800 |
| 01-00644-02060 | | | 60 | | 1.94 | 12° | 4 | 110 | 11,000 |

# RSE230

## 樹脂用エンドミル“クリアカット”
End Mill for Resin



単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (ℓ1)有効長 Effective Length | 形状 Type | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00644-02070 | 2 | 6 | 70 | Ⅱ | 1.94 | 12° | 4 | 110 | 12,000 |
| 01-00644-03000 | 3 | 9 | – | Ⅰ | – | – | 3 | 100 | 6,500 |
| 01-00644-03001 | | | – | | – | 9° | 6 | 50 | 4,500 |
| 01-00644-03003 | | 15 | – | | – | – | 3 | 100 | 7,000 |
| 01-00644-03002 | | | – | | – | 9° | 6 | 60 | 5,000 |
| 01-00644-03004 | | 20 | – | | – | 9° | 6 | 60 | 6,000 |
| 01-00644-03005 | | 25 | – | | – | 9° | 6 | 70 | 6,300 |
| 01-00644-03006 | | 30 | – | | – | 9° | 6 | 70 | 6,500 |
| 01-00644-03015 | | 9 | 15 | Ⅱ | 2.85 | 12° | 6 | 60 | 5,000 |
| 01-00644-03020 | | | 20 | | 2.85 | 12° | 6 | 60 | 5,500 |
| 01-00644-03024 | | | 24 | | 2.85 | 12° | 6 | 70 | 6,000 |
| 01-00644-03030 | | | 30 | | 2.85 | 12° | 6 | 70 | 6,000 |
| 01-00644-03036 | | | 36 | | 2.85 | 12° | 6 | 80 | 6,500 |
| 01-00644-03045 | | | 45 | | 2.85 | 12° | 6 | 90 | 7,000 |
| 01-00644-03060 | | | 60 | | 2.85 | 12° | 6 | 110 | 11,000 |
| 01-00644-03075 | | | 75 | | 2.85 | 12° | 6 | 120 | 13,500 |
| 01-00644-04000 | 4 | 12 | – | Ⅰ | – | – | 4 | 120 | 7,800 |
| 01-00644-04001 | | | – | | – | 9° | 6 | 50 | 4,500 |
| 01-00644-04003 | | 20 | – | | – | – | 4 | 120 | 10,000 |
| 01-00644-04002 | | | – | | – | 9° | 6 | 60 | 5,800 |
| 01-00644-04004 | | 30 | – | | – | 9° | 6 | 70 | 6,300 |
| 01-00644-04005 | | 40 | – | | – | 9° | 6 | 90 | 6,800 |
| 01-00644-04020 | | 12 | 20 | Ⅱ | 3.8 | 12° | 6 | 60 | 5,400 |
| 01-00644-04030 | | | 30 | | 3.8 | 12° | 6 | 70 | 6,000 |
| 01-00644-04040 | | | 40 | | 3.8 | 12° | 6 | 90 | 6,300 |
| 01-00644-04055 | | | 55 | | 3.8 | 12° | 6 | 110 | 11,000 |
| 01-00644-04070 | | | 70 | | 3.8 | 12° | 6 | 120 | 13,500 |
| 01-00644-05002 | 5 | 10 | – | Ⅰ | – | 9° | 6 | 60 | 4,800 |
| 01-00644-05000 | | 15 | – | | – | 9° | 6 | 70 | 5,200 |
| 01-00644-05001 | | 25 | – | | – | 9° | 6 | 80 | 7,000 |
| 01-00644-05003 | | 35 | – | | – | 9° | 6 | 90 | 7,400 |
| 01-00644-05004 | | 40 | – | | – | 9° | 6 | 100 | 8,500 |
| 01-00644-05030 | | 15 | 30 | Ⅱ | 4.8 | 12° | 6 | 90 | 6,500 |
| 01-00644-05040 | | | 40 | | 4.8 | 12° | 6 | 100 | 6,800 |

**オーダー方法**

RSE230 刃径(D)×刃長(ℓ)［×有効長(ℓ1)］を指示してください。(Type Ⅰ (全刃長タイプ)のφ3刃長9・15及びφ4刃長12・20のみシャンク径を指示してください。)
When you order, indicate RSE230 (D)×(ℓ) [×(ℓ1)]. Choose Shank Dia. (d) for Type I of Dia. 3×9ℓ・15ℓ and Dia. 4×12ℓ・20ℓ.

※(γ)は参考値です。
※(γ) is reference value.

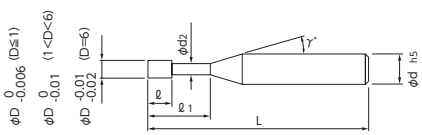


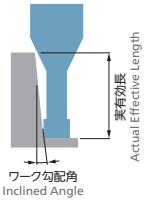
ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (ℓ1)有効長 Effective Length | 形状 Type | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00644-05055 | 5 | 15 | 55 | Ⅱ | 4.8 | 12° | 6 | 120 | 10,000 |
| 01-00644-05070 | | | 70 | | 4.8 | 12° | 6 | 130 | 14,000 |
| 01-00644-06002 | 6 | 12 | – | Ⅰ | – | – | 6 | 70 | 5,000 |
| 01-00644-06000 | | 18 | – | | – | – | 6 | 80 | 5,500 |
| 01-00644-06003 | | 25 | – | | – | – | 6 | 80 | 6,500 |
| 01-00644-06001 | | 30 | – | | – | – | 6 | 90 | 7,000 |
| 01-00644-06004 | | 40 | – | | – | – | 6 | 100 | 7,800 |
| 01-00644-06005 | | 50 | – | | – | – | 6 | 120 | 9,000 |
| 01-00644-06040 | | 18 | 40 | Ⅱ | 5.8 | – | 6 | 100 | 7,300 |
| 01-00644-06060 | | | 60 | | 5.8 | – | 6 | 120 | 9,600 |
| 01-00644-06080 | | | 80 | | 5.8 | – | 6 | 130 | 14,500 |

# DHR237

## 銅電極加工用ロングネックエンドミル
Long Neck End Mill for Copper Electrode




●銅合金の加工に特化したロングネックエンドミル。
●切れ味と仕上げ面品位を両立させるねじれ角【37.5°】を採用し、加工面への横スジ発生を抑制します。
●最適化された刃形状と DLC コーティングにより、長時間の高品位かつ安定した加工が可能です。
●銅タングステン電極の加工にも有効です。
●Long neck end mill specialized for processing copper alloy.
●Helix angle 37.5 degrees to achieve both sharpness and finished surface quality that prevents scratches on cutting surface.
●High quality and stable milling performance with long tool life by optimized design and DLC COATING.
●Processing copper tungsten electrodes is also effective.

Slot Side Face MG DLC 2 37.5°

被削材 Work Material

| 銅 Copper | 銅タングステン Copper Tungsten |
|---|---|
| ◎ | ◎ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07-00100-01003 | 0.1 | 0.3 | 0.2 | 0.085 | 12° | 4 | 45 | 12,700 | 0.34 | 0.36 | 0.38 | 0.40 | 0.44 |
| 07-00100-01005 | | 0.5 | 0.2 | 0.085 | 12° | 4 | 45 | 13,300 | 0.55 | 0.58 | 0.61 | 0.64 | 0.71 |
| 07-00100-02005 | 0.2 | 0.5 | 0.4 | 0.18 | 12° | 4 | 45 | 9,500 | 0.57 | 0.59 | 0.62 | 0.65 | 0.72 |
| 07-00100-02010 | | 1 | 0.4 | 0.18 | 12° | 4 | 45 | 10,000 | 1.09 | 1.14 | 1.19 | 1.25 | 1.38 |
| 07-00100-02015 | | 1.5 | 0.4 | 0.18 | 12° | 4 | 45 | 10,500 | 1.61 | 1.68 | 1.76 | 1.85 | 2.05 |
| 07-00100-03010 | 0.3 | 1 | 0.6 | 0.28 | 12° | 4 | 45 | 10,000 | 1.09 | 1.14 | 1.19 | 1.25 | 1.38 |
| 07-00100-03015 | | 1.5 | 0.6 | 0.28 | 12° | 4 | 45 | 10,500 | 1.61 | 1.68 | 1.76 | 1.85 | 2.05 |
| 07-00100-03020 | | 2 | 0.6 | 0.28 | 12° | 4 | 45 | 11,000 | 2.13 | 2.23 | 2.33 | 2.44 | 2.71 |
| 07-00100-04010 | 0.4 | 1 | 0.8 | 0.37 | 12° | 4 | 45 | 8,700 | 1.11 | 1.16 | 1.22 | 1.28 | 1.42 |
| 07-00100-04020 | | 2 | 0.8 | 0.37 | 12° | 4 | 45 | 8,900 | 2.15 | 2.25 | 2.36 | 2.47 | 2.74 |
| 07-00100-04030 | | 3 | 0.8 | 0.37 | 12° | 4 | 45 | 9,100 | 3.20 | 3.34 | 3.50 | 3.67 | 4.07 |
| 07-00100-04040 | | 4 | 0.8 | 0.37 | 12° | 4 | 45 | 9,300 | 4.24 | 4.43 | 4.64 | 4.87 | 5.40 |
| 07-00100-05015 | 0.5 | 1.5 | 1 | 0.46 | 12° | 4 | 45 | 8,500 | 1.66 | 1.73 | 1.81 | 1.90 | 2.11 |
| 07-00100-05020 | | 2 | 1 | 0.46 | 12° | 4 | 45 | 8,700 | 2.18 | 2.28 | 2.38 | 2.50 | 2.77 |
| 07-00100-05030 | | 3 | 1 | 0.46 | 12° | 4 | 45 | 8,900 | 3.22 | 3.37 | 3.52 | 3.70 | 4.10 |
| 07-00100-05040 | | 4 | 1 | 0.46 | 12° | 4 | 45 | 9,100 | 4.26 | 4.46 | 4.66 | 4.89 | 5.43 |
| 07-00100-05060 | | 6 | 1 | 0.46 | 12° | 4 | 45 | 9,400 | 6.35 | 6.63 | 6.95 | 7.29 | 8.08 |
| 07-00100-06020 | 0.6 | 2 | 1.2 | 0.56 | 12° | 4 | 45 | 9,400 | 2.18 | 2.28 | 2.38 | 2.50 | 2.77 |
| 07-00100-06030 | | 3 | 1.2 | 0.56 | 12° | 4 | 45 | 9,600 | 3.22 | 3.37 | 3.52 | 3.70 | 4.10 |
| 07-00100-06040 | | 4 | 1.2 | 0.56 | 12° | 4 | 45 | 9,800 | 4.26 | 4.46 | 4.66 | 4.89 | 5.43 |
| 07-00100-06060 | | 6 | 1.2 | 0.56 | 12° | 4 | 45 | 10,100 | 6.35 | 6.63 | 6.95 | 7.29 | 8.08 |
| 07-00100-08030 | 0.8 | 3 | 1.6 | 0.76 | 12° | 4 | 45 | 9,600 | 3.22 | 3.37 | 3.52 | 3.70 | 4.10 |
| 07-00100-08040 | | 4 | 1.6 | 0.76 | 12° | 4 | 45 | 9,800 | 4.26 | 4.46 | 4.66 | 4.89 | 5.43 |
| 07-00100-08060 | | 6 | 1.6 | 0.76 | 12° | 4 | 45 | 10,100 | 6.35 | 6.63 | 6.95 | 7.29 | 8.08 |
| 07-00100-08080 | | 8 | 1.6 | 0.76 | 12° | 4 | 50 | 10,300 | 8.44 | 8.81 | 9.23 | 9.68 | 10.74 |
| 07-00100-10030 | 1 | 3 | 2 | 0.95 | 12° | 4 | 45 | 9,100 | 3.25 | 3.39 | 3.55 | 3.73 | 4.13 |
| 07-00100-10040 | | 4 | 2 | 0.95 | 12° | 4 | 45 | 9,200 | 4.29 | 4.48 | 4.69 | 4.92 | 5.46 |
| 07-00100-10050 | | 5 | 2 | 0.95 | 12° | 4 | 45 | 9,400 | 5.33 | 5.57 | 5.83 | 6.12 | 6.79 |
| 07-00100-10060 | | 6 | 2 | 0.95 | 12° | 4 | 45 | 9,600 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 07-00100-10080 | | 8 | 2 | 0.95 | 12° | 4 | 50 | 9,800 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 07-00100-10100 | | 10 | 2 | 0.95 | 12° | 4 | 50 | 10,000 | 10.55 | 11.02 | 11.53 | 12.10 | 13.42 |
| 07-00100-10120 | | 12 | 2 | 0.95 | 12° | 4 | 50 | 10,000 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |
| 07-00100-15060 | 1.5 | 6 | 3 | 1.45 | 12° | 4 | 50 | 9,400 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 07-00100-15080 | | 8 | 3 | 1.45 | 12° | 4 | 50 | 9,600 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 07-00100-15120 | | 12 | 3 | 1.45 | 12° | 4 | 50 | 9,900 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |
| 07-00100-15160 | | 16 | 3 | 1.45 | 12° | 4 | 60 | 10,200 | 16.80 | 17.55 | 18.38 | 19.28 | 21.39 |

オーダー方法 DHR237 刃径(D)×有効長(ℓ1)を指示してください。
When you order, indicate DHR237 (D)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はD-166に記載
●Recommended Milling Conditions are shown on page D-166.



SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

| コードNo. Code No. | (D)刃径 Dia. | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 07-00100-20060 | 2 | 6 | 4 | 1.94 | 12° | 4 | 50 | 9,200 | 6.40 | 6.69 | 7.00 | 7.34 | 8.15 |
| 07-00100-20080 | | 8 | 4 | 1.94 | 12° | 4 | 50 | 9,200 | 8.48 | 8.86 | 9.28 | 9.74 | 10.80 |
| 07-00100-20100 | | 10 | 4 | 1.94 | 12° | 4 | 50 | 9,300 | 10.57 | 11.04 | 11.56 | 12.13 | 13.45 |
| 07-00100-20120 | | 12 | 4 | 1.94 | 12° | 4 | 50 | 9,300 | 12.66 | 13.22 | 13.84 | 14.52 | 16.11 |
| 07-00100-20140 | | 14 | 4 | 1.94 | 12° | 4 | 50 | 9,300 | 14.74 | 15.40 | 16.12 | 16.92 | 18.76 |
| 07-00100-20160 | | 16 | 4 | 1.94 | 12° | 4 | 60 | 9,500 | 16.83 | 17.58 | 18.40 | 19.31 | Free |
| 07-00100-20200 | | 20 | 4 | 1.94 | 12° | 4 | 60 | 9,500 | 21.00 | 21.94 | 22.97 | 24.10 | Free |
| 07-00100-30100 | 3 | 10 | 6 | 2.85 | 12° | 6 | 50 | 9,700 | 10.79 | 11.27 | 11.80 | 12.38 | 13.74 |
| 07-00100-30150 | | 15 | 6 | 2.85 | 12° | 6 | 60 | 10,100 | 16.01 | 16.72 | 17.50 | 18.37 | 20.37 |
| 07-00100-30200 | | 20 | 6 | 2.85 | 12° | 6 | 60 | 10,500 | 21.22 | 22.17 | 23.21 | 24.35 | 27.01 |
| 07-00100-30250 | | 25 | 6 | 2.85 | 12° | 6 | 70 | 11,500 | 26.43 | 27.62 | 28.91 | 30.33 | Free |
| 07-00100-40150 | 4 | 15 | 8 | 3.8 | 12° | 6 | 60 | 9,000 | 16.13 | 16.85 | 17.64 | 18.51 | 20.53 |
| 07-00100-40200 | | 20 | 8 | 3.8 | 12° | 6 | 60 | 9,600 | 21.34 | 22.30 | 23.34 | 24.49 | Free |
| 07-00100-40250 | | 25 | 8 | 3.8 | 12° | 6 | 70 | 10,700 | 26.56 | 27.74 | 29.04 | Free | Free |
| 07-00100-40300 | | 30 | 8 | 3.8 | 12° | 6 | 70 | 11,100 | 31.77 | 33.19 | 34.75 | Free | Free |
| 07-00100-60200 | 6 | 20 | 12 | 5.8 | – | 6 | 60 | 11,000 | Free | Free | Free | Free | Free |
| 07-00100-60300 | | 30 | 12 | 5.8 | – | 6 | 70 | 12,000 | Free | Free | Free | Free | Free |
| 07-00100-60500 | | 50 | 12 | 5.8 | – | 6 | 90 | 18,000 | Free | Free | Free | Free | Free |

# DHR237

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | | 銅 Copper | | | | | | | 銅タングステン Copper Tungsten (W70%-Cu30%) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 側面 Side Milling | | | | 溝 Slotting | | | 側面 Side Milling | | | | 溝 Slotting | | |
| 刃径 Dia. | 有効長 Effective Length | 刃径と有効長の比 L/D | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut |
| | | | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm |
| 0.1 | 0.3 | 3 | 40,000 | 180 | 0.1 | 0.006 | 40,000 | 170 | 0.01 | 30,000 | 120 | 0.05 | 0.004 | 30,000 | 110 | 0.006 |
| | 0.5 | 5 | 40,000 | 140 | 0.1 | 0.004 | 40,000 | 130 | 0.007 | 30,000 | 80 | 0.05 | 0.003 | 30,000 | 70 | 0.004 |
| 0.2 | 0.5 | 2.5 | 40,000 | 400 | 0.2 | 0.008 | 40,000 | 380 | 0.02 | 30,000 | 260 | 0.1 | 0.006 | 30,000 | 250 | 0.01 |
| | 1 | 5 | 40,000 | 350 | 0.2 | 0.006 | 40,000 | 320 | 0.015 | 30,000 | 220 | 0.1 | 0.004 | 30,000 | 200 | 0.008 |
| | 1.5 | 7.5 | 40,000 | 300 | 0.2 | 0.004 | 40,000 | 250 | 0.01 | 30,000 | 200 | 0.1 | 0.003 | 30,000 | 130 | 0.005 |
| 0.3 | 1 | 3.3 | 40,000 | 500 | 0.3 | 0.01 | 40,000 | 450 | 0.035 | 30,000 | 350 | 0.15 | 0.008 | 30,000 | 280 | 0.014 |
| | 1.5 | 5 | 40,000 | 450 | 0.3 | 0.008 | 40,000 | 400 | 0.025 | 30,000 | 300 | 0.15 | 0.006 | 30,000 | 250 | 0.012 |
| | 2 | 6.7 | 40,000 | 380 | 0.3 | 0.006 | 40,000 | 350 | 0.017 | 30,000 | 250 | 0.15 | 0.004 | 30,000 | 220 | 0.008 |
| 0.4 | 1 | 2.5 | 40,000 | 700 | 0.4 | 0.02 | 40,000 | 650 | 0.045 | 30,000 | 500 | 0.2 | 0.014 | 30,000 | 450 | 0.025 |
| | 2 | 5 | 40,000 | 600 | 0.4 | 0.015 | 40,000 | 550 | 0.03 | 30,000 | 450 | 0.2 | 0.01 | 30,000 | 400 | 0.02 |
| | 3 | 7.5 | 35,000 | 500 | 0.4 | 0.01 | 35,000 | 450 | 0.02 | 26,000 | 350 | 0.2 | 0.007 | 26,000 | 300 | 0.015 |
| | 4 | 10 | 28,000 | 350 | 0.4 | 0.006 | 28,000 | 300 | 0.015 | 24,000 | 220 | 0.2 | 0.004 | 22,000 | 200 | 0.01 |
| 0.5 | 1.5 | 3 | 40,000 | 900 | 0.5 | 0.025 | 40,000 | 800 | 0.07 | 30,000 | 650 | 0.3 | 0.02 | 30,000 | 550 | 0.05 |
| | 2 | 4 | 38,000 | 800 | 0.5 | 0.02 | 35,000 | 700 | 0.055 | 28,000 | 550 | 0.3 | 0.016 | 26,000 | 450 | 0.04 |
| | 3 | 6 | 35,000 | 700 | 0.5 | 0.015 | 32,000 | 600 | 0.04 | 26,000 | 500 | 0.3 | 0.012 | 25,000 | 400 | 0.03 |
| | 4 | 8 | 28,000 | 550 | 0.5 | 0.008 | 26,000 | 500 | 0.03 | 24,000 | 400 | 0.3 | 0.005 | 22,000 | 300 | 0.02 |
| | 6 | 12 | 18,000 | 350 | 0.5 | 0.005 | 18,000 | 300 | 0.015 | 15,000 | 220 | 0.3 | 0.003 | 15,000 | 180 | 0.01 |
| 0.6 | 2 | 3.3 | 38,000 | 1,000 | 0.6 | 0.025 | 35,000 | 850 | 0.1 | 28,000 | 700 | 0.4 | 0.018 | 26,000 | 650 | 0.08 |
| | 3 | 5 | 32,000 | 800 | 0.6 | 0.02 | 30,000 | 700 | 0.08 | 24,000 | 550 | 0.4 | 0.014 | 22,000 | 500 | 0.06 |
| | 4 | 6.7 | 28,000 | 700 | 0.6 | 0.015 | 26,000 | 600 | 0.06 | 22,000 | 500 | 0.4 | 0.012 | 20,000 | 400 | 0.04 |
| | 6 | 10 | 20,000 | 450 | 0.6 | 0.01 | 20,000 | 400 | 0.03 | 18,000 | 350 | 0.4 | 0.008 | 16,000 | 300 | 0.02 |
| 0.8 | 3 | 3.8 | 30,000 | 1,300 | 0.8 | 0.04 | 28,000 | 1,200 | 0.15 | 24,000 | 1,000 | 0.6 | 0.03 | 22,000 | 900 | 0.1 |
| | 4 | 5 | 26,000 | 1,100 | 0.8 | 0.03 | 24,000 | 1,000 | 0.12 | 22,000 | 850 | 0.6 | 0.02 | 18,000 | 650 | 0.08 |
| | 6 | 7.5 | 22,000 | 900 | 0.8 | 0.02 | 18,000 | 650 | 0.08 | 16,000 | 600 | 0.6 | 0.014 | 14,000 | 500 | 0.06 |
| | 8 | 10 | 16,000 | 600 | 0.8 | 0.01 | 16,000 | 500 | 0.05 | 14,000 | 450 | 0.6 | 0.01 | 13,000 | 350 | 0.03 |
| 1 | 3 | 3 | 24,000 | 2,200 | 1 | 0.06 | 24,000 | 2,000 | 0.22 | 20,000 | 1,600 | 0.8 | 0.04 | 20,000 | 1,400 | 0.16 |
| | 4 | 4 | 24,000 | 2,000 | 1 | 0.05 | 22,000 | 1,800 | 0.2 | 20,000 | 1,400 | 0.8 | 0.035 | 18,000 | 1,100 | 0.14 |
| | 5 | 5 | 22,000 | 1,700 | 1 | 0.04 | 20,000 | 1,500 | 0.16 | 18,000 | 1,200 | 0.8 | 0.028 | 16,000 | 950 | 0.12 |
| | 6 | 6 | 20,000 | 1,500 | 1 | 0.03 | 18,000 | 1,200 | 0.14 | 16,000 | 1,000 | 0.8 | 0.02 | 14,000 | 800 | 0.1 |
| | 8 | 8 | 16,000 | 1,200 | 1 | 0.025 | 15,000 | 1,000 | 0.1 | 14,000 | 800 | 0.8 | 0.018 | 12,000 | 650 | 0.08 |
| | 10 | 10 | 14,000 | 1,000 | 1 | 0.02 | 12,000 | 800 | 0.07 | 12,000 | 650 | 0.8 | 0.014 | 11,000 | 550 | 0.05 |
| | 12 | 12 | 10,000 | 700 | 1 | 0.01 | 10,000 | 650 | 0.05 | 9,000 | 450 | 0.8 | 0.007 | 8,000 | 400 | 0.035 |
| 1.5 | 6 | 4 | 18,000 | 2,200 | 1.5 | 0.08 | 16,000 | 1,800 | 0.3 | 15,000 | 1,600 | 1 | 0.05 | 14,000 | 1,200 | 0.2 |
| | 8 | 5.3 | 16,000 | 1,700 | 1.5 | 0.06 | 14,000 | 1,400 | 0.25 | 13,000 | 1,200 | 1 | 0.04 | 12,000 | 950 | 0.18 |
| | 12 | 8 | 12,000 | 1,200 | 1.5 | 0.04 | 11,000 | 1,000 | 0.15 | 10,000 | 800 | 1 | 0.03 | 9,000 | 650 | 0.1 |
| | 16 | 10.7 | 10,000 | 900 | 1.5 | 0.02 | 10,000 | 800 | 0.08 | 8,000 | 600 | 1 | 0.015 | 7,000 | 500 | 0.06 |
| 2 | 6 | 3 | 18,000 | 2,500 | 2 | 0.1 | 16,000 | 2,200 | 0.45 | 14,000 | 1,800 | 1.5 | 0.08 | 12,000 | 1,500 | 0.3 |
| | 8 | 4 | 16,000 | 2,200 | 2 | 0.09 | 14,000 | 1,900 | 0.4 | 12,000 | 1,500 | 1.5 | 0.07 | 12,000 | 1,400 | 0.28 |
| | 10 | 5 | 14,000 | 1,900 | 2 | 0.08 | 12,000 | 1,600 | 0.35 | 10,000 | 1,200 | 1.5 | 0.06 | 10,000 | 1,000 | 0.24 |
| | 12 | 6 | 12,000 | 1,600 | 2 | 0.07 | 11,000 | 1,400 | 0.28 | 10,000 | 1,100 | 1.5 | 0.05 | 9,000 | 900 | 0.2 |
| | 14 | 7 | 11,000 | 1,400 | 2 | 0.06 | 10,000 | 1,200 | 0.24 | 9,000 | 950 | 1.5 | 0.04 | 8,000 | 800 | 0.16 |
| | 16 | 8 | 10,000 | 1,200 | 2 | 0.045 | 9,000 | 1,000 | 0.18 | 8,000 | 800 | 1.5 | 0.03 | 7,000 | 650 | 0.12 |
| | 20 | 10 | 9,000 | 1,000 | 2 | 0.03 | 8,000 | 850 | 0.12 | 7,000 | 700 | 1.5 | 0.02 | 6,000 | 550 | 0.08 |
| 3 | 10 | 3.3 | 16,000 | 2,400 | 3 | 0.12 | 14,000 | 2,000 | 0.7 | 12,000 | 1,800 | 2.4 | 0.08 | 11,000 | 1,500 | 0.5 |
| | 15 | 5 | 14,000 | 2,100 | 3 | 0.1 | 12,000 | 1,600 | 0.6 | 11,000 | 1,600 | 2.4 | 0.07 | 9,000 | 1,100 | 0.4 |
| | 20 | 6.7 | 11,000 | 1,500 | 3 | 0.07 | 10,000 | 1,200 | 0.4 | 9,000 | 1,100 | 2.4 | 0.05 | 8,000 | 900 | 0.3 |
| | 25 | 8.3 | 10,000 | 1,300 | 3 | 0.05 | 9,000 | 1,000 | 0.2 | 8,000 | 900 | 2.4 | 0.03 | 7,000 | 700 | 0.15 |
| 4 | 15 | 3.8 | 12,000 | 2,400 | 4 | 0.2 | 10,000 | 2,000 | 0.9 | 9,000 | 1,600 | 3 | 0.15 | 8,000 | 1,400 | 0.7 |
| | 20 | 5 | 10,000 | 2,000 | 4 | 0.15 | 8,000 | 1,600 | 0.7 | 8,000 | 1,400 | 3 | 0.1 | 6,000 | 1,000 | 0.5 |
| | 25 | 6.3 | 9,000 | 1,700 | 4 | 0.1 | 8,000 | 1,500 | 0.5 | 7,000 | 1,200 | 3 | 0.07 | 6,000 | 1,000 | 0.3 |
| | 30 | 7.5 | 8,000 | 1,500 | 4 | 0.07 | 7,000 | 1,300 | 0.3 | 6,000 | 1,000 | 3 | 0.05 | 5,000 | 800 | 0.2 |
| 6 | 20 | 3.3 | 7,000 | 2,400 | 6 | 0.3 | 6,000 | 2,000 | 1.2 | 5,000 | 1,600 | 4 | 0.2 | 4,500 | 1,200 | 0.8 |
| | 30 | 5 | 5,000 | 1,600 | 6 | 0.2 | 4,000 | 1,200 | 1 | 4,000 | 1,100 | 4 | 0.15 | 3,500 | 900 | 0.6 |
| | 50 | 8.3 | 3,500 | 800 | 6 | 0.1 | 3,000 | 650 | 0.4 | 3,000 | 600 | 4 | 0.07 | 3,000 | 500 | 0.25 |

**備考 Notes**

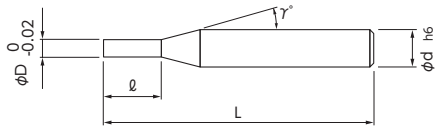
※本切削条件は参考値です。実際の加工形状および使用機械等にて切削条件を調整してください。
※切り込み量の ap は深さ方向の切り込み量、ae は径方向の切り込み量を示します。
※ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。
　また、主軸回転数が足りない場合も同様に同じ割合で下げてください。
※クーラントは不水溶性切削油をお奨めします。
※Recommend to use the milling condition as just reference. Adjust milling conditions according to machining shape and machine status.
※Depth of Cut : ap=Axial Depth of Cut / ae=Radial Depth of Cut.
※Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.
※Water-insoluble cutting fluid is recommended.



SEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# DX

## 銅電極・アルミ・プラ用 2枚刃エンドミル
2-Flute End Mill for Nonferrous

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詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

Slot Side Face SMG 2 25°

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| | | | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| | | ◎ | ◎ | ◎ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

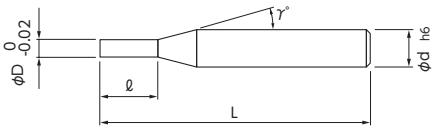
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 07-00036-00050 | 0.5 | 1 | 12° | 4 | 45 | 3,700 ▌ |
| 07-00036-00080 | 0.8 | 1.6 | 12° | 4 | 45 | 3,700 ▌ |
| 07-00036-00100 | 1 | 2 | 9° | 4 | 45 | 3,700 ▌ |
| 07-00036-00150 | 1.5 | 3 | 9° | 4 | 45 | 3,700 ▌ |
| 07-00036-00200 | 2 | 4 | 9° | 4 | 45 | 3,700 ▌ |
| 07-00036-00250 | 2.5 | 5 | 9° | 4 | 45 | 3,700 ▌ |
| 07-00036-00300 | 3 | 6 | 9° | 6 | 50 | 5,300 ▌ |
| 07-00036-00400 | 4 | 8 | 9° | 6 | 50 | 5,300 ▌ |
| 07-00036-00500 | 5 | 10 | 9° | 6 | 60 | 6,400 ▌ |
| 07-00036-00600 | 6 | 12 | – | 6 | 60 | 6,400 ▌ |
| ▲ 07-00036-00800 | 8 | 16 | – | 8 | 70 | 9,000 ▌ |
| ▲ 07-00036-01000 | 10 | 20 | – | 10 | 80 | 11,200 ▌ |
| ▲ 07-00036-01200 | 12 | 24 | – | 12 | 80 | 18,500 ▌ |
| ▲ 07-00036-01600 | 16 | 32 | – | 16 | 100 | 40,600 ▌ |
| ▲ 07-00036-02000 | 20 | 40 | – | 20 | 120 | 67,800 ▌ |

**オーダー方法**
DX 刃径(D)を指示してください。
When you order, indicate DX (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-170に記載
●Recommended Milling Conditions are shown on page D-170.

# DXM

## 銅電極・アルミ・プラ用 2枚刃ミディアムエンドミル
2-Flute Medium End Mill for Nonferrous

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● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

Side Face SMG 2 25°

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| | | | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| | | ◎ | ◎ | ◎ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

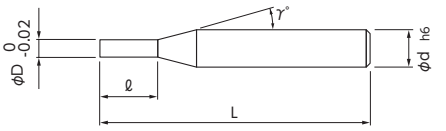
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 07-00040-00300 | 3 | 12 | 9° | 6 | 60 | 9,500 ▌ |
| 07-00040-00400 | 4 | 16 | 9° | 6 | 60 | 10,800 ▌ |
| 07-00040-00500 | 5 | 20 | 9° | 6 | 70 | 12,000 ▌ |
| 07-00040-00600 | 6 | 24 | – | 6 | 70 | 13,100 ▌ |
| ▲ 07-00040-00800 | 8 | 32 | – | 8 | 90 | 16,600 ▌ |
| ▲ 07-00040-01000 | 10 | 40 | – | 10 | 100 | 20,300 ▌ |
| ▲ 07-00040-01200 | 12 | 48 | – | 12 | 110 | 34,800 ▌ |
| ▲ 07-00040-01600 | 16 | 64 | – | 16 | 140 | 76,700 ▌ |
| ▲ 07-00040-02000 | 20 | 80 | – | 20 | 160 | 121,200 ▌ |

**オーダー方法**
DXM 刃径(D)を指示してください。
When you order, indicate DXM (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-171に記載
●Recommended Milling Conditions are shown on page D-171.

# DXL

## 銅電極・アルミ・プラ用 2枚刃ロングエンドミル
2-Flute Long End Mill for Nonferrous

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詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

Side Face SMG 2 25°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| | | | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| | | ◎ | ◎ | ◎ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

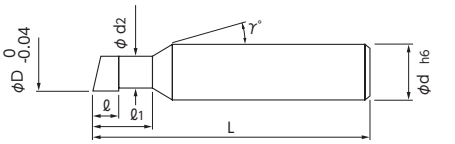
| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 07-00045-00300 | 3 | 15 | 9° | 6 | 70 | 12,000 ▌ |
| 07-00045-00400 | 4 | 20 | 9° | 6 | 70 | 14,400 ▌ |
| 07-00045-00500 | 5 | 25 | 9° | 6 | 80 | 15,700 ▌ |
| 07-00045-00600 | 6 | 30 | – | 6 | 80 | 16,700 ▌ |
| ▲ 07-00045-00800 | 8 | 40 | – | 8 | 100 | 21,600 ▌ |
| ▲ 07-00045-01000 | 10 | 50 | – | 10 | 110 | 27,800 ▌ |
| ▲ 07-00045-01200 | 12 | 60 | – | 12 | 120 | 41,400 ▌ |
| ▲ 07-00045-01600 | 16 | 80 | – | 16 | 160 | 91,600 ▌ |
| ▲ 07-00045-02000 | 20 | 100 | – | 20 | 190 | 138,900 ▌ |

**オーダー方法** DXL 刃径(D)を指示してください。
When you order, indicate DXL (D).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-172に記載
●Recommended Milling Conditions are shown on page D-172.

# DSF

## 銅電極・アルミ・プラ用 サーフェイスエンドミル
Surface End Mill for Nonferrous

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● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

Face SMG 1 12°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| | | | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| | | ◎ | ◎ | ◎ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (ℓ1)有効長 Effective Length | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 07-00001-00100 | 1 | 0.5 | 0.9 | 1 | 12° | 6 | 60 | 6,000 ▌ |
| 07-00001-00200 | 2 | 1 | 1.8 | 2 | 12° | 6 | 60 | 6,000 ▌ |
| 07-00001-00300 | 3 | 1.5 | 2.7 | 3 | 12° | 6 | 60 | 6,000 ▌ |
| 07-00001-00400 | 4 | 2 | 3.6 | 4 | 12° | 6 | 60 | 6,000 ▌ |
| 07-00001-00500 | 5 | 2.5 | 4.5 | 5 | 12° | 6 | 60 | 7,000 ▌ |
| 07-00001-00600 | 6 | 3 | 5.4 | 6 | – | 6 | 60 | 7,000 ▌ |
| ▲ 07-00001-00800 | 8 | 4 | 7.2 | 8 | – | 8 | 70 | 10,000 ▌ |
| ▲ 07-00001-01000 | 10 | 5 | 9 | 10 | – | 10 | 80 | 12,700 ▌ |
| ▲ 07-00001-01200 | 12 | 6 | 10.8 | 12 | – | 12 | 80 | 16,300 ▌ |
| ▲ 07-00001-01600 | 16 | 8 | 14.4 | 16 | – | 16 | 100 | 29,500 ▌ |
| ▲ 07-00001-02000 | 20 | 10 | 18 | 20 | – | 20 | 120 | 46,000 ▌ |

**オーダー方法** DSF 刃径(D)を指示してください。
When you order, indicate DSF (D).

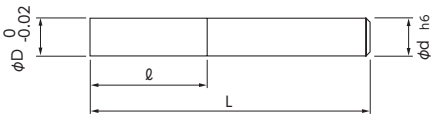
※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はD-173に記載
●Recommended Milling Conditions are shown on page D-173.



SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

# DHS

## 銅電極・アルミ・プラ用 前加工エンドミル
3-Flute Semi-finishing End Mill for Nonferrous

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詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | |
|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ |
| | | | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| | | ◎ | ◎ | ◎ |

### ▲ 生産終了品 Discontinued Item

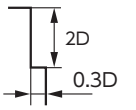
単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| | コードNo. Code No. | (D)刃径 Dia. | (ℓ)刃長 Length of Cut | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| ▲ | 07-00333-00600 | 6 | 15 | 6 | 70 | 8,300 ▌ |
| ▲ | 07-00333-00800 | 8 | 20 | 8 | 80 | 12,700 ▌ |
| ▲ | 07-00333-01000 | 10 | 25 | 10 | 90 | 18,200 ▌ |
| ▲ | 07-00333-01200 | 12 | 30 | 12 | 90 | 26,700 ▌ |
| ▲ | 07-00333-01600 | 16 | 40 | 16 | 100 | 51,800 ▌ |
| ▲ | 07-00333-02000 | 20 | 50 | 20 | 120 | 88,300 ▌ |

**オーダー方法**
DHS 刃径(D)を指示してください。
When you order, indicate DHS (D).

●切削条件表はD-174に記載
●Recommended Milling Conditions are shown on page D-174.

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 銅 Copper | | アルミニウム合金 Aluminum Alloy | |
|---|---|---|---|---|
| 切削速度 Cutting Speed | 60m/min | | 80～150m/min | |
| 刃　径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 0.5 | 38,000 | 150 | 50,000 | 520 |
| 0.8 | 24,000 | 150 | 50,000 | 520 |
| 1 | 19,000 | 150 | 48,000 | 800 |
| 1.5 | 13,000 | 150 | 32,000 | 1,000 |
| 2 | 9,600 | 150 | 24,000 | 1,000 |
| 2.5 | 7,700 | 200 | 19,000 | 1,000 |
| 3 | 6,400 | 200 | 16,000 | 1,000 |
| 4 | 4,800 | 200 | 12,000 | 1,000 |
| 5 | 3,800 | 200 | 9,600 | 1,000 |
| 6 | 3,200 | 200 | 8,000 | 1,000 |
| 8 | 2,400 | 200 | 6,000 | 1,000 |
| 10 | 1,900 | 200 | 4,800 | 1,000 |
| 12 | 1,600 | 200 | 4,000 | 1,000 |
| 16 | 1,200 | 200 | 3,000 | 1,000 |
| 20 | 960 | 200 | 2,400 | 1,000 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   | | | |
| 備　考 Notes | ※切削油を使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※鋼には、絶対に使用しないでください。<br>※Use cutting fluid.<br>※Adjust both spindle speed and feed at the same rate.<br>※Don't use for cutting steels. | | | |





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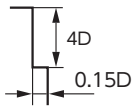
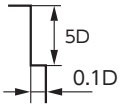
# DXM

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 銅 Copper | | アルミニウム合金 Aluminum Alloy | |
|---|---|---|---|---|
| 切削速度 Cutting Speed | 40m/min | | 50～100m/min | |
| 刃　径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 3 | 4,300 | 130 | 10,000 | 660 |
| 4 | 3,200 | 130 | 8,000 | 660 |
| 5 | 2,600 | 130 | 6,400 | 660 |
| 6 | 2,100 | 130 | 5,300 | 660 |
| 8 | 1,600 | 130 | 4,000 | 660 |
| 10 | 1,300 | 130 | 3,200 | 660 |
| 12 | 1,000 | 130 | 2,600 | 660 |
| 16 | 800 | 130 | 2,000 | 660 |
| 20 | 640 | 130 | 1,200 | 660 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   | | | |
| 備　考 Notes | ※切削油を使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※鋼には、絶対に使用しないでください。<br>※Use cutting fluid.<br>※Adjust both spindle speed and feed at the same rate.<br>※Don't use for cutting steels. | | | |

# DXL

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 銅 Copper | | アルミニウム合金 Aluminum Alloy | |
|---|---|---|---|---|
| 切削速度 Cutting Speed | 30m/min | | 40～80m/min | |
| 刃 径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 3 | 3,200 | 100 | 8,000 | 500 |
| 4 | 2,400 | 100 | 6,000 | 500 |
| 5 | 1,900 | 100 | 4,800 | 500 |
| 6 | 1,600 | 100 | 4,000 | 500 |
| 8 | 1,200 | 100 | 3,000 | 500 |
| 10 | 1,000 | 100 | 2,400 | 500 |
| 12 | 800 | 100 | 2,000 | 500 |
| 16 | 600 | 100 | 1,500 | 500 |
| 20 | 500 | 100 | 1,200 | 500 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   | | | |
| 備 考 Notes | ※切削油を使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※鋼には、絶対に使用しないでください。<br>※Use cutting fluid.<br>※Adjust both spindle speed and feed at the same rate.<br>※Don't use for cutting steels. | | | |



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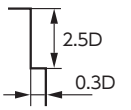
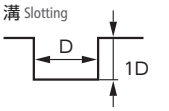
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 銅 Copper | | アルミニウム合金 Aluminum Alloy | |
|---|---|---|---|---|
| 切削速度 Cutting Speed | 80m/min | | 80～150m/min | |
| 刃　径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 26,000 | 220 | 48,000 | 480 |
| 2 | 13,000 | 220 | 24,000 | 480 |
| 3 | 8,500 | 220 | 16,000 | 480 |
| 4 | 6,400 | 220 | 12,000 | 480 |
| 5 | 5,100 | 220 | 9,600 | 480 |
| 6 | 4,200 | 220 | 8,000 | 480 |
| 8 | 3,200 | 220 | 6,000 | 480 |
| 10 | 2,600 | 220 | 4,800 | 480 |
| 12 | 2,100 | 220 | 4,000 | 480 |
| 16 | 1,600 | 220 | 3,000 | 480 |
| 20 | 1,300 | 220 | 2,400 | 480 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 溝 Slotting D 0.02～0.05mm | | | |
| 備　考 Notes | ※切削油を使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※鋼には、絶対に使用しないでください。<br>※Use cutting fluid.<br>※Adjust both spindle speed and feed at the same rate.<br>※Don't use for cutting steels. | | | |

# DHS

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 銅 Copper | | アルミニウム合金 Aluminum Alloy | |
|---|---|---|---|---|
| 切削速度 Cutting Speed | 80m/min | | 80～150m/min | |
| 刃　径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 6 | 4,200 | 320 | 8,000 | 1,200 |
| 8 | 3,200 | 320 | 6,000 | 1,200 |
| 10 | 2,600 | 320 | 4,800 | 1,200 |
| 12 | 2,100 | 320 | 4,000 | 1,200 |
| 16 | 1,600 | 320 | 3,000 | 1,200 |
| 20 | 1,300 | 320 | 2,400 | 1,200 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling   | | 溝 Slotting   | |
| 備　考 Notes | ※切削油を使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※鋼には、絶対に使用しないでください。<br>※Use cutting fluid.<br>※Adjust both spindle speed and feed at the same rate.<br>※Don't use for cutting steels. | | | |



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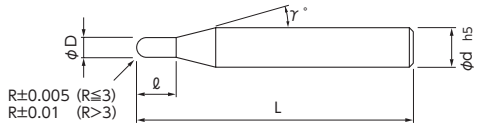
# MSBH230

## 無限コーティングプレミアム 高硬度用2枚刃ボールエンドミル
MUGEN-COATING PREMIUM 2-Flute Ball End Mill for Hardened Steel




●スタンダードタイプの高硬度用ボールエンドミル。
仕上げ加工に最適。
●68HRC までの高硬度材に対応。
●Standard ball end mill for hardened steels and suitable for finishing process.
●Applicable for hardened steels up to 68HRC.

技術資料 K-018

3D MG Premium 2 30° ≦68 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ◎ | ◎ | ◎ | | | | | |

★ 再研磨可能 （詳細はお問い合わせください。）

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

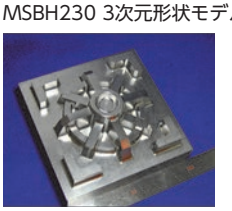
| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 08-00507-00005 | R0.05 | 0.1 | 0.1 | 12° | 4 | 50 | 10,800 |
| 08-00507-00007 | R0.075 | 0.15 | 0.15 | 12° | 4 | 50 | 10,500 |
| 08-00507-00010 | R0.1 | 0.2 | 0.2 | 12° | 4 | 50 | 8,600 |
| 08-00507-00015 | R0.15 | 0.3 | 0.3 | 12° | 4 | 50 | 6,200 |
| 08-00507-00020 | R0.2 | 0.6 | 0.4 | 12° | 4 | 50 | 4,200 |
| 08-00507-00025 | R0.25 | 0.8 | 0.5 | 12° | 4 | 50 | 3,900 |
| 08-00507-00030 | R0.3 | 0.9 | 0.6 | 12° | 4 | 50 | 3,800 |
| 08-00507-00040 | R0.4 | 1.2 | 0.8 | 12° | 4 | 50 | 3,800 |
| 08-00507-00050 | R0.5 | 1.5 | 1 | 12° | 4 | 50 | 3,500 |
| 08-00507-00075 | R0.75 | 2.3 | 1.5 | 12° | 4 | 50 | 4,200 |
| 08-00507-00100 | R1 | 3 | 2 | 12° | 4 | 60 | 3,100 |
| ★ 08-00507-00125 | R1.25 | 3.8 | 2.5 | 12° | 6 | 60 | 5,300 |
| ★ 08-00507-00150 | R1.5 | 5 | 3 | 12° | 6 | 60 | 3,800 |
| ★ 08-00507-00201 | R2 | 6 | 4 | – | 4 | 70 | 4,300 |
| ★ 08-00507-00200 | R2 | 6 | 4 | 12° | 6 | 70 | 4,900 |
| ★ 08-00507-00250 | R2.5 | 8 | 5 | 12° | 6 | 70 | 5,200 |
| ★ 08-00507-00300 | R3 | 10 | 6 | – | 6 | 80 | 5,400 |
| ★ 08-00507-00400 | R4 | 12 | 8 | – | 8 | 90 | 13,700 |
| ★ 08-00507-00500 | R5 | 15 | 10 | – | 10 | 100 | 17,600 |
| ★ 08-00507-00600 | R6 | 20 | 12 | – | 12 | 100 | 25,300 |

オーダー方法 MSBH230 ボール半径(R)×シャンク径(d)を指示してください。
When you order, indicate MSBH230 (R)×(d).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はE-003に記載
●Recommended Milling Conditions are shown on page E-003.

## 加工事例 1 Technical Data 1

MSBH230 3次元形状モデル 3D Shape Model



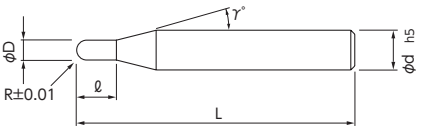
・被削材：STAVAX 52HRC
Material : STAVAX 52HRC
・総加工時間：9 時間 23 分
Total cutting time : 9hr 23min
・クーラント：オイルミスト
Coolant : Oil mist

ワークサイズ：
100×100mm(加工深さ 20mm)
Work Size : 100 x 100mm (cutting 20mm)

| 加工工程 Process | 荒取り Roughing | 中仕上げ Semi-finishing | 仕上げ Finishing |
|---|---|---|---|
| 使用工具 Tool | MSBH230 R3 | MSBH230 R2 | MSBH230 R2 |
| 回転数 [min⁻¹] Spindle speed | 14,000 | 15,000 | |
| 送り速度 [mm/min] Feed | 3,000 | 2,000 | 1,800 |
| 切り込み量 ap×ae[mm] Depth of cut | 0.3 × 2 | 0.2 × 0.3 | 0.08 × 0.05 |
| 加工時間 Cutting time | 2 時間 30 分 2hr 30min | 2 時間 23 分 2hr 23min | 4 時間 30 分 4hr 30min |

# MSBH345

## 無限コーティングプレミアム 高硬度用3枚刃ボールエンドミル
MUGEN-COATING PREMIUM 3-Flute Ball End Mill for Hardened Steel




- ●高硬度材用無限コーティングプレミアムを採用し、長寿命化を実現。
- ●独自の 3 枚刃形状と不等分割の採用でビビリの少ない高能率加工が可能。
- ●MUGEN-COATING PREMIUM realizes long tool life for machining on high-hardened steel.
- ●Original 3-flute design and unequal flute spacing to suppress chattering realize high efficient machining.

3D MG ∞ Premium 3 45° ≦68 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ◎ | ◎ | ◎ | | | | | |

★ 再研磨可能 （詳細はお問い合わせください。）

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 08-00607-00050 | R0.5 | 1.5 | 1 | 12° | 6 | 60 | 9,200 |
| 08-00607-00060 | R0.6 | 2 | 1.2 | 12° | 6 | 60 | 12,400 ▌ |
| 08-00607-00070 | R0.7 | 3 | 1.4 | 12° | 6 | 60 | 12,400 ▌ |
| 08-00607-00080 | R0.8 | 3 | 1.6 | 12° | 6 | 60 | 12,400 ▌ |
| 08-00607-00090 | R0.9 | 3 | 1.8 | 12° | 6 | 60 | 12,400 ▌ |
| 08-00607-00100 | R1 | 3 | 2 | 12° | 6 | 60 | 9,200 |
| 08-00607-00110 | R1.1 | 3.5 | 2.2 | 12° | 6 | 60 | 13,500 ▌ |
| 08-00607-00120 | R1.2 | 4 | 2.4 | 12° | 6 | 60 | 13,500 ▌ |
| 08-00607-00130 | R1.3 | 4 | 2.6 | 12° | 6 | 60 | 13,500 ▌ |
| 08-00607-00140 | R1.4 | 5 | 2.8 | 12° | 6 | 60 | 13,500 ▌ |
| ★ 08-00607-00150 | R1.5 | 5 | 3 | 12° | 6 | 60 | 10,000 |
| ★ 08-00607-00160 | R1.6 | 5 | 3.2 | 12° | 6 | 60 | 13,500 ▌ |
| ★ 08-00607-00170 | R1.7 | 6 | 3.4 | 12° | 6 | 60 | 13,500 ▌ |
| ★ 08-00607-00180 | R1.8 | 6 | 3.6 | 12° | 6 | 60 | 13,500 ▌ |
| ★ 08-00607-00190 | R1.9 | 6 | 3.8 | 12° | 6 | 60 | 13,500 ▌ |
| ★ 08-00607-00200 | R2 | 6 | 4 | 12° | 6 | 70 | 10,000 |
| ★ 08-00607-00210 | R2.1 | 7 | 4.2 | 12° | 6 | 70 | 14,600 ▌ |
| ★ 08-00607-00220 | R2.2 | 7 | 4.4 | 12° | 6 | 70 | 14,600 ▌ |
| ★ 08-00607-00230 | R2.3 | 7 | 4.6 | 12° | 6 | 70 | 14,600 ▌ |
| ★ 08-00607-00240 | R2.4 | 8 | 4.8 | 12° | 6 | 70 | 14,600 ▌ |
| ★ 08-00607-00250 | R2.5 | 8 | 5 | 12° | 6 | 70 | 10,800 |
| ★ 08-00607-00260 | R2.6 | 8 | 5.2 | 12° | 6 | 70 | 15,700 ▌ |
| ★ 08-00607-00270 | R2.7 | 9 | 5.4 | 12° | 6 | 70 | 15,700 ▌ |
| ★ 08-00607-00280 | R2.8 | 9 | 5.6 | 12° | 6 | 70 | 15,700 ▌ |
| ★ 08-00607-00290 | R2.9 | 9 | 5.8 | 12° | 6 | 70 | 15,700 ▌ |
| ★ 08-00607-00300 | R3 | 10 | 6 | – | 6 | 80 | 11,600 |

**オーダー方法**

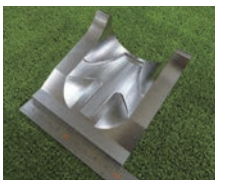
MSBH345 ボール半径(R)を指示してください。
When you order, indicate MSBH345 (R).

※(γ)は参考値です。
※(γ) is reference value.

- ●切削条件表はE-003に記載
- ●Recommended Milling Conditions are shown on page E-003.
- ●▌の規格・サイズは特定商社在庫となります。詳しくはお問い合わせください。
- ●▌:Semi-standard item, please inquire for price and delivery.

## 加工事例 1 Technical Data 1

ビンディングサンプル Binding sample



- 被削材：DC53 60HRC
  Material : DC53 60HRC
- 総加工時間：15 時間 16 分
  Total cutting time : 15hr 16min
- クーラント：オイルミスト
  Coolant : Oil mist
- ワークサイズ：100×100mm(加工深さ 50mm)
  Work Size : 100 x 100mm (cutting 50mm)

| 加工工程 Process | 荒取り Roughing | 中仕上げ Semi-finishing | 仕上げ Finishing | 取り残し Stock removal |
|---|---|---|---|---|
| 使用工具 Tool | MSBH345 R3 | MSBH345 R3 | MSBH345 R3 | MSBH345 R2 |
| 回転数 [min⁻¹] Spindle speed | 7,200 | | | 12,000 |
| 送り速度 [mm/min] Feed | 3,000 | 3,000 | 2,200 | 2,200 |
| 切り込み量 ap×ae[mm] Depth of cut | 0.3 × 1.5 | 0.3 × 0.5 | 0.1 × 0.1 | 0.1 × 0.1 |
| 加工時間 Cutting time | 6時間40分 6hr 40min | 49分 49min | 7時間20分 7hr20min | 27分 27min |



SEVKET GÜLÜ MAKINA TICARET VE SAN. LTD. ŞTI.

# MSBH230

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-018

| 被削材 Work Material | 焼き入れ鋼 Hardened Steels SKD61·STAVAX·HPM-38 (~52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (~62HRC) | | | | ハイス High Speed Tool Steels SKH (~65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.05 | 0.005 | 0.005 | 150 | 40,000 | 0.003 | 0.005 | 100 | 40,000 | 0.002 | 0.005 | 60 | 40,000 |
| 0.075 | 0.005 | 0.005 | 180 | 40,000 | 0.003 | 0.005 | 150 | 40,000 | 0.002 | 0.005 | 100 | 40,000 |
| 0.1 | 0.01 | 0.02 | 360 | 40,000 | 0.01 | 0.01 | 320 | 40,000 | 0.003 | 0.005 | 240 | 40,000 |
| 0.15 | 0.01 | 0.03 | 420 | 40,000 | 0.01 | 0.02 | 360 | 40,000 | 0.005 | 0.01 | 300 | 40,000 |
| 0.2 | 0.02 | 0.06 | 1,000 | 40,000 | 0.02 | 0.05 | 820 | 40,000 | 0.01 | 0.02 | 480 | 40,000 |
| 0.25 | 0.03 | 0.07 | 1,200 | 40,000 | 0.025 | 0.05 | 1,000 | 40,000 | 0.015 | 0.03 | 600 | 40,000 |
| 0.3 | 0.05 | 0.1 | 1,600 | 40,000 | 0.03 | 0.06 | 1,200 | 40,000 | 0.02 | 0.05 | 720 | 30,000 |
| 0.4 | 0.1 | 0.15 | 2,200 | 40,000 | 0.07 | 0.1 | 1,800 | 40,000 | 0.05 | 0.1 | 1,200 | 30,000 |
| 0.5 | 0.1 | 0.3 | 2,500 | 40,000 | 0.1 | 0.2 | 2,000 | 30,000 | 0.08 | 0.1 | 1,400 | 25,000 |
| 0.75 | 0.15 | 0.3 | 3,000 | 30,000 | 0.1 | 0.3 | 2,500 | 30,000 | 0.1 | 0.2 | 2,000 | 25,000 |
| 1 | 0.2 | 0.5 | 3,000 | 25,000 | 0.2 | 0.5 | 2,500 | 25,000 | 0.15 | 0.3 | 2,000 | 20,000 |
| 1.25 | 0.2 | 0.6 | 3,000 | 25,000 | 0.2 | 0.5 | 2,500 | 20,000 | 0.15 | 0.3 | 2,000 | 16,000 |
| 1.5 | 0.2 | 0.8 | 3,000 | 20,000 | 0.2 | 0.6 | 2,500 | 18,000 | 0.2 | 0.5 | 2,000 | 14,000 |
| 2 | 0.3 | 1.5 | 3,000 | 20,000 | 0.2 | 0.8 | 2,500 | 16,000 | 0.2 | 0.6 | 2,000 | 12,000 |
| 2.5 | 0.3 | 1.5 | 3,000 | 18,000 | 0.2 | 1.2 | 2,500 | 12,000 | 0.2 | 0.7 | 2,000 | 9,200 |
| 3 | 0.3 | 2 | 3,000 | 16,000 | 0.3 | 1.2 | 2,500 | 8,000 | 0.2 | 1 | 2,000 | 7,000 |
| 4 | 0.5 | 2 | 2,500 | 10,000 | 0.4 | 1.2 | 1,800 | 7,000 | 0.3 | 1 | 1,200 | 5,000 |
| 5 | 0.7 | 2.5 | 2,000 | 7,000 | 0.5 | 1.5 | 1,500 | 5,000 | 0.4 | 1.2 | 1,000 | 4,000 |
| 6 | 1 | 3 | 1,500 | 5,000 | 0.6 | 2 | 1,200 | 4,000 | 0.5 | 1.5 | 800 | 3,000 |

備考 Notes

※切り込み量の、ap は深さ方向の切り込み量、ae はピックフィードを示します。
※オイルミストクーラントをお奨めします。
※回転数と送り速度は、同じ割合で調整してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整してください。
※工具突出し量は、必要以上に出さないでください。
※Depth of Cut: ap=Axial Depth of Cut / ae=Radial Depth of Cut.
※We recommend using oil mist coolant.
※Adjust both spindle speed and feed at the same rate.
※Adjust milling conditions according to the volume of depth of cut and rigidity of machine.
※Length of tool overhang must be as short as possible.

# MSBH345

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 焼き入れ鋼 Hardened Steels SKD61·STAVAX (~52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (~62HRC) | | | | ハイス High Speed Tool Steels SKH (~65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.5 | 0.1 | 0.3 | 2,500 | 30,000 | 0.1 | 0.2 | 2,500 | 30,000 | 0.08 | 0.1 | 2,000 | 30,000 |
| 1 | 0.2 | 0.6 | 3,000 | 20,000 | 0.2 | 0.6 | 3,000 | 20,000 | 0.15 | 0.3 | 2,500 | 20,000 |
| 1.5 | 0.2 | 1 | 3,000 | 18,000 | 0.2 | 0.8 | 3,000 | 16,000 | 0.2 | 0.5 | 2,000 | 14,000 |
| 2 | 0.3 | 1.5 | 3,000 | 15,000 | 0.2 | 1 | 3,000 | 12,000 | 0.2 | 0.6 | 2,000 | 10,000 |
| 2.5 | 0.3 | 2 | 3,000 | 12,000 | 0.2 | 1.2 | 3,000 | 10,000 | 0.2 | 0.7 | 2,000 | 8,000 |
| 3 | 0.4 | 2 | 3,000 | 9,000 | 0.3 | 1.2 | 3,000 | 7,200 | 0.2 | 1 | 2,000 | 6,800 |

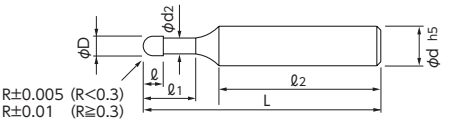
備考 Notes

※切り込み量の、ap は深さ方向の切り込み量、ae はピックフィードを示します。
※オイルミストクーラントをお奨めします。
※回転数と送り速度は、同じ割合で調整してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整してください。
※工具突出し量は、4 ~ 5D を基準とし、それ以上突出す場合は切削条件を調整してください。
※Depth of Cut: ap=Axial Depth of Cut / ae=Radial Depth of Cut.
※We recommend using oil mist coolant.
※Adjust both spindle speed and feed at the same rate.
※Adjust milling conditions according to the volume of depth of cut and rigidity of machine.
※Length of overhang is 4 to 5 times Dia. When it is longer than 4 to 5 times Dia., adjust the conditions listed above.

# MACH225SF

## 無限コーティングプレミアム ショートシャンク高速・高硬度加工用ボールエンドミル（焼きばめ用）

MUGEN-COATING PREMIUM 2-Flute Ball End Mill with Short Shank for Hardened Steel




●ショートシャンクタイプ（焼きばめ対応）。
●高速・高硬度加工用に設計されたボールエンドミル。
●It fits for Shrink Chuck System.
●It is designed for high speed cutting of hardened steels.

3D MG ∞ Premium 2 25° ≦65 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ◎ | ◎ | ◎ | ◎ | ◎ | | | |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (d)シャンク径 Shank Dia. | (ℓ2)シャンク長 Shank Length | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 08-00554-01011 | R0.1 | 0.5 | 0.2 | 0.2 | 0.175 | 4 | 28.2 | 35 | 9,800 |
| 08-00554-02011 | R0.2 | 1 | 0.4 | 0.4 | 0.365 | 4 | 27.9 | 35 | 6,500 |
| 08-00554-03011 | R0.3 | 1.5 | 0.6 | 0.6 | 0.56 | 4 | 27.6 | 35 | 5,600 |
| 08-00554-04011 | R0.4 | 2 | 0.8 | 0.8 | 0.76 | 4 | 27.3 | 35 | 5,600 |
| 08-00554-05011 | R0.5 | 2.5 | 1 | 1 | 0.95 | 4 | 32.1 | 40 | 5,200 |
| 08-00554-06011 | R0.6 | 3 | 1.2 | 1.2 | 1.15 | 4 | 31.8 | 40 | 5,700 |
| 08-00554-07511 | R0.75 | 3.8 | 1.5 | 1.5 | 1.45 | 4 | 31.3 | 40 | 5,700 |
| 08-00554-10011 | R1 | 5 | 2 | 2 | 1.94 | 4 | 30.5 | 40 | 4,600 |
| 08-00554-15011 | R1.5 | 8 | 3 | 3 | 2.85 | 4 | 28.7 | 40 | 5,600 |
| 08-00554-20012 | R2 | 10 | 4 | 4 | 3.8 | 6 | 24.8 | 40 | 6,000 |
| 08-00554-25012 | R2.5 | 12 | 5 | 5 | 4.8 | 6 | 30.1 | 45 | 7,300 |
| 08-00554-30012 | R3 | 15 | 6 | 6 | 5.7 | 6 | 29 | 45 | 7,700 |

**オーダー方法** MACH225SF ボール半径(R)を指示してください。
When you order, indicate MACH225SF (R).

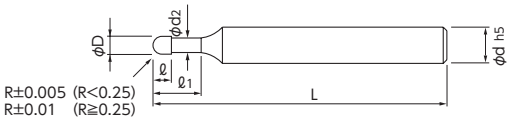
※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はE-006に記載
●Recommended Milling Conditions are shown on page E-006.



SEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MACH225

## 無限コーティングプレミアム 高速・高硬度加工用ボールエンドミル
MUGEN-COATING PREMIUM 2-Flute Ball End Mill for Hardened Steel




●高速・高硬度加工用に設計されたボールエンドミル。
●切り込みを多く設定でき、高速送りで効果を発揮。
●It is designed for high speed cutting of hardened steels.
●Perform efficiently under high feed condition and able to take large depth of cut.

3D MG ∞ Premium 2 25° ≦65 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ◎ | ◎ | ◎ | ◎ | ◎ | | | |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 08-00555-01011 | R0.1 | 0.5 | 0.2 | 0.2 | 0.175 | 4 | 50 | 10,000 |
| 08-00555-01012 | | 0.5 | 0.2 | 0.2 | 0.175 | 6 | 50 | 12,500 |
| 08-00555-02011 | R0.2 | 1 | 0.4 | 0.4 | 0.365 | 4 | 50 | 9,000 |
| 08-00555-02012 | | 1 | 0.4 | 0.4 | 0.365 | 6 | 50 | 11,500 |
| 08-00555-02511 | R0.25 | 1.25 | 0.5 | 0.5 | 0.46 | 4 | 50 | 8,000 |
| 08-00555-02512 | | 1.25 | 0.5 | 0.5 | 0.46 | 6 | 50 | 10,500 |
| 08-00555-03011 | R0.3 | 1.5 | 0.6 | 0.6 | 0.56 | 4 | 50 | 7,000 |
| 08-00555-03012 | | 1.5 | 0.6 | 0.6 | 0.56 | 6 | 50 | 9,500 |
| 08-00555-04011 | R0.4 | 2 | 0.8 | 0.8 | 0.76 | 4 | 50 | 6,500 |
| 08-00555-04012 | | 2 | 0.8 | 0.8 | 0.76 | 6 | 50 | 9,000 |
| 08-00555-05011 | R0.5 | 2.5 | 1 | 1 | 0.95 | 4 | 50 | 5,800 |
| 08-00555-05012 | | 2.5 | 1 | 1 | 0.95 | 6 | 50 | 8,300 |
| 08-00555-05021 | | 4 | 1 | 1 | 0.95 | 6 | 50 | 12,500 ▮ |
| 08-00555-05022 | | 6 | 1 | 1 | 0.95 | 6 | 50 | 13,200 ▮ |
| 08-00555-07511 | R0.75 | 3.8 | 1.5 | 1.5 | 1.45 | 4 | 50 | 5,800 |
| 08-00555-07512 | | 3.8 | 1.5 | 1.5 | 1.45 | 6 | 50 | 8,300 |
| 08-00555-10011 | R1 | 5 | 2 | 2 | 1.94 | 4 | 50 | 5,200 |
| 08-00555-10012 | | 5 | 2 | 2 | 1.94 | 6 | 50 | 8,300 |
| 08-00555-10022 | | 6 | 2 | 2 | 1.94 | 6 | 50 | 14,500 ▮ |
| 08-00555-10032 | | 8 | 2 | 2 | 1.94 | 6 | 50 | 15,400 ▮ |
| 08-00555-15012 | R1.5 | 8 | 3 | 3 | 2.85 | 6 | 60 | 9,100 |
| 08-00555-15022 | | 10 | 3 | 3 | 2.85 | 6 | 60 | 15,000 ▮ |
| 08-00555-15032 | | 15 | 3 | 3 | 2.85 | 6 | 60 | 16,200 ▮ |
| 08-00555-20012 | R2 | 10 | 4 | 4 | 3.8 | 6 | 60 | 9,100 |
| 08-00555-25012 | R2.5 | 12 | 5 | 5 | 4.8 | 6 | 60 | 10,000 |
| 08-00555-30012 | R3 | 15 | 6 | 6 | 5.7 | 6 | 60 | 10,000 |

**オーダー方法** MACH225 ボール半径(R)×有効長(ℓ1)×シャンク径(d)を指示してください。
When you order, indicate MACH225 (R)×(ℓ1)×(d).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はE-006に記載
●Recommended Milling Conditions are shown on page E-006.
●▮の規格・サイズは特定商社在庫となります。詳しくはお問い合わせください。
●▮:Semi-standard item, please inquire for price and delivery.

# MACH225・MACH225SF

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・HPM・NAK (~43HRC) | | | | | 焼き入れ鋼 Hardened Steels SKD61・STAVAX・HPM-38 (~55HRC) | | | | | 焼き入れ鋼 Hardened Steels SKD11 (~62HRC) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 通常条件 Normal Speed | | 高速条件 High Speed | | 切り込み量 Depth of Cut | 通常条件 Normal Speed | | 高速条件 High Speed | | 切り込み量 Depth of Cut | 通常条件 Normal Speed | | 高速条件 High Speed | | 切り込み量 Depth of Cut |
| Rサイズ Radius | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | ap×ae | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | ap×ae | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | ap×ae |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | mm | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | mm | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | mm |
| 0.1 | 20,000 | 400 | 50,000 | 800 | 0.01×0.02 | 20,000 | 250 | 50,000 | 500 | 0.01×0.02 | 20,000 | 250 | 50,000 | 500 | 0.01×0.02 |
| 0.2 | 20,000 | 600 | 50,000 | 1,000 | 0.02×0.05 | 20,000 | 320 | 50,000 | 680 | 0.02×0.05 | 20,000 | 320 | 50,000 | 680 | 0.02×0.05 |
| 0.25 | 20,000 | 800 | 50,000 | 1,200 | 0.03×0.05 | 20,000 | 400 | 50,000 | 800 | 0.02×0.05 | 20,000 | 400 | 50,000 | 800 | 0.02×0.05 |
| 0.3 | 20,000 | 1,200 | 50,000 | 2,000 | 0.05×0.1 | 20,000 | 460 | 50,000 | 1,000 | 0.03×0.05 | 20,000 | 460 | 50,000 | 1,000 | 0.03×0.05 |
| 0.4 | 20,000 | 1,600 | 50,000 | 2,500 | 0.1×0.2 | 20,000 | 580 | 50,000 | 1,200 | 0.05×0.1 | 20,000 | 580 | 50,000 | 1,200 | 0.05×0.1 |
| 0.5 | 20,000 | 2,000 | 50,000 | 5,000 | 0.2×0.3 | 20,000 | 1,200 | 50,000 | 3,000 | 0.1×0.2 | 20,000 | 800 | 50,000 | 2,000 | 0.1×0.2 |
| 0.75 | 20,000 | 2,000 | 50,000 | 5,000 | 0.2×0.3 | 20,000 | 1,600 | 42,000 | 3,000 | 0.1×0.2 | 20,000 | 1,200 | 32,000 | 2,000 | 0.1×0.2 |
| 1 | 20,000 | 3,200 | 50,000 | 8,000 | 0.3×0.5 | 20,000 | 2,500 | 32,000 | 3,500 | 0.2×0.5 | 20,000 | 2,000 | 24,000 | 2,400 | 0.2×0.5 |
| 1.5 | 16,000 | 2,800 | 32,000 | 6,000 | 0.3×0.5 | 16,000 | 2,500 | 21,000 | 3,500 | 0.2×0.5 | 13,000 | 2,000 | 16,000 | 2,400 | 0.2×0.5 |
| 2 | 12,000 | 2,400 | 24,000 | 5,000 | 0.5×1 | 12,000 | 2,000 | 16,000 | 3,000 | 0.2×0.7 | 9,600 | 1,600 | 12,000 | 2,000 | 0.2×0.7 |
| 2.5 | 9,600 | 2,000 | 20,000 | 5,000 | 0.5×1 | 9,600 | 2,000 | 13,000 | 3,000 | 0.2×0.7 | 7,600 | 1,300 | 9,600 | 1,600 | 0.2×0.7 |
| 3 | 8,000 | 2,000 | 16,000 | 4,000 | 0.5×1.5 | 8,000 | 1,600 | 10,000 | 2,500 | 0.2×1 | 6,400 | 1,000 | 8,000 | 1,300 | 0.2×1 |

**備　考 Notes**

※切り込み量の ap は深さ方向の切り込み量、ae はピックフィードを示します。
※オイルミストクーラントをお奨めします。
※回転数と送り速度は、同じ割合で調整してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整してください。
※工具突出し量は、必要以上に出さないでください。
※Depth of Cut : ap = Axial Depth of Cut / ae = Radial Depth of Cut.
※We recommend using oil mist coolant.
※Adjust milling conditions according to the volume of depth of cut and rigidity of machine.
※Adjust both spindle speed and feed at the same rate.
※Length of tool overhang must be as short as possible.



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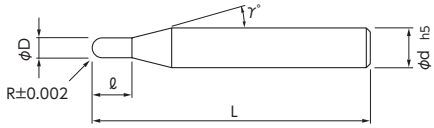
# MSB230G2

## 無限コーティング 高精度 プロフィットボールエンドミル
MUGEN-COATING Profit Ball End Mill




●超高精度！ R 精度±2μm
●チューンナップされた無限コーティングが高精度な加工を長時間持続。
●Utmost accuracy！ R-tolerance：±2μm
●Improved MUGEN-COATING guarantees long-lasting machining.

3D MG ∞ 2 30° ≦55 HRC

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

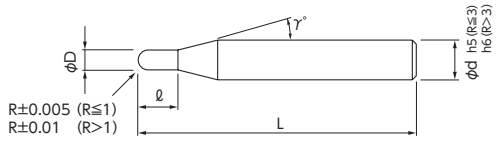
| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 08-00505-00005 | R0.05 | 0.1 | 0.1 | 15° | 4 | 50 | 19,800 |
| 08-00505-00010 | R0.1 | 0.2 | 0.2 | 15° | 4 | 50 | 11,300 |
| 08-00505-00015 | R0.15 | 0.3 | 0.3 | 15° | 4 | 50 | 10,800 |
| 08-00505-00020 | R0.2 | 0.6 | 0.4 | 15° | 4 | 50 | 7,200 |
| 08-00505-00025 | R0.25 | 0.8 | 0.5 | 15° | 4 | 50 | 6,800 |
| 08-00505-00030 | R0.3 | 0.9 | 0.6 | 15° | 4 | 50 | 6,800 |
| 08-00505-00040 | R0.4 | 1.2 | 0.8 | 15° | 4 | 50 | 6,800 |
| 08-00505-00050 | R0.5 | 1.5 | 1 | 15° | 4 | 50 | 6,800 |
| 08-00505-00075 | R0.75 | 2.3 | 1.5 | 15° | 4 | 50 | 8,000 |
| 08-00505-00100 | R1 | 3 | 2 | 9° | 4 | 60 | 5,800 |
| 08-00505-00150 | R1.5 | 5 | 3 | 9° | 6 | 60 | 7,400 |
| 08-00505-00200 | R2 | 6 | 4 | 9° | 6 | 70 | 7,400 |
| 08-00505-00250 | R2.5 | 8 | 5 | 9° | 6 | 70 | 8,800 |
| 08-00505-00300 | R3 | 10 | 6 | – | 6 | 80 | 9,400 |

**オーダー方法** MSB230G2 ボール半径(R)を指示してください。
When you order, indicate MSB230G2 (R).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はE-012に記載
●Recommended Milling Conditions are shown on page E-012.

# MSB230S

## 無限コーティング ショートボールエンドミル
MUGEN-COATING 2-Flute Short Flute Ball End Mill




●高剛性設計でビビリのない高速加工が可能。
●High rigid design reduced chatter in high speed cutting.

3D MG ∞ 2 30° ≦55 HRC

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 08-00530-00010 | R0.1 | 0.2 | 0.2 | 9° | 4 | 50 | 9,500 |
| 08-00530-00015 | R0.15 | 0.3 | 0.3 | 9° | 4 | 50 | 7,800 |
| 08-00530-00020 | R0.2 | 0.4 | 0.4 | 9° | 4 | 50 | 5,800 |
| 08-00530-00025 | R0.25 | 0.5 | 0.5 | 9° | 4 | 50 | 5,500 |
| 08-00530-00030 | R0.3 | 0.6 | 0.6 | 9° | 4 | 50 | 5,500 |
| 08-00530-00035 | R0.35 | 0.7 | 0.7 | 9° | 4 | 50 | 5,900 |
| 08-00530-00040 | R0.4 | 0.8 | 0.8 | 9° | 4 | 50 | 5,200 |
| 08-00530-00045 | R0.45 | 0.9 | 0.9 | 9° | 4 | 50 | 5,900 |
| 08-00530-00050 | R0.5 | 1 | 1 | 9° | 4 | 50 | 4,900 |
| 08-00530-00060 | R0.6 | 1.2 | 1.2 | 9° | 4 | 50 | 5,700 |
| 08-00530-00070 | R0.7 | 1.4 | 1.4 | 9° | 4 | 50 | 5,700 |
| 08-00530-00075 | R0.75 | 1.5 | 1.5 | 9° | 4 | 50 | 5,700 |
| 08-00530-00080 | R0.8 | 1.6 | 1.6 | 9° | 4 | 50 | 5,700 |
| 08-00530-00090 | R0.9 | 1.8 | 1.8 | 9° | 4 | 50 | 5,900 |
| 08-00530-00100 | R1 | 2 | 2 | 9° | 4 | 60 | 4,300 |
| 08-00530-00125 | R1.25 | 2.5 | 2.5 | 9° | 4 | 60 | 6,500 |
| 08-00530-00150 | R1.5 | 3 | 3 | 9° | 4 | 60 | 5,700 |
| 08-00530-00175 | R1.75 | 3.5 | 3.5 | 9° | 4 | 60 | 7,300 |
| 08-00530-00200 | R2 | 4 | 4 | 9° | 6 | 60 | 5,000 |
| 08-00530-00250 | R2.5 | 5 | 5 | 9° | 6 | 70 | 5,800 |
| 08-00530-00300 | R3 | 6 | 6 | – | 6 | 80 | 6,200 |
| 08-00530-00400 | R4 | 8 | 8 | – | 8 | 90 | 9,600 |
| 08-00530-00500 | R5 | 10 | 10 | – | 10 | 100 | 12,300 |
| 08-00530-00600 | R6 | 12 | 12 | – | 12 | 110 | 19,000 |

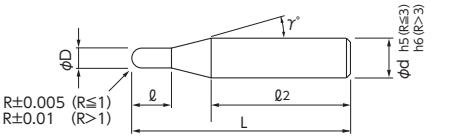
**オーダー方法** MSB230S ボール半径(R)を指示してください。
When you order, indicate MSB230S (R).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はE-012に記載
●Recommended Milling Conditions are shown on page E-012.

# MSB230SF

## 無限コーティング ショートシャンクボールエンドミル（焼きばめ用）

MUGEN-COATING 2-Flute Ball End Mill with Short Shank




●ショートシャンクタイプ（焼きばめ対応）。
●It fits for Shrink Chuck System.

3D MG ∞ 2 30° ≦55 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ | | | | | |
| ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (ℓ2)シャンク長 Shank Length | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 08-00504-00010 | R0.1 | 0.2 | 0.2 | 15° | 4 | 27.3 | 35 | 8,100 |
| 08-00504-00020 | R0.2 | 0.4 | 0.4 | 15° | 4 | 27.2 | 35 | 4,500 |
| 08-00504-00030 | R0.3 | 0.6 | 0.6 | 15° | 4 | 27.3 | 35 | 4,000 |
| 08-00504-00040 | R0.4 | 0.8 | 0.8 | 15° | 4 | 27.4 | 35 | 4,000 |
| 08-00504-00050 | R0.5 | 1 | 1 | 15° | 4 | 32.5 | 40 | 3,700 |
| 08-00504-00060 | R0.6 | 1.2 | 1.2 | 15° | 4 | 32.5 | 40 | 4,500 |
| 08-00504-00075 | R0.75 | 1.5 | 1.5 | 15° | 4 | 32.6 | 40 | 4,500 |
| 08-00504-00100 | R1 | 2 | 2 | 9° | 4 | 30.1 | 40 | 3,300 |
| 08-00504-00150 | R1.5 | 3 | 3 | 9° | 4 | 31.8 | 40 | 4,000 |
| 08-00504-00200 | R2 | 4 | 4 | 9° | 6 | 27.6 | 40 | 4,300 |
| 08-00504-00250 | R2.5 | 5 | 5 | 9° | 6 | 39.8 | 50 | 5,200 |
| 08-00504-00300 | R3 | 6 | 6 | – | 6 | 34.9 | 50 | 5,500 |
| 08-00504-00400 | R4 | 8 | 8 | – | 8 | 41.1 | 60 | 9,200 |
| 08-00504-00500 | R5 | 10 | 10 | – | 10 | 36.6 | 60 | 11,000 |
| 08-00504-00600 | R6 | 12 | 12 | – | 12 | 33.6 | 60 | 15,100 |

**オーダー方法**

MSB230SF ボール半径(R)を指示してください。
When you order, indicate MSB230SF (R).

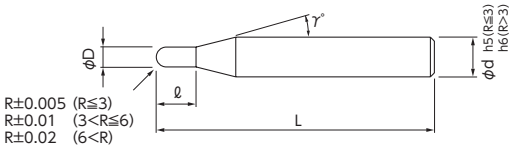
※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はE-012に記載
●Recommended Milling Conditions are shown on page E-012.



ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MSB230

## 無限コーティング 2枚刃ボールエンドミル
MUGEN-COATING 2-Flute Ball End Mill




●低速から高速までの精密３次元加工に対応。
●▲の規格は在庫が無くなり次第、販売終了となります。
●Suitable for precision three-dimensional cutting in the low to high speed range.
●▲ : The sizes will no longer be capable being sold after the stock runs out.

3D　MG　∞　2　30°　≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 08-00501-00005 | R0.05 | 0.1 | 0.1 | 15° | 4 | 50 | 10,100 |
| 08-00500-00005 | R0.05 | 0.1 | 0.1 | 15° | 6 | 50 | 11,100 |
| 08-00501-00007 | R0.075 | 0.15 | 0.15 | 15° | 4 | 50 | 9,400 |
| 08-00500-00007 | R0.075 | 0.15 | 0.15 | 15° | 6 | 50 | 10,500 |
| 08-00501-00010 | R0.1 | 0.2 | 0.2 | 15° | 4 | 50 | 7,100 |
| 08-00500-00010 | R0.1 | 0.2 | 0.2 | 15° | 6 | 50 | 8,200 |
| 08-00501-00015 | R0.15 | 0.3 | 0.3 | 15° | 4 | 50 | 5,800 |
| 08-00500-00015 | R0.15 | 0.3 | 0.3 | 15° | 6 | 50 | 7,000 |
| 08-00501-00020 | R0.2 | 0.6 | 0.4 | 15° | 4 | 50 | 3,900 |
| 08-00500-00020 | R0.2 | 0.6 | 0.4 | 15° | 6 | 50 | 5,100 |
| 08-00501-00025 | R0.25 | 0.8 | 0.5 | 15° | 4 | 50 | 3,600 |
| 08-00500-00025 | R0.25 | 0.8 | 0.5 | 15° | 6 | 50 | 4,800 |
| 08-00501-00030 | R0.3 | 0.9 | 0.6 | 15° | 4 | 50 | 3,500 |
| 08-00500-00030 | R0.3 | 0.9 | 0.6 | 15° | 6 | 50 | 4,600 |
| 08-00500-00035 | R0.35 | 1.1 | 0.7 | 15° | 6 | 50 | 7,800 |
| 08-00501-00040 | R0.4 | 1.2 | 0.8 | 15° | 4 | 50 | 3,500 |
| 08-00500-00040 | R0.4 | 1.2 | 0.8 | 15° | 6 | 50 | 4,600 |
| 08-00500-00045 | R0.45 | 1.4 | 0.9 | 15° | 6 | 50 | 7,800 |
| 08-00501-00050 | R0.5 | 1.5 | 1 | 15° | 4 | 50 | 3,200 |
| 08-00500-00050 | R0.5 | 1.5 | 1 | 15° | 6 | 50 | 4,300 |
| 08-00500-00055 | R0.55 | 1.7 | 1.1 | 15° | 6 | 50 | 7,800 |
| 08-00501-00060 | R0.6 | 1.8 | 1.2 | 15° | 4 | 50 | 4,500 |
| 08-00500-00060 | R0.6 | 1.8 | 1.2 | 15° | 6 | 50 | 5,500 |
| 08-00500-00065 | R0.65 | 2 | 1.3 | 15° | 6 | 50 | 7,800 |
| 08-00501-00070 | R0.7 | 2.1 | 1.4 | 15° | 4 | 50 | 4,500 |
| 08-00500-00070 | R0.7 | 2.1 | 1.4 | 15° | 6 | 50 | 5,500 |

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 08-00501-00075 | R0.75 | 2.3 | 1.5 | 15° | 4 | 50 | 3,900 |
| 08-00500-00075 | R0.75 | 2.3 | 1.5 | 15° | 6 | 50 | 5,000 |
| 08-00501-00080 | R0.8 | 2.4 | 1.6 | 15° | 4 | 50 | 4,500 |
| 08-00500-00080 | R0.8 | 2.4 | 1.6 | 15° | 6 | 50 | 5,500 |
| 08-00500-00085 | R0.85 | 2.6 | 1.7 | 15° | 6 | 50 | 7,800 |
| 08-00500-00090 | R0.9 | 2.7 | 1.8 | 15° | 6 | 50 | 7,800 |
| 08-00500-00095 | R0.95 | 2.9 | 1.9 | 15° | 6 | 50 | 7,800 |
| 08-00501-00100 | R1 | 3 | 2 | 9° | 4 | 60 | 2,900 |
| 08-00500-00100 | R1 | 3 | 2 | 9° | 6 | 60 | 3,900 |
| 08-00500-00105 | R1.05 | 3.2 | 2.1 | 9° | 6 | 60 | 7,800 |
| 08-00500-00110 | R1.1 | 3.3 | 2.2 | 9° | 6 | 60 | 7,800 |
| 08-00500-00115 | R1.15 | 3.5 | 2.3 | 9° | 6 | 60 | 7,800 |
| 08-00500-00120 | R1.2 | 3.6 | 2.4 | 9° | 6 | 60 | 7,800 |
| 08-00501-00125 | R1.25 | 3.8 | 2.5 | 9° | 4 | 60 | 5,000 |
| 08-00500-00125 | R1.25 | 3.8 | 2.5 | 9° | 6 | 60 | 6,000 |
| 08-00500-00130 | R1.3 | 3.9 | 2.6 | 9° | 6 | 60 | 7,800 |
| 08-00500-00135 | R1.35 | 4.1 | 2.7 | 9° | 6 | 60 | 7,800 |
| 08-00500-00140 | R1.4 | 4.2 | 2.8 | 9° | 6 | 60 | 7,800 |
| 08-00500-00145 | R1.45 | 4.4 | 2.9 | 9° | 6 | 60 | 7,800 |
| 08-00501-00150 | R1.5 | 5 | 3 | 9° | 4 | 60 | 3,500 |
| 08-00500-00150 | R1.5 | 5 | 3 | 9° | 6 | 60 | 3,500 |
| 08-00500-00155 | R1.55 | 5 | 3.1 | 9° | 6 | 60 | 8,200 |
| 08-00500-00160 | R1.6 | 5 | 3.2 | 9° | 6 | 60 | 8,200 |
| 08-00500-00165 | R1.65 | 5 | 3.3 | 9° | 6 | 60 | 8,200 |
| 08-00500-00170 | R1.7 | 5.1 | 3.4 | 9° | 6 | 60 | 8,200 |
| 08-00500-00175 | R1.75 | 5.3 | 3.5 | 9° | 6 | 60 | 6,500 |

**オーダー方法**
MSB230 ボール半径(R)×シャンク径(d)を指示してください。
When you order, indicate MSB230 (R)×(d).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はE-012に記載
●Recommended Milling Conditions are shown on page E-012.

# MSB230

## 無限コーティング 2枚刃ボールエンドミル
MUGEN-COATING 2-Flute Ball End Mill

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

▲ 生産終了品 Discontinued Item

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 08-00500-00180 | R1.8 | 5.4 | 3.6 | 9° | 6 | 60 | 8,200 |
| 08-00500-00185 | R1.85 | 5.6 | 3.7 | 9° | 6 | 60 | 8,200 |
| 08-00500-00190 | R1.9 | 5.7 | 3.8 | 9° | 6 | 60 | 8,200 |
| 08-00500-00195 | R1.95 | 5.9 | 3.9 | 9° | 6 | 60 | 8,200 |
| 08-00500-00200 | R2 | 6 | 4 | 9° | 6 | 70 | 4,000 |
| 08-00500-00205 | R2.05 | 6.2 | 4.1 | 9° | 6 | 70 | 10,000 |
| 08-00500-00210 | R2.1 | 6.3 | 4.2 | 9° | 6 | 70 | 10,000 |
| 08-00500-00215 | R2.15 | 6.5 | 4.3 | 9° | 6 | 70 | 10,000 |
| 08-00500-00220 | R2.2 | 6.6 | 4.4 | 9° | 6 | 70 | 10,000 |
| 08-00500-00225 | R2.25 | 6.8 | 4.5 | 9° | 6 | 70 | 10,000 |
| 08-00500-00230 | R2.3 | 6.9 | 4.6 | 9° | 6 | 70 | 10,000 |
| 08-00500-00235 | R2.35 | 7.1 | 4.7 | 9° | 6 | 70 | 10,000 |
| 08-00500-00240 | R2.4 | 7.2 | 4.8 | 9° | 6 | 70 | 10,000 |
| 08-00500-00245 | R2.45 | 7.4 | 4.9 | 9° | 6 | 70 | 10,000 |
| 08-00500-00250 | R2.5 | 8 | 5 | 9° | 6 | 70 | 4,800 |
| 08-00500-00255 | R2.55 | 8 | 5.1 | 9° | 6 | 70 | 10,000 |
| 08-00500-00260 | R2.6 | 8 | 5.2 | 9° | 6 | 70 | 10,000 |
| 08-00500-00265 | R2.65 | 8 | 5.3 | 9° | 6 | 70 | 10,000 |
| 08-00500-00270 | R2.7 | 8.1 | 5.4 | 9° | 6 | 70 | 10,000 |
| 08-00500-00275 | R2.75 | 8.3 | 5.5 | 9° | 6 | 70 | 10,000 |
| 08-00500-00280 | R2.8 | 8.4 | 5.6 | 9° | 6 | 70 | 10,000 |
| 08-00500-00285 | R2.85 | 8.6 | 5.7 | 9° | 6 | 70 | 10,000 |
| 08-00500-00290 | R2.9 | 8.7 | 5.8 | 9° | 6 | 70 | 10,000 |
| 08-00500-00295 | R2.95 | 8.9 | 5.9 | 9° | 6 | 70 | 10,000 |
| 08-00500-00300 | R3 | 10 | 6 | – | 6 | 80 | 5,000 |
| 08-00500-00350 | R3.5 | 10.5 | 7 | – | 6 | 80 | 10,700 |

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 08-00500-00400 | R4 | 12 | 8 | – | 8 | 90 | 9,700 |
| 08-00500-00450 | R4.5 | 13.5 | 9 | – | 8 | 90 | 14,900 |
| 08-00500-00500 | R5 | 15 | 10 | – | 10 | 100 | 12,700 |
| 08-00500-00550 | R5.5 | 16.5 | 11 | – | 10 | 100 | 24,800 |
| 08-00500-00600 | R6 | 20 | 12 | – | 12 | 110 | 21,400 |
| ▲ 08-00500-00700 | R7 | 21 | 14 | – | 12 | 160 | 48,600 |
| ▲ 08-00500-00800 | R8 | 25 | 16 | – | 16 | 160 | 57,600 |
| ▲ 08-00500-00900 | R9 | 27 | 18 | – | 16 | 170 | 86,900 |
| ▲ 08-00500-01000 | R10 | 30 | 20 | – | 20 | 170 | 89,500 |

**オーダー方法**
MSB230 ボール半径(R)×シャンク径(d)を指示してください。
When you order, indicate MSB230 (R)×(d).

※(γ)は参考値です。
※(γ) is reference value.

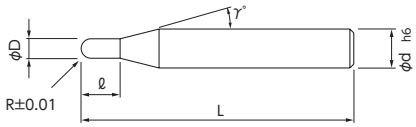
●切削条件表はE-012に記載
●Recommended Milling Conditions are shown on page E-012.



SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

# MSBL230

## 無限コーティング ロングボールエンドミル
MUGEN-COATING 2-Flute Long Ball End Mill




●ロングボールエンドミルに無限コーティングを採用。
●サイズは R0.1 ～ R5。
●ロングシャンクを活かした加工が可能。
● Our original MUGEN-COATING has been put on 2-flute long ball end mill.
● The available sizes are from radius 0.1 to 5.
● Take advantage of long shank feature.

3D　MG　∞　2　30°　≦55 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 08-00510-00010 | R0.1 | 0.5 | 0.2 | 9° | 3 | 70 | 15,700 ▮ |
| 08-00510-00015 | R0.15 | 0.75 | 0.3 | 9° | 3 | 70 | 15,700 ▮ |
| 08-00510-00020 | R0.2 | 1 | 0.4 | 9° | 3 | 70 | 15,700 ▮ |
| 08-00510-00025 | R0.25 | 1.25 | 0.5 | 9° | 3 | 70 | 15,700 ▮ |
| 08-00510-00030 | R0.3 | 1.5 | 0.6 | 9° | 3 | 70 | 13,900 ▮ |
| 08-00510-00035 | R0.35 | 1.75 | 0.7 | 9° | 3 | 70 | 13,900 ▮ |
| 08-00510-00040 | R0.4 | 2 | 0.8 | 9° | 3 | 70 | 13,900 ▮ |
| 08-00510-00045 | R0.45 | 2.25 | 0.9 | 9° | 3 | 70 | 13,900 ▮ |
| 08-00510-00050 | R0.5 | 2.5 | 1 | 9° | 3 | 70 | 11,000 |
| 08-00510-00055 | R0.55 | 2.75 | 1.1 | 9° | 3 | 70 | 13,900 ▮ |
| 08-00510-00060 | R0.6 | 3 | 1.2 | 9° | 3 | 70 | 13,900 ▮ |
| 08-00510-00065 | R0.65 | 3.25 | 1.3 | 9° | 3 | 70 | 13,900 ▮ |
| 08-00510-00070 | R0.7 | 3.5 | 1.4 | 9° | 3 | 70 | 13,900 ▮ |
| 08-00510-00075 | R0.75 | 3.75 | 1.5 | 9° | 3 | 70 | 13,900 ▮ |
| 08-00510-00080 | R0.8 | 4 | 1.6 | 9° | 3 | 70 | 13,900 ▮ |
| 08-00510-00085 | R0.85 | 4.25 | 1.7 | 9° | 3 | 70 | 13,900 ▮ |
| 08-00510-00090 | R0.9 | 4.5 | 1.8 | 9° | 3 | 70 | 13,900 ▮ |
| 08-00510-00095 | R0.95 | 4.75 | 1.9 | 9° | 3 | 70 | 13,900 ▮ |
| 08-00510-00100 | R1 | 5 | 2 | 9° | 3 | 70 | 12,000 |
| 08-00510-00110 | R1.1 | 5.5 | 2.2 | 9° | 3 | 80 | 14,800 ▮ |
| 08-00510-00120 | R1.2 | 6 | 2.4 | 9° | 3 | 80 | 14,800 ▮ |
| 08-00510-00125 | R1.25 | 6.25 | 2.5 | 9° | 3 | 80 | 14,800 ▮ |
| 08-00510-00130 | R1.3 | 6.5 | 2.6 | 9° | 3 | 80 | 14,800 ▮ |
| 08-00510-00140 | R1.4 | 7 | 2.8 | 9° | 3 | 80 | 14,800 ▮ |
| 08-00510-00150 | R1.5 | 7.5 | 3 | – | 3 | 80 | 13,000 |
| 08-00510-00160 | R1.6 | 8 | 3.2 | – | 3 | 120 | 14,900 ▮ |

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 08-00510-00170 | R1.7 | 8.5 | 3.4 | – | 3 | 120 | 14,900 ▮ |
| 08-00510-00180 | R1.8 | 9 | 3.6 | 9° | 4 | 120 | 16,700 ▮ |
| 08-00510-00190 | R1.9 | 9.5 | 3.8 | 9° | 4 | 120 | 16,700 ▮ |
| 08-00510-00200 | R2 | 10 | 4 | – | 4 | 120 | 13,000 |
| 08-00510-00210 | R2.1 | 10.5 | 4.2 | – | 4 | 150 | 18,400 ▮ |
| 08-00510-00220 | R2.2 | 11 | 4.4 | – | 4 | 150 | 18,400 ▮ |
| 08-00510-00230 | R2.3 | 11.5 | 4.6 | 9° | 6 | 150 | 22,400 ▮ |
| 08-00510-00240 | R2.4 | 12 | 4.8 | 9° | 6 | 150 | 22,400 ▮ |
| 08-00510-00250 | R2.5 | 12.5 | 5 | 9° | 6 | 150 | 22,400 ▮ |
| 08-00510-00260 | R2.6 | 13 | 5.2 | 9° | 6 | 150 | 22,400 ▮ |
| 08-00510-00270 | R2.7 | 13.5 | 5.4 | 9° | 6 | 150 | 22,400 ▮ |
| 08-00510-00280 | R2.8 | 14 | 5.6 | 9° | 6 | 150 | 22,400 ▮ |
| 08-00510-00290 | R2.9 | 14.5 | 5.8 | 9° | 6 | 150 | 22,400 ▮ |
| 08-00510-00300 | R3 | 15 | 6 | – | 6 | 150 | 18,000 |
| 08-00510-00400 | R4 | 20 | 8 | – | 8 | 160 | 29,100 |
| 08-00510-00500 | R5 | 25 | 10 | – | 10 | 200 | 34,800 |

**オーダー方法**　MSBL230 ボール半径(R)を指示してください。
When you order, indicate MSBL230 (R).

※(γ)は参考値です。
※(γ) is reference value.
● ▮の規格・サイズは特定商社在庫となります。詳しくはお問い合わせください。
● ▮ :Semi-standard item, please inquire for price and delivery.

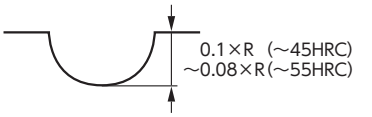
# MSB230G2・MSB230S・MSB230SF・MSB230

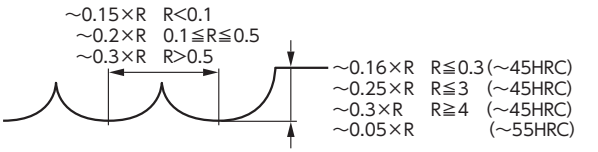
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼・調質鋼 Alloy Steels Prehardened Steels SCM・SKD・SUS・HPM・NAK | | 焼き入れ鋼 Hardened Steels SKD61 (~52HRC) | | アルミニウム合金 Aluminum Alloy | | 銅 Copper | |
|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 150m/min | | 120~150m/min | | 80~100m/min | | 150m/min~ | | 100~150m/min | |
| Rサイズ Radius | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 0.05 | 50,000 | 200 | 50,000 | 150 | 50,000 | 100 | 50,000 | 250 | 50,000 | 250 |
| 0.1 | 50,000 | 400 | 50,000 | 340 | 50,000 | 200 | 50,000 | 500 | 50,000 | 500 |
| 0.2 | 50,000 | 630 | 50,000 | 600 | 50,000 | 630 | 50,000 | 600 | 50,000 | 600 |
| 0.3 | 50,000 | 930 | 50,000 | 940 | 48,000 | 900 | 50,000 | 750 | 50,000 | 750 |
| 0.4 | 50,000 | 1,200 | 48,000 | 1,200 | 36,000 | 900 | 50,000 | 1,000 | 50,000 | 1,000 |
| 0.5 | 48,000 | 1,430 | 38,000 | 1,200 | 29,000 | 900 | 50,000 | 1,250 | 48,000 | 1,000 |
| 0.6 | 40,000 | 1,430 | 32,000 | 1,200 | 24,000 | 810 | 50,000 | 1,480 | 40,000 | 1,080 |
| 0.8 | 30,000 | 1,270 | 24,000 | 1,000 | 18,000 | 670 | 50,000 | 1,900 | 30,000 | 1,160 |
| 1 | 24,000 | 1,160 | 19,000 | 800 | 14,300 | 600 | 48,000 | 2,400 | 24,000 | 1,200 |
| 1.5 | 16,000 | 930 | 13,000 | 600 | 9,600 | 460 | 32,000 | 2,400 | 16,000 | 1,200 |
| 2 | 12,000 | 930 | 10,000 | 570 | 7,200 | 450 | 24,000 | 2,400 | 12,000 | 1,200 |
| 2.5 | 9,600 | 930 | 8,000 | 560 | 5,700 | 450 | 19,000 | 2,400 | 9,600 | 1,200 |
| 3 | 8,000 | 930 | 6,400 | 540 | 4,800 | 450 | 16,000 | 2,400 | 8,000 | 1,200 |
| 4 | 6,000 | 900 | 4,800 | 540 | 3,600 | 450 | 12,000 | 2,400 | 6,000 | 1,200 |
| 5 | 4,800 | 900 | 3,800 | 540 | 2,900 | 450 | 9,600 | 2,300 | 4,800 | 1,150 |
| 6 | 4,000 | 900 | 3,200 | 540 | 2,400 | 450 | 8,000 | 2,100 | 4,000 | 1,050 |
| 7 | 3,400 | 900 | 2,750 | 540 | 2,050 | 450 | 6,800 | 2,000 | 3,400 | 1,000 |
| 8 | 3,000 | 900 | 2,400 | 540 | 1,800 | 450 | 6,000 | 2,000 | 3,000 | 1,000 |
| 9 | 2,650 | 900 | 2,100 | 520 | 1,600 | 450 | 5,300 | 2,000 | 2,650 | 1,000 |
| 10 | 2,400 | 900 | 1,900 | 520 | 1,450 | 450 | 4,800 | 2,000 | 2,400 | 1,000 |

切り込み量 Depth of Cut

(R:ボール半径 Radius)




備　考 Notes

※溝加工の送り速度は、60%にしてください。
※工具突出し量は、4Dを基準とし、それ以上突き出す場合は切削条件を調整してください。
※エアーブローまたはオイルミストが最適です。
※回転数と送り速度は、同じ割合で調整してください。
※When slotting, reduce the feed by 60% from the above values.
※Length of overhang is 4 times Dia. as standard. When it is longer than 4 times Dia., adjust the conditions listed above.
※Recommended airblow or oil mist.
※Adjust both spindle speed and feed at the same rate.



ŞEVKET OĞLU® MAKINA TİCARET VE SAN. LTD. ŞTİ.

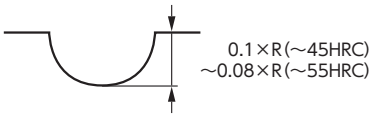
# MSB230G2・MSB230S・MSB230SF・MSB230

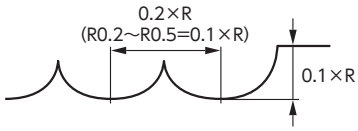
## 高速切削条件参考表 Recommended High Speed Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM・SKD・SUS | | 調質鋼 Prehardened Steels HPM・NAK | | 焼き入れ鋼 Hardened Steels SKD61 (～52HRC) | |
|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 250m/min | | 200m/min | | 180m/min | | 100m/min | |
| Rサイズ Radius | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 0.2 | ～50,000 | ～1,500 | ～50,000 | ～1,200 | ～50,000 | ～1,000 | ～50,000 | 600 |
| 0.3 | ～50,000 | ～1,500 | ～50,000 | ～1,200 | ～50,000 | ～1,000 | ～50,000 | 700 |
| 0.4 | ～50,000 | ～3,000 | ～50,000 | ～2,500 | ～50,000 | ～2,200 | 40,000 | 1,000 |
| 0.5 | ～50,000 | ～3,000 | ～50,000 | ～2,500 | ～50,000 | ～2,200 | 32,000 | 1,500 |
| 1 | 40,000 | 5,000 | 32,000 | 3,200 | 29,000 | 2,900 | 16,000 | 1,500 |
| 1.5 | 27,000 | 5,000 | 21,000 | 3,200 | 19,000 | 2,900 | 10,600 | 1,500 |
| 2 | 20,000 | 5,000 | 16,000 | 3,200 | 14,000 | 2,900 | 8,000 | 1,500 |
| 3 | 13,500 | 3,000 | 10,600 | 2,000 | 9,500 | 1,800 | 5,300 | 1,200 |
| 4 | 10,000 | 3,000 | 8,000 | 2,000 | 7,200 | 1,800 | 4,000 | 1,200 |
| 5 | 8,000 | 3,000 | 6,400 | 2,000 | 5,700 | 1,800 | 3,200 | 1,200 |
| 6 | 6,700 | 2,500 | 5,300 | 1,800 | 4,800 | 1,600 | 2,700 | 1,200 |
| 8 | 5,000 | 2,000 | 4,000 | 1,500 | 3,600 | 1,300 | 2,000 | 800 |
| 10 | 4,000 | 1,500 | 3,200 | 1,200 | 2,900 | 1,000 | 1,600 | 800 |

切り込み量 Depth of Cut

(R:ボール半径 Radius)



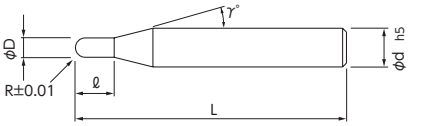




備　考 Notes

※溝加工の送り速度は、60%にしてください。
※エアーブローまたはオイルミストが最適です。
※回転数と送り速度は、同じ割合で調整してください。
※ミーリングチャック、機械は出来るだけ剛性のあるものをお奨めします。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整してください。
※When slotting, reduce the feed by 60% from the above values.
※Recommended air blow or oil mist.
※Adjust both spindle speed and feed at the same rate.
※Use a rigid machine and chuck holder.
※Adjust milling conditions according to the volume of depth of cut and rigidity of the machine.

# MSB345

## 無限コーティング 3枚刃ボールエンドミル
MUGEN-COATING 3-Flute Ball End Mill




●独自の 3 枚刃形状と不等分割の採用でビビリの少ない高能率加工が可能。
●Original 3-flute design and unequal flute spacing to suppress chattering realize high efficient machining.

3D MG ∞ 3 45° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ |

★ 再研磨可能 （詳細はお問い合わせください。）

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 08-00600-00050 | R0.5 | 1.5 | 1 | 12° | 6 | 60 | 6,800 |
| 08-00600-00060 | R0.6 | 2 | 1.2 | 12° | 6 | 60 | 9,200 ▌ |
| 08-00600-00070 | R0.7 | 3 | 1.4 | 12° | 6 | 60 | 9,200 ▌ |
| 08-00600-00080 | R0.8 | 3 | 1.6 | 12° | 6 | 60 | 9,200 ▌ |
| 08-00600-00090 | R0.9 | 3 | 1.8 | 12° | 6 | 60 | 9,200 ▌ |
| 08-00600-00100 | R1 | 3 | 2 | 12° | 6 | 60 | 6,800 |
| 08-00600-00110 | R1.1 | 3.5 | 2.2 | 12° | 6 | 60 | 9,800 ▌ |
| 08-00600-00120 | R1.2 | 4 | 2.4 | 12° | 6 | 60 | 9,800 ▌ |
| 08-00600-00130 | R1.3 | 4 | 2.6 | 12° | 6 | 60 | 9,800 ▌ |
| 08-00600-00140 | R1.4 | 5 | 2.8 | 12° | 6 | 60 | 9,800 ▌ |
| ★ 08-00600-00150 | R1.5 | 5 | 3 | 12° | 6 | 60 | 7,300 |
| ★ 08-00600-00160 | R1.6 | 5 | 3.2 | 12° | 6 | 60 | 9,800 ▌ |
| ★ 08-00600-00170 | R1.7 | 6 | 3.4 | 12° | 6 | 60 | 9,800 ▌ |
| ★ 08-00600-00180 | R1.8 | 6 | 3.6 | 12° | 6 | 60 | 9,800 ▌ |
| ★ 08-00600-00190 | R1.9 | 6 | 3.8 | 12° | 6 | 60 | 9,800 ▌ |
| ★ 08-00600-00200 | R2 | 6 | 4 | 12° | 6 | 70 | 7,300 |
| ★ 08-00600-00210 | R2.1 | 7 | 4.2 | 12° | 6 | 70 | 10,800 ▌ |
| ★ 08-00600-00220 | R2.2 | 7 | 4.4 | 12° | 6 | 70 | 10,800 ▌ |
| ★ 08-00600-00230 | R2.3 | 7 | 4.6 | 12° | 6 | 70 | 10,800 ▌ |
| ★ 08-00600-00240 | R2.4 | 8 | 4.8 | 12° | 6 | 70 | 10,800 ▌ |
| ★ 08-00600-00250 | R2.5 | 8 | 5 | 12° | 6 | 70 | 8,000 |
| ★ 08-00600-00260 | R2.6 | 8 | 5.2 | 12° | 6 | 70 | 11,500 ▌ |
| ★ 08-00600-00270 | R2.7 | 9 | 5.4 | 12° | 6 | 70 | 11,500 ▌ |
| ★ 08-00600-00280 | R2.8 | 9 | 5.6 | 12° | 6 | 70 | 11,500 ▌ |
| ★ 08-00600-00290 | R2.9 | 9 | 5.8 | 12° | 6 | 70 | 11,500 ▌ |
| ★ 08-00600-00300 | R3 | 10 | 6 | — | 6 | 80 | 8,500 |
| ★ 08-00600-00310 | R3.1 | 10 | 6.2 | 12° | 8 | 90 | 19,800 ▌ |
| ★ 08-00600-00320 | R3.2 | 10 | 6.4 | 12° | 8 | 90 | 19,800 ▌ |

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| ★ 08-00600-00330 | R3.3 | 10 | 6.6 | 12° | 8 | 90 | 19,800 ▌ |
| ★ 08-00600-00340 | R3.4 | 11 | 6.8 | 12° | 8 | 90 | 19,800 ▌ |
| ★ 08-00600-00350 | R3.5 | 11 | 7 | 12° | 8 | 90 | 19,800 ▌ |
| ★ 08-00600-00360 | R3.6 | 11 | 7.2 | 12° | 8 | 90 | 19,800 ▌ |
| ★ 08-00600-00370 | R3.7 | 12 | 7.4 | 12° | 8 | 90 | 19,800 ▌ |
| ★ 08-00600-00380 | R3.8 | 12 | 7.6 | 12° | 8 | 90 | 19,800 ▌ |
| ★ 08-00600-00390 | R3.9 | 12 | 7.8 | 12° | 8 | 90 | 19,800 ▌ |
| ★ 08-00600-00400 | R4 | 12 | 8 | — | 8 | 90 | 14,700 |
| ★ 08-00600-00410 | R4.1 | 13 | 8.2 | 12° | 10 | 100 | 26,800 ▌ |
| ★ 08-00600-00420 | R4.2 | 13 | 8.4 | 12° | 10 | 100 | 26,800 ▌ |
| ★ 08-00600-00430 | R4.3 | 13 | 8.6 | 12° | 10 | 100 | 26,800 ▌ |
| ★ 08-00600-00440 | R4.4 | 14 | 8.8 | 12° | 10 | 100 | 26,800 ▌ |
| ★ 08-00600-00450 | R4.5 | 14 | 9 | 12° | 10 | 100 | 26,800 ▌ |
| ★ 08-00600-00460 | R4.6 | 14 | 9.2 | 12° | 10 | 100 | 26,800 ▌ |
| ★ 08-00600-00470 | R4.7 | 15 | 9.4 | 12° | 10 | 100 | 26,800 ▌ |
| ★ 08-00600-00480 | R4.8 | 15 | 9.6 | 12° | 10 | 100 | 26,800 ▌ |
| ★ 08-00600-00490 | R4.9 | 15 | 9.8 | 12° | 10 | 100 | 26,800 ▌ |
| ★ 08-00600-00500 | R5 | 15 | 10 | — | 10 | 100 | 19,800 |
| ★ 08-00600-00510 | R5.1 | 16 | 10.2 | 12° | 12 | 110 | 37,400 ▌ |
| ★ 08-00600-00520 | R5.2 | 16 | 10.4 | 12° | 12 | 110 | 37,400 ▌ |
| ★ 08-00600-00530 | R5.3 | 16 | 10.6 | 12° | 12 | 110 | 37,400 ▌ |
| ★ 08-00600-00540 | R5.4 | 17 | 10.8 | 12° | 12 | 110 | 37,400 ▌ |
| ★ 08-00600-00550 | R5.5 | 17 | 11 | 12° | 12 | 110 | 37,400 ▌ |
| ★ 08-00600-00560 | R5.6 | 17 | 11.2 | 12° | 12 | 110 | 37,400 ▌ |
| ★ 08-00600-00570 | R5.7 | 18 | 11.4 | 12° | 12 | 110 | 37,400 ▌ |
| ★ 08-00600-00580 | R5.8 | 18 | 11.6 | 12° | 12 | 110 | 37,400 ▌ |
| ★ 08-00600-00590 | R5.9 | 18 | 11.8 | 12° | 12 | 110 | 37,400 ▌ |
| ★ 08-00600-00600 | R6 | 20 | 12 | — | 12 | 110 | 27,800 |

**オーダー方法** MSB345 ボール半径(R)を指示してください。
When you order, indicate MSB345 (R).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-015に記載
●Recommended Milling Conditions are shown on page E-015.
● ▌の規格・サイズは特定商社在庫となります。詳しくはお問い合わせください。
● ▌:Semi-standard item, please inquire for price and delivery.



ŞEVKET ÖĞÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

# MSB345

## 切削条件参考表 Recommended Milling Conditions

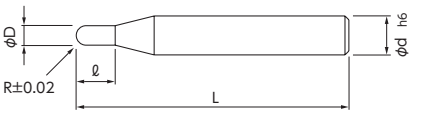
| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | | 合金鋼・調質鋼 Alloy Steels・Prehardened Steels SKD・HPM・NAK | | | | 焼き入れ鋼 Hardened Steels STAVAX・SKD61 (～52HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.5 | 0.1 | 0.3 | 4,000 | 40,000 | 0.1 | 0.3 | 3,500 | 40,000 | 0.1 | 0.3 | 2,500 | 30,000 |
| 1 | 0.2 | 0.6 | 4,500 | 30,000 | 0.2 | 0.6 | 4,000 | 30,000 | 0.2 | 0.6 | 3,000 | 20,000 |
| 1.5 | 0.3 | 1 | 4,500 | 24,000 | 0.3 | 1 | 4,000 | 24,000 | 0.2 | 1 | 3,000 | 18,000 |
| 2 | 0.4 | 1.5 | 4,500 | 20,000 | 0.4 | 1.5 | 4,000 | 20,000 | 0.3 | 1.5 | 3,000 | 15,000 |
| 2.5 | 0.5 | 1.7 | 4,500 | 16,000 | 0.5 | 1.7 | 4,000 | 16,000 | 0.3 | 2 | 3,000 | 12,000 |
| 3 | 0.6 | 2 | 4,500 | 10,000 | 0.6 | 2 | 4,000 | 10,000 | 0.4 | 2 | 3,000 | 9,000 |
| 4 | 0.8 | 2.5 | 4,500 | 8,000 | 0.8 | 2.5 | 4,000 | 8,000 | 0.5 | 2 | 3,000 | 7,000 |
| 5 | 1.2 | 3 | 4,500 | 6,500 | 1.2 | 3 | 4,000 | 6,500 | 0.7 | 2.5 | 3,000 | 5,500 |
| 6 | 1.5 | 4 | 4,500 | 5,000 | 1.5 | 4 | 4,000 | 5,000 | 1 | 3 | 3,000 | 4,000 |

**備　考 Notes**

※切り込み量の、ap は深さ方向の切り込み量、ae はピックフィードを示します。
※回転数と送り速度は、同じ割合で調整してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整してください。
※工具突出し量は、4～5D を基準とし、それ以上突出す場合は切削条件を調整してください。
※Depth of Cut: ap=Axial Depth of Cut / ae=Radial Depth of Cut.
※Adjust both spindle speed and feed at the same rate.
※Adjust milling conditions according to the volume of depth of cut and rigidity of machine.
※Length of overhang is 4 to 5 times Dia. as standard. When it is longer than 4 to 5 times Dia., adjust the conditions listed above.

# MSBXL230

## 無限コーティング 超ロングシャンクボールエンドミル
MUGEN-COATING 2-Flute Extra Long Ball End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00511-00050 | R0.5 | 2.5 | 1 | 3 | 100 | 14,900 ▌ |
| 08-00511-00100 | R1 | 5 | 2 | 3 | 100 | 14,700 ▌ |
| 08-00511-00150 | R1.5 | 7.5 | 3 | 3 | 120 | 14,900 ▌ |
| 08-00511-00200 | R2 | 10 | 4 | 4 | 150 | 18,400 ▌ |
| 08-00511-00250 | R2.5 | 12.5 | 5 | 6 | 180 | 27,500 ▌ |
| 08-00511-00300 | R3 | 15 | 6 | 6 | 180 | 27,500 ▌ |
| 08-00511-00400 | R4 | 20 | 8 | 8 | 200 | 49,900 ▌ |
| 08-00511-00500 | R5 | 25 | 10 | 10 | 250 | 70,000 ▌ |

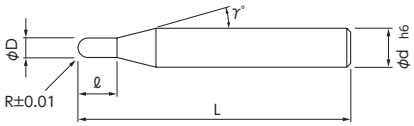
**オーダー方法**
MSBXL230 ボール半径(R)を指示してください。
When you order, indicate MSBXL230 (R).



SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

# NCB-2X

## Xコーティング ミニチュアボールエンドミル
X-COATING 2-Flute Miniature Ball End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | |
|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ |
| ◎ | ◎ | ◎ | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹 脂 Resin |
| ○ | | ○ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

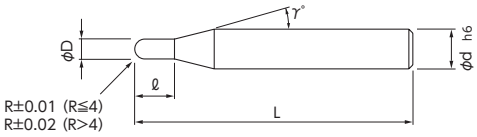
| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 01-00513-00200 | R0.2 | 0.8 | 0.4 | 9° | 3 | 35 | 12,300 ▌ |
| 01-00513-00250 | R0.25 | 1 | 0.5 | 9° | 3 | 35 | 11,800 ▌ |
| 01-00513-00300 | R0.3 | 1.2 | 0.6 | 9° | 3 | 35 | 11,500 ▌ |
| 01-00513-00350 | R0.35 | 1.4 | 0.7 | 9° | 3 | 35 | 15,000 ▌ |
| 01-00513-00400 | R0.4 | 1.6 | 0.8 | 9° | 3 | 35 | 12,000 ▌ |
| 01-00513-00450 | R0.45 | 1.8 | 0.9 | 9° | 3 | 35 | 14,000 ▌ |
| 01-00513-00500 | R0.5 | 2 | 1 | 9° | 3 | 35 | 9,500 ▌ |
| 01-00513-00600 | R0.6 | 2.4 | 1.2 | 9° | 3 | 35 | 13,400 ▌ |
| 01-00513-00700 | R0.7 | 2.8 | 1.4 | 9° | 3 | 35 | 13,400 ▌ |
| 01-00513-00750 | R0.75 | 3 | 1.5 | 9° | 3 | 35 | 10,500 ▌ |
| 01-00513-00800 | R0.8 | 3.2 | 1.6 | 9° | 3 | 35 | 10,500 ▌ |
| 01-00513-00900 | R0.9 | 3.6 | 1.8 | 9° | 3 | 35 | 13,400 ▌ |

**オーダー方法** NCB-2X ボール半径(R)を指示してください。
When you order, indicate NCB-2X (R).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はE-020に記載
●Recommended Milling Conditions are shown on page E-020.

# NSB-2X

## Xコーティング ボールエンドミル
X-COATING 2-Flute Ball End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

3D MG X 2 30°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | | | ○ | | ○ | ○ | ○ |

### ▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 01-00523-00100 | R1 | 3 | 2 | 9° | 4 | 60 | 8,200 ▌ |
| 01-00523-00105 | R1.05 | 3.5 | 2.1 | 9° | 4 | 60 | 11,700 ▌ |
| 01-00523-00110 | R1.1 | 3.5 | 2.2 | 9° | 4 | 60 | 11,700 ▌ |
| 01-00523-00115 | R1.15 | 3.5 | 2.3 | 9° | 4 | 60 | 11,700 ▌ |
| 01-00523-00120 | R1.2 | 3.5 | 2.4 | 9° | 4 | 60 | 11,700 ▌ |
| 01-00523-00125 | R1.25 | 3.5 | 2.5 | 9° | 4 | 60 | 11,700 ▌ |
| 01-00523-00130 | R1.3 | 4 | 2.6 | 9° | 6 | 60 | 13,400 ▌ |
| 01-00523-00135 | R1.35 | 4 | 2.7 | 9° | 6 | 60 | 13,400 ▌ |
| 01-00523-00140 | R1.4 | 4 | 2.8 | 9° | 6 | 60 | 13,400 ▌ |
| 01-00523-00145 | R1.45 | 4 | 2.9 | 9° | 6 | 60 | 13,400 ▌ |
| 01-00523-00150 | R1.5 | 4 | 3 | 9° | 6 | 60 | 9,000 ▌ |
| 01-00523-00155 | R1.55 | 5 | 3.1 | 9° | 6 | 60 | 13,400 ▌ |
| 01-00523-00160 | R1.6 | 5 | 3.2 | 9° | 6 | 60 | 13,400 ▌ |
| 01-00523-00165 | R1.65 | 5 | 3.3 | 9° | 6 | 60 | 13,400 ▌ |
| 01-00523-00170 | R1.7 | 5 | 3.4 | 9° | 6 | 60 | 13,400 ▌ |
| 01-00523-00175 | R1.75 | 5 | 3.5 | 9° | 6 | 60 | 13,400 ▌ |
| 01-00523-00180 | R1.8 | 6 | 3.6 | 9° | 6 | 60 | 13,400 ▌ |
| 01-00523-00185 | R1.85 | 6 | 3.7 | 9° | 6 | 60 | 13,400 ▌ |
| 01-00523-00190 | R1.9 | 6 | 3.8 | 9° | 6 | 60 | 13,400 ▌ |
| 01-00523-00195 | R1.95 | 6 | 3.9 | 9° | 6 | 60 | 13,400 ▌ |
| 01-00523-00200 | R2 | 6 | 4 | 9° | 6 | 60 | 9,000 ▌ |
| 01-00523-00205 | R2.05 | 8 | 4.1 | 9° | 6 | 60 | 15,000 ▌ |
| 01-00523-00210 | R2.1 | 8 | 4.2 | 9° | 6 | 60 | 15,000 ▌ |
| 01-00523-00215 | R2.15 | 8 | 4.3 | 9° | 6 | 60 | 15,000 ▌ |
| 01-00523-00220 | R2.2 | 8 | 4.4 | 9° | 6 | 60 | 15,000 ▌ |
| 01-00523-00225 | R2.25 | 8 | 4.5 | 9° | 6 | 60 | 15,000 ▌ |
| 01-00523-00230 | R2.3 | 8 | 4.6 | 9° | 6 | 60 | 15,000 ▌ |
| 01-00523-00235 | R2.35 | 8 | 4.7 | 9° | 6 | 60 | 15,000 ▌ |
| 01-00523-00240 | R2.4 | 8 | 4.8 | 9° | 6 | 60 | 15,000 ▌ |
| 01-00523-00245 | R2.45 | 8 | 4.9 | 9° | 6 | 60 | 15,000 ▌ |

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 01-00523-00250 | R2.5 | 8 | 5 | 9° | 6 | 60 | 10,500 ▌ |
| 01-00523-00255 | R2.55 | 10 | 5.1 | 9° | 6 | 80 | 16,400 ▌ |
| 01-00523-00260 | R2.6 | 10 | 5.2 | 9° | 6 | 80 | 16,400 ▌ |
| 01-00523-00265 | R2.65 | 10 | 5.3 | 9° | 6 | 80 | 16,400 ▌ |
| 01-00523-00270 | R2.7 | 10 | 5.4 | 9° | 6 | 80 | 16,400 ▌ |
| 01-00523-00275 | R2.75 | 10 | 5.5 | 9° | 6 | 80 | 16,400 ▌ |
| 01-00523-00280 | R2.8 | 10 | 5.6 | 9° | 6 | 80 | 16,400 ▌ |
| 01-00523-00285 | R2.85 | 10 | 5.7 | 9° | 6 | 80 | 16,400 ▌ |
| 01-00523-00290 | R2.9 | 10 | 5.8 | 9° | 6 | 80 | 16,400 ▌ |
| 01-00523-00295 | R2.95 | 10 | 5.9 | 9° | 6 | 80 | 16,400 ▌ |
| 01-00523-00300 | R3 | 10 | 6 | – | 6 | 80 | 11,000 ▌ |
| 01-00523-00310 | R3.1 | 13 | 6.2 | 9° | 8 | 90 | 28,100 ▌ |
| 01-00523-00320 | R3.2 | 13 | 6.4 | 9° | 8 | 90 | 28,100 ▌ |
| 01-00523-00330 | R3.3 | 13 | 6.6 | 9° | 8 | 90 | 28,100 ▌ |
| 01-00523-00340 | R3.4 | 13 | 6.8 | 9° | 8 | 90 | 28,100 ▌ |
| 01-00523-00350 | R3.5 | 13 | 7 | 9° | 8 | 90 | 28,100 ▌ |
| 01-00523-00360 | R3.6 | 13 | 7.2 | 9° | 8 | 90 | 28,100 ▌ |
| 01-00523-00370 | R3.7 | 13 | 7.4 | 9° | 8 | 90 | 28,100 ▌ |
| 01-00523-00380 | R3.8 | 13 | 7.6 | 9° | 8 | 90 | 28,100 ▌ |
| 01-00523-00390 | R3.9 | 13 | 7.8 | 9° | 8 | 90 | 28,100 ▌ |
| 01-00523-00400 | R4 | 13 | 8 | – | 8 | 90 | 17,400 ▌ |
| 01-00523-00410 | R4.1 | 15 | 8.2 | 9° | 10 | 100 | 36,100 ▌ |
| 01-00523-00420 | R4.2 | 15 | 8.4 | 9° | 10 | 100 | 36,100 ▌ |
| 01-00523-00430 | R4.3 | 15 | 8.6 | 9° | 10 | 100 | 36,100 ▌ |
| 01-00523-00440 | R4.4 | 15 | 8.8 | 9° | 10 | 100 | 36,100 ▌ |
| 01-00523-00450 | R4.5 | 15 | 9 | 9° | 10 | 100 | 36,100 ▌ |
| 01-00523-00460 | R4.6 | 15 | 9.2 | 9° | 10 | 100 | 36,100 ▌ |
| 01-00523-00470 | R4.7 | 15 | 9.4 | 9° | 10 | 100 | 36,100 ▌ |
| 01-00523-00480 | R4.8 | 15 | 9.6 | 9° | 10 | 100 | 36,100 ▌ |
| 01-00523-00490 | R4.9 | 15 | 9.8 | 9° | 10 | 100 | 36,100 ▌ |

**オーダー方法**
NSB-2X ボール半径(R)を指示してください。
When you order, indicate NSB-2X (R).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はE-020に記載
●Recommended Milling Conditions are shown on page E-020.

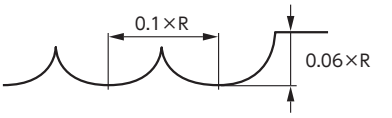


ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 01-00523-00500 | R5 | 15 | 10 | – | 10 | 100 | 20,900 |
| 01-00523-00510 | R5.1 | 15 | 10.2 | 9° | 12 | 110 | 46,800 |
| 01-00523-00520 | R5.2 | 15 | 10.4 | 9° | 12 | 110 | 46,800 |
| 01-00523-00530 | R5.3 | 15 | 10.6 | 9° | 12 | 110 | 46,800 |
| 01-00523-00540 | R5.4 | 15 | 10.8 | 9° | 12 | 110 | 46,800 |
| 01-00523-00550 | R5.5 | 15 | 11 | 9° | 12 | 110 | 46,800 |
| 01-00523-00560 | R5.6 | 15 | 11.2 | 9° | 12 | 110 | 46,800 |
| 01-00523-00570 | R5.7 | 15 | 11.4 | 9° | 12 | 110 | 46,800 |
| 01-00523-00580 | R5.8 | 15 | 11.6 | 9° | 12 | 110 | 46,800 |
| 01-00523-00590 | R5.9 | 15 | 11.8 | 9° | 12 | 110 | 46,800 |
| 01-00523-00600 | R6 | 15 | 12 | – | 12 | 110 | 31,600 |
| ▲ 01-00523-00650 | R6.5 | 20 | 13 | – | 12 | 110 | 53,400 |
| ▲ 01-00523-00700 | R7 | 20 | 14 | 9° | 16 | 160 | 87,400 |
| ▲ 01-00523-00750 | R7.5 | 20 | 15 | 9° | 16 | 160 | 87,400 |
| ▲ 01-00523-00800 | R8 | 20 | 16 | – | 16 | 160 | 62,700 |
| ▲ 01-00523-00850 | R8.5 | 25 | 17 | 9° | 20 | 170 | 136,400 |
| ▲ 01-00523-00900 | R9 | 25 | 18 | 9° | 20 | 170 | 136,400 |
| ▲ 01-00523-00950 | R9.5 | 25 | 19 | 9° | 20 | 170 | 136,400 |
| ▲ 01-00523-01000 | R10 | 25 | 20 | – | 20 | 170 | 92,000 |

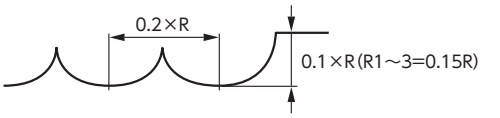
# NCB-2X

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼・合金鋼・調質鋼 Carbon Steels・Alloy Steels・Prehardened Steels S50C・SCM・SKD・SUS・HPM・NAK | |
|---|---|---|
| 切削速度 Cutting Speed | 60～80m/min | |
| Rサイズ Radius | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min |
| 0.2 | 50,000 | 800 |
| 0.25 | 50,000 | 800 |
| 0.3 | 42,500 | 870 |
| 0.4 | 32,000 | 930 |
| 0.5 | 25,500 | 930 |
| 0.75 | 17,000 | 930 |
| 0.8 | 16,000 | 930 |
| 切り込み量 Depth of Cut (R:ボール半径 Radius) |   | |
| 備　考 Notes | ※切削油の使用をお奨めします。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※Use cutting fluid.<br>※Adjust both spindle speed and feed at the same rate. | |

# NSB-2X

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM・SKD・SUS | | 調質鋼 Prehardened Steels HPM・NAK(～45HRC) | |
|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 120m/min | | 100m/min | | 80m/min | |
| Rサイズ Radius | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 19,000 | 870 | 16,000 | 760 | 12,700 | 520 |
| 1.5 | 12,700 | 870 | 10,600 | 760 | 8,450 | 520 |
| 2 | 9,600 | 870 | 8,000 | 760 | 6,400 | 520 |
| 2.5 | 7,600 | 870 | 6,400 | 760 | 5,100 | 520 |
| 3 | 6,400 | 870 | 5,300 | 760 | 4,250 | 520 |
| 4 | 4,800 | 870 | 4,000 | 760 | 3,200 | 520 |
| 5 | 3,800 | 870 | 3,200 | 760 | 2,550 | 520 |
| 6 | 3,200 | 870 | 2,650 | 760 | 2,150 | 520 |
| 8 | 2,400 | 870 | 2,000 | 760 | 1,600 | 520 |
| 10 | 1,900 | 870 | 1,600 | 760 | 1,300 | 520 |
| 切り込み量 Depth of Cut (R:ボール半径 Radius) |   | | | | | |
| 備　考 Notes | ※切削油の使用をお奨めします。<br>※上記の表は、平面部の条件です。傾斜等により送り速度を調整してください。<br>※工具突出し量、切り込み量などによって、回転数と送り速度は大幅に変動します。<br>※Use cutting fluid.<br>※This table shows milling conditions for flat surface. Adjust feed for inclined surface.<br>※Spindle speed and feed are changed according to overhang length and depth of cut. | | | | | |

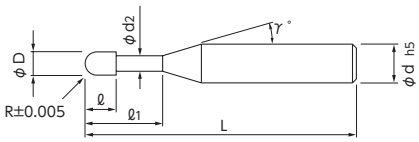


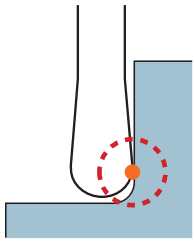
ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MRBH230

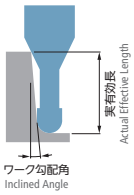
## 無限コーティングプレミアム 高硬度用２枚刃ロングネックボールエンドミル

MUGEN-COATING PREMIUM 2-Flute Long Neck Ball End Mill for Hardened Steel



点切削のためビビらない!
Suppres chattering by point milling.




●高硬度用の無限コーティングプレミアムと独自の新形状により耐チッピング性に優れ、ビビリを抑えることにより仕上げ面が向上。
●68HRC までの高硬度材に対応。
●全 224 サイズ！
●MUGEN-COATING PREMIUM for hardened steels and unique new design excel in chipping prevention and resolves chattering to realize excellent finished surface.
●Applicable for hardened steels up to 68HRC.
●Total 224 sizes!

技術資料 K-018

3D | MG | ∞ Premium | 2 | 30° | ≦68 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ◎ | ◎ | ◎ | ○ | ○ | | | |

★ 再研磨可能 （詳細はお問い合わせください。）

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00527-00050 | R0.05 | 0.2 | 0.07 | 0.1 | 0.085 | 12° | 4 | 45 | 11,700 | 0.24 | 0.25 | 0.26 | 0.27 | 0.29 |
| 08-00527-00051 | | 0.3 | 0.07 | 0.1 | 0.085 | 12° | 4 | 45 | 10,300 | 0.34 | 0.36 | 0.37 | 0.39 | 0.42 |
| 08-00527-00053 | | 0.5 | 0.07 | 0.1 | 0.085 | 12° | 4 | 45 | 11,200 | 0.55 | 0.57 | 0.60 | 0.63 | 0.69 |
| 08-00527-00071 | R0.075 | 0.3 | 0.1 | 0.15 | 0.13 | 12° | 4 | 45 | 12,000 | 0.36 | 0.37 | 0.39 | 0.40 | 0.44 |
| 08-00527-00073 | | 0.5 | 0.1 | 0.15 | 0.13 | 12° | 4 | 45 | 12,700 | 0.57 | 0.59 | 0.61 | 0.64 | 0.70 |
| 08-00527-00075 | | 1 | 0.1 | 0.15 | 0.13 | 12° | 4 | 45 | 13,500 | 1.09 | 1.13 | 1.18 | 1.24 | 1.37 |
| 08-00527-00100 | R0.1 | 0.3 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 7,200 | 0.35 | 0.36 | 0.38 | 0.39 | 0.42 |
| 08-00527-00101 | | 0.5 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 7,200 | 0.56 | 0.58 | 0.61 | 0.63 | 0.69 |
| 08-00527-00102 | | 0.75 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 7,200 | 0.82 | 0.85 | 0.89 | 0.93 | 1.02 |
| 08-00527-00103 | | 1 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 7,200 | 1.08 | 1.13 | 1.18 | 1.23 | 1.35 |
| 08-00528-00103 | | 1 | 0.15 | 0.2 | 0.18 | 12° | 6 | 50 | 10,200 | 1.08 | 1.13 | 1.18 | 1.23 | 1.35 |
| 08-00527-00104 | | 1.25 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 7,800 | 1.34 | 1.40 | 1.46 | 1.53 | 1.68 |
| 08-00527-00105 | | 1.5 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 7,800 | 1.60 | 1.67 | 1.75 | 1.83 | 2.02 |
| 08-00527-00106 | | 1.75 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 8,700 | 1.86 | 1.94 | 2.03 | 2.13 | 2.35 |
| 08-00527-00107 | | 2 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 8,700 | 2.13 | 2.22 | 2.32 | 2.43 | 2.68 |
| 08-00527-00108 | | 2.5 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 9,500 | 2.65 | 2.76 | 2.89 | 3.02 | 3.34 |
| 08-00527-00109 | | 3 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 10,200 | 3.17 | 3.31 | 3.46 | 3.62 | 4.01 |
| 08-00527-00162 | R0.15 | 0.5 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,100 | 0.56 | 0.58 | 0.60 | 0.63 | 0.68 |
| 08-00527-00150 | | 0.6 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,100 | 0.66 | 0.69 | 0.71 | 0.74 | 0.81 |
| 08-00527-00163 | | 0.75 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,100 | 0.82 | 0.86 | 0.89 | 0.93 | 1.01 |
| 08-00527-00151 | | 1 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,100 | 1.08 | 1.12 | 1.17 | 1.22 | 1.34 |
| 08-00527-00152 | | 1.25 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,600 | 1.34 | 1.39 | 1.45 | 1.52 | 1.67 |
| 08-00527-00153 | | 1.5 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,600 | 1.60 | 1.67 | 1.74 | 1.82 | 2.00 |
| 08-00528-00153 | | 1.5 | 0.2 | 0.3 | 0.28 | 12° | 6 | 50 | 10,700 | 1.60 | 1.67 | 1.74 | 1.82 | 2.00 |
| 08-00527-00154 | | 1.75 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,600 | 1.86 | 1.94 | 2.02 | 2.12 | 2.33 |
| 08-00527-00155 | | 2 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,600 | 2.12 | 2.21 | 2.31 | 2.42 | 2.66 |
| 08-00527-00156 | | 2.25 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,800 | 2.38 | 2.48 | 2.59 | 2.71 | 3.00 |
| 08-00527-00157 | | 2.5 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,800 | 2.64 | 2.76 | 2.88 | 3.01 | 3.33 |
| 08-00527-00159 | | 3 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,800 | 3.17 | 3.30 | 3.45 | 3.61 | 3.99 |

オーダー方法

MRBH230 ボール半径(R)×有効長(ℓ1)×シャンク径(d)を指示してください。
When you order, indicate MRBH230 (R)×(ℓ1)×(d).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-027に記載
●Recommended Milling Conditions are shown on page E-027.



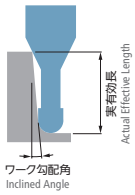



ŞEVKET ÖĞÜ® MAKINA TİCARET VE SAN. LTD. ŞTİ.

# MRBH230

## 無限コーティングプレミアム 高硬度用２枚刃ロングネックボールエンドミル

MUGEN-COATING PREMIUM 2-Flute Long Neck Ball End Mill for Hardened Steel




★ 再研磨可能　（詳細はお問い合わせください。）

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00527-00160 | R0.15 | 3.5 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 8,200 | 3.69 | 3.85 | 4.02 | 4.21 | 4.65 |
| 08-00527-00161 | | 4 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 8,200 | 4.21 | 4.39 | 4.59 | 4.81 | 5.32 |
| 08-00527-00211 | R0.2 | 0.5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 4,900 | 0.59 | 0.60 | 0.62 | 0.64 | 0.69 |
| 08-00527-00201 | | 0.8 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 4,900 | 0.89 | 0.93 | 0.96 | 1.00 | 1.09 |
| 08-00527-00202 | | 1 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 4,900 | 1.10 | 1.14 | 1.19 | 1.24 | 1.35 |
| 08-00528-00202 | | 1 | 0.3 | 0.4 | 0.37 | 12° | 6 | 50 | 7,200 | 1.10 | 1.14 | 1.19 | 1.24 | 1.35 |
| 08-00527-00203 | | 1.5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 5,000 | 1.62 | 1.69 | 1.76 | 1.84 | 2.02 |
| 08-00527-00204 | | 2 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 5,100 | 2.15 | 2.23 | 2.33 | 2.43 | 2.68 |
| 08-00528-00204 | | 2 | 0.3 | 0.4 | 0.37 | 12° | 6 | 50 | 7,500 | 2.15 | 2.23 | 2.33 | 2.43 | 2.68 |
| 08-00527-00205 | | 2.5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 5,300 | 2.67 | 2.78 | 2.90 | 3.03 | 3.34 |
| 08-00527-00206 | | 3 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 5,600 | 3.19 | 3.32 | 3.47 | 3.63 | 4.01 |
| 08-00527-00207 | | 3.5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 6,100 | 3.71 | 3.87 | 4.04 | 4.23 | 4.67 |
| 08-00527-00208 | | 4 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 6,100 | 4.23 | 4.41 | 4.61 | 4.83 | 5.33 |
| 08-00527-00209 | | 4.5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 6,400 | 4.75 | 4.96 | 5.18 | 5.43 | 6.00 |
| 08-00527-00210 | | 5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 6,400 | 5.27 | 5.50 | 5.75 | 6.02 | 6.66 |
| 08-00527-00212 | | 6 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 7,500 | 6.33 | 6.60 | 6.90 | 7.23 | 8.00 |
| 08-00527-00250 | R0.25 | 1 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 4,900 | 1.13 | 1.16 | 1.21 | 1.26 | 1.37 |
| 08-00527-00251 | | 1.5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 4,900 | 1.65 | 1.71 | 1.78 | 1.85 | 2.03 |
| 08-00527-00252 | | 2 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 4,900 | 2.17 | 2.25 | 2.35 | 2.45 | 2.69 |
| 08-00527-00253 | | 2.5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 4,900 | 2.69 | 2.80 | 2.92 | 3.05 | 3.36 |
| 08-00527-00254 | | 3 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 4,900 | 3.21 | 3.34 | 3.49 | 3.65 | 4.02 |
| 08-00527-00255 | | 3.5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 4,900 | 3.73 | 3.89 | 4.06 | 4.25 | 4.69 |
| 08-00527-00256 | | 4 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 4,900 | 4.25 | 4.43 | 4.63 | 4.85 | 5.35 |
| 08-00527-00257 | | 4.5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 5,000 | 4.78 | 4.98 | 5.20 | 5.44 | 6.01 |
| 08-00527-00258 | | 5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 5,000 | 5.30 | 5.52 | 5.77 | 6.04 | 6.68 |
| 08-00527-00259 | | 5.5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 5,100 | 5.82 | 6.07 | 6.34 | 6.64 | 7.34 |
| 08-00527-00260 | | 6 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 5,100 | 6.34 | 6.61 | 6.91 | 7.24 | 8.00 |
| 08-00527-00262 | | 8 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 6,100 | 8.42 | 8.79 | 9.19 | 9.63 | 10.66 |
| 08-00527-00264 | | 10 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 7,700 | 10.52 | 10.98 | 11.49 | 12.04 | 13.35 |
| 08-00527-00300 | R0.3 | 1 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 4,200 | 1.12 | 1.16 | 1.20 | 1.25 | 1.35 |
| 08-00527-00301 | | 1.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 3,800 | 1.64 | 1.71 | 1.77 | 1.84 | 2.02 |
| 08-00527-00302 | | 2 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 3,800 | 2.17 | 2.25 | 2.34 | 2.44 | 2.68 |
| 08-00528-00302 | | 2 | 0.45 | 0.6 | 0.56 | 12° | 6 | 50 | 5,800 | 2.17 | 2.25 | 2.34 | 2.44 | 2.68 |
| 08-00527-00303 | | 2.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 3,900 | 2.69 | 2.79 | 2.91 | 3.04 | 3.34 |
| 08-00527-00304 | | 3 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 3,900 | 3.21 | 3.34 | 3.48 | 3.64 | 4.01 |
| 08-00528-00304 | | 3 | 0.45 | 0.6 | 0.56 | 12° | 6 | 50 | 5,900 | 3.21 | 3.34 | 3.48 | 3.64 | 4.01 |
| 08-00527-00305 | | 3.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 4,000 | 3.73 | 3.88 | 4.05 | 4.24 | 4.67 |
| 08-00527-00306 | | 4 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 4,000 | 4.25 | 4.43 | 4.62 | 4.84 | 5.33 |
| 08-00528-00306 | | 4 | 0.45 | 0.6 | 0.56 | 12° | 6 | 50 | 6,100 | 4.25 | 4.43 | 4.62 | 4.84 | 5.33 |
| 08-00527-00321 | | 4.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 4,000 | 4.78 | 4.98 | 5.20 | 5.45 | 6.02 |
| 08-00527-00308 | | 5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 4,000 | 5.29 | 5.52 | 5.76 | 6.03 | 6.66 |
| 08-00527-00322 | | 5.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 4,000 | 5.82 | 6.07 | 6.34 | 6.64 | 7.35 |
| 08-00527-00310 | | 6 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 4,000 | 6.34 | 6.61 | 6.90 | 7.23 | 7.99 |

**オーダー方法**

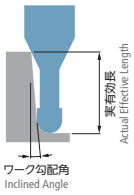
MRBH230 ボール半径(R)×有効長(ℓ1)×シャンク径(d)を指示してください。
When you order, indicate MRBH230 (R)×(ℓ1)×(d).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-027に記載
●Recommended Milling Conditions are shown on page E-027.



SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

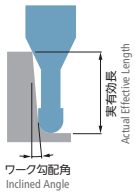



| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00527-00312 | R0.3 | 7 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 4,500 | 7.38 | 7.70 | 8.04 | 8.43 | 9.31 |
| 08-00527-00314 | | 8 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 5,300 | 8.42 | 8.79 | 9.18 | 9.62 | 10.64 |
| 08-00527-00316 | | 9 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 5,600 | 9.47 | 9.88 | 10.33 | 10.82 | 11.97 |
| 08-00527-00318 | | 10 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 5,400 | 10.51 | 10.97 | 11.47 | 12.02 | 13.30 |
| 08-00527-00320 | | 12 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 6,100 | 12.59 | 13.14 | 13.75 | 14.41 | 15.95 |
| 08-00527-00350 | R0.35 | 2 | 0.5 | 0.7 | 0.66 | 12° | 4 | 45 | 4,300 | 2.17 | 2.25 | 2.34 | 2.44 | 2.67 |
| 08-00527-00351 | | 4 | 0.5 | 0.7 | 0.66 | 12° | 4 | 45 | 4,600 | 4.25 | 4.43 | 4.62 | 4.84 | 5.33 |
| 08-00527-00352 | | 6 | 0.5 | 0.7 | 0.66 | 12° | 4 | 45 | 4,600 | 6.34 | 6.61 | 6.91 | 7.23 | 8.00 |
| 08-00527-00353 | | 8 | 0.5 | 0.7 | 0.66 | 12° | 4 | 45 | 4,600 | 8.43 | 8.79 | 9.19 | 9.63 | 10.66 |
| 08-00527-00401 | R0.4 | 2 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 3,800 | 2.16 | 2.24 | 2.33 | 2.42 | 2.65 |
| 08-00528-00401 | | 2 | 0.6 | 0.8 | 0.76 | 12° | 6 | 50 | 5,800 | 2.16 | 2.24 | 2.33 | 2.42 | 2.65 |
| 08-00527-00402 | | 3 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 4,000 | 3.20 | 3.33 | 3.47 | 3.62 | 3.97 |
| 08-00527-00403 | | 4 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 4,000 | 4.25 | 4.42 | 4.61 | 4.82 | 5.30 |
| 08-00527-00404 | | 5 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 4,000 | 5.29 | 5.51 | 5.75 | 6.01 | 6.63 |
| 08-00527-00405 | | 6 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 4,000 | 6.33 | 6.60 | 6.89 | 7.21 | 7.96 |
| 08-00527-00406 | | 7 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 4,000 | 7.38 | 7.69 | 8.03 | 8.41 | 9.28 |
| 08-00527-00407 | | 8 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 4,000 | 8.42 | 8.78 | 9.17 | 9.60 | 10.61 |
| 08-00527-00409 | | 10 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 5,300 | 10.50 | 10.96 | 11.45 | 12.00 | 13.26 |
| 08-00527-00410 | | 12 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 5,800 | 12.59 | 13.14 | 13.73 | 14.39 | 15.92 |
| 08-00527-00450 | R0.45 | 2 | 0.65 | 0.9 | 0.86 | 12° | 4 | 45 | 4,300 | 2.16 | 2.24 | 2.33 | 2.42 | 2.64 |
| 08-00527-00451 | | 4 | 0.65 | 0.9 | 0.86 | 12° | 4 | 45 | 4,600 | 4.25 | 4.42 | 4.61 | 4.82 | 5.30 |
| 08-00527-00452 | | 6 | 0.65 | 0.9 | 0.86 | 12° | 4 | 45 | 4,600 | 6.34 | 6.60 | 6.89 | 7.21 | 7.96 |
| 08-00527-00453 | | 8 | 0.65 | 0.9 | 0.86 | 12° | 4 | 45 | 4,600 | 8.42 | 8.78 | 9.17 | 9.61 | 10.62 |
| 08-00527-00500 | R0.5 | 2 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,200 | 2.18 | 2.26 | 2.34 | 2.43 | 2.65 |
| 08-00527-00514 | | 2.5 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,200 | 2.71 | 2.81 | 2.92 | 3.04 | 3.32 |
| 08-00527-00501 | | 3 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,200 | 3.22 | 3.35 | 3.48 | 3.63 | 3.97 |
| 08-00528-00501 | | 3 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 5,100 | 3.22 | 3.35 | 3.48 | 3.63 | 3.97 |
| 08-00527-00502 | | 4 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,600 | 4.27 | 4.44 | 4.62 | 4.83 | 5.30 |
| 08-00528-00502 | | 4 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 5,600 | 4.27 | 4.44 | 4.62 | 4.83 | 5.30 |
| 08-00527-00503 | | 5 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,600 | 5.31 | 5.53 | 5.76 | 6.02 | 6.63 |
| 08-00528-00503 | | 5 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 5,600 | 5.31 | 5.53 | 5.76 | 6.02 | 6.63 |
| 08-00527-00504 | | 6 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,900 | 6.35 | 6.62 | 6.90 | 7.22 | 7.96 |
| 08-00528-00504 | | 6 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 5,900 | 6.35 | 6.62 | 6.90 | 7.22 | 7.96 |
| 08-00527-00505 | | 7 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,900 | 7.40 | 7.71 | 8.04 | 8.42 | 9.28 |
| 08-00528-00505 | | 7 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 5,900 | 7.40 | 7.71 | 8.04 | 8.42 | 9.28 |
| 08-00527-00506 | | 8 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,900 | 8.44 | 8.79 | 9.18 | 9.61 | 10.61 |
| 08-00528-00506 | | 8 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 5,900 | 8.44 | 8.79 | 9.18 | 9.61 | 10.61 |
| 08-00527-00507 | | 9 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,900 | 9.48 | 9.88 | 10.32 | 10.81 | 11.94 |
| 08-00527-00508 | | 10 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,900 | 10.52 | 10.97 | 11.46 | 12.01 | 13.26 |
| 08-00528-00508 | | 10 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 5,900 | 10.52 | 10.97 | 11.46 | 12.01 | 13.26 |
| 08-00527-00509 | | 12 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,900 | 12.61 | 13.15 | 13.75 | 14.40 | 15.92 |
| 08-00527-00515 | | 13 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 4,500 | 13.66 | 14.25 | 14.90 | 15.62 | 17.29 |
| 08-00527-00510 | | 14 | 0.75 | 1 | 0.95 | 12° | 4 | 50 | 4,500 | 14.70 | 15.33 | 16.03 | 16.79 | 18.57 |

# MRBH230

## 無限コーティングプレミアム 高硬度用２枚刃ロングネックボールエンドミル

MUGEN-COATING PREMIUM 2-Flute Long Neck Ball End Mill for Hardened Steel




★ 再研磨可能　(詳細はお問い合わせください。)

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00527-00511 | R0.5 | 16 | 0.75 | 1 | 0.95 | 12° | 4 | 50 | 5,300 | 16.78 | 17.51 | 18.31 | 19.18 | 21.23 |
| 08-00527-00512 | | 18 | 0.75 | 1 | 0.95 | 12° | 4 | 55 | 5,300 | 18.87 | 19.69 | 20.59 | 21.58 | 23.88 |
| 08-00527-00513 | | 20 | 0.75 | 1 | 0.95 | 12° | 4 | 55 | 6,400 | 20.95 | 21.87 | 22.87 | 23.97 | 26.54 |
| 08-00528-00516 | | 22 | 0.75 | 1 | 0.95 | 12° | 6 | 60 | 9,600 | 22.82 | 23.59 | 24.43 | 25.33 | 27.34 |
| 08-00527-00600 | R0.6 | 2.4 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 4,800 | 2.59 | 2.68 | 2.78 | 2.89 | 3.15 |
| 08-00527-00601 | | 4 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 4,800 | 4.26 | 4.43 | 4.61 | 4.81 | 5.27 |
| 08-00527-00602 | | 6 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 5,200 | 6.35 | 6.61 | 6.89 | 7.20 | 7.92 |
| 08-00527-00603 | | 8 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 5,200 | 8.43 | 8.79 | 9.17 | 9.59 | 10.58 |
| 08-00527-00604 | | 10 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 5,200 | 10.52 | 10.96 | 11.45 | 11.99 | 13.23 |
| 08-00527-00605 | | 12 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 5,200 | 12.61 | 13.14 | 13.73 | 14.38 | 15.89 |
| 08-00527-00606 | | 14 | 0.9 | 1.2 | 1.15 | 12° | 4 | 50 | 5,700 | 14.69 | 15.32 | 16.01 | 16.77 | 18.54 |
| 08-00527-00607 | | 16 | 0.9 | 1.2 | 1.15 | 12° | 4 | 50 | 6,200 | 16.78 | 17.50 | 18.29 | 19.17 | 21.20 |
| 08-00527-00700 | R0.7 | 8 | 1 | 1.4 | 1.35 | 12° | 4 | 45 | 4,500 | 8.44 | 8.78 | 9.17 | 9.59 | 10.57 |
| 08-00527-00701 | | 12 | 1 | 1.4 | 1.35 | 12° | 4 | 50 | 4,500 | 12.61 | 13.14 | 13.73 | 14.38 | 15.90 |
| 08-00527-00702 | | 16 | 1 | 1.4 | 1.35 | 12° | 4 | 50 | 4,500 | 16.78 | 17.50 | 18.30 | 19.17 | 21.22 |
| 08-00527-00750 | R0.75 | 3 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 3,700 | 3.21 | 3.33 | 3.45 | 3.58 | 3.89 |
| 08-00527-00751 | | 4 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 3,700 | 4.26 | 4.41 | 4.59 | 4.78 | 5.22 |
| 08-00527-00753 | | 6 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 3,700 | 6.34 | 6.59 | 6.87 | 7.17 | 7.88 |
| 08-00528-00753 | | 6 | 1.1 | 1.5 | 1.45 | 12° | 6 | 50 | 6,000 | 6.34 | 6.59 | 6.87 | 7.17 | 7.88 |
| 08-00527-00755 | | 8 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 3,900 | 8.43 | 8.77 | 9.15 | 9.56 | 10.53 |
| 08-00528-00755 | | 8 | 1.1 | 1.5 | 1.45 | 12° | 6 | 50 | 6,000 | 8.43 | 8.77 | 9.15 | 9.56 | 10.53 |
| 08-00527-00757 | | 10 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 4,200 | 10.51 | 10.95 | 11.43 | 11.96 | 13.18 |
| 08-00527-00758 | | 12 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 4,500 | 12.60 | 13.13 | 13.71 | 14.35 | 15.84 |
| 08-00527-00759 | | 14 | 1.1 | 1.5 | 1.45 | 12° | 4 | 50 | 4,500 | 14.69 | 15.31 | 15.99 | 16.74 | 18.49 |
| 08-00527-00760 | | 16 | 1.1 | 1.5 | 1.45 | 12° | 4 | 50 | 4,500 | 16.77 | 17.49 | 18.27 | 19.14 | 21.15 |
| 08-00527-00761 | | 18 | 1.1 | 1.5 | 1.45 | 12° | 4 | 55 | 4,500 | 18.86 | 19.68 | 20.57 | 21.56 | 23.87 |
| 08-00527-00762 | | 20 | 1.1 | 1.5 | 1.45 | 12° | 4 | 55 | 4,500 | 20.94 | 21.85 | 22.84 | 23.92 | Free |
| 08-00527-00763 | | 22 | 1.1 | 1.5 | 1.45 | 12° | 4 | 60 | 4,500 | 23.03 | 24.02 | 25.12 | 26.32 | Free |
| 08-00527-00764 | | 30 | 1.1 | 1.5 | 1.45 | 12° | 4 | 70 | 4,500 | 31.37 | 32.74 | 34.24 | 35.89 | Free |
| 08-00527-00803 | R0.8 | 8 | 1.2 | 1.6 | 1.55 | 12° | 4 | 45 | 5,200 | 8.43 | 8.77 | 9.14 | 9.55 | 10.51 |
| 08-00527-00805 | | 12 | 1.2 | 1.6 | 1.55 | 12° | 4 | 45 | 5,200 | 12.60 | 13.13 | 13.70 | 14.34 | 15.82 |
| 08-00527-00807 | | 16 | 1.2 | 1.6 | 1.55 | 12° | 4 | 50 | 5,200 | 16.77 | 17.48 | 18.27 | 19.13 | 21.13 |
| 08-00527-00809 | | 20 | 1.2 | 1.6 | 1.55 | 12° | 4 | 55 | 5,200 | 20.94 | 21.84 | 22.83 | 23.91 | Free |

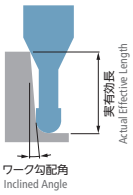
**オーダー方法**　MRBH230 ボール半径(R)×有効長(ℓ1)×シャンク径(d)を指示してください。
When you order, indicate MRBH230 (R)×(ℓ1)×(d).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-027に記載
●Recommended Milling Conditions are shown on page E-027.



SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

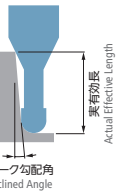



| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00527-01001 | R1 | 3 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 3,200 | 3.23 | 3.33 | 3.44 | 3.56 | 3.85 |
| 08-00527-01002 | | 4 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 3,200 | 4.27 | 4.42 | 4.58 | 4.76 | 5.17 |
| 08-00528-01002 | | 4 | 1.5 | 2 | 1.94 | 12° | 6 | 50 | 5,100 | 4.27 | 4.42 | 4.58 | 4.76 | 5.17 |
| ★ 08-00527-01004 | | 6 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 3,600 | 6.36 | 6.60 | 6.86 | 7.15 | 7.83 |
| ★ 08-00528-01004 | | 6 | 1.5 | 2 | 1.94 | 12° | 6 | 50 | 5,500 | 6.36 | 6.60 | 6.86 | 7.15 | 7.83 |
| ★ 08-00527-01006 | | 8 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 3,900 | 8.44 | 8.78 | 9.14 | 9.54 | 10.48 |
| ★ 08-00528-01006 | | 8 | 1.5 | 2 | 1.94 | 12° | 6 | 50 | 5,900 | 8.44 | 8.78 | 9.14 | 9.54 | 10.48 |
| ★ 08-00527-01008 | | 10 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 3,900 | 10.53 | 10.95 | 11.42 | 11.94 | 13.14 |
| ★ 08-00528-01008 | | 10 | 1.5 | 2 | 1.94 | 12° | 6 | 50 | 5,900 | 10.53 | 10.95 | 11.42 | 11.94 | 13.14 |
| ★ 08-00527-01010 | | 12 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 3,900 | 12.61 | 13.13 | 13.70 | 14.33 | 15.79 |
| ★ 08-00527-01020 | | 13 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 3,900 | 13.66 | 14.23 | 14.86 | 15.55 | 17.16 |
| ★ 08-00527-01011 | | 14 | 1.5 | 2 | 1.94 | 12° | 4 | 50 | 3,900 | 14.70 | 15.31 | 15.98 | 16.72 | 18.45 |
| ★ 08-00527-01012 | | 16 | 1.5 | 2 | 1.94 | 12° | 4 | 50 | 3,900 | 16.78 | 17.49 | 18.27 | 19.12 | Free |
| ★ 08-00528-01012 | | 16 | 1.5 | 2 | 1.94 | 12° | 6 | 60 | 5,900 | 16.78 | 17.49 | 18.27 | 19.12 | Free |
| ★ 08-00527-01013 | | 18 | 1.5 | 2 | 1.94 | 12° | 4 | 55 | 3,900 | 18.87 | 19.67 | 20.55 | 21.51 | Free |
| ★ 08-00527-01014 | | 20 | 1.5 | 2 | 1.94 | 12° | 4 | 55 | 3,900 | 20.96 | 21.85 | 22.83 | 23.90 | Free |
| ★ 08-00527-01015 | | 22 | 1.5 | 2 | 1.94 | 12° | 4 | 60 | 5,300 | 23.04 | 24.03 | 25.11 | 26.30 | Free |
| ★ 08-00527-01016 | | 25 | 1.5 | 2 | 1.94 | 12° | 4 | 65 | 5,400 | 26.17 | 27.30 | 28.53 | 29.89 | Free |
| ★ 08-00528-01016 | | 25 | 1.5 | 2 | 1.94 | 12° | 6 | 65 | 5,500 | 26.17 | 27.30 | 28.53 | 29.89 | Free |
| ★ 08-00527-01017 | | 30 | 1.5 | 2 | 1.94 | 12° | 4 | 70 | 6,100 | 31.38 | 32.74 | 34.23 | Free | Free |
| ★ 08-00527-01018 | | 35 | 1.5 | 2 | 1.94 | 12° | 4 | 70 | 8,300 | 36.60 | 38.19 | 39.93 | Free | Free |
| ★ 08-00527-01019 | | 40 | 1.5 | 2 | 1.94 | 12° | 4 | 90 | 8,300 | 41.81 | 43.64 | Free | Free | Free |
| ★ 08-00527-01250 | R1.25 | 6 | 2.3 | 2.5 | 2.4 | 12° | 4 | 45 | 4,800 | 6.45 | 6.68 | 6.94 | 7.22 | 7.89 |
| ★ 08-00527-01251 | | 8 | 2.3 | 2.5 | 2.4 | 12° | 4 | 45 | 4,200 | 8.54 | 8.86 | 9.22 | 9.62 | 10.55 |
| ★ 08-00527-01252 | | 10 | 2.3 | 2.5 | 2.4 | 12° | 4 | 45 | 5,100 | 10.62 | 11.04 | 11.49 | 12.00 | 13.18 |
| ★ 08-00527-01253 | | 15 | 2.3 | 2.5 | 2.4 | 12° | 4 | 50 | 5,200 | 15.83 | 16.48 | 17.20 | 17.98 | Free |
| ★ 08-00527-01254 | | 20 | 2.3 | 2.5 | 2.4 | 12° | 4 | 55 | 6,100 | 21.04 | 21.93 | 22.90 | Free | Free |
| ★ 08-00527-01255 | | 25 | 2.3 | 2.5 | 2.4 | 12° | 4 | 65 | 6,500 | 26.26 | 27.38 | 28.60 | Free | Free |
| ★ 08-00527-01256 | | 30 | 2.3 | 2.5 | 2.4 | 12° | 4 | 70 | 7,500 | 31.47 | 32.82 | Free | Free | Free |
| ★ 08-00527-01257 | | 35 | 2.3 | 2.5 | 2.4 | 12° | 4 | 70 | 9,300 | 36.69 | 38.27 | Free | Free | Free |
| ★ 08-00527-01501 | R1.5 | 6 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 3,900 | 6.56 | 6.78 | 7.03 | 7.31 | 7.95 |
| ★ 08-00527-01502 | | 8 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 3,900 | 8.64 | 8.96 | 9.31 | 9.70 | 10.60 |
| ★ 08-00527-01503 | | 10 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 4,500 | 10.73 | 11.14 | 11.59 | 12.09 | 13.26 |
| ★ 08-00527-01504 | | 12 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 4,700 | 12.81 | 13.32 | 13.88 | 14.49 | 15.91 |
| ★ 08-00527-01505 | | 14 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 5,200 | 14.90 | 15.50 | 16.16 | 16.88 | 18.57 |
| ★ 08-00527-01506 | | 16 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 5,200 | 16.98 | 17.68 | 18.44 | 19.27 | 21.22 |
| ★ 08-00527-01508 | | 20 | 2.5 | 3 | 2.85 | 12° | 6 | 65 | 5,000 | 21.16 | 22.04 | 23.00 | 24.06 | 26.53 |
| ★ 08-00527-01509 | | 25 | 2.5 | 3 | 2.85 | 12° | 6 | 65 | 5,000 | 26.37 | 27.48 | 28.70 | 30.04 | Free |
| ★ 08-00527-01510 | | 30 | 2.5 | 3 | 2.85 | 12° | 6 | 70 | 5,700 | 31.58 | 32.93 | 34.40 | 36.03 | Free |
| ★ 08-00527-01511 | | 35 | 2.5 | 3 | 2.85 | 12° | 6 | 80 | 7,200 | 36.80 | 38.38 | 40.11 | 42.01 | Free |
| ★ 08-00527-01512 | | 40 | 2.5 | 3 | 2.85 | 12° | 6 | 90 | 9,000 | 42.01 | 43.83 | 45.81 | Free | Free |

# MRBH230

## 無限コーティングプレミアム 高硬度用２枚刃ロングネックボールエンドミル

MUGEN-COATING PREMIUM 2-Flute Long Neck Ball End Mill for Hardened Steel




★ 再研磨可能　(詳細はお問い合わせください。)

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ★ 08-00527-01750 | R1.75 | 15 | 2.8 | 3.5 | 3.35 | 12° | 6 | 60 | 6,600 | 15.94 | 16.58 | 17.28 | 18.05 | 19.86 |
| ★ 08-00527-01754 | | 20 | 2.8 | 3.5 | 3.35 | 12° | 6 | 65 | 6,600 | 21.14 | 22.01 | 22.96 | 24.01 | Free |
| ★ 08-00527-01751 | | 25 | 2.8 | 3.5 | 3.35 | 12° | 6 | 65 | 7,000 | 26.37 | 27.47 | 28.69 | 30.03 | Free |
| ★ 08-00527-01755 | | 30 | 2.8 | 3.5 | 3.35 | 12° | 6 | 70 | 7,000 | 31.57 | 32.91 | 34.37 | 35.98 | Free |
| ★ 08-00527-01752 | | 35 | 2.8 | 3.5 | 3.35 | 12° | 6 | 80 | 9,000 | 36.79 | 38.37 | 40.10 | Free | Free |
| ★ 08-00527-01756 | | 40 | 2.8 | 3.5 | 3.35 | 12° | 6 | 90 | 9,000 | 42.00 | 43.80 | 45.77 | Free | Free |
| ★ 08-00527-01753 | | 45 | 2.8 | 3.5 | 3.35 | 12° | 6 | 90 | 11,000 | 47.22 | 49.27 | Free | Free | Free |
| ★ 08-00527-02000 | R2 | 8 | 3 | 4 | 3.8 | – | 4 | 65 | 3,800 | 8.74 | 9.05 | 9.38 | 9.74 | 10.60 |
| ★ 08-00527-02001 | | 8 | 3 | 4 | 3.8 | 12° | 6 | 65 | 4,000 | 8.74 | 9.05 | 9.38 | 9.74 | 10.60 |
| ★ 08-00527-02002 | | 10 | 3 | 4 | 3.8 | 12° | 6 | 65 | 4,000 | 10.83 | 11.22 | 11.66 | 12.14 | 13.25 |
| ★ 08-00527-02003 | | 12 | 3 | 4 | 3.8 | 12° | 6 | 65 | 5,200 | 12.91 | 13.40 | 13.94 | 14.53 | 15.91 |
| ★ 08-00527-02101 | | 14 | 3 | 4 | 3.8 | 12° | 6 | 65 | 5,200 | 15.00 | 15.58 | 16.22 | 16.92 | 18.56 |
| ★ 08-00527-02004 | | 15 | 3 | 4 | 3.8 | 12° | 6 | 65 | 5,200 | 16.04 | 16.67 | 17.36 | 18.12 | 19.89 |
| ★ 08-00527-02006 | | 20 | 3 | 4 | 3.8 | 12° | 6 | 65 | 5,200 | 21.26 | 22.12 | 23.06 | 24.10 | Free |
| ★ 08-00527-02008 | | 25 | 3 | 4 | 3.8 | 12° | 6 | 70 | 5,200 | 26.47 | 27.57 | 28.77 | 30.09 | Free |
| ★ 08-00527-02010 | | 30 | 3 | 4 | 3.8 | 12° | 6 | 70 | 5,200 | 31.68 | 33.01 | 34.47 | Free | Free |
| ★ 08-00527-02011 | | 35 | 3 | 4 | 3.8 | 12° | 6 | 80 | 6,000 | 36.90 | 38.46 | 40.17 | Free | Free |
| ★ 08-00527-02012 | | 40 | 3 | 4 | 3.8 | 12° | 6 | 85 | 6,700 | 42.11 | 43.91 | Free | Free | Free |
| ★ 08-00527-02013 | | 45 | 3 | 4 | 3.8 | 12° | 6 | 90 | 8,700 | 47.33 | 49.36 | Free | Free | Free |
| ★ 08-00527-02014 | | 50 | 3 | 4 | 3.8 | 12° | 6 | 100 | 9,500 | 52.54 | 54.80 | Free | Free | Free |
| ★ 08-00527-02500 | R2.5 | 10 | 3.5 | 5 | 4.8 | 12° | 6 | 70 | 6,100 | 10.81 | 11.18 | 11.59 | 12.04 | Free |
| ★ 08-00527-02501 | | 15 | 3.5 | 5 | 4.8 | 12° | 6 | 70 | 8,600 | 16.02 | 16.63 | 17.29 | Free | Free |
| ★ 08-00527-02502 | | 20 | 3.5 | 5 | 4.8 | 12° | 6 | 70 | 8,700 | 21.24 | 22.08 | Free | Free | Free |
| ★ 08-00527-02503 | | 25 | 3.5 | 5 | 4.8 | 12° | 6 | 70 | 8,700 | 26.45 | 27.52 | Free | Free | Free |
| ★ 08-00527-02504 | | 30 | 3.5 | 5 | 4.8 | 12° | 6 | 80 | 9,300 | 31.66 | Free | Free | Free | Free |
| ★ 08-00527-02506 | | 40 | 3.5 | 5 | 4.8 | 12° | 6 | 90 | 11,600 | 42.09 | Free | Free | Free | Free |
| ★ 08-00527-03000 | R3 | 10 | 6 | 6 | 5.7 | – | 6 | 70 | 6,500 | Free | Free | Free | Free | Free |
| ★ 08-00527-03001 | | 15 | 6 | 6 | 5.7 | – | 6 | 70 | 6,500 | Free | Free | Free | Free | Free |
| ★ 08-00527-03002 | | 20 | 6 | 6 | 5.7 | – | 6 | 70 | 6,500 | Free | Free | Free | Free | Free |
| ★ 08-00527-03003 | | 25 | 6 | 6 | 5.7 | – | 6 | 70 | 6,500 | Free | Free | Free | Free | Free |
| ★ 08-00527-03004 | | 30 | 6 | 6 | 5.7 | – | 6 | 80 | 6,700 | Free | Free | Free | Free | Free |
| ★ 08-00527-03007 | | 35 | 6 | 6 | 5.7 | – | 6 | 85 | 6,700 | Free | Free | Free | Free | Free |
| ★ 08-00527-03005 | | 40 | 6 | 6 | 5.7 | – | 6 | 90 | 7,300 | Free | Free | Free | Free | Free |
| ★ 08-00527-03006 | | 50 | 6 | 6 | 5.7 | – | 6 | 120 | 7,900 | Free | Free | Free | Free | Free |
| ★ 08-00527-03008 | | 60 | 6 | 6 | 5.7 | – | 6 | 120 | 8,500 | Free | Free | Free | Free | Free |

**オーダー方法**

MRBH230 ボール半径(R)×有効長(ℓ1)×シャンク径(d)を指示してください。
When you order, indicate MRBH230 (R)×(ℓ1)×(d).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-027に記載
●Recommended Milling Conditions are shown on page E-027.



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# MRBH230

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-018

| 被削材 Work Material | | | 焼き入れ鋼 Hardened Steels SKD61・STAVAX・HPM-38 (～52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (～62HRC) | | | | ハイス High Speed Tool Steels SKH (～65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 有効長 Effective Length | 刃径と有効長の比 L/D | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.05 | 0.2 | 2.0 | 0.003 | 0.005 | 120 | 40,000 | 0.002 | 0.005 | 100 | 40,000 | 0.002 | 0.003 | 70 | 40,000 |
| | 0.3 | 3.0 | 0.003 | 0.005 | 100 | 40,000 | 0.002 | 0.005 | 70 | 40,000 | 0.002 | 0.003 | 50 | 40,000 |
| | 0.5 | 5.0 | 0.002 | 0.003 | 70 | 40,000 | 0.001 | 0.003 | 50 | 40,000 | 0.001 | 0.002 | 30 | 40,000 |
| 0.075 | 0.3 | 2.0 | 0.003 | 0.005 | 180 | 40,000 | 0.002 | 0.005 | 150 | 40,000 | 0.002 | 0.003 | 100 | 40,000 |
| | 0.5 | 3.3 | 0.003 | 0.005 | 150 | 40,000 | 0.002 | 0.005 | 120 | 40,000 | 0.002 | 0.003 | 70 | 40,000 |
| | 1 | 6.7 | 0.002 | 0.003 | 70 | 40,000 | 0.001 | 0.003 | 50 | 40,000 | 0.001 | 0.002 | 30 | 40,000 |
| 0.1 | 0.3 | 1.5 | 0.01 | 0.01 | 350 | 40,000 | 0.006 | 0.005 | 300 | 40,000 | 0.003 | 0.003 | 200 | 40,000 |
| | 0.5 | 2.5 | 0.008 | 0.01 | 320 | 40,000 | 0.005 | 0.005 | 280 | 40,000 | 0.003 | 0.003 | 180 | 40,000 |
| | 0.75 | 3.8 | 0.005 | 0.01 | 280 | 40,000 | 0.003 | 0.005 | 200 | 40,000 | 0.002 | 0.003 | 150 | 40,000 |
| | 1 | 5.0 | 0.003 | 0.005 | 250 | 40,000 | 0.002 | 0.003 | 160 | 40,000 | 0.001 | 0.002 | 120 | 40,000 |
| | 1.25 | 6.3 | 0.003 | 0.005 | 180 | 40,000 | 0.002 | 0.003 | 140 | 40,000 | 0.001 | 0.002 | 100 | 40,000 |
| | 1.5 | 7.5 | 0.003 | 0.005 | 150 | 40,000 | 0.002 | 0.003 | 120 | 40,000 | 0.001 | 0.002 | 80 | 40,000 |
| | 1.75 | 8.8 | 0.002 | 0.003 | 120 | 40,000 | 0.001 | 0.002 | 100 | 40,000 | 0.001 | 0.002 | 60 | 40,000 |
| | 2 | 10.0 | 0.002 | 0.003 | 100 | 40,000 | 0.001 | 0.002 | 80 | 40,000 | 0.001 | 0.001 | 50 | 40,000 |
| | 2.5 | 12.5 | 0.001 | 0.002 | 70 | 40,000 | 0.001 | 0.001 | 60 | 40,000 | 0.001 | 0.001 | 40 | 40,000 |
| | 3 | 15.0 | 0.001 | 0.001 | 50 | 40,000 | 0.001 | 0.001 | 40 | 40,000 | 0.001 | 0.001 | 30 | 40,000 |
| 0.15 | 0.5 | 1.7 | 0.01 | 0.015 | 350 | 40,000 | 0.007 | 0.01 | 300 | 40,000 | 0.003 | 0.005 | 280 | 40,000 |
| | 0.6 | 2.0 | 0.007 | 0.01 | 350 | 40,000 | 0.005 | 0.007 | 300 | 40,000 | 0.003 | 0.005 | 250 | 40,000 |
| | 0.75 | 2.5 | 0.007 | 0.01 | 330 | 40,000 | 0.005 | 0.007 | 280 | 40,000 | 0.003 | 0.005 | 230 | 40,000 |
| | 1 | 3.3 | 0.007 | 0.01 | 320 | 40,000 | 0.005 | 0.007 | 250 | 40,000 | 0.003 | 0.005 | 200 | 40,000 |
| | 1.25 | 4.2 | 0.005 | 0.007 | 280 | 40,000 | 0.003 | 0.005 | 200 | 40,000 | 0.002 | 0.003 | 160 | 40,000 |
| | 1.5 | 5.0 | 0.005 | 0.007 | 230 | 40,000 | 0.003 | 0.005 | 180 | 40,000 | 0.002 | 0.003 | 120 | 40,000 |
| | 1.75 | 5.8 | 0.003 | 0.005 | 180 | 40,000 | 0.002 | 0.003 | 150 | 40,000 | 0.002 | 0.002 | 100 | 40,000 |
| | 2 | 6.7 | 0.003 | 0.005 | 150 | 40,000 | 0.002 | 0.003 | 120 | 40,000 | 0.002 | 0.002 | 90 | 40,000 |
| | 2.25 | 7.5 | 0.002 | 0.003 | 120 | 40,000 | 0.001 | 0.002 | 100 | 40,000 | 0.001 | 0.001 | 80 | 40,000 |
| | 2.5 | 8.3 | 0.002 | 0.003 | 100 | 40,000 | 0.001 | 0.002 | 80 | 40,000 | 0.001 | 0.001 | 70 | 40,000 |
| | 3 | 10.0 | 0.001 | 0.003 | 80 | 40,000 | 0.001 | 0.002 | 70 | 40,000 | 0.001 | 0.001 | 60 | 40,000 |
| | 3.5 | 11.7 | 0.001 | 0.002 | 70 | 40,000 | 0.001 | 0.001 | 60 | 40,000 | 0.001 | 0.001 | 50 | 40,000 |
| | 4 | 13.3 | 0.001 | 0.002 | 60 | 40,000 | 0.001 | 0.001 | 50 | 40,000 | 0.001 | 0.001 | 40 | 40,000 |
| 0.2 | 0.5 | 1.3 | 0.03 | 0.05 | 800 | 40,000 | 0.03 | 0.03 | 720 | 40,000 | 0.009 | 0.02 | 580 | 40,000 |
| | 0.8 | 2.0 | 0.02 | 0.05 | 800 | 40,000 | 0.02 | 0.03 | 720 | 40,000 | 0.008 | 0.02 | 580 | 40,000 |
| | 1 | 2.5 | 0.02 | 0.05 | 800 | 40,000 | 0.02 | 0.03 | 720 | 40,000 | 0.008 | 0.02 | 580 | 40,000 |
| | 1.5 | 3.8 | 0.01 | 0.03 | 620 | 40,000 | 0.01 | 0.02 | 500 | 40,000 | 0.005 | 0.01 | 400 | 40,000 |
| | 2 | 5.0 | 0.01 | 0.02 | 500 | 40,000 | 0.01 | 0.01 | 380 | 40,000 | 0.005 | 0.007 | 300 | 40,000 |
| | 2.5 | 6.3 | 0.007 | 0.01 | 420 | 40,000 | 0.005 | 0.007 | 300 | 40,000 | 0.003 | 0.005 | 260 | 40,000 |
| | 3 | 7.5 | 0.007 | 0.01 | 300 | 40,000 | 0.005 | 0.007 | 240 | 40,000 | 0.003 | 0.005 | 200 | 40,000 |
| | 3.5 | 8.8 | 0.005 | 0.007 | 230 | 40,000 | 0.003 | 0.005 | 160 | 40,000 | 0.002 | 0.003 | 120 | 40,000 |
| | 4 | 10.0 | 0.005 | 0.005 | 160 | 30,000 | 0.003 | 0.003 | 120 | 30,000 | 0.002 | 0.003 | 90 | 30,000 |
| | 4.5 | 11.3 | 0.003 | 0.005 | 100 | 30,000 | 0.002 | 0.003 | 80 | 30,000 | 0.001 | 0.002 | 60 | 30,000 |
| | 5 | 12.5 | 0.002 | 0.003 | 70 | 30,000 | 0.001 | 0.002 | 50 | 30,000 | 0.001 | 0.002 | 40 | 30,000 |
| | 6 | 15.0 | 0.001 | 0.002 | 50 | 30,000 | 0.001 | 0.001 | 40 | 30,000 | 0.001 | 0.001 | 30 | 30,000 |
| 0.25 | 1 | 2.0 | 0.03 | 0.05 | 1,000 | 40,000 | 0.02 | 0.03 | 860 | 40,000 | 0.01 | 0.02 | 650 | 40,000 |
| | 1.5 | 3.0 | 0.02 | 0.05 | 850 | 40,000 | 0.01 | 0.03 | 720 | 40,000 | 0.007 | 0.02 | 520 | 40,000 |
| | 2 | 4.0 | 0.02 | 0.03 | 720 | 40,000 | 0.01 | 0.02 | 650 | 40,000 | 0.007 | 0.01 | 400 | 40,000 |
| | 2.5 | 5.0 | 0.01 | 0.02 | 600 | 40,000 | 0.007 | 0.01 | 530 | 40,000 | 0.005 | 0.007 | 360 | 40,000 |
| | 3 | 6.0 | 0.01 | 0.02 | 500 | 40,000 | 0.007 | 0.01 | 420 | 40,000 | 0.005 | 0.007 | 320 | 40,000 |
| | 3.5 | 7.0 | 0.007 | 0.01 | 420 | 40,000 | 0.005 | 0.007 | 360 | 40,000 | 0.003 | 0.005 | 280 | 40,000 |
| | 4 | 8.0 | 0.007 | 0.01 | 350 | 40,000 | 0.005 | 0.007 | 300 | 40,000 | 0.003 | 0.005 | 260 | 40,000 |
| | 4.5 | 9.0 | 0.005 | 0.005 | 300 | 40,000 | 0.003 | 0.003 | 260 | 40,000 | 0.002 | 0.003 | 220 | 40,000 |
| | 5 | 10.0 | 0.005 | 0.005 | 240 | 33,000 | 0.003 | 0.003 | 200 | 33,000 | 0.002 | 0.003 | 180 | 33,000 |
| | 5.5 | 11.0 | 0.003 | 0.005 | 200 | 30,000 | 0.002 | 0.003 | 160 | 30,000 | 0.001 | 0.002 | 120 | 30,000 |
| | 6 | 12.0 | 0.002 | 0.003 | 120 | 30,000 | 0.001 | 0.002 | 80 | 30,000 | 0.001 | 0.002 | 70 | 30,000 |
| | 8 | 16.0 | 0.002 | 0.002 | 75 | 30,000 | 0.001 | 0.002 | 60 | 30,000 | 0.001 | 0.002 | 50 | 30,000 |
| | 10 | 20.0 | 0.001 | 0.002 | 40 | 20,000 | 0.001 | 0.002 | 30 | 20,000 | 0.001 | 0.001 | 20 | 20,000 |

# MRBH230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | | 焼き入れ鋼 Hardened Steels SKD61・STAVAX・HPM-38 (～52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (～62HRC) | | | | ハイス High Speed Tool Steels SKH (～65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 有効長 Effective Length | 刃径と有効長の比 L/D | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.3 | 1 | 1.7 | 0.05 | 0.1 | 1,400 | 40,000 | 0.03 | 0.06 | 1,000 | 40,000 | 0.02 | 0.05 | 720 | 30,000 |
| | 1.5 | 2.5 | 0.05 | 0.1 | 1,400 | 40,000 | 0.03 | 0.06 | 1,000 | 40,000 | 0.02 | 0.05 | 720 | 30,000 |
| | 2 | 3.3 | 0.05 | 0.1 | 1,400 | 40,000 | 0.03 | 0.06 | 1,000 | 40,000 | 0.02 | 0.05 | 720 | 30,000 |
| | 2.5 | 4.2 | 0.03 | 0.05 | 1,200 | 40,000 | 0.02 | 0.04 | 840 | 40,000 | 0.02 | 0.03 | 640 | 30,000 |
| | 3 | 5.0 | 0.03 | 0.05 | 1,200 | 40,000 | 0.02 | 0.04 | 840 | 40,000 | 0.02 | 0.03 | 640 | 30,000 |
| | 3.5 | 5.8 | 0.02 | 0.03 | 1,000 | 40,000 | 0.01 | 0.03 | 620 | 40,000 | 0.01 | 0.02 | 480 | 30,000 |
| | 4 | 6.7 | 0.02 | 0.03 | 1,000 | 40,000 | 0.01 | 0.03 | 620 | 40,000 | 0.01 | 0.02 | 480 | 30,000 |
| | 4.5 | 7.5 | 0.02 | 0.03 | 900 | 35,000 | 0.01 | 0.02 | 580 | 35,000 | 0.008 | 0.015 | 430 | 30,000 |
| | 5 | 8.3 | 0.01 | 0.02 | 720 | 30,000 | 0.007 | 0.015 | 500 | 30,000 | 0.007 | 0.01 | 400 | 30,000 |
| | 5.5 | 9.2 | 0.01 | 0.015 | 700 | 30,000 | 0.007 | 0.01 | 450 | 30,000 | 0.005 | 0.008 | 360 | 30,000 |
| | 6 | 10.0 | 0.007 | 0.01 | 500 | 30,000 | 0.005 | 0.007 | 380 | 30,000 | 0.004 | 0.006 | 320 | 30,000 |
| | 7 | 11.7 | 0.005 | 0.007 | 400 | 25,000 | 0.003 | 0.005 | 300 | 25,000 | 0.003 | 0.003 | 260 | 20,000 |
| | 8 | 13.3 | 0.003 | 0.005 | 320 | 25,000 | 0.003 | 0.003 | 260 | 25,000 | 0.002 | 0.003 | 220 | 20,000 |
| | 9 | 15.0 | 0.003 | 0.003 | 280 | 25,000 | 0.003 | 0.002 | 220 | 25,000 | 0.001 | 0.002 | 160 | 20,000 |
| | 10 | 16.7 | 0.002 | 0.003 | 150 | 20,000 | 0.002 | 0.002 | 120 | 20,000 | 0.001 | 0.002 | 100 | 18,000 |
| | 12 | 20.0 | 0.002 | 0.002 | 80 | 20,000 | 0.002 | 0.002 | 60 | 20,000 | 0.001 | 0.002 | 50 | 18,000 |
| 0.35 | 2 | 2.9 | 0.07 | 0.1 | 1,600 | 40,000 | 0.05 | 0.08 | 1,300 | 40,000 | 0.03 | 0.07 | 1,000 | 30,000 |
| | 4 | 5.7 | 0.04 | 0.06 | 1,300 | 40,000 | 0.03 | 0.04 | 820 | 40,000 | 0.015 | 0.02 | 600 | 30,000 |
| | 6 | 8.6 | 0.01 | 0.03 | 800 | 30,000 | 0.01 | 0.015 | 500 | 30,000 | 0.006 | 0.01 | 420 | 25,000 |
| | 8 | 11.4 | 0.006 | 0.01 | 520 | 25,000 | 0.005 | 0.006 | 380 | 20,000 | 0.004 | 0.006 | 250 | 20,000 |
| 0.4 | 2 | 2.5 | 0.1 | 0.15 | 2,000 | 40,000 | 0.07 | 0.1 | 1,600 | 40,000 | 0.05 | 0.1 | 1,200 | 30,000 |
| | 3 | 3.8 | 0.1 | 0.15 | 2,000 | 40,000 | 0.07 | 0.1 | 1,600 | 40,000 | 0.05 | 0.05 | 1,200 | 30,000 |
| | 4 | 5.0 | 0.05 | 0.1 | 1,600 | 40,000 | 0.05 | 0.05 | 1,200 | 40,000 | 0.03 | 0.05 | 860 | 30,000 |
| | 5 | 6.3 | 0.05 | 0.05 | 1,600 | 40,000 | 0.03 | 0.05 | 1,000 | 40,000 | 0.02 | 0.03 | 620 | 30,000 |
| | 6 | 7.5 | 0.03 | 0.05 | 1,200 | 30,000 | 0.02 | 0.03 | 760 | 30,000 | 0.01 | 0.02 | 560 | 25,000 |
| | 7 | 8.8 | 0.02 | 0.03 | 1,000 | 30,000 | 0.01 | 0.02 | 680 | 30,000 | 0.007 | 0.01 | 520 | 25,000 |
| | 8 | 10.0 | 0.01 | 0.02 | 820 | 30,000 | 0.007 | 0.01 | 600 | 30,000 | 0.005 | 0.01 | 480 | 25,000 |
| | 10 | 12.5 | 0.005 | 0.005 | 450 | 25,000 | 0.003 | 0.003 | 380 | 25,000 | 0.002 | 0.003 | 320 | 20,000 |
| | 12 | 15.0 | 0.003 | 0.005 | 320 | 20,000 | 0.002 | 0.003 | 260 | 20,000 | 0.002 | 0.002 | 200 | 20,000 |
| 0.45 | 2 | 2.2 | 0.1 | 0.2 | 2,200 | 40,000 | 0.08 | 0.15 | 1,800 | 30,000 | 0.06 | 0.1 | 1,300 | 30,000 |
| | 4 | 4.4 | 0.05 | 0.12 | 1,800 | 40,000 | 0.04 | 0.08 | 1,400 | 30,000 | 0.03 | 0.05 | 900 | 25,000 |
| | 6 | 6.7 | 0.035 | 0.05 | 1,200 | 30,000 | 0.025 | 0.035 | 800 | 25,000 | 0.015 | 0.025 | 600 | 20,000 |
| | 8 | 8.9 | 0.025 | 0.04 | 1,000 | 30,000 | 0.015 | 0.025 | 700 | 23,000 | 0.008 | 0.015 | 500 | 20,000 |
| 0.5 | 2 | 2.0 | 0.1 | 0.3 | 2,500 | 40,000 | 0.1 | 0.2 | 2,000 | 30,000 | 0.08 | 0.1 | 1,400 | 25,000 |
| | 2.5 | 2.5 | 0.1 | 0.3 | 2,500 | 40,000 | 0.1 | 0.2 | 2,000 | 30,000 | 0.08 | 0.1 | 1,400 | 25,000 |
| | 3 | 3.0 | 0.1 | 0.3 | 2,500 | 40,000 | 0.1 | 0.2 | 2,000 | 30,000 | 0.08 | 0.1 | 1,400 | 25,000 |
| | 4 | 4.0 | 0.1 | 0.2 | 2,500 | 40,000 | 0.05 | 0.15 | 1,800 | 30,000 | 0.05 | 0.1 | 1,200 | 25,000 |
| | 5 | 5.0 | 0.05 | 0.15 | 2,000 | 30,000 | 0.04 | 0.1 | 1,600 | 25,000 | 0.03 | 0.05 | 920 | 20,000 |
| | 6 | 6.0 | 0.05 | 0.1 | 1,800 | 30,000 | 0.04 | 0.05 | 1,200 | 25,000 | 0.02 | 0.05 | 740 | 20,000 |
| | 7 | 7.0 | 0.04 | 0.06 | 1,200 | 30,000 | 0.03 | 0.04 | 950 | 25,000 | 0.02 | 0.03 | 680 | 20,000 |
| | 8 | 8.0 | 0.04 | 0.06 | 1,000 | 30,000 | 0.03 | 0.04 | 860 | 25,000 | 0.02 | 0.03 | 560 | 20,000 |
| | 9 | 9.0 | 0.03 | 0.05 | 820 | 25,000 | 0.02 | 0.03 | 750 | 20,000 | 0.01 | 0.02 | 500 | 18,000 |
| | 10 | 10.0 | 0.03 | 0.05 | 750 | 25,000 | 0.02 | 0.03 | 620 | 20,000 | 0.01 | 0.02 | 450 | 18,000 |
| | 12 | 12.0 | 0.01 | 0.03 | 600 | 20,000 | 0.007 | 0.02 | 520 | 18,000 | 0.005 | 0.01 | 400 | 16,000 |
| | 13 | 13.0 | 0.008 | 0.02 | 500 | 20,000 | 0.005 | 0.01 | 420 | 18,000 | 0.003 | 0.006 | 350 | 16,000 |
| | 14 | 14.0 | 0.005 | 0.01 | 420 | 20,000 | 0.003 | 0.007 | 360 | 18,000 | 0.002 | 0.005 | 320 | 16,000 |
| | 16 | 16.0 | 0.005 | 0.005 | 300 | 18,000 | 0.003 | 0.005 | 250 | 16,000 | 0.002 | 0.003 | 200 | 14,000 |
| | 18 | 18.0 | 0.003 | 0.005 | 180 | 18,000 | 0.002 | 0.005 | 120 | 16,000 | 0.002 | 0.002 | 85 | 14,000 |
| | 20 | 20.0 | 0.003 | 0.003 | 100 | 16,000 | 0.002 | 0.003 | 75 | 14,000 | 0.002 | 0.002 | 60 | 12,000 |
| | 22 | 22.0 | 0.002 | 0.003 | 50 | 14,000 | 0.002 | 0.002 | 40 | 12,000 | 0.001 | 0.002 | 35 | 10,000 |



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| 被削材 Work Material | | | 焼き入れ鋼 Hardened Steels SKD61・STAVAX・HPM-38 (～52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (～62HRC) | | | | ハイス High Speed Tool Steels SKH (～65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 有効長 Effective Length | 刃径と有効長の比 L/D | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.6 | 2.4 | 2.0 | 0.1 | 0.3 | 2,500 | 30,000 | 0.1 | 0.2 | 2,000 | 30,000 | 0.05 | 0.1 | 1,600 | 25,000 |
| | 4 | 3.3 | 0.1 | 0.2 | 2,500 | 30,000 | 0.07 | 0.2 | 2,000 | 30,000 | 0.05 | 0.1 | 1,600 | 25,000 |
| | 6 | 5.0 | 0.07 | 0.1 | 2,000 | 30,000 | 0.05 | 0.1 | 1,600 | 25,000 | 0.03 | 0.07 | 1,200 | 20,000 |
| | 8 | 6.7 | 0.05 | 0.1 | 1,600 | 30,000 | 0.03 | 0.07 | 1,200 | 25,000 | 0.02 | 0.05 | 920 | 20,000 |
| | 10 | 8.3 | 0.03 | 0.07 | 1,200 | 20,000 | 0.02 | 0.05 | 860 | 20,000 | 0.01 | 0.03 | 680 | 18,000 |
| | 12 | 10.0 | 0.02 | 0.05 | 860 | 20,000 | 0.01 | 0.03 | 620 | 20,000 | 0.007 | 0.02 | 480 | 18,000 |
| | 14 | 11.7 | 0.02 | 0.03 | 600 | 18,000 | 0.01 | 0.02 | 400 | 18,000 | 0.005 | 0.01 | 300 | 16,000 |
| | 16 | 13.3 | 0.01 | 0.02 | 350 | 16,000 | 0.005 | 0.01 | 250 | 16,000 | 0.003 | 0.007 | 130 | 14,000 |
| 0.7 | 8 | 5.7 | 0.12 | 0.2 | 2,500 | 30,000 | 0.08 | 0.15 | 1,800 | 20,000 | 0.03 | 0.08 | 1,000 | 20,000 |
| | 12 | 8.6 | 0.07 | 0.12 | 1,400 | 20,000 | 0.04 | 0.08 | 1,100 | 18,000 | 0.015 | 0.05 | 700 | 18,000 |
| | 16 | 11.4 | 0.02 | 0.05 | 700 | 17,000 | 0.01 | 0.03 | 600 | 17,000 | 0.008 | 0.02 | 450 | 16,000 |
| 0.75 | 3 | 2.0 | 0.15 | 0.3 | 3,000 | 30,000 | 0.1 | 0.3 | 2,500 | 30,000 | 0.1 | 0.2 | 2,000 | 25,000 |
| | 4 | 2.7 | 0.15 | 0.3 | 3,000 | 30,000 | 0.1 | 0.3 | 2,500 | 30,000 | 0.1 | 0.2 | 2,000 | 25,000 |
| | 6 | 4.0 | 0.15 | 0.2 | 3,000 | 30,000 | 0.1 | 0.2 | 2,000 | 30,000 | 0.1 | 0.1 | 1,600 | 25,000 |
| | 8 | 5.3 | 0.1 | 0.2 | 2,500 | 25,000 | 0.05 | 0.2 | 1,600 | 25,000 | 0.05 | 0.1 | 1,200 | 20,000 |
| | 10 | 6.7 | 0.1 | 0.1 | 2,500 | 25,000 | 0.05 | 0.1 | 1,200 | 25,000 | 0.05 | 0.05 | 860 | 20,000 |
| | 12 | 8.0 | 0.05 | 0.1 | 1,800 | 20,000 | 0.03 | 0.1 | 920 | 20,000 | 0.02 | 0.05 | 780 | 18,000 |
| | 14 | 9.3 | 0.05 | 0.07 | 1,200 | 20,000 | 0.03 | 0.05 | 820 | 20,000 | 0.02 | 0.03 | 650 | 18,000 |
| | 16 | 10.7 | 0.03 | 0.05 | 720 | 18,000 | 0.02 | 0.03 | 650 | 18,000 | 0.01 | 0.02 | 580 | 16,000 |
| | 18 | 12.0 | 0.02 | 0.04 | 550 | 16,000 | 0.012 | 0.025 | 400 | 16,000 | 0.008 | 0.015 | 400 | 14,000 |
| | 20 | 13.3 | 0.01 | 0.03 | 450 | 16,000 | 0.01 | 0.02 | 360 | 16,000 | 0.007 | 0.01 | 300 | 14,000 |
| | 22 | 14.7 | 0.01 | 0.02 | 330 | 14,000 | 0.01 | 0.01 | 250 | 14,000 | 0.007 | 0.007 | 200 | 12,000 |
| | 30 | 20.0 | 0.005 | 0.005 | 80 | 10,000 | 0.003 | 0.005 | 60 | 10,000 | 0.003 | 0.003 | 40 | 8,000 |
| 0.8 | 8 | 5.0 | 0.1 | 0.2 | 2,500 | 25,000 | 0.07 | 0.15 | 2,000 | 20,000 | 0.05 | 0.1 | 1,600 | 18,000 |
| | 12 | 7.5 | 0.07 | 0.1 | 1,800 | 20,000 | 0.05 | 0.07 | 1,500 | 16,000 | 0.03 | 0.05 | 1,200 | 14,000 |
| | 16 | 10.0 | 0.03 | 0.05 | 720 | 16,000 | 0.02 | 0.03 | 600 | 14,000 | 0.015 | 0.02 | 480 | 12,000 |
| | 20 | 12.5 | 0.01 | 0.03 | 500 | 14,000 | 0.01 | 0.02 | 380 | 12,000 | 0.01 | 0.01 | 300 | 10,000 |
| 1 | 3 | 1.5 | 0.2 | 0.5 | 3,000 | 25,000 | 0.2 | 0.5 | 2,500 | 25,000 | 0.15 | 0.3 | 2,000 | 20,000 |
| | 4 | 2.0 | 0.2 | 0.5 | 3,000 | 25,000 | 0.2 | 0.5 | 2,500 | 25,000 | 0.15 | 0.3 | 2,000 | 20,000 |
| | 6 | 3.0 | 0.2 | 0.5 | 2,500 | 25,000 | 0.2 | 0.3 | 2,000 | 25,000 | 0.15 | 0.3 | 1,600 | 20,000 |
| | 8 | 4.0 | 0.2 | 0.3 | 2,000 | 20,000 | 0.1 | 0.2 | 1,600 | 18,000 | 0.1 | 0.2 | 1,200 | 16,000 |
| | 10 | 5.0 | 0.1 | 0.3 | 2,000 | 18,000 | 0.1 | 0.2 | 1,600 | 16,000 | 0.1 | 0.1 | 1,200 | 14,000 |
| | 12 | 6.0 | 0.1 | 0.2 | 1,600 | 16,000 | 0.1 | 0.1 | 1,200 | 14,000 | 0.05 | 0.1 | 940 | 12,000 |
| | 13 | 6.5 | 0.08 | 0.2 | 1,600 | 16,000 | 0.06 | 0.1 | 1,200 | 14,000 | 0.04 | 0.08 | 940 | 12,000 |
| | 14 | 7.0 | 0.07 | 0.15 | 1,600 | 16,000 | 0.05 | 0.08 | 1,200 | 14,000 | 0.03 | 0.07 | 940 | 12,000 |
| | 16 | 8.0 | 0.07 | 0.15 | 1,600 | 16,000 | 0.05 | 0.08 | 1,200 | 14,000 | 0.03 | 0.07 | 940 | 12,000 |
| | 18 | 9.0 | 0.05 | 0.1 | 1,400 | 14,000 | 0.03 | 0.05 | 1,000 | 12,000 | 0.02 | 0.03 | 850 | 10,000 |
| | 20 | 10.0 | 0.05 | 0.1 | 1,000 | 14,000 | 0.03 | 0.05 | 820 | 12,000 | 0.02 | 0.03 | 720 | 10,000 |
| | 22 | 11.0 | 0.03 | 0.08 | 850 | 14,000 | 0.02 | 0.06 | 700 | 12,000 | 0.02 | 0.02 | 600 | 10,000 |
| | 25 | 12.5 | 0.03 | 0.05 | 680 | 12,000 | 0.02 | 0.03 | 560 | 10,000 | 0.01 | 0.02 | 420 | 8,500 |
| | 30 | 15.0 | 0.02 | 0.03 | 360 | 12,000 | 0.01 | 0.02 | 300 | 10,000 | 0.008 | 0.01 | 240 | 8,500 |
| | 35 | 17.5 | 0.01 | 0.02 | 150 | 10,000 | 0.007 | 0.01 | 120 | 8,000 | 0.005 | 0.007 | 100 | 6,800 |
| | 40 | 20.0 | 0.005 | 0.01 | 100 | 10,000 | 0.003 | 0.005 | 80 | 8,000 | 0.002 | 0.003 | 50 | 6,800 |
| 1.25 | 6 | 2.4 | 0.3 | 0.4 | 2,800 | 20,000 | 0.2 | 0.5 | 2,300 | 20,000 | 0.15 | 0.4 | 2,000 | 18,000 |
| | 8 | 3.2 | 0.25 | 0.3 | 2,600 | 20,000 | 0.15 | 0.3 | 2,100 | 20,000 | 0.12 | 0.25 | 1,800 | 18,000 |
| | 10 | 4.0 | 0.2 | 0.3 | 2,500 | 20,000 | 0.15 | 0.2 | 2,000 | 20,000 | 0.1 | 0.15 | 1,600 | 18,000 |
| | 15 | 6.0 | 0.1 | 0.2 | 2,000 | 18,000 | 0.07 | 0.15 | 1,600 | 16,000 | 0.05 | 0.1 | 1,200 | 14,000 |
| | 20 | 8.0 | 0.07 | 0.15 | 1,500 | 16,000 | 0.05 | 0.1 | 1,200 | 14,000 | 0.03 | 0.05 | 1,000 | 10,000 |
| | 25 | 10.0 | 0.05 | 0.1 | 1,000 | 14,000 | 0.03 | 0.07 | 850 | 12,000 | 0.02 | 0.03 | 720 | 8,000 |
| | 30 | 12.0 | 0.03 | 0.07 | 720 | 12,000 | 0.02 | 0.05 | 640 | 10,000 | 0.01 | 0.02 | 580 | 7,000 |
| | 35 | 14.0 | 0.02 | 0.03 | 450 | 10,000 | 0.01 | 0.02 | 400 | 8,500 | 0.007 | 0.01 | 320 | 6,200 |

# MRBH230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | | 焼き入れ鋼 Hardened Steels SKD61・STAVAX・HPM-38 (~52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (~62HRC) | | | | ハイス High Speed Tool Steels SKH (~65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 有効長 Effective Length | 刃径と有効長の比 L/D | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 1.5 | 6 | 2.0 | 0.2 | 0.8 | 3,000 | 20,000 | 0.2 | 0.6 | 2,500 | 18,000 | 0.2 | 0.5 | 2,000 | 14,000 |
| | 8 | 2.7 | 0.2 | 0.8 | 3,000 | 20,000 | 0.2 | 0.6 | 2,500 | 18,000 | 0.2 | 0.5 | 2,000 | 14,000 |
| | 10 | 3.3 | 0.2 | 0.6 | 2,500 | 20,000 | 0.2 | 0.4 | 2,000 | 18,000 | 0.1 | 0.3 | 1,500 | 14,000 |
| | 12 | 4.0 | 0.2 | 0.6 | 2,500 | 20,000 | 0.2 | 0.4 | 2,000 | 18,000 | 0.1 | 0.3 | 1,500 | 14,000 |
| | 14 | 4.7 | 0.1 | 0.4 | 2,000 | 18,000 | 0.1 | 0.3 | 1,600 | 16,000 | 0.1 | 0.2 | 1,200 | 12,000 |
| | 16 | 5.3 | 0.1 | 0.4 | 2,000 | 18,000 | 0.1 | 0.3 | 1,600 | 16,000 | 0.1 | 0.2 | 1,200 | 12,000 |
| | 20 | 6.7 | 0.1 | 0.3 | 1,600 | 18,000 | 0.1 | 0.2 | 1,200 | 16,000 | 0.1 | 0.1 | 960 | 12,000 |
| | 25 | 8.3 | 0.1 | 0.2 | 1,200 | 16,000 | 0.07 | 0.15 | 920 | 14,000 | 0.05 | 0.07 | 800 | 10,000 |
| | 30 | 10.0 | 0.07 | 0.1 | 750 | 14,000 | 0.05 | 0.07 | 640 | 12,000 | 0.03 | 0.05 | 600 | 8,600 |
| | 35 | 11.7 | 0.05 | 0.1 | 620 | 12,000 | 0.03 | 0.07 | 500 | 10,000 | 0.02 | 0.05 | 420 | 7,200 |
| | 40 | 13.3 | 0.03 | 0.07 | 450 | 10,000 | 0.02 | 0.05 | 320 | 8,200 | 0.01 | 0.03 | 260 | 6,400 |
| 1.75 | 15 | 4.3 | 0.25 | 1 | 3,000 | 20,000 | 0.15 | 0.5 | 2,300 | 16,000 | 0.13 | 0.4 | 1,500 | 14,000 |
| | 20 | 5.7 | 0.18 | 0.6 | 2,500 | 18,000 | 0.1 | 0.3 | 1,800 | 15,000 | 0.1 | 0.2 | 1,200 | 12,000 |
| | 25 | 7.1 | 0.12 | 0.35 | 1,800 | 16,000 | 0.1 | 0.2 | 1,600 | 14,000 | 0.06 | 0.12 | 1,000 | 10,000 |
| | 30 | 8.6 | 0.1 | 0.25 | 1,500 | 14,000 | 0.07 | 0.15 | 950 | 11,000 | 0.05 | 0.08 | 800 | 9,000 |
| | 35 | 10.0 | 0.08 | 0.2 | 1,200 | 13,000 | 0.07 | 0.12 | 800 | 10,000 | 0.03 | 0.06 | 650 | 7,500 |
| | 40 | 11.4 | 0.07 | 0.1 | 800 | 11,000 | 0.04 | 0.07 | 720 | 9,000 | 0.02 | 0.05 | 450 | 7,000 |
| | 45 | 12.9 | 0.06 | 0.07 | 700 | 10,000 | 0.035 | 0.05 | 600 | 7,500 | 0.015 | 0.03 | 320 | 6,000 |
| 2 | 8 | 2.0 | 0.3 | 1.5 | 3,000 | 20,000 | 0.2 | 0.8 | 2,500 | 16,000 | 0.2 | 0.6 | 2,000 | 12,000 |
| | 10 | 2.5 | 0.3 | 1.5 | 3,000 | 20,000 | 0.2 | 0.8 | 2,500 | 16,000 | 0.2 | 0.6 | 2,000 | 12,000 |
| | 12 | 3.0 | 0.3 | 1.5 | 3,000 | 20,000 | 0.2 | 0.8 | 2,500 | 16,000 | 0.2 | 0.6 | 2,000 | 12,000 |
| | 14 | 3.5 | 0.3 | 1.5 | 3,000 | 20,000 | 0.2 | 0.8 | 2,000 | 16,000 | 0.2 | 0.6 | 1,600 | 12,000 |
| | 15 | 3.8 | 0.3 | 1.5 | 3,000 | 20,000 | 0.2 | 0.8 | 2,000 | 16,000 | 0.2 | 0.6 | 1,600 | 12,000 |
| | 20 | 5.0 | 0.2 | 1 | 2,400 | 16,000 | 0.1 | 0.6 | 1,800 | 14,000 | 0.1 | 0.4 | 1,400 | 10,000 |
| | 25 | 6.3 | 0.2 | 0.8 | 1,600 | 16,000 | 0.1 | 0.4 | 1,200 | 14,000 | 0.1 | 0.2 | 1,000 | 10,000 |
| | 30 | 7.5 | 0.1 | 0.3 | 1,600 | 14,000 | 0.07 | 0.2 | 1,200 | 10,000 | 0.05 | 0.15 | 1,000 | 8,200 |
| | 35 | 8.8 | 0.1 | 0.2 | 1,200 | 14,000 | 0.07 | 0.15 | 1,000 | 10,000 | 0.05 | 0.1 | 820 | 8,200 |
| | 40 | 10.0 | 0.07 | 0.15 | 1,200 | 12,000 | 0.05 | 0.1 | 1,000 | 8,600 | 0.03 | 0.07 | 820 | 6,800 |
| | 45 | 11.3 | 0.07 | 0.1 | 750 | 12,000 | 0.05 | 0.07 | 620 | 8,600 | 0.03 | 0.05 | 500 | 6,800 |
| | 50 | 12.5 | 0.05 | 0.08 | 550 | 10,000 | 0.03 | 0.05 | 500 | 7,500 | 0.02 | 0.03 | 420 | 5,500 |
| 2.5 | 10 | 2.0 | 0.3 | 1.5 | 3,000 | 18,000 | 0.2 | 1.2 | 2,500 | 12,000 | 0.2 | 0.7 | 2,000 | 9,200 |
| | 15 | 3.0 | 0.3 | 1.5 | 3,000 | 18,000 | 0.2 | 1.2 | 2,500 | 12,000 | 0.2 | 0.7 | 2,000 | 9,200 |
| | 20 | 4.0 | 0.3 | 1.2 | 3,000 | 15,000 | 0.2 | 1 | 2,000 | 10,000 | 0.15 | 0.5 | 1,600 | 8,000 |
| | 25 | 5.0 | 0.2 | 1 | 2,500 | 15,000 | 0.15 | 0.8 | 1,800 | 8,600 | 0.1 | 0.3 | 1,200 | 7,200 |
| | 30 | 6.0 | 0.2 | 0.8 | 2,000 | 12,000 | 0.15 | 0.5 | 1,500 | 7,600 | 0.1 | 0.2 | 860 | 6,400 |
| | 40 | 8.0 | 0.1 | 0.2 | 1,200 | 10,000 | 0.07 | 0.15 | 1,000 | 6,800 | 0.05 | 0.1 | 650 | 5,500 |
| 3 | 10 | 1.7 | 0.3 | 2 | 3,000 | 16,000 | 0.3 | 1.2 | 2,500 | 8,000 | 0.2 | 1 | 2,000 | 7,000 |
| | 15 | 2.5 | 0.3 | 2 | 3,000 | 16,000 | 0.3 | 1.2 | 2,500 | 8,000 | 0.2 | 1 | 2,000 | 7,000 |
| | 20 | 3.3 | 0.3 | 2 | 3,000 | 16,000 | 0.3 | 1.2 | 2,500 | 8,000 | 0.2 | 1 | 2,000 | 7,000 |
| | 25 | 4.2 | 0.3 | 1.5 | 3,000 | 16,000 | 0.2 | 1 | 2,000 | 8,000 | 0.15 | 0.7 | 1,500 | 7,000 |
| | 30 | 5.0 | 0.2 | 1.5 | 3,000 | 14,000 | 0.2 | 1 | 2,000 | 7,200 | 0.15 | 0.7 | 1,500 | 6,500 |
| | 35 | 5.8 | 0.2 | 1.2 | 2,400 | 13,000 | 0.17 | 0.8 | 1,600 | 6,800 | 0.12 | 0.5 | 1,200 | 5,800 |
| | 40 | 6.7 | 0.2 | 1 | 1,800 | 12,000 | 0.15 | 0.6 | 1,200 | 6,400 | 0.1 | 0.4 | 1,000 | 5,200 |
| | 50 | 8.3 | 0.1 | 0.6 | 1,200 | 8,200 | 0.1 | 0.3 | 860 | 4,800 | 0.05 | 0.2 | 620 | 4,000 |
| | 60 | 10.0 | 0.07 | 0.3 | 600 | 6,000 | 0.05 | 0.15 | 450 | 3,200 | 0.03 | 0.07 | 300 | 2,500 |

**備　考 Notes**

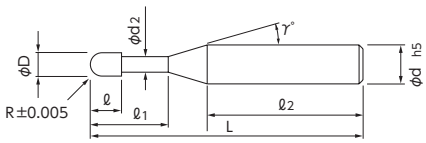
※切り込み量の、ap は深さ方向の切り込み量、ae はピックフィードを示します。
※オイルミストクーラントをお奨めします。
※回転数と送り速度は、同じ割合で調整してください。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整してください。
※工具突出し量は、必要以上に出さないでください。
※Depth of Cut: ap=Axial Depth of Cut / ae=Radial Depth of Cut.
※We recommend using oil mist coolant.
※Adjust both spindle speed and feed at the same rate.
※Adjust milling conditions according to the volume of depth of cut and rigidity of machine.
※Length of tool overhang must be as short as possible.

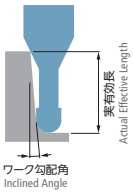


ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MRB230SF

## 無限コーティング ショートシャンクロングネックボールエンドミル（焼きばめ用）
MUGEN-COATING 2-Flute Long Neck Ball End Mill with Short Shank




●ショートシャンクタイプ（焼きばめ対応）。
●It fits for shrink chuck system.

3D　MG　∞　2　30°　≦55 HRC

被削材　Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］　Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (ℓ2)シャンク長 Shank Length | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00525-00103 | R0.1 | 0.5 | 0.15 | 0.2 | 0.18 | 15° | 4 | 27.3 | 35 | 8,400 | 0.55 | 0.56 | 0.58 | 0.60 | 0.64 |
| 08-00525-00105 | | 0.75 | 0.15 | 0.2 | 0.18 | 15° | 4 | 27.1 | 35 | 8,400 | 0.81 | 0.83 | 0.86 | 0.89 | 0.95 |
| 08-00525-00107 | | 1 | 0.15 | 0.2 | 0.18 | 15° | 4 | 26.8 | 35 | 8,400 | 1.06 | 1.10 | 1.13 | 1.17 | 1.26 |
| 08-00525-00109 | | 1.25 | 0.15 | 0.2 | 0.18 | 15° | 4 | 26.6 | 35 | 9,100 | 1.32 | 1.37 | 1.41 | 1.46 | 1.57 |
| 08-00525-00151 | R0.15 | 0.5 | 0.2 | 0.3 | 0.28 | 15° | 4 | 27.5 | 35 | 8,200 | 0.55 | 0.56 | 0.57 | 0.59 | 0.63 |
| 08-00525-00152 | | 0.6 | 0.2 | 0.3 | 0.28 | 15° | 4 | 27.4 | 35 | 8,200 | 0.65 | 0.67 | 0.69 | 0.71 | 0.75 |
| 08-00525-00153 | | 0.75 | 0.2 | 0.3 | 0.28 | 15° | 4 | 27.3 | 35 | 8,200 | 0.80 | 0.83 | 0.85 | 0.88 | 0.94 |
| 08-00525-00154 | | 1 | 0.2 | 0.3 | 0.28 | 15° | 4 | 27 | 35 | 8,200 | 1.06 | 1.09 | 1.13 | 1.17 | 1.25 |
| 08-00525-00155 | | 1.25 | 0.2 | 0.3 | 0.28 | 15° | 4 | 26.8 | 35 | 8,200 | 1.32 | 1.36 | 1.41 | 1.45 | 1.56 |
| 08-00525-00156 | | 1.5 | 0.2 | 0.3 | 0.28 | 15° | 4 | 26.5 | 35 | 8,800 | 1.58 | 1.63 | 1.68 | 1.74 | 1.87 |
| 08-00525-00157 | | 1.75 | 0.2 | 0.3 | 0.28 | 15° | 4 | 26.3 | 35 | 8,800 | 1.84 | 1.90 | 1.96 | 2.03 | 2.18 |
| 08-00525-00202 | R0.2 | 0.75 | 0.3 | 0.4 | 0.37 | 15° | 4 | 27.4 | 35 | 5,600 | 0.82 | 0.84 | 0.87 | 0.89 | 0.95 |
| 08-00525-00203 | | 1 | 0.3 | 0.4 | 0.37 | 15° | 4 | 27.2 | 35 | 5,600 | 1.08 | 1.11 | 1.14 | 1.18 | 1.26 |
| 08-00525-00204 | | 1.5 | 0.3 | 0.4 | 0.37 | 15° | 4 | 26.7 | 35 | 5,700 | 1.60 | 1.65 | 1.70 | 1.75 | 1.88 |
| 08-00525-00205 | | 2 | 0.3 | 0.4 | 0.37 | 15° | 4 | 26.2 | 35 | 5,900 | 2.11 | 2.18 | 2.25 | 2.33 | 2.50 |
| 08-00525-00206 | | 2.5 | 0.3 | 0.4 | 0.37 | 15° | 4 | 25.7 | 35 | 6,100 | 2.63 | 2.72 | 2.81 | 2.90 | 3.13 |
| 08-00525-00251 | R0.25 | 1 | 0.35 | 0.5 | 0.46 | 15° | 4 | 27.3 | 35 | 5,600 | 1.10 | 1.13 | 1.16 | 1.19 | 1.27 |
| 08-00525-00252 | | 1.5 | 0.35 | 0.5 | 0.46 | 15° | 4 | 26.8 | 35 | 5,600 | 1.61 | 1.66 | 1.71 | 1.77 | 1.89 |
| 08-00525-00253 | | 2 | 0.35 | 0.5 | 0.46 | 15° | 4 | 26.3 | 35 | 5,600 | 2.13 | 2.20 | 2.27 | 2.34 | 2.51 |
| 08-00525-00254 | | 2.5 | 0.35 | 0.5 | 0.46 | 15° | 4 | 25.8 | 35 | 5,600 | 2.65 | 2.73 | 2.82 | 2.92 | 3.14 |
| 08-00525-00255 | | 3 | 0.35 | 0.5 | 0.46 | 15° | 4 | 25.3 | 35 | 5,600 | 3.16 | 3.27 | 3.38 | 3.49 | 3.76 |
| 08-00525-00301 | R0.3 | 1.5 | 0.45 | 0.6 | 0.56 | 15° | 4 | 27 | 35 | 4,300 | 1.61 | 1.66 | 1.71 | 1.76 | 1.88 |
| 08-00525-00302 | | 2 | 0.45 | 0.6 | 0.56 | 15° | 4 | 26.5 | 35 | 4,300 | 2.13 | 2.19 | 2.26 | 2.34 | 2.50 |
| 08-00525-00303 | | 2.5 | 0.45 | 0.6 | 0.56 | 15° | 4 | 26 | 35 | 4,400 | 2.65 | 2.73 | 2.82 | 2.91 | 3.12 |
| 08-00525-00304 | | 3 | 0.45 | 0.6 | 0.56 | 15° | 4 | 25.5 | 35 | 4,400 | 3.16 | 3.26 | 3.37 | 3.49 | 3.75 |
| 08-00525-00305 | | 3.5 | 0.45 | 0.6 | 0.56 | 15° | 4 | 25 | 35 | 4,600 | 3.68 | 3.80 | 3.92 | 4.06 | 4.37 |
| 08-00525-00306 | | 4 | 0.45 | 0.6 | 0.56 | 15° | 4 | 29.5 | 40 | 4,600 | 4.20 | 4.33 | 4.48 | 4.64 | 4.99 |
| 08-00525-00307 | | 4.5 | 0.45 | 0.6 | 0.56 | 15° | 4 | 29 | 40 | 4,600 | 4.71 | 4.87 | 5.03 | 5.21 | 5.61 |
| 08-00525-00308 | | 5 | 0.45 | 0.6 | 0.56 | 15° | 4 | 28.5 | 40 | 4,600 | 5.23 | 5.40 | 5.59 | 5.79 | 6.23 |
| 08-00525-00309 | | 5.5 | 0.45 | 0.6 | 0.56 | 15° | 4 | 28 | 40 | 4,600 | 5.75 | 5.94 | 6.14 | 6.36 | 6.85 |
| 08-00525-00310 | | 6 | 0.45 | 0.6 | 0.56 | 15° | 4 | 27.5 | 40 | 4,600 | 6.26 | 6.47 | 6.70 | 6.94 | 7.48 |

**オーダー方法**　MRB230SF ボール半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate MRB230SF (R)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

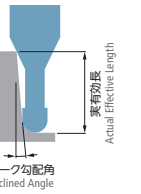
●切削条件表はE-033に記載
●Recommended Milling Conditions are shown on page E-033.

SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

# MRB230SF

## 無限コーティング ショートシャンクロングネックボールエンドミル（焼きばめ用）

MUGEN-COATING 2-Flute Long Neck Ball End Mill with Short Shank




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (ℓ2)シャンク長 Shank Length | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00525-00401 | R0.4 | 2 | 0.6 | 0.8 | 0.76 | 15° | 4 | 26.9 | 35 | 4,300 | 2.13 | 2.19 | 2.25 | 2.32 | 2.48 |
| 08-00525-00402 | | 3 | 0.6 | 0.8 | 0.76 | 15° | 4 | 25.9 | 35 | 4,600 | 3.16 | 3.26 | 3.36 | 3.47 | 3.72 |
| 08-00525-00403 | | 4 | 0.6 | 0.8 | 0.76 | 15° | 4 | 29.9 | 40 | 4,600 | 4.19 | 4.33 | 4.47 | 4.62 | 4.97 |
| 08-00525-00404 | | 5 | 0.6 | 0.8 | 0.76 | 15° | 4 | 28.9 | 40 | 4,600 | 5.23 | 5.40 | 5.58 | 5.77 | 6.21 |
| 08-00525-00501 | R0.5 | 3 | 0.75 | 1 | 0.95 | 15° | 4 | 26.3 | 35 | 3,600 | 3.18 | 3.27 | 3.37 | 3.48 | 3.72 |
| 08-00525-00502 | | 4 | 0.75 | 1 | 0.95 | 15° | 4 | 25.3 | 35 | 4,100 | 4.21 | 4.34 | 4.48 | 4.63 | 4.97 |
| 08-00525-00503 | | 5 | 0.75 | 1 | 0.95 | 15° | 4 | 29.3 | 40 | 4,100 | 5.24 | 5.41 | 5.59 | 5.78 | 6.21 |
| 08-00525-00504 | | 6 | 0.75 | 1 | 0.95 | 15° | 4 | 28.3 | 40 | 4,400 | 6.28 | 6.48 | 6.69 | 6.93 | 7.45 |
| 08-00525-00505 | | 8 | 0.75 | 1 | 0.95 | 15° | 4 | 26.3 | 40 | 4,400 | 8.34 | 8.62 | 8.91 | 9.23 | 9.94 |
| 08-00525-00506 | | 10 | 0.75 | 1 | 0.95 | 15° | 4 | 24.3 | 40 | 4,400 | 10.41 | 10.76 | 11.13 | 11.53 | 12.42 |
| 08-00525-00751 | R0.75 | 3 | 1.1 | 1.5 | 1.45 | 15° | 4 | 27.2 | 35 | 4,200 | 3.17 | 3.25 | 3.34 | 3.44 | 3.66 |
| 08-00525-00752 | | 4 | 1.1 | 1.5 | 1.45 | 15° | 4 | 26.2 | 35 | 4,200 | 4.20 | 4.32 | 4.45 | 4.59 | 4.91 |
| 08-00525-00754 | | 6 | 1.1 | 1.5 | 1.45 | 15° | 4 | 29.2 | 40 | 4,200 | 6.27 | 6.46 | 6.67 | 6.89 | 7.39 |
| 08-00525-00755 | | 8 | 1.1 | 1.5 | 1.45 | 15° | 4 | 27.2 | 40 | 4,200 | 8.34 | 8.60 | 8.88 | 9.19 | 9.88 |
| 08-00525-00756 | | 10 | 1.1 | 1.5 | 1.45 | 15° | 4 | 25.2 | 40 | 4,200 | 10.40 | 10.74 | 11.10 | 11.49 | 12.36 |
| 08-00525-01001 | R1 | 3 | 1.5 | 2 | 1.94 | 15° | 4 | 28.1 | 35 | 3,600 | 3.18 | 3.25 | 3.34 | 3.43 | 3.63 |
| 08-00525-01002 | | 4 | 1.5 | 2 | 1.94 | 15° | 4 | 27.1 | 35 | 3,600 | 4.21 | 4.32 | 4.45 | 4.58 | 4.87 |
| 08-00525-01003 | | 6 | 1.5 | 2 | 1.94 | 15° | 4 | 25.1 | 35 | 4,100 | 6.28 | 6.46 | 6.66 | 6.88 | 7.36 |
| 08-00525-01004 | | 8 | 1.5 | 2 | 1.94 | 15° | 4 | 28.1 | 40 | 4,400 | 8.35 | 8.60 | 8.88 | 9.18 | 9.84 |
| 08-00525-01005 | | 10 | 1.5 | 2 | 1.94 | 15° | 4 | 26.1 | 40 | 4,400 | 10.41 | 10.74 | 11.10 | 11.48 | 12.33 |
| 08-00525-01006 | | 12 | 1.5 | 2 | 1.94 | 15° | 4 | 29.1 | 45 | 4,400 | 12.48 | 12.88 | 13.31 | 13.77 | 14.82 |
| 08-00525-01007 | | 14 | 1.5 | 2 | 1.94 | 15° | 4 | 27.1 | 45 | 4,400 | 14.55 | 15.02 | 15.53 | 16.07 | 17.30 |
| 08-00525-01008 | | 16 | 1.5 | 2 | 1.94 | 15° | 4 | 25.1 | 45 | 4,400 | 16.62 | 17.16 | 17.75 | 18.37 | 19.79 |
| 08-00525-01009 | | 18 | 1.5 | 2 | 1.94 | 15° | 4 | 28.1 | 50 | 4,400 | 18.68 | 19.30 | 19.96 | 20.67 | Free |
| 08-00525-01010 | | 20 | 1.5 | 2 | 1.94 | 15° | 4 | 26.1 | 50 | 4,400 | 20.75 | 21.44 | 22.18 | 22.97 | Free |
| 08-00525-01501 | R1.5 | 6 | 2.5 | 3 | 2.85 | 15° | 4 | 31.8 | 40 | 4,100 | 6.44 | 6.61 | 6.79 | 7.00 | 7.45 |
| 08-00525-01502 | | 8 | 2.5 | 3 | 2.85 | 15° | 4 | 29.8 | 40 | 4,100 | 8.50 | 8.75 | 9.01 | 9.29 | 9.93 |
| 08-00525-01503 | | 10 | 2.5 | 3 | 2.85 | 15° | 4 | 27.8 | 40 | 4,400 | 10.57 | 10.89 | 11.23 | 11.59 | Free |
| 08-00525-01504 | | 12 | 2.5 | 3 | 2.85 | 15° | 4 | 25.8 | 40 | 4,400 | 12.64 | 13.03 | 13.44 | 13.89 | Free |

**オーダー方法**

MRB230SF ボール半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate MRB230SF (R)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-033に記載
●Recommended Milling Conditions are shown on page E-033.



SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

# MRB230SF

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK・HPM-1 (～44HRC) | | | | 焼き入れ鋼 Hardened Steels SKD・STAVAX・HPM-38 (～55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (～62HRC) | | | | 銅 Copper | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 有効長 Effective Length | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.1 | 0.5 | 0.01 | 0.02 | 250 | 20,000~50,000 | 0.01 | 0.01 | 210 | 20,000~50,000 | 0.007 | 0.007 | 170 | 20,000~50,000 | 0.01 | 0.02 | 250 | 20,000~50,000 |
| | 0.75 | 0.007 | 0.01 | 250 | 20,000~50,000 | 0.005 | 0.01 | 210 | 20,000~50,000 | 0.004 | 0.007 | 170 | 20,000~50,000 | 0.01 | 0.015 | 250 | 20,000~50,000 |
| | 1 | 0.005 | 0.01 | 250 | 20,000~50,000 | 0.003 | 0.005 | 210 | 20,000~50,000 | 0.002 | 0.004 | 170 | 20,000~50,000 | 0.008 | 0.015 | 250 | 20,000~50,000 |
| | 1.25 | 0.003 | 0.01 | 150 | 20,000~50,000 | 0.003 | 0.005 | 120 | 20,000~50,000 | 0.002 | 0.004 | 100 | 20,000~50,000 | 0.005 | 0.015 | 150 | 20,000~50,000 |
| 0.15 | 0.5 | 0.01 | 0.02 | 250 | 20,000~50,000 | 0.01 | 0.015 | 210 | 20,000~50,000 | 0.007 | 0.01 | 170 | 20,000~50,000 | 0.012 | 0.025 | 250 | 20,000~50,000 |
| | 0.6 | 0.01 | 0.02 | 250 | 20,000~50,000 | 0.01 | 0.015 | 210 | 20,000~50,000 | 0.007 | 0.01 | 170 | 20,000~50,000 | 0.012 | 0.025 | 250 | 20,000~50,000 |
| | 0.75 | 0.008 | 0.02 | 250 | 20,000~50,000 | 0.007 | 0.012 | 210 | 20,000~50,000 | 0.005 | 0.008 | 170 | 20,000~50,000 | 0.011 | 0.02 | 250 | 20,000~50,000 |
| | 1 | 0.007 | 0.01 | 250 | 20,000~50,000 | 0.005 | 0.01 | 210 | 20,000~50,000 | 0.004 | 0.007 | 170 | 20,000~50,000 | 0.01 | 0.02 | 250 | 20,000~50,000 |
| | 1.25 | 0.005 | 0.01 | 250 | 20,000~50,000 | 0.005 | 0.005 | 210 | 20,000~50,000 | 0.004 | 0.004 | 170 | 20,000~50,000 | 0.008 | 0.015 | 250 | 20,000~50,000 |
| | 1.5 | 0.005 | 0.01 | 200 | 20,000~50,000 | 0.005 | 0.005 | 170 | 20,000~50,000 | 0.004 | 0.004 | 140 | 20,000~50,000 | 0.008 | 0.015 | 200 | 20,000~50,000 |
| | 1.75 | 0.005 | 0.01 | 200 | 20,000~50,000 | 0.005 | 0.005 | 170 | 20,000~50,000 | 0.004 | 0.004 | 140 | 20,000~50,000 | 0.008 | 0.015 | 200 | 20,000~50,000 |
| 0.2 | 0.75 | 0.02 | 0.05 | 800 | 20,000~50,000 | 0.02 | 0.03 | 650 | 20,000~50,000 | 0.015 | 0.02 | 560 | 20,000~50,000 | 0.03 | 0.07 | 800 | 20,000~50,000 |
| | 1 | 0.02 | 0.05 | 800 | 20,000~50,000 | 0.02 | 0.03 | 650 | 20,000~50,000 | 0.012 | 0.02 | 560 | 20,000~50,000 | 0.03 | 0.07 | 800 | 20,000~50,000 |
| | 1.5 | 0.02 | 0.03 | 700 | 20,000~50,000 | 0.01 | 0.02 | 600 | 20,000~50,000 | 0.007 | 0.015 | 490 | 20,000~50,000 | 0.03 | 0.05 | 700 | 20,000~50,000 |
| | 2 | 0.015 | 0.02 | 600 | 20,000~50,000 | 0.01 | 0.015 | 500 | 20,000~50,000 | 0.007 | 0.01 | 420 | 20,000~50,000 | 0.02 | 0.03 | 600 | 20,000~50,000 |
| | 2.5 | 0.015 | 0.02 | 450 | 20,000~50,000 | 0.01 | 0.015 | 380 | 20,000~50,000 | 0.007 | 0.01 | 310 | 20,000~50,000 | 0.02 | 0.03 | 450 | 20,000~50,000 |
| 0.25 | 1 | 0.03 | 0.05 | 800 | 20,000~50,000 | 0.02 | 0.05 | 680 | 20,000~50,000 | 0.015 | 0.035 | 560 | 20,000~50,000 | 0.045 | 0.07 | 800 | 20,000~50,000 |
| | 1.5 | 0.03 | 0.05 | 700 | 20,000~50,000 | 0.02 | 0.04 | 600 | 20,000~50,000 | 0.015 | 0.03 | 490 | 20,000~50,000 | 0.04 | 0.07 | 700 | 20,000~50,000 |
| | 2 | 0.02 | 0.04 | 600 | 20,000~50,000 | 0.02 | 0.03 | 510 | 20,000~50,000 | 0.015 | 0.02 | 420 | 20,000~50,000 | 0.03 | 0.06 | 600 | 20,000~50,000 |
| | 2.5 | 0.015 | 0.04 | 600 | 20,000~50,000 | 0.01 | 0.03 | 510 | 20,000~50,000 | 0.007 | 0.02 | 420 | 20,000~50,000 | 0.02 | 0.06 | 600 | 20,000~50,000 |
| | 3 | 0.015 | 0.035 | 500 | 20,000~50,000 | 0.01 | 0.025 | 420 | 20,000~50,000 | 0.007 | 0.015 | 350 | 20,000~50,000 | 0.02 | 0.05 | 500 | 20,000~50,000 |
| 0.3 | 1.5 | 0.05 | 0.1 | 1,200 | 20,000~50,000 | 0.05 | 0.07 | 1,000 | 20,000~50,000 | 0.035 | 0.05 | 840 | 20,000~50,000 | 0.07 | 0.12 | 1,200 | 20,000~50,000 |
| | 2 | 0.05 | 0.1 | 1,200 | 20,000~50,000 | 0.04 | 0.07 | 1,000 | 20,000~50,000 | 0.028 | 0.05 | 840 | 20,000~50,000 | 0.07 | 0.12 | 1,200 | 20,000~50,000 |
| | 2.5 | 0.035 | 0.1 | 1,200 | 20,000~50,000 | 0.03 | 0.06 | 1,000 | 20,000~50,000 | 0.02 | 0.04 | 840 | 20,000~50,000 | 0.05 | 0.12 | 1,200 | 20,000~50,000 |
| | 3 | 0.025 | 0.1 | 1,000 | 20,000~50,000 | 0.03 | 0.05 | 850 | 20,000~50,000 | 0.02 | 0.035 | 700 | 20,000~50,000 | 0.04 | 0.1 | 1,000 | 20,000~50,000 |
| | 3.5 | 0.025 | 0.08 | 1,000 | 20,000~50,000 | 0.02 | 0.05 | 850 | 20,000~50,000 | 0.015 | 0.035 | 700 | 20,000~50,000 | 0.04 | 0.1 | 1,000 | 20,000~50,000 |
| | 4 | 0.025 | 0.05 | 800 | 20,000~50,000 | 0.02 | 0.04 | 680 | 20,000~50,000 | 0.015 | 0.03 | 560 | 20,000~50,000 | 0.035 | 0.08 | 800 | 20,000~50,000 |
| | 4.5 | 0.025 | 0.05 | 750 | 20,000~50,000 | 0.01 | 0.03 | 630 | 20,000~50,000 | 0.007 | 0.02 | 520 | 20,000~50,000 | 0.035 | 0.08 | 750 | 20,000~50,000 |
| | 5 | 0.02 | 0.04 | 500 | 20,000~30,000 | 0.01 | 0.02 | 420 | 20,000~30,000 | 0.007 | 0.015 | 350 | 20,000~30,000 | 0.03 | 0.06 | 500 | 20,000~30,000 |
| | 5.5 | 0.013 | 0.02 | 500 | 20,000~30,000 | 0.01 | 0.01 | 420 | 20,000~30,000 | 0.007 | 0.007 | 350 | 20,000~30,000 | 0.02 | 0.03 | 500 | 20,000~30,000 |
| | 6 | 0.01 | 0.02 | 450 | 20,000~30,000 | 0.005 | 0.01 | 380 | 20,000~30,000 | 0.004 | 0.007 | 310 | 20,000~30,000 | 0.015 | 0.03 | 450 | 20,000~30,000 |
| 0.4 | 2 | 0.1 | 0.15 | 2,000 | 20,000~50,000 | 0.1 | 0.12 | 1,700 | 20,000~50,000 | 0.07 | 0.085 | 1,400 | 14,000~35,000 | 0.15 | 0.2 | 2,000 | 20,000~50,000 |
| | 3 | 0.08 | 0.13 | 1,700 | 20,000~50,000 | 0.08 | 0.1 | 1,500 | 20,000~50,000 | 0.056 | 0.065 | 1,190 | 14,000~35,000 | 0.12 | 0.2 | 1,700 | 20,000~50,000 |
| | 4 | 0.05 | 0.12 | 1,500 | 20,000~50,000 | 0.05 | 0.08 | 1,300 | 20,000~50,000 | 0.035 | 0.055 | 1,000 | 14,000~35,000 | 0.1 | 0.2 | 1,500 | 20,000~50,000 |
| | 5 | 0.05 | 0.1 | 1,200 | 20,000~50,000 | 0.04 | 0.07 | 1,000 | 20,000~50,000 | 0.03 | 0.05 | 840 | 14,000~35,000 | 0.08 | 0.15 | 1,200 | 20,000~50,000 |

# MRB230SF

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK・HPM-1 (～44HRC) | | | | 焼き入れ鋼 Hardened Steels SKD・STAVAX・HPM-38 (～55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (～62HRC) | | | | 銅 Copper | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 有効長 Effective Length | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.5 | 3 | 0.2 | 0.3 | 3,000 | 20,000~50,000 | 0.12 | 0.3 | 2,500 | 20,000~50,000 | 0.08 | 0.21 | 2,100 | 14,000~35,000 | 0.25 | 0.4 | 3,000 | 20,000~50,000 |
| | 4 | 0.15 | 0.25 | 2,500 | 20,000~50,000 | 0.1 | 0.2 | 2,100 | 20,000~50,000 | 0.07 | 0.14 | 1,700 | 14,000~35,000 | 0.2 | 0.4 | 2,500 | 20,000~50,000 |
| | 5 | 0.1 | 0.25 | 2,000 | 20,000~50,000 | 0.08 | 0.17 | 1,700 | 20,000~50,000 | 0.055 | 0.12 | 1,400 | 14,000~35,000 | 0.15 | 0.35 | 2,000 | 20,000~50,000 |
| | 6 | 0.1 | 0.2 | 1,500 | 20,000~50,000 | 0.07 | 0.12 | 1,200 | 20,000~50,000 | 0.05 | 0.085 | 1,000 | 14,000~35,000 | 0.15 | 0.3 | 1,500 | 20,000~50,000 |
| | 8 | 0.05 | 0.1 | 1,200 | 20,000~30,000 | 0.05 | 0.08 | 1,000 | 20,000~30,000 | 0.035 | 0.055 | 840 | 14,000~21,000 | 0.08 | 0.15 | 1,200 | 20,000~30,000 |
| | 10 | 0.03 | 0.05 | 800 | 20,000~30,000 | 0.03 | 0.05 | 680 | 20,000~30,000 | 0.02 | 0.035 | 560 | 14,000~21,000 | 0.05 | 0.08 | 800 | 20,000~30,000 |
| 0.75 | 3 | 0.2 | 0.35 | 4,000 | 20,000~30,000 | 0.15 | 0.3 | 3,400 | 20,000~30,000 | 0.1 | 0.18 | 2,800 | 14,000~21,000 | 0.3 | 0.5 | 4,000 | 20,000~30,000 |
| | 4 | 0.2 | 0.3 | 4,000 | 20,000~30,000 | 0.15 | 0.25 | 3,400 | 20,000~30,000 | 0.09 | 0.15 | 2,800 | 14,000~21,000 | 0.3 | 0.45 | 4,000 | 20,000~30,000 |
| | 6 | 0.15 | 0.3 | 3,000 | 20,000~30,000 | 0.12 | 0.2 | 2,500 | 20,000~30,000 | 0.07 | 0.12 | 2,100 | 14,000~21,000 | 0.2 | 0.45 | 3,000 | 20,000~30,000 |
| | 8 | 0.1 | 0.25 | 2,400 | 20,000~30,000 | 0.08 | 0.18 | 2,000 | 20,000~30,000 | 0.05 | 0.11 | 1,700 | 14,000~21,000 | 0.15 | 0.4 | 2,400 | 20,000~30,000 |
| | 10 | 0.08 | 0.2 | 1,800 | 20,000~30,000 | 0.06 | 0.12 | 1,500 | 20,000~30,000 | 0.035 | 0.07 | 1,200 | 14,000~21,000 | 0.12 | 0.3 | 1,800 | 20,000~30,000 |
| 1 | 3 | 0.3 | 0.5 | 4,000 | 20,000~30,000 | 0.2 | 0.5 | 3,400 | 20,000~30,000 | 0.12 | 0.3 | 2,800 | 14,000~21,000 | 0.45 | 0.7 | 4,000 | 20,000~30,000 |
| | 4 | 0.3 | 0.5 | 4,000 | 20,000~30,000 | 0.2 | 0.45 | 3,400 | 20,000~30,000 | 0.12 | 0.27 | 2,800 | 14,000~21,000 | 0.45 | 0.7 | 4,000 | 20,000~30,000 |
| | 6 | 0.25 | 0.5 | 3,000 | 20,000~30,000 | 0.2 | 0.4 | 2,500 | 20,000~30,000 | 0.12 | 0.24 | 2,100 | 14,000~21,000 | 0.38 | 0.7 | 3,000 | 20,000~30,000 |
| | 8 | 0.2 | 0.3 | 2,500 | 16,000~20,000 | 0.15 | 0.3 | 2,100 | 16,000~20,000 | 0.09 | 0.18 | 1,700 | 11,200~14,000 | 0.3 | 0.45 | 2,500 | 16,000~20,000 |
| | 10 | 0.15 | 0.3 | 2,500 | 16,000~20,000 | 0.1 | 0.2 | 2,100 | 16,000~20,000 | 0.06 | 0.12 | 1,700 | 11,200~14,000 | 0.23 | 0.45 | 2,500 | 16,000~20,000 |
| | 12 | 0.13 | 0.2 | 1,800 | 12,000~16,000 | 0.1 | 0.15 | 1,500 | 12,000~16,000 | 0.06 | 0.09 | 1,300 | 8,400~11,200 | 0.2 | 0.3 | 1,800 | 12,000~16,000 |
| | 14 | 0.1 | 0.2 | 1,800 | 12,000~16,000 | 0.07 | 0.13 | 1,500 | 12,000~16,000 | 0.04 | 0.08 | 1,300 | 8,400~11,200 | 0.15 | 0.3 | 1,800 | 12,000~16,000 |
| | 16 | 0.1 | 0.15 | 1,600 | 10,000~14,000 | 0.06 | 0.11 | 1,400 | 10,000~14,000 | 0.035 | 0.065 | 1,100 | 7,000~9,800 | 0.15 | 0.25 | 1,600 | 10,000~14,000 |
| | 18 | 0.07 | 0.12 | 1,600 | 10,000~14,000 | 0.05 | 0.1 | 1,400 | 10,000~14,000 | 0.03 | 0.06 | 1,100 | 7,000~9,800 | 0.1 | 0.2 | 1,600 | 10,000~14,000 |
| | 20 | 0.06 | 0.1 | 1,000 | 8,000~12,000 | 0.05 | 0.07 | 850 | 8,000~12,000 | 0.03 | 0.04 | 700 | 5,600~8,400 | 0.1 | 0.15 | 1,000 | 8,000~12,000 |
| 1.5 | 6 | 0.35 | 0.6 | 4,000 | 16,000~20,000 | 0.25 | 0.5 | 3,400 | 16,000~20,000 | 0.15 | 0.3 | 2,800 | 11,200~14,000 | 0.5 | 1 | 4,000 | 16,000~20,000 |
| | 8 | 0.3 | 0.5 | 4,000 | 16,000~20,000 | 0.2 | 0.5 | 3,400 | 16,000~20,000 | 0.12 | 0.3 | 2,800 | 11,200~14,000 | 0.45 | 0.8 | 4,000 | 16,000~20,000 |
| | 10 | 0.3 | 0.5 | 4,000 | 16,000~20,000 | 0.2 | 0.45 | 3,400 | 16,000~20,000 | 0.12 | 0.27 | 2,800 | 11,200~14,000 | 0.45 | 0.8 | 4,000 | 16,000~20,000 |
| | 12 | 0.2 | 0.4 | 3,000 | 16,000~20,000 | 0.2 | 0.4 | 2,500 | 16,000~20,000 | 0.12 | 0.24 | 2,100 | 11,200~14,000 | 0.3 | 0.6 | 3,000 | 16,000~20,000 |

**備　考 Notes**

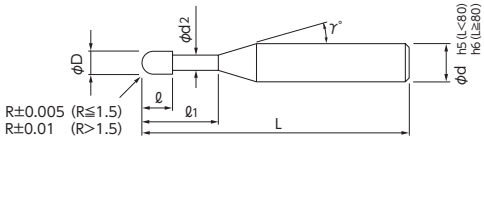
※切り込み量の ap は深さ方向の切り込み量、ae はピックフィードを示します。
※回転数と送り速度は、同じ割合で調整してください。
※焼き入れ材を加工する場合は、オイルミストをお奨めします。
※Depth of Cut : ap=Axial Depth of Cut / ae=Radial Depth of Cut.
※Adjust both spindle speed and feed at the same rate.
※Oil mist coolant is recommended for the machining of hardened steels.



ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MRB230

## 無限コーティング ロングネックボールエンドミル（深リブ用）
MUGEN-COATING 2-Flute Long Neck Ball End Mill




●狭くて深い加工に適した首逃げタイプ。
●低速から高速まで深彫り精密 3 次元加工に対応。
●全 282 サイズ！
●It is very suitable for cutting on narrow and deep rib by long neck end mill.
●It is possible to have deep and precision three-dimensional cutting in the low to high speed range.
●Total 282 sizes!

3D MG ∞ 2 30° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00520-20051 | R0.05 | 0.3 | 0.07 | 0.1 | 0.085 | 12° | 4 | 45 | 10,200 | 0.34 | 0.36 | 0.37 | 0.39 | 0.42 |
| 08-00520-20052 | | 0.5 | 0.07 | 0.1 | 0.085 | 12° | 4 | 45 | 11,000 | 0.55 | 0.57 | 0.60 | 0.63 | 0.69 |
| 08-00520-40075 | R0.075 | 0.3 | 0.1 | 0.15 | 0.13 | 12° | 4 | 45 | 11,800 | 0.36 | 0.37 | 0.39 | 0.40 | 0.44 |
| 08-00520-40076 | | 0.5 | 0.1 | 0.15 | 0.13 | 12° | 4 | 45 | 12,500 | 0.57 | 0.59 | 0.61 | 0.64 | 0.70 |
| 08-00520-40077 | | 1 | 0.1 | 0.15 | 0.13 | 12° | 4 | 45 | 13,000 | 1.09 | 1.13 | 1.18 | 1.24 | 1.37 |
| 08-00520-00101 | R0.1 | 0.5 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 7,100 | 0.57 | 0.59 | 0.62 | 0.64 | 0.70 |
| 08-00521-00101 | | 0.5 | 0.15 | 0.2 | 0.18 | 12° | 6 | 50 | 9,900 | 0.57 | 0.59 | 0.62 | 0.64 | 0.70 |
| 08-00520-10101 | | 0.75 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 7,100 | 0.83 | 0.87 | 0.90 | 0.94 | 1.04 |
| 08-00520-00102 | | 1 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 7,100 | 1.09 | 1.14 | 1.19 | 1.24 | 1.37 |
| 08-00521-00102 | | 1 | 0.15 | 0.2 | 0.18 | 12° | 6 | 50 | 9,900 | 1.09 | 1.14 | 1.19 | 1.24 | 1.37 |
| 08-00520-10102 | | 1.25 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 7,700 | 1.36 | 1.41 | 1.47 | 1.54 | 1.70 |
| 08-00520-00103 | | 1.5 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 7,700 | 1.62 | 1.68 | 1.76 | 1.84 | 2.03 |
| 08-00521-00103 | | 1.5 | 0.15 | 0.2 | 0.18 | 12° | 6 | 50 | 10,700 | 1.62 | 1.68 | 1.76 | 1.84 | 2.03 |
| 08-00520-10103 | | 1.75 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 8,500 | 1.88 | 1.96 | 2.04 | 2.14 | 2.36 |
| 08-00520-00104 | | 2 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 8,500 | 2.14 | 2.23 | 2.33 | 2.44 | 2.70 |
| 08-00521-00104 | | 2 | 0.15 | 0.2 | 0.18 | 12° | 6 | 50 | 11,600 | 2.14 | 2.23 | 2.33 | 2.44 | 2.70 |
| 08-00520-00105 | | 2.5 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 9,300 | 2.66 | 2.77 | 2.90 | 3.04 | 3.36 |
| 08-00520-00106 | | 3 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 10,000 | 3.18 | 3.32 | 3.47 | 3.64 | 4.02 |
| 08-00520-40151 | R0.15 | 0.5 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,000 | 0.56 | 0.58 | 0.60 | 0.63 | 0.68 |
| 08-00520-10151 | | 0.6 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,000 | 0.68 | 0.70 | 0.73 | 0.75 | 0.82 |
| 08-00520-40152 | | 0.75 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,000 | 0.82 | 0.86 | 0.89 | 0.93 | 1.01 |
| 08-00520-00151 | | 1 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,000 | 1.09 | 1.14 | 1.18 | 1.23 | 1.35 |
| 08-00521-00151 | | 1 | 0.2 | 0.3 | 0.28 | 12° | 6 | 50 | 9,500 | 1.09 | 1.14 | 1.18 | 1.23 | 1.35 |
| 08-00520-30153 | | 1.25 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,500 | 1.34 | 1.39 | 1.45 | 1.52 | 1.67 |
| 08-00520-10152 | | 1.5 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,500 | 1.61 | 1.68 | 1.75 | 1.83 | 2.02 |
| 08-00521-00152 | | 1.5 | 0.2 | 0.3 | 0.28 | 12° | 6 | 50 | 10,400 | 1.61 | 1.68 | 1.75 | 1.83 | 2.02 |
| 08-00520-30154 | | 1.75 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,500 | 1.86 | 1.94 | 2.02 | 2.12 | 2.33 |
| 08-00520-00152 | | 2 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,500 | 2.14 | 2.22 | 2.32 | 2.43 | 2.68 |
| 08-00521-00153 | | 2 | 0.2 | 0.3 | 0.28 | 12° | 6 | 50 | 10,400 | 2.14 | 2.22 | 2.32 | 2.43 | 2.68 |
| 08-00520-30155 | | 2.25 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,700 | 2.38 | 2.48 | 2.59 | 2.71 | 3.00 |
| 08-00520-10153 | | 2.5 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,700 | 2.66 | 2.77 | 2.89 | 3.03 | 3.34 |
| 08-00520-30156 | | 2.75 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,700 | 2.91 | 3.03 | 3.16 | 3.31 | 3.66 |

**オーダー方法**
MRB230 ボール半径(R)×有効長(ℓ1)×シャンク径(d)を指示してください。
When you order, indicate MRB230 (R)×(ℓ1)×(d).

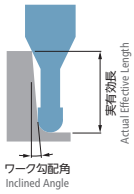
※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-042に記載
●Recommended Milling Conditions are shown on page E-042.

# MRB230

## 無限コーティング ロングネックボールエンドミル（深リブ用）

MUGEN-COATING 2-Flute Long Neck Ball End Mill




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00520-10154 | R0.15 | 3 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,700 | 3.18 | 3.31 | 3.46 | 3.63 | 4.01 |
| 08-00520-30157 | | 3.5 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 7,700 | 3.69 | 3.85 | 4.02 | 4.21 | 4.65 |
| 08-00520-20151 | | 4 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 8,000 | 4.21 | 4.39 | 4.59 | 4.81 | 5.32 |
| 08-00520-30158 | | 4.5 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 8,000 | 4.73 | 4.94 | 5.16 | 5.41 | 5.98 |
| 08-00520-20152 | | 5 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 9,000 | 5.25 | 5.48 | 5.73 | 6.01 | 6.65 |
| 08-00520-40201 | R0.2 | 0.5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 4,800 | 0.59 | 0.60 | 0.62 | 0.64 | 0.69 |
| 08-00520-10201 | | 0.75 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 4,800 | 0.85 | 0.88 | 0.92 | 0.95 | 1.04 |
| 08-00520-00201 | | 1 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 4,800 | 1.12 | 1.16 | 1.20 | 1.25 | 1.37 |
| 08-00521-00201 | | 1 | 0.3 | 0.4 | 0.37 | 12° | 6 | 50 | 7,000 | 1.12 | 1.16 | 1.20 | 1.25 | 1.37 |
| 08-00520-00204 | | 1.5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 4,900 | 1.64 | 1.70 | 1.77 | 1.85 | 2.03 |
| 08-00521-00202 | | 1.5 | 0.3 | 0.4 | 0.37 | 12° | 6 | 50 | 7,100 | 1.64 | 1.70 | 1.77 | 1.85 | 2.03 |
| 08-00520-00202 | | 2 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 5,000 | 2.16 | 2.25 | 2.34 | 2.45 | 2.70 |
| 08-00521-00203 | | 2 | 0.3 | 0.4 | 0.37 | 12° | 6 | 50 | 7,300 | 2.16 | 2.25 | 2.34 | 2.45 | 2.70 |
| 08-00520-00205 | | 2.5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 5,200 | 2.68 | 2.79 | 2.91 | 3.05 | 3.36 |
| 08-00521-00204 | | 2.5 | 0.3 | 0.4 | 0.37 | 12° | 6 | 50 | 7,500 | 2.68 | 2.79 | 2.91 | 3.05 | 3.36 |
| 08-00520-00203 | | 3 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 5,500 | 3.20 | 3.34 | 3.48 | 3.64 | 4.02 |
| 08-00521-00205 | | 3 | 0.3 | 0.4 | 0.37 | 12° | 6 | 50 | 8,000 | 3.20 | 3.34 | 3.48 | 3.64 | 4.02 |
| 08-00520-10202 | | 3.5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 6,000 | 3.72 | 3.88 | 4.05 | 4.24 | 4.69 |
| 08-00520-00206 | | 4 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 6,000 | 4.24 | 4.42 | 4.62 | 4.84 | 5.35 |
| 08-00520-10203 | | 4.5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 6,300 | 4.76 | 4.97 | 5.19 | 5.44 | 6.01 |
| 08-00520-00207 | | 5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 6,300 | 5.29 | 5.51 | 5.76 | 6.04 | 6.68 |
| 08-00520-10204 | | 5.5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 7,300 | 5.81 | 6.06 | 6.33 | 6.64 | 7.34 |
| 08-00520-10205 | | 6 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 7,300 | 6.33 | 6.60 | 6.90 | 7.23 | 8.00 |
| 08-00520-30251 | R0.25 | 1 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 4,800 | 1.13 | 1.16 | 1.21 | 1.26 | 1.37 |
| 08-00520-10251 | | 1.5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 4,800 | 1.65 | 1.71 | 1.78 | 1.85 | 2.03 |
| 08-00521-00251 | | 1.5 | 0.35 | 0.5 | 0.46 | 12° | 6 | 50 | 7,000 | 1.65 | 1.71 | 1.78 | 1.85 | 2.03 |
| 08-00520-00251 | | 2 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 4,800 | 2.17 | 2.25 | 2.35 | 2.45 | 2.69 |
| 08-00521-00252 | | 2 | 0.35 | 0.5 | 0.46 | 12° | 6 | 50 | 7,000 | 2.17 | 2.25 | 2.35 | 2.45 | 2.69 |
| 08-00520-10252 | | 2.5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 4,800 | 2.69 | 2.80 | 2.92 | 3.05 | 3.36 |
| 08-00520-10253 | | 3 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 4,800 | 3.21 | 3.34 | 3.49 | 3.65 | 4.02 |
| 08-00520-10254 | | 3.5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 4,800 | 3.73 | 3.89 | 4.06 | 4.25 | 4.69 |
| 08-00520-00252 | | 4 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 4,800 | 4.25 | 4.43 | 4.63 | 4.85 | 5.35 |
| 08-00521-00253 | | 4 | 0.35 | 0.5 | 0.46 | 12° | 6 | 50 | 7,000 | 4.25 | 4.43 | 4.63 | 4.85 | 5.35 |
| 08-00520-10255 | | 4.5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 4,900 | 4.78 | 4.98 | 5.20 | 5.44 | 6.01 |
| 08-00520-00255 | | 5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 4,900 | 5.30 | 5.52 | 5.77 | 6.04 | 6.68 |
| 08-00521-00254 | | 5 | 0.35 | 0.5 | 0.46 | 12° | 6 | 50 | 7,100 | 5.30 | 5.52 | 5.77 | 6.04 | 6.68 |
| 08-00520-10256 | | 5.5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 5,000 | 5.82 | 6.07 | 6.34 | 6.64 | 7.34 |
| 08-00520-00253 | | 6 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 5,000 | 6.34 | 6.61 | 6.91 | 7.24 | 8.00 |
| 08-00521-00255 | | 6 | 0.35 | 0.5 | 0.46 | 12° | 6 | 50 | 7,300 | 6.34 | 6.61 | 6.91 | 7.24 | 8.00 |
| 08-00520-10257 | | 7 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 6,000 | 7.38 | 7.70 | 8.05 | 8.44 | 9.33 |
| 08-00520-00254 | | 8 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 6,000 | 8.42 | 8.79 | 9.19 | 9.63 | 10.66 |
| 08-00521-00256 | | 8 | 0.35 | 0.5 | 0.46 | 12° | 6 | 50 | 8,400 | 8.42 | 8.79 | 9.19 | 9.63 | 10.66 |
| 08-00521-30251 | | 9 | 0.35 | 0.5 | 0.46 | 12° | 6 | 55 | 7,000 | 9.47 | 9.88 | 10.33 | 10.83 | 11.99 |
| 08-00521-30252 | | 10 | 0.35 | 0.5 | 0.46 | 12° | 6 | 55 | 7,700 | 10.51 | 10.97 | 11.47 | 12.03 | 13.31 |

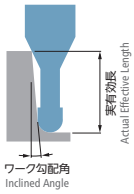
**オーダー方法**

MRB230 ボール半径(R)×有効長(ℓ1)×シャンク径(d)を指示してください。
When you order, indicate MRB230 (R)×(ℓ1)×(d).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-042に記載
●Recommended Milling Conditions are shown on page E-042.

SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

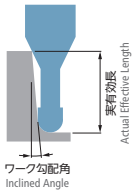



| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00520-40301 | R0.3 | 1 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 4,100 | 1.13 | 1.17 | 1.21 | 1.25 | 1.36 |
| 08-00520-10301 | | 1.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 3,700 | 1.64 | 1.71 | 1.77 | 1.84 | 2.02 |
| 08-00520-00301 | | 2 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 3,700 | 2.17 | 2.25 | 2.34 | 2.44 | 2.68 |
| 08-00521-00301 | | 2 | 0.45 | 0.6 | 0.56 | 12° | 6 | 50 | 5,600 | 2.17 | 2.25 | 2.34 | 2.44 | 2.68 |
| 08-00520-10302 | | 2.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 3,800 | 2.69 | 2.79 | 2.91 | 3.04 | 3.34 |
| 08-00520-00305 | | 3 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 3,800 | 3.21 | 3.34 | 3.48 | 3.64 | 4.01 |
| 08-00521-00302 | | 3 | 0.45 | 0.6 | 0.56 | 12° | 6 | 50 | 5,700 | 3.21 | 3.34 | 3.48 | 3.64 | 4.01 |
| 08-00520-10303 | | 3.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 3,900 | 3.73 | 3.88 | 4.05 | 4.24 | 4.67 |
| 08-00520-00302 | | 4 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 3,900 | 4.25 | 4.43 | 4.62 | 4.84 | 5.33 |
| 08-00521-00303 | | 4 | 0.45 | 0.6 | 0.56 | 12° | 6 | 50 | 5,900 | 4.25 | 4.43 | 4.62 | 4.84 | 5.33 |
| 08-00520-10304 | | 4.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 3,900 | 4.77 | 4.97 | 5.19 | 5.43 | 6.00 |
| 08-00520-00306 | | 5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 3,900 | 5.23 | 5.40 | 5.59 | 5.79 | 6.23 |
| 08-00520-10305 | | 5.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 3,900 | 5.82 | 6.06 | 6.33 | 6.63 | 7.32 |
| 08-00520-00303 | | 6 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 3,900 | 6.34 | 6.61 | 6.90 | 7.23 | 7.99 |
| 08-00521-00304 | | 6 | 0.45 | 0.6 | 0.56 | 12° | 6 | 50 | 5,900 | 6.34 | 6.61 | 6.90 | 7.23 | 7.99 |
| 08-00520-10306 | | 6.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 4,400 | 6.86 | 7.15 | 7.47 | 7.83 | 8.65 |
| 08-00520-00307 | | 7 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 4,400 | 7.38 | 7.70 | 8.04 | 8.43 | 9.31 |
| 08-00520-10307 | | 7.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 5,200 | 7.90 | 8.24 | 8.61 | 9.02 | 9.98 |
| 08-00520-00304 | | 8 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 5,200 | 8.42 | 8.79 | 9.18 | 9.62 | 10.64 |
| 08-00521-00305 | | 8 | 0.45 | 0.6 | 0.56 | 12° | 6 | 50 | 7,500 | 8.42 | 8.79 | 9.18 | 9.62 | 10.64 |
| 08-00520-10308 | | 8.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 5,500 | 8.94 | 9.33 | 9.76 | 10.22 | 11.31 |
| 08-00520-10309 | | 9 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 5,500 | 9.47 | 9.88 | 10.33 | 10.82 | 11.97 |
| 08-00520-10310 | | 9.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 5,500 | 9.99 | 10.42 | 10.90 | 11.42 | 12.63 |
| 08-00520-10311 | | 10 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 5,300 | 10.51 | 10.97 | 11.47 | 12.02 | 13.30 |
| 08-00521-00306 | | 10 | 0.45 | 0.6 | 0.56 | 12° | 6 | 50 | 8,000 | 10.40 | 10.75 | 11.13 | 11.54 | 12.45 |
| 08-00520-10312 | | 11 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 6,000 | 11.55 | 12.06 | 12.61 | 13.21 | 14.62 |
| 08-00520-10313 | | 12 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 6,000 | 12.59 | 13.14 | 13.75 | 14.41 | 15.95 |
| 08-00520-40351 | R0.35 | 2 | 0.5 | 0.7 | 0.66 | 12° | 4 | 45 | 3,700 | 2.17 | 2.25 | 2.34 | 2.44 | 2.67 |
| 08-00520-40352 | | 4 | 0.5 | 0.7 | 0.66 | 12° | 4 | 45 | 3,900 | 4.25 | 4.43 | 4.62 | 4.84 | 5.33 |
| 08-00520-40353 | | 6 | 0.5 | 0.7 | 0.66 | 12° | 4 | 45 | 3,900 | 6.34 | 6.61 | 6.91 | 7.23 | 8.00 |
| 08-00520-40354 | | 8 | 0.5 | 0.7 | 0.66 | 12° | 4 | 45 | 3,900 | 8.43 | 8.79 | 9.19 | 9.63 | 10.66 |
| 08-00520-00400 | R0.4 | 2 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 3,700 | 2.16 | 2.24 | 2.33 | 2.42 | 2.65 |
| 08-00521-00401 | | 2 | 0.6 | 0.8 | 0.76 | 12° | 6 | 50 | 5,600 | 2.16 | 2.24 | 2.33 | 2.42 | 2.65 |
| 08-00520-10401 | | 3 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 3,900 | 3.20 | 3.33 | 3.47 | 3.62 | 3.97 |
| 08-00521-00402 | | 3 | 0.6 | 0.8 | 0.76 | 12° | 6 | 50 | 5,900 | 3.20 | 3.33 | 3.47 | 3.62 | 3.97 |
| 08-00520-00401 | | 4 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 3,900 | 4.25 | 4.42 | 4.61 | 4.82 | 5.30 |
| 08-00521-00403 | | 4 | 0.6 | 0.8 | 0.76 | 12° | 6 | 50 | 5,900 | 4.25 | 4.42 | 4.61 | 4.82 | 5.30 |
| 08-00520-00405 | | 5 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 3,900 | 5.29 | 5.51 | 5.75 | 6.01 | 6.63 |
| 08-00520-00402 | | 6 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 3,900 | 6.33 | 6.60 | 6.89 | 7.21 | 7.96 |
| 08-00521-00404 | | 6 | 0.6 | 0.8 | 0.76 | 12° | 6 | 50 | 5,900 | 6.33 | 6.60 | 6.89 | 7.21 | 7.96 |
| 08-00520-00406 | | 7 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 3,900 | 7.29 | 7.53 | 7.79 | 8.07 | 8.70 |
| 08-00520-00403 | | 8 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 3,900 | 8.42 | 8.78 | 9.17 | 9.60 | 10.61 |
| 08-00521-00405 | | 8 | 0.6 | 0.8 | 0.76 | 12° | 6 | 50 | 5,900 | 8.42 | 8.78 | 9.17 | 9.60 | 10.61 |
| 08-00520-30401 | | 9 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 5,200 | 9.46 | 9.87 | 10.31 | 10.80 | 11.94 |

# MRB230

## 無限コーティング ロングネックボールエンドミル（深リブ用）

MUGEN-COATING 2-Flute Long Neck Ball End Mill




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00520-00404 | R0.4 | 10 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 5,200 | 10.50 | 10.96 | 11.45 | 12.00 | 13.26 |
| 08-00521-00406 | | 10 | 0.6 | 0.8 | 0.76 | 12° | 6 | 50 | 7,500 | 10.40 | 10.74 | 11.12 | 11.52 | 12.42 |
| 08-00520-20401 | | 12 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 6,400 | 12.59 | 13.14 | 13.73 | 14.39 | 15.92 |
| 08-00520-40451 | R0.45 | 2 | 0.65 | 0.9 | 0.86 | 12° | 4 | 45 | 3,700 | 2.16 | 2.24 | 2.33 | 2.42 | 2.64 |
| 08-00520-40452 | | 4 | 0.65 | 0.9 | 0.86 | 12° | 4 | 45 | 3,900 | 4.25 | 4.42 | 4.61 | 4.82 | 5.30 |
| 08-00520-40453 | | 6 | 0.65 | 0.9 | 0.86 | 12° | 4 | 45 | 3,900 | 6.34 | 6.60 | 6.89 | 7.21 | 7.96 |
| 08-00520-40454 | | 8 | 0.65 | 0.9 | 0.86 | 12° | 4 | 45 | 3,900 | 8.42 | 8.78 | 9.17 | 9.61 | 10.62 |
| 08-00520-40501 | R0.5 | 2 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,100 | 2.19 | 2.26 | 2.35 | 2.44 | 2.65 |
| 08-00520-40502 | | 2.5 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,100 | 2.71 | 2.81 | 2.92 | 3.04 | 3.32 |
| 08-00520-00505 | | 3 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,100 | 3.22 | 3.35 | 3.48 | 3.63 | 3.97 |
| 08-00521-00501 | | 3 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 4,900 | 3.22 | 3.35 | 3.48 | 3.63 | 3.97 |
| 08-00520-00506 | | 4 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,500 | 4.27 | 4.44 | 4.62 | 4.83 | 5.30 |
| 08-00521-00502 | | 4 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 5,400 | 4.27 | 4.44 | 4.62 | 4.83 | 5.30 |
| 08-00520-00510 | | 5 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,500 | 5.24 | 5.41 | 5.59 | 5.78 | 6.21 |
| 08-00521-00503 | | 5 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 5,400 | 5.31 | 5.53 | 5.76 | 6.02 | 6.63 |
| 08-00520-00501 | | 6 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,800 | 6.35 | 6.62 | 6.90 | 7.22 | 7.96 |
| 08-00521-00504 | | 6 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 5,700 | 6.35 | 6.62 | 6.90 | 7.22 | 7.96 |
| 08-00520-00511 | | 7 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,800 | 7.40 | 7.71 | 8.04 | 8.42 | 9.28 |
| 08-00520-00502 | | 8 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,800 | 8.44 | 8.79 | 9.18 | 9.61 | 10.61 |
| 08-00521-00505 | | 8 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 5,700 | 8.44 | 8.79 | 9.18 | 9.61 | 10.61 |
| 08-00520-00512 | | 9 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,800 | 9.48 | 9.88 | 10.32 | 10.81 | 11.94 |
| 08-00520-00507 | | 10 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,800 | 10.52 | 10.97 | 11.46 | 12.01 | 13.26 |
| 08-00521-00506 | | 10 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 5,700 | 10.41 | 10.76 | 11.13 | 11.53 | 12.42 |
| 08-00520-00504 | | 12 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3,800 | 12.61 | 13.15 | 13.75 | 14.40 | 15.92 |
| 08-00521-00507 | | 12 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 5,700 | 12.61 | 13.15 | 13.75 | 14.40 | 15.92 |
| 08-00520-40503 | | 13 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 4,400 | 13.66 | 14.25 | 14.90 | 15.62 | 17.29 |
| 08-00520-00513 | | 14 | 0.75 | 1 | 0.95 | 12° | 4 | 50 | 4,400 | 14.70 | 15.33 | 16.03 | 16.79 | 18.57 |
| 08-00520-00508 | | 16 | 0.75 | 1 | 0.95 | 12° | 4 | 50 | 5,200 | 16.78 | 17.51 | 18.31 | 19.18 | 21.23 |
| 08-00521-00508 | | 16 | 0.75 | 1 | 0.95 | 12° | 6 | 60 | 7,500 | 16.78 | 17.51 | 18.31 | 19.18 | 21.23 |
| 08-00520-00514 | | 18 | 0.75 | 1 | 0.95 | 12° | 4 | 55 | 5,200 | 18.87 | 19.69 | 20.59 | 21.58 | 23.88 |
| 08-00520-00509 | | 20 | 0.75 | 1 | 0.95 | 12° | 4 | 55 | 6,300 | 20.95 | 21.87 | 22.87 | 23.97 | 26.54 |
| 08-00521-00509 | | 20 | 0.75 | 1 | 0.95 | 12° | 6 | 60 | 8,900 | 20.95 | 21.87 | 22.87 | 23.97 | 26.54 |
| 08-00521-00510 | | 22 | 0.75 | 1 | 0.95 | 12° | 6 | 60 | 9,300 | 22.82 | 23.59 | 24.43 | 25.33 | 27.34 |
| 08-00520-40601 | R0.6 | 2.4 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 4,700 | 2.60 | 2.69 | 2.79 | 2.90 | 3.15 |
| 08-00520-20601 | | 4 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 4,700 | 4.26 | 4.43 | 4.61 | 4.81 | 5.27 |
| 08-00520-00600 | | 6 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 5,100 | 6.35 | 6.61 | 6.89 | 7.20 | 7.92 |
| 08-00521-00601 | | 6 | 0.9 | 1.2 | 1.15 | 12° | 6 | 50 | 7,250 | 6.35 | 6.61 | 6.89 | 7.20 | 7.92 |
| 08-00520-00601 | | 8 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 5,100 | 8.43 | 8.79 | 9.17 | 9.59 | 10.58 |
| 08-00521-00602 | | 8 | 0.9 | 1.2 | 1.15 | 12° | 6 | 50 | 7,250 | 8.43 | 8.79 | 9.17 | 9.59 | 10.58 |
| 08-00520-00602 | | 10 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 5,100 | 10.52 | 10.96 | 11.45 | 11.99 | 13.23 |
| 08-00521-00603 | | 10 | 0.9 | 1.2 | 1.15 | 12° | 6 | 50 | 7,250 | 10.41 | 10.75 | 11.12 | 11.51 | 12.40 |
| 08-00520-00603 | | 12 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 5,100 | 12.48 | 12.89 | 13.33 | 13.81 | 14.89 |
| 08-00521-00604 | | 12 | 0.9 | 1.2 | 1.15 | 12° | 6 | 50 | 7,250 | 12.48 | 12.89 | 13.33 | 13.81 | 14.89 |
| 08-00520-10601 | | 14 | 0.9 | 1.2 | 1.15 | 12° | 4 | 50 | 5,500 | 14.69 | 15.32 | 16.01 | 16.77 | 18.54 |

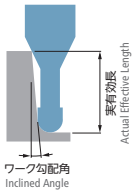
**オーダー方法**

MRB230 ボール半径(R)×有効長(ℓ1)×シャンク径(d)を指示してください。
When you order, indicate MRB230 (R)×(ℓ1)×(d).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-042に記載
●Recommended Milling Conditions are shown on page E-042.

SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

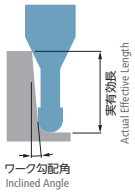



| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00520-10602 | R0.6 | 16 | 0.9 | 1.2 | 1.15 | 12° | 4 | 50 | 6,000 | 16.78 | 17.50 | 18.29 | 19.17 | 21.20 |
| 08-00521-00605 | | 16 | 0.9 | 1.2 | 1.15 | 12° | 6 | 60 | 8,250 | 16.78 | 17.50 | 18.29 | 19.17 | 21.20 |
| 08-00520-20602 | | 18 | 0.9 | 1.2 | 1.15 | 12° | 4 | 55 | 6,500 | 18.86 | 19.68 | 20.58 | 21.56 | 23.85 |
| 08-00520-30601 | | 20 | 0.9 | 1.2 | 1.15 | 12° | 4 | 55 | 6,500 | 20.95 | 21.86 | 22.86 | 23.95 | 26.50 |
| 08-00520-20603 | | 24 | 0.9 | 1.2 | 1.15 | 12° | 4 | 60 | 8,500 | 25.12 | 26.22 | 27.42 | 28.74 | Free |
| 08-00520-30701 | R0.7 | 8 | 1 | 1.4 | 1.35 | 12° | 4 | 45 | 4,400 | 8.43 | 8.78 | 9.16 | 9.57 | 10.55 |
| 08-00520-30702 | | 12 | 1 | 1.4 | 1.35 | 12° | 4 | 50 | 4,400 | 12.60 | 13.13 | 13.72 | 14.36 | 15.85 |
| 08-00520-30703 | | 16 | 1 | 1.4 | 1.35 | 12° | 4 | 50 | 4,400 | 16.77 | 17.49 | 18.28 | 19.15 | 21.16 |
| 08-00520-30751 | R0.75 | 3 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 3,600 | 3.21 | 3.33 | 3.45 | 3.58 | 3.89 |
| 08-00520-20751 | | 4 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 3,600 | 4.26 | 4.41 | 4.59 | 4.78 | 5.22 |
| 08-00520-20752 | | 6 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 3,600 | 6.34 | 6.59 | 6.87 | 7.17 | 7.88 |
| 08-00520-00751 | | 8 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 3,800 | 8.43 | 8.77 | 9.15 | 9.56 | 10.53 |
| 08-00521-00751 | | 8 | 1.1 | 1.5 | 1.45 | 12° | 6 | 50 | 5,800 | 8.43 | 8.77 | 9.15 | 9.56 | 10.53 |
| 08-00520-00752 | | 10 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 4,100 | 10.51 | 10.95 | 11.43 | 11.96 | 13.18 |
| 08-00520-00753 | | 12 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 4,400 | 12.60 | 13.13 | 13.71 | 14.35 | 15.84 |
| 08-00521-00752 | | 12 | 1.1 | 1.5 | 1.45 | 12° | 6 | 50 | 6,600 | 12.60 | 13.13 | 13.71 | 14.35 | 15.84 |
| 08-00520-00754 | | 14 | 1.1 | 1.5 | 1.45 | 12° | 4 | 50 | 4,400 | 14.69 | 15.31 | 15.99 | 16.74 | 18.49 |
| 08-00520-00755 | | 16 | 1.1 | 1.5 | 1.45 | 12° | 4 | 50 | 4,400 | 16.77 | 17.49 | 18.27 | 19.14 | 21.15 |
| 08-00521-00755 | | 16 | 1.1 | 1.5 | 1.45 | 12° | 6 | 60 | 6,600 | 16.77 | 17.49 | 18.27 | 19.14 | 21.15 |
| 08-00520-00756 | | 18 | 1.1 | 1.5 | 1.45 | 12° | 4 | 55 | 4,400 | 18.86 | 19.67 | 20.55 | 21.53 | 23.80 |
| 08-00520-00757 | | 20 | 1.1 | 1.5 | 1.45 | 12° | 4 | 55 | 4,400 | 20.94 | 21.85 | 22.84 | 23.92 | Free |
| 08-00521-00757 | | 20 | 1.1 | 1.5 | 1.45 | 12° | 6 | 60 | 6,600 | 20.94 | 21.85 | 22.84 | 23.92 | 26.46 |
| 08-00520-10751 | | 22 | 1.1 | 1.5 | 1.45 | 12° | 4 | 55 | 4,400 | 23.03 | 24.02 | 25.12 | 26.32 | Free |
| 08-00520-20753 | | 30 | 1.1 | 1.5 | 1.45 | 12° | 4 | 70 | 7,200 | 31.37 | 32.74 | 34.24 | 35.89 | Free |
| 08-00520-20801 | R0.8 | 4 | 1.2 | 1.6 | 1.55 | 12° | 4 | 45 | 5,000 | 4.25 | 4.41 | 4.58 | 4.77 | 5.21 |
| 08-00520-00801 | | 8 | 1.2 | 1.6 | 1.55 | 12° | 4 | 45 | 5,100 | 8.43 | 8.77 | 9.14 | 9.55 | 10.51 |
| 08-00520-00803 | | 12 | 1.2 | 1.6 | 1.55 | 12° | 4 | 45 | 5,100 | 12.60 | 13.13 | 13.70 | 14.34 | 15.82 |
| 08-00520-00805 | | 16 | 1.2 | 1.6 | 1.55 | 12° | 4 | 50 | 5,100 | 16.77 | 17.48 | 18.27 | 19.13 | 21.13 |
| 08-00520-00807 | | 20 | 1.2 | 1.6 | 1.55 | 12° | 4 | 55 | 5,100 | 20.94 | 21.84 | 22.83 | 23.91 | Free |
| 08-00520-30901 | R0.9 | 8 | 1.3 | 1.8 | 1.75 | 12° | 4 | 45 | 4,400 | 8.42 | 8.76 | 9.13 | 9.53 | 10.48 |
| 08-00520-30902 | | 12 | 1.3 | 1.8 | 1.75 | 12° | 4 | 45 | 4,400 | 12.59 | 13.12 | 13.69 | 14.32 | 15.79 |
| 08-00520-30903 | | 16 | 1.3 | 1.8 | 1.75 | 12° | 4 | 50 | 4,400 | 16.76 | 17.47 | 18.25 | 19.11 | 21.10 |
| 08-00520-30904 | | 20 | 1.3 | 1.8 | 1.75 | 12° | 4 | 55 | 4,400 | 20.94 | 21.83 | 22.81 | 23.89 | Free |
| 08-00520-31001 | R1 | 3 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 3,100 | 3.23 | 3.33 | 3.44 | 3.56 | 3.85 |
| 08-00520-01000 | | 4 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 3,100 | 4.27 | 4.42 | 4.58 | 4.76 | 5.17 |
| 08-00521-01000 | | 4 | 1.5 | 2 | 1.94 | 12° | 6 | 50 | 4,900 | 4.27 | 4.42 | 4.58 | 4.76 | 5.17 |
| 08-00520-01001 | | 6 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 3,500 | 6.36 | 6.60 | 6.86 | 7.15 | 7.83 |
| 08-00521-01001 | | 6 | 1.5 | 2 | 1.94 | 12° | 6 | 50 | 5,300 | 6.36 | 6.60 | 6.86 | 7.15 | 7.83 |
| 08-00520-01002 | | 8 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 3,800 | 8.44 | 8.78 | 9.14 | 9.54 | 10.48 |
| 08-00521-01002 | | 8 | 1.5 | 2 | 1.94 | 12° | 6 | 50 | 5,700 | 8.44 | 8.78 | 9.14 | 9.54 | 10.48 |
| 08-00520-01003 | | 10 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 3,800 | 10.53 | 10.95 | 11.42 | 11.94 | 13.14 |
| 08-00521-01003 | | 10 | 1.5 | 2 | 1.94 | 12° | 6 | 50 | 5,700 | 10.53 | 10.95 | 11.42 | 11.94 | 13.14 |
| 08-00520-01004 | | 12 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 3,800 | 12.61 | 13.13 | 13.70 | 14.33 | 15.79 |
| 08-00521-01004 | | 12 | 1.5 | 2 | 1.94 | 12° | 6 | 50 | 5,700 | 12.61 | 13.13 | 13.70 | 14.33 | 15.79 |

# MRB230

## 無限コーティング ロングネックボールエンドミル（深リブ用）

MUGEN-COATING 2-Flute Long Neck Ball End Mill




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00520-41001 | R1 | 13 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 3,800 | 13.66 | 14.23 | 14.86 | 15.55 | 17.16 |
| 08-00520-01005 | | 14 | 1.5 | 2 | 1.94 | 12° | 4 | 50 | 3,800 | 14.70 | 15.31 | 15.98 | 16.72 | 18.45 |
| 08-00520-01006 | | 16 | 1.5 | 2 | 1.94 | 12° | 4 | 50 | 3,800 | 16.78 | 17.49 | 18.27 | 19.12 | Free |
| 08-00521-01005 | | 16 | 1.5 | 2 | 1.94 | 12° | 6 | 60 | 5,700 | 16.78 | 17.49 | 18.27 | 19.12 | 21.10 |
| 08-00520-01007 | | 18 | 1.5 | 2 | 1.94 | 12° | 4 | 55 | 3,800 | 18.87 | 19.67 | 20.55 | 21.51 | Free |
| 08-00520-01008 | | 20 | 1.5 | 2 | 1.94 | 12° | 4 | 55 | 3,800 | 20.96 | 21.85 | 22.83 | 23.90 | Free |
| 08-00521-01008 | | 20 | 1.5 | 2 | 1.94 | 12° | 6 | 60 | 5,700 | 20.96 | 21.85 | 22.83 | 23.90 | 26.41 |
| 08-00520-01009 | | 22 | 1.5 | 2 | 1.94 | 12° | 4 | 60 | 5,200 | 23.04 | 24.03 | 25.11 | 26.30 | Free |
| 08-00520-01010 | | 25 | 1.5 | 2 | 1.94 | 12° | 4 | 65 | 5,300 | 26.17 | 27.30 | 28.53 | 29.89 | Free |
| 08-00521-01010 | | 25 | 1.5 | 2 | 1.94 | 12° | 6 | 80 | 7,500 | 26.17 | 27.30 | 28.53 | 29.89 | 33.04 |
| 08-00520-01011 | | 30 | 1.5 | 2 | 1.94 | 12° | 4 | 70 | 6,000 | 31.38 | 32.74 | 34.23 | Free | Free |
| 08-00521-01012 | | 30 | 1.5 | 2 | 1.94 | 12° | 6 | 80 | 8,500 | 31.38 | 32.74 | 34.23 | 35.87 | Free |
| 08-00520-11001 | | 35 | 1.5 | 2 | 1.94 | 12° | 4 | 70 | 8,200 | 36.60 | 38.19 | 39.93 | Free | Free |
| 08-00521-01014 | | 35 | 1.5 | 2 | 1.94 | 12° | 6 | 80 | 11,100 | 36.60 | 38.19 | 39.93 | 41.85 | Free |
| 08-00520-31002 | | 40 | 1.5 | 2 | 1.94 | 12° | 4 | 90 | 8,200 | 41.81 | 43.64 | Free | Free | Free |
| 08-00521-01015 | | 40 | 1.5 | 2 | 1.94 | 12° | 6 | 90 | 11,100 | 41.81 | 43.64 | 45.64 | 47.83 | Free |
| 08-00520-21251 | R1.25 | 6 | 2.3 | 2.5 | 2.4 | 12° | 4 | 45 | 4,100 | 6.44 | 6.68 | 6.93 | 7.21 | 7.87 |
| 08-00520-11251 | | 10 | 2.3 | 2.5 | 2.4 | 12° | 4 | 45 | 4,300 | 10.62 | 11.04 | 11.49 | 12.00 | 13.18 |
| 08-00520-11252 | | 15 | 2.3 | 2.5 | 2.4 | 12° | 4 | 50 | 5,100 | 15.83 | 16.48 | 17.20 | 17.98 | Free |
| 08-00520-11253 | | 20 | 2.3 | 2.5 | 2.4 | 12° | 4 | 55 | 6,000 | 21.04 | 21.93 | 22.90 | Free | Free |
| 08-00520-11254 | | 25 | 2.3 | 2.5 | 2.4 | 12° | 4 | 65 | 6,400 | 26.26 | 27.38 | 28.60 | Free | Free |
| 08-00520-11255 | | 30 | 2.3 | 2.5 | 2.4 | 12° | 4 | 70 | 6,400 | 31.47 | 32.82 | Free | Free | Free |
| 08-00520-21252 | | 35 | 2.3 | 2.5 | 2.4 | 12° | 4 | 70 | 7,400 | 36.69 | 38.27 | Free | Free | Free |
| 08-00520-31502 | R1.5 | 6 | 2.5 | 3 | 2.85 | 12° | 4 | 60 | 3,500 | 6.56 | 6.78 | 7.03 | 7.31 | 7.95 |
| 08-00520-31503 | | 6 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 3,800 | 6.56 | 6.78 | 7.03 | 7.31 | 7.95 |
| 08-00520-01500 | | 8 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 3,800 | 8.64 | 8.96 | 9.31 | 9.70 | 10.60 |
| 08-00520-01501 | | 10 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 4,400 | 10.73 | 11.14 | 11.59 | 12.09 | 13.26 |
| 08-00520-31504 | | 12 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 4,600 | 12.81 | 13.32 | 13.88 | 14.49 | 15.91 |
| 08-00520-31505 | | 14 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 5,100 | 14.90 | 15.50 | 16.16 | 16.88 | 18.57 |
| 08-00520-01503 | | 15 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 5,000 | 15.94 | 16.59 | 17.30 | 18.08 | 19.89 |
| 08-00520-31506 | | 16 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 5,100 | 16.98 | 17.68 | 18.44 | 19.27 | 21.22 |
| 08-00520-01505 | | 20 | 2.5 | 3 | 2.85 | 12° | 6 | 65 | 4,900 | 21.16 | 22.04 | 23.00 | 24.06 | 26.53 |
| 08-00520-01506 | | 25 | 2.5 | 3 | 2.85 | 12° | 6 | 65 | 4,900 | 26.37 | 27.48 | 28.70 | 30.04 | Free |
| 08-00520-01507 | | 30 | 2.5 | 3 | 2.85 | 12° | 6 | 70 | 5,600 | 31.58 | 32.93 | 34.40 | 36.03 | Free |
| 08-00520-01508 | | 35 | 2.5 | 3 | 2.85 | 12° | 6 | 80 | 7,100 | 36.80 | 38.38 | 40.11 | 42.01 | Free |
| 08-00520-11501 | | 40 | 2.5 | 3 | 2.85 | 12° | 6 | 90 | 8,800 | 42.01 | 43.83 | 45.81 | Free | Free |
| 08-00520-11751 | R1.75 | 10 | 2.8 | 3.5 | 3.35 | 12° | 6 | 60 | 5,600 | 10.72 | 11.12 | 11.56 | 12.05 | 13.18 |
| 08-00520-11752 | | 15 | 2.8 | 3.5 | 3.35 | 12° | 6 | 60 | 5,600 | 15.93 | 16.57 | 17.26 | 18.03 | 19.81 |
| 08-00520-11753 | | 20 | 2.8 | 3.5 | 3.35 | 12° | 6 | 65 | 6,000 | 21.14 | 22.01 | 22.96 | 24.01 | Free |
| 08-00520-11754 | | 25 | 2.8 | 3.5 | 3.35 | 12° | 6 | 65 | 6,000 | 26.36 | 27.46 | 28.67 | 29.99 | Free |
| 08-00520-11755 | | 30 | 2.8 | 3.5 | 3.35 | 12° | 6 | 70 | 6,400 | 31.57 | 32.91 | 34.37 | 35.98 | Free |
| 08-00520-11756 | | 35 | 2.8 | 3.5 | 3.35 | 12° | 6 | 80 | 7,700 | 36.79 | 38.36 | 40.07 | Free | Free |
| 08-00520-11757 | | 40 | 2.8 | 3.5 | 3.35 | 12° | 6 | 90 | 8,500 | 42.00 | 43.80 | 45.77 | Free | Free |
| 08-00520-11758 | | 45 | 2.8 | 3.5 | 3.35 | 12° | 6 | 90 | 9,300 | 47.22 | 49.25 | Free | Free | Free |

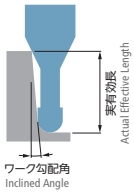
**オーダー方法**

MRB230 ボール半径(R)×有効長(ℓ1)×シャンク径(d)を指示してください。
When you order, indicate MRB230 (R)×(ℓ1)×(d).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-042に記載
●Recommended Milling Conditions are shown on page E-042.

SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.




| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00520-02000 | R2 | 10 | 3 | 4 | 3.8 | 12° | 6 | 65 | 3,900 | 10.83 | 11.22 | 11.66 | 12.14 | 13.25 |
| 08-00520-32001 | | 12 | 3 | 4 | 3.8 | 12° | 6 | 65 | 5,100 | 12.91 | 13.40 | 13.94 | 14.53 | 15.91 |
| 08-00520-32002 | | 14 | 3 | 4 | 3.8 | 12° | 6 | 65 | 5,100 | 15.00 | 15.58 | 16.22 | 16.92 | 18.56 |
| 08-00520-02001 | | 15 | 3 | 4 | 3.8 | 12° | 6 | 65 | 5,100 | 16.04 | 16.67 | 17.36 | 18.12 | 19.89 |
| 08-00520-32003 | | 16 | 3 | 4 | 3.8 | 12° | 6 | 65 | 5,100 | 17.09 | 17.76 | 18.50 | 19.32 | 21.22 |
| 08-00520-02003 | | 20 | 3 | 4 | 3.8 | 12° | 6 | 65 | 5,100 | 21.26 | 22.12 | 23.06 | 24.10 | Free |
| 08-00520-02004 | | 25 | 3 | 4 | 3.8 | 12° | 6 | 70 | 5,100 | 26.47 | 27.57 | 28.77 | 30.09 | Free |
| 08-00520-02005 | | 30 | 3 | 4 | 3.8 | 12° | 6 | 70 | 5,100 | 31.68 | 33.01 | 34.47 | Free | Free |
| 08-00520-02006 | | 35 | 3 | 4 | 3.8 | 12° | 6 | 80 | 5,900 | 36.90 | 38.46 | 40.17 | Free | Free |
| 08-00520-02007 | | 40 | 3 | 4 | 3.8 | 12° | 6 | 85 | 6,600 | 42.11 | 43.91 | Free | Free | Free |
| 08-00520-02008 | | 45 | 3 | 4 | 3.8 | 12° | 6 | 90 | 8,500 | 47.33 | 49.36 | Free | Free | Free |
| 08-00520-02009 | | 50 | 3 | 4 | 3.8 | 12° | 6 | 100 | 9,100 | 52.54 | 54.80 | Free | Free | Free |
| 08-00520-32501 | R2.5 | 10 | 3.5 | 5 | 4.8 | 12° | 6 | 70 | 6,000 | 10.81 | 11.18 | 11.59 | 12.04 | Free |
| 08-00520-12501 | | 15 | 3.5 | 5 | 4.8 | 12° | 6 | 70 | 8,500 | 16.02 | 16.63 | 17.29 | Free | Free |
| 08-00520-02501 | | 20 | 3.5 | 5 | 4.8 | 12° | 6 | 70 | 8,500 | 21.24 | 22.08 | Free | Free | Free |
| 08-00520-02502 | | 25 | 3.5 | 5 | 4.8 | 12° | 6 | 70 | 8,500 | 26.45 | 27.52 | Free | Free | Free |
| 08-00520-02503 | | 30 | 3.5 | 5 | 4.8 | 12° | 6 | 80 | 9,100 | 31.66 | Free | Free | Free | Free |
| 08-00520-02504 | | 35 | 3.5 | 5 | 4.8 | 12° | 6 | 80 | 9,100 | 36.88 | Free | Free | Free | Free |
| 08-00520-12502 | | 40 | 3.5 | 5 | 4.8 | 12° | 6 | 90 | 11,500 | 42.09 | Free | Free | Free | Free |
| 08-00520-12503 | | 45 | 3.5 | 5 | 4.8 | 12° | 6 | 100 | 12,000 | 47.31 | Free | Free | Free | Free |
| 08-00520-12504 | | 50 | 3.5 | 5 | 4.8 | 12° | 6 | 100 | 13,000 | 52.52 | Free | Free | Free | Free |
| 08-00520-33001 | R3 | 10 | 6 | 6 | 5.8 | – | 6 | 70 | 6,400 | Free | Free | Free | Free | Free |
| 08-00520-43001 | | 15 | 6 | 6 | 5.8 | – | 6 | 70 | 6,400 | Free | Free | Free | Free | Free |
| 08-00520-13001 | | 20 | 6 | 6 | 5.8 | – | 6 | 70 | 6,400 | Free | Free | Free | Free | Free |
| 08-00520-13002 | | 25 | 6 | 6 | 5.8 | – | 6 | 70 | 6,400 | Free | Free | Free | Free | Free |
| 08-00520-03001 | | 30 | 6 | 6 | 5.8 | – | 6 | 80 | 6,600 | Free | Free | Free | Free | Free |
| 08-00520-13003 | | 35 | 6 | 6 | 5.8 | – | 6 | 80 | 6,800 | Free | Free | Free | Free | Free |
| 08-00520-13004 | | 40 | 6 | 6 | 5.8 | – | 6 | 90 | 7,200 | Free | Free | Free | Free | Free |
| 08-00520-13005 | | 45 | 6 | 6 | 5.8 | – | 6 | 100 | 7,700 | Free | Free | Free | Free | Free |
| 08-00520-03003 | | 50 | 6 | 6 | 5.8 | – | 6 | 120 | 7,800 | Free | Free | Free | Free | Free |

# MRB230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK・HPM-1 (~45HRC) | | | | 焼き入れ鋼 Hardened Steels SKD・STAVAX・HPM-38 (~55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (~62HRC) | | | | 銅 Copper | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 有効長 Effective Length | 刃径と有効長の比 L/D | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.05 | 0.3 | 3 | 0.005 | 0.005 | 80 | 20,000~50,000 | 0.003 | 0.003 | 60 | 20,000~50,000 | 0.003 | 0.003 | 50 | 20,000~50,000 | 0.005 | 0.005 | 80 | 20,000~50,000 |
| | 0.5 | 5 | 0.003 | 0.003 | 70 | 20,000~50,000 | 0.003 | 0.003 | 40 | 20,000~50,000 | 0.003 | 0.003 | 40 | 20,000~50,000 | 0.005 | 0.005 | 70 | 20,000~50,000 |
| 0.075 | 0.3 | 2 | 0.005 | 0.015 | 150 | 20,000~50,000 | 0.003 | 0.005 | 120 | 20,000~50,000 | 0.002 | 0.005 | 90 | 20,000~50,000 | 0.008 | 0.01 | 150 | 20,000~50,000 |
| | 0.5 | 3.33 | 0.004 | 0.007 | 150 | 20,000~50,000 | 0.003 | 0.005 | 120 | 20,000~50,000 | 0.002 | 0.005 | 90 | 20,000~50,000 | 0.007 | 0.008 | 150 | 20,000~50,000 |
| | 1 | 6.67 | 0.003 | 0.005 | 100 | 20,000~50,000 | 0.002 | 0.003 | 70 | 20,000~50,000 | 0.001 | 0.003 | 60 | 20,000~50,000 | 0.005 | 0.007 | 100 | 20,000~50,000 |
| 0.1 | 0.5 | 2.5 | 0.01 | 0.02 | 250 | 20,000~50,000 | 0.01 | 0.01 | 210 | 20,000~50,000 | 0.007 | 0.007 | 170 | 20,000~50,000 | 0.01 | 0.02 | 250 | 20,000~50,000 |
| | 0.75 | 3.75 | 0.007 | 0.01 | 250 | 20,000~50,000 | 0.005 | 0.01 | 210 | 20,000~50,000 | 0.004 | 0.007 | 170 | 20,000~50,000 | 0.01 | 0.015 | 250 | 20,000~50,000 |
| | 1 | 5 | 0.005 | 0.01 | 250 | 20,000~50,000 | 0.003 | 0.005 | 210 | 20,000~50,000 | 0.002 | 0.004 | 170 | 20,000~50,000 | 0.008 | 0.015 | 250 | 20,000~50,000 |
| | 1.25 | 6.25 | 0.003 | 0.01 | 150 | 20,000~50,000 | 0.003 | 0.005 | 120 | 20,000~50,000 | 0.002 | 0.004 | 100 | 20,000~50,000 | 0.005 | 0.015 | 150 | 20,000~50,000 |
| | 1.5 | 7.5 | 0.003 | 0.01 | 150 | 20,000~50,000 | 0.003 | 0.005 | 120 | 20,000~50,000 | 0.002 | 0.004 | 100 | 20,000~50,000 | 0.005 | 0.015 | 150 | 20,000~50,000 |
| | 1.75 | 8.75 | 0.003 | 0.007 | 150 | 20,000~50,000 | 0.002 | 0.005 | 120 | 20,000~50,000 | 0.002 | 0.003 | 100 | 20,000~50,000 | 0.005 | 0.01 | 150 | 20,000~50,000 |
| | 2 | 10 | 0.003 | 0.005 | 100 | 20,000~50,000 | 0.002 | 0.003 | 80 | 20,000~50,000 | 0.002 | 0.003 | 70 | 20,000~50,000 | 0.005 | 0.007 | 100 | 20,000~50,000 |
| | 2.5 | 12.5 | 0.003 | 0.005 | 100 | 20,000~50,000 | 0.002 | 0.003 | 80 | 20,000~50,000 | 0.002 | 0.003 | 70 | 20,000~50,000 | 0.005 | 0.007 | 100 | 20,000~50,000 |
| | 3 | 15 | 0.002 | 0.003 | 80 | 20,000~50,000 | 0.002 | 0.002 | 60 | 20,000~50,000 | 0.002 | 0.002 | 50 | 20,000~50,000 | 0.003 | 0.004 | 80 | 20,000~50,000 |
| 0.15 | 0.5 | 1.7 | 0.01 | 0.02 | 250 | 20,000~50,000 | 0.01 | 0.015 | 210 | 20,000~50,000 | 0.007 | 0.01 | 170 | 20,000~50,000 | 0.012 | 0.025 | 250 | 20,000~50,000 |
| | 0.6 | 2 | 0.01 | 0.02 | 250 | 20,000~50,000 | 0.01 | 0.015 | 210 | 20,000~50,000 | 0.007 | 0.01 | 170 | 20,000~50,000 | 0.012 | 0.025 | 250 | 20,000~50,000 |
| | 0.75 | 2.5 | 0.008 | 0.015 | 250 | 20,000~50,000 | 0.007 | 0.01 | 210 | 20,000~50,000 | 0.005 | 0.007 | 170 | 20,000~50,000 | 0.01 | 0.02 | 250 | 20,000~50,000 |
| | 1 | 3.3 | 0.007 | 0.01 | 250 | 20,000~50,000 | 0.005 | 0.01 | 210 | 20,000~50,000 | 0.004 | 0.007 | 170 | 20,000~50,000 | 0.01 | 0.02 | 250 | 20,000~50,000 |
| | 1.25 | 4.2 | 0.005 | 0.01 | 250 | 20,000~50,000 | 0.005 | 0.005 | 210 | 20,000~50,000 | 0.004 | 0.004 | 170 | 20,000~50,000 | 0.008 | 0.015 | 250 | 20,000~50,000 |
| | 1.5 | 5 | 0.005 | 0.01 | 200 | 20,000~50,000 | 0.005 | 0.005 | 170 | 20,000~50,000 | 0.004 | 0.004 | 140 | 20,000~50,000 | 0.008 | 0.015 | 200 | 20,000~50,000 |
| | 1.75 | 5.8 | 0.005 | 0.01 | 200 | 20,000~50,000 | 0.005 | 0.005 | 170 | 20,000~50,000 | 0.004 | 0.004 | 140 | 20,000~50,000 | 0.008 | 0.015 | 200 | 20,000~50,000 |
| | 2 | 6.7 | 0.003 | 0.01 | 150 | 20,000~50,000 | 0.003 | 0.005 | 120 | 20,000~50,000 | 0.002 | 0.003 | 100 | 20,000~50,000 | 0.005 | 0.012 | 150 | 20,000~50,000 |
| | 2.25 | 7.5 | 0.003 | 0.01 | 150 | 20,000~50,000 | 0.003 | 0.005 | 120 | 20,000~50,000 | 0.002 | 0.003 | 100 | 20,000~50,000 | 0.005 | 0.012 | 150 | 20,000~50,000 |
| | 2.5 | 8.3 | 0.003 | 0.007 | 150 | 20,000~50,000 | 0.003 | 0.003 | 120 | 20,000~50,000 | 0.002 | 0.002 | 100 | 20,000~50,000 | 0.005 | 0.01 | 150 | 20,000~50,000 |
| | 2.75 | 9.2 | 0.003 | 0.007 | 150 | 20,000~50,000 | 0.003 | 0.003 | 120 | 20,000~50,000 | 0.002 | 0.002 | 100 | 20,000~50,000 | 0.005 | 0.01 | 150 | 20,000~50,000 |
| | 3 | 10 | 0.003 | 0.005 | 150 | 20,000~50,000 | 0.003 | 0.003 | 120 | 20,000~50,000 | 0.002 | 0.002 | 100 | 20,000~50,000 | 0.005 | 0.007 | 150 | 20,000~50,000 |
| | 3.5 | 11.7 | 0.003 | 0.005 | 100 | 20,000~50,000 | 0.003 | 0.003 | 80 | 20,000~50,000 | 0.002 | 0.002 | 70 | 20,000~50,000 | 0.005 | 0.007 | 100 | 20,000~50,000 |
| | 4 | 13.3 | 0.003 | 0.005 | 100 | 20,000~50,000 | 0.003 | 0.003 | 80 | 20,000~50,000 | 0.002 | 0.002 | 70 | 20,000~50,000 | 0.005 | 0.007 | 100 | 20,000~50,000 |
| | 4.5 | 15 | 0.003 | 0.003 | 80 | 20,000~50,000 | 0.003 | 0.003 | 80 | 20,000~50,000 | 0.002 | 0.002 | 50 | 20,000~50,000 | 0.005 | 0.005 | 80 | 20,000~50,000 |
| | 5 | 16.7 | 0.003 | 0.003 | 80 | 20,000~50,000 | 0.003 | 0.003 | 80 | 20,000~50,000 | 0.002 | 0.002 | 50 | 20,000~50,000 | 0.005 | 0.005 | 80 | 20,000~50,000 |
| 0.2 | 0.5 | 1.25 | 0.02 | 0.05 | 800 | 20,000~50,000 | 0.02 | 0.03 | 650 | 20,000~50,000 | 0.015 | 0.02 | 560 | 20,000~50,000 | 0.03 | 0.07 | 800 | 20,000~50,000 |
| | 0.75 | 1.9 | 0.02 | 0.05 | 800 | 20,000~50,000 | 0.02 | 0.03 | 650 | 20,000~50,000 | 0.015 | 0.02 | 560 | 20,000~50,000 | 0.03 | 0.07 | 800 | 20,000~50,000 |
| | 1 | 2.5 | 0.02 | 0.05 | 800 | 20,000~50,000 | 0.02 | 0.03 | 650 | 20,000~50,000 | 0.015 | 0.02 | 560 | 20,000~50,000 | 0.03 | 0.07 | 800 | 20,000~50,000 |
| | 1.5 | 3.8 | 0.02 | 0.03 | 700 | 20,000~50,000 | 0.01 | 0.02 | 600 | 20,000~50,000 | 0.007 | 0.015 | 490 | 20,000~50,000 | 0.03 | 0.05 | 700 | 20,000~50,000 |
| | 2 | 5 | 0.015 | 0.02 | 600 | 20,000~50,000 | 0.01 | 0.015 | 500 | 20,000~50,000 | 0.007 | 0.01 | 420 | 20,000~50,000 | 0.02 | 0.03 | 600 | 20,000~50,000 |
| | 2.5 | 6.3 | 0.015 | 0.02 | 450 | 20,000~50,000 | 0.01 | 0.015 | 380 | 20,000~50,000 | 0.007 | 0.01 | 310 | 20,000~50,000 | 0.02 | 0.03 | 450 | 20,000~50,000 |
| | 3 | 7.5 | 0.01 | 0.02 | 400 | 20,000~30,000 | 0.01 | 0.01 | 340 | 20,000~30,000 | 0.007 | 0.007 | 280 | 20,000~30,000 | 0.015 | 0.03 | 400 | 20,000~30,000 |
| | 3.5 | 8.8 | 0.01 | 0.015 | 350 | 20,000~30,000 | 0.01 | 0.01 | 300 | 20,000~30,000 | 0.007 | 0.007 | 240 | 20,000~30,000 | 0.015 | 0.02 | 350 | 20,000~30,000 |
| | 4 | 10 | 0.005 | 0.01 | 250 | 20,000~30,000 | 0.005 | 0.007 | 210 | 20,000~30,000 | 0.004 | 0.004 | 170 | 20,000~30,000 | 0.008 | 0.015 | 250 | 20,000~30,000 |
| | 4.5 | 11.3 | 0.005 | 0.007 | 200 | 20,000~30,000 | 0.005 | 0.005 | 170 | 20,000~30,000 | 0.004 | 0.004 | 140 | 20,000~30,000 | 0.008 | 0.01 | 200 | 20,000~30,000 |
| | 5 | 12.5 | 0.003 | 0.005 | 150 | 20,000~30,000 | 0.003 | 0.005 | 120 | 20,000~30,000 | 0.002 | 0.003 | 100 | 20,000~30,000 | 0.005 | 0.007 | 150 | 20,000~30,000 |
| | 5.5 | 13.8 | 0.003 | 0.005 | 100 | 20,000~30,000 | 0.003 | 0.005 | 80 | 20,000~30,000 | 0.002 | 0.003 | 70 | 20,000~30,000 | 0.005 | 0.007 | 100 | 20,000~30,000 |
| | 6 | 15 | 0.003 | 0.003 | 80 | 20,000~30,000 | 0.003 | 0.003 | 60 | 20,000~30,000 | 0.002 | 0.002 | 50 | 20,000~30,000 | 0.005 | 0.005 | 80 | 20,000~30,000 |
| 0.25 | 1 | 2 | 0.03 | 0.05 | 800 | 20,000~50,000 | 0.02 | 0.05 | 680 | 20,000~50,000 | 0.015 | 0.035 | 560 | 20,000~50,000 | 0.045 | 0.07 | 800 | 20,000~50,000 |
| | 1.5 | 3 | 0.03 | 0.05 | 700 | 20,000~50,000 | 0.02 | 0.04 | 600 | 20,000~50,000 | 0.015 | 0.03 | 490 | 20,000~50,000 | 0.04 | 0.07 | 700 | 20,000~50,000 |
| | 2 | 4 | 0.02 | 0.04 | 600 | 20,000~50,000 | 0.02 | 0.03 | 510 | 20,000~50,000 | 0.015 | 0.02 | 420 | 20,000~50,000 | 0.03 | 0.06 | 600 | 20,000~50,000 |
| | 2.5 | 5 | 0.015 | 0.04 | 600 | 20,000~50,000 | 0.01 | 0.03 | 510 | 20,000~50,000 | 0.007 | 0.02 | 420 | 20,000~50,000 | 0.02 | 0.06 | 600 | 20,000~50,000 |
| | 3 | 6 | 0.015 | 0.035 | 500 | 20,000~50,000 | 0.01 | 0.025 | 420 | 20,000~50,000 | 0.007 | 0.015 | 350 | 20,000~50,000 | 0.02 | 0.05 | 500 | 20,000~50,000 |
| | 3.5 | 7 | 0.015 | 0.03 | 400 | 20,000~50,000 | 0.01 | 0.02 | 340 | 20,000~50,000 | 0.007 | 0.015 | 280 | 20,000~50,000 | 0.02 | 0.045 | 400 | 20,000~50,000 |



ŞEVKET ÖLÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| 被削材 Work Material | | | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK・HPM-1 (~45HRC) | | | | 焼き入れ鋼 Hardened Steels SKD・STAVAX・HPM-38 (~55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (~62HRC) | | | | 銅 Copper | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 有効長 Effective Length | 刃径と有効長の比 L/D | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.25 | 4 | 8 | 0.012 | 0.02 | 400 | 20,000~50,000 | 0.005 | 0.01 | 340 | 20,000~50,000 | 0.004 | 0.007 | 280 | 20,000~50,000 | 0.018 | 0.03 | 400 | 20,000~50,000 |
| | 4.5 | 9 | 0.008 | 0.01 | 320 | 20,000~50,000 | 0.005 | 0.005 | 270 | 20,000~50,000 | 0.004 | 0.004 | 220 | 20,000~50,000 | 0.012 | 0.015 | 320 | 20,000~50,000 |
| | 5 | 10 | 0.005 | 0.01 | 250 | 20,000~30,000 | 0.005 | 0.005 | 210 | 20,000~30,000 | 0.003 | 0.003 | 170 | 20,000~30,000 | 0.008 | 0.015 | 250 | 20,000~30,000 |
| | 5.5 | 11 | 0.005 | 0.007 | 200 | 20,000~30,000 | 0.003 | 0.003 | 170 | 20,000~30,000 | 0.002 | 0.002 | 140 | 20,000~30,000 | 0.008 | 0.01 | 200 | 20,000~30,000 |
| | 6 | 12 | 0.005 | 0.005 | 150 | 20,000~30,000 | 0.003 | 0.003 | 120 | 20,000~30,000 | 0.002 | 0.002 | 100 | 20,000~30,000 | 0.008 | 0.008 | 150 | 20,000~30,000 |
| | 7 | 14 | 0.003 | 0.005 | 120 | 20,000~30,000 | 0.003 | 0.003 | 100 | 20,000~30,000 | 0.002 | 0.002 | 80 | 20,000~30,000 | 0.005 | 0.008 | 120 | 20,000~30,000 |
| | 8 | 16 | 0.003 | 0.003 | 120 | 20,000~30,000 | 0.002 | 0.002 | 100 | 20,000~30,000 | 0.002 | 0.002 | 80 | 20,000~30,000 | 0.005 | 0.005 | 120 | 20,000~30,000 |
| | 9 | 18 | 0.002 | 0.002 | 100 | 18,000~24,000 | 0.002 | 0.002 | 80 | 18,000~24,000 | 0.002 | 0.002 | 70 | 18,000~24,000 | 0.003 | 0.003 | 100 | 18,000~24,000 |
| | 10 | 20 | 0.002 | 0.002 | 80 | 18,000~24,000 | 0.002 | 0.002 | 60 | 18,000~24,000 | 0.002 | 0.002 | 50 | 18,000~24,000 | 0.003 | 0.003 | 80 | 18,000~24,000 |
| 0.3 | 1 | 1.7 | 0.05 | 0.1 | 1,200 | 20,000~50,000 | 0.05 | 0.07 | 1,000 | 20,000~50,000 | 0.035 | 0.05 | 840 | 20,000~50,000 | 0.07 | 0.12 | 1,200 | 20,000~50,000 |
| | 1.5 | 2.5 | 0.05 | 0.1 | 1,200 | 20,000~50,000 | 0.05 | 0.07 | 1,000 | 20,000~50,000 | 0.035 | 0.05 | 840 | 20,000~50,000 | 0.07 | 0.12 | 1,200 | 20,000~50,000 |
| | 2 | 3.3 | 0.05 | 0.1 | 1,200 | 20,000~50,000 | 0.04 | 0.07 | 1,000 | 20,000~50,000 | 0.028 | 0.05 | 840 | 20,000~50,000 | 0.07 | 0.12 | 1,200 | 20,000~50,000 |
| | 2.5 | 4.2 | 0.035 | 0.1 | 1,200 | 20,000~50,000 | 0.03 | 0.06 | 1,000 | 20,000~50,000 | 0.02 | 0.04 | 840 | 20,000~50,000 | 0.05 | 0.12 | 1,200 | 20,000~50,000 |
| | 3 | 5 | 0.025 | 0.1 | 1,000 | 20,000~50,000 | 0.03 | 0.05 | 850 | 20,000~50,000 | 0.02 | 0.035 | 700 | 20,000~50,000 | 0.04 | 0.1 | 1,000 | 20,000~50,000 |
| | 3.5 | 5.8 | 0.025 | 0.08 | 1,000 | 20,000~50,000 | 0.02 | 0.05 | 850 | 20,000~50,000 | 0.015 | 0.035 | 700 | 20,000~50,000 | 0.04 | 0.1 | 1,000 | 20,000~50,000 |
| | 4 | 6.7 | 0.025 | 0.05 | 800 | 20,000~50,000 | 0.02 | 0.04 | 680 | 20,000~50,000 | 0.015 | 0.03 | 560 | 20,000~50,000 | 0.035 | 0.08 | 800 | 20,000~50,000 |
| | 4.5 | 7.5 | 0.025 | 0.05 | 750 | 20,000~50,000 | 0.01 | 0.03 | 630 | 20,000~50,000 | 0.007 | 0.02 | 520 | 20,000~50,000 | 0.035 | 0.08 | 750 | 20,000~50,000 |
| | 5 | 8.3 | 0.02 | 0.04 | 500 | 20,000~30,000 | 0.01 | 0.02 | 420 | 20,000~30,000 | 0.007 | 0.015 | 350 | 20,000~30,000 | 0.03 | 0.06 | 500 | 20,000~30,000 |
| | 5.5 | 9.2 | 0.013 | 0.02 | 500 | 20,000~30,000 | 0.01 | 0.01 | 420 | 20,000~30,000 | 0.007 | 0.007 | 350 | 20,000~30,000 | 0.02 | 0.03 | 500 | 20,000~30,000 |
| | 6 | 10 | 0.01 | 0.02 | 450 | 20,000~30,000 | 0.005 | 0.01 | 380 | 20,000~30,000 | 0.004 | 0.007 | 310 | 20,000~30,000 | 0.015 | 0.03 | 450 | 20,000~30,000 |
| | 6.5 | 10.8 | 0.008 | 0.02 | 450 | 20,000~30,000 | 0.005 | 0.005 | 380 | 20,000~30,000 | 0.004 | 0.004 | 310 | 20,000~30,000 | 0.012 | 0.03 | 450 | 20,000~30,000 |
| | 7 | 11.7 | 0.008 | 0.02 | 400 | 20,000~30,000 | 0.005 | 0.005 | 340 | 20,000~30,000 | 0.004 | 0.004 | 280 | 20,000~30,000 | 0.012 | 0.03 | 400 | 20,000~30,000 |
| | 7.5 | 12.5 | 0.005 | 0.02 | 350 | 20,000~30,000 | 0.003 | 0.005 | 300 | 20,000~30,000 | 0.003 | 0.004 | 250 | 20,000~30,000 | 0.008 | 0.03 | 350 | 20,000~30,000 |
| | 8 | 13.3 | 0.005 | 0.01 | 300 | 18,000~24,000 | 0.003 | 0.005 | 250 | 18,000~24,000 | 0.002 | 0.004 | 210 | 18,000~24,000 | 0.008 | 0.015 | 300 | 18,000~24,000 |
| | 8.5 | 14.2 | 0.005 | 0.01 | 250 | 18,000~24,000 | 0.003 | 0.003 | 210 | 18,000~24,000 | 0.002 | 0.002 | 170 | 18,000~24,000 | 0.008 | 0.015 | 250 | 18,000~24,000 |
| | 9 | 15 | 0.005 | 0.01 | 250 | 18,000~24,000 | 0.003 | 0.003 | 210 | 18,000~24,000 | 0.002 | 0.002 | 170 | 18,000~24,000 | 0.007 | 0.015 | 250 | 18,000~24,000 |
| | 9.5 | 15.8 | 0.005 | 0.005 | 200 | 18,000~24,000 | 0.003 | 0.003 | 170 | 18,000~24,000 | 0.002 | 0.002 | 140 | 18,000~24,000 | 0.007 | 0.008 | 200 | 18,000~24,000 |
| | 10 | 16.7 | 0.003 | 0.005 | 150 | 18,000~24,000 | 0.002 | 0.003 | 120 | 18,000~24,000 | 0.002 | 0.002 | 100 | 18,000~24,000 | 0.005 | 0.008 | 150 | 18,000~24,000 |
| | 11 | 18.3 | 0.003 | 0.003 | 110 | 16,000~20,000 | 0.002 | 0.002 | 90 | 16,000~20,000 | 0.002 | 0.002 | 80 | 16,000~20,000 | 0.005 | 0.005 | 110 | 16,000~20,000 |
| | 12 | 20 | 0.003 | 0.003 | 80 | 16,000~20,000 | 0.002 | 0.002 | 60 | 16,000~20,000 | 0.002 | 0.002 | 50 | 16,000~20,000 | 0.005 | 0.005 | 80 | 16,000~20,000 |
| 0.35 | 2 | 2.9 | 0.08 | 0.12 | 1,800 | 20,000~50,000 | 0.07 | 0.08 | 1,300 | 20,000~50,000 | 0.04 | 0.06 | 1,000 | 20,000~30,000 | 0.1 | 0.15 | 1,500 | 20,000~30,000 |
| | 4 | 5.7 | 0.05 | 0.11 | 1,300 | 20,000~50,000 | 0.03 | 0.06 | 1,100 | 20,000~50,000 | 0.02 | 0.04 | 700 | 20,000~30,000 | 0.06 | 0.12 | 1,200 | 20,000~30,000 |
| | 6 | 8.6 | 0.03 | 0.05 | 700 | 20,000~30,000 | 0.01 | 0.02 | 600 | 20,000~30,000 | 0.008 | 0.015 | 450 | 20,000~30,000 | 0.04 | 0.07 | 600 | 20,000~30,000 |
| | 8 | 11.4 | 0.005 | 0.01 | 400 | 18,000~24,000 | 0.003 | 0.005 | 330 | 18,000~24,000 | 0.002 | 0.003 | 250 | 14,000~21,000 | 0.008 | 0.01 | 400 | 18,000~24,000 |
| 0.4 | 2 | 2.5 | 0.1 | 0.15 | 2,000 | 20,000~50,000 | 0.1 | 0.12 | 1,700 | 20,000~50,000 | 0.07 | 0.085 | 1,400 | 14,000~35,000 | 0.15 | 0.2 | 2,000 | 20,000~50,000 |
| | 3 | 3.8 | 0.07 | 0.15 | 1,800 | 20,000~50,000 | 0.07 | 0.1 | 1,500 | 20,000~50,000 | 0.05 | 0.07 | 1,200 | 14,000~35,000 | 0.12 | 0.2 | 1,800 | 20,000~50,000 |
| | 4 | 5 | 0.05 | 0.12 | 1,500 | 20,000~50,000 | 0.05 | 0.08 | 1,300 | 20,000~50,000 | 0.035 | 0.055 | 1,000 | 14,000~35,000 | 0.1 | 0.2 | 1,500 | 20,000~50,000 |
| | 5 | 6.3 | 0.05 | 0.1 | 1,200 | 20,000~50,000 | 0.04 | 0.07 | 1,000 | 20,000~50,000 | 0.03 | 0.05 | 840 | 14,000~35,000 | 0.08 | 0.15 | 1,200 | 20,000~50,000 |
| | 6 | 7.5 | 0.05 | 0.08 | 900 | 20,000~30,000 | 0.03 | 0.05 | 750 | 20,000~30,000 | 0.02 | 0.035 | 630 | 14,000~21,000 | 0.07 | 0.12 | 900 | 20,000~30,000 |
| | 7 | 8.8 | 0.03 | 0.05 | 700 | 20,000~30,000 | 0.02 | 0.03 | 600 | 20,000~30,000 | 0.015 | 0.02 | 490 | 14,000~21,000 | 0.05 | 0.08 | 700 | 20,000~30,000 |
| | 8 | 10 | 0.015 | 0.03 | 500 | 18,000~24,000 | 0.01 | 0.01 | 420 | 18,000~24,000 | 0.007 | 0.007 | 350 | 12,600~16,800 | 0.02 | 0.05 | 500 | 18,000~24,000 |
| | 9 | 11.3 | 0.005 | 0.01 | 400 | 18,000~24,000 | 0.003 | 0.005 | 340 | 18,000~24,000 | 0.002 | 0.003 | 280 | 12,600~16,800 | 0.008 | 0.01 | 400 | 18,000~24,000 |
| | 10 | 12.5 | 0.005 | 0.01 | 350 | 18,000~24,000 | 0.003 | 0.005 | 300 | 18,000~24,000 | 0.002 | 0.003 | 240 | 12,600~16,800 | 0.008 | 0.008 | 350 | 18,000~24,000 |
| | 12 | 15 | 0.005 | 0.005 | 250 | 16,000~20,000 | 0.003 | 0.003 | 210 | 16,000~20,000 | 0.002 | 0.002 | 170 | 11,200~14,000 | 0.008 | 0.008 | 250 | 16,000~20,000 |
| 0.45 | 2 | 2.2 | 0.15 | 0.2 | 2,500 | 20,000~50,000 | 0.1 | 0.2 | 2,000 | 20,000~50,000 | 0.07 | 0.15 | 1,800 | 14,000~35,000 | 0.2 | 0.3 | 2,800 | 20,000~50,000 |
| | 4 | 4.4 | 0.1 | 0.2 | 2,000 | 20,000~50,000 | 0.05 | 0.12 | 1,500 | 20,000~50,000 | 0.04 | 0.08 | 1,100 | 14,000~35,000 | 0.15 | 0.25 | 2,000 | 20,000~50,000 |
| | 6 | 6.7 | 0.07 | 0.15 | 1,300 | 20,000~30,000 | 0.035 | 0.05 | 1,000 | 20,000~30,000 | 0.025 | 0.035 | 650 | 14,000~21,000 | 0.1 | 0.2 | 1,300 | 20,000~30,000 |
| | 8 | 8.9 | 0.035 | 0.05 | 800 | 20,000~30,000 | 0.025 | 0.04 | 700 | 20,000~30,000 | 0.015 | 0.025 | 550 | 12,600~16,800 | 0.055 | 0.08 | 800 | 18,000~24,000 |

# MRB230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK・HPM-1 (~45HRC) | | | | 焼き入れ鋼 Hardened Steels SKD・STAVAX・HPM-38 (~55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (~62HRC) | | | | 銅 Copper | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 有効長 Effective Length | 刃径と有効長の比 L/D | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.5 | 2 | 2 | 0.25 | 0.35 | 3,200 | 20,000~50,000 | 0.12 | 0.3 | 2,500 | 20,000~50,000 | 0.085 | 0.2 | 2,300 | 14,000~35,000 | 0.25 | 0.4 | 3,500 | 20,000~50,000 |
| | 2.5 | 2.5 | 0.25 | 0.3 | 3,000 | 20,000~50,000 | 0.12 | 0.3 | 2,500 | 20,000~50,000 | 0.08 | 0.2 | 2,300 | 14,000~35,000 | 0.25 | 0.4 | 3,200 | 20,000~50,000 |
| | 3 | 3 | 0.2 | 0.3 | 3,000 | 20,000~50,000 | 0.12 | 0.3 | 2,500 | 20,000~50,000 | 0.08 | 0.2 | 2,100 | 14,000~35,000 | 0.25 | 0.4 | 3,000 | 20,000~50,000 |
| | 4 | 4 | 0.15 | 0.25 | 2,500 | 20,000~50,000 | 0.1 | 0.2 | 2,100 | 20,000~50,000 | 0.07 | 0.14 | 1,700 | 14,000~35,000 | 0.2 | 0.4 | 2,500 | 20,000~50,000 |
| | 5 | 5 | 0.1 | 0.25 | 2,000 | 20,000~50,000 | 0.08 | 0.17 | 1,700 | 20,000~50,000 | 0.055 | 0.12 | 1,400 | 14,000~35,000 | 0.15 | 0.35 | 2,000 | 20,000~50,000 |
| | 6 | 6 | 0.1 | 0.2 | 1,500 | 20,000~50,000 | 0.07 | 0.12 | 1,200 | 20,000~50,000 | 0.05 | 0.085 | 1,000 | 14,000~35,000 | 0.15 | 0.3 | 1,500 | 20,000~50,000 |
| | 7 | 7 | 0.08 | 0.2 | 1,300 | 20,000~30,000 | 0.06 | 0.1 | 1,100 | 20,000~30,000 | 0.04 | 0.07 | 910 | 14,000~21,000 | 0.12 | 0.3 | 1,300 | 20,000~30,000 |
| | 8 | 8 | 0.05 | 0.1 | 1,200 | 20,000~30,000 | 0.05 | 0.08 | 1,000 | 20,000~30,000 | 0.035 | 0.055 | 840 | 14,000~21,000 | 0.08 | 0.15 | 1,200 | 20,000~30,000 |
| | 9 | 9 | 0.04 | 0.06 | 1,000 | 20,000~30,000 | 0.05 | 0.05 | 850 | 20,000~30,000 | 0.035 | 0.035 | 700 | 14,000~21,000 | 0.06 | 0.1 | 1,000 | 20,000~30,000 |
| | 10 | 10 | 0.03 | 0.05 | 800 | 20,000~30,000 | 0.03 | 0.05 | 680 | 20,000~30,000 | 0.02 | 0.035 | 560 | 14,000~21,000 | 0.05 | 0.08 | 800 | 20,000~30,000 |
| | 12 | 12 | 0.015 | 0.025 | 600 | 16,000~20,000 | 0.01 | 0.03 | 510 | 16,000~20,000 | 0.007 | 0.02 | 420 | 11,200~14,000 | 0.02 | 0.04 | 600 | 16,000~20,000 |
| | 13 | 13 | 0.012 | 0.025 | 600 | 16,000~20,000 | 0.007 | 0.02 | 450 | 16,000~20,000 | 0.005 | 0.01 | 400 | 11,200~14,000 | 0.015 | 0.03 | 600 | 16,000~20,000 |
| | 14 | 14 | 0.01 | 0.02 | 500 | 16,000~20,000 | 0.005 | 0.01 | 420 | 16,000~20,000 | 0.004 | 0.007 | 350 | 11,200~14,000 | 0.015 | 0.03 | 500 | 16,000~20,000 |
| | 16 | 16 | 0.005 | 0.01 | 250 | 12,000~16,000 | 0.005 | 0.01 | 210 | 12,000~16,000 | 0.004 | 0.007 | 170 | 8,400~11,200 | 0.01 | 0.015 | 250 | 12,000~16,000 |
| | 18 | 18 | 0.005 | 0.005 | 150 | 12,000~16,000 | 0.003 | 0.003 | 120 | 12,000~16,000 | 0.002 | 0.002 | 100 | 8,400~11,200 | 0.008 | 0.01 | 150 | 12,000~16,000 |
| | 20 | 20 | 0.005 | 0.005 | 100 | 12,000~16,000 | 0.003 | 0.003 | 80 | 12,000~16,000 | 0.002 | 0.002 | 70 | 8,400~11,200 | 0.008 | 0.008 | 100 | 12,000~16,000 |
| | 22 | 22 | 0.003 | 0.005 | 80 | 12,000~16,000 | 0.002 | 0.003 | 60 | 12,000~16,000 | 0.002 | 0.002 | 50 | 8,400~11,200 | 0.005 | 0.008 | 80 | 12,000~16,000 |
| 0.6 | 2.4 | 2 | 0.25 | 0.35 | 3,400 | 20,000~30,000 | 0.12 | 0.3 | 2,500 | 20,000~30,000 | 0.09 | 0.21 | 2,500 | 14,000~21,000 | 0.3 | 0.45 | 3,400 | 20,000~30,000 |
| | 4 | 3.3 | 0.2 | 0.3 | 3,000 | 20,000~30,000 | 0.12 | 0.3 | 2,500 | 20,000~30,000 | 0.085 | 0.21 | 2,100 | 14,000~21,000 | 0.28 | 0.45 | 3,000 | 20,000~30,000 |
| | 6 | 5 | 0.1 | 0.25 | 2,000 | 20,000~30,000 | 0.08 | 0.17 | 1,700 | 20,000~30,000 | 0.055 | 0.12 | 1,400 | 14,000~21,000 | 0.15 | 0.4 | 2,000 | 20,000~30,000 |
| | 8 | 6.7 | 0.08 | 0.2 | 1,300 | 20,000~30,000 | 0.06 | 0.15 | 1,100 | 20,000~30,000 | 0.04 | 0.1 | 910 | 14,000~21,000 | 0.12 | 0.3 | 1,300 | 20,000~30,000 |
| | 10 | 8.3 | 0.05 | 0.1 | 1,200 | 14,000~20,000 | 0.03 | 0.08 | 1,000 | 14,000~20,000 | 0.02 | 0.055 | 840 | 9,800~14,000 | 0.08 | 0.15 | 1,200 | 14,000~20,000 |
| | 12 | 10 | 0.03 | 0.05 | 800 | 14,000~20,000 | 0.02 | 0.04 | 680 | 14,000~20,000 | 0.015 | 0.03 | 560 | 9,800~14,000 | 0.05 | 0.08 | 800 | 14,000~20,000 |
| | 14 | 11.7 | 0.015 | 0.025 | 600 | 14,000~20,000 | 0.01 | 0.02 | 510 | 14,000~20,000 | 0.007 | 0.015 | 420 | 9,800~14,000 | 0.02 | 0.04 | 600 | 14,000~20,000 |
| | 16 | 13.3 | 0.01 | 0.02 | 400 | 14,000~20,000 | 0.01 | 0.01 | 340 | 14,000~20,000 | 0.007 | 0.007 | 280 | 9,800~14,000 | 0.015 | 0.03 | 400 | 14,000~20,000 |
| | 18 | 15 | 0.005 | 0.01 | 250 | 12,000~18,000 | 0.005 | 0.01 | 210 | 12,000~18,000 | 0.005 | 0.005 | 170 | 8,400~12,600 | 0.012 | 0.015 | 250 | 12,000~18,000 |
| | 20 | 16.7 | 0.005 | 0.007 | 200 | 12,000~18,000 | 0.005 | 0.005 | 170 | 12,000~18,000 | 0.003 | 0.003 | 140 | 8,400~12,600 | 0.01 | 0.01 | 200 | 12,000~18,000 |
| | 24 | 20 | 0.005 | 0.005 | 100 | 12,000~18,000 | 0.003 | 0.003 | 80 | 12,000~18,000 | 0.002 | 0.002 | 70 | 8,400~12,600 | 0.008 | 0.01 | 100 | 12,000~18,000 |
| 0.7 | 8 | 5.7 | 0.1 | 0.3 | 2,500 | 20,000~30,000 | 0.1 | 0.2 | 2,100 | 20,000~30,000 | 0.07 | 0.14 | 1,700 | 14,000~21,000 | 0.15 | 0.45 | 2,500 | 20,000~30,000 |
| | 12 | 8.6 | 0.07 | 0.12 | 1,200 | 14,000~20,000 | 0.05 | 0.1 | 1,000 | 14,000~20,000 | 0.035 | 0.07 | 840 | 9,800~14,000 | 0.1 | 0.18 | 1,200 | 14,000~20,000 |
| | 16 | 11.4 | 0.03 | 0.05 | 600 | 14,000~20,000 | 0.015 | 0.03 | 510 | 14,000~20,000 | 0.01 | 0.02 | 420 | 9,800~14,000 | 0.05 | 0.08 | 600 | 14,000~20,000 |
| 0.75 | 3 | 2 | 0.2 | 0.35 | 4,000 | 20,000~30,000 | 0.15 | 0.3 | 3,400 | 20,000~30,000 | 0.1 | 0.18 | 2,800 | 14,000~21,000 | 0.3 | 0.5 | 4,000 | 20,000~30,000 |
| | 4 | 2.7 | 0.2 | 0.3 | 4,000 | 20,000~30,000 | 0.15 | 0.25 | 3,400 | 20,000~30,000 | 0.09 | 0.15 | 2,800 | 14,000~21,000 | 0.3 | 0.45 | 4,000 | 20,000~30,000 |
| | 6 | 4 | 0.15 | 0.3 | 3,000 | 20,000~30,000 | 0.12 | 0.2 | 2,500 | 20,000~30,000 | 0.07 | 0.12 | 2,100 | 14,000~21,000 | 0.2 | 0.45 | 3,000 | 20,000~30,000 |
| | 8 | 5.3 | 0.1 | 0.25 | 2,400 | 20,000~30,000 | 0.08 | 0.18 | 2,000 | 20,000~30,000 | 0.05 | 0.11 | 1,700 | 14,000~21,000 | 0.15 | 0.4 | 2,400 | 20,000~30,000 |
| | 10 | 6.7 | 0.08 | 0.2 | 1,800 | 20,000~30,000 | 0.06 | 0.12 | 1,500 | 20,000~30,000 | 0.035 | 0.07 | 1,200 | 14,000~21,000 | 0.12 | 0.3 | 1,800 | 20,000~30,000 |
| | 12 | 8 | 0.07 | 0.13 | 1,200 | 18,000~24,000 | 0.05 | 0.09 | 1,000 | 18,000~24,000 | 0.03 | 0.055 | 840 | 12,600~16,800 | 0.1 | 0.2 | 1,200 | 18,000~24,000 |
| | 14 | 9.3 | 0.06 | 0.1 | 1,200 | 18,000~24,000 | 0.04 | 0.07 | 1,000 | 18,000~24,000 | 0.025 | 0.04 | 840 | 12,600~16,800 | 0.1 | 0.15 | 1,200 | 18,000~24,000 |
| | 16 | 10.7 | 0.05 | 0.08 | 800 | 12,000~18,000 | 0.035 | 0.06 | 680 | 12,000~18,000 | 0.02 | 0.035 | 560 | 8,400~12,600 | 0.07 | 0.12 | 800 | 12,000~18,000 |
| | 18 | 12 | 0.03 | 0.05 | 500 | 12,000~18,000 | 0.02 | 0.04 | 420 | 12,000~18,000 | 0.012 | 0.025 | 350 | 8,400~12,600 | 0.05 | 0.08 | 500 | 12,000~18,000 |
| | 20 | 13.3 | 0.02 | 0.04 | 400 | 12,000~18,000 | 0.015 | 0.03 | 340 | 12,000~18,000 | 0.01 | 0.02 | 280 | 8,400~12,600 | 0.03 | 0.06 | 400 | 12,000~18,000 |
| | 22 | 14.7 | 0.01 | 0.02 | 250 | 10,000~14,000 | 0.005 | 0.005 | 210 | 10,000~14,000 | 0.003 | 0.003 | 170 | 7,000~ 9,800 | 0.02 | 0.03 | 250 | 10,000~14,000 |
| | 30 | 20 | 0.005 | 0.005 | 100 | 10,000~14,000 | 0.003 | 0.005 | 80 | 10,000~14,000 | 0.002 | 0.003 | 70 | 7,000~ 9,800 | 0.01 | 0.008 | 100 | 10,000~14,000 |
| 0.8 | 4 | 2.5 | 0.2 | 0.3 | 4,000 | 18,000~24,000 | 0.17 | 0.25 | 3,400 | 18,000~24,000 | 0.1 | 0.15 | 2,800 | 12,600~16,800 | 0.3 | 0.45 | 4,000 | 18,000~24,000 |
| | 8 | 5 | 0.1 | 0.3 | 3,000 | 18,000~24,000 | 0.09 | 0.2 | 2,500 | 18,000~24,000 | 0.055 | 0.12 | 2,100 | 12,600~16,800 | 0.15 | 0.45 | 3,000 | 18,000~24,000 |
| | 12 | 7.5 | 0.07 | 0.15 | 1,800 | 18,000~24,000 | 0.06 | 0.12 | 1,500 | 18,000~24,000 | 0.035 | 0.07 | 1,300 | 12,600~16,800 | 0.1 | 0.25 | 1,800 | 18,000~24,000 |
| | 16 | 10 | 0.05 | 0.1 | 650 | 12,000~18,000 | 0.035 | 0.07 | 550 | 12,000~18,000 | 0.02 | 0.04 | 450 | 8,400~12,600 | 0.08 | 0.15 | 650 | 12,000~18,000 |
| | 20 | 12.5 | 0.03 | 0.05 | 450 | 12,000~18,000 | 0.02 | 0.04 | 380 | 12,000~18,000 | 0.01 | 0.025 | 310 | 8,400~12,600 | 0.05 | 0.08 | 450 | 12,000~18,000 |



ŞEVKET ÖLÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| 被削材 Work Material | | | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK・HPM-1 (~45HRC) | | | | 焼き入れ鋼 Hardened Steels SKD・STAVAX・HPM-38 (~55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (~62HRC) | | | | 銅 Copper | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 有効長 Effective Length | 刃径と有効長の比 L/D | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.9 | 8 | 4.4 | 0.15 | 0.3 | 2,500 | 16,000~20,000 | 0.12 | 0.2 | 2,100 | 16,000~20,000 | 0.07 | 0.12 | 1,750 | 11,200~14,000 | 0.2 | 0.45 | 2,500 | 16,000~20,000 |
| | 12 | 6.7 | 0.1 | 0.2 | 1,800 | 12,000~16,000 | 0.07 | 0.15 | 1,500 | 12,000~16,000 | 0.04 | 0.09 | 1,300 | 8,400~11,200 | 0.15 | 0.3 | 1,800 | 12,000~16,000 |
| | 16 | 8.9 | 0.08 | 0.13 | 1,600 | 10,000~14,000 | 0.06 | 0.1 | 1,400 | 10,000~14,000 | 0.035 | 0.06 | 1,100 | 7,000~ 9,800 | 0.12 | 0.2 | 1,600 | 10,000~14,000 |
| | 20 | 11.1 | 0.05 | 0.1 | 1,000 | 8,000~12,000 | 0.04 | 0.08 | 850 | 8,000~12,000 | 0.025 | 0.05 | 700 | 5,600~ 8,400 | 0.08 | 0.15 | 1,000 | 8,000~12,000 |
| 1 | 3 | 1.5 | 0.3 | 0.5 | 4,000 | 20,000~30,000 | 0.2 | 0.5 | 3,400 | 20,000~30,000 | 0.12 | 0.3 | 2,800 | 14,000~21,000 | 0.45 | 0.7 | 4,000 | 20,000~30,000 |
| | 4 | 2 | 0.3 | 0.5 | 4,000 | 20,000~30,000 | 0.2 | 0.45 | 3,400 | 20,000~30,000 | 0.12 | 0.27 | 2,800 | 14,000~21,000 | 0.45 | 0.7 | 4,000 | 20,000~30,000 |
| | 6 | 3 | 0.25 | 0.5 | 3,000 | 20,000~30,000 | 0.2 | 0.4 | 2,500 | 20,000~30,000 | 0.12 | 0.24 | 2,100 | 14,000~21,000 | 0.38 | 0.7 | 3,000 | 20,000~30,000 |
| | 8 | 4 | 0.2 | 0.3 | 2,500 | 16,000~20,000 | 0.15 | 0.3 | 2,100 | 16,000~20,000 | 0.09 | 0.18 | 1,700 | 11,200~14,000 | 0.3 | 0.45 | 2,500 | 16,000~20,000 |
| | 10 | 5 | 0.15 | 0.3 | 2,500 | 16,000~20,000 | 0.1 | 0.2 | 2,100 | 16,000~20,000 | 0.06 | 0.12 | 1,700 | 11,200~14,000 | 0.23 | 0.45 | 2,500 | 16,000~20,000 |
| | 12 | 6 | 0.13 | 0.2 | 1,800 | 12,000~16,000 | 0.1 | 0.15 | 1,500 | 12,000~16,000 | 0.06 | 0.09 | 1,300 | 8,400~11,200 | 0.2 | 0.3 | 1,800 | 12,000~16,000 |
| | 13 | 6.5 | 0.12 | 0.2 | 1,800 | 12,000~16,000 | 0.08 | 0.13 | 1,500 | 12,000~16,000 | 0.05 | 0.08 | 1,300 | 8,400~11,200 | 0.2 | 0.3 | 1,800 | 12,000~16,000 |
| | 14 | 7 | 0.1 | 0.2 | 1,800 | 12,000~16,000 | 0.07 | 0.13 | 1,500 | 12,000~16,000 | 0.04 | 0.08 | 1,300 | 8,400~11,200 | 0.15 | 0.3 | 1,800 | 12,000~16,000 |
| | 16 | 8 | 0.1 | 0.15 | 1,600 | 10,000~14,000 | 0.06 | 0.11 | 1,400 | 10,000~14,000 | 0.035 | 0.065 | 1,100 | 7,000~ 9,800 | 0.15 | 0.25 | 1,600 | 10,000~14,000 |
| | 18 | 9 | 0.07 | 0.12 | 1,600 | 10,000~14,000 | 0.05 | 0.1 | 1,400 | 10,000~14,000 | 0.03 | 0.06 | 1,100 | 7,000~ 9,800 | 0.1 | 0.2 | 1,600 | 10,000~14,000 |
| | 20 | 10 | 0.06 | 0.1 | 1,000 | 8,000~12,000 | 0.05 | 0.07 | 850 | 8,000~12,000 | 0.03 | 0.04 | 700 | 5,600~ 8,400 | 0.1 | 0.15 | 1,000 | 8,000~12,000 |
| | 22 | 11 | 0.05 | 0.1 | 1,000 | 8,000~12,000 | 0.04 | 0.06 | 850 | 8,000~12,000 | 0.025 | 0.035 | 700 | 5,600~ 8,400 | 0.08 | 0.15 | 1,000 | 8,000~12,000 |
| | 25 | 12.5 | 0.03 | 0.05 | 800 | 8,000~12,000 | 0.03 | 0.04 | 680 | 8,000~12,000 | 0.02 | 0.025 | 560 | 5,600~ 8,400 | 0.05 | 0.08 | 800 | 8,000~12,000 |
| | 30 | 15 | 0.02 | 0.04 | 420 | 6,000~10,000 | 0.02 | 0.04 | 360 | 6,000~10,000 | 0.01 | 0.025 | 300 | 4,200~ 7,000 | 0.03 | 0.06 | 420 | 6,000~10,000 |
| | 35 | 17.5 | 0.02 | 0.03 | 140 | 6,000~10,000 | 0.015 | 0.02 | 120 | 6,000~10,000 | 0.01 | 0.01 | 100 | 4,200~ 7,000 | 0.03 | 0.04 | 140 | 6,000~10,000 |
| | 40 | 20 | 0.007 | 0.01 | 100 | 6,000~10,000 | 0.004 | 0.007 | 80 | 6,000~10,000 | 0.002 | 0.004 | 70 | 4,200~ 7,000 | 0.01 | 0.015 | 100 | 6,000~10,000 |
| 1.25 | 6 | 2.4 | 0.35 | 0.5 | 4,000 | 16,000~20,000 | 0.3 | 0.4 | 3,400 | 16,000~20,000 | 0.18 | 0.24 | 2,800 | 11,200~14,000 | 0.5 | 0.8 | 4,000 | 16,000~20,000 |
| | 10 | 4 | 0.2 | 0.5 | 3,000 | 16,000~20,000 | 0.25 | 0.35 | 2,500 | 16,000~20,000 | 0.15 | 0.21 | 2,100 | 11,200~14,000 | 0.3 | 0.8 | 3,000 | 16,000~20,000 |
| | 15 | 6 | 0.15 | 0.3 | 2,500 | 16,000~20,000 | 0.1 | 0.2 | 2,100 | 16,000~20,000 | 0.06 | 0.12 | 1,700 | 11,200~14,000 | 0.25 | 0.45 | 2,500 | 16,000~20,000 |
| | 20 | 8 | 0.1 | 0.2 | 1,800 | 12,000~16,000 | 0.08 | 0.15 | 1,500 | 12,000~16,000 | 0.05 | 0.09 | 1,300 | 8,400~11,200 | 0.15 | 0.3 | 1,800 | 12,000~16,000 |
| | 25 | 10 | 0.075 | 0.14 | 1,100 | 10,000~14,000 | 0.05 | 0.1 | 930 | 10,000~14,000 | 0.03 | 0.06 | 770 | 7,000~ 9,800 | 0.1 | 0.2 | 1,100 | 10,000~14,000 |
| | 30 | 12 | 0.04 | 0.08 | 800 | 8,000~12,000 | 0.02 | 0.06 | 680 | 8,000~12,000 | 0.012 | 0.035 | 560 | 5,600~ 8,400 | 0.06 | 0.15 | 800 | 8,000~12,000 |
| | 35 | 14 | 0.03 | 0.07 | 450 | 6,000~10,000 | 0.01 | 0.03 | 380 | 6,000~10,000 | 0.006 | 0.018 | 310 | 4,200~ 7,000 | 0.05 | 0.1 | 450 | 6,000~10,000 |
| 1.5 | 6 | 2 | 0.35 | 0.6 | 4,000 | 16,000~20,000 | 0.25 | 0.5 | 3,400 | 16,000~20,000 | 0.15 | 0.3 | 2,800 | 11,200~14,000 | 0.5 | 1 | 4,000 | 16,000~20,000 |
| | 8 | 2.7 | 0.3 | 0.5 | 4,000 | 16,000~20,000 | 0.2 | 0.5 | 3,400 | 16,000~20,000 | 0.12 | 0.3 | 2,800 | 11,200~14,000 | 0.45 | 0.8 | 4,000 | 16,000~20,000 |
| | 10 | 3.3 | 0.3 | 0.5 | 4,000 | 16,000~20,000 | 0.2 | 0.45 | 3,400 | 16,000~20,000 | 0.12 | 0.27 | 2,800 | 11,200~14,000 | 0.45 | 0.8 | 4,000 | 16,000~20,000 |
| | 12 | 4 | 0.2 | 0.4 | 3,000 | 16,000~20,000 | 0.2 | 0.4 | 2,500 | 16,000~20,000 | 0.12 | 0.24 | 2,100 | 11,200~14,000 | 0.3 | 0.6 | 3,000 | 16,000~20,000 |
| | 14 | 4.7 | 0.2 | 0.4 | 3,000 | 16,000~20,000 | 0.15 | 0.35 | 2,500 | 16,000~20,000 | 0.09 | 0.21 | 2,100 | 11,200~14,000 | 0.3 | 0.6 | 3,000 | 16,000~20,000 |
| | 15 | 5 | 0.15 | 0.4 | 3,000 | 16,000~20,000 | 0.13 | 0.35 | 2,500 | 16,000~20,000 | 0.08 | 0.21 | 2,100 | 11,200~14,000 | 0.23 | 0.6 | 3,000 | 16,000~20,000 |
| | 16 | 5.3 | 0.15 | 0.35 | 3,000 | 16,000~20,000 | 0.13 | 0.35 | 2,500 | 16,000~20,000 | 0.07 | 0.21 | 2,100 | 11,200~14,000 | 0.23 | 0.5 | 3,000 | 16,000~20,000 |
| | 20 | 6.7 | 0.15 | 0.3 | 1,800 | 12,000~16,000 | 0.1 | 0.2 | 1,500 | 12,000~16,000 | 0.06 | 0.12 | 1,300 | 8,400~11,200 | 0.23 | 0.45 | 1,800 | 12,000~16,000 |
| | 25 | 8.3 | 0.13 | 0.27 | 1,200 | 12,000~16,000 | 0.1 | 0.16 | 1,000 | 12,000~16,000 | 0.06 | 0.09 | 840 | 8,400~11,200 | 0.2 | 0.4 | 1,200 | 12,000~16,000 |
| | 30 | 10 | 0.1 | 0.2 | 800 | 8,000~12,000 | 0.07 | 0.12 | 680 | 8,000~12,000 | 0.04 | 0.07 | 560 | 5,600~ 8,400 | 0.15 | 0.3 | 800 | 8,000~12,000 |
| | 35 | 11.7 | 0.07 | 0.15 | 600 | 8,000~12,000 | 0.05 | 0.1 | 510 | 8,000~12,000 | 0.03 | 0.06 | 420 | 5,600~ 8,400 | 0.1 | 0.2 | 600 | 8,000~12,000 |
| | 40 | 13.3 | 0.05 | 0.1 | 460 | 6,000~10,000 | 0.05 | 0.07 | 390 | 6,000~10,000 | 0.03 | 0.04 | 320 | 4,200~ 7,000 | 0.08 | 0.15 | 460 | 6,000~10,000 |
| 1.75 | 10 | 2.9 | 0.35 | 0.6 | 4,000 | 16,000~20,000 | 0.25 | 0.5 | 3,400 | 16,000~20,000 | 0.15 | 0.3 | 2,800 | 11,200~14,000 | 0.5 | 1 | 4,000 | 16,000~20,000 |
| | 15 | 4.3 | 0.3 | 0.4 | 4,000 | 16,000~20,000 | 0.2 | 0.45 | 3,400 | 16,000~20,000 | 0.12 | 0.27 | 2,800 | 11,200~14,000 | 0.45 | 0.6 | 4,000 | 16,000~20,000 |
| | 20 | 5.7 | 0.2 | 0.3 | 2,400 | 14,000~18,000 | 0.13 | 0.35 | 2,000 | 14,000~18,000 | 0.08 | 0.21 | 1,680 | 9,800~12,600 | 0.3 | 0.45 | 2,400 | 14,000~18,000 |
| | 25 | 7.1 | 0.17 | 0.3 | 2,000 | 14,000~18,000 | 0.1 | 0.3 | 1,800 | 14,000~18,000 | 0.08 | 0.15 | 1,400 | 8,400~ 9,800 | 0.25 | 0.42 | 2,000 | 14,000~18,000 |
| | 30 | 8.6 | 0.15 | 0.27 | 1,600 | 8,000~12,000 | 0.1 | 0.2 | 1,400 | 8,000~12,000 | 0.06 | 0.12 | 1,120 | 5,600~ 8,400 | 0.23 | 0.4 | 1,600 | 8,000~12,000 |
| | 35 | 10 | 0.1 | 0.2 | 1,200 | 8,000~12,000 | 0.07 | 0.15 | 1,000 | 8,000~12,000 | 0.05 | 0.08 | 800 | 5,600~ 8,400 | 0.15 | 0.3 | 1,200 | 8,000~12,000 |
| | 40 | 11.4 | 0.07 | 0.13 | 800 | 6,000~10,000 | 0.05 | 0.1 | 680 | 6,000~10,000 | 0.03 | 0.06 | 560 | 4,200~ 7,000 | 0.1 | 0.2 | 800 | 6,000~10,000 |
| | 45 | 12.9 | 0.05 | 0.1 | 800 | 6,000~10,000 | 0.05 | 0.05 | 680 | 6,000~10,000 | 0.03 | 0.03 | 560 | 4,200~ 7,000 | 0.08 | 0.15 | 800 | 6,000~10,000 |

# MRB230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK・HPM-1 (~45HRC) | | | | 焼き入れ鋼 Hardened Steels SKD・STAVAX・HPM-38 (~55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (~62HRC) | | | | 銅 Copper | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 有効長 Effective Length | 刃径と有効長の比 L/D | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 2 | 10 | 2.5 | 0.35 | 0.8 | 4,000 | 16,000~20,000 | 0.25 | 0.7 | 3,400 | 16,000~20,000 | 0.15 | 0.42 | 2,800 | 11,200~14,000 | 0.55 | 1.2 | 4,000 | 16,000~20,000 |
| | 12 | 3 | 0.35 | 0.7 | 4,000 | 16,000~20,000 | 0.25 | 0.7 | 3,400 | 16,000~20,000 | 0.15 | 0.42 | 2,800 | 11,200~14,000 | 0.53 | 1 | 4,000 | 16,000~20,000 |
| | 14 | 3.5 | 0.3 | 0.6 | 4,000 | 16,000~20,000 | 0.2 | 0.5 | 3,400 | 16,000~20,000 | 0.12 | 0.3 | 2,800 | 11,200~14,000 | 0.45 | 1 | 4,000 | 16,000~20,000 |
| | 15 | 3.8 | 0.25 | 0.55 | 3,500 | 16,000~20,000 | 0.2 | 0.4 | 3,000 | 16,000~20,000 | 0.12 | 0.24 | 2,500 | 11,200~14,000 | 0.38 | 0.8 | 3,500 | 16,000~20,000 |
| | 16 | 4 | 0.2 | 0.5 | 3,500 | 16,000~20,000 | 0.2 | 0.3 | 3,000 | 16,000~20,000 | 0.12 | 0.18 | 2,500 | 11,200~14,000 | 0.3 | 0.8 | 3,500 | 16,000~20,000 |
| | 20 | 5 | 0.2 | 0.35 | 3,300 | 16,000~20,000 | 0.15 | 0.3 | 2,800 | 16,000~20,000 | 0.09 | 0.18 | 2,300 | 11,200~14,000 | 0.3 | 0.5 | 3,300 | 16,000~20,000 |
| | 25 | 6.3 | 0.15 | 0.3 | 2,600 | 12,000~16,000 | 0.12 | 0.25 | 2,200 | 12,000~16,000 | 0.07 | 0.15 | 1,800 | 8,400~11,200 | 0.23 | 0.45 | 2,600 | 12,000~16,000 |
| | 30 | 7.5 | 0.12 | 0.25 | 2,600 | 12,000~16,000 | 0.1 | 0.2 | 2,200 | 12,000~16,000 | 0.06 | 0.12 | 1,800 | 8,400~11,200 | 0.2 | 0.4 | 2,600 | 12,000~16,000 |
| | 35 | 8.8 | 0.12 | 0.2 | 1,800 | 10,000~14,000 | 0.07 | 0.15 | 1,500 | 10,000~14,000 | 0.04 | 0.09 | 1,300 | 7,000~ 9,800 | 0.18 | 0.3 | 1,800 | 10,000~14,000 |
| | 40 | 10 | 0.1 | 0.15 | 1,200 | 10,000~14,000 | 0.07 | 0.12 | 1,000 | 10,000~14,000 | 0.04 | 0.07 | 840 | 7,000~ 9,800 | 0.15 | 0.2 | 1,200 | 10,000~14,000 |
| | 45 | 11.3 | 0.07 | 0.12 | 800 | 10,000~14,000 | 0.05 | 0.1 | 700 | 10,000~14,000 | 0.03 | 0.05 | 600 | 4,200~ 7,000 | 0.1 | 0.17 | 800 | 10,000~14,000 |
| | 50 | 12.5 | 0.07 | 0.1 | 600 | 6,000~10,000 | 0.05 | 0.07 | 500 | 6,000~10,000 | 0.03 | 0.04 | 420 | 4,200~ 7,000 | 0.1 | 0.15 | 600 | 6,000~10,000 |
| 2.5 | 10 | 2 | 0.4 | 1.2 | 4,000 | 16,000~20,000 | 0.3 | 1 | 3,400 | 16,000~20,000 | 0.18 | 0.6 | 2,800 | 11,200~14,000 | 0.6 | 1.8 | 4,000 | 16,000~20,000 |
| | 15 | 3 | 0.35 | 1 | 4,000 | 16,000~20,000 | 0.3 | 0.9 | 3,400 | 16,000~20,000 | 0.18 | 0.54 | 2,800 | 11,200~14,000 | 0.55 | 1.5 | 4,000 | 16,000~20,000 |
| | 20 | 4 | 0.3 | 0.7 | 4,000 | 16,000~20,000 | 0.25 | 0.7 | 3,400 | 16,000~20,000 | 0.15 | 0.42 | 2,800 | 11,200~14,000 | 0.45 | 1 | 4,000 | 16,000~20,000 |
| | 25 | 5 | 0.25 | 0.6 | 3,000 | 14,000~16,000 | 0.2 | 0.5 | 2,500 | 14,000~16,000 | 0.12 | 0.3 | 2,100 | 9,800~11,200 | 0.38 | 0.9 | 3,000 | 14,000~16,000 |
| | 30 | 6 | 0.2 | 0.5 | 2,400 | 14,000~16,000 | 0.15 | 0.4 | 2,000 | 14,000~16,000 | 0.09 | 0.24 | 1,700 | 9,800~11,200 | 0.3 | 0.8 | 2,400 | 14,000~16,000 |
| | 35 | 7 | 0.15 | 0.4 | 1,600 | 10,000~14,000 | 0.15 | 0.3 | 1,400 | 10,000~14,000 | 0.09 | 0.18 | 1,100 | 7,000~ 9,800 | 0.23 | 0.6 | 1,600 | 10,000~14,000 |
| | 40 | 8 | 0.15 | 0.3 | 1,200 | 8,000~12,000 | 0.12 | 0.2 | 1,000 | 8,000~12,000 | 0.07 | 0.12 | 840 | 5,600~ 8,400 | 0.23 | 0.45 | 1,200 | 8,000~12,000 |
| | 45 | 9 | 0.12 | 0.2 | 1,000 | 8,000~12,000 | 0.1 | 0.15 | 850 | 8,000~12,000 | 0.06 | 0.09 | 700 | 5,600~ 8,400 | 0.18 | 0.3 | 1,000 | 8,000~12,000 |
| | 50 | 10 | 0.1 | 0.15 | 680 | 6,000~10,000 | 0.07 | 0.1 | 570 | 6,000~10,000 | 0.04 | 0.06 | 470 | 4,200~ 7,000 | 0.15 | 0.25 | 680 | 6,000~10,000 |
| 3 | 10 | 1.7 | 0.5 | 1.5 | 4,000 | 14,000~18,000 | 0.35 | 1.2 | 3,400 | 14,000~18,000 | 0.21 | 0.72 | 2,800 | 9,800~12,600 | 0.75 | 2.3 | 4,000 | 14,000~18,000 |
| | 15 | 2.5 | 0.5 | 1.3 | 4,000 | 14,000~18,000 | 0.35 | 1.2 | 3,400 | 14,000~18,000 | 0.21 | 0.68 | 2,800 | 9,800~12,600 | 0.75 | 2 | 4,000 | 14,000~18,000 |
| | 20 | 3.3 | 0.5 | 1.2 | 4,000 | 14,000~18,000 | 0.35 | 1.1 | 3,400 | 14,000~18,000 | 0.21 | 0.66 | 2,800 | 9,800~12,600 | 0.75 | 1.8 | 4,000 | 14,000~18,000 |
| | 25 | 4.2 | 0.4 | 1 | 4,000 | 14,000~18,000 | 0.3 | 0.8 | 3,400 | 14,000~18,000 | 0.18 | 0.48 | 2,800 | 9,800~12,600 | 0.6 | 1.5 | 4,000 | 14,000~18,000 |
| | 30 | 5 | 0.35 | 0.7 | 3,000 | 8,000~12,000 | 0.25 | 0.6 | 2,500 | 8,000~12,000 | 0.15 | 0.36 | 2,100 | 5,600~ 8,400 | 0.53 | 1 | 3,000 | 8,000~12,000 |
| | 35 | 5.8 | 0.35 | 0.5 | 2,500 | 8,000~12,000 | 0.2 | 0.5 | 2,100 | 8,000~12,000 | 0.12 | 0.3 | 1,700 | 5,600~ 8,400 | 0.53 | 0.8 | 2,500 | 8,000~12,000 |
| | 40 | 6.7 | 0.25 | 0.4 | 2,300 | 8,000~12,000 | 0.2 | 0.4 | 1,900 | 8,000~12,000 | 0.12 | 0.24 | 1,600 | 5,600~ 8,400 | 0.38 | 0.6 | 2,300 | 8,000~12,000 |
| | 45 | 7.5 | 0.25 | 0.4 | 1,500 | 6,000~ 8,000 | 0.2 | 0.35 | 1,200 | 6,000~ 8,000 | 0.12 | 0.21 | 1,000 | 4,200~ 5,600 | 0.38 | 0.6 | 1,500 | 6,000~ 8,000 |
| | 50 | 8.3 | 0.2 | 0.4 | 1,500 | 6,000~ 8,000 | 0.2 | 0.3 | 1,200 | 6,000~ 8,000 | 0.12 | 0.18 | 1,000 | 4,200~ 5,600 | 0.3 | 0.6 | 1,500 | 6,000~ 8,000 |

**備考 Notes**

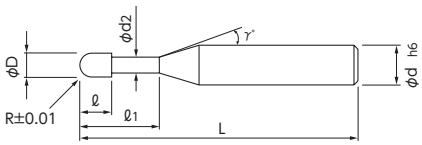
※本切削条件は参考値です。実際の加工形状および使用機械等にて切削条件を調整してください。
※切り込み量の ap は深さ方向の切り込み量、ae はピックフィードを示します。
※ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。
また、主軸回転数が足りない場合も同様に同じ割合で下げてください。
※ L(有効長)/D(刃径)が、15 倍を超える様な場合は、加工形状等で大きく左右される場合があります。
※焼き入れ鋼を加工する場合は、オイルミストをお奨めします。
※Recommend to use the milling condition as just reference. Adjust milling conditions according to machining shape and machine status.
※Depth of Cut : ap=Axial Depth of Cut / ae=Radial Depth of Cut.
※Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.
※In case L/D exceeds 15, find an adequate condition considering machining profile.
※Oil mist coolant is recommended for the machining of hardened steels.



SEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MRBLN230-6

## 無限コーティング ロングネックボールエンドミル φ6シャンクタイプ（深リブ用）
MUGEN-COATING 2-Flute Long Neck Ball End Mill (Shank Dia. 6)




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

3D MG ∞ 2 30° ≦55 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 08-00522-01501 | R0.15 | 3 | 0.3 | 0.3 | 0.28 | 15° | 6 | 60 | 18,200 ▌ |
| 08-00522-02001 | R0.2 | 4 | 0.4 | 0.4 | 0.37 | 15° | 6 | 60 | 16,700 ▌ |
| 08-00522-02501 | R0.25 | 5 | 0.8 | 0.5 | 0.46 | 15° | 6 | 60 | 13,900 ▌ |
| 08-00522-03001 | R0.3 | 3 | 1 | 0.6 | 0.56 | 15° | 6 | 60 | 12,000 ▌ |
| 08-00522-03005 | | 5 | 1 | 0.6 | 0.56 | 15° | 6 | 60 | 12,000 ▌ |
| 08-00522-03006 | | 6 | 1 | 0.6 | 0.56 | 15° | 6 | 60 | 12,000 ▌ |
| 08-00522-04008 | R0.4 | 8 | 1.4 | 0.8 | 0.76 | 15° | 6 | 60 | 12,000 ▌ |
| 08-00522-05010 | R0.5 | 10 | 1.5 | 1 | 0.95 | 15° | 6 | 60 | 11,400 ▌ |
| 08-00522-07515 | R0.75 | 15 | 1.75 | 1.5 | 1.45 | 15° | 6 | 60 | 12,400 ▌ |
| 08-00522-10020 | R1 | 20 | 2 | 2 | 1.94 | 15° | 6 | 60 | 12,400 ▌ |

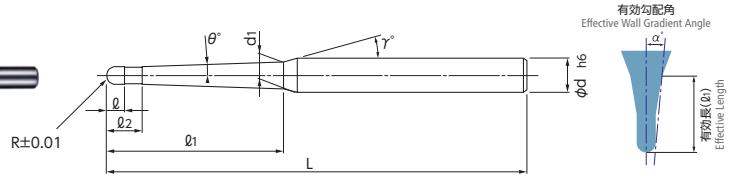
**オーダー方法**
MRBLN230-6 ボール半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate MRBLN230-6 (R)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

# MRBTNH230

## 無限コーティングプレミアム ロングテーパーネック2枚刃ボールエンドミル

MUGEN-COATING PREMIUM 2-Flute Long Taper Neck Ball End Mill




［首部形状について］
表記の首角（θ）および首角２（γ）は目安になります。被削材と首部の干渉が心配される時は、必ず実測での確認をお願いします。
[Neck Shape]
(θ) and (γ) is reference value. Tool measurement required in order to avoid interference to the work material.

- 深部の加工で高精度化が図れるテーパーネック形状のボールエンドミル。
- 最適化されたテーパーネック形状と、無限コーティングプレミアムの採用で、高硬度材の加工時に真価を発揮します。
- 汎用性の高い２枚刃で、全 159 サイズをラインナップしました。
- Taper neck type ball end mill improves accuracy for deep milling.
- Optimized taper neck design and MUGEN-COATING PREMIUM realized to show its higher ability for hardened steels.
- Lineup of total 159 size with high versatility 2-flute end mills.

技術資料 K-020

3D MG Premium 2 30° ≦68 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ◎ | ◎ | ◎ | ○ | ○ | | | |

★ 再研磨可能 （詳細はお問い合わせください。）

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

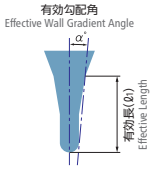
| コードNo. Code No. | (R)ボール半径 Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (α)有効勾配角 Effective Wall Gradient Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00588-01021 | R0.1 | 30′ | 1.5 | 0.21 | 0.15 | 0.3 | 12° | 0°29′ | 4 | 50 | 9,900 |
| 08-00588-01023 | | | 2 | 0.22 | 0.15 | 0.3 | 12° | 0°28′ | 4 | 50 | 10,400 |
| 08-00588-01031 | | 1° | 1.5 | 0.24 | 0.15 | 0.3 | 12° | 0°58′ | 4 | 50 | 9,900 |
| 08-00588-01033 | | | 2 | 0.25 | 0.15 | 0.3 | 12° | 0°58′ | 4 | 50 | 10,400 |
| 08-00588-01041 | | 1°30′ | 1.5 | 0.26 | 0.15 | 0.3 | 12° | 1°29′ | 4 | 50 | 9,900 |
| 08-00588-01043 | | | 2 | 0.29 | 0.15 | 0.3 | 12° | 1°28′ | 4 | 50 | 10,400 |
| 08-00588-01051 | | 2° | 1.5 | 0.29 | 0.15 | 0.3 | 12° | 1°59′ | 4 | 50 | 9,900 |
| 08-00588-01053 | | | 2 | 0.32 | 0.15 | 0.3 | 12° | 1°59′ | 4 | 50 | 10,400 |
| 08-00588-01521 | R0.15 | 30′ | 2 | 0.32 | 0.2 | 0.45 | 12° | 0°28′ | 4 | 50 | 9,900 |
| 08-00588-01523 | | | 3 | 0.34 | 0.2 | 0.45 | 12° | 0°29′ | 4 | 50 | 10,400 |
| 08-00588-01531 | | 1° | 2 | 0.35 | 0.2 | 0.45 | 12° | 0°59′ | 4 | 50 | 9,900 |
| 08-00588-01533 | | | 3 | 0.39 | 0.2 | 0.45 | 12° | 0°59′ | 4 | 50 | 10,400 |
| 08-00588-01541 | | 1°30′ | 2 | 0.38 | 0.2 | 0.45 | 12° | 1°29′ | 4 | 50 | 9,900 |
| 08-00588-01543 | | | 3 | 0.44 | 0.2 | 0.45 | 12° | 1°29′ | 4 | 50 | 10,400 |
| 08-00588-01551 | | 2° | 2 | 0.42 | 0.2 | 0.45 | 12° | 1°58′ | 4 | 50 | 9,900 |
| 08-00588-01553 | | | 3 | 0.49 | 0.2 | 0.45 | 12° | 1°59′ | 4 | 50 | 10,400 |
| 08-00588-02021 | R0.2 | 30′ | 3 | 0.43 | 0.3 | 0.6 | 12° | 0°29′ | 4 | 50 | 7,700 |
| 08-00588-02023 | | | 4 | 0.45 | 0.3 | 0.6 | 12° | 0°29′ | 4 | 50 | 7,700 |
| 08-00588-02025 | | | 6 | 0.48 | 0.3 | 0.6 | 12° | 0°29′ | 4 | 50 | 8,100 |
| 08-00588-02031 | | 1° | 3 | 0.48 | 0.3 | 0.6 | 12° | 0°59′ | 4 | 50 | 7,700 |
| 08-00588-02033 | | | 4 | 0.51 | 0.3 | 0.6 | 12° | 0°59′ | 4 | 50 | 7,700 |
| 08-00588-02035 | | | 6 | 0.58 | 0.3 | 0.6 | 12° | 0°59′ | 4 | 50 | 8,100 |
| 08-00588-02041 | | 1°30′ | 3 | 0.53 | 0.3 | 0.6 | 12° | 1°29′ | 4 | 50 | 7,700 |
| 08-00588-02043 | | | 4 | 0.58 | 0.3 | 0.6 | 12° | 1°29′ | 4 | 50 | 7,700 |
| 08-00588-02045 | | | 6 | 0.68 | 0.3 | 0.6 | 12° | 1°29′ | 4 | 50 | 8,100 |
| 08-00588-02051 | | 2° | 3 | 0.58 | 0.3 | 0.6 | 12° | 1°59′ | 4 | 50 | 7,700 |
| 08-00588-02053 | | | 4 | 0.65 | 0.3 | 0.6 | 12° | 1°59′ | 4 | 50 | 7,700 |
| 08-00588-02055 | | | 6 | 0.79 | 0.3 | 0.6 | 12° | 1°59′ | 4 | 50 | 8,100 |

オーダー方法
MRBTNH230 ボール半径(R)×首角(θ)×有効長(ℓ1)を指示してください。
When you order, indicate MRBTNH230 (R)×(θ)×(ℓ1).

- 切削条件表はE-052に記載
- Recommended Milling Conditions are shown on page E-052.



ŞEVKET ÖĞÜ® MAKINA TİCARET VE SAN. LTD. ŞTİ.



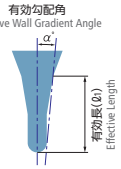

| コードNo. Code No. | (R)ボール半径 Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (α)有効勾配角 Effective Wall Gradient Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00588-02521 | R0.25 | 30′ | 4 | 0.54 | 0.35 | 0.75 | 12° | 0°29′ | 4 | 50 | 7,300 |
| 08-00588-02523 | | | 5 | 0.56 | 0.35 | 0.75 | 12° | 0°29′ | 4 | 50 | 7,500 |
| 08-00588-02531 | | 1° | 4 | 0.61 | 0.35 | 0.75 | 12° | 0°59′ | 4 | 50 | 7,300 |
| 08-00588-02533 | | | 5 | 0.64 | 0.35 | 0.75 | 12° | 0°59′ | 4 | 50 | 7,500 |
| 08-00588-02541 | | 1°30′ | 4 | 0.67 | 0.35 | 0.75 | 12° | 1°29′ | 4 | 50 | 7,300 |
| 08-00588-02543 | | | 5 | 0.73 | 0.35 | 0.75 | 12° | 1°29′ | 4 | 50 | 7,500 |
| 08-00588-02551 | | 2° | 4 | 0.74 | 0.35 | 0.75 | 12° | 1°59′ | 4 | 50 | 7,300 |
| 08-00588-02553 | | | 5 | 0.81 | 0.35 | 0.75 | 12° | 1°59′ | 4 | 50 | 7,500 |
| 08-00588-03021 | R0.3 | 30′ | 4 | 0.64 | 0.45 | 0.9 | 12° | 0°29′ | 4 | 50 | 6,800 |
| 08-00588-03023 | | | 5 | 0.66 | 0.45 | 0.9 | 12° | 0°29′ | 4 | 50 | 7,100 |
| 08-00588-03025 | | | 6 | 0.67 | 0.45 | 0.9 | 12° | 0°29′ | 4 | 50 | 7,100 |
| 08-00588-03027 | | | 8 | 0.71 | 0.45 | 0.9 | 12° | 0°29′ | 4 | 50 | 7,300 |
| 08-00588-03031 | | 1° | 4 | 0.70 | 0.45 | 0.9 | 12° | 0°59′ | 4 | 50 | 6,800 |
| 08-00588-03033 | | | 5 | 0.74 | 0.45 | 0.9 | 12° | 0°59′ | 4 | 50 | 7,100 |
| 08-00588-03035 | | | 6 | 0.77 | 0.45 | 0.9 | 12° | 0°59′ | 4 | 50 | 7,100 |
| 08-00588-03037 | | | 8 | 0.84 | 0.45 | 0.9 | 12° | 0°59′ | 4 | 50 | 7,300 |
| 08-00588-03041 | | 1°30′ | 4 | 0.77 | 0.45 | 0.9 | 12° | 1°29′ | 4 | 50 | 6,800 |
| 08-00588-03043 | | | 5 | 0.82 | 0.45 | 0.9 | 12° | 1°29′ | 4 | 50 | 7,100 |
| 08-00588-03045 | | | 6 | 0.87 | 0.45 | 0.9 | 12° | 1°29′ | 4 | 50 | 7,100 |
| 08-00588-03047 | | | 8 | 0.98 | 0.45 | 0.9 | 12° | 1°29′ | 4 | 50 | 7,300 |
| 08-00588-03053 | | 2° | 5 | 0.90 | 0.45 | 0.9 | 12° | 1°59′ | 4 | 50 | 7,100 |
| 08-00588-03055 | | | 6 | 0.97 | 0.45 | 0.9 | 12° | 1°59′ | 4 | 50 | 7,100 |
| 08-00588-03057 | | | 8 | 1.11 | 0.45 | 0.9 | 12° | 1°59′ | 4 | 50 | 7,300 |
| 08-00588-04021 | R0.4 | 30′ | 8 | 0.89 | 0.6 | 1.2 | 12° | 0°29′ | 4 | 60 | 7,600 |
| 08-00588-04023 | | | 12 | 0.96 | 0.6 | 1.2 | 12° | 0°29′ | 4 | 60 | 8,000 |
| 08-00588-04031 | | 1° | 8 | 1.03 | 0.6 | 1.2 | 12° | 0°59′ | 4 | 60 | 7,600 |
| 08-00588-04033 | | | 12 | 1.17 | 0.6 | 1.2 | 12° | 0°59′ | 4 | 60 | 8,000 |
| 08-00588-04041 | | 1°30′ | 8 | 1.16 | 0.6 | 1.2 | 12° | 1°29′ | 4 | 60 | 7,600 |
| 08-00588-04043 | | | 12 | 1.37 | 0.6 | 1.2 | 12° | 1°29′ | 4 | 60 | 8,000 |
| 08-00588-04051 | | 2° | 8 | 1.29 | 0.6 | 1.2 | 12° | 1°59′ | 4 | 60 | 7,600 |
| 08-00588-04053 | | | 12 | 1.57 | 0.6 | 1.2 | 12° | 1°59′ | 4 | 60 | 8,000 |
| 08-00588-05021 | R0.5 | 30′ | 6 | 1.05 | 0.75 | 1.5 | 12° | 0°29′ | 4 | 60 | 5,400 |
| 08-00588-05022 | | | 8 | 1.08 | 0.75 | 1.5 | 12° | 0°29′ | 4 | 60 | 5,900 |
| 08-00588-05023 | | | 10 | 1.12 | 0.75 | 1.5 | 12° | 0°29′ | 4 | 60 | 6,500 |
| 08-00588-05024 | | | 12 | 1.15 | 0.75 | 1.5 | 12° | 0°29′ | 4 | 60 | 6,500 |
| 08-00588-05025 | | | 16 | 1.22 | 0.75 | 1.5 | 12° | 0°29′ | 4 | 60 | 6,800 |
| 08-00588-05026 | | | 20 | 1.29 | 0.75 | 1.5 | 12° | 0°29′ | 4 | 70 | 8,200 |
| 08-00588-05027 | | | 25 | 1.38 | 0.75 | 1.5 | 12° | 0°29′ | 4 | 70 | 8,700 |
| 08-00588-05028 | | | 30 | 1.47 | 0.75 | 1.5 | 12° | 0°29′ | 4 | 70 | 9,000 |
| 08-00588-05031 | | 1° | 6 | 1.15 | 0.75 | 1.5 | 12° | 0°59′ | 4 | 60 | 5,400 |
| 08-00588-05032 | | | 8 | 1.22 | 0.75 | 1.5 | 12° | 0°59′ | 4 | 60 | 5,900 |
| 08-00588-05033 | | | 10 | 1.29 | 0.75 | 1.5 | 12° | 0°59′ | 4 | 60 | 6,500 |
| 08-00588-05034 | | | 12 | 1.36 | 0.75 | 1.5 | 12° | 0°59′ | 4 | 60 | 6,500 |
| 08-00588-05035 | | | 16 | 1.50 | 0.75 | 1.5 | 12° | 0°59′ | 4 | 60 | 6,800 |

# MRBTNH230

## 無限コーティングプレミアム ロングテーパーネック2枚刃ボールエンドミル

MUGEN-COATING PREMIUM 2-Flute Long Taper Neck Ball End Mill

[首部形状について]
表記の首角（θ）および首角２（γ）は目安になります。被削材と首部の干渉が心配される時は、必ず実測での確認をお願いします。
〔Neck Shape〕
（θ）and（γ）is reference value. Tool measurement required in order to avoid interference to the work material.




★ 再研磨可能　（詳細はお問い合わせください。）

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

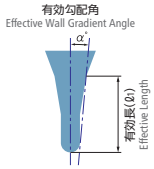
| コードNo. Code No. | (R)ボール半径 Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (α)有効勾配角 Effective Wall Gradient Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00588-05036 | R0.5 | 1° | 20 | 1.63 | 0.75 | 1.5 | 12° | 0°59′ | 4 | 70 | 8,200 |
| 08-00588-05037 | | | 25 | 1.81 | 0.75 | 1.5 | 12° | 0°59′ | 4 | 70 | 8,700 |
| 08-00588-05038 | | | 30 | 1.98 | 0.75 | 1.5 | 12° | 0°59′ | 4 | 70 | 9,000 |
| 08-00588-05041 | | 1°30′ | 6 | 1.24 | 0.75 | 1.5 | 12° | 1°29′ | 4 | 60 | 5,400 |
| 08-00588-05042 | | | 8 | 1.35 | 0.75 | 1.5 | 12° | 1°29′ | 4 | 60 | 5,900 |
| 08-00588-05043 | | | 10 | 1.45 | 0.75 | 1.5 | 12° | 1°29′ | 4 | 60 | 6,500 |
| 08-00588-05044 | | | 12 | 1.56 | 0.75 | 1.5 | 12° | 1°29′ | 4 | 60 | 6,500 |
| 08-00588-05045 | | | 16 | 1.77 | 0.75 | 1.5 | 12° | 1°29′ | 4 | 60 | 6,800 |
| 08-00588-05046 | | | 20 | 1.98 | 0.75 | 1.5 | 12° | 1°29′ | 4 | 70 | 8,200 |
| 08-00588-05047 | | | 25 | 2.24 | 0.75 | 1.5 | 12° | 1°29′ | 4 | 70 | 8,700 |
| 08-00588-05048 | | | 30 | 2.50 | 0.75 | 1.5 | 12° | 1°29′ | 4 | 70 | 9,000 |
| 08-00588-05052 | | 2° | 8 | 1.48 | 0.75 | 1.5 | 12° | 1°59′ | 4 | 60 | 5,900 |
| 08-00588-05053 | | | 10 | 1.62 | 0.75 | 1.5 | 12° | 1°59′ | 4 | 60 | 6,500 |
| 08-00588-05056 | | | 20 | 2.32 | 0.75 | 1.5 | 12° | 1°59′ | 4 | 70 | 8,200 |
| 08-00588-05058 | | | 30 | 3.01 | 0.75 | 1.5 | 12° | 1°59′ | 4 | 70 | 9,000 |
| 08-00588-07521 | R0.75 | 30′ | 10 | 1.61 | 1.1 | 2.25 | 12° | 0°29′ | 4 | 60 | 6,800 |
| 08-00588-07523 | | | 15 | 1.69 | 1.1 | 2.25 | 12° | 0°29′ | 4 | 60 | 7,400 |
| 08-00588-07525 | | | 20 | 1.78 | 1.1 | 2.25 | 12° | 0°29′ | 4 | 70 | 8,200 |
| 08-00588-07527 | | | 25 | 1.87 | 1.1 | 2.25 | 12° | 0°29′ | 4 | 70 | 9,000 |
| 08-00588-07529 | | | 30 | 1.96 | 1.1 | 2.25 | 12° | 0°29′ | 4 | 70 | 10,300 |
| 08-00588-07531 | | 1° | 10 | 1.77 | 1.1 | 2.25 | 12° | 0°59′ | 4 | 60 | 6,800 |
| 08-00588-07533 | | | 15 | 1.94 | 1.1 | 2.25 | 12° | 0°59′ | 4 | 60 | 7,400 |
| 08-00588-07535 | | | 20 | 2.12 | 1.1 | 2.25 | 12° | 0°59′ | 4 | 70 | 8,200 |
| 08-00588-07537 | | | 25 | 2.29 | 1.1 | 2.25 | 12° | 0°59′ | 4 | 70 | 9,000 |
| 08-00588-07539 | | | 30 | 2.47 | 1.1 | 2.25 | 12° | 0°59′ | 4 | 70 | 10,300 |
| 08-00588-07541 | | 1°30′ | 10 | 1.93 | 1.1 | 2.25 | 12° | 1°29′ | 4 | 60 | 6,800 |
| 08-00588-07543 | | | 15 | 2.19 | 1.1 | 2.25 | 12° | 1°29′ | 4 | 60 | 7,400 |
| 08-00588-07545 | | | 20 | 2.45 | 1.1 | 2.25 | 12° | 1°29′ | 4 | 70 | 8,200 |
| 08-00588-07551 | | 2° | 10 | 2.09 | 1.1 | 2.25 | 12° | 1°59′ | 4 | 60 | 6,800 |
| 08-00588-07553 | | | 15 | 2.44 | 1.1 | 2.25 | 12° | 1°59′ | 4 | 60 | 7,400 |
| 08-00588-07555 | | | 20 | 2.79 | 1.1 | 2.25 | 12° | 1°59′ | 4 | 70 | 9,000 |
| ★ 08-00588-10021 | R1 | 30′ | 12 | 2.14 | 1.5 | 3 | 12° | 0°29′ | 4 | 60 | 6,000 |
| ★ 08-00588-10022 | | | 16 | 2.21 | 1.5 | 3 | 12° | 0°29′ | 4 | 60 | 6,200 |
| ★ 08-00588-10023 | | | 20 | 2.28 | 1.5 | 3 | 12° | 0°29′ | 4 | 70 | 7,400 |
| ★ 08-00588-10024 | | | 25 | 2.37 | 1.5 | 3 | 12° | 0°29′ | 4 | 70 | 8,200 |
| ★ 08-00588-10025 | | | 30 | 2.46 | 1.5 | 3 | 12° | 0°29′ | 4 | 70 | 9,000 |
| ★ 08-00588-10026 | | | 35 | 2.54 | 1.5 | 3 | 12° | 0°29′ | 4 | 80 | 9,800 |
| ★ 08-00588-10027 | | | 40 | 2.63 | 1.5 | 3 | 12° | 0°29′ | 4 | 80 | 10,600 |
| ★ 08-00588-10028 | | | 50 | 2.81 | 1.5 | 3 | 12° | 0°30′ | 4 | 90 | 12,000 |
| ★ 08-00588-10031 | | 1° | 12 | 2.33 | 1.5 | 3 | 12° | 0°59′ | 4 | 60 | 6,000 |
| ★ 08-00588-10032 | | | 16 | 2.47 | 1.5 | 3 | 12° | 0°59′ | 4 | 60 | 6,200 |
| ★ 08-00588-10033 | | | 20 | 2.61 | 1.5 | 3 | 12° | 0°59′ | 4 | 70 | 7,400 |
| ★ 08-00588-10034 | | | 25 | 2.79 | 1.5 | 3 | 12° | 0°59′ | 4 | 70 | 8,200 |
| ★ 08-00588-10035 | | | 30 | 2.96 | 1.5 | 3 | 12° | 0°59′ | 4 | 70 | 9,000 |

**オーダー方法**
MRBTNH230 ボール半径(R)×首角(θ)×有効長(ℓ1)を指示してください。
When you order, indicate MRBTNH230 (R)×(θ)×(ℓ1).

●切削条件表はE-052に記載
●Recommended Milling Conditions are shown on page E-052.



SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.




| コードNo. Code No. | (R)ボール半径 Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (α)有効勾配角 Effective Wall Gradient Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ★ 08-00588-10036 | R1 | 1° | 35 | 3.14 | 1.5 | 3 | 12° | 0°59′ | 6 | 80 | 11,600 |
| ★ 08-00588-10037 | | | 40 | 3.31 | 1.5 | 3 | 12° | 0°59′ | 6 | 80 | 12,200 |
| ★ 08-00588-10038 | | | 50 | 3.66 | 1.5 | 3 | 12° | 0°59′ | 6 | 90 | 13,500 |
| ★ 08-00588-10041 | | 1°30′ | 12 | 2.53 | 1.5 | 3 | 12° | 1°29′ | 4 | 60 | 6,000 |
| ★ 08-00588-10042 | | | 16 | 2.74 | 1.5 | 3 | 12° | 1°29′ | 4 | 60 | 6,200 |
| ★ 08-00588-10043 | | | 20 | 2.95 | 1.5 | 3 | 12° | 1°29′ | 4 | 70 | 7,400 |
| ★ 08-00588-10044 | | | 25 | 3.21 | 1.5 | 3 | 12° | 1°29′ | 4 | 70 | 8,200 |
| ★ 08-00588-10045 | | | 30 | 3.47 | 1.5 | 3 | 12° | 1°29′ | 6 | 70 | 10,600 |
| ★ 08-00588-10046 | | | 35 | 3.73 | 1.5 | 3 | 12° | 1°29′ | 6 | 80 | 11,600 |
| ★ 08-00588-10047 | | | 40 | 3.99 | 1.5 | 3 | 12° | 1°29′ | 6 | 80 | 12,200 |
| ★ 08-00588-10048 | | | 50 | 4.52 | 1.5 | 3 | 12° | 1°30′ | 6 | 90 | 13,500 |
| ★ 08-00588-10051 | | 2° | 12 | 2.72 | 1.5 | 3 | 12° | 1°59′ | 4 | 60 | 6,000 |
| ★ 08-00588-10052 | | | 16 | 3.00 | 1.5 | 3 | 12° | 1°59′ | 4 | 60 | 6,200 |
| ★ 08-00588-10053 | | | 20 | 3.28 | 1.5 | 3 | 12° | 1°59′ | 4 | 70 | 7,800 |
| ★ 08-00588-10054 | | | 25 | 3.63 | 1.5 | 3 | 12° | 1°59′ | 6 | 70 | 8,600 |
| ★ 08-00588-10055 | | | 30 | 3.98 | 1.5 | 3 | 12° | 1°59′ | 6 | 70 | 10,600 |
| ★ 08-00588-10057 | | | 40 | 4.67 | 1.5 | 3 | 12° | 1°59′ | 6 | 80 | 12,200 |
| ★ 08-00588-10058 | | | 50 | 5.37 | 1.5 | 3 | 12° | 2°00′ | 6 | 90 | 13,500 |
| ★ 08-00588-15021 | R1.5 | 30′ | 15 | 3.13 | 2.5 | 4.5 | 12° | 0°29′ | 6 | 70 | 8,200 |
| ★ 08-00588-15022 | | | 20 | 3.22 | 2.5 | 4.5 | 12° | 0°29′ | 6 | 70 | 8,700 |
| ★ 08-00588-15023 | | | 25 | 3.31 | 2.5 | 4.5 | 12° | 0°29′ | 6 | 70 | 9,400 |
| ★ 08-00588-15024 | | | 30 | 3.40 | 2.5 | 4.5 | 12° | 0°29′ | 6 | 70 | 10,100 |
| ★ 08-00588-15025 | | | 40 | 3.57 | 2.5 | 4.5 | 12° | 0°29′ | 6 | 80 | 11,200 |
| ★ 08-00588-15026 | | | 50 | 3.74 | 2.5 | 4.5 | 12° | 0°29′ | 6 | 90 | 13,000 |
| ★ 08-00588-15031 | | 1° | 15 | 3.37 | 2.5 | 4.5 | 12° | 0°59′ | 6 | 70 | 8,200 |
| ★ 08-00588-15032 | | | 20 | 3.54 | 2.5 | 4.5 | 12° | 0°59′ | 6 | 70 | 8,700 |
| ★ 08-00588-15033 | | | 25 | 3.72 | 2.5 | 4.5 | 12° | 0°59′ | 6 | 70 | 9,400 |
| ★ 08-00588-15034 | | | 30 | 3.89 | 2.5 | 4.5 | 12° | 0°59′ | 6 | 70 | 10,100 |
| ★ 08-00588-15035 | | | 40 | 4.24 | 2.5 | 4.5 | 12° | 0°59′ | 6 | 80 | 11,200 |
| ★ 08-00588-15036 | | | 50 | 4.59 | 2.5 | 4.5 | 12° | 0°59′ | 6 | 90 | 13,000 |
| ★ 08-00588-15041 | | 1°30′ | 15 | 3.61 | 2.5 | 4.5 | 12° | 1°29′ | 6 | 70 | 8,200 |
| ★ 08-00588-15042 | | | 20 | 3.87 | 2.5 | 4.5 | 12° | 1°29′ | 6 | 70 | 8,700 |
| ★ 08-00588-15043 | | | 25 | 4.13 | 2.5 | 4.5 | 12° | 1°29′ | 6 | 70 | 9,400 |
| ★ 08-00588-15044 | | | 30 | 4.39 | 2.5 | 4.5 | 12° | 1°29′ | 6 | 70 | 10,100 |
| ★ 08-00588-15045 | | | 40 | 4.91 | 2.5 | 4.5 | 12° | 1°29′ | 6 | 80 | 11,200 |
| ★ 08-00588-15046 | | | 50 | 5.44 | 2.5 | 4.5 | 12° | 1°29′ | 6 | 90 | 13,000 |
| ★ 08-00588-15051 | | 2° | 15 | 3.84 | 2.5 | 4.5 | 12° | 1°59′ | 6 | 70 | 8,200 |
| ★ 08-00588-15052 | | | 20 | 4.19 | 2.5 | 4.5 | 12° | 1°59′ | 6 | 70 | 8,700 |
| ★ 08-00588-15054 | | | 30 | 4.89 | 2.5 | 4.5 | 12° | 1°59′ | 6 | 70 | 11,700 |
| ★ 08-00588-20031 | R2 | 1° | 20 | 4.57 | 3 | 6 | 12° | 0°59′ | 6 | 80 | 10,800 |
| ★ 08-00588-20033 | | | 30 | 4.92 | 3 | 6 | 12° | 0°59′ | 6 | 80 | 10,800 |
| ★ 08-00588-20035 | | | 40 | 5.26 | 3 | 6 | 12° | 0°59′ | 6 | 80 | 14,200 |
| ★ 08-00588-20037 | | | 61.1 | 6.00 | 3 | 6 | – | 0°59′ | 6 | 110 | 16,200 |

# MRBTNH230

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-020

| 被削材 Work Material | | | 調質鋼 Prehardened Steels HPM・NAK (~41HRC) | | | | 焼き入れ鋼 Hardened Steels STAVAX・SKD61 (~52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・PD613 (~62HRC) | | | | ハイス High Speed Tool Steels SKH・HAP (~65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 首角 Neck Taper Angle | 有効長 Effective Length | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.1 | 30′ | 1.5 | 0.003 | 0.01 | 200 | 40,000 | 0.003 | 0.005 | 180 | 40,000 | 0.002 | 0.003 | 140 | 40,000 | 0.001 | 0.002 | 100 | 40,000 |
| | | 2 | 0.003 | 0.005 | 150 | 40,000 | 0.002 | 0.003 | 120 | 40,000 | 0.001 | 0.002 | 100 | 40,000 | 0.001 | 0.002 | 60 | 40,000 |
| | 1° | 1.5 | 0.003 | 0.007 | 200 | 40,000 | 0.003 | 0.005 | 180 | 40,000 | 0.002 | 0.003 | 140 | 40,000 | 0.001 | 0.002 | 100 | 40,000 |
| | | 2 | 0.003 | 0.007 | 160 | 40,000 | 0.003 | 0.005 | 140 | 40,000 | 0.002 | 0.003 | 120 | 40,000 | 0.001 | 0.002 | 80 | 40,000 |
| | 1°30′ | 1.5 | 0.005 | 0.01 | 230 | 40,000 | 0.003 | 0.005 | 200 | 40,000 | 0.002 | 0.003 | 160 | 40,000 | 0.001 | 0.002 | 120 | 40,000 |
| | | 2 | 0.003 | 0.01 | 200 | 40,000 | 0.003 | 0.005 | 160 | 40,000 | 0.002 | 0.003 | 140 | 40,000 | 0.001 | 0.002 | 100 | 40,000 |
| | 2° | 1.5 | 0.007 | 0.01 | 250 | 40,000 | 0.005 | 0.01 | 230 | 40,000 | 0.003 | 0.005 | 180 | 40,000 | 0.002 | 0.003 | 140 | 40,000 |
| | | 2 | 0.003 | 0.01 | 230 | 40,000 | 0.003 | 0.005 | 180 | 40,000 | 0.002 | 0.003 | 140 | 40,000 | 0.001 | 0.002 | 100 | 40,000 |
| 0.15 | 30′ | 2 | 0.003 | 0.007 | 230 | 40,000 | 0.003 | 0.005 | 200 | 40,000 | 0.002 | 0.003 | 160 | 40,000 | 0.002 | 0.002 | 120 | 40,000 |
| | | 3 | 0.003 | 0.005 | 180 | 40,000 | 0.002 | 0.003 | 140 | 40,000 | 0.001 | 0.002 | 120 | 40,000 | 0.001 | 0.002 | 70 | 40,000 |
| | 1° | 2 | 0.003 | 0.01 | 230 | 40,000 | 0.003 | 0.005 | 200 | 40,000 | 0.002 | 0.003 | 160 | 40,000 | 0.002 | 0.002 | 120 | 40,000 |
| | | 3 | 0.003 | 0.007 | 200 | 40,000 | 0.003 | 0.005 | 160 | 40,000 | 0.002 | 0.003 | 140 | 40,000 | 0.001 | 0.002 | 90 | 40,000 |
| | 1°30′ | 2 | 0.005 | 0.01 | 250 | 40,000 | 0.003 | 0.005 | 230 | 40,000 | 0.002 | 0.003 | 180 | 40,000 | 0.002 | 0.002 | 140 | 40,000 |
| | | 3 | 0.003 | 0.01 | 220 | 40,000 | 0.003 | 0.005 | 180 | 40,000 | 0.002 | 0.003 | 150 | 40,000 | 0.001 | 0.002 | 110 | 40,000 |
| | 2° | 2 | 0.007 | 0.01 | 280 | 40,000 | 0.005 | 0.01 | 250 | 40,000 | 0.003 | 0.005 | 200 | 40,000 | 0.002 | 0.003 | 160 | 40,000 |
| | | 3 | 0.003 | 0.01 | 250 | 40,000 | 0.003 | 0.005 | 200 | 40,000 | 0.002 | 0.003 | 160 | 40,000 | 0.002 | 0.002 | 120 | 40,000 |
| 0.2 | 30′ | 3 | 0.01 | 0.02 | 360 | 40,000 | 0.007 | 0.01 | 300 | 40,000 | 0.005 | 0.007 | 240 | 40,000 | 0.003 | 0.005 | 160 | 40,000 |
| | | 4 | 0.007 | 0.01 | 240 | 40,000 | 0.005 | 0.005 | 160 | 40,000 | 0.003 | 0.003 | 120 | 40,000 | 0.002 | 0.003 | 100 | 40,000 |
| | | 6 | 0.005 | 0.01 | 160 | 40,000 | 0.003 | 0.005 | 120 | 40,000 | 0.002 | 0.003 | 100 | 40,000 | 0.001 | 0.003 | 70 | 40,000 |
| | 1° | 3 | 0.01 | 0.02 | 400 | 40,000 | 0.007 | 0.01 | 320 | 40,000 | 0.005 | 0.007 | 260 | 40,000 | 0.003 | 0.005 | 200 | 40,000 |
| | | 4 | 0.01 | 0.015 | 320 | 40,000 | 0.005 | 0.007 | 240 | 40,000 | 0.003 | 0.005 | 160 | 40,000 | 0.002 | 0.003 | 120 | 40,000 |
| | | 6 | 0.005 | 0.007 | 200 | 40,000 | 0.005 | 0.005 | 160 | 40,000 | 0.003 | 0.003 | 120 | 40,000 | 0.002 | 0.002 | 90 | 40,000 |
| | 1°30′ | 3 | 0.015 | 0.02 | 450 | 40,000 | 0.007 | 0.01 | 360 | 40,000 | 0.005 | 0.007 | 280 | 40,000 | 0.003 | 0.005 | 240 | 40,000 |
| | | 4 | 0.01 | 0.02 | 400 | 40,000 | 0.007 | 0.01 | 300 | 40,000 | 0.005 | 0.007 | 240 | 40,000 | 0.003 | 0.005 | 160 | 40,000 |
| | | 6 | 0.007 | 0.01 | 300 | 40,000 | 0.005 | 0.007 | 240 | 40,000 | 0.003 | 0.005 | 160 | 40,000 | 0.002 | 0.003 | 120 | 40,000 |
| | 2° | 3 | 0.015 | 0.02 | 480 | 40,000 | 0.007 | 0.01 | 400 | 40,000 | 0.005 | 0.007 | 320 | 40,000 | 0.003 | 0.005 | 280 | 40,000 |
| | | 4 | 0.01 | 0.02 | 400 | 40,000 | 0.007 | 0.01 | 320 | 40,000 | 0.005 | 0.007 | 260 | 40,000 | 0.003 | 0.005 | 220 | 40,000 |
| | | 6 | 0.01 | 0.015 | 320 | 40,000 | 0.005 | 0.007 | 240 | 40,000 | 0.003 | 0.005 | 180 | 40,000 | 0.002 | 0.003 | 140 | 40,000 |
| 0.25 | 30′ | 4 | 0.012 | 0.02 | 500 | 40,000 | 0.007 | 0.01 | 450 | 40,000 | 0.005 | 0.007 | 360 | 40,000 | 0.003 | 0.005 | 280 | 40,000 |
| | | 5 | 0.008 | 0.01 | 460 | 40,000 | 0.005 | 0.005 | 400 | 40,000 | 0.003 | 0.003 | 300 | 40,000 | 0.002 | 0.003 | 240 | 40,000 |
| | 1° | 4 | 0.015 | 0.03 | 580 | 40,000 | 0.007 | 0.01 | 520 | 40,000 | 0.005 | 0.007 | 400 | 40,000 | 0.003 | 0.005 | 320 | 40,000 |
| | | 5 | 0.012 | 0.02 | 500 | 40,000 | 0.007 | 0.01 | 440 | 40,000 | 0.005 | 0.007 | 360 | 40,000 | 0.003 | 0.005 | 260 | 40,000 |
| | 1°30′ | 4 | 0.015 | 0.035 | 640 | 40,000 | 0.01 | 0.02 | 560 | 40,000 | 0.007 | 0.01 | 480 | 40,000 | 0.005 | 0.007 | 360 | 40,000 |
| | | 5 | 0.012 | 0.02 | 500 | 40,000 | 0.007 | 0.01 | 460 | 40,000 | 0.005 | 0.007 | 380 | 40,000 | 0.003 | 0.005 | 280 | 40,000 |
| | 2° | 4 | 0.015 | 0.035 | 700 | 40,000 | 0.01 | 0.02 | 640 | 40,000 | 0.007 | 0.01 | 540 | 40,000 | 0.005 | 0.007 | 400 | 40,000 |
| | | 5 | 0.015 | 0.03 | 600 | 40,000 | 0.007 | 0.015 | 520 | 40,000 | 0.005 | 0.01 | 420 | 40,000 | 0.003 | 0.007 | 300 | 40,000 |
| 0.3 | 30′ | 4 | 0.025 | 0.07 | 900 | 40,000 | 0.02 | 0.03 | 800 | 40,000 | 0.01 | 0.03 | 580 | 40,000 | 0.01 | 0.02 | 450 | 30,000 |
| | | 5 | 0.025 | 0.05 | 750 | 40,000 | 0.02 | 0.03 | 700 | 35,000 | 0.01 | 0.02 | 500 | 35,000 | 0.008 | 0.015 | 420 | 30,000 |
| | | 6 | 0.015 | 0.02 | 500 | 35,000 | 0.01 | 0.015 | 460 | 30,000 | 0.007 | 0.01 | 400 | 30,000 | 0.005 | 0.008 | 360 | 30,000 |
| | | 8 | 0.008 | 0.015 | 400 | 30,000 | 0.005 | 0.007 | 360 | 25,000 | 0.003 | 0.005 | 300 | 25,000 | 0.003 | 0.003 | 260 | 20,000 |
| | 1° | 4 | 0.025 | 0.07 | 900 | 40,000 | 0.02 | 0.03 | 800 | 40,000 | 0.01 | 0.03 | 580 | 40,000 | 0.01 | 0.02 | 450 | 30,000 |
| | | 5 | 0.025 | 0.05 | 750 | 40,000 | 0.02 | 0.03 | 700 | 35,000 | 0.01 | 0.02 | 500 | 35,000 | 0.008 | 0.015 | 420 | 30,000 |
| | | 6 | 0.02 | 0.04 | 540 | 35,000 | 0.01 | 0.02 | 500 | 30,000 | 0.007 | 0.015 | 460 | 30,000 | 0.007 | 0.01 | 400 | 30,000 |
| | | 8 | 0.01 | 0.02 | 460 | 35,000 | 0.007 | 0.01 | 400 | 30,000 | 0.005 | 0.007 | 360 | 30,000 | 0.003 | 0.005 | 320 | 30,000 |
| | 1°30′ | 4 | 0.025 | 0.07 | 1,000 | 40,000 | 0.02 | 0.03 | 900 | 40,000 | 0.01 | 0.03 | 620 | 40,000 | 0.01 | 0.02 | 480 | 30,000 |
| | | 5 | 0.025 | 0.05 | 800 | 40,000 | 0.02 | 0.03 | 750 | 40,000 | 0.01 | 0.03 | 560 | 40,000 | 0.01 | 0.02 | 440 | 30,000 |
| | | 6 | 0.025 | 0.04 | 750 | 40,000 | 0.02 | 0.025 | 700 | 35,000 | 0.01 | 0.02 | 500 | 35,000 | 0.008 | 0.015 | 420 | 30,000 |
| | | 8 | 0.013 | 0.02 | 500 | 35,000 | 0.01 | 0.015 | 460 | 30,000 | 0.007 | 0.01 | 400 | 30,000 | 0.005 | 0.008 | 360 | 30,000 |



ŞEVKET ÖLÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| 被削材 Work Material | | | 調質鋼 Prehardened Steels HPM・NAK (~41HRC) | | | | 焼き入れ鋼 Hardened Steels STAVAX・SKD61 (~52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・PD613 (~62HRC) | | | | ハイス High Speed Tool Steels SKH・HAP (~65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 首角 Neck Taper Angle | 有効長 Effective Length | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.3 | 2° | 5 | 0.025 | 0.07 | 1,000 | 40,000 | 0.02 | 0.03 | 900 | 40,000 | 0.01 | 0.03 | 620 | 40,000 | 0.01 | 0.02 | 480 | 30,000 |
| | | 6 | 0.025 | 0.05 | 800 | 40,000 | 0.02 | 0.03 | 750 | 35,000 | 0.01 | 0.02 | 560 | 35,000 | 0.008 | 0.015 | 440 | 30,000 |
| | | 8 | 0.02 | 0.03 | 540 | 35,000 | 0.01 | 0.02 | 500 | 30,000 | 0.007 | 0.015 | 460 | 30,000 | 0.007 | 0.01 | 400 | 30,000 |
| 0.4 | 30′ | 8 | 0.015 | 0.03 | 720 | 35,000 | 0.012 | 0.02 | 600 | 30,000 | 0.007 | 0.015 | 540 | 30,000 | 0.005 | 0.01 | 480 | 25,000 |
| | | 12 | 0.005 | 0.01 | 460 | 30,000 | 0.005 | 0.005 | 400 | 25,000 | 0.003 | 0.003 | 360 | 25,000 | 0.002 | 0.003 | 320 | 25,000 |
| | 1° | 8 | 0.03 | 0.05 | 800 | 35,000 | 0.02 | 0.03 | 700 | 30,000 | 0.01 | 0.02 | 680 | 30,000 | 0.007 | 0.01 | 520 | 25,000 |
| | | 12 | 0.005 | 0.01 | 460 | 30,000 | 0.005 | 0.005 | 400 | 25,000 | 0.003 | 0.003 | 360 | 25,000 | 0.002 | 0.003 | 320 | 20,000 |
| | 1°30′ | 8 | 0.05 | 0.07 | 900 | 35,000 | 0.03 | 0.05 | 800 | 30,000 | 0.02 | 0.03 | 760 | 30,000 | 0.01 | 0.02 | 560 | 25,000 |
| | | 12 | 0.015 | 0.03 | 640 | 35,000 | 0.01 | 0.02 | 500 | 30,000 | 0.007 | 0.01 | 500 | 30,000 | 0.005 | 0.01 | 480 | 25,000 |
| | 2° | 8 | 0.05 | 0.08 | 1,000 | 35,000 | 0.03 | 0.05 | 900 | 30,000 | 0.02 | 0.03 | 760 | 30,000 | 0.01 | 0.02 | 560 | 25,000 |
| | | 12 | 0.03 | 0.05 | 800 | 35,000 | 0.02 | 0.03 | 700 | 30,000 | 0.01 | 0.02 | 600 | 30,000 | 0.007 | 0.01 | 520 | 25,000 |
| 0.5 | 30′ | 6 | 0.1 | 0.2 | 1,600 | 35,000 | 0.05 | 0.1 | 1,400 | 30,000 | 0.04 | 0.05 | 1,200 | 25,000 | 0.02 | 0.05 | 740 | 20,000 |
| | | 8 | 0.08 | 0.2 | 1,300 | 35,000 | 0.04 | 0.06 | 1,200 | 30,000 | 0.03 | 0.04 | 950 | 25,000 | 0.02 | 0.03 | 680 | 20,000 |
| | | 10 | 0.03 | 0.06 | 1,000 | 30,000 | 0.03 | 0.05 | 820 | 25,000 | 0.015 | 0.03 | 750 | 20,000 | 0.01 | 0.02 | 500 | 18,000 |
| | | 12 | 0.03 | 0.06 | 820 | 30,000 | 0.03 | 0.05 | 720 | 25,000 | 0.015 | 0.03 | 620 | 20,000 | 0.01 | 0.02 | 450 | 18,000 |
| | | 16 | 0.012 | 0.025 | 540 | 25,000 | 0.008 | 0.02 | 500 | 20,000 | 0.005 | 0.01 | 420 | 18,000 | 0.003 | 0.006 | 350 | 16,000 |
| | | 20 | 0.005 | 0.01 | 300 | 20,000 | 0.005 | 0.005 | 250 | 18,000 | 0.003 | 0.005 | 200 | 16,000 | 0.002 | 0.003 | 150 | 14,000 |
| | | 25 | 0.005 | 0.005 | 180 | 20,000 | 0.003 | 0.005 | 150 | 18,000 | 0.002 | 0.005 | 120 | 16,000 | 0.002 | 0.002 | 85 | 14,000 |
| | | 30 | 0.003 | 0.005 | 120 | 16,000 | 0.003 | 0.003 | 100 | 16,000 | 0.002 | 0.003 | 75 | 14,000 | 0.001 | 0.002 | 60 | 12,000 |
| | 1° | 6 | 0.1 | 0.25 | 2,000 | 35,000 | 0.05 | 0.15 | 1,800 | 30,000 | 0.04 | 0.1 | 1,600 | 25,000 | 0.03 | 0.05 | 920 | 20,000 |
| | | 8 | 0.1 | 0.2 | 1,600 | 35,000 | 0.05 | 0.1 | 1,400 | 30,000 | 0.04 | 0.05 | 1,200 | 25,000 | 0.02 | 0.05 | 740 | 20,000 |
| | | 10 | 0.05 | 0.1 | 1,200 | 35,000 | 0.04 | 0.06 | 1,000 | 30,000 | 0.03 | 0.04 | 800 | 25,000 | 0.02 | 0.03 | 560 | 20,000 |
| | | 12 | 0.04 | 0.06 | 1,000 | 30,000 | 0.03 | 0.05 | 820 | 25,000 | 0.02 | 0.03 | 700 | 20,000 | 0.01 | 0.02 | 500 | 18,000 |
| | | 16 | 0.015 | 0.025 | 600 | 25,000 | 0.01 | 0.025 | 500 | 20,000 | 0.007 | 0.02 | 450 | 18,000 | 0.005 | 0.01 | 400 | 16,000 |
| | | 20 | 0.012 | 0.025 | 500 | 25,000 | 0.008 | 0.02 | 400 | 20,000 | 0.005 | 0.01 | 360 | 18,000 | 0.003 | 0.006 | 320 | 16,000 |
| | | 25 | 0.005 | 0.01 | 300 | 20,000 | 0.005 | 0.005 | 250 | 18,000 | 0.003 | 0.005 | 200 | 16,000 | 0.002 | 0.003 | 150 | 14,000 |
| | | 30 | 0.005 | 0.005 | 200 | 20,000 | 0.003 | 0.005 | 150 | 18,000 | 0.002 | 0.005 | 120 | 16,000 | 0.002 | 0.002 | 85 | 14,000 |
| | 1°30′ | 6 | 0.15 | 0.25 | 2,000 | 40,000 | 0.1 | 0.2 | 2,000 | 40,000 | 0.05 | 0.15 | 1,600 | 30,000 | 0.05 | 0.1 | 1,200 | 25,000 |
| | | 8 | 0.1 | 0.2 | 1,800 | 35,000 | 0.05 | 0.1 | 1,600 | 30,000 | 0.04 | 0.05 | 1,200 | 25,000 | 0.02 | 0.05 | 800 | 20,000 |
| | | 10 | 0.08 | 0.2 | 1,400 | 35,000 | 0.04 | 0.06 | 1,200 | 30,000 | 0.03 | 0.04 | 900 | 25,000 | 0.02 | 0.03 | 700 | 20,000 |
| | | 12 | 0.05 | 0.1 | 1,200 | 35,000 | 0.04 | 0.06 | 1,000 | 30,000 | 0.03 | 0.04 | 800 | 25,000 | 0.02 | 0.03 | 550 | 20,000 |
| | | 16 | 0.03 | 0.05 | 800 | 30,000 | 0.02 | 0.05 | 700 | 25,000 | 0.02 | 0.03 | 600 | 20,000 | 0.01 | 0.02 | 500 | 18,000 |
| | | 20 | 0.015 | 0.025 | 600 | 25,000 | 0.01 | 0.025 | 500 | 20,000 | 0.007 | 0.02 | 450 | 18,000 | 0.005 | 0.01 | 400 | 16,000 |
| | | 25 | 0.012 | 0.025 | 500 | 25,000 | 0.008 | 0.02 | 400 | 20,000 | 0.005 | 0.01 | 350 | 18,000 | 0.003 | 0.006 | 300 | 16,000 |
| | | 30 | 0.01 | 0.02 | 400 | 20,000 | 0.005 | 0.01 | 300 | 20,000 | 0.003 | 0.007 | 250 | 18,000 | 0.002 | 0.005 | 200 | 16,000 |
| | 2° | 8 | 0.1 | 0.2 | 2,000 | 35,000 | 0.05 | 0.1 | 1,600 | 30,000 | 0.04 | 0.05 | 1,200 | 25,000 | 0.02 | 0.05 | 900 | 20,000 |
| | | 10 | 0.05 | 0.2 | 1,600 | 35,000 | 0.04 | 0.1 | 1,200 | 30,000 | 0.03 | 0.05 | 1,000 | 25,000 | 0.02 | 0.05 | 700 | 20,000 |
| | | 20 | 0.03 | 0.05 | 800 | 30,000 | 0.02 | 0.05 | 700 | 25,000 | 0.02 | 0.03 | 600 | 20,000 | 0.01 | 0.02 | 450 | 18,000 |
| | | 30 | 0.015 | 0.03 | 600 | 20,000 | 0.01 | 0.03 | 500 | 20,000 | 0.007 | 0.02 | 400 | 18,000 | 0.005 | 0.01 | 350 | 16,000 |
| 0.75 | 30′ | 10 | 0.15 | 0.2 | 2,000 | 30,000 | 0.1 | 0.15 | 1,600 | 25,000 | 0.05 | 0.15 | 1,400 | 25,000 | 0.05 | 0.07 | 1,000 | 20,000 |
| | | 15 | 0.07 | 0.15 | 1,400 | 25,000 | 0.05 | 0.08 | 1,000 | 20,000 | 0.03 | 0.07 | 800 | 20,000 | 0.02 | 0.04 | 600 | 18,000 |
| | | 20 | 0.03 | 0.05 | 800 | 18,000 | 0.02 | 0.04 | 600 | 16,000 | 0.012 | 0.025 | 450 | 16,000 | 0.008 | 0.015 | 360 | 14,000 |
| | | 25 | 0.02 | 0.04 | 540 | 18,000 | 0.01 | 0.03 | 450 | 16,000 | 0.01 | 0.02 | 360 | 16,000 | 0.007 | 0.01 | 300 | 14,000 |
| | | 30 | 0.01 | 0.03 | 360 | 14,000 | 0.007 | 0.02 | 320 | 14,000 | 0.005 | 0.01 | 240 | 14,000 | 0.003 | 0.005 | 200 | 12,000 |
| | 1° | 10 | 0.15 | 0.25 | 2,000 | 30,000 | 0.1 | 0.2 | 1,800 | 25,000 | 0.05 | 0.2 | 1,400 | 25,000 | 0.05 | 0.1 | 1,000 | 20,000 |
| | | 15 | 0.08 | 0.15 | 1,600 | 25,000 | 0.05 | 0.1 | 1,200 | 20,000 | 0.03 | 0.1 | 920 | 20,000 | 0.02 | 0.05 | 780 | 18,000 |
| | | 20 | 0.05 | 0.1 | 1,000 | 20,000 | 0.03 | 0.07 | 800 | 18,000 | 0.02 | 0.05 | 600 | 18,000 | 0.015 | 0.03 | 550 | 16,000 |
| | | 25 | 0.03 | 0.05 | 700 | 18,000 | 0.02 | 0.04 | 550 | 16,000 | 0.012 | 0.025 | 400 | 16,000 | 0.008 | 0.015 | 350 | 14,000 |
| | | 30 | 0.02 | 0.04 | 450 | 16,000 | 0.01 | 0.03 | 360 | 16,000 | 0.01 | 0.02 | 300 | 16,000 | 0.007 | 0.01 | 250 | 14,000 |

# MRBTNH230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | | 調質鋼 Prehardened Steels HPM・NAK (~41HRC) | | | | 焼き入れ鋼 Hardened Steels STAVAX・SKD61 (~52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・PD613 (~62HRC) | | | | ハイス High Speed Tool Steels SKH・HAP (~65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 首角 Neck Taper Angle | 有効長 Effective Length | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.75 | 1°30′ | 10 | 0.15 | 0.25 | 2,000 | 30,000 | 0.1 | 0.2 | 2,000 | 25,000 | 0.05 | 0.2 | 1,600 | 25,000 | 0.05 | 0.1 | 1,200 | 20,000 |
| | | 15 | 0.08 | 0.15 | 1,800 | 25,000 | 0.05 | 0.1 | 1,400 | 20,000 | 0.03 | 0.1 | 920 | 20,000 | 0.02 | 0.05 | 780 | 18,000 |
| | | 20 | 0.06 | 0.1 | 1,200 | 25,000 | 0.05 | 0.07 | 1,000 | 20,000 | 0.03 | 0.05 | 820 | 20,000 | 0.02 | 0.03 | 650 | 18,000 |
| | 2° | 10 | 0.2 | 0.3 | 2,000 | 30,000 | 0.1 | 0.2 | 2,000 | 25,000 | 0.05 | 0.2 | 1,600 | 25,000 | 0.05 | 0.1 | 1,200 | 20,000 |
| | | 15 | 0.1 | 0.2 | 2,000 | 30,000 | 0.1 | 0.1 | 1,600 | 25,000 | 0.05 | 0.1 | 1,200 | 25,000 | 0.05 | 0.05 | 900 | 20,000 |
| | | 20 | 0.07 | 0.12 | 1,400 | 25,000 | 0.05 | 0.1 | 1,200 | 20,000 | 0.03 | 0.1 | 900 | 20,000 | 0.02 | 0.05 | 750 | 18,000 |
| 1 | 30′ | 12 | 0.15 | 0.3 | 2,400 | 20,000 | 0.1 | 0.3 | 2,000 | 18,000 | 0.1 | 0.2 | 1,600 | 16,000 | 0.1 | 0.1 | 1,200 | 14,000 |
| | | 16 | 0.1 | 0.2 | 1,800 | 18,000 | 0.07 | 0.15 | 1,600 | 16,000 | 0.05 | 0.08 | 1,200 | 14,000 | 0.03 | 0.07 | 800 | 12,000 |
| | | 20 | 0.07 | 0.12 | 1,600 | 16,000 | 0.05 | 0.1 | 1,400 | 14,000 | 0.03 | 0.06 | 1,000 | 12,000 | 0.02 | 0.04 | 700 | 10,000 |
| | | 25 | 0.05 | 0.1 | 1,000 | 14,000 | 0.03 | 0.08 | 850 | 14,000 | 0.02 | 0.05 | 700 | 12,000 | 0.02 | 0.02 | 600 | 10,000 |
| | | 30 | 0.03 | 0.08 | 800 | 12,000 | 0.03 | 0.05 | 700 | 12,000 | 0.02 | 0.03 | 540 | 10,000 | 0.01 | 0.02 | 420 | 8,500 |
| | | 35 | 0.03 | 0.05 | 600 | 12,000 | 0.025 | 0.04 | 500 | 12,000 | 0.015 | 0.025 | 420 | 10,000 | 0.008 | 0.015 | 320 | 8,500 |
| | | 40 | 0.02 | 0.04 | 420 | 12,000 | 0.02 | 0.03 | 360 | 12,000 | 0.01 | 0.02 | 300 | 10,000 | 0.008 | 0.01 | 240 | 8,500 |
| | | 50 | 0.01 | 0.03 | 300 | 10,000 | 0.01 | 0.02 | 240 | 10,000 | 0.005 | 0.01 | 200 | 8,500 | 0.005 | 0.005 | 160 | 7,000 |
| | 1° | 12 | 0.15 | 0.3 | 2,400 | 20,000 | 0.15 | 0.3 | 2,000 | 18,000 | 0.1 | 0.2 | 1,600 | 16,000 | 0.1 | 0.1 | 1,200 | 14,000 |
| | | 16 | 0.12 | 0.2 | 1,800 | 18,000 | 0.1 | 0.15 | 1,600 | 16,000 | 0.1 | 0.1 | 1,400 | 14,000 | 0.05 | 0.1 | 900 | 12,000 |
| | | 20 | 0.1 | 0.15 | 1,600 | 18,000 | 0.07 | 0.1 | 1,400 | 16,000 | 0.05 | 0.08 | 1,200 | 14,000 | 0.03 | 0.05 | 800 | 12,000 |
| | | 25 | 0.07 | 0.12 | 1,400 | 14,000 | 0.05 | 0.1 | 1,200 | 14,000 | 0.03 | 0.05 | 1,000 | 12,000 | 0.02 | 0.03 | 700 | 10,000 |
| | | 30 | 0.05 | 0.1 | 1,000 | 14,000 | 0.035 | 0.08 | 850 | 14,000 | 0.025 | 0.05 | 700 | 12,000 | 0.02 | 0.02 | 600 | 10,000 |
| | | 35 | 0.05 | 0.1 | 800 | 12,000 | 0.035 | 0.06 | 700 | 12,000 | 0.02 | 0.05 | 600 | 10,000 | 0.015 | 0.02 | 500 | 8,500 |
| | | 40 | 0.03 | 0.05 | 700 | 12,000 | 0.03 | 0.05 | 600 | 12,000 | 0.02 | 0.04 | 540 | 10,000 | 0.01 | 0.02 | 400 | 8,500 |
| | | 50 | 0.025 | 0.04 | 420 | 12,000 | 0.02 | 0.03 | 360 | 12,000 | 0.01 | 0.02 | 300 | 10,000 | 0.008 | 0.01 | 240 | 8,500 |
| | 1°30′ | 12 | 0.2 | 0.35 | 2,400 | 20,000 | 0.15 | 0.35 | 2,000 | 18,000 | 0.12 | 0.2 | 1,600 | 16,000 | 0.1 | 0.15 | 1,200 | 14,000 |
| | | 16 | 0.15 | 0.2 | 1,800 | 18,000 | 0.1 | 0.2 | 1,600 | 16,000 | 0.1 | 0.15 | 1,400 | 14,000 | 0.05 | 0.1 | 1,000 | 12,000 |
| | | 20 | 0.1 | 0.2 | 1,800 | 18,000 | 0.07 | 0.15 | 1,600 | 16,000 | 0.05 | 0.1 | 1,200 | 14,000 | 0.03 | 0.1 | 900 | 12,000 |
| | | 25 | 0.1 | 0.15 | 1,600 | 16,000 | 0.07 | 0.12 | 1,400 | 16,000 | 0.05 | 0.08 | 1,200 | 14,000 | 0.03 | 0.07 | 900 | 12,000 |
| | | 30 | 0.07 | 0.12 | 1,400 | 14,000 | 0.05 | 0.1 | 1,200 | 14,000 | 0.03 | 0.06 | 1,000 | 12,000 | 0.02 | 0.03 | 850 | 10,000 |
| | | 35 | 0.06 | 0.12 | 1,000 | 14,000 | 0.05 | 0.1 | 900 | 14,000 | 0.03 | 0.05 | 800 | 12,000 | 0.02 | 0.03 | 700 | 10,000 |
| | | 40 | 0.05 | 0.1 | 900 | 14,000 | 0.03 | 0.08 | 800 | 14,000 | 0.02 | 0.05 | 700 | 12,000 | 0.02 | 0.02 | 600 | 10,000 |
| | | 50 | 0.04 | 0.07 | 800 | 12,000 | 0.03 | 0.05 | 700 | 12,000 | 0.02 | 0.04 | 600 | 10,000 | 0.01 | 0.02 | 420 | 8,500 |
| | 2° | 12 | 0.2 | 0.4 | 2,400 | 20,000 | 0.2 | 0.3 | 2,000 | 20,000 | 0.15 | 0.25 | 1,600 | 18,000 | 0.1 | 0.2 | 1,200 | 16,000 |
| | | 16 | 0.15 | 0.3 | 2,400 | 20,000 | 0.1 | 0.3 | 2,000 | 18,000 | 0.1 | 0.2 | 1,600 | 16,000 | 0.1 | 0.1 | 1,200 | 14,000 |
| | | 20 | 0.12 | 0.2 | 2,000 | 18,000 | 0.1 | 0.2 | 1,800 | 16,000 | 0.1 | 0.1 | 1,400 | 14,000 | 0.05 | 0.1 | 1,100 | 12,000 |
| | | 25 | 0.1 | 0.2 | 1,800 | 16,000 | 0.07 | 0.15 | 1,600 | 16,000 | 0.05 | 0.1 | 1,200 | 14,000 | 0.03 | 0.07 | 1,000 | 12,000 |
| | | 30 | 0.1 | 0.15 | 1,600 | 16,000 | 0.07 | 0.15 | 1,400 | 16,000 | 0.05 | 0.08 | 1,100 | 14,000 | 0.03 | 0.07 | 900 | 12,000 |
| | | 40 | 0.07 | 0.12 | 1,400 | 14,000 | 0.05 | 0.1 | 1,200 | 14,000 | 0.03 | 0.05 | 1,000 | 12,000 | 0.02 | 0.03 | 800 | 10,000 |
| | | 50 | 0.05 | 0.12 | 1,000 | 14,000 | 0.05 | 0.1 | 900 | 14,000 | 0.03 | 0.05 | 800 | 12,000 | 0.02 | 0.03 | 600 | 10,000 |
| 1.5 | 30′ | 15 | 0.2 | 0.4 | 2,400 | 18,000 | 0.1 | 0.4 | 2,000 | 18,000 | 0.1 | 0.3 | 1,600 | 14,000 | 0.1 | 0.2 | 1,200 | 12,000 |
| | | 20 | 0.15 | 0.3 | 2,000 | 18,000 | 0.1 | 0.3 | 1,600 | 18,000 | 0.1 | 0.2 | 1,400 | 14,000 | 0.08 | 0.1 | 1,000 | 12,000 |
| | | 25 | 0.12 | 0.3 | 1,800 | 16,000 | 0.1 | 0.25 | 1,400 | 16,000 | 0.07 | 0.15 | 1,200 | 12,000 | 0.05 | 0.07 | 900 | 10,000 |
| | | 30 | 0.12 | 0.25 | 1,200 | 16,000 | 0.08 | 0.2 | 1,200 | 14,000 | 0.05 | 0.1 | 1,000 | 12,000 | 0.035 | 0.06 | 700 | 10,000 |
| | | 40 | 0.07 | 0.15 | 800 | 14,000 | 0.04 | 0.1 | 720 | 12,000 | 0.025 | 0.06 | 600 | 10,000 | 0.02 | 0.04 | 480 | 8,000 |
| | | 50 | 0.05 | 0.1 | 600 | 12,000 | 0.025 | 0.04 | 540 | 10,000 | 0.015 | 0.02 | 480 | 7,000 | 0.01 | 0.02 | 360 | 5,000 |
| | 1° | 15 | 0.2 | 0.5 | 2,400 | 20,000 | 0.15 | 0.5 | 2,000 | 20,000 | 0.15 | 0.4 | 1,600 | 18,000 | 0.1 | 0.3 | 1,400 | 14,000 |
| | | 20 | 0.15 | 0.4 | 2,000 | 18,000 | 0.1 | 0.4 | 1,800 | 18,000 | 0.1 | 0.2 | 1,400 | 16,000 | 0.08 | 0.2 | 1,200 | 12,000 |
| | | 25 | 0.15 | 0.3 | 1,800 | 18,000 | 0.1 | 0.3 | 1,600 | 16,000 | 0.1 | 0.15 | 1,200 | 12,000 | 0.06 | 0.1 | 1,000 | 10,000 |
| | | 30 | 0.12 | 0.3 | 1,600 | 16,000 | 0.08 | 0.2 | 1,200 | 14,000 | 0.05 | 0.1 | 1,000 | 12,000 | 0.035 | 0.07 | 700 | 10,000 |
| | | 40 | 0.07 | 0.15 | 1,000 | 16,000 | 0.04 | 0.1 | 800 | 12,000 | 0.03 | 0.06 | 600 | 10,000 | 0.02 | 0.04 | 500 | 8,000 |
| | | 50 | 0.05 | 0.12 | 700 | 12,000 | 0.025 | 0.04 | 580 | 10,000 | 0.015 | 0.02 | 480 | 7,000 | 0.01 | 0.02 | 360 | 5,000 |



ŞEVKET ÖLÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| 被削材 Work Material | | | 調質鋼 Prehardened Steels HPM・NAK (~41HRC) | | | | 焼き入れ鋼 Hardened Steels STAVAX・SKD61 (~52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・PD613 (~62HRC) | | | | ハイス High Speed Tool Steels SKH・HAP (~65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 首角 Neck Taper Angle | 有効長 Effective Length | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 1.5 | 1°30′ | 15 | 0.25 | 0.5 | 3,000 | 20,000 | 0.2 | 0.5 | 2,400 | 20,000 | 0.2 | 0.4 | 2,000 | 18,000 | 0.15 | 0.3 | 1,400 | 14,000 |
| | | 20 | 0.15 | 0.4 | 2,400 | 18,000 | 0.1 | 0.4 | 2,000 | 18,000 | 0.1 | 0.3 | 1,600 | 16,000 | 0.1 | 0.2 | 1,200 | 12,000 |
| | | 25 | 0.15 | 0.3 | 2,000 | 18,000 | 0.1 | 0.3 | 1,600 | 18,000 | 0.1 | 0.2 | 1,400 | 16,000 | 0.1 | 0.1 | 1,000 | 12,000 |
| | | 30 | 0.12 | 0.3 | 1,800 | 16,000 | 0.1 | 0.25 | 1,400 | 16,000 | 0.07 | 0.15 | 1,200 | 14,000 | 0.05 | 0.07 | 900 | 10,000 |
| | | 40 | 0.1 | 0.25 | 1,200 | 16,000 | 0.06 | 0.2 | 1,000 | 14,000 | 0.04 | 0.1 | 800 | 12,000 | 0.03 | 0.05 | 520 | 10,000 |
| | | 50 | 0.07 | 0.15 | 800 | 12,000 | 0.035 | 0.1 | 600 | 10,000 | 0.02 | 0.07 | 500 | 8,000 | 0.02 | 0.05 | 400 | 6,000 |
| | 2° | 15 | 0.25 | 0.6 | 3,000 | 20,000 | 0.2 | 0.6 | 2,400 | 20,000 | 0.2 | 0.4 | 2,000 | 18,000 | 0.15 | 0.3 | 1,600 | 14,000 |
| | | 20 | 0.2 | 0.5 | 2,400 | 18,000 | 0.15 | 0.4 | 2,000 | 18,000 | 0.12 | 0.3 | 1,600 | 16,000 | 0.1 | 0.2 | 1,200 | 12,000 |
| | | 30 | 0.2 | 0.4 | 2,000 | 16,000 | 0.15 | 0.3 | 1,800 | 16,000 | 0.1 | 0.2 | 1,400 | 14,000 | 0.07 | 0.12 | 1,000 | 12,000 |
| 2 | 1° | 20 | 0.5 | 1.5 | 3,000 | 18,000 | 0.4 | 1 | 2,400 | 18,000 | 0.2 | 0.8 | 2,000 | 16,000 | 0.15 | 0.6 | 1,600 | 12,000 |
| | | 30 | 0.3 | 1 | 2,400 | 16,000 | 0.2 | 0.7 | 1,600 | 14,000 | 0.1 | 0.3 | 1,200 | 12,000 | 0.06 | 0.15 | 1,000 | 10,000 |
| | | 40 | 0.2 | 0.3 | 2,000 | 12,000 | 0.1 | 0.15 | 1,200 | 9,000 | 0.06 | 0.1 | 1,000 | 6,000 | 0.035 | 0.07 | 800 | 5,000 |
| | | 61.1 | 0.05 | 0.1 | 1,200 | 8,000 | 0.025 | 0.04 | 600 | 5,000 | 0.015 | 0.025 | 480 | 3,500 | 0.01 | 0.02 | 360 | 3,000 |

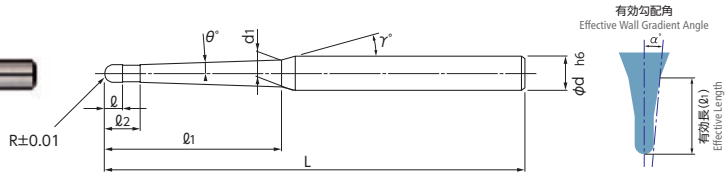
**備　考 Notes**

※切削条件参考表は、等高線荒加工の条件を示します。
※切り込み量の、ap は深さ方向の切り込み量、ae はピックフィードを示します。
※ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。また、主軸回転数が足りない場合も同様に同じ割合で下げてください。
※深い部分を加工する際は、クーラントの給油および切りくずの排出性に十分注意してください。
※オイルミストクーラントをお奨めします。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整してください。
※Above conditions are for contour line roughing process.
※Depth of Cut : ap=Axial Depth of Cut / ae=Radical Depth of Cut.
※Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.
※Coolant supply and chip disposal in the deep portion are very important.
※Recommended oil mist coolant.
※Adjust milling conditions according to the volume of depth of cut and rigidity of machine.

# MRBTNH345

## 無限コーティングプレミアム ロングテーパーネック3枚刃ボールエンドミル

MUGEN-COATING PREMIUM 3-Flute Long Taper Neck Ball End Mill




技術資料 K-021

- 首下部をテーパーにし、従来のロングネックタイプよりも剛性を向上。
- 耐熱性に優れた無限コーティングプレミアムを採用し、高硬度材加工においても長寿命。
- NS 独自の 3 枚刃形状の採用で高能率加工が可能。
- Higher rigidity brought by taper neck than existing long neck.
- MUGEN-COATING PREMIUM because of high heat resistance, realized long tool life for hardened steels.
- High effective machining achieved by NS original 3-flute design.

3D MG Premium 3 45° ≦68 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ◎ | ◎ | ◎ | | | | | |

★ 再研磨可能 （詳細はお問い合わせください。）

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (α)有効勾配角 Effective Wall Gradient Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00590-05020 | R0.5 | 30′ | 12 | 1.11 | 0.75 | 1.25 | 12° | 0°15′ | 6 | 60 | 7,400 |
| 08-00590-05021 | | | 16 | 1.18 | 0.75 | 1.25 | 12° | 0°19′ | 6 | 60 | 7,400 |
| 08-00590-05022 | | | 20 | 1.25 | 0.75 | 1.25 | 12° | 0°21′ | 6 | 70 | 9,400 |
| 08-00590-05023 | | | 25 | 1.34 | 0.75 | 1.25 | 12° | 0°23′ | 6 | 70 | 9,900 |
| 08-00590-05024 | | | 30 | 1.42 | 0.75 | 1.25 | 12° | 0°24′ | 6 | 70 | 10,400 |
| 08-00590-05030 | | 1° | 12 | 1.30 | 0.75 | 1.25 | 12° | 0°42′ | 6 | 60 | 7,400 |
| 08-00590-05031 | | | 16 | 1.44 | 0.75 | 1.25 | 12° | 0°46′ | 6 | 60 | 7,400 |
| 08-00590-05032 | | | 20 | 1.58 | 0.75 | 1.25 | 12° | 0°49′ | 6 | 70 | 9,400 |
| 08-00590-05033 | | | 25 | 1.75 | 0.75 | 1.25 | 12° | 0°51′ | 6 | 70 | 9,900 |
| 08-00590-05034 | | | 30 | 1.93 | 0.75 | 1.25 | 12° | 0°53′ | 6 | 70 | 10,400 |
| 08-00590-05040 | | 1°30′ | 12 | 1.48 | 0.75 | 1.25 | 12° | 1°09′ | 6 | 60 | 7,400 |
| 08-00590-05041 | | | 16 | 1.69 | 0.75 | 1.25 | 12° | 1°14′ | 6 | 60 | 7,400 |
| 08-00590-05042 | | | 20 | 1.90 | 0.75 | 1.25 | 12° | 1°17′ | 6 | 70 | 9,400 |
| 08-00590-05043 | | | 25 | 2.17 | 0.75 | 1.25 | 12° | 1°20′ | 6 | 70 | 9,900 |
| 08-00590-05044 | | | 30 | 2.43 | 0.75 | 1.25 | 12° | 1°21′ | 6 | 70 | 10,400 |
| 08-00590-05050 | | 2° | 20 | 2.23 | 0.75 | 1.25 | 12° | 1°45′ | 6 | 70 | 9,400 |
| 08-00590-05051 | | | 30 | 2.93 | 0.75 | 1.25 | 12° | 1°50′ | 6 | 70 | 10,400 |
| 08-00590-07520 | R0.75 | 30′ | 12 | 1.58 | 1.1 | 1.85 | 12° | 0°12′ | 6 | 60 | 7,800 |
| 08-00590-07521 | | | 16 | 1.65 | 1.1 | 1.85 | 12° | 0°16′ | 6 | 60 | 8,500 |
| 08-00590-07523 | | | 20 | 1.72 | 1.1 | 1.85 | 12° | 0°19′ | 6 | 70 | 8,500 |
| 08-00590-07524 | | | 25 | 1.81 | 1.1 | 1.85 | 12° | 0°21′ | 6 | 70 | 9,200 |
| 08-00590-07525 | | | 30 | 1.90 | 1.1 | 1.85 | 12° | 0°22′ | 6 | 70 | 9,200 |
| 08-00590-07530 | | 1° | 12 | 1.76 | 1.1 | 1.85 | 12° | 0°37′ | 6 | 60 | 7,800 |
| 08-00590-07531 | | | 16 | 1.90 | 1.1 | 1.85 | 12° | 0°43′ | 6 | 60 | 8,500 |
| 08-00590-07532 | | | 20 | 2.04 | 1.1 | 1.85 | 12° | 0°46′ | 6 | 70 | 8,500 |
| 08-00590-07533 | | | 25 | 2.22 | 1.1 | 1.85 | 12° | 0°49′ | 6 | 70 | 9,200 |
| 08-00590-07534 | | | 30 | 2.39 | 1.1 | 1.85 | 12° | 0°51′ | 6 | 70 | 9,200 |
| 08-00590-07540 | | 1°30′ | 20 | 2.36 | 1.1 | 1.85 | 12° | 1°13′ | 6 | 70 | 8,500 |
| 08-00590-07541 | | | 30 | 2.88 | 1.1 | 1.85 | 12° | 1°19′ | 6 | 70 | 9,200 |
| 08-00590-07552 | | 2° | 30 | 3.37 | 1.1 | 1.85 | 12° | 1°47′ | 6 | 70 | 9,200 |

オーダー方法

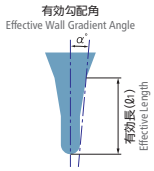
MRBTNH345 ボール半径(R)×首角(θ)×有効長(ℓ1)を指示してください。
When you order, indicate MRBTNH345 (R)×(θ)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

- 切削条件表はE-058に記載
- Recommended Milling Conditions are shown on page E-058.



ŞEVKET ÖĞÜ® MAKINA TİCARET VE SAN. LTD. ŞTİ.




| コードNo. Code No. | (R)ボール半径 Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (α)有効勾配角 Effective Wall Gradient Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00590-10020 | R1 | 30′ | 12 | 2.06 | 1.5 | 2.5 | 12° | 0°08′ | 6 | 60 | 7,800 |
| 08-00590-10021 | | | 16 | 2.13 | 1.5 | 2.5 | 12° | 0°13′ | 6 | 60 | 8,000 |
| 08-00590-10022 | | | 20 | 2.20 | 1.5 | 2.5 | 12° | 0°16′ | 6 | 70 | 8,500 |
| 08-00590-10023 | | | 25 | 2.28 | 1.5 | 2.5 | 12° | 0°19′ | 6 | 70 | 9,400 |
| 08-00590-10024 | | | 30 | 2.37 | 1.5 | 2.5 | 12° | 0°21′ | 6 | 70 | 10,400 |
| 08-00590-10025 | | | 40 | 2.54 | 1.5 | 2.5 | 12° | 0°23′ | 6 | 80 | 12,200 |
| 08-00590-10030 | | 1° | 12 | 2.22 | 1.5 | 2.5 | 12° | 0°31′ | 6 | 60 | 7,800 |
| 08-00590-10031 | | | 16 | 2.36 | 1.5 | 2.5 | 12° | 0°38′ | 6 | 60 | 8,000 |
| 08-00590-10032 | | | 20 | 2.50 | 1.5 | 2.5 | 12° | 0°43′ | 6 | 70 | 8,500 |
| 08-00590-10033 | | | 25 | 2.68 | 1.5 | 2.5 | 12° | 0°46′ | 6 | 70 | 9,400 |
| 08-00590-10034 | | | 30 | 2.85 | 1.5 | 2.5 | 12° | 0°48′ | 6 | 70 | 10,400 |
| 08-00590-10035 | | | 40 | 3.20 | 1.5 | 2.5 | 12° | 0°51′ | 6 | 80 | 12,900 |
| 08-00590-10040 | | 1°30′ | 20 | 2.81 | 1.5 | 2.5 | 12° | 1°09′ | 6 | 70 | 8,500 |
| 08-00590-10041 | | | 25 | 3.07 | 1.5 | 2.5 | 12° | 1°13′ | 6 | 70 | 10,200 |
| 08-00590-10042 | | | 30 | 3.33 | 1.5 | 2.5 | 12° | 1°16′ | 6 | 70 | 11,700 |
| 08-00590-10043 | | | 40 | 3.85 | 1.5 | 2.5 | 12° | 1°19′ | 6 | 80 | 13,000 |
| 08-00590-10050 | | 2° | 20 | 3.11 | 1.5 | 2.5 | 12° | 1°35′ | 6 | 70 | 8,500 |
| 08-00590-10051 | | | 25 | 3.46 | 1.5 | 2.5 | 12° | 1°40′ | 6 | 70 | 10,200 |
| 08-00590-10052 | | | 30 | 3.81 | 1.5 | 2.5 | 12° | 1°43′ | 6 | 70 | 11,700 |
| 08-00590-10053 | | | 40 | 4.51 | 1.5 | 2.5 | 12° | 1°47′ | 6 | 80 | 13,000 |
| ★ 08-00590-15020 | R1.5 | 30′ | 15 | 3.16 | 4.5 | 6 | 12° | 0°18′ | 6 | 70 | 9,400 |
| ★ 08-00590-15021 | | | 20 | 3.24 | 4.5 | 6 | 12° | 0°21′ | 6 | 70 | 9,600 |
| ★ 08-00590-15022 | | | 25 | 3.33 | 4.5 | 6 | 12° | 0°22′ | 6 | 70 | 10,200 |
| ★ 08-00590-15023 | | | 30 | 3.42 | 4.5 | 6 | 12° | 0°24′ | 6 | 70 | 11,700 |
| ★ 08-00590-15024 | | | 40 | 3.59 | 4.5 | 6 | 12° | 0°25′ | 6 | 80 | 13,000 |
| ★ 08-00590-15030 | | 1° | 15 | 3.31 | 4.5 | 6 | 12° | 0°36′ | 6 | 70 | 9,400 |
| ★ 08-00590-15031 | | | 20 | 3.49 | 4.5 | 6 | 12° | 0°42′ | 6 | 70 | 9,600 |
| ★ 08-00590-15032 | | | 25 | 3.66 | 4.5 | 6 | 12° | 0°45′ | 6 | 70 | 10,200 |
| ★ 08-00590-15033 | | | 30 | 3.84 | 4.5 | 6 | 12° | 0°48′ | 6 | 70 | 11,700 |
| ★ 08-00590-15034 | | | 40 | 4.19 | 4.5 | 6 | 12° | 0°51′ | 6 | 80 | 13,000 |
| ★ 08-00590-15040 | | 1°30′ | 30 | 4.26 | 4.5 | 6 | 12° | 1°12′ | 6 | 70 | 11,700 |
| ★ 08-00590-15041 | | | 40 | 4.78 | 4.5 | 6 | 12° | 1°16′ | 6 | 80 | 13,000 |
| ★ 08-00590-15042 | | | 50 | 5.30 | 4.5 | 6 | 12° | 1°19′ | 6 | 100 | 15,100 |
| ★ 08-00590-15050 | | 2° | 30 | 4.68 | 4.5 | 6 | 12° | 1°36′ | 6 | 70 | 11,700 |
| ★ 08-00590-15051 | | | 40 | 5.37 | 4.5 | 6 | 12° | 1°42′ | 6 | 80 | 13,000 |
| ★ 08-00590-20031 | R2 | 1° | 30 | 4.77 | 6 | 8 | 12° | 0°44′ | 6 | 80 | 11,700 |
| ★ 08-00590-20032 | | | 40 | 5.12 | 6 | 8 | 12° | 0°48′ | 6 | 80 | 14,700 |
| ★ 08-00590-20033 | | | 50 | 5.47 | 6 | 8 | 12° | 0°50′ | 6 | 100 | 17,500 |
| ★ 08-00590-20034 | | | 65.2 | – | 6 | 8 | – | 0°53′ | 6 | 110 | 18,800 |

# MRBTNH345

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-021

| 被削材 Work Material | | | 焼き入れ鋼 Hardened Steels SKD61・STAVAX (~52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (~62HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 首角 Neck Taper Angle | 有効長 Effective Length | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.5 | 30′ | 12 | 0.02 | 0.1 | 1,000 | 16,000 | 0.01 | 0.07 | 800 | 14,000 |
| | | 16 | 0.01 | 0.1 | 600 | 12,000 | 0.005 | 0.07 | 500 | 10,000 |
| | | 20 | 0.01 | 0.07 | 400 | 10,000 | 0.005 | 0.05 | 300 | 8,000 |
| | | 25 | 0.005 | 0.05 | 300 | 8,000 | 0.003 | 0.03 | 250 | 6,000 |
| | | 30 | 0.005 | 0.02 | 200 | 6,000 | 0.003 | 0.01 | 150 | 4,000 |
| | 1° | 12 | 0.03 | 0.15 | 1,200 | 16,000 | 0.02 | 0.1 | 1,000 | 14,000 |
| | | 16 | 0.02 | 0.15 | 700 | 12,000 | 0.01 | 0.1 | 600 | 10,000 |
| | | 20 | 0.02 | 0.1 | 500 | 10,000 | 0.01 | 0.08 | 400 | 8,000 |
| | | 25 | 0.01 | 0.08 | 400 | 8,000 | 0.008 | 0.06 | 300 | 6,000 |
| | | 30 | 0.01 | 0.06 | 300 | 6,000 | 0.005 | 0.04 | 200 | 4,000 |
| | 1°30′ | 12 | 0.03 | 0.15 | 1,200 | 16,000 | 0.02 | 0.1 | 1,000 | 14,000 |
| | | 16 | 0.02 | 0.15 | 700 | 12,000 | 0.01 | 0.1 | 600 | 10,000 |
| | | 20 | 0.02 | 0.1 | 500 | 10,000 | 0.01 | 0.08 | 400 | 8,000 |
| | | 25 | 0.01 | 0.08 | 400 | 8,000 | 0.008 | 0.06 | 300 | 6,000 |
| | | 30 | 0.01 | 0.06 | 300 | 6,000 | 0.005 | 0.04 | 200 | 4,000 |
| | 2° | 20 | 0.03 | 0.2 | 700 | 12,000 | 0.02 | 0.15 | 600 | 10,000 |
| | | 30 | 0.02 | 0.1 | 500 | 8,000 | 0.01 | 0.08 | 400 | 6,000 |
| 0.75 | 30′ | 12 | 0.06 | 0.2 | 1,500 | 18,000 | 0.04 | 0.15 | 1,200 | 16,000 |
| | | 16 | 0.04 | 0.2 | 1,200 | 16,000 | 0.02 | 0.15 | 950 | 14,000 |
| | | 20 | 0.02 | 0.1 | 700 | 12,000 | 0.015 | 0.07 | 600 | 10,000 |
| | | 25 | 0.01 | 0.1 | 500 | 9,000 | 0.01 | 0.07 | 350 | 7,000 |
| | | 30 | 0.01 | 0.05 | 300 | 7,000 | 0.01 | 0.04 | 200 | 5,000 |
| | 1° | 12 | 0.06 | 0.2 | 1,500 | 18,000 | 0.05 | 0.15 | 1,300 | 16,000 |
| | | 16 | 0.04 | 0.2 | 1,200 | 16,000 | 0.04 | 0.15 | 1,000 | 14,000 |
| | | 20 | 0.04 | 0.15 | 700 | 12,000 | 0.04 | 0.1 | 700 | 10,000 |
| | | 25 | 0.03 | 0.15 | 600 | 9,000 | 0.01 | 0.1 | 400 | 7,000 |
| | | 30 | 0.02 | 0.1 | 400 | 7,000 | 0.015 | 0.08 | 270 | 5,000 |
| | 1°30′ | 20 | 0.05 | 0.2 | 800 | 12,000 | 0.04 | 0.15 | 800 | 10,000 |
| | | 30 | 0.03 | 0.1 | 400 | 7,000 | 0.02 | 0.1 | 350 | 5,000 |
| | 2° | 30 | 0.04 | 0.2 | 500 | 7,000 | 0.03 | 0.15 | 400 | 6,000 |
| 1 | 30′ | 12 | 0.1 | 0.3 | 1,500 | 16,000 | 0.08 | 0.2 | 1,400 | 14,000 |
| | | 16 | 0.1 | 0.3 | 1,200 | 12,000 | 0.08 | 0.2 | 1,000 | 10,000 |
| | | 20 | 0.07 | 0.25 | 800 | 10,000 | 0.05 | 0.2 | 600 | 8,000 |
| | | 25 | 0.07 | 0.2 | 600 | 8,500 | 0.05 | 0.15 | 500 | 6,500 |
| | | 30 | 0.04 | 0.1 | 400 | 7,000 | 0.02 | 0.07 | 300 | 5,000 |
| | | 40 | 0.02 | 0.07 | 300 | 5,000 | 0.01 | 0.05 | 200 | 4,000 |
| | 1° | 12 | 0.1 | 0.3 | 1,500 | 16,000 | 0.08 | 0.25 | 1,400 | 14,000 |
| | | 16 | 0.1 | 0.3 | 1,200 | 12,000 | 0.08 | 0.25 | 1,000 | 10,000 |
| | | 20 | 0.08 | 0.25 | 1,000 | 10,000 | 0.06 | 0.2 | 800 | 8,000 |
| | | 25 | 0.08 | 0.2 | 800 | 8,500 | 0.06 | 0.15 | 600 | 6,500 |
| | | 30 | 0.07 | 0.15 | 600 | 7,000 | 0.04 | 0.1 | 400 | 5,000 |
| | | 40 | 0.04 | 0.08 | 400 | 5,000 | 0.02 | 0.06 | 300 | 4,000 |
| | 1°30′ | 20 | 0.08 | 0.3 | 1,000 | 10,000 | 0.06 | 0.25 | 800 | 8,000 |
| | | 25 | 0.08 | 0.2 | 800 | 8,500 | 0.06 | 0.15 | 600 | 6,500 |
| | | 30 | 0.07 | 0.15 | 600 | 7,000 | 0.04 | 0.1 | 400 | 5,000 |
| | | 40 | 0.04 | 0.08 | 400 | 5,000 | 0.02 | 0.06 | 300 | 4,000 |



ŞEVKET GÜLÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

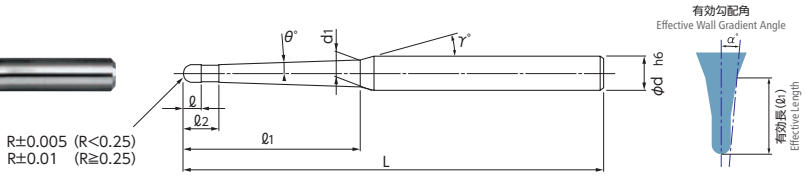
| 被削材 Work Material | | | 焼き入れ鋼 Hardened Steels SKD61・STAVAX (~52HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (~62HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 首角 Neck Taper Angle | 有効長 Effective Length | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 1 | 2° | 20 | 0.1 | 0.35 | 1,200 | 10,000 | 0.08 | 0.25 | 1,000 | 8,000 |
| | | 25 | 0.1 | 0.3 | 1,000 | 8,000 | 0.08 | 0.2 | 800 | 6,500 |
| | | 30 | 0.08 | 0.25 | 800 | 6,000 | 0.06 | 0.15 | 600 | 5,000 |
| | | 40 | 0.05 | 0.1 | 500 | 4,000 | 0.03 | 0.08 | 400 | 4,000 |
| 1.5 | 30′ | 15 | 0.2 | 0.4 | 2,000 | 18,000 | 0.1 | 0.3 | 1,600 | 15,000 |
| | | 20 | 0.1 | 0.3 | 1,500 | 14,000 | 0.07 | 0.2 | 1,200 | 12,000 |
| | | 25 | 0.1 | 0.3 | 1,200 | 12,000 | 0.07 | 0.2 | 1,000 | 10,000 |
| | | 30 | 0.07 | 0.2 | 1,000 | 8,500 | 0.05 | 0.1 | 700 | 7,000 |
| | | 40 | 0.05 | 0.2 | 600 | 6,000 | 0.02 | 0.1 | 400 | 4,200 |
| | 1° | 15 | 0.2 | 0.4 | 2,000 | 18,000 | 0.1 | 0.3 | 1,600 | 15,000 |
| | | 20 | 0.1 | 0.3 | 1,500 | 16,000 | 0.08 | 0.2 | 1,200 | 12,000 |
| | | 25 | 0.1 | 0.3 | 1,200 | 14,000 | 0.08 | 0.2 | 1,000 | 10,000 |
| | | 30 | 0.08 | 0.2 | 1,000 | 10,000 | 0.06 | 0.15 | 800 | 7,000 |
| | | 40 | 0.07 | 0.1 | 700 | 7,000 | 0.04 | 0.08 | 500 | 4,200 |
| | 1° 30′ | 30 | 0.08 | 0.2 | 1,000 | 12,000 | 0.06 | 0.15 | 800 | 7,000 |
| | | 40 | 0.07 | 0.1 | 700 | 8,000 | 0.04 | 0.08 | 500 | 4,200 |
| | | 50 | 0.05 | 0.1 | 400 | 6,000 | 0.03 | 0.08 | 300 | 3,500 |
| | 2° | 30 | 0.1 | 0.3 | 1,500 | 12,000 | 0.08 | 0.3 | 1,200 | 10,000 |
| | | 40 | 0.08 | 0.2 | 800 | 8,000 | 0.06 | 0.2 | 600 | 7,000 |
| 2 | 1° | 30 | 0.3 | 0.5 | 1,500 | 8,500 | 0.2 | 0.4 | 1,200 | 7,000 |
| | | 40 | 0.2 | 0.5 | 1,200 | 6,000 | 0.1 | 0.4 | 1,000 | 5,000 |
| | | 50 | 0.1 | 0.3 | 700 | 5,000 | 0.05 | 0.2 | 600 | 4,000 |
| | | 65.2 | 0.07 | 0.2 | 400 | 4,000 | 0.03 | 0.1 | 300 | 3,000 |

**備　考 Notes**

※ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。また、主軸回転数が足りない場合も同様に同じ割合で下げてください。
※深い部分を加工する際は、クーラントの給油および切りくずの排出性に十分注意してください。
※オイルミストクーラントをお奨めします。
※切り込み量、機械剛性により条件が異なることがあります。その都度調整してください。
※Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.
※Coolant supply and chip disposal are important for machining deep-rib.
※We recommend using oil mist coolant.
※Adjust milling conditions according to the volume of depth of cut and rigidity of machine.

# MRBTN230

## 無限コーティング ロングテーパーネックボールエンドミル
MUGEN-COATING 2-Flute Long Taper Neck Ball End Mill




●首下部をテーパーにし、工具剛性を向上。
●従来品に比べ切り込み量を大きく取ることが可能。
●It is possible to increase rigidity with the neck taper.
●The volume of depth of cut will be more than conventional end mills.

3D MG ∞ 2 30° ≦55 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (α)有効勾配角 Effective Wall Gradient Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00570-01020 | R0.1 | 30′ | 1 | 0.21 | 0.2 | 0.4 | 12° | 0°19′ | 4 | 50 | 9,000 |
| 08-00570-01021 | | | 1.5 | 0.22 | 0.2 | 0.4 | 12° | 0°23′ | 4 | 50 | 9,600 |
| 08-00570-01022 | | | 2 | 0.23 | 0.2 | 0.4 | 12° | 0°25′ | 4 | 50 | 10,100 |
| 08-00570-01040 | | 1° | 1 | 0.22 | 0.2 | 0.4 | 12° | 0°38′ | 4 | 50 | 9,000 |
| 08-00570-01041 | | | 1.5 | 0.24 | 0.2 | 0.4 | 12° | 0°47′ | 4 | 50 | 9,600 |
| 08-00570-01042 | | | 2 | 0.26 | 0.2 | 0.4 | 12° | 0°51′ | 4 | 50 | 10,100 |
| 08-00570-01050 | | 1°30′ | 1 | 0.23 | 0.2 | 0.4 | 12° | 0°57′ | 4 | 50 | 9,000 |
| 08-00570-01051 | | | 1.5 | 0.26 | 0.2 | 0.4 | 12° | 1°11′ | 4 | 50 | 9,600 |
| 08-00570-01052 | | | 2 | 0.28 | 0.2 | 0.4 | 12° | 1°16′ | 4 | 50 | 10,100 |
| 08-00570-01060 | | 2° | 1 | 0.24 | 0.2 | 0.4 | 12° | 1°16′ | 4 | 50 | 9,000 |
| 08-00570-01061 | | | 1.5 | 0.28 | 0.2 | 0.4 | 12° | 1°35′ | 4 | 50 | 9,600 |
| 08-00570-01062 | | | 2 | 0.31 | 0.2 | 0.4 | 12° | 1°41′ | 4 | 50 | 10,100 |
| 08-00570-01080 | | 3° | 1 | 0.26 | 0.2 | 0.4 | 12° | 1°54′ | 4 | 50 | 9,000 |
| 08-00570-01081 | | | 1.5 | 0.32 | 0.2 | 0.4 | 12° | 2°21′ | 4 | 50 | 9,600 |
| 08-00570-01082 | | | 2 | 0.37 | 0.2 | 0.4 | 12° | 2°32′ | 4 | 50 | 10,100 |
| 08-00570-01092 | | 5° | 2 | 0.48 | 0.2 | 0.4 | 12° | 4°13′ | 4 | 50 | 10,100 |
| 08-00570-01521 | R0.15 | 30′ | 3 | 0.34 | 0.3 | 0.6 | 12° | 0°25′ | 4 | 50 | 10,100 |
| 08-00570-01540 | | 1° | 2 | 0.35 | 0.3 | 0.6 | 12° | 0°45′ | 4 | 50 | 9,600 |
| 08-00570-01541 | | | 3 | 0.38 | 0.3 | 0.6 | 12° | 0°51′ | 4 | 50 | 10,100 |
| 08-00570-01550 | | 1°30′ | 2 | 0.37 | 0.3 | 0.6 | 12° | 1°08′ | 4 | 50 | 9,600 |
| 08-00570-01551 | | | 3 | 0.43 | 0.3 | 0.6 | 12° | 1°16′ | 4 | 50 | 10,100 |
| 08-00570-01561 | | 2° | 3 | 0.47 | 0.3 | 0.6 | 12° | 1°41′ | 4 | 50 | 10,100 |
| 08-00570-01581 | | 3° | 3 | 0.55 | 0.3 | 0.6 | 12° | 2°32′ | 4 | 50 | 10,100 |
| 08-00570-01591 | | 5° | 3 | 0.72 | 0.3 | 0.6 | 12° | 4°13′ | 4 | 50 | 10,100 |
| 08-00570-02021 | R0.2 | 30′ | 2 | 0.42 | 0.4 | 0.8 | 12° | 0°20′ | 4 | 50 | 7,400 |
| 08-00570-02023 | | | 3 | 0.44 | 0.4 | 0.8 | 12° | 0°24′ | 4 | 50 | 7,400 |
| 08-00570-02022 | | | 4 | 0.46 | 0.4 | 0.8 | 12° | 0°25′ | 4 | 50 | 7,400 |
| 08-00570-02041 | | 1° | 2 | 0.44 | 0.4 | 0.8 | 12° | 0°40′ | 4 | 50 | 7,400 |
| 08-00570-02043 | | | 3 | 0.48 | 0.4 | 0.8 | 12° | 0°47′ | 4 | 50 | 7,400 |
| 08-00570-02042 | | | 4 | 0.51 | 0.4 | 0.8 | 12° | 0°51′ | 4 | 50 | 7,400 |

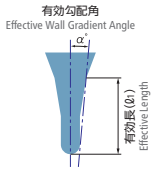
**オーダー方法**
MRBTN230 ボール半径(R)×首角(θ)×有効長(ℓ1)を指示してください。
When you order, indicate MRBTN230 (R)×(θ)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-065に記載
●Recommended Milling Conditions are shown on page E-065.



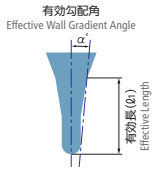
ŞEVKET ÖĞÜ® MAKINA TICARET VE SAN. LTD. ŞTI.




| コードNo. Code No. | (R)ボール半径 Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (α)有効勾配角 Effective Wall Gradient Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00570-02051 | R0.2 | 1°30′ | 2 | 0.46 | 0.4 | 0.8 | 12° | 1°00′ | 4 | 50 | 7,400 |
| 08-00570-02053 | | | 3 | 0.52 | 0.4 | 0.8 | 12° | 1°11′ | 4 | 50 | 7,400 |
| 08-00570-02052 | | | 4 | 0.57 | 0.4 | 0.8 | 12° | 1°16′ | 4 | 50 | 7,400 |
| 08-00570-02061 | | 2° | 2 | 0.48 | 0.4 | 0.8 | 12° | 1°20′ | 4 | 50 | 7,400 |
| 08-00570-02063 | | | 3 | 0.55 | 0.4 | 0.8 | 12° | 1°34′ | 4 | 50 | 7,400 |
| 08-00570-02062 | | | 4 | 0.62 | 0.4 | 0.8 | 12° | 1°41′ | 4 | 50 | 7,400 |
| 08-00570-02081 | | 3° | 2 | 0.53 | 0.4 | 0.8 | 12° | 2°00′ | 4 | 50 | 7,400 |
| 08-00570-02082 | | | 4 | 0.74 | 0.4 | 0.8 | 12° | 2°31′ | 4 | 50 | 7,400 |
| 08-00570-02092 | | 5° | 4 | 0.96 | 0.4 | 0.8 | 12° | 4°13′ | 4 | 50 | 7,400 |
| 08-00570-02521 | R0.25 | 30′ | 3 | 0.53 | 0.5 | 1 | 12° | 0°22′ | 4 | 50 | 7,000 |
| 08-00570-02522 | | | 5 | 0.57 | 0.5 | 1 | 12° | 0°25′ | 4 | 50 | 7,200 |
| 08-00570-02541 | | 1° | 3 | 0.57 | 0.5 | 1 | 12° | 0°44′ | 4 | 50 | 7,000 |
| 08-00570-02542 | | | 5 | 0.64 | 0.5 | 1 | 12° | 0°51′ | 4 | 50 | 7,200 |
| 08-00570-02551 | | 1°30′ | 3 | 0.6 | 0.5 | 1 | 12° | 1°06′ | 4 | 50 | 7,000 |
| 08-00570-02552 | | | 5 | 0.71 | 0.5 | 1 | 12° | 1°16′ | 4 | 50 | 7,200 |
| 08-00570-02561 | | 2° | 3 | 0.64 | 0.5 | 1 | 12° | 1°27′ | 4 | 50 | 7,000 |
| 08-00570-02562 | | | 5 | 0.78 | 0.5 | 1 | 12° | 1°41′ | 4 | 50 | 7,200 |
| 08-00570-02581 | | 3° | 3 | 0.71 | 0.5 | 1 | 12° | 2°11′ | 4 | 50 | 7,000 |
| 08-00570-02582 | | | 5 | 0.92 | 0.5 | 1 | 12° | 2°32′ | 4 | 50 | 7,200 |
| 08-00570-02592 | | 5° | 5 | 1.2 | 0.5 | 1 | 12° | 4°13′ | 4 | 50 | 7,200 |
| 08-00570-03021 | R0.3 | 30′ | 5 | 0.67 | 0.6 | 1.2 | 12° | 0°24′ | 4 | 50 | 6,900 |
| 08-00570-03022 | | | 8 | 0.72 | 0.6 | 1.2 | 12° | 0°27′ | 4 | 50 | 7,100 |
| 08-00570-03040 | | 1° | 4 | 0.7 | 0.6 | 1.2 | 12° | 0°45′ | 4 | 50 | 6,600 |
| 08-00570-03041 | | | 5 | 0.73 | 0.6 | 1.2 | 12° | 0°49′ | 4 | 50 | 6,900 |
| 08-00570-03043 | | | 6 | 0.77 | 0.6 | 1.2 | 12° | 0°51′ | 4 | 50 | 6,900 |
| 08-00570-03042 | | | 8 | 0.84 | 0.6 | 1.2 | 12° | 0°53′ | 4 | 50 | 7,100 |
| 08-00570-03051 | | 1°30′ | 5 | 0.8 | 0.6 | 1.2 | 12° | 1°13′ | 4 | 50 | 6,900 |
| 08-00570-03052 | | | 8 | 0.96 | 0.6 | 1.2 | 12° | 1°19′ | 4 | 50 | 7,100 |
| 08-00570-03061 | | 2° | 6 | 0.94 | 0.6 | 1.2 | 12° | 1°41′ | 4 | 50 | 6,900 |
| 08-00570-03062 | | | 8 | 1.07 | 0.6 | 1.2 | 12° | 1°46′ | 4 | 50 | 7,100 |
| 08-00570-03081 | | 3° | 6 | 1.1 | 0.6 | 1.2 | 12° | 2°32′ | 4 | 50 | 6,900 |
| 08-00570-03082 | | | 8 | 1.31 | 0.6 | 1.2 | 12° | 2°39′ | 4 | 50 | 7,100 |
| 08-00570-03092 | | 5° | 8 | 1.79 | 0.6 | 1.2 | 12° | 4°25′ | 4 | 50 | 7,100 |
| 08-00570-04021 | R0.4 | 30′ | 8 | 0.91 | 0.8 | 1.6 | 12° | 0°25′ | 4 | 50 | 7,400 |
| 08-00570-04022 | | | 12 | 0.98 | 0.8 | 1.6 | 12° | 0°27′ | 4 | 60 | 7,800 |
| 08-00570-04041 | | 1° | 8 | 1.02 | 0.8 | 1.6 | 12° | 0°50′ | 4 | 50 | 7,400 |
| 08-00570-04042 | | | 12 | 1.16 | 0.8 | 1.6 | 12° | 0°54′ | 4 | 60 | 7,800 |
| 08-00570-04051 | | 1°30′ | 8 | 1.14 | 0.8 | 1.6 | 12° | 1°16′ | 4 | 50 | 7,400 |
| 08-00570-04052 | | | 12 | 1.34 | 0.8 | 1.6 | 12° | 1°21′ | 4 | 60 | 7,800 |
| 08-00570-04061 | | 2° | 8 | 1.25 | 0.8 | 1.6 | 12° | 1°42′ | 4 | 50 | 7,400 |
| 08-00570-04062 | | | 12 | 1.53 | 0.8 | 1.6 | 12° | 1°48′ | 4 | 60 | 7,800 |

# MRBTN230

## 無限コーティング ロングテーパーネックボールエンドミル
MUGEN-COATING 2-Flute Long Taper Neck Ball End Mill




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (α)有効勾配角 Effective Wall Gradient Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00570-04081 | R0.4 | 3° | 8 | 1.47 | 0.8 | 1.6 | 12° | 2°31′ | 4 | 50 | 7,400 |
| 08-00570-04082 | | | 12 | 1.89 | 0.8 | 1.6 | 12° | 2°41′ | 4 | 60 | 7,800 |
| 08-00570-05021 | R0.5 | 30′ | 10 | 1.14 | 1 | 2 | 12° | 0°25′ | 4 | 60 | 6,300 |
| 08-00570-05022 | | | 15 | 1.23 | 1 | 2 | 12° | 0°27′ | 4 | 60 | 6,600 |
| 08-00570-05023 | | | 20 | 1.31 | 1 | 2 | 12° | 0°28′ | 4 | 70 | 8,000 |
| 08-00570-05024 | | | 25 | 1.41 | 1 | 2 | 12° | 0°29′ | 4 | 70 | 8,500 |
| 08-00570-05039 | | 1° | 6 | 1.14 | 1 | 2 | 12° | 0°43′ | 4 | 60 | 5,200 |
| 08-00570-05040 | | | 8 | 1.21 | 1 | 2 | 12° | 0°48′ | 4 | 60 | 5,700 |
| 08-00570-05041 | | | 10 | 1.28 | 1 | 2 | 12° | 0°50′ | 4 | 60 | 6,300 |
| 08-00570-05044 | | | 12 | 1.35 | 1 | 2 | 12° | 0°52′ | 4 | 60 | 6,300 |
| 08-00570-05042 | | | 15 | 1.45 | 1 | 2 | 12° | 0°54′ | 4 | 60 | 6,600 |
| 08-00570-05045 | | | 16 | 1.49 | 1 | 2 | 12° | 0°54′ | 4 | 60 | 6,600 |
| 08-00570-05043 | | | 20 | 1.63 | 1 | 2 | 12° | 0°55′ | 4 | 70 | 8,000 |
| 08-00570-05046 | | | 22 | 1.7 | 1 | 2 | 12° | 0°56′ | 4 | 70 | 8,200 |
| 08-00570-05047 | | | 25 | 1.8 | 1 | 2 | 12° | 0°56′ | 4 | 70 | 8,500 |
| 08-00570-05049 | | 1°30′ | 6 | 1.21 | 1 | 2 | 12° | 1°05′ | 4 | 60 | 5,200 |
| 08-00570-05050 | | | 8 | 1.31 | 1 | 2 | 12° | 1°12′ | 4 | 60 | 5,700 |
| 08-00570-05051 | | | 10 | 1.42 | 1 | 2 | 12° | 1°16′ | 4 | 60 | 6,300 |
| 08-00570-05054 | | | 12 | 1.52 | 1 | 2 | 12° | 1°18′ | 4 | 60 | 6,300 |
| 08-00570-05052 | | | 15 | 1.68 | 1 | 2 | 12° | 1°21′ | 4 | 60 | 6,600 |
| 08-00570-05055 | | | 16 | 1.73 | 1 | 2 | 12° | 1°21′ | 4 | 60 | 6,600 |
| 08-00570-05053 | | | 20 | 1.94 | 1 | 2 | 12° | 1°23′ | 4 | 70 | 8,000 |
| 08-00570-05056 | | | 22 | 2.05 | 1 | 2 | 12° | 1°24′ | 4 | 70 | 8,200 |
| 08-00570-05057 | | | 25 | 2.2 | 1 | 2 | 12° | 1°24′ | 4 | 70 | 8,500 |
| 08-00570-05059 | | | 36 | 2.78 | 1 | 2 | 12° | 1°26′ | 4 | 70 | 9,300 |
| 08-00570-05061 | | 2° | 10 | 1.56 | 1 | 2 | 12° | 1°41′ | 4 | 60 | 6,300 |
| 08-00570-05062 | | | 15 | 1.91 | 1 | 2 | 12° | 1°48′ | 4 | 60 | 6,600 |
| 08-00570-05063 | | | 20 | 2.26 | 1 | 2 | 12° | 1°51′ | 4 | 70 | 8,000 |
| 08-00570-05081 | | 3° | 10 | 1.84 | 1 | 2 | 12° | 2°31′ | 4 | 60 | 6,300 |
| 08-00570-05082 | | | 15 | 2.36 | 1 | 2 | 12° | 2°41′ | 4 | 60 | 6,600 |
| 08-00570-05083 | | | 20 | 2.89 | 1 | 2 | 12° | 2°46′ | 4 | 70 | 8,000 |
| 08-00570-05092 | | 5° | 15 | 3.27 | 1 | 2 | 12° | 4°28′ | 6 | 60 | 8,500 |
| 08-00570-05093 | | | 20 | 4.15 | 1 | 2 | 12° | 4°37′ | 6 | 70 | 9,700 |
| 08-00570-06021 | R0.6 | 30′ | 12 | 1.37 | 1.2 | 2.4 | 12° | 0°25′ | 4 | 60 | 7,200 |
| 08-00570-06022 | | | 24 | 1.58 | 1.2 | 2.4 | 12° | 0°28′ | 4 | 70 | 8,900 |
| 08-00570-06041 | | 1° | 12 | 1.54 | 1.2 | 2.4 | 12° | 0°51′ | 4 | 60 | 7,200 |
| 08-00570-06042 | | | 24 | 1.95 | 1.2 | 2.4 | 12° | 0°55′ | 4 | 70 | 8,900 |
| 08-00570-06051 | | 1°30′ | 12 | 1.7 | 1.2 | 2.4 | 12° | 1°16′ | 4 | 60 | 7,200 |
| 08-00570-06052 | | | 24 | 2.33 | 1.2 | 2.4 | 12° | 1°23′ | 4 | 70 | 8,900 |
| 08-00570-06061 | | 2° | 12 | 1.87 | 1.2 | 2.4 | 12° | 1°41′ | 4 | 60 | 7,200 |
| 08-00570-06062 | | | 24 | 2.71 | 1.2 | 2.4 | 12° | 1°51′ | 4 | 70 | 8,900 |

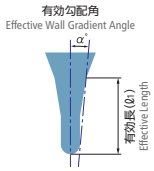
**オーダー方法**
MRBTN230 ボール半径(R)×首角(θ)×有効長(ℓ1)を指示してください。
When you order, indicate MRBTN230(R)×(θ)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-065に記載
●Recommended Milling Conditions are shown on page E-065.



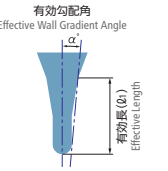
ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.




| コードNo. Code No. | (R)ボール半径 Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (α)有効勾配角 Effective Wall Gradient Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00570-06081 | R0.6 | 3° | 12 | 2.21 | 1.2 | 2.4 | 12° | 2°32′ | 4 | 60 | 7,200 |
| 08-00570-06082 | | | 24 | 3.46 | 1.2 | 2.4 | 12° | 2°46′ | 6 | 70 | 9,700 |
| 08-00570-06091 | | 5° | 12 | 2.88 | 1.2 | 2.4 | 12° | 4°13′ | 4 | 60 | 7,200 |
| 08-00570-06092 | | | 24 | 4.98 | 1.2 | 2.4 | 12° | 4°37′ | 6 | 70 | 9,700 |
| 08-00570-07520 | R0.75 | 30′ | 10 | 1.62 | 1.5 | 3 | 12° | 0°23′ | 4 | 60 | 6,600 |
| 08-00570-07521 | | | 15 | 1.71 | 1.5 | 3 | 12° | 0°25′ | 4 | 60 | 7,200 |
| 08-00570-07522 | | | 30 | 1.97 | 1.5 | 3 | 12° | 0°28′ | 4 | 70 | 10,100 |
| 08-00570-07540 | | 1° | 10 | 1.74 | 1.5 | 3 | 12° | 0°45′ | 4 | 60 | 6,600 |
| 08-00570-07541 | | | 15 | 1.92 | 1.5 | 3 | 12° | 0°51′ | 4 | 60 | 7,200 |
| 08-00570-07543 | | | 20 | 2.09 | 1.5 | 3 | 12° | 0°53′ | 4 | 60 | 8,000 |
| 08-00570-07542 | | | 30 | 2.44 | 1.5 | 3 | 12° | 0°55′ | 4 | 70 | 10,100 |
| 08-00570-07550 | | 1°30′ | 10 | 1.87 | 1.5 | 3 | 12° | 1°08′ | 4 | 60 | 6,600 |
| 08-00570-07551 | | | 15 | 2.13 | 1.5 | 3 | 12° | 1°16′ | 4 | 60 | 7,200 |
| 08-00570-07552 | | | 30 | 2.91 | 1.5 | 3 | 12° | 1°23′ | 4 | 70 | 10,100 |
| 08-00570-07560 | | 2° | 10 | 1.99 | 1.5 | 3 | 12° | 1°31′ | 4 | 60 | 6,600 |
| 08-00570-07561 | | | 15 | 2.34 | 1.5 | 3 | 12° | 1°41′ | 4 | 60 | 7,200 |
| 08-00570-07563 | | | 20 | 2.69 | 1.5 | 3 | 12° | 1°46′ | 4 | 60 | 8,800 |
| 08-00570-07562 | | | 30 | 3.39 | 1.5 | 3 | 12° | 1°51′ | 6 | 70 | 11,200 |
| 08-00570-07581 | | 3° | 15 | 2.76 | 1.5 | 3 | 12° | 2°32′ | 4 | 60 | 7,200 |
| 08-00570-07583 | | | 20 | 3.28 | 1.5 | 3 | 12° | 2°39′ | 4 | 60 | 8,800 |
| 08-00570-07582 | | | 30 | 4.33 | 1.5 | 3 | 12° | 2°46′ | 6 | 70 | 11,200 |
| 08-00570-07591 | | 5° | 15 | 3.6 | 1.5 | 3 | 12° | 4°13′ | 6 | 60 | 8,000 |
| 08-00570-07592 | | | 28.7 | 6 | 1.5 | 3 | 12° | 4°36′ | 6 | 70 | 11,200 |
| 08-00570-10019 | R1 | 30′ | 12 | 2.14 | 2 | 4 | 12° | 0°21′ | 4 | 60 | 5,800 |
| 08-00570-10020 | | | 16 | 2.21 | 2 | 4 | 12° | 0°24′ | 4 | 60 | 6,000 |
| 08-00570-10021 | | | 20 | 2.28 | 2 | 4 | 12° | 0°25′ | 4 | 60 | 7,200 |
| 08-00570-10022 | | | 30 | 2.45 | 2 | 4 | 12° | 0°27′ | 4 | 70 | 8,800 |
| 08-00570-10023 | | | 40 | 2.63 | 2 | 4 | 12° | 0°28′ | 4 | 80 | 10,400 |
| 08-00570-10039 | | 1° | 12 | 2.28 | 2 | 4 | 12° | 0°43′ | 4 | 60 | 5,800 |
| 08-00570-10040 | | | 16 | 2.42 | 2 | 4 | 12° | 0°48′ | 4 | 60 | 6,000 |
| 08-00570-10041 | | | 20 | 2.56 | 2 | 4 | 12° | 0°51′ | 4 | 60 | 7,200 |
| 08-00570-10044 | | | 25 | 2.73 | 2 | 4 | 12° | 0°53′ | 4 | 60 | 8,000 |
| 08-00570-10042 | | | 30 | 2.91 | 2 | 4 | 12° | 0°54′ | 4 | 70 | 8,800 |
| 08-00570-10045 | | | 35 | 3.08 | 2 | 4 | 12° | 0°55′ | 4 | 80 | 11,400 |
| 08-00570-10043 | | | 40 | 3.26 | 2 | 4 | 12° | 0°55′ | 6 | 80 | 12,000 |
| 08-00570-10049 | | 1°30′ | 12 | 2.42 | 2 | 4 | 12° | 1°05′ | 4 | 60 | 5,800 |
| 08-00570-10050 | | | 16 | 2.63 | 2 | 4 | 12° | 1°12′ | 4 | 60 | 6,000 |
| 08-00570-10051 | | | 20 | 2.84 | 2 | 4 | 12° | 1°16′ | 4 | 60 | 7,200 |
| 08-00570-10054 | | | 25 | 3.1 | 2 | 4 | 12° | 1°19′ | 4 | 60 | 8,000 |
| 08-00570-10052 | | | 30 | 3.36 | 2 | 4 | 12° | 1°21′ | 6 | 70 | 10,400 |
| 08-00570-10055 | | | 35 | 3.62 | 2 | 4 | 12° | 1°22′ | 6 | 80 | 11,400 |
| 08-00570-10053 | | | 40 | 3.89 | 2 | 4 | 12° | 1°23′ | 6 | 80 | 12,000 |

# MRBTN230

## 無限コーティング ロングテーパーネックボールエンドミル
MUGEN-COATING 2-Flute Long Taper Neck Ball End Mill




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (α)有効勾配角 Effective Wall Gradient Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00570-10059 | R1 | 2° | 12 | 2.56 | 2 | 4 | 12° | 1°27′ | 4 | 60 | 5,800 |
| 08-00570-10060 | | | 16 | 2.84 | 2 | 4 | 12° | 1°36′ | 4 | 60 | 6,000 |
| 08-00570-10061 | | | 20 | 3.12 | 2 | 4 | 12° | 1°41′ | 4 | 60 | 7,600 |
| 08-00570-10062 | | | 30 | 3.82 | 2 | 4 | 12° | 1°48′ | 6 | 70 | 10,400 |
| 08-00570-10063 | | | 40 | 4.51 | 2 | 4 | 12° | 1°51′ | 6 | 80 | 12,000 |
| 08-00570-10079 | | 3° | 12 | 2.84 | 2 | 4 | 12° | 2°11′ | 4 | 60 | 5,800 |
| 08-00570-10080 | | | 16 | 3.26 | 2 | 4 | 12° | 2°24′ | 4 | 60 | 6,000 |
| 08-00570-10081 | | | 20 | 3.68 | 2 | 4 | 12° | 2°31′ | 6 | 70 | 8,000 |
| 08-00570-10082 | | | 30 | 4.73 | 2 | 4 | 12° | 2°41′ | 6 | 70 | 10,400 |
| 08-00570-10083 | | | 40 | 5.77 | 2 | 4 | 12° | 2°46′ | 6 | 80 | 12,000 |
| 08-00570-10091 | | 5° | 20 | 4.8 | 2 | 4 | 12° | 4°13′ | 6 | 70 | 11,000 |
| 08-00570-10092 | | | 26.8 | 6 | 2 | 4 | – | 4°25′ | 6 | 70 | 11,800 |
| 08-00570-10093 | | | 38.2 | 8 | 2 | 4 | – | 4°36′ | 8 | 80 | 22,000 |
| 08-00570-15018 | R1.5 | 30′ | 15 | 3.16 | 3 | 6 | 12° | 0°20′ | 6 | 70 | 8,000 |
| 08-00570-15019 | | | 20 | 3.24 | 3 | 6 | 12° | 0°22′ | 6 | 70 | 8,500 |
| 08-00570-15020 | | | 30 | 3.43 | 3 | 6 | 12° | 0°26′ | 6 | 70 | 9,900 |
| 08-00570-15022 | | | 40 | 3.6 | 3 | 6 | 12° | 0°27′ | 6 | 80 | 11,000 |
| 08-00570-15021 | | | 50 | 3.77 | 3 | 6 | 12° | 0°27′ | 6 | 90 | 12,800 |
| 08-00570-15038 | | 1° | 15 | 3.31 | 3 | 6 | 12° | 0°39′ | 6 | 70 | 8,000 |
| 08-00570-15039 | | | 20 | 3.49 | 3 | 6 | 12° | 0°45′ | 6 | 70 | 8,500 |
| 08-00570-15040 | | | 30 | 3.84 | 3 | 6 | 12° | 0°51′ | 6 | 70 | 9,900 |
| 08-00570-15042 | | | 40 | 4.19 | 3 | 6 | 12° | 0°53′ | 6 | 80 | 11,000 |
| 08-00570-15041 | | | 50 | 4.54 | 3 | 6 | 12° | 0°54′ | 6 | 90 | 12,800 |
| 08-00570-15048 | | 1°30′ | 15 | 3.47 | 3 | 6 | 12° | 1°00′ | 6 | 70 | 8,000 |
| 08-00570-15049 | | | 20 | 3.73 | 3 | 6 | 12° | 1°07′ | 6 | 70 | 8,500 |
| 08-00570-15050 | | | 30 | 4.26 | 3 | 6 | 12° | 1°16′ | 6 | 70 | 9,900 |
| 08-00570-15052 | | | 40 | 4.78 | 3 | 6 | 12° | 1°19′ | 6 | 80 | 11,000 |
| 08-00570-15051 | | | 50 | 5.3 | 3 | 6 | 12° | 1°22′ | 6 | 90 | 12,800 |
| 08-00570-15058 | | 2° | 15 | 3.63 | 3 | 6 | 12° | 1°20′ | 6 | 70 | 8,000 |
| 08-00570-15059 | | | 20 | 3.98 | 3 | 6 | 12° | 1°31′ | 6 | 70 | 8,500 |
| 08-00570-15060 | | | 30 | 4.68 | 3 | 6 | 12° | 1°41′ | 6 | 70 | 11,500 |
| 08-00570-15061 | | | 48.9 | 6 | 3 | 6 | – | 1°49′ | 6 | 90 | 12,800 |
| 08-00570-15079 | | 3° | 20 | 4.47 | 3 | 6 | 12° | 2°16′ | 6 | 70 | 9,000 |
| 08-00570-15080 | | | 30 | 5.52 | 3 | 6 | 12° | 2°32′ | 6 | 70 | 11,500 |
| 08-00570-15081 | | | 50 | 7.61 | 3 | 6 | 12° | 2°43′ | 8 | 90 | 23,300 |
| 08-00570-15091 | | 5° | 23.1 | 6 | 3 | 6 | – | 3°58′ | 6 | 70 | 12,800 |
| 08-00570-20019 | R2 | 30′ | 20 | 4.21 | 4 | 8 | 12° | 0°19′ | 6 | 70 | 10,600 |
| 08-00570-20020 | | | 40 | 4.56 | 4 | 8 | 12° | 0°25′ | 6 | 90 | 14,000 |
| 08-00570-20021 | | | 60 | 4.91 | 4 | 8 | 12° | 0°27′ | 6 | 110 | 16,000 |
| 08-00570-20039 | | 1° | 20 | 4.42 | 4 | 8 | 12° | 0°40′ | 6 | 70 | 10,600 |
| 08-00570-20040 | | | 40 | 5.12 | 4 | 8 | 12° | 0°50′ | 6 | 90 | 14,000 |
| 08-00570-20041 | | | 60 | 5.82 | 4 | 8 | 12° | 0°54′ | 6 | 110 | 16,000 |

**オーダー方法** MRBTN230 ボール半径(R)×首角(θ)×有効長(ℓ1)を指示してください。
When you order, indicate MRBTN230(R)×(θ)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-065に記載
●Recommended Milling Conditions are shown on page E-065.



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# MRBTN230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | | 炭素鋼・合金鋼・調質鋼 Carbon Steels・Alloy Steels・Prehardened Steels S50C・SCM・SKD・SUS・HPM・NAK | | | |
|---|---|---|---|---|---|---|
| Rサイズ Radius | 首角 Neck Taper Angle | 有効長 Effective Length | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed |
| | | | ap mm | ae mm | $min^{-1}$ | mm/min |
| 0.1 | 30′ | 1 | 0.01 | 0.01 | 20,000 | ~300 |
| | | 2 | 0.005 | 0.005 | | |
| | 1° | 1 | 0.01 | 0.01 | | |
| | | 1.5 | 0.005 | 0.005 | | |
| | | 2 | 0.005 | 0.005 | | |
| | 1°30′ | 1 | 0.01 | 0.01 | | |
| | | 1.5 | 0.005 | 0.01 | | |
| | | 2 | 0.005 | 0.01 | | |
| | 2° | 1 | 0.01 | 0.01 | | |
| | | 1.5 | 0.01 | 0.01 | | |
| | | 2 | 0.01 | 0.01 | | |
| | 3° | 1 | 0.01 | 0.02 | | |
| | | 1.5 | 0.01 | 0.02 | | |
| | | 2 | 0.01 | 0.02 | | |
| | 5° | 2 | 0.01 | 0.02 | | |
| 0.15 | 30′ | 3 | 0.005 | 0.01 | 20,000 | ~300 |
| | 1° | 2 | 0.005 | 0.01 | | |
| | | 3 | 0.005 | 0.01 | | |
| | 1°30′ | 2 | 0.005 | 0.01 | | |
| | | 3 | 0.005 | 0.01 | | |
| | 2° | 3 | 0.01 | 0.02 | | |
| | 3° | 3 | 0.01 | 0.02 | | |
| | 5° | 3 | 0.01 | 0.02 | | |
| 0.2 | 30′ | 2 | 0.01 | 0.02 | 20,000 | ~500 |
| | | 3 | 0.01 | 0.02 | | |
| | | 4 | 0.01 | 0.02 | | |
| | 1° | 2 | 0.01 | 0.02 | | |
| | | 3 | 0.01 | 0.02 | | |
| | | 4 | 0.01 | 0.02 | | |
| | 1°30′ | 2 | 0.01 | 0.03 | | |
| | | 3 | 0.01 | 0.03 | | |
| | | 4 | 0.01 | 0.03 | | |
| | 2° | 2 | 0.02 | 0.03 | | |
| | | 3 | 0.02 | 0.03 | | |
| | | 4 | 0.02 | 0.03 | | |
| | 3° | 2 | 0.02 | 0.05 | | |
| | | 4 | 0.02 | 0.05 | | |
| | 5° | 4 | 0.03 | 0.05 | | |
| 0.25 | 30′ | 3 | 0.01 | 0.02 | 20,000 | ~500 |
| | | 5 | 0.01 | 0.02 | | |
| | 1° | 3 | 0.01 | 0.02 | | |
| | | 5 | 0.01 | 0.02 | | |
| | 1°30′ | 3 | 0.01 | 0.03 | | |
| | | 5 | 0.01 | 0.03 | | |
| | 2° | 3 | 0.02 | 0.03 | | |
| | | 5 | 0.02 | 0.03 | | |
| | 3° | 3 | 0.02 | 0.05 | | |
| | | 5 | 0.02 | 0.05 | | |
| | 5° | 5 | 0.03 | 0.05 | | |
| 0.3 | 30′ | 5 | 0.01 | 0.02 | 20,000 | ~800 |
| | | 8 | 0.01 | 0.02 | | |
| | 1° | 4 | 0.01 | 0.02 | | |
| | | 5 | 0.01 | 0.02 | | |
| | | 6 | 0.01 | 0.02 | | |
| | | 8 | 0.01 | 0.02 | | |
| | 1°30′ | 5 | 0.01 | 0.03 | | |
| | | 8 | 0.01 | 0.03 | | |
| | 2° | 6 | 0.02 | 0.03 | | |
| | | 8 | 0.02 | 0.03 | | |
| | 3° | 6 | 0.02 | 0.05 | | |
| | | 8 | 0.02 | 0.05 | | |
| | 5° | 8 | 0.03 | 0.05 | | |

# MRBTN230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | | 炭素鋼・合金鋼・調質鋼 Carbon Steels・Alloy Steels・Prehardened Steels S50C・SCM・SKD・SUS・HPM・NAK | | | |
|---|---|---|---|---|---|---|
| Rサイズ Radius | 首角 Neck Taper Angle | 有効長 Effective Length | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed |
| | | | ap mm | ae mm | $min^{-1}$ | mm/min |
| 0.4 | 30′ | 8 | 0.01 | 0.02 | 20,000 | ~1,000 |
| | | 12 | 0.01 | 0.02 | | |
| | 1° | 8 | 0.01 | 0.02 | | |
| | | 12 | 0.01 | 0.02 | | |
| | 1°30′ | 8 | 0.02 | 0.03 | | |
| | | 12 | 0.02 | 0.03 | | |
| | 2° | 8 | 0.03 | 0.05 | | |
| | | 12 | 0.03 | 0.05 | | |
| | 3° | 8 | 0.03 | 0.05 | | |
| | | 12 | 0.03 | 0.05 | | |
| 0.5 | 30′ | 10 | 0.01 | 0.03 | 16,000~20,000 | ~1,200 |
| | | 15 | 0.01 | 0.02 | | |
| | | 20 | 0.01 | 0.01 | | |
| | | 25 | 0.005 | 0.005 | | |
| | 1° | 6 | 0.05 | 0.07 | | |
| | | 10 | 0.02 | 0.05 | | |
| | | 12 | 0.02 | 0.05 | | |
| | | 15 | 0.02 | 0.03 | | |
| | | 16 | 0.01 | 0.03 | | |
| | | 20 | 0.01 | 0.02 | | |
| | | 22 | 0.01 | 0.01 | | |
| | | 25 | 0.005 | 0.01 | | |
| | 1°30′ | 6 | 0.07 | 0.15 | | |
| | | 8 | 0.05 | 0.1 | | |
| | | 10 | 0.03 | 0.05 | | |
| | | 12 | 0.02 | 0.05 | | |
| | | 15 | 0.02 | 0.03 | | |
| | | 16 | 0.02 | 0.03 | | |
| | | 20 | 0.01 | 0.05 | | |
| | | 22 | 0.01 | 0.01 | | |
| | | 25 | 0.005 | 0.01 | | |
| | | 36 | 0.003 | 0.005 | | |
| | 2° | 10 | 0.05 | 0.1 | | |
| | | 15 | 0.02 | 0.05 | | |
| | | 20 | 0.01 | 0.03 | | |
| | 3° | 10 | 0.07 | 0.15 | | |
| | | 15 | 0.03 | 0.05 | | |
| | | 20 | 0.02 | 0.05 | | |
| | 5° | 15 | 0.07 | 0.2 | | |
| | | 20 | 0.03 | 0.05 | | |
| 0.6 | 30′ | 12 | 0.03 | 0.05 | 16,000~20,000 | ~1,200 |
| | | 24 | 0.01 | 0.01 | | |
| | 1° | 12 | 0.03 | 0.05 | | |
| | | 24 | 0.01 | 0.02 | | |
| | 1°30′ | 12 | 0.03 | 0.05 | | |
| | | 24 | 0.02 | 0.02 | | |
| | 2° | 12 | 0.04 | 0.05 | | |
| | | 24 | 0.02 | 0.03 | | |
| | 3° | 12 | 0.04 | 0.07 | | |
| | | 24 | 0.03 | 0.03 | | |
| | 5° | 12 | 0.05 | 0.1 | | |
| | | 24 | 0.03 | 0.05 | | |



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| 被削材 Work Material | | | 炭素鋼・合金鋼・調質鋼 Carbon Steels・Alloy Steels・Prehardened Steels S50C・SCM・SKD・SUS・HPM・NAK | | | |
|---|---|---|---|---|---|---|
| Rサイズ Radius | 首角 Neck Taper Angle | 有効長 Effective Length | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed |
| | | | ap mm | ae mm | $min^{-1}$ | mm/min |
| 0.75 | 30′ | 10 | 0.1 | 0.2 | 16,000～20,000 | ～1,200 |
| | | 15 | 0.05 | 0.1 | | |
| | | 30 | 0.01 | 0.01 | | |
| | 1° | 10 | 0.1 | 0.2 | | |
| | | 15 | 0.05 | 0.1 | | |
| | | 20 | 0.02 | 0.05 | | |
| | | 30 | 0.01 | 0.01 | | |
| | 1°30′ | 10 | 0.1 | 0.2 | | |
| | | 15 | 0.05 | 0.1 | | |
| | | 30 | 0.01 | 0.02 | | |
| | 2° | 10 | 0.1 | 0.3 | | |
| | | 15 | 0.05 | 0.12 | | |
| | | 20 | 0.03 | 0.05 | | |
| | | 30 | 0.02 | 0.03 | | |
| | 3° | 15 | 0.1 | 0.15 | | |
| | | 20 | 0.05 | 0.07 | | |
| | | 30 | 0.03 | 0.05 | | |
| | 5° | 15 | 0.1 | 0.2 | | |
| | | 28.7 | 0.05 | 0.07 | | |
| 1 | 30′ | 12 | 0.1 | 0.2 | 16,000～20,000 | ～1,600 |
| | | 16 | 0.07 | 0.15 | | |
| | | 20 | 0.05 | 0.1 | | |
| | | 30 | 0.02 | 0.05 | | |
| | | 40 | 0.01 | 0.015 | | |
| | 1° | 16 | 0.1 | 0.12 | | |
| | | 20 | 0.05 | 0.1 | | |
| | | 25 | 0.03 | 0.05 | | |
| | | 30 | 0.02 | 0.05 | | |
| | | 35 | 0.02 | 0.05 | | |
| | | 40 | 0.01 | 0.02 | | |
| | 1°30′ | 12 | 0.15 | 0.3 | | |
| | | 16 | 0.1 | 0.15 | | |
| | | 20 | 0.05 | 0.12 | | |
| | | 25 | 0.03 | 0.07 | | |
| | | 30 | 0.03 | 0.05 | | |
| | | 35 | 0.02 | 0.05 | | |
| | | 40 | 0.01 | 0.02 | | |
| | 2° | 12 | 0.2 | 0.3 | | |
| | | 16 | 0.1 | 0.2 | | |
| | | 20 | 0.07 | 0.15 | | |
| | | 30 | 0.03 | 0.1 | | |
| | | 40 | 0.02 | 0.03 | | |
| | 3° | 12 | 0.2 | 0.5 | | |
| | | 16 | 0.1 | 0.3 | | |
| | | 20 | 0.07 | 0.2 | | |
| | | 30 | 0.05 | 0.1 | | |
| | | 40 | 0.02 | 0.05 | | |
| | 5° | 20 | 0.1 | 0.1 | | |
| | | 26.8 | 0.08 | 0.2 | | |
| | | 38.2 | 0.05 | 0.12 | | |

# MRBTN230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | | 炭素鋼・合金鋼・調質鋼 Carbon Steels・Alloy Steels・Prehardened Steels S50C・SCM・SKD・SUS・HPM・NAK | | | |
|---|---|---|---|---|---|---|
| Rサイズ Radius | 首角 Neck Taper Angle | 有効長 Effective Length | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed |
| | | | ap mm | ae mm | $min^{-1}$ | mm/min |
| 1.5 | 30′ | 15 | 0.15 | 0.3 | 16,000 | ~1,600 |
| | | 20 | 0.08 | 0.1 | | |
| | | 30 | 0.03 | 0.05 | | |
| | | 40 | 0.02 | 0.03 | | |
| | | 50 | 0.01 | 0.01 | | |
| | 1° | 15 | 0.15 | 0.3 | | |
| | | 20 | 0.1 | 0.15 | | |
| | | 30 | 0.05 | 0.07 | | |
| | | 40 | 0.02 | 0.05 | | |
| | | 50 | 0.01 | 0.02 | | |
| | 1°30′ | 15 | 0.2 | 0.3 | | |
| | | 20 | 0.15 | 0.2 | | |
| | | 30 | 0.07 | 0.1 | | |
| | | 40 | 0.03 | 0.05 | | |
| | | 50 | 0.02 | 0.03 | | |
| | 2° | 15 | 0.2 | 0.3 | | |
| | | 20 | 0.15 | 0.2 | | |
| | | 30 | 0.1 | 0.1 | | |
| | | 48.9 | 0.03 | 0.05 | | |
| | 3° | 20 | 0.2 | 0.3 | | |
| | | 30 | 0.1 | 0.15 | | |
| | | 50 | 0.05 | 0.1 | | |
| 2 | 30′ | 20 | 0.2 | 0.3 | 14,000 | ~1,400 |
| | | 40 | 0.05 | 0.1 | | |
| | | 60 | 0.01 | 0.02 | | |
| | 1° | 20 | 0.2 | 0.5 | | |
| | | 40 | 0.07 | 0.2 | | |
| | | 60 | 0.01 | 0.03 | | |
| 備　考 Notes | ※切削条件を設定する際、各サイズ有効長の長いタイプ及び首角の小さいタイプは、上記切削条件範囲内の低めで設定してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※切削油は発煙性の少ないものを使用してください。<br>※焼き入れ鋼には、オイルミストクーラントの使用をお奨めします。<br>※When deciding milling condition in case the effective length is long and/or the neck taper angle is small, it is recommended both axial depth of cut and radial depth of cut values are chosen at lower level within the specified range.<br>※Adjust both spindle speed and feed at the same rate.<br>※Use cutting fluid with smoke retardant.<br>※We recommend using oil mist coolant for hardened steels. | | | | | |



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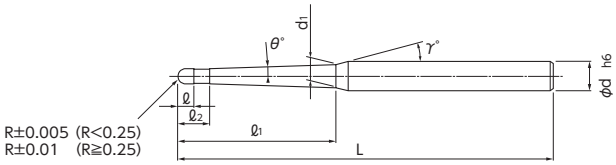
# MRBTN230L

## 無限コーティング 超ロングテーパーネックボールエンドミル
MUGEN-COATING 2-Flute Extra Long Taper Neck Ball End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

3D MG ∞ 2 30° ≦55 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | | ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|
| 08-00580-01021 | R0.1 | 30′ | 2.5 | 0.24 | 0.2 | 0.4 | 12° | 4 | 50 | 14,500 ▌ |
| 08-00580-01022 | | | 3 | 0.25 | 0.2 | 0.4 | 12° | 4 | 50 | 14,500 ▌ |
| 08-00580-01041 | | 1° | 2.5 | 0.27 | 0.2 | 0.4 | 12° | 4 | 50 | 14,500 ▌ |
| 08-00580-01042 | | | 3 | 0.29 | 0.2 | 0.4 | 12° | 4 | 50 | 14,500 ▌ |
| 08-00580-01051 | | 1°30′ | 2.5 | 0.31 | 0.2 | 0.4 | 12° | 4 | 50 | 14,500 ▌ |
| 08-00580-01052 | | | 3 | 0.34 | 0.2 | 0.4 | 12° | 4 | 50 | 14,500 ▌ |
| 08-00580-01061 | | 2° | 2.5 | 0.35 | 0.2 | 0.4 | 12° | 4 | 50 | 14,500 ▌ |
| 08-00580-01062 | | | 3 | 0.38 | 0.2 | 0.4 | 12° | 4 | 50 | 14,500 ▌ |
| 08-00580-01081 | | 3° | 2.5 | 0.42 | 0.2 | 0.4 | 12° | 4 | 50 | 14,500 ▌ |
| 08-00580-01082 | | | 3 | 0.47 | 0.2 | 0.4 | 12° | 4 | 50 | 14,500 ▌ |
| 08-00580-01092 | | 5° | 3 | 0.65 | 0.2 | 0.4 | 12° | 4 | 50 | 14,500 ▌ |
| 08-00580-01521 | R0.15 | 30′ | 4 | 0.36 | 0.3 | 0.5 | 12° | 4 | 50 | 14,500 ▌ |
| 08-00580-01541 | | 1° | 4 | 0.42 | 0.3 | 0.5 | 12° | 4 | 50 | 14,500 ▌ |
| 08-00580-01551 | | 1°30′ | 4 | 0.48 | 0.3 | 0.5 | 12° | 4 | 50 | 14,500 ▌ |
| 08-00580-01561 | | 2° | 4 | 0.54 | 0.3 | 0.5 | 12° | 4 | 50 | 14,500 ▌ |
| 08-00580-01581 | | 3° | 4 | 0.67 | 0.3 | 0.5 | 12° | 4 | 50 | 14,500 ▌ |
| 08-00580-01591 | | 5° | 4 | 0.91 | 0.3 | 0.5 | 12° | 4 | 50 | 14,500 ▌ |
| 08-00580-02021 | R0.2 | 30′ | 5 | 0.47 | 0.4 | 0.8 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02022 | | | 6 | 0.49 | 0.4 | 0.8 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02041 | | 1° | 5 | 0.55 | 0.4 | 0.8 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02042 | | | 6 | 0.58 | 0.4 | 0.8 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02051 | | 1°30′ | 5 | 0.62 | 0.4 | 0.8 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02052 | | | 6 | 0.67 | 0.4 | 0.8 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02061 | | 2° | 5 | 0.69 | 0.4 | 0.8 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02062 | | | 6 | 0.76 | 0.4 | 0.8 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02081 | | 3° | 5 | 0.84 | 0.4 | 0.8 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02082 | | | 6 | 0.95 | 0.4 | 0.8 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02092 | | 5° | 6 | 1.31 | 0.4 | 0.8 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02521 | R0.25 | 30′ | 6 | 0.59 | 0.5 | 1 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02522 | | | 7 | 0.6 | 0.5 | 1 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02541 | | 1° | 6 | 0.67 | 0.5 | 1 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02542 | | | 7 | 0.71 | 0.5 | 1 | 12° | 4 | 50 | 11,000 ▌ |

**オーダー方法** MRBTN230L ボール半径(R)×首角(θ)×有効長(ℓ1)を指示してください。
When you order, indicate MRBTN230L (R)×(θ)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

# MRBTN230L

## 無限コーティング 超ロングテーパーネックボールエンドミル

MUGEN-COATING 2-Flute Extra Long Taper Neck Ball End Mill

● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|
| 08-00580-02551 | R0.25 | 1°30′ | 6 | 0.76 | 0.5 | 1 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02552 | | | 7 | 0.81 | 0.5 | 1 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02561 | | 2° | 6 | 0.85 | 0.5 | 1 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02562 | | | 7 | 0.92 | 0.5 | 1 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02581 | | 3° | 6 | 1.02 | 0.5 | 1 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02582 | | | 7 | 1.13 | 0.5 | 1 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-02592 | | 5° | 7 | 1.55 | 0.5 | 1 | 12° | 4 | 50 | 11,000 ▌ |
| 08-00580-03021 | R0.3 | 30′ | 10 | 0.75 | 0.6 | 1.2 | 12° | 4 | 60 | 11,000 ▌ |
| 08-00580-03022 | | | 12 | 0.79 | 0.6 | 1.2 | 12° | 4 | 60 | 11,500 ▌ |
| 08-00580-03023 | | | 20 | 0.93 | 0.6 | 1.2 | 12° | 4 | 60 | 12,500 ▌ |
| 08-00580-03041 | | 1° | 10 | 0.91 | 0.6 | 1.2 | 12° | 4 | 60 | 11,000 ▌ |
| 08-00580-03042 | | | 12 | 0.98 | 0.6 | 1.2 | 12° | 4 | 60 | 11,500 ▌ |
| 08-00580-03043 | | | 20 | 1.26 | 0.6 | 1.2 | 12° | 4 | 60 | 12,500 ▌ |
| 08-00580-03051 | | 1°30′ | 10 | 1.06 | 0.6 | 1.2 | 12° | 4 | 60 | 11,000 ▌ |
| 08-00580-03052 | | | 12 | 1.17 | 0.6 | 1.2 | 12° | 4 | 60 | 11,500 ▌ |
| 08-00580-03053 | | | 20 | 1.58 | 0.6 | 1.2 | 12° | 4 | 60 | 12,500 ▌ |
| 08-00580-03061 | | 2° | 10 | 1.21 | 0.6 | 1.2 | 12° | 4 | 60 | 11,000 ▌ |
| 08-00580-03062 | | | 12 | 1.35 | 0.6 | 1.2 | 12° | 4 | 60 | 11,500 ▌ |
| 08-00580-03063 | | | 20 | 1.91 | 0.6 | 1.2 | 12° | 4 | 60 | 12,500 ▌ |
| 08-00580-03081 | | 3° | 10 | 1.52 | 0.6 | 1.2 | 12° | 4 | 60 | 11,000 ▌ |
| 08-00580-03082 | | | 12 | 1.73 | 0.6 | 1.2 | 12° | 4 | 60 | 11,500 ▌ |
| 08-00580-03083 | | | 20 | 2.57 | 0.6 | 1.2 | 12° | 4 | 60 | 12,500 ▌ |
| 08-00580-03091 | | 5° | 10 | 2.14 | 0.6 | 1.2 | 12° | 4 | 60 | 11,000 ▌ |
| 08-00580-03092 | | | 12 | 2.49 | 0.6 | 1.2 | 12° | 4 | 60 | 11,500 ▌ |
| 08-00580-03093 | | | 20 | 4 | 0.6 | 1.2 | – | 4 | 60 | 12,500 ▌ |
| 08-00580-04021 | R0.4 | 30′ | 16 | 1.05 | 0.8 | 1.6 | 12° | 4 | 60 | 11,500 ▌ |
| 08-00580-04022 | | | 20 | 1.12 | 0.8 | 1.6 | 12° | 4 | 60 | 12,000 ▌ |
| 08-00580-04041 | | 1° | 16 | 1.3 | 0.8 | 1.6 | 12° | 4 | 60 | 11,500 ▌ |
| 08-00580-04042 | | | 20 | 1.44 | 0.8 | 1.6 | 12° | 4 | 60 | 12,000 ▌ |
| 08-00580-04051 | | 1°30′ | 16 | 1.55 | 0.8 | 1.6 | 12° | 4 | 60 | 11,500 ▌ |
| 08-00580-04052 | | | 20 | 1.76 | 0.8 | 1.6 | 12° | 4 | 60 | 12,000 ▌ |
| 08-00580-04061 | | 2° | 16 | 1.81 | 0.8 | 1.6 | 12° | 4 | 60 | 11,500 ▌ |
| 08-00580-04062 | | | 20 | 2.09 | 0.8 | 1.6 | 12° | 4 | 60 | 12,000 ▌ |
| 08-00580-04081 | | 3° | 16 | 2.31 | 0.8 | 1.6 | 12° | 4 | 60 | 11,500 ▌ |
| 08-00580-04082 | | | 20 | 2.73 | 0.8 | 1.6 | 12° | 4 | 60 | 12,000 ▌ |
| 08-00580-04092 | | 5° | 19.8 | 4 | 0.8 | 1.6 | – | 4 | 60 | 12,000 ▌ |
| 08-00580-05021 | R0.5 | 30′ | 30 | 1.49 | 1 | 2 | 12° | 4 | 70 | 13,000 ▌ |
| 08-00580-05022 | | | 50 | 1.84 | 1 | 2 | 12° | 4 | 90 | 14,500 ▌ |
| 08-00580-05023 | | | 80 | 2.36 | 1 | 2 | 12° | 4 | 130 | 18,000 ▌ |
| 08-00580-05041 | | 1° | 30 | 1.98 | 1 | 2 | 12° | 4 | 70 | 13,000 ▌ |
| 08-00580-05042 | | | 50 | 2.68 | 1 | 2 | 12° | 4 | 90 | 14,500 ▌ |
| 08-00580-05043 | | | 80 | 3.72 | 1 | 2 | 12° | 4 | 130 | 18,000 ▌ |

**オーダー方法** MRBTN230L ボール半径(R)×首角(θ)×有効長(ℓ1)を指示してください。
When you order, indicate MRBTN230L (R)×(θ)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.



ŞEVKET ÖĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| コードNo. Code No. | (R)ボール半径 Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|
| 08-00580-05051 | R0.5 | 1°30′ | 30 | 2.47 | 1 | 2 | 12° | 4 | 70 | 13,000 |
| 08-00580-05052 | | | 50 | 3.51 | 1 | 2 | 12° | 4 | 90 | 14,500 |
| 08-00580-05053 | | | 80 | 5.09 | 1 | 2 | 12° | 6 | 130 | 19,000 |
| 08-00580-05061 | | 2° | 30 | 2.96 | 1 | 2 | 12° | 4 | 70 | 13,000 |
| 08-00580-05062 | | | 50 | 4.35 | 1 | 2 | 12° | 6 | 90 | 16,000 |
| 08-00580-05063 | | | 73.5 | 6 | 1 | 2 | – | 6 | 130 | 19,000 |
| 08-00580-05081 | | 3° | 30.6 | 4 | 1 | 2 | – | 4 | 70 | 13,000 |
| 08-00580-05082 | | | 49.7 | 6 | 1 | 2 | – | 6 | 90 | 16,000 |
| 08-00580-05083 | | | 80 | 9.18 | 1 | 2 | 12° | 10 | 130 | 34,300 |
| 08-00580-05091 | | 5° | 30.5 | 6 | 1 | 2 | – | 6 | 70 | 15,000 |
| 08-00580-05092 | | | 53.4 | 10 | 1 | 2 | – | 10 | 90 | 26,800 |
| 08-00580-06021 | R0.6 | 30′ | 36 | 1.79 | 1.2 | 2.4 | 12° | 4 | 80 | 14,000 |
| 08-00580-06022 | | | 48 | 2 | 1.2 | 2.4 | 12° | 4 | 90 | 15,000 |
| 08-00580-06041 | | 1° | 36 | 2.37 | 1.2 | 2.4 | 12° | 4 | 80 | 14,000 |
| 08-00580-06042 | | | 48 | 2.79 | 1.2 | 2.4 | 12° | 4 | 90 | 15,000 |
| 08-00580-06051 | | 1°30′ | 36 | 2.96 | 1.2 | 2.4 | 12° | 4 | 80 | 14,000 |
| 08-00580-06052 | | | 48 | 3.59 | 1.2 | 2.4 | 12° | 4 | 90 | 15,000 |
| 08-00580-06061 | | 2° | 36 | 3.55 | 1.2 | 2.4 | 12° | 4 | 80 | 14,000 |
| 08-00580-06062 | | | 48 | 4.38 | 1.2 | 2.4 | 12° | 6 | 90 | 16,000 |
| 08-00580-06081 | | 3° | 36 | 4.72 | 1.2 | 2.4 | 12° | 6 | 80 | 15,000 |
| 08-00580-06082 | | | 48 | 6 | 1.2 | 2.4 | – | 6 | 90 | 16,000 |
| 08-00580-06092 | | 5° | 41.2 | 8 | 1.2 | 2.4 | – | 8 | 90 | 20,900 |
| 08-00580-07521 | R0.75 | 30′ | 45 | 2.23 | 1.5 | 3 | 12° | 4 | 90 | 15,000 |
| 08-00580-07522 | | | 60 | 2.49 | 1.5 | 3 | 12° | 4 | 110 | 16,000 |
| 08-00580-07541 | | 1° | 45 | 2.97 | 1.5 | 3 | 12° | 4 | 90 | 15,000 |
| 08-00580-07542 | | | 60 | 3.49 | 1.5 | 3 | 12° | 4 | 110 | 16,000 |
| 08-00580-07551 | | 1°30′ | 45 | 3.7 | 1.5 | 3 | 12° | 4 | 90 | 15,000 |
| 08-00580-07552 | | | 60 | 4.49 | 1.5 | 3 | 12° | 6 | 110 | 18,000 |
| 08-00580-07561 | | 2° | 45 | 4.43 | 1.5 | 3 | 12° | 6 | 90 | 16,000 |
| 08-00580-07562 | | | 60 | 5.48 | 1.5 | 3 | 12° | 6 | 110 | 18,000 |
| 08-00580-07581 | | 3° | 45.9 | 6 | 1.5 | 3 | – | 6 | 90 | 16,000 |
| 08-00580-07582 | | | 60 | 7.47 | 1.5 | 3 | 12° | 8 | 110 | 25,600 |
| 08-00580-07591 | | 5° | 45 | 8.85 | 1.5 | 3 | 12° | 10 | 90 | 27,900 |
| 08-00580-07592 | | | 60 | 11.47 | 1.5 | 3 | 12° | 12 | 110 | 36,000 |
| 08-00580-10021 | R1 | 30′ | 50 | 2.8 | 2 | 4 | 12° | 4 | 100 | 15,500 |
| 08-00580-10022 | | | 80 | 3.33 | 2 | 4 | 12° | 4 | 130 | 18,000 |
| 08-00580-10041 | | 1° | 50 | 3.61 | 2 | 4 | 12° | 4 | 100 | 15,500 |
| 08-00580-10042 | | | 80 | 4.65 | 2 | 4 | 12° | 6 | 130 | 19,000 |
| 08-00580-10051 | | 1°30′ | 50 | 4.41 | 2 | 4 | 12° | 6 | 100 | 17,000 |
| 08-00580-10052 | | | 80.3 | 6 | 2 | 4 | – | 6 | 130 | 19,000 |
| 08-00580-10061 | | 2° | 50 | 5.21 | 2 | 4 | 12° | 6 | 100 | 17,000 |
| 08-00580-10062 | | | 80 | 7.31 | 2 | 4 | 12° | 8 | 130 | 27,900 |

# MRBTN230L

## 無限コーティング 超ロングテーパーネックボールエンドミル

MUGEN-COATING 2-Flute Extra Long Taper Neck Ball End Mill

● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|
| 08-00580-10081 | R1 | 3° | 50 | 6.82 | 2 | 4 | 12° | 8 | 100 | 23,300 ▌ |
| 08-00580-10082 | | | 80.3 | 10 | 2 | 4 | – | 10 | 130 | 33,700 ▌ |
| 08-00580-10091 | | 5° | 49.7 | 10 | 2 | 4 | – | 10 | 100 | 29,100 ▌ |
| 08-00580-15021 | R1.5 | 30′ | 80 | 4.29 | 3 | 6 | 12° | 6 | 130 | 20,000 ▌ |
| 08-00580-15041 | | 1° | 80 | 5.58 | 3 | 6 | 12° | 6 | 130 | 20,000 ▌ |
| 08-00580-15051 | | 1°30′ | 80 | 6.88 | 3 | 6 | 12° | 8 | 130 | 36,000 ▌ |
| 08-00580-15061 | | 2° | 77.5 | 8 | 3 | 6 | – | 8 | 130 | 27,900 ▌ |
| 08-00580-15081 | | 3° | 72.7 | 10 | 3 | 6 | – | 10 | 130 | 33,700 ▌ |
| 08-00580-20021 | R2 | 30′ | 80 | 5.26 | 4 | 8 | 12° | 6 | 130 | 22,000 ▌ |
| 08-00580-20041 | | 1° | 80 | 6.51 | 4 | 8 | 12° | 8 | 130 | 27,900 ▌ |
| 08-00580-20051 | | 1°30′ | 60 | 6.72 | 4 | 8 | 12° | 8 | 110 | 25,600 ▌ |
| 08-00580-20052 | | | 84.3 | 8 | 4 | 8 | – | 8 | 130 | 27,900 ▌ |
| 08-00580-20061 | | 2° | 60 | 7.63 | 4 | 8 | 12° | 8 | 110 | 25,600 ▌ |
| 08-00580-20062 | | | 80 | 9.03 | 4 | 8 | 12° | 10 | 130 | 33,700 ▌ |
| 08-00580-20081 | | 3° | 60 | 9.45 | 4 | 8 | 12° | 10 | 110 | 30,200 ▌ |
| 08-00580-20082 | | | 84.3 | 12 | 4 | 8 | – | 12 | 130 | 44,000 ▌ |
| 08-00580-25021 | R2.5 | 30′ | 50 | 5.7 | 5 | 10 | 12° | 6 | 100 | 18,000 ▌ |
| 08-00580-25022 | | | 80 | 6.22 | 5 | 10 | 12° | 8 | 130 | 27,900 ▌ |
| 08-00580-25041 | | 1° | 50 | 6.4 | 5 | 10 | 12° | 8 | 100 | 26,800 ▌ |
| 08-00580-25042 | | | 80 | 7.44 | 5 | 10 | 12° | 8 | 130 | 29,100 ▌ |
| 08-00580-25051 | | 1°30′ | 50 | 7.09 | 5 | 10 | 12° | 8 | 100 | 25,600 ▌ |
| 08-00580-25052 | | | 80 | 8.67 | 5 | 10 | 12° | 10 | 130 | 33,700 ▌ |
| 08-00580-25061 | | 2° | 52.9 | 8 | 5 | 10 | – | 8 | 100 | 26,800 ▌ |
| 08-00580-25062 | | | 81.5 | 10 | 5 | 10 | – | 10 | 130 | 33,700 ▌ |
| 08-00580-25081 | | 3° | 57.7 | 10 | 5 | 10 | – | 10 | 110 | 30,200 ▌ |
| 08-00580-30041 | R3 | 1° | 69.2 | 8 | 6 | 12 | – | 8 | 130 | 30,200 ▌ |
| 08-00580-30051 | | 1°30′ | 88.3 | 10 | 6 | 12 | – | 10 | 140 | 37,100 ▌ |
| 08-00580-30061 | | 2° | 69.3 | 10 | 6 | 12 | – | 10 | 130 | 34,800 ▌ |
| 08-00580-30081 | | 3° | 69.2 | 12 | 6 | 12 | – | 12 | 130 | 44,000 ▌ |
| 08-00580-40041 | R4 | 1° | 73.2 | 10 | 8 | 16 | – | 10 | 130 | 33,700 ▌ |
| 08-00580-40051 | | 1°30′ | 80 | 11.35 | 8 | 16 | 12° | 12 | 130 | 42,900 ▌ |
| 08-00580-40061 | | 2° | 73.2 | 12 | 8 | 16 | – | 12 | 130 | 42,900 ▌ |
| 08-00580-50041 | R5 | 1° | 77.2 | 12 | 10 | 20 | – | 12 | 130 | 42,900 ▌ |
| 08-00580-50051 | | 1°30′ | 58.2 | 12 | 10 | 20 | – | 12 | 110 | 37,100 ▌ |

**オーダー方法**

MRBTN230L ボール半径(R)×首角(θ)×有効長(ℓ1)を指示してください。
When you order, indicate MRBTN230L (R)×(θ)×(ℓ1).

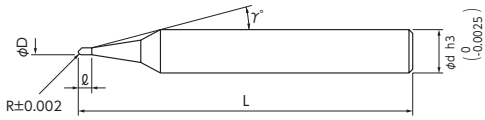
※(γ)は参考値です。
※(γ) is reference value.



ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# NSMB100

## 超微細加工用ボールエンドミル“マイクロボール”
Ball End Mill for precision machining “Micro Ball”




- ●世界初！ R サイズ R0.005 より標準化を実現。
- ●世界最小ボールエンドミル“マイクロボール”が微細加工領域を拡張。
- ●NS 独自の R 部形状を採用し、良好な仕上面を実現。
- ●The world's first standardization of Ball size R0.005. Micro Ball develops new machining field in high-precision technology.
- ●The world's smallest ball end mill “Micro Ball” extends precision machining field.
- ●NS original R design exericises fine finishing surface.

3D SMG 1 0°

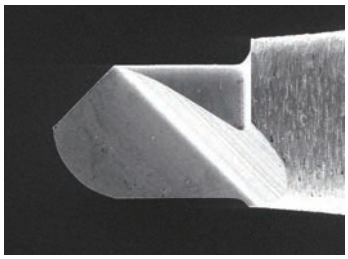
### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | ○ | ○ | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 01-00003-00005 | R0.005 | 0.01 | 0.01 | 15° | 4 | 45 | 34,700 |
| 01-00003-00010 | R0.01 | 0.02 | 0.02 | 15° | 4 | 45 | 27,800 |
| 01-00003-00015 | R0.015 | 0.03 | 0.03 | 15° | 4 | 45 | 23,800 |
| 01-00003-00020 | R0.02 | 0.04 | 0.04 | 15° | 4 | 45 | 20,000 |
| 01-00003-00025 | R0.025 | 0.05 | 0.05 | 15° | 4 | 45 | 18,000 |
| 01-00003-00030 | R0.03 | 0.06 | 0.06 | 15° | 4 | 45 | 12,900 |
| 01-00003-00040 | R0.04 | 0.08 | 0.08 | 15° | 4 | 45 | 10,800 |
| 01-00003-00050 | R0.05 | 0.1 | 0.1 | 15° | 4 | 45 | 9,000 |

NSMB100　R0.05

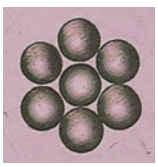


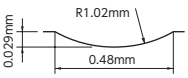
**オーダー方法**　NSMB100 ボール半径(R)を指示してください。 ※(γ)は参考値です。
When you order, indicate NSMB100 (R). ※(γ) is reference value.

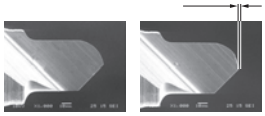
- ●切削条件表はE-074に記載
- ●Recommended Milling Conditions are shown on page E-074.

## 加工事例 1　Technical Data 1

R0.03　レンズアレイモデル Lens Array Model





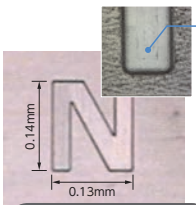

切削前 Before machining　切削後 After machining

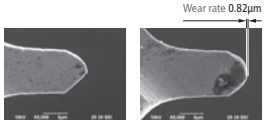
| | | |
|---|---|---|
| 被削材 Material | タフピッチ銅 Tough pitch copper | |
| 回転数 Spindle speed | 60,000min$^{-1}$ | |
| 送り速度 Feed | 荒取り：50mm/min Roughing | 仕上げ：30mm/min Finishing |
| 切り込み量※ Depth of cut | 荒取り：1μm×2μm Roughing (ap×ae) | 仕上げ：1μm×1μm Finishing (ap×ae) |
| 加工時間 Cutting time | 4 時間 40 分 4hr 40min | |
| 加工距離 Cutting length | 10.4m | |
| クーラント Coolant | オイルミスト Oil mist | |

●荒取り・仕上げを同一工具で行いました。
Full process done by one tool.
※ap は切り込み深さ、ae は切り込み幅を示します。
ap: Axial Depth of Cut,
ae: Radial Depth of Cut.

## 加工事例 2　Technical Data 2

R0.005　N 文字加工 N Engraving




切削前 Before machining　切削後 After machining

| | |
|---|---|
| 被削材 Material | NAK80 40HRC |
| 回転数 Spindle speed | 60,000min$^{-1}$ |
| 送り速度 Feed | 5mm/min |
| 切り込み量※ Depth of cut | 0.3μm × 0.5μm (ap × ae) |
| 加工時間 Cutting time | 2 時間 30 分 2hr 30min |
| 加工距離 Cutting length | 0.8m |
| クーラント Coolant | オイルミスト Oil mist |

●荒取り・仕上げを同一工具で行いました。
Full process done by one tool.
※ap は切り込み深さ、ae は切り込み幅を示します。
ap: Axial Depth of Cut,
ae: Radial Depth of Cut.

# NSMB100

## 切削条件参考表 Recommended Milling Conditions

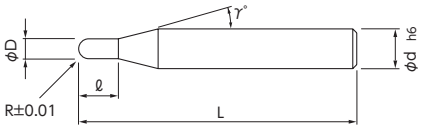
| 被削材 Work Material | タフピッチ銅・アルミニウム合金 Tough Pitch Copper・Aluminum Alloy | | | | |
|---|---|---|---|---|---|
| R サイズ Radius | 切り込み量 Depth of Cut | | 送り速度 Feed | アプローチ速度 Approaching Feed | 回転数 Spindle Speed |
| | ap mm | ae mm | mm/min | mm/min | $min^{-1}$ |
| **0.005** | 0.0003 | 0.0005 | 5 | 2 | 60,000 |
| **0.01** | 0.0005 | 0.001 | 10 | 3 | 60,000 |
| **0.02** | 0.001 | 0.002 | 20 | 5 | 60,000 |
| **0.03** | 0.002 | 0.003 | 80 | 10 | 60,000 |
| **0.04** | 0.002 | 0.004 | 200 | 30 | 60,000 |
| **0.05** | 0.003 | 0.005 | 300 | 30 | 60,000 |
| 備　考 Notes | ※切り込み量の、ap は深さ方向の切り込み量、ae はピックフィードを示します。<br>※工具の着脱やプリセット時には細心の注意を払ってください。<br>※被削材、加工内容に適したクーラントをご使用ください。<br>※チャッキングの振れは極力抑えてください。<br>（可能ならば使用される回転数での動的振れ精度を確認してください）<br>※アプローチ角は 3 ˚以下にしてください。<br>※切り込み量の増加は工具折損の要因となります。特に ap の数値には気を付けてください。<br>※Depth of Cut: ap=Axial Depth of Cut / ae=Radial Depth of Cut.<br>※Handle with care when exchanging and presetting tool.<br>※Use proper type of coolant for material and machining process.<br>※Minimize chucking runout<br>(Recommend to measure actual runout at activated spindle speed).<br>※Tool approaching angle must be 3 degrees or below.<br>※Increase of Depth of Cut may cause a tool breakage, especially careful for Axial Depth of Cut. | | | | |



ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# NCB-2

## ミニチュアボールエンドミル
2-Flute Miniature Ball End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

3D MG 2 30°

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ○ | ○ | ○ | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
| ○ | | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

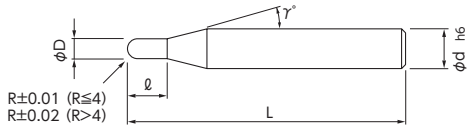
| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 01-00512-00200 | R0.2 | 0.8 | 0.4 | 9° | 3 | 35 | 11,000 ▌ |
| 01-00512-00250 | R0.25 | 1 | 0.5 | 9° | 3 | 35 | 10,600 ▌ |
| 01-00512-00300 | R0.3 | 1.2 | 0.6 | 9° | 3 | 35 | 10,000 ▌ |
| 01-00512-00350 | R0.35 | 1.4 | 0.7 | 9° | 3 | 35 | 11,000 ▌ |
| 01-00512-00400 | R0.4 | 1.6 | 0.8 | 9° | 3 | 35 | 11,000 ▌ |
| 01-00512-00450 | R0.45 | 1.8 | 0.9 | 9° | 3 | 35 | 11,000 ▌ |
| 01-00512-00500 | R0.5 | 2 | 1 | 9° | 3 | 35 | 8,000 ▌ |
| 01-00512-00600 | R0.6 | 2.4 | 1.2 | 9° | 3 | 35 | 8,800 ▌ |
| 01-00512-00700 | R0.7 | 2.8 | 1.4 | 9° | 3 | 35 | 8,800 ▌ |
| 01-00512-00750 | R0.75 | 3 | 1.5 | 9° | 3 | 35 | 8,800 ▌ |
| 01-00512-00800 | R0.8 | 3.2 | 1.6 | 9° | 3 | 35 | 8,800 ▌ |
| 01-00512-00900 | R0.9 | 3.6 | 1.8 | 9° | 3 | 35 | 8,800 ▌ |

**オーダー方法** NCB-2 ボール半径(R)を指示してください。
When you order, indicate NCB-2 (R).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はE-076に記載
●Recommended Milling Conditions are shown on page E-076.

# NSB-2

## ボールエンドミル
2-Flute Ball End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
●▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
●▲: The sizes will no longer be capable being sold after the stock runs out.

3D MG 2 30°

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ○ | ○ | ○ | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
| ○ | | ◎ | ◎ | ◎ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

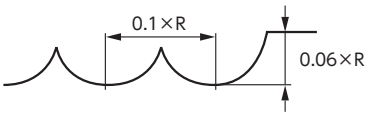
| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 01-00522-00100 | R1 | 3 | 2 | 9° | 4 | 60 | 7,000 ▌ |
| 01-00522-00125 | R1.25 | 3.5 | 2.5 | 9° | 4 | 60 | 7,500 ▌ |
| 01-00522-00150 | R1.5 | 4 | 3 | 9° | 6 | 60 | 7,800 ▌ |
| 01-00522-00175 | R1.75 | 5 | 3.5 | 9° | 6 | 60 | 8,000 ▌ |
| 01-00522-00200 | R2 | 6 | 4 | 9° | 6 | 60 | 8,000 ▌ |
| 01-00522-00250 | R2.5 | 8 | 5 | 9° | 6 | 60 | 9,000 ▌ |
| 01-00522-00300 | R3 | 10 | 6 | – | 6 | 80 | 9,400 ▌ |
| ▲ 01-00522-00350 | R3.5 | 13 | 7 | 9° | 8 | 90 | 18,300 ▌ |
| ▲ 01-00522-00400 | R4 | 13 | 8 | – | 8 | 90 | 14,000 ▌ |
| ▲ 01-00522-00450 | R4.5 | 15 | 9 | 9° | 10 | 100 | 24,300 ▌ |
| ▲ 01-00522-00500 | R5 | 15 | 10 | – | 10 | 100 | 16,900 ▌ |
| ▲ 01-00522-00550 | R5.5 | 15 | 11 | 9° | 12 | 110 | 30,400 ▌ |
| ▲ 01-00522-00600 | R6 | 15 | 12 | – | 12 | 110 | 24,400 ▌ |
| ▲ 01-00522-00700 | R7 | 20 | 14 | 9° | 16 | 160 | 63,900 ▌ |
| ▲ 01-00522-00800 | R8 | 20 | 16 | – | 16 | 160 | 55,000 ▌ |
| ▲ 01-00522-00900 | R9 | 25 | 18 | 9° | 20 | 170 | 95,900 ▌ |
| ▲ 01-00522-01000 | R10 | 25 | 20 | – | 20 | 170 | 81,600 ▌ |

**オーダー方法** NSB-2 ボール半径(R)を指示してください。
When you order, indicate NSB-2 (R).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はE-076に記載
●Recommended Milling Conditions are shown on page E-076.

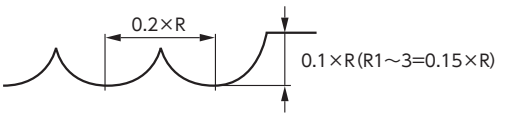
# NCB-2

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼・合金鋼・調質鋼 Carbon Steels・Alloy Steels・Prehardened Steels S50C・SCM・SKD・SUS・HPM・NAK | |
|---|---|---|
| 切削速度 Cutting Speed | 50m/min | |
| Rサイズ Radius | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min |
| 0.2 | 40,000 | 700 |
| 0.25 | 32,000 | 750 |
| 0.3 | 27,000 | 750 |
| 0.4 | 20,000 | 870 |
| 0.5 | 13,300 | 870 |
| 0.6 | 11,400 | 870 |
| 0.7 | 10,600 | 870 |
| 0.75 | 10,000 | 870 |
| 0.8 | 9,000 | 870 |
| 0.9 | 8,800 | 850 |
| 切り込み量 Depth of Cut (R:ボール半径 Radius) |   | |
| 備　考 Notes | ※切削油を使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※Use cutting fluid.<br>※Adjust both spindle speed and feed at the same rate. | |

# NSB-2

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM・SKD・SUS | | 調質鋼 Prehardened Steels HPM・NAK(～45HRC) | |
|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 80m/min | | 70m/min | | 60m/min | |
| Rサイズ Radius | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 12,700 | 700 | 11,100 | 580 | 9,600 | 450 |
| 1.5 | 8,500 | 700 | 7,400 | 580 | 6,400 | 450 |
| 2 | 6,400 | 700 | 5,600 | 580 | 4,800 | 450 |
| 2.5 | 5,100 | 700 | 4,500 | 580 | 3,800 | 450 |
| 3 | 4,200 | 700 | 3,700 | 580 | 3,200 | 450 |
| 4 | 3,200 | 700 | 2,800 | 580 | 2,400 | 450 |
| 5 | 2,500 | 700 | 2,200 | 580 | 1,900 | 450 |
| 6 | 2,100 | 700 | 1,900 | 580 | 1,600 | 450 |
| 8 | 1,600 | 700 | 1,400 | 580 | 1,200 | 450 |
| 10 | 1,300 | 700 | 1,100 | 580 | 1,000 | 450 |
| 切り込み量 Depth of Cut (R:ボール半径 Radius) |   | | | | | |
| 備　考 Notes | ※切削油を使用してください。<br>※上記の表は直線部の条件です。傾斜等により送り速度を調整してください。<br>※工具突出し量・切り込み量などによって、回転数と送り速度は大幅に変動します。<br>※Use cutting fluid.<br>※This table shows milling conditions of straight tool path. Adjust feed for inclined surface.<br>※Spindle speed and feed are changed according to overhang length and depth of cut. | | | | | |



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# NSBL-2

## ロングボールエンドミル
2-Flute Long Ball End Mill

● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | |
|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ |
| ○ | ○ | ○ | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| ○ | | ◎ | ◎ | ◎ |

### ▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

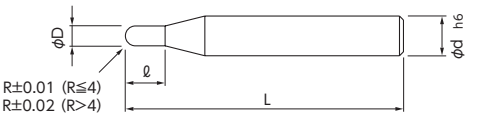
| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00530-00300 | R3 | 15 | 6 | 6 | 120 | 13,000 ▌ |
| 01-00530-00400 | R4 | 20 | 8 | 8 | 130 | 20,300 ▌ |
| 01-00530-00500 | R5 | 25 | 10 | 10 | 150 | 25,200 ▌ |
| 01-00530-00600 | R6 | 30 | 12 | 12 | 180 | 40,200 ▌ |
| ▲ 01-00530-00800 | R8 | 40 | 16 | 16 | 200 | 72,000 ▌ |
| ▲ 01-00530-01000 | R10 | 50 | 20 | 20 | 220 | 110,500 ▌ |

**オーダー方法** NSBL-2 ボール半径(R)を指示してください。
When you order, indicate NSBL-2 (R).

# NLBL-2

## ロング刃ロングシャンクボールエンドミル

2-Flute Extra Long Ball End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

3D MG 2 30°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00528-00051 | R0.5 | 5 | 1 | 4 | 50 | 14,500 ▌ |
| 01-00528-00071 | R0.75 | 8 | 1.5 | 4 | 50 | 14,500 ▌ |
| 01-00528-00101 | R1 | 10 | 2 | 4 | 100 | 14,500 ▌ |
| 01-00528-00121 | R1.25 | 13 | 2.5 | 4 | 100 | 14,500 ▌ |
| 01-00528-00151 | R1.5 | 10 | 3 | 6 | 60 | 12,700 ▌ |
| 01-00528-00152 | | 15 | 3 | 6 | 100 | 16,000 ▌ |
| 01-00528-00171 | R1.75 | 10 | 3.5 | 6 | 60 | 12,700 ▌ |
| 01-00528-00172 | | 18 | 3.5 | 6 | 100 | 16,000 ▌ |
| 01-00528-00201 | R2 | 10 | 4 | 6 | 60 | 12,700 ▌ |
| 01-00528-00202 | | 15 | 4 | 6 | 80 | 15,000 ▌ |
| 01-00528-00203 | | 20 | 4 | 6 | 100 | 16,500 ▌ |
| 01-00528-00221 | R2.25 | 22 | 4.5 | 6 | 100 | 17,200 ▌ |
| 01-00528-00251 | R2.5 | 15 | 5 | 6 | 60 | 14,900 ▌ |
| 01-00528-00252 | | 20 | 5 | 6 | 80 | 16,500 ▌ |
| 01-00528-00253 | | 25 | 5 | 6 | 100 | 18,000 ▌ |
| 01-00528-00271 | R2.75 | 28 | 5.5 | 6 | 100 | 16,500 ▌ |
| 01-00528-00301 | R3 | 20 | 6 | 6 | 100 | 16,500 ▌ |
| 01-00528-00302 | | 30 | 6 | 6 | 150 | 18,700 ▌ |
| 01-00528-00351 | R3.5 | 20 | 7 | 8 | 90 | 24,000 ▌ |
| 01-00528-00352 | | 35 | 7 | 8 | 150 | 30,100 ▌ |
| 01-00528-00401 | R4 | 20 | 8 | 8 | 90 | 20,900 ▌ |
| 01-00528-00402 | | 40 | 8 | 8 | 150 | 27,000 ▌ |
| 01-00528-00451 | R4.5 | 25 | 9 | 10 | 100 | 32,600 ▌ |
| 01-00528-00452 | | 45 | 9 | 10 | 150 | 38,100 ▌ |

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 01-00528-00501 | R5 | 30 | 10 | 10 | 100 | 28,300 ▌ |
| 01-00528-00502 | | 40 | 10 | 10 | 150 | 33,000 ▌ |
| 01-00528-00503 | | 50 | 10 | 10 | 200 | 36,600 ▌ |
| 01-00528-00551 | R5.5 | 30 | 11 | 12 | 110 | 46,000 ▌ |
| 01-00528-00552 | | 50 | 11 | 12 | 150 | 54,100 ▌ |
| 01-00528-00601 | R6 | 30 | 12 | 12 | 110 | 44,000 ▌ |
| 01-00528-00602 | | 55 | 12 | 12 | 150 | 51,700 ▌ |
| 01-00528-00651 | R6.5 | 30 | 13 | 12 | 120 | 54,900 ▌ |
| 01-00528-00652 | | 55 | 13 | 12 | 150 | 63,400 ▌ |
| 01-00528-00701 | R7 | 30 | 14 | 12 | 140 | 67,600 ▌ |
| 01-00528-00702 | | 55 | 14 | 12 | 200 | 78,100 ▌ |
| 01-00528-00751 | R7.5 | 35 | 15 | 16 | 160 | 107,600 ▌ |
| 01-00528-00752 | | 60 | 15 | 16 | 200 | 124,600 ▌ |
| 01-00528-00801 | R8 | 35 | 16 | 16 | 160 | 107,600 ▌ |
| 01-00528-00802 | | 50 | 16 | 16 | 200 | 124,600 ▌ |
| 01-00528-00803 | | 60 | 16 | 16 | 230 | 132,900 ▌ |
| 01-00528-00851 | R8.5 | 35 | 17 | 16 | 160 | 116,100 ▌ |
| 01-00528-00852 | | 60 | 17 | 16 | 200 | 130,800 ▌ |
| 01-00528-00901 | R9 | 40 | 18 | 20 | 170 | 151,800 ▌ |
| 01-00528-00902 | | 70 | 18 | 20 | 250 | 206,700 ▌ |
| 01-00528-00951 | R9.5 | 40 | 19 | 20 | 170 | 151,800 ▌ |
| 01-00528-00952 | | 70 | 19 | 20 | 250 | 206,700 ▌ |
| 01-00528-01001 | R10 | 40 | 20 | 20 | 170 | 151,800 ▌ |
| 01-00528-01002 | | 55 | 20 | 20 | 200 | 168,800 ▌ |
| 01-00528-01003 | | 70 | 20 | 20 | 250 | 206,700 ▌ |

**オーダー方法**

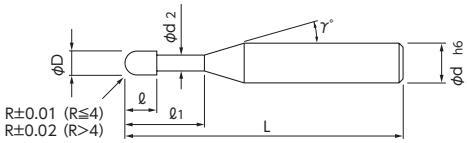
NLBL-2 ボール半径(R)×刃長(ℓ)を指示してください。
When you order, indicate NLBL-2 (R)×(ℓ).



ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# NHB-2

## ロングネックボールエンドミル（深リブ用）
2-Flute Long Neck Ball End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

3D MG 2 30°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00432-00401 | R0.4 | 6 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 9,400 ▌ |
| 01-00432-00402 | | 8 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 9,400 ▌ |
| 01-00432-00502 | R0.5 | 8 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 7,500 ▌ |
| 01-00432-00503 | | 12 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 7,500 ▌ |
| 01-00432-00602 | R0.6 | 8 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 9,400 ▌ |
| 01-00432-00603 | | 12 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 9,400 ▌ |
| 01-00432-00702 | R0.7 | 8 | 1 | 1.4 | 1.35 | 12° | 4 | 45 | 9,400 ▌ |
| 01-00432-00703 | | 12 | 1 | 1.4 | 1.35 | 12° | 4 | 45 | 9,400 ▌ |
| 01-00432-00704 | | 16 | 1 | 1.4 | 1.35 | 12° | 4 | 50 | 9,400 ▌ |
| 01-00432-00752 | R0.75 | 8 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 8,300 ▌ |
| 01-00432-00753 | | 12 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 8,300 ▌ |
| 01-00432-00754 | | 16 | 1.1 | 1.5 | 1.45 | 12° | 4 | 50 | 8,300 ▌ |
| 01-00432-00755 | | 20 | 1.1 | 1.5 | 1.45 | 12° | 4 | 55 | 8,300 ▌ |
| 01-00432-00802 | R0.8 | 8 | 1.2 | 1.6 | 1.55 | 12° | 4 | 45 | 9,400 ▌ |
| 01-00432-00803 | | 12 | 1.2 | 1.6 | 1.55 | 12° | 4 | 45 | 9,400 ▌ |
| 01-00432-00804 | | 16 | 1.2 | 1.6 | 1.55 | 12° | 4 | 50 | 9,400 ▌ |
| 01-00432-00805 | | 20 | 1.2 | 1.6 | 1.55 | 12° | 4 | 55 | 9,400 ▌ |
| 01-00432-00902 | R0.9 | 8 | 1.3 | 1.8 | 1.75 | 12° | 4 | 45 | 9,400 ▌ |
| 01-00432-00903 | | 12 | 1.3 | 1.8 | 1.75 | 12° | 4 | 45 | 9,400 ▌ |
| 01-00432-00904 | | 16 | 1.3 | 1.8 | 1.75 | 12° | 4 | 50 | 9,400 ▌ |
| 01-00432-00905 | | 20 | 1.3 | 1.8 | 1.75 | 12° | 4 | 55 | 9,600 ▌ |
| 01-00432-01002 | R1 | 8 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 7,500 ▌ |
| 01-00432-01003 | | 12 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 7,500 ▌ |
| 01-00432-01004 | | 16 | 1.5 | 2 | 1.94 | 12° | 4 | 50 | 7,500 ▌ |
| 01-00432-01005 | | 20 | 1.5 | 2 | 1.94 | 12° | 4 | 55 | 7,700 ▌ |
| 01-00432-01510 | R1.5 | 10 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 9,200 ▌ |
| 01-00432-01515 | | 15 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 9,200 ▌ |
| 01-00432-01520 | | 20 | 2.5 | 3 | 2.85 | 12° | 6 | 65 | 9,600 ▌ |
| 01-00432-01525 | | 25 | 2.5 | 3 | 2.85 | 12° | 6 | 65 | 9,600 ▌ |

**オーダー方法**
NHB-2 ボール半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate NHB-2 (R)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-081に記載
●Recommended Milling Conditions are shown on page E-081.

# NHB-2

## ロングネックボールエンドミル（深リブ用）
2-Flute Long Neck Ball End Mill

● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00432-02015 | R2 | 15 | 3 | 4 | 3.8 | 12° | 6 | 65 | 10,000 ▌ |
| 01-00432-02020 | | 20 | 3 | 4 | 3.8 | 12° | 6 | 65 | 10,000 ▌ |
| 01-00432-02025 | | 25 | 3 | 4 | 3.8 | 12° | 6 | 70 | 10,400 ▌ |
| 01-00432-02030 | | 30 | 3 | 4 | 3.8 | 12° | 6 | 70 | 10,400 ▌ |
| 01-00432-02520 | R2.5 | 20 | 3.5 | 5 | 4.8 | 12° | 6 | 70 | 10,600 ▌ |
| 01-00432-02525 | | 25 | 3.5 | 5 | 4.8 | 12° | 6 | 70 | 10,600 ▌ |
| 01-00432-02530 | | 30 | 3.5 | 5 | 4.8 | 12° | 6 | 80 | 11,100 ▌ |
| 01-00432-02535 | | 35 | 3.5 | 5 | 4.8 | 12° | 6 | 80 | 11,100 ▌ |
| 01-00432-03030 | R3 | 30 | 6 | 6 | 5.8 | 12° | 6 | 80 | 12,500 ▌ |
| 01-00432-03050 | | 50 | 6 | 6 | 5.8 | 12° | 6 | 120 | 15,100 ▌ |
| ▲ 01-00432-04040 | R4 | 40 | 8 | 8 | 7.8 | 12° | 8 | 90 | 17,200 ▌ |
| ▲ 01-00432-04060 | | 60 | 8 | 8 | 7.8 | 12° | 8 | 130 | 19,400 ▌ |
| ▲ 01-00432-05050 | R5 | 50 | 10 | 10 | 9.8 | 12° | 10 | 100 | 22,200 ▌ |
| ▲ 01-00432-05070 | | 70 | 10 | 10 | 9.8 | 12° | 10 | 150 | 24,000 ▌ |

**オーダー方法**
NHB-2 ボール半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate NHB-2 (R)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-081に記載
●Recommended Milling Conditions are shown on page E-081.



ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# NHB-2

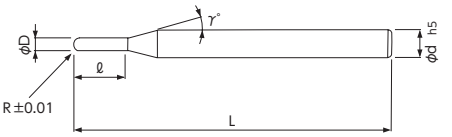
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | 炭素鋼・合金鋼・調質鋼 Carbon Steels・Alloy Steels・Prehardened Steels S50C・SCM・SKD・SUS・HPM・NAK | | アルミニウム合金 Aluminum Alloy | | 銅 Copper | | 樹脂 Resin | |
|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | | 30～50m/min | | 100～200m/min | | 50～150m/min | | 40～60m/min | |
| Rサイズ Radius | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | mm | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 0.4 | 0.01～0.02 | 12,000～20,000 | 100～250 | 40,000～ | 500～ 800 | 20,000～ | 300～ 750 | 16,000～24,000 | 190～240 |
| 0.5 | 0.01～0.03 | 9,600～16,000 | 150～400 | 32,000～ | 750～1,600 | 16,000～48,000 | 450～1,200 | 12,700～19,100 | 190～240 |
| 0.6 | 0.016～0.06 | 8,000～13,300 | 150～400 | 26,500～ | 750～1,600 | 13,300～40,000 | 450～1,200 | 10,600～16,000 | 250～320 |
| 0.7 | 0.012～0.1 | 6,800～11,400 | 150～400 | 22,700～45,500 | 750～1,600 | 11,400～34,100 | 450～1,200 | 9,100～13,600 | 250～320 |
| 0.75 | 0.008～0.12 | 6,400～10,600 | 150～400 | 20,000～40,000 | 750～1,600 | 10,600～32,000 | 450～1,200 | 8,500～12,700 | 250～320 |
| 0.8 | 0.012～0.15 | 6,000～10,000 | 150～400 | 19,900～39,800 | 750～1,600 | 10,000～30,000 | 450～1,200 | 8,000～12,000 | 250～320 |
| 0.9 | 0.02～0.18 | 5,300～ 8,800 | 150～400 | 17,700～35,400 | 750～1,600 | 8,800～26,500 | 450～1,200 | 7,100～10,600 | 250～320 |
| 1 | 0.03～0.2 | 4,800～ 8,000 | 150～400 | 16,000～32,000 | 750～1,600 | 8,000～24,000 | 450～1,200 | 6,400～ 9,600 | 250～320 |
| 1.5 | 0.08～0.3 | 3,200～ 5,300 | 150～400 | 10,600～21,200 | 750～1,600 | 5,300～16,000 | 450～1,200 | 4,200～ 6,400 | 250～320 |
| 2 | 0.12～0.3 | 2,400～ 4,000 | 150～400 | 8,000～16,000 | 750～1,600 | 4,000～12,000 | 450～1,200 | 3,200～ 4,800 | 190～240 |
| 2.5 | 0.2～0.3 | 1,900～ 3,200 | 150～400 | 6,400～12,700 | 750～1,600 | 3,200～ 9,600 | 450～1,200 | 2,500～ 3,800 | 160～200 |
| 3 | 0.2～0.3 | 1,600～ 2,700 | 150～400 | 5,300～10,600 | 750～1,600 | 2,700～ 8,000 | 450～1,200 | 2,100～ 3,200 | 160～200 |
| 4 | 0.2～0.3 | 1,200～ 2,000 | 150～400 | 4,000～ 8,000 | 750～1,600 | 2,000～ 6,000 | 450～1,200 | 1,600～ 2,400 | 160～200 |
| 5 | 0.2～0.3 | 1,000～ 1,600 | 150～400 | 3,200～ 6,400 | 750～1,600 | 1,600～ 4,800 | 450～1,200 | 1,300～ 1,900 | 160～200 |
| 備　考 Notes | | ※工具の有効長によって、切り込み量及び回転数、送り速度を調整してください。<br>※切削油は発煙性の少ないものを使用してください。<br>※Adjust spindle speed, feed and depth of cut according to effective length.<br>※Use cutting fluid with smoke retardant. | | | | | | | |

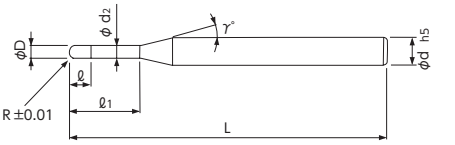
# ALB225

## アルミ用ボールエンドミル
Ball End Mill for Aluminum

### Type Ⅰ:全刃長タイプ




### Type Ⅱ:ロングネックタイプ




技術資料 K-028

●NS 独自の刃形状により、コーナー部や側面加工時のビビリを抑制。
●NS unique flute design reduces chattering at corner and side milling.

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ◎ | ○ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (ℓ1)有効長 Effective Length | 形状 Type | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|
| 01-00638-03001 | R0.3 | 0.45 | 3 | Ⅱ | 0.6 | 0.56 | 12° | 4 | 60 | 4,700 |
| 01-00638-04001 | R0.4 | 0.6 | 4 | Ⅱ | 0.8 | 0.76 | 12° | 4 | 60 | 5,100 |
| 01-00638-05001 | R0.5 | 2 | – | Ⅰ | 1 | – | 12° | 4 | 60 | 3,500 |
| 01-00638-05011 | | 0.75 | 5 | Ⅱ | 1 | 0.95 | 12° | 4 | 60 | 4,500 |
| 01-00638-05013 | | | 10 | Ⅱ | 1 | 0.95 | 12° | 4 | 60 | 4,800 |
| 01-00638-07501 | R0.75 | 3 | – | Ⅰ | 1.5 | – | 12° | 4 | 60 | 4,200 |
| 01-00638-07511 | | 1.1 | 7.5 | Ⅱ | 1.5 | 1.45 | 12° | 4 | 60 | 4,600 |
| 01-00638-07513 | | | 15 | Ⅱ | 1.5 | 1.45 | 12° | 4 | 60 | 5,700 |
| 01-00638-10001 | R1 | 4 | – | Ⅰ | 2 | – | 12° | 4 | 60 | 3,400 |
| 01-00638-10011 | | 1.5 | 10 | Ⅱ | 2 | 1.94 | 12° | 4 | 60 | 4,200 |
| 01-00638-10013 | | | 20 | Ⅱ | 2 | 1.94 | 12° | 4 | 60 | 4,600 |
| 01-00638-15001 | R1.5 | 6 | – | Ⅰ | 3 | – | 12° | 6 | 60 | 4,200 |
| 01-00638-15011 | | 2.5 | 15 | Ⅱ | 3 | 2.85 | 12° | 6 | 60 | 5,400 |
| 01-00638-15013 | | | 30 | Ⅱ | 3 | 2.85 | 12° | 6 | 70 | 6,300 |
| 01-00638-20001 | R2 | 8 | – | Ⅰ | 4 | – | 12° | 6 | 70 | 4,700 |
| 01-00638-20011 | | 3 | 20 | Ⅱ | 4 | 3.8 | 12° | 6 | 80 | 6,000 |
| 01-00638-20013 | | | 40 | Ⅱ | 4 | 3.8 | 12° | 6 | 90 | 7,500 |
| 01-00638-25001 | R2.5 | 10 | – | Ⅰ | 5 | – | 12° | 6 | 80 | 5,200 |
| 01-00638-25011 | | 3.5 | 25 | Ⅱ | 5 | 4.8 | 12° | 6 | 80 | 6,800 |
| 01-00638-25013 | | | 50 | Ⅱ | 5 | 4.8 | 12° | 6 | 100 | 8,800 |
| 01-00638-30001 | R3 | 12 | – | Ⅰ | 6 | – | – | 6 | 90 | 5,800 |
| 01-00638-30011 | | 6 | 30 | Ⅱ | 6 | 5.8 | – | 6 | 90 | 7,500 |
| 01-00638-30013 | | | 60 | Ⅱ | 6 | 5.8 | – | 6 | 120 | 9,600 |
| 01-00638-40001 | R4 | 16 | – | Ⅰ | 8 | – | – | 8 | 90 | 10,900 |
| 01-00638-50001 | R5 | 20 | – | Ⅰ | 10 | – | – | 10 | 100 | 13,900 |
| 01-00638-60001 | R6 | 24 | – | Ⅰ | 12 | – | – | 12 | 110 | 19,800 |

オーダー方法
ALB225 ボール半径(R)×刃長(ℓ)[×有効長(ℓ1)]を指示してください。
When you order, indicate ALB225 (R)×(ℓ) [×(ℓ1)].

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-084に記載
●Recommended Milling Conditions are shown on page E-084.

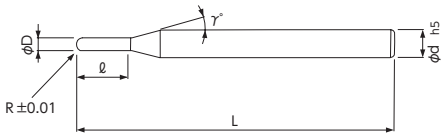


SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

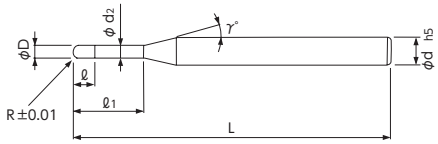
# ALB225-DLC

## アルミ用ボールエンドミル（DLCコーティング）
DLC COATING Ball End Mill for Aluminum

### Type Ⅰ:全刃長タイプ




### Type Ⅱ:ロングネックタイプ




●NS 独自の密着性が高い DLC コーティングを採用し、長時間加工に適しています。
●Our original DLC COATING are adopted, it is suitable for cutting for long time.

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ◎ | ○ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (ℓ1)有効長 Effective Length | 形状 Type | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|
| 01-00668-03001 | R0.3 | 0.45 | 3 | Ⅱ | 0.6 | 0.56 | 12° | 4 | 60 | 6,800 |
| 01-00668-04001 | R0.4 | 0.6 | 4 | Ⅱ | 0.8 | 0.76 | 12° | 4 | 60 | 7,200 |
| 01-00668-05001 | R0.5 | 2 | – | Ⅰ | 1 | – | 12° | 4 | 60 | 5,600 |
| 01-00668-05011 | | 0.75 | 5 | Ⅱ | 1 | 0.95 | 12° | 4 | 60 | 6,600 |
| 01-00668-05013 | | | 10 | Ⅱ | 1 | 0.95 | 12° | 4 | 60 | 6,900 |
| 01-00668-07501 | R0.75 | 3 | – | Ⅰ | 1.5 | – | 12° | 4 | 60 | 6,300 |
| 01-00668-07511 | | 1.1 | 7.5 | Ⅱ | 1.5 | 1.45 | 12° | 4 | 60 | 6,700 |
| 01-00668-07513 | | | 15 | Ⅱ | 1.5 | 1.45 | 12° | 4 | 60 | 7,800 |
| 01-00668-10001 | R1 | 4 | – | Ⅰ | 2 | – | 12° | 4 | 60 | 5,500 |
| 01-00668-10011 | | 1.5 | 10 | Ⅱ | 2 | 1.94 | 12° | 4 | 60 | 6,300 |
| 01-00668-10013 | | | 20 | Ⅱ | 2 | 1.94 | 12° | 4 | 60 | 6,700 |
| 01-00668-15001 | R1.5 | 6 | – | Ⅰ | 3 | – | 12° | 6 | 60 | 6,300 |
| 01-00668-15011 | | 2.5 | 15 | Ⅱ | 3 | 2.85 | 12° | 6 | 60 | 7,500 |
| 01-00668-15013 | | | 30 | Ⅱ | 3 | 2.85 | 12° | 6 | 70 | 8,700 |
| 01-00668-20001 | R2 | 8 | – | Ⅰ | 4 | – | 12° | 6 | 70 | 7,100 |
| 01-00668-20011 | | 3 | 20 | Ⅱ | 4 | 3.8 | 12° | 6 | 80 | 8,400 |
| 01-00668-20013 | | | 40 | Ⅱ | 4 | 3.8 | 12° | 6 | 90 | 9,900 |
| 01-00668-25001 | R2.5 | 10 | – | Ⅰ | 5 | – | 12° | 6 | 80 | 7,600 |
| 01-00668-25011 | | 3.5 | 25 | Ⅱ | 5 | 4.8 | 12° | 6 | 80 | 9,200 |
| 01-00668-25013 | | | 50 | Ⅱ | 5 | 4.8 | 12° | 6 | 100 | 11,600 |
| 01-00668-30001 | R3 | 12 | – | Ⅰ | 6 | – | – | 6 | 90 | 8,600 |
| 01-00668-30011 | | 6 | 30 | Ⅱ | 6 | 5.8 | – | 6 | 90 | 10,300 |
| 01-00668-30013 | | | 60 | Ⅱ | 6 | 5.8 | – | 6 | 120 | 12,600 |
| 01-00668-40001 | R4 | 16 | – | Ⅰ | 8 | – | – | 8 | 90 | 14,200 |
| 01-00668-50001 | R5 | 20 | – | Ⅰ | 10 | – | – | 10 | 100 | 17,400 |
| 01-00668-60001 | R6 | 24 | – | Ⅰ | 12 | – | – | 12 | 110 | 23,700 |

**オーダー方法** ALB225-DLC ボール半径(R)×刃長(ℓ)[×有効長(ℓ1)]を指示してください。
When you order, indicate ALB225-DLC (R)×(ℓ) [×(ℓ1)].

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-084に記載
●Recommended Milling Conditions are shown on page E-084.

# ALB225・ALB225-DLC

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-028

| 被削材 Work Material | | | アルミニウム合金 Aluminum Alloy A2017・A5052・A7075 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 通常条件 Normal Speed | | | | 高速条件 High Speed | | | |
| 工具突出し量 Tool Overhung | | | L/D≧10 | | | | L/D<10 | | | |
| Rサイズ Radius | 刃長 Length of Cut | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | ae mm |
| 0.3 | 0.45 | 3 | 20,000 | 1,000 | 0.1 | 0.2 | 40,000 | 2,000 | 0.1 | 0.2 |
| 0.4 | 0.6 | 4 | 20,000 | 1,000 | 0.1 | 0.2 | 40,000 | 2,000 | 0.1 | 0.2 |
| 0.5 | 2 | — | 20,000 | 2,000 | 0.3 | 0.3 | 40,000 | 4,000 | 0.3 | 0.3 |
| | 0.75 | 5 | 20,000 | 1,500 | 0.3 | 0.3 | 30,000 | 3,000 | 0.3 | 0.3 |
| | 0.75 | 10 | 10,000 | 1,000 | 0.2 | 0.2 | 20,000 | 2,000 | 0.2 | 0.2 |
| 0.75 | 3 | — | 20,000 | 2,000 | 0.3 | 0.5 | 40,000 | 4,000 | 0.3 | 0.5 |
| | 1.1 | 7.5 | 16,000 | 1,600 | 0.3 | 0.5 | 30,000 | 3,000 | 0.3 | 0.5 |
| | 1.1 | 15 | 10,000 | 1,000 | 0.2 | 0.3 | 20,000 | 2,000 | 0.2 | 0.3 |
| 1 | 4 | — | 20,000 | 2,000 | 0.5 | 0.5 | 30,000 | 4,000 | 0.5 | 0.5 |
| | 1.5 | 10 | 15,000 | 1,500 | 0.3 | 0.5 | 20,000 | 3,000 | 0.3 | 0.5 |
| | 1.5 | 20 | 12,000 | 1,200 | 0.2 | 0.5 | 15,000 | 2,000 | 0.2 | 0.5 |
| 1.5 | 6 | — | 18,000 | 2,000 | 0.6 | 1 | 25,000 | 4,000 | 0.6 | 1 |
| | 2.5 | 15 | 15,000 | 1,600 | 0.6 | 1 | 20,000 | 3,000 | 0.6 | 1 |
| | 2.5 | 30 | 12,000 | 1,200 | 0.3 | 1 | 15,000 | 2,000 | 0.3 | 1 |
| 2 | 8 | — | 14,000 | 2,000 | 0.5 | 1.5 | 20,000 | 4,000 | 0.5 | 1.5 |
| | 3 | 20 | 12,000 | 1,500 | 0.5 | 1.5 | 16,000 | 3,000 | 0.5 | 1.5 |
| | 3 | 40 | 8,000 | 1,000 | 0.3 | 1.5 | 12,000 | 2,000 | 0.3 | 1.5 |
| 2.5 | 10 | — | 12,000 | 3,000 | 0.8 | 1.8 | 20,000 | 5,000 | 0.8 | 1.8 |
| | 3.5 | 25 | 8,000 | 2,000 | 0.8 | 1.8 | 15,000 | 3,000 | 0.8 | 1.8 |
| | 3.5 | 50 | 5,000 | 1,500 | 0.5 | 1.8 | 10,000 | 2,000 | 0.5 | 1.8 |
| 3 | 12 | — | 12,000 | 3,000 | 1 | 2 | 20,000 | 5,000 | 1 | 2 |
| | 6 | 30 | 8,000 | 2,000 | 1 | 2 | 15,000 | 4,000 | 1 | 2 |
| | 6 | 60 | 5,000 | 1,200 | 0.6 | 2 | 10,000 | 2,000 | 0.6 | 2 |
| 4 | 16 | — | 10,000 | 2,000 | 1 | 2 | 15,000 | 3,000 | 1 | 2 |
| 5 | 20 | — | 8,000 | 2,000 | 2 | 3 | 12,000 | 3,000 | 2 | 3 |
| 6 | 24 | — | 6,000 | 2,000 | 3 | 4 | 10,000 | 3,000 | 3 | 4 |

**備考 Notes**

※切り込み量の ap は深さ方向の切り込み量、ae はピックフィードを示します。
※回転数と送り速度は、同じ割合で調整してください。
（機械の回転を 20,000 回転以上で使用する場合も同様に調整してください。）
※機械、チャックは剛性のある精度の高いものを使用してください。
※ワークや機械、ミーリングチャックにより振動、
または異音が発生する場合は切削条件を変更してください。
※水溶性切削油のご使用をお奨めします。
※Depth of Cut: ap=Axial Depth of Cut / ae=Radial Depth of Cut.
※Adjust both spindle speed and feed at the same rate.
(When using spindle speed 20,000 or more, the same adjustment is required.)
※Use a rigid and precise machine and chuck holder.
※Adjust milling conditions when vibration and abnormal sounds occur according to the rigidity of the machine and the chuck holder, or work clamping condition.
※Water soluble cutting fluid is recommended.

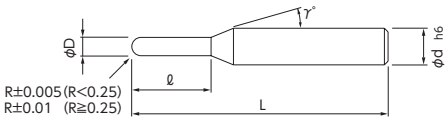


ŞEVKET OĞLU® MAKINA TİCARET VE SAN. LTD. ŞTİ.

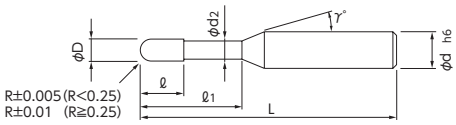
# RSB230

## 樹脂用ボールエンドミル“クリアカット”
Ball End Mill for Resin

### Type Ⅰ:全刃長タイプ




### Type Ⅱ:ロングネックタイプ




●3 倍刃長・5 倍刃長・10 倍刃長・超ロングネック・同径タイプ 加工形状に合わせて選択可能！
●アルミ・銅などの非鉄にも使用可能。
●Select the right one for your job, 3D or 5D or 10D Length of cut, with Extra Long-neck or without neck.
●Applicable to nonferrous material such as Aluminum and copper.

3D MG 2 30°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (ℓ1)有効長 Effective Length | 形状 Type | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d2)首下径 Neck Dia. | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|
| 01-00654-01000 | R0.1 | 0.6 | – | Ⅰ | 0.2 | 9° | – | 4 | 50 | 7,400 |
| 01-00654-01001 | | 1 | – | Ⅰ | 0.2 | 9° | – | 4 | 50 | 8,400 |
| 01-00654-01002 | | 0.6 | 2 | Ⅱ | 0.2 | 12° | 0.18 | 4 | 50 | 14,400 |
| 01-00654-01500 | R0.15 | 0.9 | – | Ⅰ | 0.3 | 9° | – | 4 | 50 | 6,500 |
| 01-00654-01501 | | 1.5 | – | Ⅰ | 0.3 | 9° | – | 4 | 50 | 7,200 |
| 01-00654-01503 | | 0.9 | 3 | Ⅱ | 0.3 | 12° | 0.28 | 4 | 50 | 13,800 |
| 01-00654-02000 | R0.2 | 1.2 | – | Ⅰ | 0.4 | 9° | – | 4 | 50 | 7,100 |
| 01-00654-02001 | | 2 | – | Ⅰ | 0.4 | 9° | – | 4 | 50 | 8,400 |
| 01-00654-02004 | | 1.2 | 4 | Ⅱ | 0.4 | 12° | 0.37 | 4 | 50 | 8,200 |
| 01-00654-02005 | | | 5 | Ⅱ | 0.4 | 12° | 0.37 | 4 | 50 | 9,000 |
| 01-00654-02500 | R0.25 | 1.5 | – | Ⅰ | 0.5 | 9° | – | 4 | 50 | 4,800 |
| 01-00654-02501 | | 2.5 | – | Ⅰ | 0.5 | 9° | – | 4 | 50 | 5,800 |
| 01-00654-02502 | | 5 | – | Ⅰ | 0.5 | 9° | – | 4 | 50 | 7,200 |
| 01-00654-02510 | | 1.5 | 10 | Ⅱ | 0.5 | 12° | 0.46 | 4 | 50 | 9,600 |
| 01-00654-02515 | | | 15 | Ⅱ | 0.5 | 12° | 0.46 | 4 | 50 | 10,800 |
| 01-00654-02520 | | | 20 | Ⅱ | 0.5 | 12° | 0.46 | 4 | 60 | 12,600 |
| 01-00654-03000 | R0.3 | 1.8 | – | Ⅰ | 0.6 | 9° | – | 4 | 50 | 5,600 |
| 01-00654-03001 | | 3 | – | Ⅰ | 0.6 | 9° | – | 4 | 50 | 6,800 |
| 01-00654-03006 | | 1.8 | 6 | Ⅱ | 0.6 | 12° | 0.56 | 4 | 50 | 6,000 |
| 01-00654-03010 | | | 10 | Ⅱ | 0.6 | 12° | 0.56 | 4 | 50 | 9,400 |
| 01-00654-04000 | R0.4 | 2.4 | – | Ⅰ | 0.8 | 9° | – | 4 | 50 | 5,600 |
| 01-00654-04001 | | 4 | – | Ⅰ | 0.8 | 9° | – | 4 | 50 | 6,800 |
| 01-00654-04008 | | 2.4 | 8 | Ⅱ | 0.8 | 12° | 0.76 | 4 | 50 | 5,900 |
| 01-00654-04012 | | | 12 | Ⅱ | 0.8 | 12° | 0.76 | 4 | 50 | 7,100 |
| 01-00654-05000 | R0.5 | 3 | – | Ⅰ | 1 | 9° | – | 4 | 50 | 3,900 |
| 01-00654-05001 | | 5 | – | Ⅰ | 1 | 9° | – | 4 | 50 | 4,800 |
| 01-00654-05002 | | 10 | – | Ⅰ | 1 | 9° | – | 4 | 50 | 9,200 |
| 01-00654-05010 | | 3 | 10 | Ⅱ | 1 | 12° | 0.95 | 4 | 50 | 5,100 |

**オーダー方法**
RSB230 ボール半径(R)×刃長(ℓ)［×有効長(ℓ1)］を指示してください。(Type Ⅰ(全刃長タイプ)のR1.5刃長9及びR2刃長12のみシャンク径を指示してください。)
When you order, indicate RSB230 (R)×(ℓ) [×(ℓ1)]. Choose Shank Dia. (d) for type Ⅰ of R1.5×9ℓ and R2×12ℓ.

※(γ)は参考値です。
※(γ) is reference value.

# RSB230

## 樹脂用ボールエンドミル“クリアカット”

Ball End Mill for Resin

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (ℓ1)有効長 Effective Length | 形状 Type | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d2)首下径 Neck Dia. | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|
| 01-00654-05015 | R0.5 | 3 | 15 | Ⅱ | 1 | 12° | 0.95 | 4 | 60 | 5,100 |
| 01-00654-05020 | | | 20 | Ⅱ | 1 | 12° | 0.95 | 4 | 60 | 6,000 |
| 01-00654-05030 | | | 30 | Ⅱ | 1 | 12° | 0.95 | 4 | 70 | 9,000 |
| 01-00654-07500 | R0.75 | 4.5 | – | Ⅰ | 1.5 | 9° | – | 4 | 50 | 4,200 |
| 01-00654-07501 | | 7.5 | – | Ⅰ | 1.5 | 9° | – | 4 | 50 | 5,100 |
| 01-00654-07502 | | 15 | – | Ⅰ | 1.5 | 9° | – | 4 | 60 | 9,400 |
| 01-00654-07515 | | 4.5 | 15 | Ⅱ | 1.5 | 12° | 1.45 | 4 | 60 | 5,200 |
| 01-00654-07530 | | | 30 | Ⅱ | 1.5 | 12° | 1.45 | 4 | 70 | 8,400 |
| 01-00654-07545 | | | 45 | Ⅱ | 1.5 | 12° | 1.45 | 4 | 90 | 12,000 |
| 01-00654-10000 | R1 | 6 | – | Ⅰ | 2 | 9° | – | 4 | 50 | 4,200 |
| 01-00654-10001 | | 10 | – | Ⅰ | 2 | 9° | – | 4 | 50 | 5,100 |
| 01-00654-10002 | | 20 | – | Ⅰ | 2 | 9° | – | 4 | 60 | 9,400 |
| 01-00654-10020 | | 6 | 20 | Ⅱ | 2 | 12° | 1.94 | 4 | 60 | 5,100 |
| 01-00654-10030 | | | 30 | Ⅱ | 2 | 12° | 1.94 | 4 | 80 | 6,200 |
| 01-00654-10050 | | | 50 | Ⅱ | 2 | 12° | 1.94 | 4 | 110 | 11,800 |
| 01-00654-10070 | | | 70 | Ⅱ | 2 | 12° | 1.94 | 4 | 110 | 14,400 |
| 01-00654-15000 | R1.5 | 9 | – | Ⅰ | 3 | – | – | 3 | 100 | 7,800 |
| 01-00654-15001 | | | – | Ⅰ | 3 | 9° | – | 6 | 50 | 5,400 |
| 01-00654-15002 | | 15 | – | Ⅰ | 3 | 9° | – | 6 | 60 | 6,000 |
| 01-00654-15030 | | 9 | 30 | Ⅱ | 3 | 12° | 2.85 | 6 | 70 | 7,200 |
| 01-00654-15045 | | | 45 | Ⅱ | 3 | 12° | 2.85 | 6 | 90 | 8,400 |
| 01-00654-15060 | | | 60 | Ⅱ | 3 | 12° | 2.85 | 6 | 110 | 13,200 |
| 01-00654-20000 | R2 | 12 | – | Ⅰ | 4 | – | – | 4 | 120 | 9,400 |
| 01-00654-20001 | | | – | Ⅰ | 4 | 9° | – | 6 | 50 | 5,400 |
| 01-00654-20002 | | 20 | – | Ⅰ | 4 | 9° | – | 6 | 60 | 7,000 |
| 01-00654-20030 | | 12 | 30 | Ⅱ | 4 | 12° | 3.8 | 6 | 70 | 7,200 |
| 01-00654-20040 | | | 40 | Ⅱ | 4 | 12° | 3.8 | 6 | 90 | 7,600 |
| 01-00654-20070 | | | 70 | Ⅱ | 4 | 12° | 3.8 | 6 | 120 | 16,200 |
| 01-00654-25000 | R2.5 | 15 | – | Ⅰ | 5 | 9° | – | 6 | 70 | 6,300 |
| 01-00654-25001 | | 25 | – | Ⅰ | 5 | 9° | – | 6 | 80 | 8,400 |
| 01-00654-30000 | R3 | 18 | – | Ⅰ | 6 | – | – | 6 | 80 | 6,600 |
| 01-00654-30001 | | 30 | – | Ⅰ | 6 | – | – | 6 | 90 | 8,400 |
| 01-00654-30040 | | 18 | 40 | Ⅱ | 6 | – | 5.8 | 6 | 100 | 8,800 |
| 01-00654-30060 | | | 60 | Ⅱ | 6 | – | 5.8 | 6 | 120 | 11,600 |
| 01-00654-30080 | | | 80 | Ⅱ | 6 | – | 5.8 | 6 | 130 | 17,400 |

**オーダー方法**

RSB230 ボール半径(R)×刃長(ℓ)[×有効長(ℓ1)]を指示してください。(Type Ⅰ (全刃長タイプ)のR1.5刃長9及びR2刃長12のみシャンク径を指示してください。)

When you order, indicate RSB230 (R)×(ℓ) [×(ℓ1)]. Choose Shank Dia. (d) for type Ⅰ of R1.5×9ℓ and R2×12ℓ.

※(γ)は参考値です。

※(γ) is reference value.

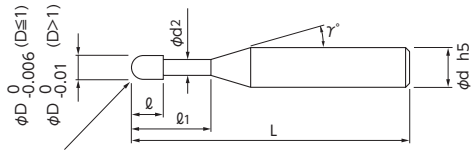


ŞEVKET ÖĞÜT® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# DRB230

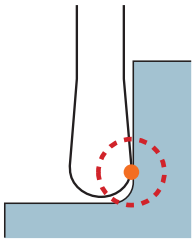
New

## 銅電極加工用ロングネックボールエンドミル
Long Neck Ball End Mill for Copper Electrode

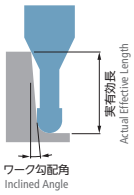



※R±0.002 (R≦0.2)
※R±0.003 (0.2<R≦0.5)
※R±0.004 (R>0.5)

※DRB230 の R 精度は実刃径の 1/2 を基準とした精度です。
R accuracy of DRB230 is based on a half value.



点切削のためビビらない!
Suppres chattering by point milling




●銅合金の加工に特化したロングネックボールエンドミル。
●切れ味鋭い刃形状と DLC コーティングにより、長時間の高品位かつ安定した加工が可能です。
●銅タングステン電極の加工にも有効です。
●Long neck ball end mill specialized for processing copper alloy.
●Sharp edge shearing ability and DLC coating realized high quality and stable a long life processing.
●Processing copper tungsten electrodes is also effective.

技術資料 K-029

3D MG DLC 2 30°

被削材 Work Material

| 銅 Copper | 銅タングステン Copper Tungsten |
|---|---|
| ◎ | ◎ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07-00530-00503 | R0.05 | 0.3 | 0.07 | 0.1 | 0.085 | 12° | 4 | 45 | 13,900 | 0.34 | 0.36 | 0.37 | 0.39 | 0.42 |
| 07-00530-00505 | | 0.5 | 0.07 | 0.1 | 0.085 | 12° | 4 | 45 | 14,500 | 0.55 | 0.57 | 0.60 | 0.63 | 0.69 |
| 07-00530-01005 | R0.1 | 0.5 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 11,100 | 0.56 | 0.58 | 0.61 | 0.63 | 0.69 |
| 07-00530-01010 | | 1 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 11,600 | 1.08 | 1.13 | 1.18 | 1.23 | 1.35 |
| 07-00530-01015 | | 1.5 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 12,100 | 1.60 | 1.67 | 1.75 | 1.83 | 2.02 |
| 07-00530-01510 | R0.15 | 1 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 11,600 | 1.08 | 1.12 | 1.17 | 1.22 | 1.34 |
| 07-00530-01515 | | 1.5 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 12,100 | 1.60 | 1.67 | 1.74 | 1.82 | 2.00 |
| 07-00530-01520 | | 2 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 12,600 | 2.12 | 2.21 | 2.31 | 2.42 | 2.66 |
| 07-00530-02010 | R0.2 | 1 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 10,100 | 1.10 | 1.14 | 1.19 | 1.24 | 1.35 |
| 07-00530-02020 | | 2 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 10,300 | 2.15 | 2.23 | 2.33 | 2.43 | 2.68 |
| 07-00530-02030 | | 3 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 10,500 | 3.19 | 3.32 | 3.47 | 3.63 | 4.01 |
| 07-00530-02040 | | 4 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 10,700 | 4.23 | 4.41 | 4.61 | 4.83 | 5.33 |
| 07-00530-02520 | R0.25 | 2 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 9,900 | 2.17 | 2.25 | 2.35 | 2.45 | 2.69 |
| 07-00530-02530 | | 3 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 10,100 | 3.21 | 3.34 | 3.49 | 3.65 | 4.02 |
| 07-00530-02540 | | 4 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 10,300 | 4.25 | 4.43 | 4.63 | 4.85 | 5.35 |
| 07-00530-02550 | | 5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 10,500 | 5.30 | 5.52 | 5.77 | 6.04 | 6.68 |
| 07-00530-03020 | R0.3 | 2 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 7,700 | 2.17 | 2.25 | 2.34 | 2.44 | 2.68 |
| 07-00530-03030 | | 3 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 7,900 | 3.21 | 3.34 | 3.48 | 3.64 | 4.01 |
| 07-00530-03040 | | 4 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 8,100 | 4.25 | 4.43 | 4.62 | 4.84 | 5.33 |
| 07-00530-03050 | | 5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 8,300 | 5.29 | 5.52 | 5.76 | 6.03 | 6.66 |
| 07-00530-03060 | | 6 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 8,500 | 6.34 | 6.61 | 6.90 | 7.23 | 7.99 |

オーダー方法
DRB230 ボール半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate DRB230 (R)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-089に記載
●Recommended Milling Conditions are shown on page E-089.



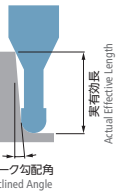



SEVKET GÜLÜ MAKINA TICARET VE SAN. LTD. ŞTI.

# DRB230

New

## 銅電極加工用ロングネックボールエンドミル
Long Neck Ball End Mill for Copper Electrode




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 30′ | 1° | 1°30′ | 2° | 3° |
| 07-00530-04030 | R0.4 | 3 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 7,900 | 3.20 | 3.33 | 3.47 | 3.62 | 3.97 |
| 07-00530-04040 | | 4 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 8,100 | 4.25 | 4.42 | 4.61 | 4.82 | 5.30 |
| 07-00530-04060 | | 6 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 8,300 | 6.33 | 6.60 | 6.89 | 7.21 | 7.96 |
| 07-00530-04080 | | 8 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 8,500 | 8.42 | 8.78 | 9.17 | 9.60 | 10.61 |
| 07-00530-05030 | R0.5 | 3 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 7,500 | 3.22 | 3.35 | 3.48 | 3.63 | 3.97 |
| 07-00530-05040 | | 4 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 7,500 | 4.27 | 4.44 | 4.62 | 4.83 | 5.30 |
| 07-00530-05050 | | 5 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 7,700 | 5.31 | 5.53 | 5.76 | 6.02 | 6.63 |
| 07-00530-05060 | | 6 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 7,700 | 6.35 | 6.62 | 6.90 | 7.22 | 7.96 |
| 07-00530-05080 | | 8 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 8,100 | 8.44 | 8.79 | 9.18 | 9.61 | 10.61 |
| 07-00530-05100 | | 10 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 8,100 | 10.52 | 10.97 | 11.46 | 12.01 | 13.26 |
| 07-00530-05120 | | 12 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 8,100 | 12.61 | 13.15 | 13.75 | 14.40 | 15.92 |
| 07-00530-07506 | R0.75 | 6 | 1.1 | 1.5 | 1.45 | 12° | 4 | 50 | 7,700 | 6.34 | 6.59 | 6.87 | 7.17 | 7.88 |
| 07-00530-07512 | | 12 | 1.1 | 1.5 | 1.45 | 12° | 4 | 50 | 8,700 | 12.60 | 13.13 | 13.71 | 14.35 | 15.84 |
| 07-00530-07518 | | 18 | 1.1 | 1.5 | 1.45 | 12° | 4 | 50 | 9,700 | 18.86 | 19.67 | 20.55 | 21.53 | 23.80 |
| 07-00530-10040 | R1 | 4 | 1.5 | 2 | 1.94 | 12° | 4 | 50 | 7,900 | 4.27 | 4.42 | 4.58 | 4.76 | 5.17 |
| 07-00530-10060 | | 6 | 1.5 | 2 | 1.94 | 12° | 4 | 50 | 7,900 | 6.36 | 6.60 | 6.86 | 7.15 | 7.83 |
| 07-00530-10080 | | 8 | 1.5 | 2 | 1.94 | 12° | 4 | 50 | 8,100 | 8.44 | 8.78 | 9.14 | 9.54 | 10.48 |
| 07-00530-10100 | | 10 | 1.5 | 2 | 1.94 | 12° | 4 | 50 | 8,100 | 10.53 | 10.95 | 11.42 | 11.94 | 13.14 |
| 07-00530-10120 | | 12 | 1.5 | 2 | 1.94 | 12° | 4 | 50 | 8,100 | 12.61 | 13.13 | 13.70 | 14.33 | 15.79 |
| 07-00530-10160 | | 16 | 1.5 | 2 | 1.94 | 12° | 4 | 50 | 8,100 | 16.78 | 17.49 | 18.27 | 19.12 | Free |
| 07-00530-10200 | | 20 | 1.5 | 2 | 1.94 | 12° | 4 | 60 | 9,000 | 20.96 | 21.85 | 22.83 | 23.90 | Free |
| 07-00530-10250 | | 25 | 1.5 | 2 | 1.94 | 12° | 4 | 60 | 10,000 | 26.17 | 27.30 | 28.53 | 29.89 | Free |
| 07-00530-15100 | R1.5 | 10 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 10,300 | 10.73 | 11.14 | 11.59 | 12.09 | 13.26 |
| 07-00530-15150 | | 15 | 2.5 | 3 | 2.85 | 12° | 6 | 70 | 10,500 | 15.94 | 16.59 | 17.30 | 18.08 | 19.89 |
| 07-00530-15200 | | 20 | 2.5 | 3 | 2.85 | 12° | 6 | 70 | 11,000 | 21.16 | 22.04 | 23.00 | 24.06 | 26.53 |
| 07-00530-15250 | | 25 | 2.5 | 3 | 2.85 | 12° | 6 | 70 | 11,000 | 26.37 | 27.48 | 28.70 | 30.04 | Free |
| 07-00530-15300 | | 30 | 2.5 | 3 | 2.85 | 12° | 6 | 70 | 12,000 | 31.58 | 32.93 | 34.40 | 36.03 | Free |
| 07-00530-20100 | R2 | 10 | 3 | 4 | 3.8 | 12° | 6 | 60 | 9,500 | 10.83 | 11.22 | 11.66 | 12.14 | 13.25 |
| 07-00530-20150 | | 15 | 3 | 4 | 3.8 | 12° | 6 | 60 | 9,500 | 16.04 | 16.67 | 17.36 | 18.12 | 19.89 |
| 07-00530-20200 | | 20 | 3 | 4 | 3.8 | 12° | 6 | 60 | 11,300 | 21.26 | 22.12 | 23.06 | 24.10 | Free |
| 07-00530-20250 | | 25 | 3 | 4 | 3.8 | 12° | 6 | 70 | 12,000 | 26.47 | 27.57 | 28.77 | 30.09 | Free |
| 07-00530-20300 | | 30 | 3 | 4 | 3.8 | 12° | 6 | 70 | 12,500 | 31.68 | 33.01 | 34.47 | Free | Free |
| 07-00530-20400 | | 40 | 3 | 4 | 3.8 | 12° | 6 | 80 | 13,500 | 42.11 | 43.91 | Free | Free | Free |
| 07-00530-30200 | R3 | 20 | 6 | 6 | 5.7 | – | 6 | 70 | 12,500 | Free | Free | Free | Free | Free |
| 07-00530-30300 | | 30 | 6 | 6 | 5.7 | – | 6 | 80 | 13,100 | Free | Free | Free | Free | Free |
| 07-00530-30500 | | 50 | 6 | 6 | 5.7 | – | 6 | 100 | 15,200 | Free | Free | Free | Free | Free |

**オーダー方法**
DRB230 ボール半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate DRB230 (R)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-089に記載
●Recommended Milling Conditions are shown on page E-089.



SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

# DRB230

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-029

| 被削材 Work Material | | | 銅 Copper | | | | 銅タングステン Copper Tungsten (W70% - Cu30%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 有効長 Effective Length | 刃径と有効長の比 L/D | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.05 | 0.3 | 3 | 0.01 | 0.01 | 200 | 40,000 | 0.008 | 0.008 | 150 | 30,000 |
| | 0.5 | 5 | 0.007 | 0.007 | 150 | 40,000 | 0.005 | 0.005 | 100 | 30,000 |
| 0.1 | 0.5 | 2.5 | 0.025 | 0.05 | 500 | 40,000 | 0.02 | 0.04 | 350 | 30,000 |
| | 1 | 5 | 0.02 | 0.04 | 400 | 40,000 | 0.015 | 0.03 | 250 | 30,000 |
| | 1.5 | 7.5 | 0.015 | 0.03 | 300 | 40,000 | 0.008 | 0.02 | 150 | 30,000 |
| 0.15 | 1 | 3.3 | 0.03 | 0.07 | 700 | 40,000 | 0.03 | 0.07 | 500 | 30,000 |
| | 1.5 | 5 | 0.025 | 0.05 | 500 | 40,000 | 0.02 | 0.05 | 300 | 30,000 |
| | 2 | 6.7 | 0.015 | 0.03 | 400 | 40,000 | 0.01 | 0.02 | 200 | 30,000 |
| 0.2 | 1 | 2.5 | 0.05 | 0.1 | 1,000 | 40,000 | 0.04 | 0.08 | 700 | 30,000 |
| | 2 | 5 | 0.035 | 0.06 | 600 | 40,000 | 0.02 | 0.05 | 350 | 30,000 |
| | 3 | 7.5 | 0.02 | 0.04 | 400 | 30,000 | 0.01 | 0.03 | 200 | 25,000 |
| | 4 | 10 | 0.008 | 0.015 | 250 | 25,000 | 0.005 | 0.01 | 100 | 18,000 |
| 0.25 | 2 | 4 | 0.08 | 0.15 | 800 | 40,000 | 0.08 | 0.15 | 500 | 30,000 |
| | 3 | 6 | 0.06 | 0.1 | 600 | 35,000 | 0.06 | 0.08 | 400 | 27,000 |
| | 4 | 8 | 0.04 | 0.08 | 400 | 30,000 | 0.025 | 0.05 | 200 | 22,000 |
| | 5 | 10 | 0.02 | 0.04 | 300 | 25,000 | 0.01 | 0.02 | 150 | 18,000 |
| 0.3 | 2 | 3.3 | 0.12 | 0.2 | 1,600 | 40,000 | 0.12 | 0.2 | 1,200 | 30,000 |
| | 3 | 5 | 0.1 | 0.14 | 1,000 | 40,000 | 0.08 | 0.1 | 700 | 30,000 |
| | 4 | 6.7 | 0.07 | 0.1 | 700 | 30,000 | 0.04 | 0.06 | 400 | 25,000 |
| | 5 | 8.3 | 0.05 | 0.08 | 600 | 27,000 | 0.02 | 0.04 | 300 | 22,000 |
| | 6 | 10 | 0.04 | 0.06 | 500 | 25,000 | 0.01 | 0.03 | 200 | 20,000 |
| 0.4 | 3 | 3.8 | 0.15 | 0.3 | 2,000 | 40,000 | 0.15 | 0.3 | 1,400 | 30,000 |
| | 4 | 5 | 0.12 | 0.2 | 1,600 | 35,000 | 0.1 | 0.16 | 1,000 | 27,000 |
| | 6 | 7.5 | 0.08 | 0.15 | 1,000 | 30,000 | 0.05 | 0.1 | 500 | 20,000 |
| | 8 | 10 | 0.05 | 0.06 | 700 | 22,000 | 0.02 | 0.025 | 300 | 16,000 |
| 0.5 | 3 | 3 | 0.25 | 0.4 | 2,800 | 40,000 | 0.25 | 0.4 | 2,000 | 30,000 |
| | 4 | 4 | 0.2 | 0.4 | 2,400 | 40,000 | 0.2 | 0.4 | 1,600 | 30,000 |
| | 5 | 5 | 0.16 | 0.3 | 2,000 | 35,000 | 0.12 | 0.25 | 1,400 | 27,000 |
| | 6 | 6 | 0.14 | 0.3 | 1,600 | 30,000 | 0.1 | 0.25 | 1,000 | 25,000 |
| | 8 | 8 | 0.12 | 0.2 | 1,000 | 25,000 | 0.06 | 0.1 | 500 | 18,000 |
| | 10 | 10 | 0.08 | 0.15 | 800 | 20,000 | 0.03 | 0.05 | 300 | 16,000 |
| | 12 | 12 | 0.06 | 0.1 | 600 | 16,000 | 0.015 | 0.04 | 200 | 12,000 |
| 0.75 | 6 | 4 | 0.3 | 0.6 | 2,400 | 30,000 | 0.3 | 0.6 | 1,800 | 25,000 |
| | 12 | 8 | 0.15 | 0.3 | 1,000 | 16,000 | 0.1 | 0.2 | 500 | 12,000 |
| | 18 | 12 | 0.08 | 0.12 | 700 | 10,000 | 0.02 | 0.06 | 200 | 8,000 |
| 1 | 4 | 2 | 0.45 | 0.8 | 4,000 | 30,000 | 0.45 | 0.8 | 2,400 | 22,000 |
| | 6 | 3 | 0.45 | 0.8 | 3,000 | 27,000 | 0.45 | 0.8 | 1,800 | 20,000 |
| | 8 | 4 | 0.4 | 0.8 | 2,400 | 25,000 | 0.4 | 0.8 | 1,600 | 18,000 |
| | 10 | 5 | 0.3 | 0.6 | 2,000 | 22,000 | 0.25 | 0.5 | 1,400 | 16,000 |
| | 12 | 6 | 0.3 | 0.6 | 1,400 | 16,000 | 0.25 | 0.5 | 900 | 12,000 |
| | 16 | 8 | 0.25 | 0.5 | 1,000 | 12,000 | 0.12 | 0.25 | 500 | 9,000 |
| | 20 | 10 | 0.15 | 0.3 | 800 | 10,000 | 0.06 | 0.1 | 350 | 8,000 |
| | 25 | 12.5 | 0.08 | 0.15 | 600 | 8,000 | 0.03 | 0.05 | 200 | 6,000 |

# DRB230

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-029

| 被削材 Work Material | | | 銅 Copper | | | | 銅タングステン Copper Tungsten (W70% - Cu30%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Rサイズ Radius | 有効長 Effective Length | 刃径と有効長の比 L/D | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed | 切り込み量 Depth of Cut | | 送り速度 Feed | 回転数 Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 1.5 | 10 | 3.3 | 0.7 | 1.5 | 3,400 | 20,000 | 0.6 | 1.2 | 2,400 | 16,000 |
| | 15 | 5 | 0.6 | 1 | 3,000 | 18,000 | 0.6 | 1.2 | 2,000 | 14,000 |
| | 20 | 6.7 | 0.5 | 0.8 | 2,400 | 16,000 | 0.4 | 0.6 | 1,400 | 12,000 |
| | 25 | 8.3 | 0.4 | 0.6 | 1,800 | 12,000 | 0.2 | 0.3 | 900 | 10,000 |
| | 30 | 10 | 0.2 | 0.4 | 1,200 | 8,000 | 0.08 | 0.15 | 500 | 6,000 |
| 2 | 10 | 2.5 | 1 | 1.6 | 4,000 | 16,000 | 0.8 | 1.6 | 2,800 | 12,000 |
| | 15 | 3.8 | 0.8 | 1.6 | 3,400 | 16,000 | 0.8 | 1.6 | 2,400 | 12,000 |
| | 20 | 5 | 0.8 | 1.6 | 3,000 | 14,000 | 0.8 | 1.6 | 2,000 | 10,000 |
| | 25 | 6.3 | 0.6 | 1.2 | 3,000 | 14,000 | 0.5 | 1 | 2,000 | 10,000 |
| | 30 | 7.5 | 0.5 | 1 | 2,400 | 12,000 | 0.3 | 0.5 | 1,200 | 7,000 |
| | 40 | 10 | 0.4 | 0.8 | 1,200 | 8,000 | 0.15 | 0.3 | 500 | 5,000 |
| 3 | 20 | 3.3 | 1 | 2 | 3,600 | 12,000 | 1 | 2 | 2,400 | 9,000 |
| | 30 | 5 | 0.8 | 1.6 | 3,000 | 10,000 | 0.4 | 0.8 | 1,800 | 7,000 |
| | 50 | 8.3 | 0.5 | 1 | 1,800 | 6,000 | 0.25 | 0.5 | 800 | 4,000 |

**備　考 Notes**

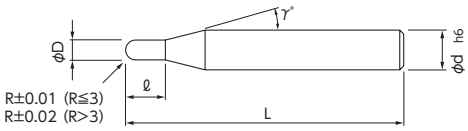
※本切削条件は参考値です。実際の加工形状および使用機械等にて切削条件を調整してください。
※切り込み量の ap は深さ方向の切り込み量、ae はピックフィードを示します。
※ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。
　また、主軸回転数が足りない場合も同様に同じ割合で下げてください。
※不水溶性切削油のご使用をお奨めします。
※These recommended cutting conditions indicate just reference. It should be adjusted according to milling shape and machine type.
※Depth of Cut : ap=Axial Depth of Cut / ae=Radial Depth of Cut.
※Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.
※Water-insoluble cutting fluid is recommended.



SEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# DB

## 銅電極・アルミ・プラ用ボールエンドミル
2-Flute Ball End Mill for Nonferrous

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● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | |
|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ |
| | | | | |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| | | ◎ | ◎ | ◎ |

### ▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 07-00523-00050 | R0.5 | 2 | 1 | 9° | 4 | 45 | 7,400 ▌ |
| 07-00523-00075 | R0.75 | 3 | 1.5 | 9° | 4 | 45 | 7,400 ▌ |
| 07-00523-00100 | R1 | 4 | 2 | 12° | 6 | 60 | 7,400 ▌ |
| 07-00523-00125 | R1.25 | 5 | 2.5 | 9° | 6 | 60 | 7,400 ▌ |
| 07-00523-00150 | R1.5 | 6 | 3 | 9° | 6 | 60 | 8,500 ▌ |
| 07-00523-00175 | R1.75 | 7 | 3.5 | 9° | 6 | 60 | 8,500 ▌ |
| 07-00523-00200 | R2 | 8 | 4 | 9° | 6 | 60 | 8,500 ▌ |
| 07-00523-00250 | R2.5 | 10 | 5 | 9° | 6 | 60 | 9,600 ▌ |
| 07-00523-00300 | R3 | 12 | 6 | – | 6 | 80 | 10,600 ▌ |
| ▲ 07-00523-00400 | R4 | 16 | 8 | – | 8 | 90 | 14,600 ▌ |
| ▲ 07-00523-00500 | R5 | 20 | 10 | – | 10 | 100 | 17,800 ▌ |
| ▲ 07-00523-00600 | R6 | 24 | 12 | – | 12 | 110 | 27,200 ▌ |
| ▲ 07-00523-00800 | R8 | 32 | 16 | – | 16 | 150 | 60,900 ▌ |
| ▲ 07-00523-01000 | R10 | 40 | 20 | – | 20 | 170 | 94,600 ▌ |

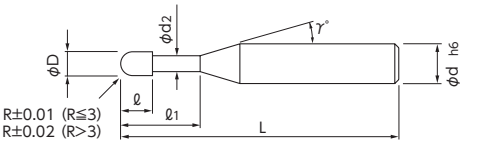
**オーダー方法**
DB ボール半径(R)を指示してください。
When you order, indicate DB (R).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はE-093に記載
●Recommended Milling Conditions are shown on page E-093.

# DHB

## 銅電極・アルミ・プラ用 ロングネックボールエンドミル（深リブ用）

2-Flute Long Neck Ball End Mill for Nonferrous

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● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

3D SMG 2 25°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹 脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ | | | | | |
| | | | | | | | ◎ | ◎ | ◎ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (D)刃径 Dia. | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 07-00432-00504 | R0.5 | 4 | 1.5 | 1 | 0.95 | 12° | 4 | 50 | 9,500 ▌ |
| 07-00432-00506 | | 6 | 1.5 | 1 | 0.95 | 12° | 4 | 50 | 9,500 ▌ |
| 07-00432-00510 | | 10 | 1.5 | 1 | 0.95 | 12° | 4 | 50 | 9,500 ▌ |
| 07-00432-00706 | R0.75 | 6 | 2.25 | 1.5 | 1.45 | 12° | 4 | 50 | 9,500 ▌ |
| 07-00432-00710 | | 10 | 2.25 | 1.5 | 1.45 | 12° | 4 | 50 | 9,500 ▌ |
| 07-00432-00716 | | 16 | 2.25 | 1.5 | 1.45 | 12° | 4 | 50 | 9,500 ▌ |
| 07-00432-01008 | R1 | 8 | 3 | 2 | 1.94 | 12° | 4 | 50 | 9,500 ▌ |
| 07-00432-01014 | | 14 | 3 | 2 | 1.94 | 12° | 4 | 50 | 9,500 ▌ |
| 07-00432-01020 | | 20 | 3 | 2 | 1.94 | 12° | 4 | 50 | 9,500 ▌ |
| 07-00432-01515 | R1.5 | 15 | 4.5 | 3 | 2.85 | 12° | 6 | 60 | 10,800 ▌ |
| 07-00432-01525 | | 25 | 4.5 | 3 | 2.85 | 12° | 6 | 60 | 10,800 ▌ |
| 07-00432-01535 | | 35 | 4.5 | 3 | 2.85 | 12° | 6 | 80 | 10,800 ▌ |
| 07-00432-02020 | R2 | 20 | 6 | 4 | 3.8 | 12° | 6 | 60 | 13,200 ▌ |
| 07-00432-02030 | | 30 | 6 | 4 | 3.8 | 12° | 6 | 70 | 13,200 ▌ |
| 07-00432-02040 | | 40 | 6 | 4 | 3.8 | 12° | 6 | 90 | 13,200 ▌ |
| 07-00432-02520 | R2.5 | 20 | 7.5 | 5 | 4.8 | 12° | 6 | 60 | 15,600 ▌ |
| 07-00432-02530 | | 30 | 7.5 | 5 | 4.8 | 12° | 6 | 70 | 15,600 ▌ |
| 07-00432-02540 | | 40 | 7.5 | 5 | 4.8 | 12° | 6 | 90 | 15,600 ▌ |
| 07-00432-03020 | R3 | 20 | 9 | 6 | 5.8 | – | 6 | 60 | 18,000 ▌ |
| 07-00432-03030 | | 30 | 9 | 6 | 5.8 | 12° | 8 | 90 | 25,000 ▌ |
| 07-00432-03050 | | 50 | 9 | 6 | 5.8 | 12° | 8 | 110 | 25,000 ▌ |
| ▲ 07-00432-04020 | R4 | 20 | 12 | 8 | 7.8 | – | 8 | 70 | 22,700 ▌ |
| ▲ 07-00432-04040 | | 40 | 12 | 8 | 7.8 | 12° | 10 | 100 | 25,300 ▌ |
| ▲ 07-00432-04060 | | 60 | 12 | 8 | 7.8 | 12° | 10 | 120 | 25,300 ▌ |
| ▲ 07-00432-05030 | R5 | 30 | 15 | 10 | 9.8 | – | 10 | 90 | 25,300 ▌ |
| ▲ 07-00432-05050 | | 50 | 15 | 10 | 9.8 | 12° | 12 | 120 | 37,900 ▌ |
| ▲ 07-00432-05070 | | 70 | 15 | 10 | 9.8 | 12° | 12 | 140 | 37,900 ▌ |
| ▲ 07-00432-06040 | R6 | 40 | 18 | 12 | 11.8 | – | 12 | 110 | 41,700 ▌ |
| ▲ 07-00432-06060 | | 60 | 18 | 12 | 11.8 | 12° | 16 | 130 | 80,700 ▌ |
| ▲ 07-00432-06080 | | 80 | 18 | 12 | 11.8 | 12° | 16 | 160 | 86,800 ▌ |

**オーダー方法**
DHB ボール半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate DHB (R)×(ℓ1).

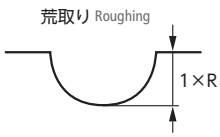
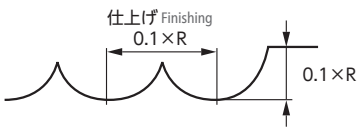
※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はE-094に記載
●Recommended Milling Conditions are shown on page E-094.



SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 銅 Copper | | | アルミニウム合金 Aluminum Alloy | | |
|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 70～100m/min | | | 100～200m/min | | |
| Rサイズ Radius | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | $min^{-1}$ | mm/min | | $min^{-1}$ | mm/min | |
| | | 荒取り Roughing | 仕上げ Finishing | | 荒取り Roughing | 仕上げ Finishing |
| 0.5 | 32,000 | 200 | 550 | 47,000 | 320 | 860 |
| 0.75 | 21,000 | 200 | 550 | 47,000 | 320 | 860 |
| 1 | 16,000 | 200 | 550 | 23,800 | 600 | 860 |
| 1.25 | 13,000 | 250 | 700 | 19,000 | 750 | 1,650 |
| 1.5 | 11,000 | 250 | 700 | 16,000 | 750 | 1,650 |
| 1.75 | 9,200 | 250 | 700 | 13,600 | 750 | 1,650 |
| 2 | 8,000 | 250 | 700 | 12,000 | 750 | 1,650 |
| 2.5 | 6,400 | 250 | 700 | 9,600 | 750 | 1,650 |
| 3 | 5,300 | 250 | 700 | 8,000 | 750 | 1,650 |
| 4 | 4,000 | 250 | 700 | 6,000 | 750 | 1,650 |
| 5 | 3,200 | 250 | 700 | 4,800 | 750 | 1,650 |
| 6 | 2,700 | 250 | 700 | 4,200 | 750 | 1,650 |
| 8 | 2,000 | 250 | 700 | 3,000 | 750 | 1,650 |
| 10 | 1,600 | 250 | 700 | 2,300 | 750 | 1,650 |
| 切り込み量 Depth of Cut (R:ボール半径 Radius) |   | | |   | | |
| 備　考 Notes | ※切削油を使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※鋼には絶対に使用しないでください。<br>※Use cutting fluid.<br>※Adjust both spindle speed and feed at the same rate.<br>※Don't use for cutting steels. | | | | | |

# DHB

## 切削条件参考表 Recommended Milling Conditions

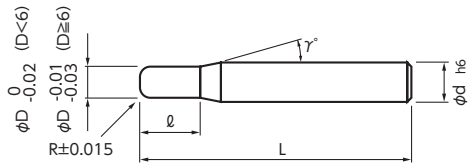
| 被削材 Work Material | | 銅 Copper | | アルミニウム合金 Aluminum Alloy | | 樹脂 Resin | |
|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | | 50～150m/min | | 100～200m/min | | 40～60m/min | |
| Rサイズ Radius | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | mm | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 0.5 | 0.015～0.18 | 15,900～47,800 | 450～1,200 | 31,800～ | 750～1,600 | 12,700～19,100 | 250～320 |
| 0.75 | 0.02～0.25 | 10,600～31,800 | 450～1,200 | 21,200～42,500 | 750～1,600 | 8,500～12,700 | 250～320 |
| 1 | 0.03～0.3 | 8,000～23,900 | 450～1,200 | 15,900～31,800 | 750～1,600 | 6,400～ 9,600 | 250～320 |
| 1.5 | 0.03～0.3 | 5,300～15,900 | 450～1,200 | 10,600～21,200 | 750～1,600 | 4,200～ 6,400 | 250～320 |
| 2 | 0.07～0.4 | 4,000～11,900 | 450～1,200 | 8,000～15,900 | 750～1,600 | 3,200～ 4,800 | 190～240 |
| 2.5 | 1～2.5 | 3,200～ 9,600 | 200～ 250 | 6,400～12,700 | 600～ 750 | 2,500～ 3,800 | 160～200 |
| 3 | 2～3 | 2,700～ 8,000 | 200～ 250 | 5,300～10,600 | 600～ 750 | 2,100～ 3,200 | 160～200 |
| 4 | 2～4 | 2,000～ 6,000 | 200～ 250 | 4,000～ 8,000 | 600～ 750 | 1,600～ 2,400 | 160～200 |
| 5 | 3～5 | 1,600～ 4,800 | 200～ 250 | 3,200～ 6,400 | 600～ 750 | 1,300～ 1,900 | 160～200 |
| 6 | 3.5～6 | 1,300～ 4,000 | 200～ 250 | 2,700～ 5,300 | 600～ 750 | 1,100～ 1,600 | 160～200 |
| 備　考 Notes | | ※工具の有効長によって、切り込み量及び回転数、送り速度を調整してください。<br>※切削油は発煙性の少ないものを使用してください。<br>※鋼には絶対に使用しないでください。<br>※Adjust spindle speed, feed and depth of cut according to effective length.<br>※Use cutting fluid with smoke retardant.<br>※Don't use for cutting steels. | | | | | |

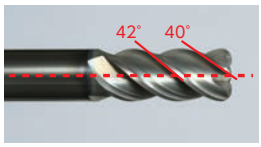


ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

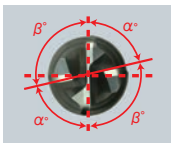
# MSXH440R

## 無限コーティングプレミアム パワーラジアスエンドミル
MUGEN-COATING PREMIUM Power Radius End Mill




不等リード
Unequal Helix Angle




不等分割
Unequal Flute Spacing

- ●パワーアップした不等リードと大きな不等分割の採用で
  ビビリを抑制し、安定した加工を実現。
- ●NS独自のスパイラル形状コーナーの採用により、従来形状に比べ切れ味がUP！
- ●荒加工時でもコーナー部のチッピングを抑制する高剛性形状を採用。
- ●無限コーティングプレミアムの採用で
  耐熱性と刃先強度を高め、加工中の切削熱をカバーします。
- ●Improved designs of unequal helix angle and flute spacing.
  Suppression from chattering to realize stable milling progression.
- ●Original spiral design at corner radius flutes improves cutting edge performance!
- ●Designed for high rigidity to suppress corner radius flute breakage even on rough milling stresses.
- ●Adopted MUGEN-COATING PREMIUM for improvement heat resistance and cutting edge strength to protect from milling heat influence.

技術資料 K-024

Slot Side Face

MG Premium 4 40°/42°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

★ 再研磨可能 （詳細はお問い合わせください。）

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| ★ 08-00150-03003 | 3 | R0.3 | 8 | 12° | 6 | 60 | 6,900 |
| ★ 08-00150-03005 | | R0.5 | 8 | 12° | 6 | 60 | 6,900 |
| ★ 08-00150-04003 | 4 | R0.3 | 11 | 12° | 6 | 60 | 7,500 |
| ★ 08-00150-04005 | | R0.5 | 11 | 12° | 6 | 60 | 7,500 |
| ★ 08-00150-04010 | | R1 | 11 | 12° | 6 | 60 | 7,500 |
| ★ 08-00150-05003 | 5 | R0.3 | 13 | 12° | 6 | 60 | 7,800 |
| ★ 08-00150-05005 | | R0.5 | 13 | 12° | 6 | 60 | 7,800 |
| ★ 08-00150-05010 | | R1 | 13 | 12° | 6 | 60 | 7,800 |
| ★ 08-00150-06005 | 6 | R0.5 | 13 | – | 6 | 60 | 8,100 |
| ★ 08-00150-06010 | | R1 | 13 | – | 6 | 60 | 8,100 |
| ★ 08-00150-08005 | 8 | R0.5 | 19 | – | 8 | 65 | 13,500 |
| ★ 08-00150-08010 | | R1 | 19 | – | 8 | 65 | 13,500 |
| ★ 08-00150-10005 | 10 | R0.5 | 22 | – | 10 | 75 | 15,700 |
| ★ 08-00150-10010 | | R1 | 22 | – | 10 | 75 | 15,700 |
| ★ 08-00150-10020 | | R2 | 22 | – | 10 | 75 | 15,700 |
| ★ 08-00150-10030 | | R3 | 22 | – | 10 | 75 | 15,700 |
| ★ 08-00150-12005 | 12 | R0.5 | 26 | – | 12 | 80 | 20,700 |
| ★ 08-00150-12010 | | R1 | 26 | – | 12 | 80 | 20,700 |
| ★ 08-00150-12020 | | R2 | 26 | – | 12 | 80 | 20,700 |

オーダー方法 MSXH440R刃径(D)×コーナー半径(R)を指示してください。
When you order, indicate MSXH440R(D)×(R).

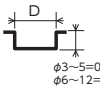
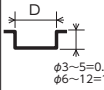
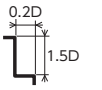
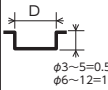
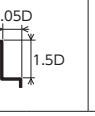
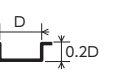
※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はF-002に記載
●Recommended Milling Conditions are shown on page F-002.

# MSXH440R

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-024

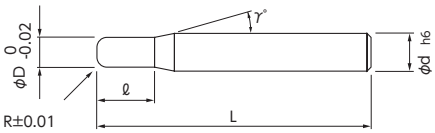
| 被削材 Work Material | | 合金鋼 Alloy Steels SKD・SCM | | | | ステンレス鋼 Stainless Steels SUS304 | | | | チタン合金 Titanium Alloy Ti-6Al-4V | | | | 超耐熱合金 Heat Resistance Alloy inconel®718 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | コーナー半径 Corner Radius | 側面 Side Milling | | 溝 Slotting | | 側面 Side Milling | | 溝 Slotting | | 側面 Side Milling | | 溝 Slotting | | 側面 Side Milling | | 溝 Slotting | |
| | | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 3 | 0.3 | 17,600 | 1,430 | 8,600 | 700 | 6,000 | 750 | 6,000 | 600 | 5,600 | 750 | 5,600 | 600 | 3,600 | 250 | 2,500 | 140 |
| | 0.5 | 17,600 | 1,430 | 8,600 | 700 | 6,000 | 750 | 6,000 | 550 | 5,600 | 750 | 5,600 | 550 | 3,600 | 250 | 2,500 | 140 |
| 4 | 0.3 | 13,200 | 1,540 | 6,500 | 780 | 5,200 | 800 | 5,200 | 650 | 4,800 | 800 | 4,800 | 650 | 3,100 | 250 | 2,200 | 150 |
| | 0.5 | 13,200 | 1,540 | 6,500 | 780 | 5,200 | 800 | 5,200 | 600 | 4,800 | 800 | 4,800 | 600 | 3,100 | 250 | 2,200 | 150 |
| | 1 | 13,200 | 1,540 | 6,500 | 780 | 5,200 | 800 | 5,200 | 550 | 4,800 | 800 | 4,800 | 550 | 3,100 | 250 | 2,200 | 150 |
| 5 | 0.3 | 10,500 | 1,650 | 5,500 | 760 | 4,600 | 900 | 4,600 | 700 | 4,200 | 900 | 4,200 | 700 | 2,600 | 300 | 1,900 | 160 |
| | 0.5 | 10,500 | 1,650 | 5,500 | 760 | 4,600 | 900 | 4,600 | 650 | 4,200 | 900 | 4,200 | 650 | 2,600 | 300 | 1,900 | 160 |
| | 1 | 10,500 | 1,650 | 5,500 | 760 | 4,600 | 900 | 4,600 | 600 | 4,200 | 900 | 4,200 | 600 | 2,600 | 300 | 1,900 | 160 |
| 6 | 0.5 | 8,800 | 2,420 | 4,300 | 630 | 4,200 | 1,000 | 4,000 | 400 | 3,800 | 1,000 | 3,600 | 400 | 2,100 | 300 | 1,300 | 170 |
| | 1 | 8,800 | 2,420 | 4,300 | 630 | 4,200 | 1,000 | 4,000 | 350 | 3,800 | 1,000 | 3,600 | 350 | 2,100 | 300 | 1,300 | 170 |
| 8 | 0.5 | 6,600 | 1,980 | 3,300 | 560 | 3,600 | 850 | 3,200 | 350 | 3,200 | 850 | 2,800 | 350 | 1,700 | 300 | 1,100 | 170 |
| | 1 | 6,600 | 1,980 | 3,300 | 560 | 3,600 | 850 | 3,200 | 300 | 3,200 | 850 | 2,800 | 300 | 1,700 | 300 | 1,100 | 170 |
| 10 | 0.5 | 5,300 | 1,430 | 2,600 | 550 | 3,000 | 600 | 2,500 | 300 | 2,600 | 600 | 2,100 | 300 | 1,300 | 250 | 900 | 160 |
| | 1 | 5,300 | 1,430 | 2,600 | 550 | 3,000 | 600 | 2,500 | 300 | 2,600 | 600 | 2,100 | 300 | 1,300 | 250 | 900 | 160 |
| | 2 | 5,300 | 1,430 | 2,600 | 550 | 3,000 | 600 | 2,500 | 250 | 2,600 | 600 | 2,100 | 250 | 1,300 | 250 | 900 | 160 |
| | 3 | 5,300 | 1,430 | 2,600 | 550 | 3,000 | 600 | 2,500 | 200 | 2,600 | 600 | 2,100 | 200 | 1,300 | 250 | 900 | 160 |
| 12 | 0.5 | 4,400 | 1,100 | 2,200 | 480 | 2,500 | 500 | 2,000 | 200 | 2,100 | 500 | 1,600 | 200 | 900 | 200 | 700 | 150 |
| | 1 | 4,400 | 1,100 | 2,200 | 480 | 2,500 | 500 | 2,000 | 200 | 2,100 | 500 | 1,600 | 200 | 900 | 200 | 700 | 150 |
| | 2 | 4,400 | 1,100 | 2,200 | 480 | 2,500 | 500 | 2,000 | 150 | 2,100 | 500 | 1,600 | 150 | 900 | 200 | 700 | 150 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | | | |   | | | |   | |   | |   | |   | |   | |
| 備考 Notes | | ※機械剛性や被削材の保持状態等により切削条件を調整してください。<br>※上記切削条件は水溶性切削油を使用した場合の切削条件参考表となります。<br>※不水溶性切削油で加工する場合は、切りくずの排出や発煙に考慮し切削条件の調整をしてください。<br>※ミーリングチャック・機械は出来るだけ剛性のあるものを使用してください。<br>※工具突出し量は出来るだけ短くしてください。<br>（上記切削条件は工具突出し量をφ3～5で5D、φ6～8で4D、φ10～12で3Dとした場合の参考値になります）<br>※Adjust milling condition conforming with machine rigidity and clamping condition.<br>※The recommended milling conditions are based on milling with water-soluble cutting fluid.<br>※Adjust milling condition with caution for chip evacuation and smoke generation when milling with water-insoluble cutting fluid.<br>※Use a rigid machine and holder.<br>※Overhang of end mill should be as short as possible from spindle nose.<br>( The recommended milling conditions are reference values under the overhang L/D: 5D(φ3~5), 4D(φ6~8), 3D(φ10~12) | | | | | | | | | | | | | | | | | |



ŞEVKET ÖĞÜT® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MHDH445R

## 無限コーティングプレミアム 高硬度用4枚刃ラジアスエンドミル
MUGEN-COATING PREMIUM 4-Flute Radius End Mill for Hardened Steel




●高硬度領域（48～65HRC）の長時間の加工でも、安定した長寿命を実現。
●強ネジレで切れ味をアップし、ラジアス形状でチッピングを抑制。
●Realized stably long tool life against high hardened steels (48~65HRC).
●Corner radius to prevent flute chipping, and high helix angle for cutting sharpness.

Slot Side Face
MG Premium 4 45° ≦65 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| | | | ◎ | ◎ |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| | | | | |

★ 再研磨可能（詳細はお問い合わせください。）
単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

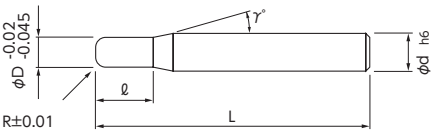
| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| ★ 08-00437-03002 | 3 | R0.2 | 6 | 12° | 6 | 60 | 12,500 |
| ★ 08-00437-03003 | | R0.3 | | | | | 12,500 |
| ★ 08-00437-03005 | | R0.5 | | | | | 12,500 |
| ★ 08-00437-04002 | 4 | R0.2 | 8 | 12° | 6 | 60 | 13,500 |
| ★ 08-00437-04003 | | R0.3 | | | | | 13,500 |
| ★ 08-00437-04005 | | R0.5 | | | | | 13,500 |

**オーダー方法**
MHDH445R 刃径(D)×コーナー半径(R)を指示してください。
When you order, indicate MHDH445R (D)×(R).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はF-004に記載
●Recommended Milling Conditions are shown on page F-004.

# MHDH645R

## 無限コーティングプレミアム 高硬度用6枚刃ラジアスエンドミル
MUGEN-COATING PREMIUM 6-Flute Radius End Mill for Hardened Steel




●高硬度領域（48～65HRC）の長時間の加工でも、安定した長寿命を実現。
●多刃、強ネジレで切れ味をアップし、ラジアス形状でチッピングを抑制。
●Realized stably long tool life against high hardened steels (48~65HRC).
●Corner radius to prevent flute chipping, and high helix angle for cutting sharpness.

Slot Side Face
MG Premium 6 45° ≦65 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| | | | ◎ | ◎ |
| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
| | | | | |

★ 再研磨可能（詳細はお問い合わせください。）
単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| ★ 08-00438-05002 | 5 | R0.2 | 10 | 12° | 6 | 60 | 14,500 |
| ★ 08-00438-05003 | | R0.3 | | | | | 14,500 |
| ★ 08-00438-05005 | | R0.5 | | | | | 14,500 |
| ★ 08-00438-05010 | | R1 | | | | | 14,500 |
| ★ 08-00438-06002 | 6 | R0.2 | 12 | – | 6 | 60 | 15,500 |
| ★ 08-00438-06003 | | R0.3 | | | | | 15,500 |
| ★ 08-00438-06005 | | R0.5 | | | | | 15,500 |
| ★ 08-00438-06010 | | R1 | | | | | 15,500 |
| ★ 08-00438-08003 | 8 | R0.3 | 16 | – | 8 | 65 | 21,500 |
| ★ 08-00438-08005 | | R0.5 | | | | | 21,500 |
| ★ 08-00438-08010 | | R1 | | | | | 21,500 |
| ★ 08-00438-08015 | | R1.5 | | | | | 21,500 |
| ★ 08-00438-10003 | 10 | R0.3 | 20 | – | 10 | 75 | 29,200 |
| ★ 08-00438-10005 | | R0.5 | | | | | 29,200 |
| ★ 08-00438-10010 | | R1 | | | | | 29,200 |
| ★ 08-00438-10015 | | R1.5 | | | | | 29,200 |
| ★ 08-00438-10020 | | R2 | | | | | 29,200 |
| ★ 08-00438-12005 | 12 | R0.5 | 24 | – | 12 | 80 | 35,200 |
| ★ 08-00438-12010 | | R1 | | | | | 35,200 |
| ★ 08-00438-12015 | | R1.5 | | | | | 35,200 |
| ★ 08-00438-12020 | | R2 | | | | | 35,200 |

**オーダー方法**
MHDH645R 刃径(D)×コーナー半径(R)を指示してください。
When you order, indicate MHDH645R (D)×(R).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はF-004に記載
●Recommended Milling Conditions are shown on page F-004.

# MHDH445R・MHDH645R

## 切削条件参考表 Recommended Milling Conditions

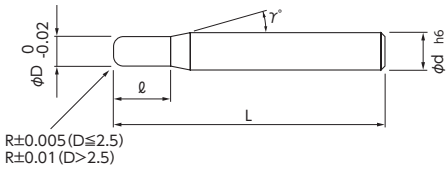
| 被削材 Work Material | 焼き入れ鋼 Hardened Steels HPM-38・STAVAX・SKD61 (~55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11 (~62HRC) | | | | ハイス High Speed Tool Steels SKH (~65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | 側面 Side Milling | | 溝 Slotting | | 側面 Side Milling | | 溝 Slotting | | 側面 Side Milling | | 溝 Slotting | |
| | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 3 | 10,000 | 1,000 | 8,000 | 580 | 8,000 | 700 | 7,500 | 500 | 7,000 | 560 | 6,000 | 280 |
| 4 | 8,500 | 1,200 | 7,500 | 620 | 7,000 | 800 | 6,000 | 540 | 6,000 | 600 | 5,000 | 300 |
| 5 | 7,600 | 1,600 | 6,800 | 900 | 6,200 | 1,200 | 5,600 | 600 | 5,300 | 800 | 4,800 | 350 |
| 6 | 6,400 | 1,800 | 5,800 | 950 | 5,300 | 1,200 | 4,800 | 600 | 4,600 | 800 | 4,200 | 350 |
| 8 | 4,800 | 2,000 | 4,300 | 1,000 | 4,000 | 1,400 | 3,600 | 700 | 3,400 | 1,000 | 3,000 | 400 |
| 10 | 3,800 | 2,000 | 3,400 | 1,000 | 3,200 | 1,600 | 2,800 | 800 | 2,600 | 1,000 | 2,300 | 500 |
| 12 | 3,200 | 2,000 | 2,800 | 1,000 | 2,600 | 1,600 | 2,300 | 800 | 2,200 | 1,000 | 2,000 | 500 |
| 切り込み量 Depth of Cut (D:刃径 Dia.) | 側面 Side Milling 1.5D 0.03D / 溝 Slotting D 0.02D | | | | 側面 Side Milling 1.5D 0.02D / 溝 Slotting D 0.01D | | | | 側面 Side Milling 1.5D 0.02D / 溝 Slotting D 0.01D | | | |
| 備考 Notes | ※機械、チャックは剛性のある精度の高い物を使用してください。<br>※切り込み量、機械剛性により条件が異なることがあります。その都度調整してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※エアーブローまたはオイルミストの使用をお奨めします。<br>※Use a rigid and precise machine and chuck holder.<br>※Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.<br>※Adjust both spindle speed and feed at the same rate.<br>※Use oilmist coolant or air blow. | | | | | | | | | | | |



ŞEVKET ÖĞÜT® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MSRS230

## 無限コーティング 2枚刃ラジアスエンドミル
MUGEN-COATING 2-Flute Radius End Mill




Slot Side Face

MG ∞ 2 30° ≦55 HRC

●ストレートとコーナー R 加工が同時に可能。
●It is possible to cut both straight and corner radius simultaneously.

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 08-00700-01001 | 1 | R0.1 | 2 | 9° | 4 | 60 | 7,000 |
| 08-00700-01002 | | R0.2 | | | | | 7,000 |
| 08-00700-01003 | | R0.3 | | | | | 7,000 |
| 08-00700-01501 | 1.5 | R0.1 | 3 | 9° | 4 | 60 | 7,000 |
| 08-00700-01502 | | R0.2 | | | | | 7,000 |
| 08-00700-01503 | | R0.3 | | | | | 7,000 |
| 08-00700-01505 | | R0.5 | | | | | 7,000 |
| 08-00700-02001 | 2 | R0.1 | 4 | 9° | 4 | 60 | 7,000 |
| 08-00700-02002 | | R0.2 | | | | | 7,000 |
| 08-00700-02003 | | R0.3 | | | | | 7,000 |
| 08-00700-02005 | | R0.5 | | | | | 7,000 |
| 08-00700-02501 | 2.5 | R0.1 | 5 | 9° | 4 | 60 | 7,000 |
| 08-00700-02502 | | R0.2 | | | | | 7,000 |
| 08-00700-02503 | | R0.3 | | | | | 7,700 |
| 08-00700-02505 | | R0.5 | | | | | 7,700 |
| 08-00700-03001 | 3 | R0.1 | 6 | 9° | 6 | 60 | 8,600 |
| 08-00700-03002 | | R0.2 | | | | | 8,600 |
| 08-00700-03003 | | R0.3 | | | | | 8,600 |
| 08-00700-03005 | | R0.5 | | | | | 8,600 |
| 08-00700-03010 | | R1 | | | | | 9,400 |
| 08-00700-04001 | 4 | R0.1 | 8 | 9° | 6 | 65 | 8,700 |
| 08-00700-04002 | | R0.2 | | | | | 8,700 |
| 08-00700-04003 | | R0.3 | | | | | 8,700 |
| 08-00700-04005 | | R0.5 | | | | | 8,700 |
| 08-00700-04010 | | R1 | | | | | 9,500 |

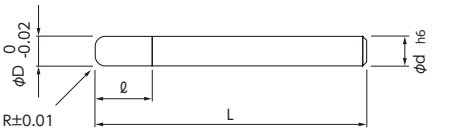
| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 08-00700-05001 | 5 | R0.1 | 10 | 9° | 6 | 70 | 8,800 |
| 08-00700-05002 | | R0.2 | | | | | 8,800 |
| 08-00700-05003 | | R0.3 | | | | | 8,800 |
| 08-00700-05005 | | R0.5 | | | | | 8,800 |
| 08-00700-05010 | | R1 | | | | | 9,600 |
| 08-00700-05015 | | R1.5 | | | | | 10,000 |

**オーダー方法** MSRS230 刃径(D)×コーナー半径(R)を指示してください。
When you order, indicate MSRS230 (D)×(R).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はF-007に記載
●Recommended Milling Conditions are shown on page F-007.

# MSRS430

## 無限コーティング 4枚刃ラジアスエンドミル
MUGEN-COATING 4-Flute Radius End Mill




●ストレートとコーナー R 加工が同時に可能。
●It is possible to cut both straight and corner radius simultaneously.

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00710-06001 | 6 | R0.1 | 12 | 6 | 80 | 14,500 |
| 08-00710-06002 | | R0.2 | | | | 14,500 |
| 08-00710-06003 | | R0.3 | | | | 14,500 |
| 08-00710-06005 | | R0.5 | | | | 14,500 |
| 08-00710-06010 | | R1 | | | | 15,500 |
| 08-00710-06015 | | R1.5 | | | | 15,500 |
| 08-00710-06020 | | R2 | | | | 15,500 |
| 08-00710-08001 | 8 | R0.1 | 16 | 8 | 90 | 20,900 |
| 08-00710-08002 | | R0.2 | | | | 20,900 |
| 08-00710-08005 | | R0.5 | | | | 20,900 |
| 08-00710-08010 | | R1 | | | | 20,900 |
| 08-00710-08015 | | R1.5 | | | | 22,000 |
| 08-00710-08020 | | R2 | | | | 22,000 |
| 08-00710-08025 | | R2.5 | | | | 23,300 |
| 08-00710-08030 | | R3 | | | | 23,300 |
| 08-00710-10001 | 10 | R0.1 | 20 | 10 | 100 | 22,000 |
| 08-00710-10002 | | R0.2 | | | | 22,000 |
| 08-00710-10003 | | R0.3 | | | | 22,000 |
| 08-00710-10005 | | R0.5 | | | | 22,000 |
| 08-00710-10010 | | R1 | | | | 22,000 |
| 08-00710-10015 | | R1.5 | | | | 23,300 |
| 08-00710-10020 | | R2 | | | | 23,300 |
| 08-00710-10025 | | R2.5 | | | | 25,600 |
| 08-00710-10030 | | R3 | | | | 25,600 |

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 08-00710-12001 | 12 | R0.1 | 24 | 12 | 110 | 34,800 |
| 08-00710-12002 | | R0.2 | | | | 34,800 |
| 08-00710-12003 | | R0.3 | | | | 34,800 |
| 08-00710-12005 | | R0.5 | | | | 34,800 |
| 08-00710-12010 | | R1 | | | | 34,800 |
| 08-00710-12015 | | R1.5 | | | | 36,000 |
| 08-00710-12020 | | R2 | | | | 36,000 |
| 08-00710-12025 | | R2.5 | | | | 37,100 |
| 08-00710-12030 | | R3 | | | | 37,100 |

**オーダー方法** MSRS430 刃径(D)×コーナー半径(R)を指示してください。
When you order, indicate MSRS430 (D)×(R).

●切削条件表はF-007に記載
●Recommended Milling Conditions are shown on page F-007.



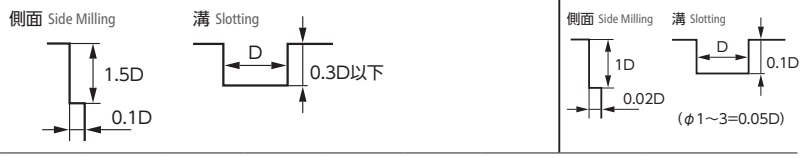
SEVKET GÜLÜ MAKINA TICARET VE SAN. LTD. ŞTI.

# MSRS230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM・SKD・SUS | | | 調質鋼 Prehardened Steels HPM・NAK | | | 焼き入れ鋼 Hardened Steels SKD61 (~52HRC) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 60~80m/min | | | 50~70m/min | | | 30~50m/min | | | 20~30m/min | | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting |
| 1 | 25,500 | 200 | 100 | 19,200 | 130 | 50 | 12,800 | 80 | 40 | 6,400 | 60 | 30 |
| 1.5 | 17,100 | 340 | 120 | 12,800 | 180 | 60 | 8,500 | 90 | 45 | 4,200 | 70 | 35 |
| 2 | 12,800 | 400 | 150 | 9,600 | 210 | 70 | 6,400 | 110 | 55 | 3,200 | 80 | 40 |
| 2.5 | 10,200 | 400 | 150 | 7,700 | 210 | 70 | 5,100 | 110 | 55 | 2,500 | 80 | 40 |
| 3 | 8,500 | 450 | 160 | 6,400 | 250 | 80 | 4,300 | 120 | 60 | 2,100 | 100 | 50 |
| 4 | 6,400 | 450 | 160 | 4,800 | 250 | 80 | 3,200 | 120 | 60 | 1,600 | 100 | 50 |
| 5 | 5,100 | 600 | 200 | 3,800 | 300 | 90 | 2,600 | 150 | 75 | 1,300 | 120 | 60 |

切り込み量 Depth of Cut (D:刃径 Dia.)




備考 Notes

※加工面の傾斜角によっては送り速度を調整してください。
※コーナー部での送り速度は 30 ~ 50%下げてください。
※回転数が上がらない場合は同じ割合で送り速度を調整し、切り込み量も調整してください。
※Adjust feed according to inclined angle.
※When corner processing, reduce the feed by approximately 50%~30%.
※Adjust spindle speed and feed at the same rate also reduce depth of cut, if the machine spindle speed insufficient.

# MSRS430

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM・SKD・SUS | | 調質鋼 Prehardened Steels HPM・NAK | | 焼き入れ鋼 Hardened Steels SKD61 (~52HRC) | |
|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 60~80m/min | | 50~70m/min | | 30~50m/min | | 20~30m/min | |
| 刃径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | min$^{-1}$ | mm/min | min$^{-1}$ | mm/min | min$^{-1}$ | mm/min | min$^{-1}$ | mm/min |
| 6 | 4,300 | 780 | 3,200 | 580 | 2,200 | 380 | 1,100 | 160 |
| 8 | 3,200 | 780 | 2,400 | 580 | 1,600 | 380 | 800 | 160 |
| 10 | 2,600 | 780 | 1,900 | 580 | 1,300 | 380 | 650 | 160 |
| 12 | 2,100 | 780 | 1,600 | 580 | 1,100 | 380 | 530 | 160 |

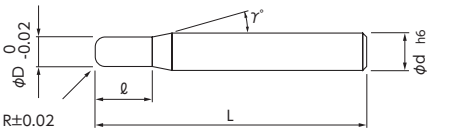
切り込み量 Depth of Cut (D:刃径 Dia.)

備考 Notes

※加工面の傾斜角によっては送り速度を調整してください。
※コーナー部での送り速度は 30 ~ 50%下げてください。
※回転数が上がらない場合は同じ割合で送り速度を調整し、切り込み量も調整してください。
※Adjust feed according to inclined angle.
※When corner processing, reduce the feed by approximately 50%~30%.
※Adjust spindle speed and feed at the same rate also reduce depth of cut, if the machine spindle speed insufficient.

# NSR-2

## ラジアスエンドミル
2-Flute Radius End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
●▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

Slot Side Face
MG 2 30°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ |

### ▲生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 01-00772-00102 | 1 | R0.2 | 3 | 9° | 4 | 45 | 9,300 ▌ |
| 01-00772-00152 | 1.5 | R0.2 | 4.5 | 9° | 4 | 45 | 9,000 ▌ |
| 01-00772-00155 | | R0.5 | | | | | 9,700 ▌ |
| 01-00772-00202 | 2 | R0.2 | 6 | 9° | 4 | 45 | 8,300 ▌ |
| 01-00772-00205 | | R0.5 | | | | | 9,000 ▌ |
| 01-00772-00252 | 2.5 | R0.2 | 8 | 9° | 4 | 45 | 8,300 ▌ |
| 01-00772-00255 | | R0.5 | | | | | 9,000 ▌ |
| 01-00772-00302 | 3 | R0.2 | 10 | 9° | 6 | 45 | 8,700 ▌ |
| 01-00772-00305 | | R0.5 | | | | | 9,300 ▌ |
| 01-00772-00310 | | R1 | | | | | 10,300 ▌ |
| 01-00772-00402 | 4 | R0.2 | 12 | 9° | 6 | 50 | 9,000 ▌ |
| 01-00772-00405 | | R0.5 | | | | | 9,700 ▌ |
| 01-00772-00410 | | R1 | | | | | 10,300 ▌ |
| 01-00772-00502 | 5 | R0.2 | 15 | 9° | 6 | 55 | 9,300 ▌ |
| 01-00772-00505 | | R0.5 | | | | | 10,000 ▌ |
| 01-00772-00510 | | R1 | | | | | 10,700 ▌ |
| 01-00772-00515 | | R1.5 | | | | | 11,300 ▌ |
| 01-00772-00602 | 6 | R0.2 | 18 | – | 6 | 60 | 9,700 ▌ |
| 01-00772-00605 | | R0.5 | | | | | 10,300 ▌ |
| 01-00772-00610 | | R1 | | | | | 11,000 ▌ |
| 01-00772-00615 | | R1.5 | | | | | 11,700 ▌ |
| 01-00772-00620 | | R2 | | | | | 12,300 ▌ |
| ▲ 01-00772-00805 | 8 | R0.5 | 24 | – | 8 | 70 | 14,000 ▌ |
| ▲ 01-00772-00810 | | R1 | | | | | 15,100 ▌ |
| ▲ 01-00772-00815 | | R1.5 | | | | | 15,800 ▌ |
| ▲ 01-00772-00820 | | R2 | | | | | 16,600 ▌ |
| ▲ 01-00772-00825 | | R2.5 | | | | | 16,900 ▌ |
| ▲ 01-00772-00830 | | R3 | | | | | 16,900 ▌ |

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| ▲ 01-00772-01005 | 10 | R0.5 | 30 | – | 10 | 80 | 18,300 ▌ |
| ▲ 01-00772-01010 | | R1 | | | | | 19,000 ▌ |
| ▲ 01-00772-01015 | | R1.5 | | | | | 19,700 ▌ |
| ▲ 01-00772-01020 | | R2 | | | | | 20,400 ▌ |
| ▲ 01-00772-01025 | | R2.5 | | | | | 21,100 ▌ |
| ▲ 01-00772-01030 | | R3 | | | | | 21,100 ▌ |
| ▲ 01-00772-01205 | 12 | R0.5 | 36 | – | 12 | 85 | 26,400 ▌ |
| ▲ 01-00772-01210 | | R1 | | | | | 27,100 ▌ |
| ▲ 01-00772-01215 | | R1.5 | | | | | 27,800 ▌ |
| ▲ 01-00772-01220 | | R2 | | | | | 28,700 ▌ |
| ▲ 01-00772-01225 | | R2.5 | | | | | 29,400 ▌ |
| ▲ 01-00772-01230 | | R3 | | | | | 29,400 ▌ |
| ▲ 01-00772-01610 | 16 | R1 | 50 | – | 16 | 110 | 63,900 ▌ |
| ▲ 01-00772-01615 | | R1.5 | | | | | 65,300 ▌ |
| ▲ 01-00772-01620 | | R2 | | | | | 66,200 ▌ |
| ▲ 01-00772-01625 | | R2.5 | | | | | 67,500 ▌ |
| ▲ 01-00772-01630 | | R3 | | | | | 67,500 ▌ |
| ▲ 01-00772-01640 | | R4 | | | | | 68,200 ▌ |
| ▲ 01-00772-01650 | | R5 | | | | | 69,000 ▌ |
| ▲ 01-00772-02010 | 20 | R1 | 60 | – | 20 | 135 | 98,200 ▌ |
| ▲ 01-00772-02015 | | R1.5 | | | | | 99,400 ▌ |
| ▲ 01-00772-02020 | | R2 | | | | | 100,700 ▌ |
| ▲ 01-00772-02025 | | R2.5 | | | | | 101,900 ▌ |
| ▲ 01-00772-02030 | | R3 | | | | | 101,900 ▌ |
| ▲ 01-00772-02040 | | R4 | | | | | 102,700 ▌ |
| ▲ 01-00772-02050 | | R5 | | | | | 103,600 ▌ |

**オーダー方法**
NSR-2 刃径(D)×コーナー半径(R)を指示してください。
When you order, indicate NSR-2 (D)×(R).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はF-009に記載
●Recommended Milling Conditions are shown on page F-009



SEVKET GÜLÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

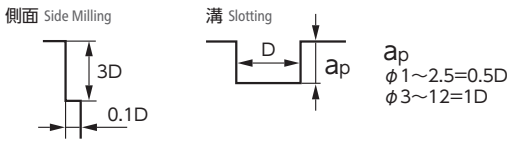
# NSR-2

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM・SKD・SUS | | | 調質鋼 Prehardened Steels HPM・NAK | | |
|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 40～50m/min | | | 35～45m/min | | | 25～35m/min | | |
| 刃 径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | $min^{-1}$ | mm/min | | $min^{-1}$ | mm/min | | $min^{-1}$ | mm/min | |
| | | 側面 Side Milling | 溝 Slotting | | 側面 Side Milling | 溝 Slotting | | 側面 Side Milling | 溝 Slotting |
| 1 | 14,300 | 130 | 50 | 12,700 | 90 | 40 | 9,600 | 80 | 35 |
| 1.5 | 9,600 | 130 | 50 | 8,500 | 90 | 40 | 6,400 | 80 | 35 |
| 2 | 7,200 | 130 | 50 | 6,400 | 90 | 40 | 4,800 | 80 | 35 |
| 2.5 | 5,700 | 130 | 50 | 5,100 | 90 | 40 | 3,800 | 80 | 35 |
| 3 | 4,800 | 150 | 60 | 4,200 | 120 | 50 | 3,200 | 90 | 40 |
| 4 | 3,600 | 150 | 60 | 3,200 | 120 | 50 | 2,400 | 90 | 40 |
| 5 | 2,900 | 170 | 70 | 2,500 | 140 | 55 | 1,900 | 110 | 45 |
| 6 | 2,400 | 170 | 70 | 2,100 | 140 | 55 | 1,600 | 110 | 45 |
| 8 | 1,800 | 170 | 70 | 1,600 | 140 | 55 | 1,200 | 110 | 45 |
| 10 | 1,400 | 170 | 70 | 1,300 | 140 | 55 | 1,000 | 110 | 45 |
| 12 | 1,200 | 170 | 70 | 1,100 | 140 | 55 | 800 | 110 | 45 |

切り込み量 Depth of Cut

(D:刃径 Dia.)



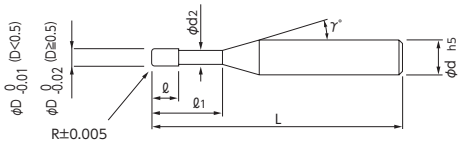

備 考 Notes

※加工面の傾斜角によっては送り速度を調整してください。
※コーナー部での送り速度は 30 ～ 50%下げてください。
※回転数が上がらない場合は同じ割合で送り速度を調整し、切り込み量も調整してください。
※Adjust feed according to inclined angle.
※When corner processing, reduce the feed by approximately 30%～50%.
※Adjust spindle speed and feed at the same rate also reduce depth of cut, if the machine spindle speed insufficient.

# MHRH230R

## 無限コーティングプレミアム 高硬度用2枚刃ロングネックラジアスエンドミル

MUGEN-COATING PREMIUM 2-Flute Long Neck Radius End Mill for Hardened Steel




●高硬度用の無限コーティングプレミアムと新形状の採用で耐チッピング性に優れ、ビビリを抑えることにより仕上げ面が向上。
●全97サイズ。
●MUGEN-COATING PREMIUM for hardened steels and unique new design excel in chipping prevention and resolve chattering to realize excellent finished surface.
●Total 97 sizes.

**[首部形状について]**
表記の首角(γ)は目安になります。被削材との干渉が心配される時は、必ず実測での確認をお願いします。

(Neck Shape)
(γ) is reference value.Tool measurement required in order to avoid interference to the work material.

Slot Side Face MG Premium 2 30° ≦65 HRC

### 被削材 Work Material

| 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | ○ | ○ |

◆ New サイズ

単位 [寸法：mm / 価格：円] Unit [Size : mm / Retail Price : JPY]

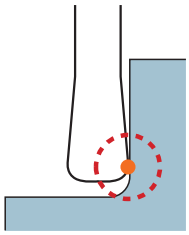
| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ◆ 08-00227-02021 | 0.2 | R0.02 | 0.5 | 0.15 | 0.18 | 12° | 4 | 45 | 10,100 | 0.56 | 0.59 | 0.62 | 0.65 | 0.71 |
| ◆ 08-00227-02023 | | | 1 | | | | | 45 | 10,100 | 1.09 | 1.13 | 1.19 | 1.24 | 1.38 |
| ◆ 08-00227-02025 | | | 1.5 | | | | | 45 | 11,900 | 1.61 | 1.68 | 1.76 | 1.84 | 2.04 |
| ◆ 08-00227-02027 | | | 2 | | | | | 45 | 13,000 | 2.13 | 2.22 | 2.33 | 2.44 | 2.71 |
| 08-00227-02051 | | R0.05 | 0.5 | | | | | 45 | 10,100 | 0.56 | 0.59 | 0.61 | 0.64 | 0.70 |
| 08-00227-02053 | | | 1 | | | | | 45 | 10,100 | 1.08 | 1.13 | 1.18 | 1.24 | 1.37 |
| 08-00227-02055 | | | 1.5 | | | | | 45 | 11,900 | 1.61 | 1.68 | 1.75 | 1.84 | 2.03 |
| 08-00227-02057 | | | 2 | | | | | 45 | 13,000 | 2.13 | 2.22 | 2.32 | 2.43 | 2.70 |
| ◆ 08-00227-03021 | 0.3 | R0.02 | 1 | 0.25 | 0.28 | 12° | 4 | 45 | 9,800 | 1.09 | 1.13 | 1.19 | 1.24 | 1.38 |
| ◆ 08-00227-03022 | | | 1.5 | | | | | 45 | 9,800 | 1.61 | 1.68 | 1.76 | 1.84 | 2.04 |
| ◆ 08-00227-03023 | | | 2 | | | | | 45 | 9,800 | 2.13 | 2.22 | 2.33 | 2.44 | 2.71 |
| ◆ 08-00227-03024 | | | 2.5 | | | | | 45 | 12,300 | 2.65 | 2.77 | 2.90 | 3.04 | 3.37 |
| ◆ 08-00227-03025 | | | 3 | | | | | 45 | 12,300 | 3.17 | 3.31 | 3.47 | 3.64 | 4.03 |
| 08-00227-03051 | | R0.05 | 1 | | | | | 45 | 9,800 | 1.08 | 1.13 | 1.18 | 1.24 | 1.37 |
| 08-00227-03052 | | | 1.5 | | | | | 45 | 9,800 | 1.61 | 1.68 | 1.75 | 1.84 | 2.03 |
| 08-00227-03053 | | | 2 | | | | | 45 | 9,800 | 2.13 | 2.22 | 2.32 | 2.43 | 2.70 |
| 08-00227-03054 | | | 2.5 | | | | | 45 | 12,300 | 2.65 | 2.77 | 2.89 | 3.03 | 3.36 |
| 08-00227-03055 | | | 3 | | | | | 45 | 12,300 | 3.17 | 3.31 | 3.46 | 3.63 | 4.02 |
| ◆ 08-00227-04021 | 0.4 | R0.02 | 1 | 0.3 | 0.37 | 12° | 4 | 45 | 6,500 | 1.11 | 1.16 | 1.21 | 1.27 | 1.41 |
| ◆ 08-00227-04022 | | | 1.5 | | | | | 45 | 6,500 | 1.63 | 1.70 | 1.78 | 1.87 | 2.07 |
| ◆ 08-00227-04023 | | | 2 | | | | | 45 | 6,500 | 2.15 | 2.25 | 2.35 | 2.47 | 2.74 |
| ◆ 08-00227-04024 | | | 2.5 | | | | | 45 | 6,500 | 2.67 | 2.79 | 2.92 | 3.07 | 3.40 |
| ◆ 08-00227-04025 | | | 3 | | | | | 45 | 6,500 | 3.20 | 3.34 | 3.49 | 3.67 | 4.06 |
| ◆ 08-00227-04027 | | | 4 | | | | | 45 | 6,500 | 4.24 | 4.43 | 4.63 | 4.86 | 5.39 |
| 08-00227-04051 | | R0.05 | 1 | | | | | 45 | 6,500 | 1.11 | 1.16 | 1.21 | 1.27 | 1.40 |
| ◆ 08-00227-04052 | | | 1.5 | | | | | 45 | 6,500 | 1.63 | 1.70 | 1.78 | 1.86 | 2.06 |
| 08-00227-04053 | | | 2 | | | | | 45 | 6,500 | 2.15 | 2.25 | 2.35 | 2.46 | 2.73 |
| ◆ 08-00227-04054 | | | 2.5 | | | | | 45 | 6,500 | 2.67 | 2.79 | 2.92 | 3.06 | 3.39 |
| 08-00227-04055 | | | 3 | | | | | 45 | 6,500 | 3.19 | 3.34 | 3.49 | 3.66 | 4.05 |
| 08-00227-04057 | | | 4 | | | | | 45 | 6,500 | 4.24 | 4.43 | 4.63 | 4.86 | 5.38 |
| 08-00227-04101 | | R0.1 | 1 | | | | | 45 | 6,500 | 1.11 | 1.15 | 1.20 | 1.26 | 1.38 |
| 08-00227-04103 | | | 2 | | | | | 45 | 6,500 | 2.15 | 2.24 | 2.34 | 2.45 | 2.71 |
| 08-00227-04105 | | | 3 | | | | | 45 | 6,500 | 3.19 | 3.33 | 3.48 | 3.65 | 4.04 |
| 08-00227-04107 | | | 4 | | | | | 45 | 6,500 | 4.24 | 4.42 | 4.62 | 4.85 | 5.36 |
| ◆ 08-00227-05021 | 0.5 | R0.02 | 1 | 0.4 | 0.46 | 12° | 4 | 45 | 5,300 | 1.14 | 1.19 | 1.24 | 1.30 | 1.44 |
| ◆ 08-00227-05022 | | | 2 | | | | | 45 | 5,300 | 2.18 | 2.27 | 2.38 | 2.50 | 2.77 |
| ◆ 08-00227-05023 | | | 3 | | | | | 45 | 5,300 | 3.22 | 3.36 | 3.52 | 3.69 | 4.10 |
| ◆ 08-00227-05024 | | | 4 | | | | | 45 | 5,300 | 4.26 | 4.45 | 4.66 | 4.89 | 5.42 |
| ◆ 08-00227-05025 | | | 5 | | | | | 45 | 5,300 | 5.31 | 5.54 | 5.80 | 6.09 | 6.75 |
| ◆ 08-00227-05026 | | | 6 | | | | | 45 | 5,300 | 6.35 | 6.63 | 6.94 | 7.28 | 8.08 |
| 08-00227-05051 | | R0.05 | 1 | | | | | 45 | 5,300 | 1.13 | 1.18 | 1.24 | 1.29 | 1.43 |
| 08-00227-05052 | | | 2 | | | | | 45 | 5,300 | 2.18 | 2.27 | 2.38 | 2.49 | 2.76 |
| 08-00227-05053 | | | 3 | | | | | 45 | 5,300 | 3.22 | 3.36 | 3.52 | 3.69 | 4.09 |
| 08-00227-05054 | | | 4 | | | | | 45 | 5,300 | 4.26 | 4.45 | 4.66 | 4.88 | 5.41 |
| 08-00227-05055 | | | 5 | | | | | 45 | 5,300 | 5.31 | 5.54 | 5.80 | 6.08 | 6.74 |
| ◆ 08-00227-05056 | | | 6 | | | | | 45 | 5,300 | 6.35 | 6.63 | 6.94 | 7.28 | 8.07 |

**オーダー方法**
MHRH230R 刃径(D)×コーナー半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate MHRH230R (D)×(R)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

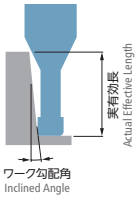
●切削条件表はF-018に記載
●Recommended Milling Conditions are shown on page F-018.

SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.



切削抵抗の少ない点当たりで面粗度アップ!!

Point milling with reducing the machining load to realize fine surface.

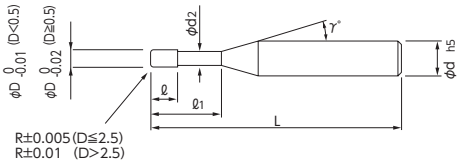


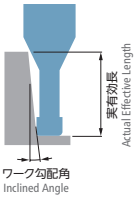

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30´ | 1° | 1°30´ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00227-05101 | 0.5 | R0.1 | 1 | 0.4 | 0.46 | 12° | 4 | 45 | 5,300 | 1.13 | 1.18 | 1.23 | 1.28 | 1.41 |
| 08-00227-05102 | | | 2 | | | | | 45 | 5,300 | 2.17 | 2.27 | 2.37 | 2.48 | 2.74 |
| 08-00227-05103 | | | 3 | | | | | 45 | 5,300 | 3.22 | 3.36 | 3.51 | 3.68 | 4.07 |
| 08-00227-05104 | | | 4 | | | | | 45 | 5,300 | 4.26 | 4.45 | 4.65 | 4.87 | 5.40 |
| 08-00227-05105 | | | 5 | | | | | 45 | 5,300 | 5.30 | 5.54 | 5.79 | 6.07 | 6.72 |
| ◆ 08-00227-05106 | | | 6 | | | | | 45 | 5,300 | 6.35 | 6.63 | 6.93 | 7.27 | 8.05 |
| ◆ 08-00227-06021 | 0.6 | R0.02 | 2 | 0.5 | 0.56 | 12° | 4 | 45 | 5,700 | 2.18 | 2.27 | 2.38 | 2.50 | 2.77 |
| ◆ 08-00227-06023 | | | 4 | | | | | 45 | 5,700 | 4.26 | 4.45 | 4.66 | 4.89 | 5.42 |
| ◆ 08-00227-06025 | | | 6 | | | | | 45 | 5,700 | 6.35 | 6.63 | 6.94 | 7.28 | 8.08 |
| ◆ 08-00227-06027 | | | 8 | | | | | 50 | 5,900 | 8.43 | 8.81 | 9.22 | 9.68 | 10.73 |
| ◆ 08-00227-06029 | | | 10 | | | | | 50 | 5,900 | 10.52 | 10.99 | 11.50 | 12.07 | 13.39 |
| 08-00227-06051 | | R0.05 | 2 | | | | | 45 | 5,700 | 2.18 | 2.27 | 2.38 | 2.49 | 2.76 |
| 08-00227-06053 | | | 4 | | | | | 45 | 5,700 | 4.26 | 4.45 | 4.66 | 4.88 | 5.41 |
| 08-00227-06055 | | | 6 | | | | | 45 | 5,700 | 6.35 | 6.63 | 6.94 | 7.28 | 8.07 |
| ◆ 08-00227-06057 | | | 8 | | | | | 50 | 5,900 | 8.43 | 8.81 | 9.22 | 9.67 | 10.72 |
| ◆ 08-00227-06059 | | | 10 | | | | | 50 | 5,900 | 10.52 | 10.99 | 11.50 | 12.06 | 13.38 |
| 08-00227-06101 | | R0.1 | 2 | | | | | 45 | 5,300 | 2.17 | 2.27 | 2.37 | 2.48 | 2.74 |
| 08-00227-06103 | | | 4 | | | | | 45 | 5,300 | 4.26 | 4.45 | 4.65 | 4.87 | 5.40 |
| 08-00227-06105 | | | 6 | | | | | 45 | 5,300 | 6.35 | 6.63 | 6.93 | 7.27 | 8.05 |
| ◆ 08-00227-06107 | | | 8 | | | | | 50 | 5,500 | 8.43 | 8.80 | 9.21 | 9.66 | 10.71 |
| ◆ 08-00227-06109 | | | 10 | | | | | 50 | 5,500 | 10.52 | 10.98 | 11.49 | 12.05 | 13.36 |
| ◆ 08-00227-07020 | 0.7 | R0.02 | 2 | 0.55 | 0.66 | 12° | 4 | 45 | 6,000 | 2.18 | 2.27 | 2.38 | 2.50 | 2.77 |
| ◆ 08-00227-07021 | | | 4 | | | | | 45 | 6,000 | 4.26 | 4.45 | 4.66 | 4.89 | 5.42 |
| ◆ 08-00227-07023 | | | 6 | | | | | 45 | 6,000 | 6.35 | 6.63 | 6.94 | 7.28 | 8.08 |
| ◆ 08-00227-07050 | | R0.05 | 2 | | | | | 45 | 6,000 | 2.18 | 2.27 | 2.38 | 2.49 | 2.76 |
| 08-00227-07051 | | | 4 | | | | | 45 | 6,000 | 4.26 | 4.45 | 4.66 | 4.88 | 5.41 |
| 08-00227-07053 | | | 6 | | | | | 45 | 6,000 | 6.35 | 6.63 | 6.94 | 7.28 | 8.07 |
| ◆ 08-00227-07100 | | R0.1 | 2 | | | | | 45 | 6,000 | 2.17 | 2.27 | 2.37 | 2.48 | 2.74 |
| 08-00227-07101 | | | 4 | | | | | 45 | 6,000 | 4.26 | 4.45 | 4.65 | 4.87 | 5.40 |
| 08-00227-07103 | | | 6 | | | | | 45 | 6,000 | 6.35 | 6.63 | 6.93 | 7.27 | 8.05 |
| ◆ 08-00227-08020 | 0.8 | R0.02 | 2 | 0.65 | 0.76 | 12° | 4 | 45 | 6,000 | 2.18 | 2.27 | 2.38 | 2.50 | 2.77 |
| ◆ 08-00227-08021 | | | 4 | | | | | 45 | 6,000 | 4.26 | 4.45 | 4.66 | 4.89 | 5.42 |
| ◆ 08-00227-08023 | | | 6 | | | | | 45 | 6,000 | 6.35 | 6.63 | 6.94 | 7.28 | 8.08 |
| ◆ 08-00227-08025 | | | 8 | | | | | 50 | 6,200 | 8.43 | 8.81 | 9.22 | 9.68 | 10.73 |
| ◆ 08-00227-08050 | | R0.05 | 2 | | | | | 45 | 6,000 | 2.18 | 2.27 | 2.38 | 2.49 | 2.76 |
| 08-00227-08051 | | | 4 | | | | | 45 | 6,000 | 4.26 | 4.45 | 4.66 | 4.88 | 5.41 |
| 08-00227-08053 | | | 6 | | | | | 45 | 6,000 | 6.35 | 6.63 | 6.94 | 7.28 | 8.07 |
| 08-00227-08055 | | | 8 | | | | | 50 | 6,200 | 8.43 | 8.81 | 9.22 | 9.67 | 10.72 |
| ◆ 08-00227-08059 | | | 12 | | | | | 50 | 6,200 | 12.60 | 13.17 | 13.78 | 14.46 | 16.03 |
| ◆ 08-00227-08100 | | R0.1 | 2 | | | | | 45 | 6,000 | 2.17 | 2.27 | 2.37 | 2.48 | 2.74 |
| 08-00227-08101 | | | 4 | | | | | 45 | 6,000 | 4.26 | 4.45 | 4.65 | 4.87 | 5.40 |
| 08-00227-08103 | | | 6 | | | | | 45 | 6,000 | 6.35 | 6.63 | 6.93 | 7.27 | 8.05 |
| 08-00227-08105 | | | 8 | | | | | 50 | 6,200 | 8.43 | 8.80 | 9.21 | 9.66 | 10.71 |
| ◆ 08-00227-08109 | | | 12 | | | | | 50 | 6,200 | 12.60 | 13.16 | 13.77 | 14.45 | 16.01 |
| ◆ 08-00227-08200 | | R0.2 | 2 | | | | | 45 | 6,000 | 2.17 | 2.26 | 2.36 | 2.46 | 2.71 |
| 08-00227-08201 | | | 4 | | | | | 45 | 6,000 | 4.26 | 4.44 | 4.64 | 4.85 | 5.36 |
| 08-00227-08203 | | | 6 | | | | | 45 | 6,000 | 6.34 | 6.62 | 6.92 | 7.25 | 8.02 |
| 08-00227-08205 | | | 8 | | | | | 50 | 6,200 | 8.43 | 8.80 | 9.20 | 9.64 | 10.67 |
| ◆ 08-00227-08209 | | | 12 | | | | | 50 | 6,200 | 12.60 | 13.15 | 13.76 | 14.43 | 15.98 |
| 08-00227-09101 | 0.9 | R0.1 | 4 | 0.7 | 0.85 | 12° | 4 | 45 | 6,800 | 4.28 | 4.47 | 4.68 | 4.90 | 5.43 |
| 08-00227-09105 | | | 8 | | | | | 50 | 6,800 | 8.46 | 8.83 | 9.24 | 9.69 | 10.74 |

# MHRH430R

## 無限コーティングプレミアム 高硬度用4枚刃ロングネックラジアスエンドミル

MUGEN-COATING PREMIUM 4-Flute Long Neck Radius End Mill for Hardened Steel




- 高硬度用の無限コーティングプレミアムと新形状の採用で耐チッピング性に優れ、ビビリを抑えることにより仕上げ面が向上。
- 高能率加工が可能な 4 枚刃タイプ。
- 全 326サイズ。
- MUGEN-COATING PREMIUM for hardened steels and unique new design excel in chipping prevention and resolve chattering to realize excellent finished surface.
- 4 flutes end mill for higher efficiency.
- Total 326 sizes.

φ0.2及びφ0.3の底刃は、軸中心まで刃がありません。削り残しにご注意ください。
Beware of stocks because there is no blade to the shaft center of end teeth of φ0.2 and φ0.3.

**[首部形状について]**
表記の首角(γ)は目安になります。被削材との干渉が心配される時は、必ず実測での確認をお願いします。

(Neck Shape)
(γ) is reference value.Tool measurement required in order to avoid interference to the work material.

技術資料 K-022

Slot Side Face

MG Premium 4 30° ≦65 HRC

### 被削材 Work Material

| 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | ○ | ○ |

◆ New サイズ
★ 再研磨可能 (詳細はお問い合わせください。)

単位 [寸法：mm / 価格：円] Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ◆ 08-00237-02021 | 0.2 | R0.02 | 0.5 | 0.15 | 0.18 | 12° | 4 | 45 | 13,600 | 0.56 | 0.59 | 0.62 | 0.65 | 0.71 |
| ◆ 08-00237-02023 | | | 1 | | | | | 45 | 13,600 | 1.09 | 1.13 | 1.19 | 1.24 | 1.38 |
| ◆ 08-00237-02025 | | | 1.5 | | | | | 45 | 16,000 | 1.61 | 1.68 | 1.76 | 1.84 | 2.04 |
| ◆ 08-00237-02027 | | | 2 | | | | | 45 | 17,500 | 2.13 | 2.22 | 2.33 | 2.44 | 2.71 |
| ◆ 08-00237-02051 | | R0.05 | 0.5 | | | | | 45 | 13,600 | 0.56 | 0.59 | 0.61 | 0.64 | 0.70 |
| ◆ 08-00237-02053 | | | 1 | | | | | 45 | 13,600 | 1.08 | 1.13 | 1.18 | 1.24 | 1.37 |
| ◆ 08-00237-02055 | | | 1.5 | | | | | 45 | 16,000 | 1.61 | 1.68 | 1.75 | 1.84 | 2.03 |
| ◆ 08-00237-02057 | | | 2 | | | | | 45 | 17,500 | 2.13 | 2.22 | 2.32 | 2.43 | 2.70 |
| ◆ 08-00237-03021 | 0.3 | R0.02 | 1 | 0.25 | 0.28 | 12° | 4 | 45 | 13,200 | 1.09 | 1.13 | 1.19 | 1.24 | 1.38 |
| ◆ 08-00237-03022 | | | 1.5 | | | | | 45 | 13,200 | 1.61 | 1.68 | 1.76 | 1.84 | 2.04 |
| ◆ 08-00237-03023 | | | 2 | | | | | 45 | 13,200 | 2.13 | 2.22 | 2.33 | 2.44 | 2.71 |
| ◆ 08-00237-03024 | | | 2.5 | | | | | 45 | 16,500 | 2.65 | 2.77 | 2.90 | 3.04 | 3.37 |
| ◆ 08-00237-03025 | | | 3 | | | | | 45 | 16,500 | 3.17 | 3.31 | 3.47 | 3.64 | 4.03 |
| ◆ 08-00237-03051 | | R0.05 | 1 | | | | | 45 | 13,200 | 1.08 | 1.13 | 1.18 | 1.24 | 1.37 |
| ◆ 08-00237-03052 | | | 1.5 | | | | | 45 | 13,200 | 1.61 | 1.68 | 1.75 | 1.84 | 2.03 |
| ◆ 08-00237-03053 | | | 2 | | | | | 45 | 13,200 | 2.13 | 2.22 | 2.32 | 2.43 | 2.70 |
| ◆ 08-00237-03054 | | | 2.5 | | | | | 45 | 16,500 | 2.65 | 2.77 | 2.89 | 3.03 | 3.36 |
| ◆ 08-00237-03055 | | | 3 | | | | | 45 | 16,500 | 3.17 | 3.31 | 3.46 | 3.63 | 4.02 |
| ◆ 08-00237-04021 | 0.4 | R0.02 | 1 | 0.3 | 0.37 | 12° | 4 | 45 | 8,800 | 1.11 | 1.16 | 1.21 | 1.27 | 1.41 |
| ◆ 08-00237-04022 | | | 1.5 | | | | | 45 | 8,800 | 1.63 | 1.70 | 1.78 | 1.87 | 2.07 |
| ◆ 08-00237-04023 | | | 2 | | | | | 45 | 8,800 | 2.15 | 2.25 | 2.35 | 2.47 | 2.74 |
| ◆ 08-00237-04024 | | | 2.5 | | | | | 45 | 8,800 | 2.67 | 2.79 | 2.92 | 3.07 | 3.40 |
| ◆ 08-00237-04025 | | | 3 | | | | | 45 | 8,800 | 3.20 | 3.34 | 3.49 | 3.67 | 4.06 |
| ◆ 08-00237-04027 | | | 4 | | | | | 45 | 8,800 | 4.24 | 4.43 | 4.63 | 4.86 | 5.39 |
| ◆ 08-00237-04051 | | R0.05 | 1 | | | | | 45 | 8,800 | 1.11 | 1.16 | 1.21 | 1.27 | 1.40 |
| ◆ 08-00237-04052 | | | 1.5 | | | | | 45 | 8,800 | 1.63 | 1.70 | 1.78 | 1.86 | 2.06 |
| ◆ 08-00237-04053 | | | 2 | | | | | 45 | 8,800 | 2.15 | 2.25 | 2.35 | 2.46 | 2.73 |
| ◆ 08-00237-04054 | | | 2.5 | | | | | 45 | 8,800 | 2.67 | 2.79 | 2.92 | 3.06 | 3.39 |
| ◆ 08-00237-04055 | | | 3 | | | | | 45 | 8,800 | 3.19 | 3.34 | 3.49 | 3.66 | 4.05 |
| ◆ 08-00237-04057 | | | 4 | | | | | 45 | 8,800 | 4.24 | 4.43 | 4.63 | 4.86 | 5.38 |
| ◆ 08-00237-04101 | | R0.1 | 1 | | | | | 45 | 8,800 | 1.11 | 1.15 | 1.20 | 1.26 | 1.38 |
| ◆ 08-00237-04103 | | | 2 | | | | | 45 | 8,800 | 2.15 | 2.24 | 2.34 | 2.45 | 2.71 |
| ◆ 08-00237-04105 | | | 3 | | | | | 45 | 8,800 | 3.19 | 3.33 | 3.48 | 3.65 | 4.04 |
| ◆ 08-00237-04107 | | | 4 | | | | | 45 | 8,800 | 4.24 | 4.42 | 4.62 | 4.85 | 5.36 |
| ◆ 08-00237-05021 | 0.5 | R0.02 | 1 | 0.4 | 0.46 | 12° | 4 | 45 | 7,200 | 1.14 | 1.19 | 1.24 | 1.30 | 1.44 |
| ◆ 08-00237-05022 | | | 2 | | | | | 45 | 7,200 | 2.18 | 2.27 | 2.38 | 2.50 | 2.77 |
| ◆ 08-00237-05023 | | | 3 | | | | | 45 | 7,200 | 3.22 | 3.36 | 3.52 | 3.69 | 4.10 |
| ◆ 08-00237-05024 | | | 4 | | | | | 45 | 7,200 | 4.26 | 4.45 | 4.66 | 4.89 | 5.42 |
| ◆ 08-00237-05025 | | | 5 | | | | | 45 | 7,200 | 5.31 | 5.54 | 5.80 | 6.09 | 6.75 |
| ◆ 08-00237-05026 | | | 6 | | | | | 45 | 7,200 | 6.35 | 6.63 | 6.94 | 7.28 | 8.08 |

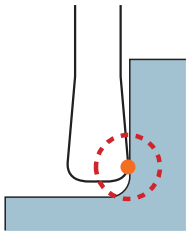
**オーダー方法** MHRH430R 刃径(D)×コーナー半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate MHRH430R (D)×(R)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

- 切削条件表はF-019に記載
- Recommended Milling Conditions are shown on page F-019.

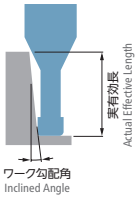


SEVKET ÖĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.



切削抵抗の少ない点当たりで面粗度アップ!!

Point milling with reducing the machining load to realize fine surface.

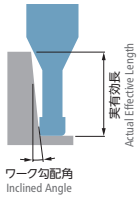



| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30´ | 1° | 1°30´ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00237-05051 | 0.5 | R0.05 | 1 | 0.4 | 0.46 | 12° | 4 | 45 | 7,200 | 1.13 | 1.18 | 1.24 | 1.29 | 1.43 |
| 08-00237-05052 | | | 2 | | | | | 45 | 7,200 | 2.18 | 2.27 | 2.38 | 2.49 | 2.76 |
| 08-00237-05053 | | | 3 | | | | | 45 | 7,200 | 3.22 | 3.36 | 3.52 | 3.69 | 4.09 |
| 08-00237-05054 | | | 4 | | | | | 45 | 7,200 | 4.26 | 4.45 | 4.66 | 4.88 | 5.41 |
| 08-00237-05055 | | | 5 | | | | | 45 | 7,200 | 5.31 | 5.54 | 5.80 | 6.08 | 6.74 |
| 08-00237-05056 | | | 6 | | | | | 45 | 7,200 | 6.35 | 6.63 | 6.94 | 7.28 | 8.07 |
| 08-00237-05101 | | R0.1 | 1 | | | | | 45 | 7,200 | 1.13 | 1.18 | 1.23 | 1.28 | 1.41 |
| 08-00237-05102 | | | 2 | | | | | 45 | 7,200 | 2.17 | 2.27 | 2.37 | 2.48 | 2.74 |
| 08-00237-05103 | | | 3 | | | | | 45 | 7,200 | 3.22 | 3.36 | 3.51 | 3.68 | 4.07 |
| 08-00237-05104 | | | 4 | | | | | 45 | 7,200 | 4.26 | 4.45 | 4.65 | 4.87 | 5.40 |
| 08-00237-05105 | | | 5 | | | | | 45 | 7,200 | 5.30 | 5.54 | 5.79 | 6.07 | 6.72 |
| 08-00237-05106 | | | 6 | | | | | 45 | 7,200 | 6.35 | 6.63 | 6.93 | 7.27 | 8.05 |
| 08-00237-06021 | 0.6 | R0.02 | 2 | 0.5 | 0.56 | 12° | 4 | 45 | 7,700 | 2.18 | 2.27 | 2.38 | 2.50 | 2.77 |
| 08-00237-06023 | | | 4 | | | | | 45 | 7,700 | 4.26 | 4.45 | 4.66 | 4.89 | 5.42 |
| 08-00237-06025 | | | 6 | | | | | 45 | 7,700 | 6.35 | 6.63 | 6.94 | 7.28 | 8.08 |
| 08-00237-06027 | | | 8 | | | | | 50 | 8,000 | 8.43 | 8.81 | 9.22 | 9.68 | 10.73 |
| 08-00237-06029 | | | 10 | | | | | 50 | 8,000 | 10.52 | 10.99 | 11.50 | 12.07 | 13.39 |
| 08-00237-06051 | | R0.05 | 2 | | | | | 45 | 7,700 | 2.18 | 2.27 | 2.38 | 2.49 | 2.76 |
| 08-00237-06053 | | | 4 | | | | | 45 | 7,700 | 4.26 | 4.45 | 4.66 | 4.88 | 5.41 |
| 08-00237-06055 | | | 6 | | | | | 45 | 7,700 | 6.35 | 6.63 | 6.94 | 7.28 | 8.07 |
| 08-00237-06057 | | | 8 | | | | | 50 | 8,000 | 8.43 | 8.81 | 9.22 | 9.67 | 10.72 |
| 08-00237-06059 | | | 10 | | | | | 50 | 8,000 | 10.52 | 10.99 | 11.50 | 12.06 | 13.38 |
| 08-00237-06101 | | R0.1 | 2 | | | | | 45 | 7,200 | 2.17 | 2.27 | 2.37 | 2.48 | 2.74 |
| 08-00237-06103 | | | 4 | | | | | 45 | 7,200 | 4.26 | 4.45 | 4.65 | 4.87 | 5.40 |
| 08-00237-06105 | | | 6 | | | | | 45 | 7,200 | 6.35 | 6.63 | 6.93 | 7.27 | 8.05 |
| 08-00237-06107 | | | 8 | | | | | 50 | 7,400 | 8.43 | 8.80 | 9.21 | 9.66 | 10.71 |
| 08-00237-06109 | | | 10 | | | | | 50 | 7,400 | 10.52 | 10.98 | 11.49 | 12.05 | 13.36 |
| 08-00237-07020 | 0.7 | R0.02 | 2 | 0.55 | 0.66 | 12° | 4 | 45 | 8,100 | 2.18 | 2.27 | 2.38 | 2.50 | 2.77 |
| 08-00237-07021 | | | 4 | | | | | 45 | 8,100 | 4.26 | 4.45 | 4.66 | 4.89 | 5.42 |
| 08-00237-07023 | | | 6 | | | | | 45 | 8,100 | 6.35 | 6.63 | 6.94 | 7.28 | 8.08 |
| 08-00237-07050 | | R0.05 | 2 | | | | | 45 | 8,100 | 2.18 | 2.27 | 2.38 | 2.49 | 2.76 |
| 08-00237-07051 | | | 4 | | | | | 45 | 8,100 | 4.26 | 4.45 | 4.66 | 4.88 | 5.41 |
| 08-00237-07053 | | | 6 | | | | | 45 | 8,100 | 6.35 | 6.63 | 6.94 | 7.28 | 8.07 |
| 08-00237-07100 | | R0.1 | 2 | | | | | 45 | 8,100 | 2.17 | 2.27 | 2.37 | 2.48 | 2.74 |
| 08-00237-07101 | | | 4 | | | | | 45 | 8,100 | 4.26 | 4.45 | 4.65 | 4.87 | 5.40 |
| 08-00237-07103 | | | 6 | | | | | 45 | 8,100 | 6.35 | 6.63 | 6.93 | 7.27 | 8.05 |
| 08-00237-08020 | 0.8 | R0.02 | 2 | 0.65 | 0.76 | 12° | 4 | 45 | 8,100 | 2.18 | 2.27 | 2.38 | 2.50 | 2.77 |
| 08-00237-08021 | | | 4 | | | | | 45 | 8,100 | 4.26 | 4.45 | 4.66 | 4.89 | 5.42 |
| 08-00237-08023 | | | 6 | | | | | 45 | 8,100 | 6.35 | 6.63 | 6.94 | 7.28 | 8.08 |
| 08-00237-08025 | | | 8 | | | | | 50 | 8,400 | 8.43 | 8.81 | 9.22 | 9.68 | 10.73 |
| 08-00237-08050 | | R0.05 | 2 | | | | | 45 | 8,100 | 2.18 | 2.27 | 2.38 | 2.49 | 2.76 |
| 08-00237-08051 | | | 4 | | | | | 45 | 8,100 | 4.26 | 4.45 | 4.66 | 4.88 | 5.41 |
| 08-00237-08053 | | | 6 | | | | | 45 | 8,100 | 6.35 | 6.63 | 6.94 | 7.28 | 8.07 |
| 08-00237-08055 | | | 8 | | | | | 50 | 8,400 | 8.43 | 8.81 | 9.22 | 9.67 | 10.72 |
| 08-00237-08059 | | | 12 | | | | | 50 | 8,400 | 12.60 | 13.17 | 13.78 | 14.46 | 16.03 |
| 08-00237-08100 | | R0.1 | 2 | | | | | 45 | 8,100 | 2.17 | 2.27 | 2.37 | 2.48 | 2.74 |
| 08-00237-08101 | | | 4 | | | | | 45 | 8,100 | 4.26 | 4.45 | 4.65 | 4.87 | 5.40 |
| 08-00237-08103 | | | 6 | | | | | 45 | 8,100 | 6.35 | 6.63 | 6.93 | 7.27 | 8.05 |
| 08-00237-08105 | | | 8 | | | | | 50 | 8,400 | 8.43 | 8.80 | 9.21 | 9.66 | 10.71 |
| 08-00237-08109 | | | 12 | | | | | 50 | 8,400 | 12.60 | 13.16 | 13.77 | 14.45 | 16.01 |
| 08-00237-08200 | | R0.2 | 2 | | | | | 45 | 8,100 | 2.17 | 2.26 | 2.36 | 2.46 | 2.71 |
| 08-00237-08201 | | | 4 | | | | | 45 | 8,100 | 4.26 | 4.44 | 4.64 | 4.85 | 5.36 |
| 08-00237-08203 | | | 6 | | | | | 45 | 8,100 | 6.34 | 6.62 | 6.92 | 7.25 | 8.02 |
| 08-00237-08205 | | | 8 | | | | | 50 | 8,400 | 8.43 | 8.80 | 9.20 | 9.64 | 10.67 |
| 08-00237-08209 | | | 12 | | | | | 50 | 8,400 | 12.60 | 13.15 | 13.76 | 14.43 | 15.98 |

# MHRH430R

## 無限コーティングプレミアム 高硬度用4枚刃ロングネックラジアスエンドミル

MUGEN-COATING PREMIUM 4-Flute Long Neck Radius End Mill for Hardened Steel




◆ New サイズ
★ 再研磨可能 （詳細はお問い合わせください。）

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ◆ 08-00237-09101 | 0.9 | R0.1 | 4 | 0.7 | 0.85 | 12° | 4 | 45 | 9,200 | 4.28 | 4.47 | 4.68 | 4.90 | 5.43 |
| ◆ 08-00237-09105 | | | 8 | | | | | 50 | 9,200 | 8.46 | 8.83 | 9.24 | 9.69 | 10.74 |
| ◆ 08-00237-10028 | 1 | R0.02 | 2 | 0.8 | 0.95 | 12° | 4 | 50 | 6,200 | 2.20 | 2.30 | 2.41 | 2.52 | 2.80 |
| ◆ 08-00237-10020 | | | 3 | | | | | 50 | 6,200 | 3.25 | 3.39 | 3.55 | 3.72 | 4.13 |
| ◆ 08-00237-10021 | | | 4 | | | | | 50 | 6,200 | 4.29 | 4.48 | 4.69 | 4.92 | 5.45 |
| ◆ 08-00237-10022 | | | 5 | | | | | 50 | 6,800 | 5.33 | 5.57 | 5.83 | 6.11 | 6.78 |
| ◆ 08-00237-10023 | | | 6 | | | | | 50 | 6,800 | 6.37 | 6.66 | 6.97 | 7.31 | 8.11 |
| ◆ 08-00237-10025 | | | 8 | | | | | 50 | 6,800 | 8.46 | 8.84 | 9.25 | 9.70 | 10.76 |
| ◆ 08-00237-10027 | | | 10 | | | | | 50 | 6,800 | 10.54 | 11.02 | 11.53 | 12.10 | 13.42 |
| 08-00237-10058 | | R0.05 | 2 | | | | | 50 | 6,200 | 2.20 | 2.30 | 2.40 | 2.52 | 2.79 |
| 08-00237-10050 | | | 3 | | | | | 50 | 6,200 | 3.24 | 3.39 | 3.54 | 3.72 | 4.12 |
| 08-00237-10051 | | | 4 | | | | | 50 | 6,200 | 4.29 | 4.48 | 4.68 | 4.91 | 5.44 |
| 08-00237-10052 | | | 5 | | | | | 50 | 6,800 | 5.33 | 5.57 | 5.82 | 6.11 | 6.77 |
| 08-00237-10053 | | | 6 | | | | | 50 | 6,800 | 6.37 | 6.66 | 6.97 | 7.31 | 8.10 |
| 08-00237-10055 | | | 8 | | | | | 50 | 6,800 | 8.46 | 8.83 | 9.25 | 9.70 | 10.75 |
| 08-00237-10057 | | | 10 | | | | | 50 | 6,800 | 10.54 | 11.01 | 11.53 | 12.09 | 13.41 |
| 08-00237-10108 | | R0.1 | 2 | | | | | 50 | 6,200 | 2.20 | 2.29 | 2.40 | 2.51 | 2.77 |
| 08-00237-10100 | | | 3 | | | | | 50 | 6,200 | 3.24 | 3.38 | 3.54 | 3.71 | 4.10 |
| 08-00237-10101 | | | 4 | | | | | 50 | 6,200 | 4.28 | 4.47 | 4.68 | 4.90 | 5.43 |
| 08-00237-10102 | | | 5 | | | | | 50 | 6,800 | 5.33 | 5.56 | 5.82 | 6.10 | 6.75 |
| 08-00237-10103 | | | 6 | | | | | 50 | 6,800 | 6.37 | 6.65 | 6.96 | 7.30 | 8.08 |
| 08-00237-10105 | | | 8 | | | | | 50 | 6,800 | 8.46 | 8.83 | 9.24 | 9.69 | 10.74 |
| 08-00237-10107 | | | 10 | | | | | 50 | 6,800 | 10.54 | 11.01 | 11.52 | 12.08 | 13.39 |
| 08-00237-10208 | | R0.2 | 2 | | | | | 50 | 6,200 | 2.19 | 2.28 | 2.38 | 2.49 | 2.74 |
| 08-00237-10200 | | | 3 | | | | | 50 | 6,200 | 3.24 | 3.37 | 3.52 | 3.69 | 4.07 |
| 08-00237-10201 | | | 4 | | | | | 50 | 6,200 | 4.28 | 4.46 | 4.66 | 4.88 | 5.39 |
| 08-00237-10202 | | | 5 | | | | | 50 | 6,800 | 5.32 | 5.55 | 5.80 | 6.08 | 6.72 |
| 08-00237-10203 | | | 6 | | | | | 50 | 6,800 | 6.37 | 6.64 | 6.94 | 7.28 | 8.05 |
| 08-00237-10205 | | | 8 | | | | | 50 | 6,800 | 8.45 | 8.82 | 9.23 | 9.67 | 10.70 |
| 08-00237-10207 | | | 10 | | | | | 50 | 6,800 | 10.54 | 11.00 | 11.51 | 12.06 | 13.36 |
| 08-00237-10308 | | R0.3 | 2 | | | | | 50 | 6,200 | 2.19 | 2.28 | 2.37 | 2.47 | 2.71 |
| 08-00237-10300 | | | 3 | | | | | 50 | 6,200 | 3.23 | 3.36 | 3.51 | 3.67 | 4.03 |
| 08-00237-10301 | | | 4 | | | | | 50 | 6,200 | 4.28 | 4.45 | 4.65 | 4.86 | 5.36 |
| 08-00237-10302 | | | 5 | | | | | 50 | 6,800 | 5.32 | 5.54 | 5.79 | 6.06 | 6.69 |
| 08-00237-10303 | | | 6 | | | | | 50 | 6,800 | 6.36 | 6.63 | 6.93 | 7.26 | 8.02 |
| 08-00237-10305 | | | 8 | | | | | 50 | 6,800 | 8.45 | 8.81 | 9.21 | 9.65 | 10.67 |
| 08-00237-10307 | | | 10 | | | | | 50 | 6,800 | 10.53 | 10.99 | 11.49 | 12.04 | 13.33 |
| 08-00237-12101 | 1.2 | R0.1 | 5 | 1 | 1.14 | 12° | 4 | 50 | 7,000 | 5.35 | 5.59 | 5.84 | 6.13 | 6.79 |
| 08-00237-12103 | | | 10 | | | | | 50 | 7,000 | 10.57 | 11.03 | 11.55 | 12.11 | 13.42 |
| 08-00237-12201 | | R0.2 | 5 | | | | | 50 | 7,000 | 5.35 | 5.58 | 5.83 | 6.11 | 6.75 |
| 08-00237-12203 | | | 10 | | | | | 50 | 7,000 | 10.56 | 11.03 | 11.53 | 12.09 | 13.39 |
| 08-00237-12301 | | R0.3 | 5 | | | | | 50 | 7,000 | 5.34 | 5.57 | 5.82 | 6.09 | 6.72 |
| 08-00237-12303 | | | 10 | | | | | 50 | 7,000 | 10.56 | 11.02 | 11.52 | 12.07 | 13.36 |
| ◆ 08-00237-15020 | 1.5 | R0.02 | 3 | 1.2 | 1.43 | 12° | 4 | 50 | 6,600 | 3.29 | 3.44 | 3.60 | 3.78 | 4.19 |
| ◆ 08-00237-15021 | | | 4 | | | | | 50 | 6,600 | 4.34 | 4.53 | 4.74 | 4.97 | 5.52 |
| ◆ 08-00237-15023 | | | 6 | | | | | 50 | 6,600 | 6.42 | 6.71 | 7.02 | 7.37 | 8.17 |
| ◆ 08-00237-15025 | | | 8 | | | | | 50 | 7,000 | 8.51 | 8.89 | 9.30 | 9.76 | 10.82 |
| ◆ 08-00237-15027 | | | 12 | | | | | 50 | 7,000 | 12.68 | 13.25 | 13.87 | 14.55 | 16.13 |
| ◆ 08-00237-15029 | | | 15 | | | | | 50 | 7,000 | 15.81 | 16.51 | 17.29 | 18.14 | 20.12 |
| 08-00237-15050 | | R0.05 | 3 | | | | | 50 | 6,600 | 3.29 | 3.44 | 3.60 | 3.77 | 4.18 |
| 08-00237-15051 | | | 4 | | | | | 50 | 6,600 | 4.34 | 4.53 | 4.74 | 4.97 | 5.51 |
| 08-00237-15053 | | | 6 | | | | | 50 | 6,600 | 6.42 | 6.71 | 7.02 | 7.36 | 8.16 |
| 08-00237-15055 | | | 8 | | | | | 50 | 7,000 | 8.51 | 8.89 | 9.30 | 9.75 | 10.82 |
| 08-00237-15057 | | | 12 | | | | | 50 | 7,000 | 12.68 | 13.24 | 13.86 | 14.54 | 16.12 |
| 08-00237-15059 | | | 15 | | | | | 50 | 7,000 | 15.81 | 16.51 | 17.28 | 18.13 | 20.11 |

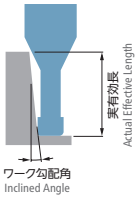
**オーダー方法** MHRH430R 刃径(D)×コーナー半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate MHRH430R (D)×(R)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はF-019に記載
●Recommended Milling Conditions are shown on page F-019.



SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

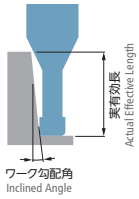



| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00237-15100 | 1.5 | R0.1 | 3 | 1.2 | 1.43 | 12° | 4 | 50 | 6,600 | 3.29 | 3.43 | 3.59 | 3.76 | 4.16 |
| 08-00237-15101 | | | 4 | | | | | 50 | 6,600 | 4.33 | 4.52 | 4.73 | 4.96 | 5.49 |
| 08-00237-15103 | | | 6 | | | | | 50 | 6,600 | 6.42 | 6.70 | 7.01 | 7.35 | 8.14 |
| 08-00237-15105 | | | 8 | | | | | 50 | 7,000 | 8.50 | 8.88 | 9.29 | 9.75 | 10.80 |
| 08-00237-15107 | | | 12 | | | | | 50 | 7,000 | 12.68 | 13.24 | 13.85 | 14.53 | 16.11 |
| 08-00237-15109 | | | 15 | | | | | 60 | 7,000 | 15.80 | 16.51 | 17.28 | 18.12 | 20.09 |
| 08-00237-15200 | | R0.2 | 3 | | | | | 50 | 6,600 | 3.29 | 3.42 | 3.58 | 3.74 | 4.13 |
| 08-00237-15201 | | | 4 | | | | | 50 | 6,600 | 4.33 | 4.51 | 4.72 | 4.94 | 5.46 |
| 08-00237-15203 | | | 6 | | | | | 50 | 6,600 | 6.42 | 6.69 | 7.00 | 7.33 | 8.11 |
| 08-00237-15205 | | | 8 | | | | | 50 | 7,000 | 8.50 | 8.87 | 9.28 | 9.73 | 10.77 |
| 08-00237-15207 | | | 12 | | | | | 50 | 7,000 | 12.67 | 13.23 | 13.84 | 14.51 | 16.08 |
| 08-00237-15209 | | | 15 | | | | | 60 | 7,000 | 15.80 | 16.50 | 17.26 | 18.10 | 20.06 |
| 08-00237-15300 | | R0.3 | 3 | | | | | 50 | 6,600 | 3.28 | 3.42 | 3.56 | 3.72 | 4.10 |
| 08-00237-15301 | | | 4 | | | | | 50 | 6,600 | 4.33 | 4.51 | 4.70 | 4.92 | 5.42 |
| 08-00237-15303 | | | 6 | | | | | 50 | 6,600 | 6.41 | 6.68 | 6.98 | 7.31 | 8.08 |
| 08-00237-15305 | | | 8 | | | | | 50 | 7,000 | 8.50 | 8.86 | 9.26 | 9.71 | 10.73 |
| 08-00237-15307 | | | 12 | | | | | 50 | 7,000 | 12.67 | 13.22 | 13.83 | 14.49 | 16.04 |
| 08-00237-15309 | | | 15 | | | | | 60 | 7,000 | 15.80 | 16.49 | 17.25 | 18.08 | 20.02 |
| 08-00237-15500 | | R0.5 | 3 | | | | | 50 | 6,600 | 3.27 | 3.40 | 3.53 | 3.68 | 4.03 |
| 08-00237-15501 | | | 4 | | | | | 50 | 6,600 | 4.32 | 4.49 | 4.67 | 4.88 | 5.36 |
| 08-00237-15503 | | | 6 | | | | | 50 | 6,600 | 6.40 | 6.67 | 6.96 | 7.27 | 8.01 |
| 08-00237-15505 | | | 8 | | | | | 50 | 7,000 | 8.49 | 8.85 | 9.24 | 9.67 | 10.67 |
| 08-00237-15507 | | | 12 | | | | | 50 | 7,000 | 12.66 | 13.20 | 13.80 | 14.45 | 15.98 |
| 08-00237-15509 | | | 15 | | | | | 60 | 7,000 | 15.79 | 16.47 | 17.22 | 18.04 | 19.96 |
| ◆ 08-00237-20020 | 2 | R0.02 | 4 | 1.6 | 1.91 | 12° | 4 | 50 | 6,600 | 4.39 | 4.58 | 4.80 | 5.03 | 5.58 |
| ◆ 08-00237-20021 | | | 6 | | | | | 50 | 6,600 | 6.47 | 6.76 | 7.08 | 7.42 | 8.23 |
| ◆ 08-00237-20023 | | | 8 | | | | | 50 | 7,000 | 8.56 | 8.94 | 9.36 | 9.82 | 10.89 |
| ◆ 08-00237-20025 | | | 12 | | | | | 50 | 7,000 | 12.73 | 13.30 | 13.92 | 14.60 | 16.20 |
| ◆ 08-00237-20027 | | | 16 | | | | | 60 | 7,000 | 16.90 | 17.66 | 18.48 | 19.39 | 21.51 |
| ◆ 08-00237-20029 | | | 20 | | | | | 60 | 7,000 | 21.07 | 22.01 | 23.04 | 24.18 | Free |
| 08-00237-20050 | | R0.05 | 4 | | | | | 50 | 6,600 | 4.38 | 4.58 | 4.79 | 5.02 | 5.57 |
| 08-00237-20051 | | | 6 | | | | | 50 | 6,600 | 6.47 | 6.76 | 7.07 | 7.42 | 8.22 |
| 08-00237-20053 | | | 8 | | | | | 50 | 7,000 | 8.56 | 8.94 | 9.35 | 9.81 | 10.88 |
| 08-00237-20055 | | | 12 | | | | | 50 | 7,000 | 12.73 | 13.29 | 13.92 | 14.60 | 16.19 |
| 08-00237-20057 | | | 16 | | | | | 60 | 7,000 | 16.90 | 17.65 | 18.48 | 19.38 | 21.50 |
| 08-00237-20059 | | | 20 | | | | | 60 | 7,000 | 21.07 | 22.01 | 23.04 | 24.17 | Free |
| 08-00237-20100 | | R0.1 | 4 | | | | | 50 | 6,600 | 4.38 | 4.57 | 4.78 | 5.02 | 5.55 |
| 08-00237-20101 | | | 6 | | | | | 50 | 6,600 | 6.47 | 6.75 | 7.07 | 7.41 | 8.21 |
| 08-00237-20103 | | | 8 | | | | | 50 | 7,000 | 8.55 | 8.93 | 9.35 | 9.80 | 10.86 |
| 08-00237-20105 | | | 12 | | | | | 50 | 7,000 | 12.73 | 13.29 | 13.91 | 14.59 | 16.17 |
| 08-00237-20107 | | | 16 | | | | | 60 | 7,000 | 16.90 | 17.65 | 18.47 | 19.37 | 21.48 |
| 08-00237-20109 | | | 20 | | | | | 60 | 7,000 | 21.07 | 22.01 | 23.03 | 24.16 | Free |
| 08-00237-20200 | | R0.2 | 4 | | | | | 50 | 6,600 | 4.38 | 4.57 | 4.77 | 5.00 | 5.52 |
| 08-00237-20201 | | | 6 | | | | | 50 | 6,600 | 6.46 | 6.74 | 7.05 | 7.39 | 8.17 |
| 08-00237-20203 | | | 8 | | | | | 50 | 7,000 | 8.55 | 8.92 | 9.33 | 9.78 | 10.83 |
| 08-00237-20205 | | | 12 | | | | | 50 | 7,000 | 12.72 | 13.28 | 13.89 | 14.57 | 16.14 |
| 08-00237-20207 | | | 16 | | | | | 60 | 7,000 | 16.89 | 17.64 | 18.46 | 19.35 | 21.45 |
| 08-00237-20209 | | | 20 | | | | | 60 | 7,000 | 21.06 | 22.00 | 23.02 | 24.14 | Free |
| 08-00237-20300 | | R0.3 | 4 | | | | | 50 | 6,600 | 4.37 | 4.56 | 4.76 | 4.98 | 5.49 |
| 08-00237-20301 | | | 6 | | | | | 50 | 6,600 | 6.46 | 6.74 | 7.04 | 7.37 | 8.14 |
| 08-00237-20303 | | | 8 | | | | | 50 | 7,000 | 8.55 | 8.91 | 9.32 | 9.76 | 10.80 |
| 08-00237-20305 | | | 12 | | | | | 50 | 7,000 | 12.72 | 13.27 | 13.88 | 14.55 | 16.10 |
| 08-00237-20307 | | | 16 | | | | | 60 | 7,000 | 16.89 | 17.63 | 18.44 | 19.33 | 21.41 |
| 08-00237-20309 | | | 20 | | | | | 60 | 7,000 | 21.06 | 21.99 | 23.00 | 24.12 | Free |
| 08-00237-20500 | | R0.5 | 4 | | | | | 50 | 6,600 | 4.37 | 4.54 | 4.73 | 4.94 | 5.42 |
| 08-00237-20501 | | | 6 | | | | | 50 | 6,600 | 6.45 | 6.72 | 7.01 | 7.33 | 8.08 |
| 08-00237-20503 | | | 8 | | | | | 50 | 7,000 | 8.54 | 8.90 | 9.29 | 9.72 | 10.73 |
| 08-00237-20505 | | | 12 | | | | | 50 | 7,000 | 12.71 | 13.25 | 13.85 | 14.51 | 16.04 |
| 08-00237-20507 | | | 16 | | | | | 60 | 7,000 | 16.88 | 17.61 | 18.41 | 19.30 | 21.35 |
| 08-00237-20509 | | | 20 | | | | | 60 | 7,000 | 21.05 | 21.97 | 22.98 | 24.08 | Free |

# MHRH430R

## 無限コーティングプレミアム 高硬度用4枚刃ロングネックラジアスエンドミル

MUGEN-COATING PREMIUM 4-Flute Long Neck Radius End Mill for Hardened Steel




◆ New サイズ
★ 再研磨可能 （詳細はお問い合わせください。）

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00237-25101 | 2.5 | R0.1 | 10 | 2 | 2.39 | 12° | 4 | 50 | 7,200 | 10.69 | 11.16 | 11.68 | 12.25 | 13.58 |
| 08-00237-25103 | | | 20 | | | | | 60 | 7,500 | 21.12 | 22.06 | 23.09 | 24.22 | Free |
| 08-00237-25105 | | | 30 | | | | | 70 | 7,700 | 31.54 | 32.95 | 34.49 | Free | Free |
| 08-00237-25201 | | R0.2 | 10 | | | | | 50 | 7,200 | 10.68 | 11.15 | 11.67 | 12.23 | 13.55 |
| 08-00237-25203 | | | 20 | | | | | 60 | 7,500 | 21.11 | 22.05 | 23.07 | 24.20 | Free |
| 08-00237-25205 | | | 30 | | | | | 70 | 7,700 | 31.54 | 32.94 | 34.48 | Free | Free |
| 08-00237-25301 | | R0.3 | 10 | | | | | 50 | 7,200 | 10.68 | 11.14 | 11.65 | 12.21 | 13.51 |
| 08-00237-25303 | | | 20 | | | | | 60 | 7,500 | 21.11 | 22.04 | 23.06 | 24.18 | Free |
| 08-00237-25305 | | | 30 | | | | | 70 | 7,700 | 31.54 | 32.93 | 34.46 | Free | Free |
| 08-00237-25501 | | R0.5 | 10 | | | | | 50 | 7,200 | 10.67 | 11.13 | 11.62 | 12.17 | 13.45 |
| 08-00237-25503 | | | 20 | | | | | 60 | 7,500 | 21.10 | 22.02 | 23.03 | 24.14 | Free |
| 08-00237-25505 | | | 30 | | | | | 70 | 7,700 | 31.53 | 32.92 | 34.43 | Free | Free |
| 08-00237-30058 | 3 | R0.05 | 4 | 2.5 | 2.85 | 12° | 6 | 50 | 6,000 | 4.53 | 4.73 | 4.95 | 5.19 | 5.76 |
| 08-00237-30050 | | | 6 | | | | | 50 | 6,000 | 6.62 | 6.91 | 7.23 | 7.59 | 8.41 |
| 08-00237-30051 | | | 8 | | | | | 50 | 6,000 | 8.70 | 9.09 | 9.51 | 9.98 | 11.06 |
| 08-00237-30053 | | | 12 | | | | | 50 | 7,200 | 12.87 | 13.45 | 14.08 | 14.77 | 16.37 |
| 08-00237-30055 | | | 16 | | | | | 60 | 9,000 | 17.05 | 17.81 | 18.64 | 19.55 | 21.68 |
| 08-00237-30057 | | | 20 | | | | | 60 | 9,000 | 21.22 | 22.16 | 23.20 | 24.34 | 26.99 |
| 08-00237-30112 | | R0.1 | 4 | | | | | 50 | 6,000 | 4.53 | 4.73 | 4.95 | 5.18 | 5.74 |
| 08-00237-30100 | | | 6 | | | | | 50 | 6,000 | 6.62 | 6.91 | 7.23 | 7.58 | 8.39 |
| 08-00237-30101 | | | 8 | | | | | 50 | 6,000 | 8.70 | 9.09 | 9.51 | 9.97 | 11.05 |
| 08-00237-30103 | | | 12 | | | | | 50 | 7,200 | 12.87 | 13.44 | 14.07 | 14.76 | 16.36 |
| 08-00237-30105 | | | 16 | | | | | 60 | 9,000 | 17.04 | 17.80 | 18.63 | 19.54 | 21.67 |
| 08-00237-30107 | | | 20 | | | | | 60 | 9,000 | 21.21 | 22.16 | 23.19 | 24.33 | 26.98 |
| 08-00237-30109 | | | 25 | | | | | 70 | 9,000 | 26.43 | 27.61 | 28.90 | 30.31 | Free |
| 08-00237-30111 | | | 30 | | | | | 70 | 10,100 | 31.64 | 33.05 | 34.60 | 36.30 | Free |
| 08-00237-30212 | | R0.2 | 4 | | | | | 50 | 6,000 | 4.53 | 4.72 | 4.93 | 5.16 | 5.71 |
| 08-00237-30200 | | | 6 | | | | | 50 | 6,000 | 6.61 | 6.90 | 7.21 | 7.56 | 8.36 |
| 08-00237-30201 | | | 8 | | | | | 50 | 6,000 | 8.70 | 9.08 | 9.49 | 9.95 | 11.02 |
| 08-00237-30203 | | | 12 | | | | | 50 | 7,200 | 12.87 | 13.44 | 14.06 | 14.74 | 16.32 |
| 08-00237-30205 | | | 16 | | | | | 60 | 9,000 | 17.04 | 17.79 | 18.62 | 19.52 | 21.63 |
| 08-00237-30207 | | | 20 | | | | | 60 | 9,000 | 21.21 | 22.15 | 23.18 | 24.31 | 26.94 |
| 08-00237-30209 | | | 25 | | | | | 70 | 9,000 | 26.42 | 27.60 | 28.88 | 30.29 | Free |
| 08-00237-30211 | | | 30 | | | | | 70 | 10,100 | 31.64 | 33.05 | 34.58 | 36.28 | Free |
| 08-00237-30312 | | R0.3 | 4 | | | | | 50 | 6,000 | 4.52 | 4.71 | 4.92 | 5.14 | 5.67 |
| 08-00237-30300 | | | 6 | | | | | 50 | 6,000 | 6.61 | 6.89 | 7.20 | 7.54 | 8.33 |
| 08-00237-30301 | | | 8 | | | | | 50 | 6,000 | 8.69 | 9.07 | 9.48 | 9.93 | 10.98 |
| 08-00237-30303 | | | 12 | | | | | 50 | 7,200 | 12.86 | 13.43 | 14.04 | 14.72 | 16.29 |
| 08-00237-30305 | | | 16 | | | | | 60 | 9,000 | 17.04 | 17.78 | 18.60 | 19.50 | 21.60 |
| 08-00237-30307 | | | 20 | | | | | 60 | 9,000 | 21.21 | 22.14 | 23.17 | 24.29 | 26.91 |
| 08-00237-30309 | | | 25 | | | | | 70 | 9,000 | 26.42 | 27.59 | 28.87 | 30.27 | Free |
| 08-00237-30311 | | | 30 | | | | | 70 | 10,100 | 31.63 | 33.04 | 34.57 | 36.26 | Free |
| 08-00237-30512 | | R0.5 | 4 | | | | | 50 | 6,000 | 4.51 | 4.69 | 4.89 | 5.11 | 5.61 |
| 08-00237-30500 | | | 6 | | | | | 50 | 6,000 | 6.60 | 6.87 | 7.17 | 7.50 | 8.26 |
| 08-00237-30501 | | | 8 | | | | | 50 | 6,000 | 8.68 | 9.05 | 9.45 | 9.89 | 10.92 |
| 08-00237-30503 | | | 12 | | | | | 50 | 7,200 | 12.86 | 13.41 | 14.01 | 14.68 | 16.23 |
| 08-00237-30505 | | | 16 | | | | | 60 | 9,000 | 17.03 | 17.77 | 18.58 | 19.46 | 21.54 |
| 08-00237-30507 | | | 20 | | | | | 60 | 9,000 | 21.20 | 22.12 | 23.14 | 24.25 | 26.84 |
| 08-00237-30509 | | | 25 | | | | | 70 | 9,000 | 26.41 | 27.57 | 28.84 | 30.23 | Free |
| 08-00237-30511 | | | 30 | | | | | 70 | 10,100 | 31.63 | 33.02 | 34.54 | 36.22 | Free |
| 08-00237-31001 | | R1 | 8 | | | | | 50 | 6,000 | 8.66 | 9.01 | 9.38 | 9.79 | 10.75 |
| 08-00237-31003 | | | 12 | | | | | 50 | 7,200 | 12.83 | 13.36 | 13.94 | 14.58 | 16.06 |
| 08-00237-31005 | | | 16 | | | | | 60 | 9,000 | 17.01 | 17.72 | 18.50 | 19.37 | 21.37 |
| 08-00237-31007 | | | 20 | | | | | 60 | 9,000 | 21.18 | 22.08 | 23.07 | 24.15 | 26.68 |
| 08-00237-31009 | | | 25 | | | | | 70 | 9,000 | 26.39 | 27.53 | 28.77 | 30.14 | 33.32 |
| 08-00237-31011 | | | 30 | | | | | 70 | 10,100 | 31.60 | 32.97 | 34.47 | 36.12 | Free |

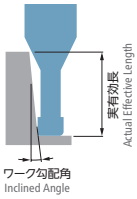
**オーダー方法**
MHRH430R 刃径(D)×コーナー半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate MHRH430R (D)×(R)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はF-019に記載
●Recommended Milling Conditions are shown on page F-019.



ŞEVKET ÖLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.




| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ★ 08-00237-40106 | 4 | R0.1 | 8 | 3.2 | 3.8 | 12° | 6 | 60 | 9,000 | 8.82 | 9.21 | 9.64 | 10.11 | 11.20 |
| ★ 08-00237-40100 | | | 12 | | | | | 60 | 9,000 | 13.00 | 13.57 | 14.20 | 14.90 | 16.51 |
| ★ 08-00237-40101 | | | 16 | | | | | 60 | 9,000 | 17.17 | 17.93 | 18.77 | 19.68 | 21.82 |
| ★ 08-00237-40103 | | | 24 | | | | | 70 | 10,000 | 25.51 | 26.65 | 27.89 | 29.26 | Free |
| ★ 08-00237-40105 | | | 32 | | | | | 70 | 10,000 | 33.85 | 35.36 | 37.01 | Free | Free |
| ★ 08-00237-40206 | | R0.2 | 8 | | | | | 60 | 9,000 | 8.82 | 9.21 | 9.63 | 10.09 | 11.17 |
| ★ 08-00237-40200 | | | 12 | | | | | 60 | 9,000 | 12.99 | 13.56 | 14.19 | 14.88 | 16.48 |
| ★ 08-00237-40201 | | | 16 | | | | | 60 | 9,000 | 17.16 | 17.92 | 18.75 | 19.66 | 21.79 |
| ★ 08-00237-40203 | | | 24 | | | | | 70 | 10,000 | 25.50 | 26.64 | 27.88 | 29.24 | Free |
| ★ 08-00237-40205 | | | 32 | | | | | 70 | 10,000 | 33.85 | 35.35 | 37.00 | Free | Free |
| ★ 08-00237-40306 | | R0.3 | 8 | | | | | 60 | 9,000 | 8.82 | 9.20 | 9.61 | 10.07 | 11.14 |
| ★ 08-00237-40300 | | | 12 | | | | | 60 | 9,000 | 12.99 | 13.55 | 14.18 | 14.86 | 16.45 |
| ★ 08-00237-40301 | | | 16 | | | | | 60 | 9,000 | 17.16 | 17.91 | 18.74 | 19.64 | 21.76 |
| ★ 08-00237-40303 | | | 24 | | | | | 70 | 10,000 | 25.50 | 26.63 | 27.86 | 29.22 | Free |
| ★ 08-00237-40305 | | | 32 | | | | | 70 | 10,000 | 33.84 | 35.34 | 36.99 | Free | Free |
| ★ 08-00237-40506 | | R0.5 | 8 | | | | | 60 | 9,000 | 8.81 | 9.18 | 9.59 | 10.03 | 11.07 |
| ★ 08-00237-40500 | | | 12 | | | | | 60 | 9,000 | 12.98 | 13.54 | 14.15 | 14.82 | 16.38 |
| ★ 08-00237-40501 | | | 16 | | | | | 60 | 9,000 | 17.15 | 17.89 | 18.71 | 19.61 | 21.69 |
| ★ 08-00237-40503 | | | 24 | | | | | 70 | 10,000 | 25.49 | 26.61 | 27.83 | 29.18 | Free |
| ★ 08-00237-40505 | | | 32 | | | | | 70 | 10,000 | 33.83 | 35.33 | 36.96 | Free | Free |
| ★ 08-00237-41006 | | R1 | 8 | | | | | 60 | 9,000 | 8.79 | 9.13 | 9.52 | 9.93 | 10.91 |
| ★ 08-00237-41000 | | | 12 | | | | | 60 | 9,000 | 12.96 | 13.49 | 14.08 | 14.72 | 16.22 |
| ★ 08-00237-41001 | | | 16 | | | | | 60 | 9,000 | 17.13 | 17.85 | 18.64 | 19.51 | 21.53 |
| ★ 08-00237-41003 | | | 24 | | | | | 70 | 10,000 | 25.47 | 26.57 | 27.76 | 29.08 | Free |
| ★ 08-00237-41005 | | | 32 | | | | | 70 | 10,000 | 33.81 | 35.28 | 36.89 | Free | Free |
| ★ 08-00237-50100 | 5 | R0.1 | 15 | 4 | 4.75 | 12° | 6 | 70 | 12,800 | 16.25 | 16.97 | 17.76 | 18.63 | Free |
| ★ 08-00237-50101 | | | 20 | | | | | 70 | 12,800 | 21.46 | 22.42 | 23.46 | Free | Free |
| ★ 08-00237-50103 | | | 40 | | | | | 90 | 16,000 | 42.32 | Free | Free | Free | Free |
| ★ 08-00237-50200 | | R0.2 | 15 | | | | | 70 | 12,800 | 16.24 | 16.96 | 17.75 | 18.61 | Free |
| ★ 08-00237-50201 | | | 20 | | | | | 70 | 12,800 | 21.46 | 22.41 | 23.45 | Free | Free |
| ★ 08-00237-50203 | | | 40 | | | | | 90 | 16,000 | 42.31 | Free | Free | Free | Free |
| ★ 08-00237-50300 | | R0.3 | 15 | | | | | 70 | 12,800 | 16.24 | 16.95 | 17.73 | 18.59 | Free |
| ★ 08-00237-50301 | | | 20 | | | | | 70 | 12,800 | 21.45 | 22.40 | 23.43 | Free | Free |
| ★ 08-00237-50303 | | | 40 | | | | | 90 | 16,000 | 42.31 | Free | Free | Free | Free |
| ★ 08-00237-50500 | | R0.5 | 15 | | | | | 70 | 12,800 | 16.23 | 16.93 | 17.70 | 18.55 | Free |
| ★ 08-00237-50501 | | | 20 | | | | | 70 | 12,800 | 21.44 | 22.38 | 23.41 | Free | Free |
| ★ 08-00237-50503 | | | 40 | | | | | 90 | 16,000 | 42.30 | Free | Free | Free | Free |
| ★ 08-00237-51000 | | R1 | 15 | | | | | 70 | 12,800 | 16.21 | 16.89 | 17.63 | 18.45 | Free |
| ★ 08-00237-51001 | | | 20 | | | | | 70 | 12,800 | 21.42 | 22.34 | 23.34 | Free | Free |
| ★ 08-00237-51003 | | | 40 | | | | | 90 | 16,000 | 42.28 | Free | Free | Free | Free |
| ★ 08-00237-60104 | 6 | R0.1 | 12 | 5 | 5.7 | – | 6 | 70 | 13,000 | Free | Free | Free | Free | Free |
| ★ 08-00237-60100 | | | 18 | | | | | 90 | 16,500 | Free | Free | Free | Free | Free |
| ★ 08-00237-60101 | | | 24 | | | | | 90 | 16,500 | Free | Free | Free | Free | Free |
| ★ 08-00237-60103 | | | 48 | | | | | 110 | 20,100 | Free | Free | Free | Free | Free |
| ★ 08-00237-60204 | | R0.2 | 12 | | | | | 70 | 13,000 | Free | Free | Free | Free | Free |
| ★ 08-00237-60200 | | | 18 | | | | | 90 | 16,500 | Free | Free | Free | Free | Free |
| ★ 08-00237-60201 | | | 24 | | | | | 90 | 16,500 | Free | Free | Free | Free | Free |
| ★ 08-00237-60203 | | | 48 | | | | | 110 | 20,100 | Free | Free | Free | Free | Free |
| ★ 08-00237-60304 | | R0.3 | 12 | | | | | 70 | 13,000 | Free | Free | Free | Free | Free |
| ★ 08-00237-60300 | | | 18 | | | | | 90 | 16,500 | Free | Free | Free | Free | Free |
| ★ 08-00237-60301 | | | 24 | | | | | 90 | 16,500 | Free | Free | Free | Free | Free |
| ★ 08-00237-60303 | | | 48 | | | | | 110 | 20,100 | Free | Free | Free | Free | Free |
| ★ 08-00237-60504 | | R0.5 | 12 | | | | | 70 | 13,000 | Free | Free | Free | Free | Free |
| ★ 08-00237-60500 | | | 18 | | | | | 90 | 16,500 | Free | Free | Free | Free | Free |
| ★ 08-00237-60501 | | | 24 | | | | | 90 | 16,500 | Free | Free | Free | Free | Free |
| ★ 08-00237-60503 | | | 48 | | | | | 110 | 20,100 | Free | Free | Free | Free | Free |
| ★ 08-00237-61004 | | R1 | 12 | | | | | 70 | 13,000 | Free | Free | Free | Free | Free |
| ★ 08-00237-61000 | | | 18 | | | | | 90 | 16,500 | Free | Free | Free | Free | Free |
| ★ 08-00237-61001 | | | 24 | | | | | 90 | 16,500 | Free | Free | Free | Free | Free |
| ★ 08-00237-61003 | | | 48 | | | | | 110 | 20,100 | Free | Free | Free | Free | Free |

# MHRH230R

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | | 調質鋼 Prehardened Steels HPM・NAK (~42HRC) | | | | 焼き入れ鋼 Hardened Steels HPM-38・STAVAX・SKD61 (~55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・PD613 (~62HRC) | | | | ハイス High Speed Tool Steels SKH (~65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | コーナー半径 Corner Radius | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | ae mm |
| 0.2 | 0.02 | 0.5 | 30,000 | 240 | 0.005 | 0.05 | 30,000 | 200 | 0.003 | 0.04 | 30,000 | 160 | 0.003 | 0.02 | 30,000 | 120 | 0.003 | 0.01 |
| | | 1 | 30,000 | 180 | 0.005 | 0.05 | 30,000 | 150 | 0.003 | 0.04 | 30,000 | 120 | 0.002 | 0.02 | 30,000 | 80 | 0.002 | 0.01 |
| | | 1.5 | 30,000 | 120 | 0.004 | 0.05 | 30,000 | 100 | 0.002 | 0.04 | 30,000 | 80 | 0.002 | 0.02 | 30,000 | 60 | 0.001 | 0.01 |
| | | 2 | 30,000 | 70 | 0.003 | 0.05 | 30,000 | 50 | 0.002 | 0.04 | 30,000 | 40 | 0.001 | 0.02 | 30,000 | 30 | 0.001 | 0.01 |
| | 0.05 | 0.5 | 30,000 | 240 | 0.01 | 0.05 | 30,000 | 200 | 0.003 | 0.04 | 30,000 | 160 | 0.003 | 0.02 | 30,000 | 120 | 0.003 | 0.01 |
| | | 1 | 30,000 | 180 | 0.007 | 0.05 | 30,000 | 150 | 0.003 | 0.04 | 30,000 | 120 | 0.003 | 0.02 | 30,000 | 80 | 0.003 | 0.01 |
| | | 1.5 | 30,000 | 120 | 0.005 | 0.05 | 30,000 | 100 | 0.002 | 0.04 | 30,000 | 80 | 0.002 | 0.02 | 30,000 | 60 | 0.002 | 0.01 |
| | | 2 | 30,000 | 70 | 0.003 | 0.05 | 30,000 | 50 | 0.002 | 0.04 | 30,000 | 40 | 0.002 | 0.02 | 30,000 | 30 | 0.002 | 0.01 |
| 0.3 | 0.02 | 1 | 30,000 | 350 | 0.015 | 0.1 | 30,000 | 300 | 0.003 | 0.08 | 30,000 | 250 | 0.003 | 0.04 | 30,000 | 200 | 0.003 | 0.03 |
| | | 1.5 | 30,000 | 240 | 0.01 | 0.1 | 30,000 | 200 | 0.003 | 0.08 | 30,000 | 160 | 0.003 | 0.04 | 30,000 | 120 | 0.003 | 0.03 |
| | | 2 | 30,000 | 180 | 0.007 | 0.1 | 30,000 | 150 | 0.003 | 0.08 | 30,000 | 120 | 0.003 | 0.04 | 25,000 | 100 | 0.003 | 0.03 |
| | | 2.5 | 30,000 | 150 | 0.005 | 0.1 | 25,000 | 100 | 0.002 | 0.08 | 25,000 | 80 | 0.002 | 0.04 | 20,000 | 60 | 0.002 | 0.03 |
| | | 3 | 30,000 | 70 | 0.004 | 0.1 | 25,000 | 50 | 0.002 | 0.08 | 25,000 | 40 | 0.002 | 0.04 | 20,000 | 30 | 0.002 | 0.03 |
| | 0.05 | 1 | 30,000 | 350 | 0.02 | 0.1 | 30,000 | 300 | 0.003 | 0.08 | 30,000 | 250 | 0.003 | 0.04 | 30,000 | 200 | 0.003 | 0.03 |
| | | 1.5 | 30,000 | 240 | 0.015 | 0.1 | 30,000 | 200 | 0.003 | 0.08 | 30,000 | 160 | 0.003 | 0.04 | 30,000 | 120 | 0.003 | 0.03 |
| | | 2 | 30,000 | 180 | 0.01 | 0.1 | 30,000 | 150 | 0.003 | 0.08 | 30,000 | 120 | 0.003 | 0.04 | 25,000 | 100 | 0.003 | 0.03 |
| | | 2.5 | 30,000 | 150 | 0.007 | 0.1 | 25,000 | 100 | 0.002 | 0.08 | 25,000 | 80 | 0.002 | 0.04 | 20,000 | 60 | 0.002 | 0.03 |
| | | 3 | 30,000 | 70 | 0.005 | 0.1 | 25,000 | 50 | 0.002 | 0.08 | 25,000 | 40 | 0.002 | 0.04 | 20,000 | 30 | 0.002 | 0.03 |
| 0.4 | 0.02 | 1 | 30,000 | 450 | 0.015 | 0.12 | 30,000 | 400 | 0.005 | 0.1 | 28,000 | 350 | 0.005 | 0.05 | 25,000 | 300 | 0.004 | 0.04 |
| | | 1.5 | 30,000 | 400 | 0.012 | 0.12 | 30,000 | 350 | 0.005 | 0.1 | 28,000 | 300 | 0.005 | 0.05 | 25,000 | 260 | 0.004 | 0.04 |
| | | 2 | 30,000 | 360 | 0.01 | 0.12 | 30,000 | 300 | 0.005 | 0.1 | 25,000 | 250 | 0.005 | 0.05 | 25,000 | 220 | 0.003 | 0.04 |
| | | 2.5 | 30,000 | 340 | 0.008 | 0.12 | 28,000 | 280 | 0.004 | 0.1 | 25,000 | 240 | 0.004 | 0.05 | 20,000 | 180 | 0.003 | 0.04 |
| | | 3 | 30,000 | 320 | 0.008 | 0.12 | 25,000 | 250 | 0.004 | 0.1 | 23,000 | 220 | 0.003 | 0.05 | 18,000 | 160 | 0.002 | 0.04 |
| | | 4 | 30,000 | 250 | 0.006 | 0.12 | 25,000 | 200 | 0.003 | 0.1 | 20,000 | 160 | 0.002 | 0.05 | 18,000 | 120 | 0.002 | 0.04 |
| | 0.05 0.1 | 1 | 30,000 | 450 | 0.025 | 0.12 | 30,000 | 400 | 0.005 | 0.1 | 28,000 | 350 | 0.005 | 0.05 | 25,000 | 300 | 0.005 | 0.04 |
| | | 1.5 | 30,000 | 400 | 0.022 | 0.12 | 30,000 | 350 | 0.005 | 0.1 | 28,000 | 300 | 0.005 | 0.05 | 25,000 | 260 | 0.005 | 0.04 |
| | | 2 | 30,000 | 360 | 0.02 | 0.12 | 30,000 | 300 | 0.005 | 0.1 | 25,000 | 250 | 0.005 | 0.05 | 25,000 | 220 | 0.005 | 0.04 |
| | | 2.5 | 30,000 | 340 | 0.015 | 0.12 | 28,000 | 280 | 0.004 | 0.1 | 25,000 | 240 | 0.004 | 0.05 | 20,000 | 180 | 0.004 | 0.04 |
| | | 3 | 30,000 | 320 | 0.015 | 0.12 | 25,000 | 250 | 0.004 | 0.1 | 23,000 | 220 | 0.003 | 0.05 | 18,000 | 160 | 0.003 | 0.04 |
| | | 4 | 30,000 | 250 | 0.01 | 0.12 | 25,000 | 200 | 0.003 | 0.1 | 20,000 | 160 | 0.002 | 0.05 | 18,000 | 120 | 0.002 | 0.04 |
| 0.5 | 0.02 | 1 | 30,000 | 600 | 0.016 | 0.14 | 25,000 | 500 | 0.008 | 0.15 | 23,000 | 450 | 0.006 | 0.1 | 20,000 | 400 | 0.004 | 0.08 |
| | | 2 | 30,000 | 500 | 0.014 | 0.14 | 25,000 | 420 | 0.007 | 0.15 | 23,000 | 360 | 0.005 | 0.1 | 20,000 | 300 | 0.003 | 0.08 |
| | | 3 | 30,000 | 420 | 0.012 | 0.14 | 25,000 | 350 | 0.006 | 0.15 | 23,000 | 320 | 0.004 | 0.1 | 20,000 | 280 | 0.003 | 0.08 |
| | | 4 | 25,000 | 380 | 0.01 | 0.14 | 25,000 | 300 | 0.004 | 0.15 | 23,000 | 240 | 0.002 | 0.1 | 20,000 | 180 | 0.002 | 0.08 |
| | | 5 | 25,000 | 300 | 0.008 | 0.14 | 20,000 | 200 | 0.003 | 0.15 | 18,000 | 150 | 0.002 | 0.1 | 16,000 | 100 | 0.002 | 0.08 |
| | | 6 | 25,000 | 250 | 0.004 | 0.14 | 20,000 | 160 | 0.002 | 0.15 | 18,000 | 100 | 0.001 | 0.1 | 16,000 | 70 | 0.001 | 0.08 |
| | 0.05 0.1 | 1 | 30,000 | 600 | 0.03 | 0.14 | 25,000 | 500 | 0.01 | 0.15 | 23,000 | 450 | 0.007 | 0.1 | 20,000 | 400 | 0.005 | 0.08 |
| | | 2 | 30,000 | 500 | 0.025 | 0.14 | 25,000 | 420 | 0.01 | 0.15 | 23,000 | 360 | 0.007 | 0.1 | 20,000 | 300 | 0.005 | 0.08 |
| | | 3 | 30,000 | 420 | 0.02 | 0.14 | 25,000 | 350 | 0.008 | 0.15 | 23,000 | 320 | 0.005 | 0.1 | 20,000 | 280 | 0.003 | 0.08 |
| | | 4 | 25,000 | 380 | 0.015 | 0.14 | 25,000 | 300 | 0.005 | 0.15 | 23,000 | 240 | 0.003 | 0.1 | 20,000 | 180 | 0.002 | 0.08 |
| | | 5 | 25,000 | 300 | 0.01 | 0.14 | 20,000 | 200 | 0.004 | 0.15 | 18,000 | 150 | 0.003 | 0.1 | 16,000 | 100 | 0.002 | 0.08 |
| | | 6 | 25,000 | 250 | 0.008 | 0.14 | 20,000 | 160 | 0.003 | 0.15 | 18,000 | 100 | 0.002 | 0.1 | 16,000 | 70 | 0.001 | 0.08 |
| 0.6 | 0.02 | 2 | 30,000 | 600 | 0.016 | 0.2 | 25,000 | 500 | 0.012 | 0.2 | 23,000 | 400 | 0.006 | 0.15 | 20,000 | 320 | 0.004 | 0.1 |
| | | 4 | 25,000 | 450 | 0.012 | 0.2 | 23,000 | 400 | 0.007 | 0.2 | 20,000 | 300 | 0.004 | 0.15 | 18,000 | 200 | 0.003 | 0.1 |
| | | 6 | 23,000 | 300 | 0.008 | 0.2 | 20,000 | 200 | 0.005 | 0.2 | 18,000 | 150 | 0.003 | 0.15 | 12,000 | 100 | 0.002 | 0.1 |
| | | 8 | 18,000 | 200 | 0.006 | 0.2 | 16,000 | 150 | 0.003 | 0.2 | 14,000 | 100 | 0.001 | 0.15 | 10,000 | 80 | 0.001 | 0.1 |
| | | 10 | 16,000 | 120 | 0.003 | 0.2 | 14,000 | 100 | 0.001 | 0.2 | 12,000 | 80 | 0.001 | 0.15 | 8,000 | 50 | 0.001 | 0.1 |
| | 0.05 0.1 | 2 | 30,000 | 600 | 0.035 | 0.2 | 25,000 | 500 | 0.02 | 0.2 | 23,000 | 400 | 0.01 | 0.15 | 20,000 | 320 | 0.007 | 0.1 |
| | | 4 | 25,000 | 450 | 0.025 | 0.2 | 23,000 | 400 | 0.015 | 0.2 | 20,000 | 300 | 0.007 | 0.15 | 18,000 | 200 | 0.005 | 0.1 |
| | | 6 | 23,000 | 300 | 0.015 | 0.2 | 20,000 | 200 | 0.008 | 0.2 | 18,000 | 150 | 0.005 | 0.15 | 12,000 | 100 | 0.003 | 0.1 |
| | | 8 | 18,000 | 200 | 0.01 | 0.2 | 16,000 | 150 | 0.005 | 0.2 | 14,000 | 100 | 0.002 | 0.15 | 10,000 | 80 | 0.001 | 0.1 |
| | | 10 | 16,000 | 120 | 0.005 | 0.2 | 14,000 | 100 | 0.002 | 0.2 | 12,000 | 80 | 0.001 | 0.15 | 8,000 | 50 | 0.001 | 0.1 |
| 0.7 | 0.02 | 2 | 30,000 | 900 | 0.016 | 0.25 | 25,000 | 700 | 0.012 | 0.25 | 23,000 | 600 | 0.006 | 0.15 | 20,000 | 450 | 0.003 | 0.12 |
| | | 4 | 28,000 | 700 | 0.012 | 0.25 | 25,000 | 600 | 0.008 | 0.25 | 23,000 | 500 | 0.005 | 0.15 | 20,000 | 350 | 0.002 | 0.12 |
| | | 6 | 25,000 | 500 | 0.008 | 0.25 | 20,000 | 350 | 0.005 | 0.25 | 18,000 | 250 | 0.003 | 0.15 | 16,000 | 200 | 0.002 | 0.12 |
| | 0.05 0.1 | 2 | 30,000 | 900 | 0.04 | 0.25 | 25,000 | 700 | 0.03 | 0.25 | 23,000 | 600 | 0.015 | 0.15 | 20,000 | 450 | 0.01 | 0.12 |
| | | 4 | 28,000 | 700 | 0.03 | 0.25 | 25,000 | 600 | 0.02 | 0.25 | 23,000 | 500 | 0.01 | 0.15 | 20,000 | 350 | 0.007 | 0.12 |
| | | 6 | 25,000 | 500 | 0.02 | 0.25 | 20,000 | 350 | 0.01 | 0.25 | 18,000 | 250 | 0.007 | 0.15 | 16,000 | 200 | 0.005 | 0.12 |
| 0.8 | 0.02 | 2 | 28,000 | 1,000 | 0.016 | 0.3 | 25,000 | 800 | 0.014 | 0.25 | 23,000 | 700 | 0.006 | 0.16 | 20,000 | 500 | 0.005 | 0.14 |
| | | 4 | 28,000 | 900 | 0.012 | 0.3 | 25,000 | 700 | 0.008 | 0.25 | 23,000 | 600 | 0.005 | 0.16 | 20,000 | 400 | 0.003 | 0.14 |
| | | 6 | 23,000 | 700 | 0.009 | 0.3 | 20,000 | 550 | 0.006 | 0.25 | 18,000 | 450 | 0.004 | 0.16 | 16,000 | 320 | 0.002 | 0.14 |
| | | 8 | 18,000 | 500 | 0.006 | 0.3 | 16,000 | 400 | 0.003 | 0.25 | 14,000 | 300 | 0.002 | 0.16 | 12,000 | 200 | 0.002 | 0.14 |
| | 0.05 0.1 0.2 | 2 | 28,000 | 1,000 | 0.05 | 0.3 | 25,000 | 800 | 0.03 | 0.25 | 23,000 | 700 | 0.02 | 0.16 | 20,000 | 500 | 0.015 | 0.14 |
| | | 4 | 28,000 | 900 | 0.045 | 0.3 | 25,000 | 700 | 0.025 | 0.25 | 23,000 | 600 | 0.015 | 0.16 | 20,000 | 400 | 0.01 | 0.14 |
| | | 6 | 23,000 | 700 | 0.03 | 0.3 | 20,000 | 550 | 0.02 | 0.25 | 18,000 | 450 | 0.01 | 0.16 | 16,000 | 320 | 0.007 | 0.14 |
| | | 8 | 18,000 | 500 | 0.02 | 0.3 | 16,000 | 400 | 0.01 | 0.25 | 14,000 | 300 | 0.005 | 0.16 | 12,000 | 200 | 0.005 | 0.14 |
| | | 12 | 16,000 | 300 | 0.007 | 0.3 | 14,000 | 200 | 0.005 | 0.25 | 12,000 | 120 | 0.003 | 0.16 | 10,000 | 80 | 0.001 | 0.14 |
| 0.9 | 0.1 | 4 | 25,000 | 1,100 | 0.05 | 0.3 | 25,000 | 850 | 0.03 | 0.3 | 20,000 | 700 | 0.02 | 0.2 | 18,000 | 600 | 0.01 | 0.15 |
| | | 8 | 18,000 | 500 | 0.03 | 0.3 | 16,000 | 400 | 0.01 | 0.3 | 14,000 | 350 | 0.008 | 0.2 | 10,000 | 250 | 0.005 | 0.15 |

**備考 Notes**

※実際の加工形状および使用機械等にて切削条件を調整してください。
※切り込み量の ap は切り込み深さ、ae は切り込み幅を示します。
※焼き入れ鋼を切削加工する場合は、オイルミストクーラントをお奨めします。
※ Z 切り込み時のアプローチ方法として、ヘリカル（螺旋）及びランプ（傾斜）での切削加工をお奨めします。
※ L (有効長) / D (刃径) が 8 倍を超える場合は立ち壁付近の送り速度を 50%以下、切り込み量：ae を 30%以下に調整してください。
※溝切削は、切削条件表を参考に切り込み量：ap 及び送り速度を 50%以下に設定し、往復切削をお奨めします。
※ ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。また、主軸回転数が足りない場合も同様に同じ割合で下げてください。
※Adjust milling conditions according to milling shape and machine type.
※ap : Axial Depth of Cut, ae : Radial Depth of Cut.
※Recommend to use oil mist coolant for machining hardened steels.
※Recommend to apply helical or ramping for approaching into axial direction.
※Adjust feed rate 50% lower and cutting depth (ae) 30% lower for milling deep wall area when L/D exceeds 8 for stable milling.
※For slotting, recommend reciprocating milling by adjusting feed & ap in below 50% of recommended milling condition.
※Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.



SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

# MHRH430R

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-022

| 被削材 Work Material | | | 調質鋼 Prehardened Steels HPM・NAK (~42HRC) | | | | 焼き入れ鋼 Hardened Steels HPM-38・STAVAX・SKD61 (~55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・PD613 (~62HRC) | | | | ハイス High Speed Tool Steels SKH (~65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | コーナー半径 Corner Radius | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | | min-1 | mm/min | ap mm | ae mm | min-1 | mm/min | ap mm | ae mm | min-1 | mm/min | ap mm | ae mm | min-1 | mm/min | ap mm | ae mm |
| 0.2 | 0.02 | 0.5 | 30,000 | 480 | 0.005 | 0.05 | 30,000 | 400 | 0.003 | 0.04 | 30,000 | 320 | 0.003 | 0.02 | 30,000 | 240 | 0.003 | 0.01 |
| | | 1 | 30,000 | 360 | 0.005 | 0.05 | 30,000 | 300 | 0.003 | 0.04 | 30,000 | 240 | 0.002 | 0.02 | 30,000 | 160 | 0.002 | 0.01 |
| | | 1.5 | 30,000 | 240 | 0.004 | 0.05 | 30,000 | 200 | 0.002 | 0.04 | 30,000 | 160 | 0.002 | 0.02 | 30,000 | 120 | 0.001 | 0.01 |
| | | 2 | 30,000 | 140 | 0.003 | 0.05 | 30,000 | 100 | 0.002 | 0.04 | 30,000 | 80 | 0.001 | 0.02 | 30,000 | 60 | 0.001 | 0.01 |
| | 0.05 | 0.5 | 30,000 | 480 | 0.01 | 0.05 | 30,000 | 400 | 0.003 | 0.04 | 30,000 | 320 | 0.003 | 0.02 | 30,000 | 240 | 0.003 | 0.01 |
| | | 1 | 30,000 | 360 | 0.007 | 0.05 | 30,000 | 300 | 0.003 | 0.04 | 30,000 | 240 | 0.003 | 0.02 | 30,000 | 160 | 0.003 | 0.01 |
| | | 1.5 | 30,000 | 240 | 0.005 | 0.05 | 30,000 | 200 | 0.002 | 0.04 | 30,000 | 160 | 0.002 | 0.02 | 30,000 | 120 | 0.002 | 0.01 |
| | | 2 | 30,000 | 140 | 0.003 | 0.05 | 30,000 | 100 | 0.002 | 0.04 | 30,000 | 80 | 0.002 | 0.02 | 30,000 | 60 | 0.002 | 0.01 |
| 0.3 | 0.02 | 1 | 30,000 | 700 | 0.015 | 0.1 | 30,000 | 600 | 0.003 | 0.08 | 30,000 | 500 | 0.003 | 0.04 | 30,000 | 400 | 0.003 | 0.03 |
| | | 1.5 | 30,000 | 480 | 0.01 | 0.1 | 30,000 | 400 | 0.003 | 0.08 | 30,000 | 320 | 0.003 | 0.04 | 30,000 | 240 | 0.003 | 0.03 |
| | | 2 | 30,000 | 360 | 0.007 | 0.1 | 30,000 | 300 | 0.003 | 0.08 | 30,000 | 240 | 0.003 | 0.04 | 25,000 | 200 | 0.003 | 0.03 |
| | | 2.5 | 30,000 | 300 | 0.005 | 0.1 | 25,000 | 200 | 0.002 | 0.08 | 25,000 | 160 | 0.002 | 0.04 | 20,000 | 120 | 0.002 | 0.03 |
| | | 3 | 30,000 | 140 | 0.004 | 0.1 | 25,000 | 100 | 0.002 | 0.08 | 25,000 | 80 | 0.002 | 0.04 | 20,000 | 60 | 0.002 | 0.03 |
| | 0.05 | 1 | 30,000 | 700 | 0.02 | 0.1 | 30,000 | 600 | 0.003 | 0.08 | 30,000 | 500 | 0.003 | 0.04 | 30,000 | 400 | 0.003 | 0.03 |
| | | 1.5 | 30,000 | 480 | 0.015 | 0.1 | 30,000 | 400 | 0.003 | 0.08 | 30,000 | 320 | 0.003 | 0.04 | 30,000 | 240 | 0.003 | 0.03 |
| | | 2 | 30,000 | 360 | 0.01 | 0.1 | 30,000 | 300 | 0.003 | 0.08 | 30,000 | 240 | 0.003 | 0.04 | 25,000 | 200 | 0.003 | 0.03 |
| | | 2.5 | 30,000 | 300 | 0.007 | 0.1 | 25,000 | 200 | 0.002 | 0.08 | 25,000 | 160 | 0.002 | 0.04 | 20,000 | 120 | 0.002 | 0.03 |
| | | 3 | 30,000 | 140 | 0.005 | 0.1 | 25,000 | 100 | 0.002 | 0.08 | 25,000 | 80 | 0.002 | 0.04 | 20,000 | 60 | 0.002 | 0.03 |
| 0.4 | 0.02 | 1 | 30,000 | 900 | 0.015 | 0.12 | 30,000 | 800 | 0.005 | 0.1 | 28,000 | 700 | 0.005 | 0.05 | 25,000 | 600 | 0.004 | 0.04 |
| | | 1.5 | 30,000 | 800 | 0.012 | 0.12 | 30,000 | 700 | 0.005 | 0.1 | 28,000 | 600 | 0.005 | 0.05 | 25,000 | 520 | 0.004 | 0.04 |
| | | 2 | 30,000 | 720 | 0.01 | 0.12 | 30,000 | 600 | 0.005 | 0.1 | 25,000 | 500 | 0.005 | 0.05 | 25,000 | 440 | 0.003 | 0.04 |
| | | 2.5 | 30,000 | 680 | 0.008 | 0.12 | 28,000 | 560 | 0.004 | 0.1 | 25,000 | 480 | 0.004 | 0.05 | 20,000 | 360 | 0.003 | 0.04 |
| | | 3 | 30,000 | 640 | 0.008 | 0.12 | 25,000 | 500 | 0.004 | 0.1 | 23,000 | 440 | 0.003 | 0.05 | 18,000 | 320 | 0.002 | 0.04 |
| | | 4 | 30,000 | 500 | 0.006 | 0.12 | 25,000 | 400 | 0.003 | 0.1 | 20,000 | 320 | 0.002 | 0.05 | 18,000 | 240 | 0.002 | 0.04 |
| | 0.05 0.1 | 1 | 30,000 | 900 | 0.025 | 0.12 | 30,000 | 800 | 0.005 | 0.1 | 28,000 | 700 | 0.005 | 0.05 | 25,000 | 600 | 0.005 | 0.04 |
| | | 1.5 | 30,000 | 800 | 0.022 | 0.12 | 30,000 | 700 | 0.005 | 0.1 | 28,000 | 600 | 0.005 | 0.05 | 25,000 | 520 | 0.005 | 0.04 |
| | | 2 | 30,000 | 720 | 0.02 | 0.12 | 30,000 | 600 | 0.005 | 0.1 | 25,000 | 500 | 0.005 | 0.05 | 25,000 | 440 | 0.005 | 0.04 |
| | | 2.5 | 30,000 | 680 | 0.015 | 0.12 | 28,000 | 560 | 0.004 | 0.1 | 25,000 | 480 | 0.004 | 0.05 | 20,000 | 360 | 0.004 | 0.04 |
| | | 3 | 30,000 | 640 | 0.015 | 0.12 | 25,000 | 500 | 0.004 | 0.1 | 23,000 | 440 | 0.003 | 0.05 | 18,000 | 320 | 0.003 | 0.04 |
| | | 4 | 30,000 | 500 | 0.01 | 0.12 | 25,000 | 400 | 0.003 | 0.1 | 20,000 | 320 | 0.002 | 0.05 | 18,000 | 240 | 0.002 | 0.04 |
| 0.5 | 0.02 | 1 | 30,000 | 1,200 | 0.016 | 0.14 | 25,000 | 1,000 | 0.008 | 0.15 | 23,000 | 900 | 0.006 | 0.1 | 20,000 | 800 | 0.004 | 0.08 |
| | | 2 | 30,000 | 1,000 | 0.014 | 0.14 | 25,000 | 840 | 0.007 | 0.15 | 23,000 | 720 | 0.005 | 0.1 | 20,000 | 600 | 0.003 | 0.08 |
| | | 3 | 30,000 | 840 | 0.012 | 0.14 | 25,000 | 700 | 0.006 | 0.15 | 23,000 | 640 | 0.004 | 0.1 | 20,000 | 560 | 0.003 | 0.08 |
| | | 4 | 25,000 | 760 | 0.01 | 0.14 | 25,000 | 600 | 0.004 | 0.15 | 23,000 | 480 | 0.002 | 0.1 | 20,000 | 360 | 0.002 | 0.08 |
| | | 5 | 25,000 | 600 | 0.008 | 0.14 | 20,000 | 400 | 0.003 | 0.15 | 18,000 | 300 | 0.002 | 0.1 | 16,000 | 200 | 0.002 | 0.08 |
| | | 6 | 25,000 | 500 | 0.004 | 0.14 | 20,000 | 320 | 0.002 | 0.15 | 18,000 | 200 | 0.001 | 0.1 | 16,000 | 140 | 0.001 | 0.08 |
| | 0.05 0.1 | 1 | 30,000 | 1,200 | 0.03 | 0.14 | 25,000 | 1,000 | 0.01 | 0.15 | 23,000 | 900 | 0.007 | 0.1 | 20,000 | 800 | 0.005 | 0.08 |
| | | 2 | 30,000 | 1,000 | 0.025 | 0.14 | 25,000 | 840 | 0.01 | 0.15 | 23,000 | 720 | 0.007 | 0.1 | 20,000 | 600 | 0.005 | 0.08 |
| | | 3 | 30,000 | 840 | 0.02 | 0.14 | 25,000 | 700 | 0.008 | 0.15 | 23,000 | 640 | 0.005 | 0.1 | 20,000 | 560 | 0.003 | 0.08 |
| | | 4 | 25,000 | 760 | 0.015 | 0.14 | 25,000 | 600 | 0.005 | 0.15 | 23,000 | 480 | 0.003 | 0.1 | 20,000 | 360 | 0.002 | 0.08 |
| | | 5 | 25,000 | 600 | 0.01 | 0.14 | 20,000 | 400 | 0.004 | 0.15 | 18,000 | 300 | 0.003 | 0.1 | 16,000 | 200 | 0.002 | 0.08 |
| | | 6 | 25,000 | 500 | 0.008 | 0.14 | 20,000 | 320 | 0.003 | 0.15 | 18,000 | 200 | 0.002 | 0.1 | 16,000 | 140 | 0.001 | 0.08 |
| 0.6 | 0.02 | 2 | 30,000 | 1,200 | 0.016 | 0.2 | 25,000 | 1,000 | 0.012 | 0.2 | 23,000 | 800 | 0.006 | 0.15 | 20,000 | 640 | 0.004 | 0.1 |
| | | 4 | 25,000 | 900 | 0.012 | 0.2 | 23,000 | 800 | 0.007 | 0.2 | 20,000 | 600 | 0.004 | 0.15 | 18,000 | 400 | 0.003 | 0.1 |
| | | 6 | 23,000 | 600 | 0.008 | 0.2 | 20,000 | 400 | 0.005 | 0.2 | 18,000 | 300 | 0.003 | 0.15 | 12,000 | 200 | 0.002 | 0.1 |
| | | 8 | 18,000 | 400 | 0.006 | 0.2 | 16,000 | 300 | 0.003 | 0.2 | 14,000 | 200 | 0.001 | 0.15 | 10,000 | 160 | 0.001 | 0.1 |
| | | 10 | 16,000 | 240 | 0.003 | 0.2 | 14,000 | 200 | 0.001 | 0.2 | 12,000 | 160 | 0.001 | 0.15 | 8,000 | 100 | 0.001 | 0.1 |
| | 0.05 0.1 | 2 | 30,000 | 1,200 | 0.035 | 0.2 | 25,000 | 1,000 | 0.02 | 0.2 | 23,000 | 800 | 0.01 | 0.15 | 20,000 | 640 | 0.007 | 0.1 |
| | | 4 | 25,000 | 900 | 0.025 | 0.2 | 23,000 | 800 | 0.015 | 0.2 | 20,000 | 600 | 0.007 | 0.15 | 18,000 | 400 | 0.005 | 0.1 |
| | | 6 | 23,000 | 600 | 0.015 | 0.2 | 20,000 | 400 | 0.008 | 0.2 | 18,000 | 300 | 0.005 | 0.15 | 12,000 | 200 | 0.003 | 0.1 |
| | | 8 | 18,000 | 400 | 0.01 | 0.2 | 16,000 | 300 | 0.005 | 0.2 | 14,000 | 200 | 0.002 | 0.15 | 10,000 | 160 | 0.001 | 0.1 |
| | | 10 | 16,000 | 240 | 0.005 | 0.2 | 14,000 | 200 | 0.002 | 0.2 | 12,000 | 160 | 0.001 | 0.15 | 8,000 | 100 | 0.001 | 0.1 |
| 0.7 | 0.02 | 2 | 30,000 | 1,800 | 0.016 | 0.25 | 25,000 | 1,400 | 0.012 | 0.25 | 23,000 | 1,200 | 0.006 | 0.15 | 20,000 | 900 | 0.003 | 0.12 |
| | | 4 | 28,000 | 1,400 | 0.012 | 0.25 | 25,000 | 1,200 | 0.008 | 0.25 | 23,000 | 1,000 | 0.005 | 0.15 | 20,000 | 700 | 0.002 | 0.12 |
| | | 6 | 25,000 | 1,000 | 0.008 | 0.25 | 20,000 | 700 | 0.005 | 0.25 | 18,000 | 500 | 0.003 | 0.15 | 16,000 | 400 | 0.002 | 0.12 |
| | 0.05 0.1 | 2 | 30,000 | 1,800 | 0.04 | 0.25 | 25,000 | 1,400 | 0.03 | 0.25 | 23,000 | 1,200 | 0.015 | 0.15 | 20,000 | 900 | 0.01 | 0.12 |
| | | 4 | 28,000 | 1,400 | 0.03 | 0.25 | 25,000 | 1,200 | 0.02 | 0.25 | 23,000 | 1,000 | 0.01 | 0.15 | 20,000 | 700 | 0.007 | 0.12 |
| | | 6 | 25,000 | 1,000 | 0.02 | 0.25 | 20,000 | 700 | 0.01 | 0.25 | 18,000 | 500 | 0.007 | 0.15 | 16,000 | 400 | 0.005 | 0.12 |
| 0.8 | 0.02 | 2 | 28,000 | 2,000 | 0.016 | 0.3 | 25,000 | 1,600 | 0.014 | 0.25 | 23,000 | 1,400 | 0.006 | 0.16 | 20,000 | 1,000 | 0.005 | 0.14 |
| | | 4 | 28,000 | 1,800 | 0.012 | 0.3 | 25,000 | 1,400 | 0.008 | 0.25 | 23,000 | 1,200 | 0.005 | 0.16 | 20,000 | 800 | 0.003 | 0.14 |
| | | 6 | 23,000 | 1,400 | 0.009 | 0.3 | 20,000 | 1,100 | 0.006 | 0.25 | 18,000 | 900 | 0.004 | 0.16 | 16,000 | 650 | 0.002 | 0.14 |
| | | 8 | 18,000 | 1,000 | 0.006 | 0.3 | 16,000 | 800 | 0.003 | 0.25 | 14,000 | 600 | 0.002 | 0.16 | 12,000 | 400 | 0.002 | 0.14 |
| | 0.05 0.1 0.2 | 2 | 28,000 | 2,000 | 0.05 | 0.3 | 25,000 | 1,600 | 0.03 | 0.25 | 23,000 | 1,400 | 0.02 | 0.16 | 20,000 | 1,000 | 0.015 | 0.14 |
| | | 4 | 28,000 | 1,800 | 0.045 | 0.3 | 25,000 | 1,400 | 0.025 | 0.25 | 23,000 | 1,200 | 0.015 | 0.16 | 20,000 | 800 | 0.01 | 0.14 |
| | | 6 | 23,000 | 1,400 | 0.03 | 0.3 | 20,000 | 1,100 | 0.02 | 0.25 | 18,000 | 900 | 0.01 | 0.16 | 16,000 | 650 | 0.007 | 0.14 |
| | | 8 | 18,000 | 1,000 | 0.02 | 0.3 | 16,000 | 800 | 0.01 | 0.25 | 14,000 | 600 | 0.005 | 0.16 | 12,000 | 400 | 0.005 | 0.14 |
| | | 12 | 16,000 | 600 | 0.007 | 0.3 | 14,000 | 400 | 0.005 | 0.25 | 12,000 | 240 | 0.003 | 0.16 | 10,000 | 160 | 0.001 | 0.14 |
| 0.9 | 0.1 | 4 | 25,000 | 2,200 | 0.05 | 0.3 | 25,000 | 1,700 | 0.03 | 0.3 | 20,000 | 1,400 | 0.02 | 0.2 | 18,000 | 1,200 | 0.01 | 0.15 |
| | | 8 | 18,000 | 1,000 | 0.03 | 0.3 | 16,000 | 800 | 0.01 | 0.3 | 14,000 | 700 | 0.008 | 0.2 | 10,000 | 500 | 0.005 | 0.15 |

# MHRH430R

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-022

| 被削材 Work Material | | | 調質鋼 Prehardened Steels HPM・NAK (~42HRC) | | | | 焼き入れ鋼 Hardened Steels HPM-38・STAVAX・SKD61 (~55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・PD613 (~62HRC) | | | | ハイス High Speed Tool Steels SKH (~65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | コーナー半径 Corner Radius | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | | min-1 | mm/min | ap mm | ae mm | min-1 | mm/min | ap mm | ae mm | min-1 | mm/min | ap mm | ae mm | min-1 | mm/min | ap mm | ae mm |
| 1 | 0.02 | 2 | 30,000 | 2,800 | 0.016 | 0.35 | 25,000 | 2,300 | 0.012 | 0.3 | 21,000 | 2,000 | 0.01 | 0.25 | 17,000 | 1,400 | 0.008 | 0.2 |
| | | 3 | 28,000 | 2,500 | 0.016 | 0.35 | 23,000 | 2,100 | 0.012 | 0.3 | 20,000 | 1,800 | 0.01 | 0.25 | 16,000 | 1,300 | 0.008 | 0.2 |
| | | 4 | 25,000 | 2,200 | 0.014 | 0.35 | 21,000 | 1,800 | 0.01 | 0.3 | 18,000 | 1,500 | 0.008 | 0.25 | 14,000 | 1,100 | 0.005 | 0.2 |
| | | 5 | 23,000 | 1,900 | 0.012 | 0.35 | 19,000 | 1,600 | 0.008 | 0.3 | 16,000 | 1,400 | 0.005 | 0.25 | 13,000 | 1,000 | 0.003 | 0.2 |
| | | 6 | 20,000 | 1,700 | 0.01 | 0.35 | 16,000 | 1,400 | 0.008 | 0.3 | 14,000 | 1,200 | 0.005 | 0.25 | 11,000 | 850 | 0.003 | 0.2 |
| | | 8 | 18,000 | 1,400 | 0.008 | 0.35 | 15,000 | 1,100 | 0.006 | 0.3 | 13,000 | 900 | 0.005 | 0.25 | 10,000 | 650 | 0.002 | 0.2 |
| | | 10 | 16,000 | 1,000 | 0.006 | 0.35 | 13,000 | 800 | 0.004 | 0.3 | 11,000 | 700 | 0.003 | 0.25 | 9,000 | 500 | 0.002 | 0.2 |
| | 0.05 0.1 0.2 0.3 | 2 | 30,000 | 2,800 | 0.065 | 0.35 | 25,000 | 2,300 | 0.05 | 0.3 | 21,000 | 2,000 | 0.04 | 0.25 | 17,000 | 1,400 | 0.03 | 0.2 |
| | | 3 | 28,000 | 2,500 | 0.06 | 0.35 | 23,000 | 2,100 | 0.05 | 0.3 | 20,000 | 1,800 | 0.04 | 0.25 | 16,000 | 1,300 | 0.03 | 0.2 |
| | | 4 | 25,000 | 2,200 | 0.055 | 0.35 | 21,000 | 1,800 | 0.04 | 0.3 | 18,000 | 1,500 | 0.03 | 0.25 | 14,000 | 1,100 | 0.02 | 0.2 |
| | | 5 | 23,000 | 1,900 | 0.05 | 0.35 | 19,000 | 1,600 | 0.03 | 0.3 | 16,000 | 1,400 | 0.02 | 0.25 | 13,000 | 1,000 | 0.01 | 0.2 |
| | | 6 | 20,000 | 1,700 | 0.045 | 0.35 | 16,000 | 1,400 | 0.02 | 0.3 | 14,000 | 1,200 | 0.01 | 0.25 | 11,000 | 850 | 0.007 | 0.2 |
| | | 8 | 18,000 | 1,400 | 0.035 | 0.35 | 15,000 | 1,100 | 0.015 | 0.3 | 13,000 | 900 | 0.008 | 0.25 | 10,000 | 650 | 0.005 | 0.2 |
| | | 10 | 16,000 | 1,000 | 0.025 | 0.35 | 13,000 | 800 | 0.01 | 0.3 | 11,000 | 700 | 0.006 | 0.25 | 9,000 | 500 | 0.005 | 0.2 |
| 1.2 | 0.1 0.2 0.3 | 5 | 24,000 | 2,200 | 0.06 | 0.45 | 20,000 | 1,800 | 0.045 | 0.4 | 17,000 | 1,500 | 0.03 | 0.3 | 14,000 | 1,100 | 0.02 | 0.2 |
| | | 10 | 16,000 | 1,400 | 0.04 | 0.45 | 13,000 | 1,100 | 0.03 | 0.4 | 11,000 | 950 | 0.01 | 0.3 | 9,000 | 700 | 0.005 | 0.2 |
| 1.5 | 0.02 | 3 | 28,000 | 2,800 | 0.016 | 0.55 | 23,000 | 2,300 | 0.012 | 0.5 | 20,000 | 2,000 | 0.01 | 0.4 | 16,000 | 1,400 | 0.008 | 0.3 |
| | | 4 | 25,000 | 2,400 | 0.016 | 0.55 | 21,000 | 2,000 | 0.012 | 0.5 | 18,000 | 1,700 | 0.01 | 0.4 | 14,000 | 1,200 | 0.008 | 0.3 |
| | | 6 | 23,000 | 2,200 | 0.014 | 0.55 | 19,000 | 1,800 | 0.01 | 0.5 | 16,000 | 1,500 | 0.008 | 0.4 | 13,000 | 1,100 | 0.005 | 0.3 |
| | | 8 | 20,000 | 1,800 | 0.014 | 0.55 | 16,000 | 1,500 | 0.01 | 0.5 | 14,000 | 1,300 | 0.008 | 0.4 | 11,000 | 900 | 0.003 | 0.3 |
| | | 12 | 16,000 | 1,400 | 0.012 | 0.55 | 13,000 | 1,100 | 0.008 | 0.5 | 11,000 | 950 | 0.005 | 0.4 | 9,000 | 650 | 0.002 | 0.3 |
| | | 15 | 14,000 | 1,000 | 0.008 | 0.55 | 11,000 | 800 | 0.005 | 0.5 | 9,000 | 700 | 0.003 | 0.4 | 7,000 | 500 | 0.002 | 0.3 |
| | 0.05 0.1 0.2 0.3 0.5 | 3 | 28,000 | 2,800 | 0.1 | 0.55 | 23,000 | 2,300 | 0.05 | 0.5 | 20,000 | 2,000 | 0.04 | 0.4 | 16,000 | 1,400 | 0.03 | 0.3 |
| | | 4 | 25,000 | 2,400 | 0.08 | 0.55 | 21,000 | 2,000 | 0.05 | 0.5 | 18,000 | 1,700 | 0.04 | 0.4 | 14,000 | 1,200 | 0.03 | 0.3 |
| | | 6 | 23,000 | 2,200 | 0.08 | 0.55 | 19,000 | 1,800 | 0.045 | 0.5 | 16,000 | 1,500 | 0.03 | 0.4 | 13,000 | 1,100 | 0.02 | 0.3 |
| | | 8 | 20,000 | 1,800 | 0.06 | 0.55 | 16,000 | 1,500 | 0.04 | 0.5 | 14,000 | 1,300 | 0.025 | 0.4 | 11,000 | 900 | 0.01 | 0.3 |
| | | 12 | 16,000 | 1,400 | 0.06 | 0.55 | 13,000 | 1,100 | 0.03 | 0.5 | 11,000 | 950 | 0.02 | 0.4 | 9,000 | 650 | 0.007 | 0.3 |
| | | 15 | 14,000 | 1,000 | 0.03 | 0.55 | 11,000 | 800 | 0.02 | 0.5 | 9,000 | 700 | 0.007 | 0.4 | 7,000 | 500 | 0.005 | 0.3 |
| 2 | 0.02 | 4 | 24,000 | 2,800 | 0.02 | 0.7 | 20,000 | 2,300 | 0.015 | 0.6 | 17,000 | 2,000 | 0.012 | 0.5 | 14,000 | 1,400 | 0.008 | 0.35 |
| | | 6 | 22,000 | 2,500 | 0.018 | 0.7 | 18,000 | 2,100 | 0.015 | 0.6 | 15,000 | 1,800 | 0.012 | 0.5 | 12,000 | 1,300 | 0.008 | 0.35 |
| | | 8 | 20,000 | 2,200 | 0.016 | 0.7 | 16,000 | 1,800 | 0.012 | 0.6 | 14,000 | 1,500 | 0.01 | 0.5 | 11,000 | 1,100 | 0.005 | 0.35 |
| | | 12 | 16,000 | 1,700 | 0.014 | 0.7 | 13,000 | 1,400 | 0.01 | 0.6 | 11,000 | 1,200 | 0.008 | 0.5 | 9,000 | 850 | 0.003 | 0.35 |
| | | 16 | 14,000 | 1,400 | 0.012 | 0.7 | 11,000 | 1,100 | 0.008 | 0.6 | 9,500 | 950 | 0.005 | 0.5 | 7,500 | 650 | 0.002 | 0.35 |
| | | 20 | 10,000 | 800 | 0.01 | 0.7 | 8,000 | 650 | 0.005 | 0.6 | 7,000 | 550 | 0.003 | 0.5 | 5,500 | 400 | 0.002 | 0.35 |
| | 0.05 0.1 0.2 0.3 0.5 | 4 | 24,000 | 2,800 | 0.13 | 0.7 | 20,000 | 2,300 | 0.06 | 0.6 | 17,000 | 2,000 | 0.05 | 0.5 | 14,000 | 1,400 | 0.03 | 0.35 |
| | | 6 | 22,000 | 2,500 | 0.12 | 0.7 | 18,000 | 2,100 | 0.06 | 0.6 | 15,000 | 1,800 | 0.05 | 0.5 | 12,000 | 1,300 | 0.03 | 0.35 |
| | | 8 | 20,000 | 2,200 | 0.11 | 0.7 | 16,000 | 1,800 | 0.05 | 0.6 | 14,000 | 1,500 | 0.04 | 0.5 | 11,000 | 1,100 | 0.02 | 0.35 |
| | | 12 | 16,000 | 1,700 | 0.09 | 0.7 | 13,000 | 1,400 | 0.04 | 0.6 | 11,000 | 1,200 | 0.03 | 0.5 | 9,000 | 850 | 0.01 | 0.35 |
| | | 16 | 14,000 | 1,400 | 0.07 | 0.7 | 11,000 | 1,100 | 0.03 | 0.6 | 9,500 | 950 | 0.02 | 0.5 | 7,500 | 650 | 0.007 | 0.35 |
| | | 20 | 10,000 | 800 | 0.05 | 0.7 | 8,000 | 650 | 0.02 | 0.6 | 7,000 | 550 | 0.01 | 0.5 | 5,500 | 400 | 0.005 | 0.35 |
| 2.5 | 0.1 0.2 0.3 0.5 | 10 | 16,000 | 2,200 | 0.14 | 0.85 | 13,000 | 1,800 | 0.07 | 0.7 | 11,000 | 1,500 | 0.05 | 0.5 | 9,000 | 1,100 | 0.03 | 0.5 |
| | | 20 | 11,000 | 1,400 | 0.08 | 0.85 | 9,000 | 1,100 | 0.04 | 0.7 | 7,500 | 950 | 0.02 | 0.5 | 6,000 | 650 | 0.01 | 0.5 |
| | | 30 | 7,000 | 800 | 0.03 | 0.85 | 5,500 | 650 | 0.01 | 0.7 | 4,500 | 550 | 0.01 | 0.5 | 3,500 | 400 | 0.005 | 0.5 |
| 3 | 0.05 0.1 0.2 0.3 0.5 1 | 4 | 18,000 | 2,800 | 0.18 | 1 | 15,000 | 2,300 | 0.1 | 0.8 | 13,000 | 2,000 | 0.07 | 0.7 | 10,000 | 1,400 | 0.05 | 0.6 |
| | | 6 | 16,000 | 2,500 | 0.17 | 1 | 13,000 | 2,100 | 0.1 | 0.8 | 11,000 | 1,800 | 0.07 | 0.7 | 9,000 | 1,300 | 0.05 | 0.6 |
| | | 8 | 14,000 | 2,200 | 0.16 | 1 | 11,000 | 1,800 | 0.1 | 0.8 | 9,500 | 1,500 | 0.07 | 0.7 | 7,500 | 1,100 | 0.05 | 0.6 |
| | | 12 | 13,500 | 2,000 | 0.16 | 1 | 11,000 | 1,600 | 0.08 | 0.8 | 9,500 | 1,400 | 0.06 | 0.7 | 7,500 | 1,000 | 0.04 | 0.6 |
| | | 16 | 12,000 | 1,800 | 0.14 | 1 | 10,000 | 1,500 | 0.07 | 0.8 | 8,500 | 1,300 | 0.05 | 0.7 | 7,000 | 900 | 0.03 | 0.6 |
| | | 20 | 10,000 | 1,400 | 0.12 | 1 | 8,000 | 1,100 | 0.05 | 0.8 | 7,000 | 950 | 0.04 | 0.7 | 5,500 | 700 | 0.02 | 0.6 |
| | | 25 | 9,000 | 1,200 | 0.08 | 1 | 7,500 | 1,000 | 0.04 | 0.8 | 6,500 | 850 | 0.02 | 0.7 | 5,000 | 600 | 0.01 | 0.6 |
| | | 30 | 8,000 | 800 | 0.06 | 1 | 6,500 | 650 | 0.03 | 0.8 | 5,500 | 550 | 0.02 | 0.7 | 4,500 | 400 | 0.007 | 0.6 |
| 4 | 0.1 0.2 0.3 0.5 1 | 8 | 12,000 | 2,600 | 0.25 | 1.4 | 10,000 | 2,100 | 0.15 | 1.2 | 8,500 | 1,800 | 0.08 | 1 | 7,000 | 1,300 | 0.06 | 0.8 |
| | | 12 | 12,000 | 2,600 | 0.25 | 1.4 | 10,000 | 2,100 | 0.15 | 1.2 | 8,500 | 1,800 | 0.08 | 1 | 7,000 | 1,300 | 0.06 | 0.8 |
| | | 16 | 10,000 | 2,200 | 0.17 | 1.4 | 8,000 | 1,800 | 0.1 | 1.2 | 7,000 | 1,500 | 0.06 | 1 | 5,500 | 1,100 | 0.05 | 0.8 |
| | | 24 | 8,000 | 1,600 | 0.14 | 1.4 | 6,500 | 1,300 | 0.08 | 1.2 | 5,500 | 1,100 | 0.05 | 1 | 4,500 | 750 | 0.03 | 0.8 |
| | | 32 | 6,500 | 1,300 | 0.08 | 1.4 | 5,500 | 1,100 | 0.04 | 1.2 | 4,500 | 950 | 0.02 | 1 | 3,500 | 650 | 0.01 | 0.8 |
| 5 | 0.1 0.2 0.3 0.5 1 | 15 | 9,500 | 2,400 | 0.25 | 2.2 | 8,000 | 2,000 | 0.15 | 2 | 7,000 | 1,700 | 0.08 | 1.6 | 5,500 | 1,200 | 0.06 | 1.2 |
| | | 20 | 8,000 | 2,000 | 0.18 | 2.2 | 6,500 | 1,600 | 0.1 | 2 | 5,500 | 1,400 | 0.07 | 1.6 | 4,500 | 1,000 | 0.05 | 1.2 |
| | | 40 | 5,000 | 1,200 | 0.09 | 2.2 | 4,000 | 1,000 | 0.05 | 2 | 3,500 | 850 | 0.02 | 1.6 | 3,000 | 600 | 0.01 | 1.2 |
| 6 | 0.1 0.2 0.3 0.5 1 | 12 | 8,000 | 2,500 | 0.35 | 2.7 | 6,500 | 2,100 | 0.18 | 2.5 | 5,500 | 1,800 | 0.08 | 2 | 4,500 | 1,300 | 0.06 | 1.5 |
| | | 18 | 7,000 | 2,200 | 0.3 | 2.7 | 5,500 | 1,800 | 0.18 | 2.5 | 4,500 | 1,500 | 0.08 | 2 | 3,500 | 1,100 | 0.06 | 1.5 |
| | | 24 | 6,000 | 1,800 | 0.2 | 2.7 | 5,000 | 1,500 | 0.15 | 2.5 | 4,000 | 1,300 | 0.07 | 2 | 3,000 | 900 | 0.05 | 1.5 |
| | | 48 | 3,000 | 900 | 0.1 | 2.7 | 2,500 | 750 | 0.05 | 2.5 | 2,000 | 650 | 0.03 | 2 | 2,000 | 450 | 0.02 | 1.5 |

**備考 Notes**

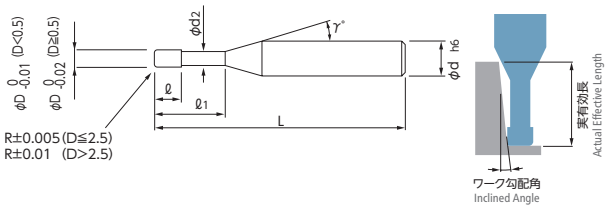
※実際の加工形状および使用機械等にて切削条件を調整してください。
※切り込み量の ap は切り込み深さ、ae は切り込み幅を示します。
※焼き入れ鋼を切削加工する場合は、オイルミストクーラントをお奨めします。
※ Z 切り込み時のアプローチ方法として、ヘリカル（螺旋）及びランプ（傾斜）での切削加工をお奨めします。
※ L (有効長) / D (刃径) が 8 倍を超える場合は立ち壁付近の送り速度を 50%以下、切り込み量：ae を 30%以下に調整してください。
※溝切削は、切削条件表を参考に切り込み量：ap 及び送り速度を 50%以下に設定し、往復切削をお奨めします。
※ ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。また、主軸回転数が足りない場合も同様に同じ割合で下げてください。
※Adjust milling conditions according to milling shape and machine type.
※ap : Axial Depth of Cut, ae : Radial Depth of Cut.
※Recommend to use oil mist coolant for machining hardened steels.
※Recommend to apply helical or ramping for approaching into axial direction.
※Adjust feed rate 50% lower and cutting depth (ae) 30% lower for milling deep wall area when L/D exceeds 8 for stable milling.
※For slotting, recommend reciprocating milling by adjusting feed & ap in below 50% of recommended milling condition.
※Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.



ŞEVKET ÖLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

# MHR230R

## 無限コーティング 2枚刃ロングネックラジアスエンドミル
MUGEN-COATING 2-Flute Long Neck Radius End Mill




●外周刃はワークへの接触を最小限にした設計でビビリを抑制。
●ボールエンドミルと比べ、ピックフィードが大きく取れるため高能率加工を実現。
●コーナー半径精度は±5μm！の高精度。（刃径φ2.5 以下）
●チューンナップされた無限コーティングにより、焼き入れ鋼・調質鋼の加工に抜群の威力を発揮し、銅電極の加工にも最適。
●Minimized chattering by peripheral cutting edge designed for minimal contact to work material.
●Realized high efficiency milling by obtaining larger radial depth of cutting comparing with Ball End Mill.
●Corner R accuracy : ±5μm (2.5D and below)
●Upgraded MUGEN-COATING brings outstanding performance for milling of Prehardened Steels and Copper Electrode as well.

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00221-02050 | 0.2 | R0.05 | 0.5 | 0.15 | 0.18 | 12° | 4 | 45 | 9,000 | 0.57 | 0.59 | 0.62 | 0.65 | 0.71 |
| 08-00220-02001 | | | 0.5 | | | | 6 | 50 | 10,900 | 0.57 | 0.59 | 0.62 | 0.65 | 0.71 |
| 08-00221-02051 | | | 1 | | | | 4 | 45 | 9,000 | 1.09 | 1.14 | 1.19 | 1.24 | 1.38 |
| 08-00220-02002 | | | 1 | | | | 6 | 50 | 10,900 | 1.09 | 1.14 | 1.19 | 1.24 | 1.38 |
| 08-00221-02052 | | | 1.5 | | | | 4 | 45 | 9,000 | 1.61 | 1.68 | 1.76 | 1.84 | 2.04 |
| 08-00221-02053 | | | 2 | | | | 4 | 45 | 9,000 | 2.13 | 2.23 | 2.33 | 2.44 | 2.71 |
| 08-00221-03050 | 0.3 | R0.05 | 1 | 0.25 | 0.28 | 12° | 4 | 45 | 8,700 | 1.09 | 1.14 | 1.19 | 1.24 | 1.38 |
| 08-00220-03001 | | | 1 | | | | 6 | 50 | 10,500 | 1.09 | 1.14 | 1.19 | 1.24 | 1.38 |
| 08-00221-03051 | | | 1.5 | | | | 4 | 45 | 8,700 | 1.61 | 1.68 | 1.76 | 1.84 | 2.04 |
| 08-00221-03052 | | | 2 | | | | 4 | 45 | 8,700 | 2.13 | 2.23 | 2.33 | 2.44 | 2.71 |
| 08-00220-03002 | | | 2 | | | | 6 | 50 | 10,500 | 2.13 | 2.23 | 2.33 | 2.44 | 2.71 |
| 08-00221-03053 | | | 2.5 | | | | 4 | 45 | 9,600 | 2.65 | 2.77 | 2.90 | 3.04 | 3.37 |
| 08-00221-03054 | | | 3 | | | | 4 | 45 | 9,600 | 3.18 | 3.32 | 3.47 | 3.64 | 4.04 |
| 08-00221-04050 | 0.4 | R0.05 | 1 | 0.3 | 0.37 | 12° | 4 | 45 | 5,800 | 1.11 | 1.16 | 1.22 | 1.27 | 1.41 |
| 08-00221-04051 | | | 1.5 | | | | 4 | 45 | 5,800 | 1.64 | 1.71 | 1.79 | 1.87 | 2.07 |
| 08-00221-04052 | | | 2 | | | | 4 | 45 | 5,800 | 2.16 | 2.25 | 2.36 | 2.47 | 2.74 |
| 08-00220-04005 | | | 2 | | | | 6 | 50 | 7,000 | 2.16 | 2.25 | 2.36 | 2.47 | 2.74 |
| 08-00221-04053 | | | 3 | | | | 4 | 45 | 5,800 | 3.20 | 3.34 | 3.50 | 3.67 | 4.07 |
| 08-00220-04006 | | | 3 | | | | 6 | 50 | 7,000 | 3.20 | 3.34 | 3.50 | 3.67 | 4.07 |
| 08-00221-04054 | | | 4 | | | | 4 | 45 | 5,800 | 4.24 | 4.43 | 4.64 | 4.87 | 5.40 |
| 08-00220-04007 | | | 4 | | | | 6 | 50 | 7,000 | 4.24 | 4.43 | 4.64 | 4.87 | 5.40 |
| 08-00221-04100 | | R0.1 | 1 | | | | 4 | 45 | 5,800 | 1.11 | 1.16 | 1.21 | 1.26 | 1.39 |
| 08-00221-04101 | | | 1.5 | | | | 4 | 45 | 5,800 | 1.63 | 1.70 | 1.78 | 1.86 | 2.06 |
| 08-00221-04102 | | | 2 | | | | 4 | 45 | 5,800 | 2.16 | 2.25 | 2.35 | 2.46 | 2.72 |
| 08-00220-04011 | | | 2 | | | | 6 | 50 | 7,000 | 2.16 | 2.25 | 2.35 | 2.46 | 2.72 |
| 08-00221-04103 | | | 3 | | | | 4 | 45 | 5,800 | 3.20 | 3.34 | 3.49 | 3.66 | 4.05 |
| 08-00220-04013 | | | 3 | | | | 6 | 50 | 7,000 | 3.20 | 3.34 | 3.49 | 3.66 | 4.05 |
| 08-00221-04104 | | | 4 | | | | 4 | 45 | 5,800 | 4.24 | 4.43 | 4.63 | 4.86 | 5.39 |
| 08-00220-04012 | | | 4 | | | | 6 | 50 | 7,000 | 4.24 | 4.43 | 4.63 | 4.86 | 5.39 |

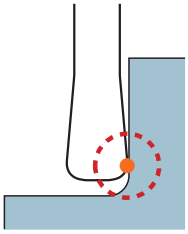
**オーダー方法** MHR230R 刃径(D)×コーナー半径(R)×有効長(ℓ1)×シャンク径(d)を指示してください。
When you order, indicate MHR230R (D)×(R)×(ℓ1)×(d).

※(γ)は参考値です。
※(γ) is reference value.

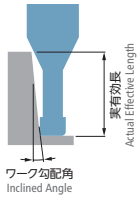
●切削条件表はF-036に記載
●Recommended Milling Conditions are shown on page F-036.

# MHR230R

## 無限コーティング 2枚刃ロングネックラジアスエンドミル
MUGEN-COATING 2-Flute Long Neck Radius End Mill



切削抵抗の少ない点当たりで面粗度アップ!!（刃径φ2.5以下）
Point milling with reducing the machining load to realize fine surface. (D≦2.5)




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00221-05050 | 0.5 | R0.05 | 1 | 0.4 | 0.46 | 12° | 4 | 45 | 4,700 | 1.14 | 1.19 | 1.24 | 1.30 | 1.44 |
| 08-00221-05051 | | | 2 | | | | 4 | 45 | 4,700 | 2.18 | 2.28 | 2.38 | 2.50 | 2.77 |
| 08-00220-05005 | | | 2 | | | | 6 | 50 | 5,700 | 2.18 | 2.28 | 2.38 | 2.50 | 2.77 |
| 08-00221-05052 | | | 3 | | | | 4 | 45 | 4,700 | 3.22 | 3.37 | 3.52 | 3.70 | 4.10 |
| 08-00220-05006 | | | 3 | | | | 6 | 50 | 5,700 | 3.22 | 3.37 | 3.52 | 3.70 | 4.10 |
| 08-00221-05053 | | | 4 | | | | 4 | 45 | 4,700 | 4.27 | 4.46 | 4.67 | 4.90 | 5.43 |
| 08-00220-05007 | | | 4 | | | | 6 | 50 | 5,700 | 4.27 | 4.46 | 4.67 | 4.90 | 5.43 |
| 08-00221-05054 | | | 5 | | | | 4 | 45 | 4,700 | 5.31 | 5.55 | 5.81 | 6.09 | 6.76 |
| 08-00220-05008 | | | 5 | | | | 6 | 50 | 5,700 | 5.31 | 5.55 | 5.81 | 6.09 | 6.76 |
| 08-00221-05055 | | | 6 | | | | 4 | 45 | 4,700 | 6.35 | 6.64 | 6.95 | 7.29 | 8.10 |
| 08-00221-05100 | | R0.1 | 1 | | | | 4 | 45 | 4,700 | 1.14 | 1.18 | 1.24 | 1.29 | 1.42 |
| 08-00221-05101 | | | 2 | | | | 4 | 45 | 4,700 | 2.18 | 2.27 | 2.38 | 2.49 | 2.75 |
| 08-00220-05011 | | | 2 | | | | 6 | 50 | 5,700 | 2.18 | 2.27 | 2.38 | 2.49 | 2.75 |
| 08-00221-05102 | | | 3 | | | | 4 | 45 | 4,700 | 3.22 | 3.36 | 3.52 | 3.69 | 4.09 |
| 08-00220-05013 | | | 3 | | | | 6 | 50 | 5,700 | 3.22 | 3.36 | 3.52 | 3.69 | 4.09 |
| 08-00221-05103 | | | 4 | | | | 4 | 45 | 4,700 | 4.27 | 4.45 | 4.66 | 4.89 | 5.42 |
| 08-00220-05012 | | | 4 | | | | 6 | 50 | 5,700 | 4.27 | 4.45 | 4.66 | 4.89 | 5.42 |
| 08-00221-05104 | | | 5 | | | | 4 | 45 | 4,700 | 5.31 | 5.54 | 5.80 | 6.08 | 6.75 |
| 08-00220-05014 | | | 5 | | | | 6 | 50 | 5,700 | 5.31 | 5.54 | 5.80 | 6.08 | 6.75 |
| 08-00221-05105 | | | 6 | | | | 4 | 45 | 4,700 | 6.35 | 6.63 | 6.94 | 7.28 | 8.08 |
| 08-00221-06050 | 0.6 | R0.05 | 2 | 0.5 | 0.56 | 12° | 4 | 45 | 4,700 | 2.18 | 2.28 | 2.38 | 2.50 | 2.77 |
| 08-00220-06005 | | | 2 | | | | 6 | 50 | 5,700 | 2.18 | 2.28 | 2.38 | 2.50 | 2.77 |
| 08-00221-06051 | | | 3 | | | | 4 | 45 | 4,700 | 3.22 | 3.37 | 3.52 | 3.70 | 4.10 |
| 08-00221-06052 | | | 4 | | | | 4 | 45 | 4,700 | 4.27 | 4.46 | 4.67 | 4.90 | 5.43 |
| 08-00220-06007 | | | 4 | | | | 6 | 50 | 5,700 | 4.27 | 4.46 | 4.67 | 4.90 | 5.43 |
| 08-00221-06053 | | | 6 | | | | 4 | 45 | 4,700 | 6.35 | 6.64 | 6.95 | 7.29 | 8.10 |
| 08-00220-06009 | | | 6 | | | | 6 | 50 | 5,700 | 6.35 | 6.64 | 6.95 | 7.29 | 8.10 |
| 08-00221-06054 | | | 8 | | | | 4 | 50 | 4,700 | 8.44 | 8.82 | 9.23 | 9.69 | 10.76 |
| 08-00221-06100 | | R0.1 | 2 | | | | 4 | 45 | 4,700 | 2.18 | 2.27 | 2.38 | 2.49 | 2.75 |
| 08-00221-06101 | | | 3 | | | | 4 | 45 | 4,700 | 3.22 | 3.36 | 3.52 | 3.69 | 4.09 |
| 08-00221-06102 | | | 4 | | | | 4 | 45 | 4,700 | 4.27 | 4.45 | 4.66 | 4.89 | 5.42 |
| 08-00220-06011 | | | 4 | | | | 6 | 50 | 5,700 | 4.27 | 4.45 | 4.66 | 4.89 | 5.42 |
| 08-00221-06103 | | | 6 | | | | 4 | 45 | 4,700 | 6.35 | 6.63 | 6.94 | 7.28 | 8.08 |
| 08-00220-06012 | | | 6 | | | | 6 | 50 | 5,700 | 6.35 | 6.63 | 6.94 | 7.28 | 8.08 |
| 08-00221-06104 | | | 8 | | | | 4 | 50 | 4,700 | 8.44 | 8.81 | 9.22 | 9.68 | 10.74 |
| 08-00221-06200 | | R0.2 | 2 | | | | 4 | 45 | 4,700 | 2.18 | 2.26 | 2.36 | 2.47 | 2.72 |
| 08-00221-06201 | | | 3 | | | | 4 | 45 | 4,700 | 3.22 | 3.35 | 3.50 | 3.67 | 4.05 |

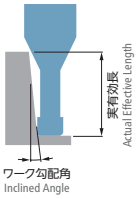
**オーダー方法**
MHR230R 刃径(D)×コーナー半径(R)×有効長(ℓ1)×シャンク径(d)を指示してください。
When you order, indicate MHR230R (D)×(R)×(ℓ1)×(d).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はF-036に記載
●Recommended Milling Conditions are shown on page F-036.



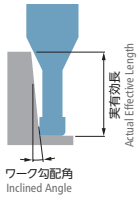
ŞEVKET ÖĞLÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.




| コードNo. Code No. | (D) 刃径 Dia. | (R) コーナー半径 Corner Radius | (ℓ1) 有効長 Effective Length | (ℓ) 刃長 Length of Cut | (d2) 首下径 Neck Dia. | (γ) 首角 Neck Taper Angle | (d) シャンク径 Shank Dia. | (L) 全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00221-06202 | 0.6 | R0.2 | 4 | 0.5 | 0.56 | 12° | 4 | 45 | 4,700 | 4.26 | 4.44 | 4.64 | 4.87 | 5.38 |
| 08-00221-06203 | | | 6 | | | | 4 | 45 | 4,700 | 6.35 | 6.62 | 6.93 | 7.26 | 8.05 |
| 08-00221-06204 | | | 8 | | | | 4 | 50 | 4,700 | 8.43 | 8.80 | 9.21 | 9.66 | 10.71 |
| 08-00221-07050 | 0.7 | R0.05 | 4 | 0.55 | 0.66 | 12° | 4 | 45 | 5,000 | 4.27 | 4.46 | 4.67 | 4.90 | 5.43 |
| 08-00220-07005 | | | 4 | | | | 6 | 50 | 6,000 | 4.27 | 4.46 | 4.67 | 4.90 | 5.43 |
| 08-00221-07051 | | | 6 | | | | 4 | 45 | 5,000 | 6.35 | 6.64 | 6.95 | 7.29 | 8.10 |
| 08-00220-07006 | | | 6 | | | | 6 | 50 | 6,000 | 6.35 | 6.64 | 6.95 | 7.29 | 8.10 |
| 08-00221-07100 | | R0.1 | 4 | | | | 4 | 45 | 5,000 | 4.27 | 4.45 | 4.66 | 4.89 | 5.42 |
| 08-00220-07011 | | | 4 | | | | 6 | 50 | 6,000 | 4.27 | 4.45 | 4.66 | 4.89 | 5.42 |
| 08-00221-07101 | | | 6 | | | | 4 | 45 | 5,000 | 6.35 | 6.63 | 6.94 | 7.28 | 8.08 |
| 08-00220-07012 | | | 6 | | | | 6 | 50 | 6,000 | 6.35 | 6.63 | 6.94 | 7.28 | 8.08 |
| 08-00221-08050 | 0.8 | R0.05 | 4 | 0.65 | 0.76 | 12° | 4 | 45 | 5,400 | 4.27 | 4.46 | 4.67 | 4.90 | 5.43 |
| 08-00220-08005 | | | 4 | | | | 6 | 50 | 6,500 | 4.27 | 4.46 | 4.67 | 4.90 | 5.43 |
| 08-00221-08051 | | | 6 | | | | 4 | 45 | 5,400 | 6.35 | 6.64 | 6.95 | 7.29 | 8.10 |
| 08-00220-08006 | | | 6 | | | | 6 | 50 | 6,500 | 6.35 | 6.64 | 6.95 | 7.29 | 8.10 |
| 08-00221-08052 | | | 8 | | | | 4 | 50 | 5,400 | 8.44 | 8.82 | 9.23 | 9.69 | 10.76 |
| 08-00220-08007 | | | 8 | | | | 6 | 50 | 6,500 | 8.44 | 8.82 | 9.23 | 9.69 | 10.76 |
| 08-00221-08100 | | R0.1 | 4 | | | | 4 | 45 | 5,400 | 4.27 | 4.45 | 4.66 | 4.89 | 5.42 |
| 08-00220-08011 | | | 4 | | | | 6 | 50 | 6,500 | 4.27 | 4.45 | 4.66 | 4.89 | 5.42 |
| 08-00221-08101 | | | 6 | | | | 4 | 45 | 5,400 | 6.35 | 6.63 | 6.94 | 7.28 | 8.08 |
| 08-00220-08012 | | | 6 | | | | 6 | 50 | 6,500 | 6.35 | 6.63 | 6.94 | 7.28 | 8.08 |
| 08-00221-08102 | | | 8 | | | | 4 | 50 | 5,400 | 8.44 | 8.81 | 9.22 | 9.68 | 10.74 |
| 08-00220-08013 | | | 8 | | | | 6 | 50 | 6,500 | 8.44 | 8.81 | 9.22 | 9.68 | 10.74 |
| 08-00221-08200 | | R0.2 | 4 | | | | 4 | 45 | 5,400 | 4.26 | 4.44 | 4.64 | 4.87 | 5.38 |
| 08-00220-08021 | | | 4 | | | | 6 | 50 | 6,500 | 4.26 | 4.44 | 4.64 | 4.87 | 5.38 |
| 08-00221-08201 | | | 6 | | | | 4 | 45 | 5,400 | 6.35 | 6.62 | 6.93 | 7.26 | 8.05 |
| 08-00220-08022 | | | 6 | | | | 6 | 50 | 6,500 | 6.35 | 6.62 | 6.93 | 7.26 | 8.05 |
| 08-00221-08202 | | | 8 | | | | 4 | 50 | 5,400 | 8.43 | 8.80 | 9.21 | 9.66 | 10.71 |
| 08-00220-08023 | | | 8 | | | | 6 | 50 | 6,500 | 8.43 | 8.80 | 9.21 | 9.66 | 10.71 |
| 08-00221-09100 | 0.9 | R0.1 | 4 | 0.7 | 0.85 | 12° | 4 | 45 | 6,000 | 4.27 | 4.45 | 4.66 | 4.89 | 5.42 |
| 08-00220-09011 | | | 4 | | | | 6 | 50 | 6,800 | 4.27 | 4.45 | 4.66 | 4.89 | 5.42 |
| 08-00221-09101 | | | 8 | | | | 4 | 50 | 6,000 | 8.44 | 8.81 | 9.22 | 9.68 | 10.74 |
| 08-00220-09012 | | | 8 | | | | 6 | 50 | 6,800 | 8.44 | 8.81 | 9.22 | 9.68 | 10.74 |
| 08-00221-10050 | 1 | R0.05 | 2 | 0.8 | 0.95 | 12° | 4 | 50 | 4,600 | 2.21 | 2.30 | 2.41 | 2.53 | 2.80 |
| 08-00221-10051 | | | 3 | | | | 4 | 50 | 4,600 | 3.25 | 3.39 | 3.55 | 3.73 | 4.13 |
| 08-00220-10001 | | | 3 | | | | 6 | 50 | 6,000 | 3.25 | 3.39 | 3.55 | 3.73 | 4.13 |
| 08-00221-10052 | | | 4 | | | | 4 | 50 | 4,600 | 4.29 | 4.48 | 4.69 | 4.92 | 5.46 |

# MHR230R

## 無限コーティング 2枚刃ロングネックラジアスエンドミル
MUGEN-COATING 2-Flute Long Neck Radius End Mill




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00220-10002 | 1 | R0.05 | 4 | 0.8 | 0.95 | 12° | 6 | 50 | 6,000 | 4.29 | 4.48 | 4.69 | 4.92 | 5.46 |
| 08-00221-10053 | | | 5 | | | | 4 | 50 | 4,600 | 5.34 | 5.57 | 5.83 | 6.12 | 6.80 |
| 08-00220-10003 | | | 5 | | | | 6 | 50 | 6,000 | 5.34 | 5.57 | 5.83 | 6.12 | 6.80 |
| 08-00221-10054 | | | 6 | | | | 4 | 50 | 5,000 | 6.38 | 6.66 | 6.98 | 7.32 | 8.13 |
| 08-00220-10004 | | | 6 | | | | 6 | 50 | 6,000 | 6.38 | 6.66 | 6.98 | 7.32 | 8.13 |
| 08-00221-10055 | | | 8 | | | | 4 | 50 | 5,000 | 8.46 | 8.84 | 9.26 | 9.72 | 10.79 |
| 08-00220-10006 | | | 8 | | | | 6 | 50 | 6,000 | 8.46 | 8.84 | 9.26 | 9.72 | 10.79 |
| 08-00221-10056 | | | 10 | | | | 4 | 50 | 5,000 | 10.55 | 11.02 | 11.54 | 12.11 | 13.45 |
| 08-00220-10008 | | | 10 | | | | 6 | 50 | 6,000 | 10.55 | 11.02 | 11.54 | 12.11 | 13.45 |
| 08-00221-10057 | | | 12 | | | | 4 | 50 | 5,000 | 12.64 | 13.20 | 13.82 | 14.51 | 16.11 |
| 08-00220-10009 | | | 12 | | | | 6 | 50 | 6,000 | 12.64 | 13.20 | 13.82 | 14.51 | 16.11 |
| 08-00221-10058 | | | 16 | | | | 4 | 60 | 6,600 | 16.81 | 17.56 | 18.39 | 19.30 | 21.44 |
| 08-00221-10059 | | | 20 | | | | 4 | 60 | 7,300 | 20.98 | 21.92 | 22.95 | 24.09 | 26.76 |
| 08-00221-10100 | | R0.1 | 2 | | | | 4 | 50 | 4,600 | 2.20 | 2.30 | 2.40 | 2.52 | 2.79 |
| 08-00221-10101 | | | 3 | | | | 4 | 50 | 4,600 | 3.25 | 3.39 | 3.54 | 3.72 | 4.12 |
| 08-00220-10010 | | | 3 | | | | 6 | 50 | 6,000 | 3.25 | 3.39 | 3.54 | 3.72 | 4.12 |
| 08-00221-10102 | | | 4 | | | | 4 | 50 | 4,600 | 4.29 | 4.48 | 4.69 | 4.91 | 5.45 |
| 08-00220-10011 | | | 4 | | | | 6 | 50 | 6,000 | 4.29 | 4.48 | 4.69 | 4.91 | 5.45 |
| 08-00221-10103 | | | 5 | | | | 4 | 50 | 4,600 | 5.33 | 5.57 | 5.83 | 6.11 | 6.78 |
| 08-00220-10014 | | | 5 | | | | 6 | 50 | 6,000 | 5.33 | 5.57 | 5.83 | 6.11 | 6.78 |
| 08-00221-10104 | | | 6 | | | | 4 | 50 | 5,000 | 6.38 | 6.66 | 6.97 | 7.31 | 8.11 |
| 08-00220-10015 | | | 6 | | | | 6 | 50 | 6,000 | 6.38 | 6.66 | 6.97 | 7.31 | 8.11 |
| 08-00221-10105 | | | 8 | | | | 4 | 50 | 5,000 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00220-10012 | | | 8 | | | | 6 | 50 | 6,000 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00221-10106 | | | 10 | | | | 4 | 50 | 5,000 | 10.55 | 11.02 | 11.53 | 12.10 | 13.43 |
| 08-00220-10016 | | | 10 | | | | 6 | 50 | 6,000 | 10.55 | 11.02 | 11.53 | 12.10 | 13.43 |
| 08-00221-10107 | | | 12 | | | | 4 | 50 | 5,000 | 12.63 | 13.20 | 13.82 | 14.50 | 16.10 |
| 08-00220-10013 | | | 12 | | | | 6 | 50 | 6,000 | 12.63 | 13.20 | 13.82 | 14.50 | 16.10 |
| 08-00221-10108 | | | 16 | | | | 4 | 60 | 6,600 | 16.80 | 17.56 | 18.38 | 19.29 | 21.42 |
| 08-00221-10109 | | | 20 | | | | 4 | 60 | 7,300 | 20.98 | 21.92 | 22.95 | 24.08 | 26.74 |
| 08-00221-10200 | | R0.2 | 2 | | | | 4 | 50 | 4,600 | 2.20 | 2.29 | 2.39 | 2.50 | 2.75 |
| 08-00221-10201 | | | 3 | | | | 4 | 50 | 4,600 | 3.24 | 3.38 | 3.53 | 3.70 | 4.08 |
| 08-00220-10024 | | | 3 | | | | 6 | 50 | 6,000 | 3.24 | 3.38 | 3.53 | 3.70 | 4.08 |
| 08-00221-10202 | | | 4 | | | | 4 | 50 | 4,600 | 4.29 | 4.47 | 4.67 | 4.89 | 5.42 |
| 08-00220-10021 | | | 4 | | | | 6 | 50 | 6,000 | 4.29 | 4.47 | 4.67 | 4.89 | 5.42 |
| 08-00221-10203 | | | 5 | | | | 4 | 50 | 4,600 | 5.33 | 5.56 | 5.81 | 6.09 | 6.75 |
| 08-00220-10025 | | | 5 | | | | 6 | 50 | 6,000 | 5.33 | 5.56 | 5.81 | 6.09 | 6.75 |

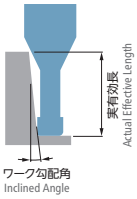
**オーダー方法** MHR230R 刃径(D)×コーナー半径(R)×有効長(ℓ1)×シャンク径(d)を指示してください。
When you order, indicate MHR230R (D)×(R)×(ℓ1)×(d).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はF-036に記載
●Recommended Milling Conditions are shown on page F-036.



ŞEVKET OĞLU® MAKINA TİCARET VE SAN. LTD. ŞTİ.

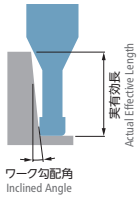



| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00221-10204 | 1 | R0.2 | 6 | 0.8 | 0.95 | 12° | 4 | 50 | 5,000 | 6.37 | 6.65 | 6.95 | 7.29 | 8.08 |
| 08-00220-10026 | | | 6 | | | | 6 | 50 | 6,000 | 6.37 | 6.65 | 6.95 | 7.29 | 8.08 |
| 08-00221-10205 | | | 8 | | | | 4 | 50 | 5,000 | 8.46 | 8.83 | 9.24 | 9.69 | 10.74 |
| 08-00220-10022 | | | 8 | | | | 6 | 50 | 6,000 | 8.46 | 8.83 | 9.24 | 9.69 | 10.74 |
| 08-00221-10206 | | | 10 | | | | 4 | 50 | 5,000 | 10.54 | 11.01 | 11.52 | 12.08 | 13.40 |
| 08-00220-10027 | | | 10 | | | | 6 | 50 | 6,000 | 10.54 | 11.01 | 11.52 | 12.08 | 13.40 |
| 08-00221-10207 | | | 12 | | | | 4 | 50 | 5,000 | 12.63 | 13.19 | 13.80 | 14.48 | 16.06 |
| 08-00220-10023 | | | 12 | | | | 6 | 50 | 6,000 | 12.63 | 13.19 | 13.80 | 14.48 | 16.06 |
| 08-00221-10208 | | | 16 | | | | 4 | 60 | 6,600 | 16.80 | 17.55 | 18.37 | 19.27 | 21.39 |
| 08-00221-10209 | | | 20 | | | | 4 | 60 | 7,300 | 20.97 | 21.91 | 22.93 | 24.06 | 26.71 |
| 08-00221-10300 | | R0.3 | 2 | | | | 4 | 50 | 4,600 | 2.20 | 2.28 | 2.38 | 2.48 | 2.72 |
| 08-00221-10301 | | | 3 | | | | 4 | 50 | 4,600 | 3.24 | 3.37 | 3.52 | 3.68 | 4.05 |
| 08-00220-10034 | | | 3 | | | | 6 | 50 | 6,000 | 3.24 | 3.37 | 3.52 | 3.68 | 4.05 |
| 08-00221-10302 | | | 4 | | | | 4 | 50 | 4,600 | 4.28 | 4.46 | 4.66 | 4.87 | 5.38 |
| 08-00220-10031 | | | 4 | | | | 6 | 50 | 6,000 | 4.28 | 4.46 | 4.66 | 4.87 | 5.38 |
| 08-00221-10303 | | | 5 | | | | 4 | 50 | 4,600 | 5.32 | 5.55 | 5.80 | 6.07 | 6.71 |
| 08-00220-10035 | | | 5 | | | | 6 | 50 | 6,000 | 5.32 | 5.55 | 5.80 | 6.07 | 6.71 |
| 08-00221-10304 | | | 6 | | | | 4 | 50 | 5,000 | 6.37 | 6.64 | 6.94 | 7.27 | 8.04 |
| 08-00220-10036 | | | 6 | | | | 6 | 50 | 6,000 | 6.37 | 6.64 | 6.94 | 7.27 | 8.04 |
| 08-00221-10305 | | | 8 | | | | 4 | 50 | 5,000 | 8.45 | 8.82 | 9.22 | 9.67 | 10.71 |
| 08-00220-10032 | | | 8 | | | | 6 | 50 | 6,000 | 8.45 | 8.82 | 9.22 | 9.67 | 10.71 |
| 08-00221-10306 | | | 10 | | | | 4 | 50 | 5,000 | 10.54 | 11.00 | 11.51 | 12.06 | 13.37 |
| 08-00220-10037 | | | 10 | | | | 6 | 50 | 6,000 | 10.54 | 11.00 | 11.51 | 12.06 | 13.37 |
| 08-00221-10307 | | | 12 | | | | 4 | 50 | 5,000 | 12.62 | 13.18 | 13.79 | 14.46 | 16.03 |
| 08-00220-10033 | | | 12 | | | | 6 | 50 | 6,000 | 12.62 | 13.18 | 13.79 | 14.46 | 16.03 |
| 08-00221-10308 | | | 16 | | | | 4 | 60 | 6,600 | 16.80 | 17.54 | 18.35 | 19.25 | 21.35 |
| 08-00221-10309 | | | 20 | | | | 4 | 60 | 7,300 | 20.97 | 21.90 | 22.92 | 24.04 | 26.68 |
| 08-00220-12011 | 1.2 | R0.1 | 5 | 1 | 1.14 | 12° | 6 | 50 | 6,200 | 5.33 | 5.56 | 5.82 | 6.10 | 6.76 |
| 08-00221-12100 | | | 6 | | | | 4 | 50 | 5,100 | 6.38 | 6.66 | 6.97 | 7.31 | 8.11 |
| 08-00221-12101 | | | 8 | | | | 4 | 50 | 5,100 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00221-12102 | | | 10 | | | | 4 | 50 | 5,100 | 10.55 | 11.02 | 11.53 | 12.10 | 13.43 |
| 08-00220-12013 | | | 10 | | | | 6 | 50 | 6,200 | 10.55 | 11.02 | 11.53 | 12.10 | 13.43 |
| 08-00221-12103 | | | 12 | | | | 4 | 50 | 5,100 | 12.63 | 13.20 | 13.82 | 14.50 | 16.10 |
| 08-00220-12015 | | | 15 | | | | 6 | 60 | 9,100 | 15.76 | 16.46 | 17.22 | 18.07 | 20.03 |
| 08-00221-12104 | | | 16 | | | | 4 | 60 | 5,100 | 16.80 | 17.56 | 18.38 | 19.29 | 21.42 |
| 08-00221-12105 | | | 20 | | | | 4 | 60 | 7,800 | 20.98 | 21.92 | 22.95 | 24.08 | 26.74 |
| 08-00220-12021 | | R0.2 | 5 | | | | 6 | 50 | 6,200 | 5.32 | 5.55 | 5.80 | 6.08 | 6.72 |

# MHR230R

## 無限コーティング 2枚刃ロングネックラジアスエンドミル

MUGEN-COATING 2-Flute Long Neck Radius End Mill




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00221-12200 | 1.2 | R0.2 | 6 | 1 | 1.14 | 12° | 4 | 50 | 5,100 | 6.37 | 6.65 | 6.95 | 7.29 | 8.08 |
| 08-00221-12201 | | | 8 | | | | 4 | 50 | 5,100 | 8.46 | 8.83 | 9.24 | 9.69 | 10.74 |
| 08-00221-12202 | | | 10 | | | | 4 | 50 | 5,100 | 10.54 | 11.01 | 11.52 | 12.08 | 13.40 |
| 08-00220-12022 | | | 10 | | | | 6 | 50 | 6,200 | 10.54 | 11.01 | 11.52 | 12.08 | 13.40 |
| 08-00221-12203 | | | 12 | | | | 4 | 50 | 5,100 | 12.63 | 13.19 | 13.80 | 14.48 | 16.06 |
| 08-00220-12023 | | | 15 | | | | 6 | 60 | 9,400 | 15.75 | 16.45 | 17.21 | 18.05 | 20.00 |
| 08-00221-12204 | | | 16 | | | | 4 | 60 | 5,100 | 16.80 | 17.55 | 18.37 | 19.27 | 21.39 |
| 08-00221-12205 | | | 20 | | | | 4 | 60 | 7,800 | 20.97 | 21.91 | 22.93 | 24.06 | 26.71 |
| 08-00220-12031 | | R0.3 | 5 | | | | 6 | 50 | 6,200 | 5.32 | 5.54 | 5.79 | 6.06 | 6.69 |
| 08-00221-12300 | | | 6 | | | | 4 | 50 | 5,100 | 6.37 | 6.64 | 6.94 | 7.27 | 8.04 |
| 08-00221-12301 | | | 8 | | | | 4 | 50 | 5,100 | 8.45 | 8.82 | 9.22 | 9.67 | 10.71 |
| 08-00221-12302 | | | 10 | | | | 4 | 50 | 5,100 | 10.54 | 11.00 | 11.51 | 12.06 | 13.37 |
| 08-00220-12032 | | | 10 | | | | 6 | 50 | 6,200 | 10.54 | 11.00 | 11.51 | 12.06 | 13.37 |
| 08-00221-12303 | | | 12 | | | | 4 | 50 | 5,100 | 12.62 | 13.18 | 13.79 | 14.46 | 16.03 |
| 08-00220-12033 | | | 15 | | | | 6 | 60 | 9,100 | 15.75 | 16.44 | 17.20 | 18.03 | 19.96 |
| 08-00221-12304 | | | 16 | | | | 4 | 60 | 5,100 | 16.80 | 17.54 | 18.35 | 19.25 | 21.35 |
| 08-00221-12305 | | | 20 | | | | 4 | 60 | 7,800 | 20.97 | 21.90 | 22.92 | 24.04 | 26.68 |
| 08-00221-15100 | 1.5 | R0.1 | 4 | 1.2 | 1.45 | 12° | 4 | 50 | 4,900 | 4.29 | 4.48 | 4.69 | 4.91 | 5.45 |
| 08-00221-15101 | | | 6 | | | | 4 | 50 | 4,900 | 6.38 | 6.66 | 6.97 | 7.31 | 8.11 |
| 08-00220-15011 | | | 6 | | | | 6 | 50 | 6,200 | 6.38 | 6.66 | 6.97 | 7.31 | 8.11 |
| 08-00221-15102 | | | 8 | | | | 4 | 50 | 5,100 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00221-15103 | | | 10 | | | | 4 | 50 | 5,100 | 10.55 | 11.02 | 11.53 | 12.10 | 13.43 |
| 08-00221-15104 | | | 12 | | | | 4 | 50 | 5,100 | 12.63 | 13.20 | 13.82 | 14.50 | 16.10 |
| 08-00220-15013 | | | 12 | | | | 6 | 50 | 6,200 | 12.63 | 13.20 | 13.82 | 14.50 | 16.10 |
| 08-00221-15105 | | | 16 | | | | 4 | 60 | 5,100 | 16.80 | 17.56 | 18.38 | 19.29 | 21.42 |
| 08-00221-15106 | | | 18 | | | | 4 | 60 | 5,100 | 18.89 | 19.74 | 20.66 | 21.69 | 24.08 |
| 08-00220-15015 | | | 18 | | | | 6 | 60 | 6,200 | 18.89 | 19.74 | 20.66 | 21.69 | 24.08 |
| 08-00221-15107 | | | 20 | | | | 4 | 60 | 5,100 | 20.98 | 21.92 | 22.95 | 24.08 | 26.74 |
| 08-00221-15200 | | R0.2 | 4 | | | | 4 | 50 | 4,900 | 4.29 | 4.47 | 4.67 | 4.89 | 5.42 |
| 08-00221-15201 | | | 6 | | | | 4 | 50 | 4,900 | 6.37 | 6.65 | 6.95 | 7.29 | 8.08 |
| 08-00220-15021 | | | 6 | | | | 6 | 50 | 6,200 | 6.37 | 6.65 | 6.95 | 7.29 | 8.08 |
| 08-00221-15202 | | | 8 | | | | 4 | 50 | 5,100 | 8.46 | 8.83 | 9.24 | 9.69 | 10.74 |
| 08-00221-15203 | | | 10 | | | | 4 | 50 | 5,100 | 10.54 | 11.01 | 11.52 | 12.08 | 13.40 |
| 08-00221-15204 | | | 12 | | | | 4 | 50 | 5,100 | 12.63 | 13.19 | 13.80 | 14.48 | 16.06 |
| 08-00220-15023 | | | 12 | | | | 6 | 50 | 6,200 | 12.63 | 13.19 | 13.80 | 14.48 | 16.06 |
| 08-00221-15205 | | | 16 | | | | 4 | 60 | 5,100 | 16.80 | 17.55 | 18.37 | 19.27 | 21.39 |
| 08-00221-15206 | | | 18 | | | | 4 | 60 | 5,100 | 18.89 | 19.73 | 20.65 | 21.67 | 24.05 |

**オーダー方法**

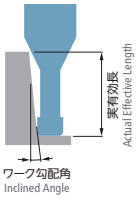
MHR230R 刃径(D)×コーナー半径(R)×有効長(ℓ1)×シャンク径(d)を指示してください。
When you order, indicate MHR230R (D)×(R)×(ℓ1)×(d).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はF-036に記載
●Recommended Milling Conditions are shown on page F-036.



SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

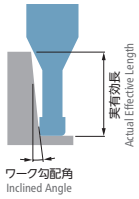



| コードNo. Code No. | (D) 刃径 Dia. | (R) コーナー半径 Corner Radius | (ℓ1) 有効長 Effective Length | (ℓ) 刃長 Length of Cut | (d2) 首下径 Neck Dia. | (γ) 首角 Neck Taper Angle | (d) シャンク径 Shank Dia. | (L) 全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00220-15025 | 1.5 | R0.2 | 18 | 1.2 | 1.45 | 12° | 6 | 60 | 6,200 | 18.89 | 19.73 | 20.65 | 21.67 | 24.05 |
| 08-00221-15207 | | | 20 | | | | 4 | 60 | 5,100 | 20.97 | 21.91 | 22.93 | 24.06 | 26.71 |
| 08-00221-15300 | | R0.3 | 4 | | | | 4 | 50 | 4,900 | 4.28 | 4.46 | 4.66 | 4.87 | 5.38 |
| 08-00221-15301 | | | 6 | | | | 4 | 50 | 4,900 | 6.37 | 6.64 | 6.94 | 7.27 | 8.04 |
| 08-00220-15031 | | | 6 | | | | 6 | 50 | 6,200 | 6.37 | 6.64 | 6.94 | 7.27 | 8.04 |
| 08-00221-15302 | | | 8 | | | | 4 | 50 | 5,100 | 8.45 | 8.82 | 9.22 | 9.67 | 10.71 |
| 08-00221-15303 | | | 10 | | | | 4 | 50 | 5,100 | 10.54 | 11.00 | 11.51 | 12.06 | 13.37 |
| 08-00221-15304 | | | 12 | | | | 4 | 50 | 5,100 | 12.62 | 13.18 | 13.79 | 14.46 | 16.03 |
| 08-00220-15032 | | | 12 | | | | 6 | 50 | 6,200 | 12.62 | 13.18 | 13.79 | 14.46 | 16.03 |
| 08-00221-15305 | | | 16 | | | | 4 | 60 | 5,100 | 16.80 | 17.54 | 18.35 | 19.25 | 21.35 |
| 08-00221-15306 | | | 18 | | | | 4 | 60 | 5,100 | 18.88 | 19.72 | 20.64 | 21.65 | 24.01 |
| 08-00220-15033 | | | 18 | | | | 6 | 60 | 6,200 | 18.88 | 19.72 | 20.64 | 21.65 | 24.01 |
| 08-00221-15307 | | | 20 | | | | 4 | 60 | 5,100 | 20.97 | 21.90 | 22.92 | 24.04 | 26.68 |
| 08-00221-15500 | | R0.5 | 4 | | | | 4 | 50 | 4,900 | 4.27 | 4.44 | 4.63 | 4.83 | 5.32 |
| 08-00221-15501 | | | 6 | | | | 4 | 50 | 4,900 | 6.36 | 6.62 | 6.91 | 7.23 | 7.98 |
| 08-00220-15051 | | | 6 | | | | 6 | 50 | 6,200 | 6.36 | 6.62 | 6.91 | 7.23 | 7.98 |
| 08-00221-15502 | | | 8 | | | | 4 | 50 | 5,100 | 8.44 | 8.80 | 9.19 | 9.63 | 10.64 |
| 08-00221-15503 | | | 10 | | | | 4 | 50 | 5,100 | 10.53 | 10.98 | 11.48 | 12.02 | 13.30 |
| 08-00221-15504 | | | 12 | | | | 4 | 50 | 5,100 | 12.62 | 13.16 | 13.76 | 14.42 | 15.96 |
| 08-00220-15052 | | | 12 | | | | 6 | 50 | 6,200 | 12.62 | 13.16 | 13.76 | 14.42 | 15.96 |
| 08-00221-15505 | | | 16 | | | | 4 | 60 | 5,100 | 16.79 | 17.52 | 18.32 | 19.21 | 21.29 |
| 08-00221-15506 | | | 18 | | | | 4 | 60 | 5,100 | 18.87 | 19.70 | 20.61 | 21.61 | 23.95 |
| 08-00220-15053 | | | 18 | | | | 6 | 60 | 6,200 | 18.87 | 19.70 | 20.61 | 21.61 | 23.95 |
| 08-00221-15507 | | | 20 | | | | 4 | 60 | 5,100 | 20.96 | 21.88 | 22.89 | 24.00 | 26.61 |
| 08-00221-20100 | 2 | R0.1 | 4 | 1.6 | 1.91 | 12° | 4 | 50 | 4,900 | 4.31 | 4.50 | 4.71 | 4.94 | 5.48 |
| 08-00221-20101 | | | 6 | | | | 4 | 50 | 4,900 | 6.40 | 6.68 | 7.00 | 7.34 | 8.14 |
| 08-00221-20102 | | | 8 | | | | 4 | 50 | 5,100 | 8.49 | 8.86 | 9.28 | 9.73 | 10.80 |
| 08-00220-20011 | | | 8 | | | | 6 | 50 | 6,300 | 8.49 | 8.86 | 9.28 | 9.73 | 10.80 |
| 08-00221-20103 | | | 10 | | | | 4 | 50 | 5,100 | 10.57 | 11.04 | 11.56 | 12.13 | 13.47 |
| 08-00221-20104 | | | 12 | | | | 4 | 50 | 5,100 | 12.66 | 13.22 | 13.84 | 14.53 | 16.13 |
| 08-00220-20014 | | | 12 | | | | 6 | 50 | 6,300 | 12.66 | 13.22 | 13.84 | 14.53 | 16.13 |
| 08-00221-20105 | | | 16 | | | | 4 | 60 | 5,100 | 16.83 | 17.58 | 18.41 | 19.32 | 21.45 |
| 08-00220-20012 | | | 16 | | | | 6 | 60 | 6,300 | 16.83 | 17.58 | 18.41 | 19.32 | 21.45 |
| 08-00221-20106 | | | 20 | | | | 4 | 60 | 5,100 | 21.00 | 21.94 | 22.97 | 24.11 | 26.77 |
| 08-00220-20015 | | | 20 | | | | 6 | 60 | 6,300 | 21.00 | 21.94 | 22.97 | 24.11 | 26.77 |
| 08-00221-20107 | | | 24 | | | | 4 | 70 | 5,100 | 25.17 | 26.30 | 27.54 | 28.90 | 32.10 |
| 08-00220-20013 | | | 24 | | | | 6 | 70 | 6,300 | 25.17 | 26.30 | 27.54 | 28.90 | 32.10 |

# MHR230R

## 無限コーティング 2枚刃ロングネックラジアスエンドミル

MUGEN-COATING 2-Flute Long Neck Radius End Mill




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 30′ | 1° | 1°30′ | 2° | 3° |
| 08-00221-20108 | 2 | R0.1 | 26 | 1.6 | 1.91 | 12° | 4 | 70 | 5,100 | 27.26 | 28.48 | 29.82 | 31.30 | 34.76 |
| 08-00221-20109 | | | 30 | | | | 4 | 70 | 5,100 | 31.43 | 32.84 | 34.39 | 36.09 | 40.08 |
| 08-00221-20200 | | R0.2 | 4 | | | | 4 | 50 | 4,900 | 4.31 | 4.50 | 4.70 | 4.92 | 5.45 |
| 08-00221-20201 | | | 6 | | | | 4 | 50 | 4,900 | 6.40 | 6.68 | 6.98 | 7.32 | 8.11 |
| 08-00221-20202 | | | 8 | | | | 4 | 50 | 5,100 | 8.48 | 8.85 | 9.26 | 9.71 | 10.77 |
| 08-00220-20021 | | | 8 | | | | 6 | 50 | 6,300 | 8.48 | 8.85 | 9.26 | 9.71 | 10.77 |
| 08-00221-20203 | | | 10 | | | | 4 | 50 | 5,100 | 10.57 | 11.03 | 11.55 | 12.11 | 13.43 |
| 08-00221-20204 | | | 12 | | | | 4 | 50 | 5,100 | 12.65 | 13.21 | 13.83 | 14.51 | 16.09 |
| 08-00220-20023 | | | 12 | | | | 6 | 50 | 6,300 | 12.65 | 13.21 | 13.83 | 14.51 | 16.09 |
| 08-00221-20205 | | | 16 | | | | 4 | 60 | 5,100 | 16.83 | 17.57 | 18.39 | 19.30 | 21.42 |
| 08-00220-20025 | | | 16 | | | | 6 | 60 | 6,300 | 16.83 | 17.57 | 18.39 | 19.30 | 21.42 |
| 08-00221-20206 | | | 20 | | | | 4 | 60 | 5,100 | 21.00 | 21.93 | 22.96 | 24.09 | 26.74 |
| 08-00220-20027 | | | 20 | | | | 6 | 60 | 6,300 | 21.00 | 21.93 | 22.96 | 24.09 | 26.74 |
| 08-00221-20207 | | | 24 | | | | 4 | 70 | 5,100 | 25.17 | 26.29 | 27.52 | 28.88 | 32.06 |
| 08-00220-20029 | | | 24 | | | | 6 | 70 | 6,300 | 25.17 | 26.29 | 27.52 | 28.88 | 32.06 |
| 08-00221-20208 | | | 26 | | | | 4 | 70 | 5,100 | 27.25 | 28.47 | 29.81 | 31.28 | 34.73 |
| 08-00221-20209 | | | 30 | | | | 4 | 70 | 5,100 | 31.43 | 32.83 | 34.37 | 36.07 | 40.05 |
| 08-00221-20300 | | R0.3 | 4 | | | | 4 | 50 | 4,900 | 4.31 | 4.49 | 4.68 | 4.90 | 5.41 |
| 08-00221-20301 | | | 6 | | | | 4 | 50 | 4,900 | 6.39 | 6.67 | 6.97 | 7.30 | 8.08 |
| 08-00221-20302 | | | 8 | | | | 4 | 50 | 5,100 | 8.48 | 8.85 | 9.25 | 9.70 | 10.74 |
| 08-00220-20031 | | | 8 | | | | 6 | 50 | 6,300 | 8.48 | 8.85 | 9.25 | 9.70 | 10.74 |
| 08-00221-20303 | | | 10 | | | | 4 | 50 | 5,100 | 10.56 | 11.03 | 11.53 | 12.09 | 13.40 |
| 08-00221-20304 | | | 12 | | | | 4 | 50 | 5,100 | 12.65 | 13.20 | 13.81 | 14.49 | 16.06 |
| 08-00220-20034 | | | 12 | | | | 6 | 50 | 6,300 | 12.65 | 13.20 | 13.81 | 14.49 | 16.06 |
| 08-00221-20305 | | | 16 | | | | 4 | 60 | 5,100 | 16.82 | 17.56 | 18.38 | 19.28 | 21.38 |
| 08-00220-20032 | | | 16 | | | | 6 | 60 | 6,300 | 16.82 | 17.56 | 18.38 | 19.28 | 21.38 |
| 08-00221-20306 | | | 20 | | | | 4 | 60 | 5,100 | 20.99 | 21.92 | 22.95 | 24.07 | 26.71 |
| 08-00220-20035 | | | 20 | | | | 6 | 60 | 6,300 | 20.99 | 21.92 | 22.95 | 24.07 | 26.71 |
| 08-00221-20307 | | | 24 | | | | 4 | 70 | 5,100 | 25.16 | 26.28 | 27.51 | 28.86 | 32.03 |
| 08-00220-20033 | | | 24 | | | | 6 | 70 | 6,300 | 25.16 | 26.28 | 27.51 | 28.86 | 32.03 |
| 08-00221-20308 | | | 26 | | | | 4 | 70 | 5,100 | 27.25 | 28.46 | 29.79 | 31.26 | 34.69 |
| 08-00221-20309 | | | 30 | | | | 4 | 70 | 5,100 | 31.42 | 32.82 | 34.36 | 36.05 | 40.02 |
| 08-00221-20500 | | R0.5 | 4 | | | | 4 | 50 | 4,900 | 4.30 | 4.47 | 4.66 | 4.86 | 5.35 |
| 08-00221-20501 | | | 6 | | | | 4 | 50 | 4,900 | 6.38 | 6.65 | 6.94 | 7.26 | 8.01 |
| 08-00221-20502 | | | 8 | | | | 4 | 50 | 5,100 | 8.47 | 8.83 | 9.22 | 9.66 | 10.67 |
| 08-00220-20051 | | | 8 | | | | 6 | 50 | 6,300 | 8.47 | 8.83 | 9.22 | 9.66 | 10.67 |
| 08-00221-20503 | | | 10 | | | | 4 | 50 | 5,100 | 10.55 | 11.01 | 11.50 | 12.05 | 13.33 |

**オーダー方法**

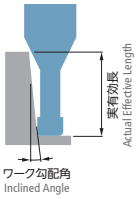
MHR230R 刃径(D)×コーナー半径(R)×有効長(ℓ1)×シャンク径(d)を指示してください。
When you order, indicate MHR230R (D)×(R)×(ℓ1)×(d).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はF-036に記載
●Recommended Milling Conditions are shown on page F-036.



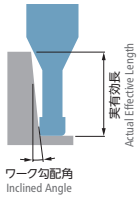
ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.




| コードNo. Code No. | (D) 刃径 Dia. | (R) コーナー半径 Corner Radius | (ℓ1) 有効長 Effective Length | (ℓ) 刃長 Length of Cut | (d2) 首下径 Neck Dia. | (γ) 首角 Neck Taper Angle | (d) シャンク径 Shank Dia. | (L) 全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00221-20504 | 2 | R0.5 | 12 | 1.6 | 1.91 | 12° | 4 | 50 | 5,100 | 12.64 | 13.19 | 13.79 | 14.45 | 15.99 |
| 08-00220-20054 | | | 12 | | | | 6 | 50 | 6,300 | 12.64 | 13.19 | 13.79 | 14.45 | 15.99 |
| 08-00221-20505 | | | 16 | | | | 4 | 60 | 5,100 | 16.81 | 17.55 | 18.35 | 19.24 | 21.32 |
| 08-00220-20052 | | | 16 | | | | 6 | 60 | 6,300 | 16.81 | 17.55 | 18.35 | 19.24 | 21.32 |
| 08-00221-20506 | | | 20 | | | | 4 | 60 | 5,100 | 20.98 | 21.91 | 22.92 | 24.03 | 26.64 |
| 08-00220-20055 | | | 20 | | | | 6 | 60 | 6,300 | 20.98 | 21.91 | 22.92 | 24.03 | 26.64 |
| 08-00221-20507 | | | 24 | | | | 4 | 70 | 5,100 | 25.16 | 26.26 | 27.48 | 28.82 | 31.97 |
| 08-00220-20053 | | | 24 | | | | 6 | 70 | 6,300 | 25.16 | 26.26 | 27.48 | 28.82 | 31.97 |
| 08-00221-20508 | | | 26 | | | | 4 | 70 | 5,100 | 27.24 | 28.44 | 29.76 | 31.22 | 34.63 |
| 08-00221-20509 | | | 30 | | | | 4 | 70 | 5,100 | 31.41 | 32.80 | 34.33 | 36.01 | 39.95 |
| 08-00221-25100 | 2.5 | R0.1 | 10 | 2 | 2.39 | 12° | 4 | 50 | 5,400 | 10.67 | 11.15 | 11.67 | 12.24 | 13.59 |
| 08-00220-25011 | | | 10 | | | | 6 | 50 | 6,500 | 10.67 | 11.15 | 11.67 | 12.24 | 13.59 |
| 08-00221-25101 | | | 20 | | | | 4 | 60 | 5,500 | 21.10 | 22.04 | 23.08 | 24.22 | 26.90 |
| 08-00220-25013 | | | 20 | | | | 6 | 60 | 6,700 | 21.10 | 22.04 | 23.08 | 24.22 | 26.90 |
| 08-00221-25102 | | | 30 | | | | 4 | 70 | 5,700 | 31.53 | 32.94 | 34.49 | 36.21 | 40.21 |
| 08-00220-25015 | | | 30 | | | | 6 | 70 | 7,000 | 31.53 | 32.94 | 34.49 | 36.21 | 40.21 |
| 08-00221-25200 | | R0.2 | 10 | | | | 4 | 50 | 5,400 | 10.67 | 11.14 | 11.65 | 12.22 | 13.56 |
| 08-00220-25021 | | | 10 | | | | 6 | 50 | 6,500 | 10.67 | 11.14 | 11.65 | 12.22 | 13.56 |
| 08-00221-25201 | | | 20 | | | | 4 | 60 | 5,500 | 21.10 | 22.04 | 23.07 | 24.20 | 26.87 |
| 08-00220-25023 | | | 20 | | | | 6 | 60 | 6,700 | 21.10 | 22.04 | 23.07 | 24.20 | 26.87 |
| 08-00221-25202 | | | 30 | | | | 4 | 70 | 5,700 | 31.52 | 32.93 | 34.48 | 36.19 | 40.18 |
| 08-00220-25025 | | | 30 | | | | 6 | 70 | 7,000 | 31.52 | 32.93 | 34.48 | 36.19 | 40.18 |
| 08-00221-25300 | | R0.3 | 10 | | | | 4 | 50 | 5,400 | 10.66 | 11.13 | 11.64 | 12.20 | 13.53 |
| 08-00220-25031 | | | 10 | | | | 6 | 50 | 6,500 | 10.66 | 11.13 | 11.64 | 12.20 | 13.53 |
| 08-00221-25301 | | | 20 | | | | 4 | 60 | 5,500 | 21.09 | 22.03 | 23.05 | 24.19 | 26.83 |
| 08-00220-25032 | | | 20 | | | | 6 | 60 | 6,700 | 21.09 | 22.03 | 23.05 | 24.19 | 26.83 |
| 08-00221-25302 | | | 30 | | | | 4 | 70 | 5,700 | 31.52 | 32.92 | 34.47 | 36.17 | 40.14 |
| 08-00220-25033 | | | 30 | | | | 6 | 70 | 6,900 | 31.52 | 32.92 | 34.47 | 36.17 | 40.14 |
| 08-00221-25500 | | R0.5 | 10 | | | | 4 | 50 | 5,400 | 10.65 | 11.11 | 11.61 | 12.16 | 13.46 |
| 08-00220-25051 | | | 10 | | | | 6 | 50 | 6,500 | 10.65 | 11.11 | 11.61 | 12.16 | 13.46 |
| 08-00221-25501 | | | 20 | | | | 4 | 60 | 5,500 | 21.08 | 22.01 | 23.02 | 24.15 | 26.77 |
| 08-00220-25052 | | | 20 | | | | 6 | 60 | 6,700 | 21.08 | 22.01 | 23.02 | 24.15 | 26.77 |
| 08-00221-25502 | | | 30 | | | | 4 | 70 | 5,700 | 31.51 | 32.91 | 34.44 | 36.13 | 40.08 |
| 08-00220-25053 | | | 30 | | | | 6 | 70 | 6,900 | 31.51 | 32.91 | 34.44 | 36.13 | 40.08 |
| 08-00220-30011 | 3 | R0.1 | 12 | 4.5 | 2.85 | 12° | 6 | 50 | 8,600 | 12.87 | 13.44 | 14.07 | 14.76 | 16.36 |
| 08-00220-30013 | | | 18 | | | | 6 | 60 | 8,800 | 19.13 | 19.98 | 20.91 | 21.94 | 24.32 |
| 08-00220-30015 | | | 24 | | | | 6 | 70 | 9,100 | 25.39 | 26.52 | 27.76 | 29.12 | Free |

# MHR230R

## 無限コーティング 2枚刃ロングネックラジアスエンドミル
MUGEN-COATING 2-Flute Long Neck Radius End Mill




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00220-30017 | 3 | R0.1 | 30 | 4.5 | 2.85 | 12° | 6 | 70 | 9,500 | 31.64 | 33.05 | 34.60 | 36.30 | Free |
| 08-00220-30019 | | | 36 | | | | 6 | 80 | 9,500 | 37.90 | 39.59 | 41.44 | 43.48 | Free |
| 08-00220-30021 | | R0.2 | 12 | | | | 6 | 50 | 8,600 | 12.87 | 13.44 | 14.06 | 14.74 | 16.33 |
| 08-00220-30023 | | | 18 | | | | 6 | 60 | 8,800 | 19.13 | 19.97 | 20.90 | 21.92 | 24.29 |
| 08-00220-30025 | | | 24 | | | | 6 | 70 | 9,100 | 25.38 | 26.51 | 27.74 | 29.10 | Free |
| 08-00220-30027 | | | 30 | | | | 6 | 70 | 9,500 | 31.64 | 33.05 | 34.58 | 36.28 | Free |
| 08-00220-30029 | | | 36 | | | | 6 | 80 | 9,500 | 37.90 | 39.58 | 41.43 | 43.46 | Free |
| 08-00220-30031 | | R0.3 | 12 | | | | 6 | 50 | 8,600 | 12.86 | 13.43 | 14.04 | 14.72 | 16.29 |
| 08-00220-30034 | | | 18 | | | | 6 | 60 | 8,800 | 19.12 | 19.96 | 20.88 | 21.90 | 24.26 |
| 08-00220-30032 | | | 24 | | | | 6 | 70 | 9,100 | 25.38 | 26.50 | 27.73 | 29.08 | Free |
| 08-00220-30035 | | | 30 | | | | 6 | 70 | 9,500 | 31.63 | 33.04 | 34.57 | 36.26 | Free |
| 08-00220-30033 | | | 36 | | | | 6 | 80 | 9,500 | 37.89 | 39.57 | 41.41 | 43.44 | Free |
| 08-00220-30051 | | R0.5 | 12 | | | | 6 | 50 | 8,600 | 12.86 | 13.41 | 14.01 | 14.68 | 16.23 |
| 08-00220-30054 | | | 18 | | | | 6 | 60 | 8,800 | 19.11 | 19.95 | 20.86 | 21.86 | 24.19 |
| 08-00220-30052 | | | 24 | | | | 6 | 70 | 9,100 | 25.37 | 26.48 | 27.70 | 29.04 | Free |
| 08-00220-30055 | | | 30 | | | | 6 | 70 | 9,500 | 31.63 | 33.02 | 34.54 | 36.22 | Free |
| 08-00220-30053 | | | 36 | | | | 6 | 80 | 9,500 | 37.88 | 39.56 | 41.39 | 43.40 | Free |
| 08-00220-30101 | | R1 | 12 | | | | 6 | 50 | 8,600 | 12.83 | 13.36 | 13.94 | 14.58 | 16.07 |
| 08-00220-30104 | | | 18 | | | | 6 | 60 | 8,800 | 19.09 | 19.90 | 20.79 | 21.76 | 24.04 |
| 08-00220-30102 | | | 24 | | | | 6 | 70 | 9,100 | 25.35 | 26.44 | 27.63 | 28.94 | Free |
| 08-00220-30105 | | | 30 | | | | 6 | 70 | 9,500 | 31.60 | 32.97 | 34.47 | 36.12 | Free |
| 08-00220-30103 | | | 36 | | | | 6 | 80 | 9,500 | 37.86 | 39.51 | 41.32 | 43.30 | Free |
| 08-00220-40011 | 4 | R0.1 | 16 | 6 | 3.8 | 12° | 6 | 60 | 8,600 | 17.17 | 17.93 | 18.77 | 19.68 | Free |
| 08-00220-40013 | | | 24 | | | | 6 | 70 | 8,600 | 25.51 | 26.65 | 27.89 | 29.26 | Free |
| 08-00220-40015 | | | 32 | | | | 6 | 70 | 8,600 | 33.85 | 35.36 | 37.01 | Free | Free |
| 08-00220-40017 | | | 48 | | | | 6 | 100 | 13,700 | 50.54 | 52.79 | Free | Free | Free |
| 08-00220-40021 | | R0.2 | 16 | | | | 6 | 60 | 8,600 | 17.16 | 17.92 | 18.75 | 19.66 | Free |
| 08-00220-40023 | | | 24 | | | | 6 | 70 | 8,600 | 25.50 | 26.64 | 27.88 | 29.24 | Free |
| 08-00220-40025 | | | 32 | | | | 6 | 70 | 8,600 | 33.85 | 35.35 | 37.00 | Free | Free |
| 08-00220-40027 | | | 48 | | | | 6 | 100 | 13,700 | 50.53 | 52.78 | Free | Free | Free |
| 08-00220-40031 | | R0.3 | 16 | | | | 6 | 60 | 8,600 | 17.16 | 17.91 | 18.74 | 19.65 | Free |
| 08-00220-40034 | | | 24 | | | | 6 | 70 | 8,600 | 25.50 | 26.63 | 27.86 | 29.22 | Free |
| 08-00220-40032 | | | 32 | | | | 6 | 70 | 8,600 | 33.84 | 35.34 | 36.99 | Free | Free |
| 08-00220-40033 | | | 48 | | | | 6 | 100 | 13,700 | 50.53 | 52.78 | Free | Free | Free |
| 08-00220-40051 | | R0.5 | 16 | | | | 6 | 60 | 8,600 | 17.15 | 17.89 | 18.71 | 19.61 | Free |
| 08-00220-40054 | | | 24 | | | | 6 | 70 | 8,600 | 25.49 | 26.61 | 27.83 | 29.18 | Free |
| 08-00220-40052 | | | 32 | | | | 6 | 70 | 8,600 | 33.83 | 35.33 | 36.96 | Free | Free |

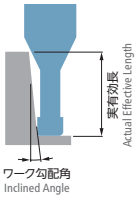
**オーダー方法** MHR230R 刃径(D)×コーナー半径(R)×有効長(ℓ1)×シャンク径(d)を指示してください。
When you order, indicate MHR230R (D)×(R)×(ℓ1)×(d).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はF-036に記載
●Recommended Milling Conditions are shown on page F-036.



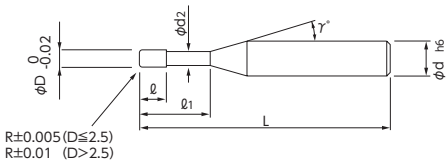
ŞEVKET OĞLU® MAKINA TİCARET VE SAN. LTD. ŞTİ.

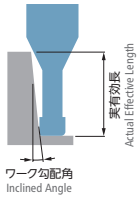



| コードNo. Code No. | (D) 刃径 Dia. | (R) コーナー半径 Corner Radius | (ℓ1) 有効長 Effective Length | (ℓ) 刃長 Length of Cut | (d2) 首下径 Neck Dia. | (γ) 首角 Neck Taper Angle | (d) シャンク径 Shank Dia. | (L) 全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00220-40053 | 4 | R0.5 | 48 | 6 | 3.8 | 12° | 6 | 100 | 13,700 | 50.52 | 52.76 | Free | Free | Free |
| 08-00220-40101 | | R1 | 16 | | | | 6 | 60 | 8,600 | 17.13 | 17.85 | 18.64 | 19.51 | Free |
| 08-00220-40104 | | | 24 | | | | 6 | 70 | 8,600 | 25.47 | 26.57 | 27.77 | 29.08 | Free |
| 08-00220-40102 | | | 32 | | | | 6 | 70 | 8,600 | 33.81 | 35.28 | 36.89 | Free | Free |
| 08-00220-40103 | | | 48 | | | | 6 | 100 | 13,700 | 50.50 | 52.71 | Free | Free | Free |
| 08-00220-50011 | 5 | R0.1 | 20 | 7.5 | 4.8 | 12° | 6 | 70 | 10,900 | 21.34 | 22.29 | Free | Free | Free |
| 08-00220-50013 | | | 40 | | | | 6 | 90 | 13,700 | 42.19 | Free | Free | Free | Free |
| 08-00220-50021 | | R0.2 | 20 | | | | 6 | 70 | 10,900 | 21.33 | 22.28 | Free | Free | Free |
| 08-00220-50023 | | | 40 | | | | 6 | 90 | 13,700 | 42.19 | Free | Free | Free | Free |
| 08-00220-50031 | | R0.3 | 20 | | | | 6 | 70 | 10,900 | 21.33 | 22.27 | Free | Free | Free |
| 08-00220-50032 | | | 40 | | | | 6 | 90 | 13,700 | 42.19 | Free | Free | Free | Free |
| 08-00220-50051 | | R0.5 | 20 | | | | 6 | 70 | 10,900 | 21.32 | 22.25 | Free | Free | Free |
| 08-00220-50052 | | | 40 | | | | 6 | 90 | 13,700 | 42.18 | Free | Free | Free | Free |
| 08-00220-50101 | | R1 | 20 | | | | 6 | 70 | 10,900 | 21.30 | 22.21 | Free | Free | Free |
| 08-00220-50102 | | | 40 | | | | 6 | 90 | 13,700 | 42.16 | Free | Free | Free | Free |
| 08-00220-60011 | 6 | R0.1 | 24 | 9 | 5.8 | – | 6 | 90 | 10,900 | Free | Free | Free | Free | Free |
| 08-00220-60013 | | | 48 | | | | 6 | 110 | 17,100 | Free | Free | Free | Free | Free |
| 08-00220-60021 | | R0.2 | 24 | | | | 6 | 90 | 10,900 | Free | Free | Free | Free | Free |
| 08-00220-60023 | | | 48 | | | | 6 | 110 | 17,100 | Free | Free | Free | Free | Free |
| 08-00220-60031 | | R0.3 | 24 | | | | 6 | 90 | 10,900 | Free | Free | Free | Free | Free |
| 08-00220-60032 | | | 48 | | | | 6 | 110 | 17,100 | Free | Free | Free | Free | Free |
| 08-00220-60051 | | R0.5 | 24 | | | | 6 | 90 | 10,900 | Free | Free | Free | Free | Free |
| 08-00220-60052 | | | 48 | | | | 6 | 110 | 17,100 | Free | Free | Free | Free | Free |
| 08-00220-60101 | | R1 | 24 | | | | 6 | 90 | 10,900 | Free | Free | Free | Free | Free |
| 08-00220-60102 | | | 48 | | | | 6 | 110 | 17,100 | Free | Free | Free | Free | Free |

# MHR430R

## 無限コーティング 4枚刃ロングネックラジアスエンドミル
MUGEN-COATING 4-Flute Long Neck Radius End Mill




- 加工バリエーションがさらに拡がる 4 枚刃。全146 サイズ。
- ショート刃長の専用設計！ワーク接触をさらに低減しビビリを抑制。
- コーナー R 精度は±5μm！の高精度。(D2.5 以下)
- チューンナップされた無限コーティングにより、焼き入れ鋼・調質鋼の加工に抜群の威力を発揮し、銅電極の加工にも最適。
- Enhanced selectivity for machining process in all 146 sizes.
- Employing short flute length. Less contact to work material reduces chattering.
- Corner R accuracy : ±5μm (2.5D and below)
- Upgraded MUGEN-COATING brings outstanding performance for milling of Prehardened Steels and Copper Electrode as well.

Slot Side Face
MG ∞ 4 30° ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00230-10021 | 1 | R0.05 | 3 | 0.8 | 0.95 | 12° | 4 | 50 | 7,200 | 3.25 | 3.39 | 3.55 | 3.73 | 4.13 |
| 08-00230-10022 | | | 4 | | | | | 50 | 7,200 | 4.29 | 4.48 | 4.69 | 4.92 | 5.46 |
| 08-00230-10023 | | | 5 | | | | | 50 | 7,200 | 5.34 | 5.57 | 5.83 | 6.12 | 6.80 |
| 08-00230-10024 | | | 6 | | | | | 50 | 7,200 | 6.38 | 6.66 | 6.98 | 7.32 | 8.13 |
| 08-00230-10025 | | | 8 | | | | | 50 | 7,200 | 8.46 | 8.84 | 9.26 | 9.72 | 10.79 |
| 08-00230-10026 | | | 10 | | | | | 50 | 7,200 | 10.55 | 11.02 | 11.54 | 12.11 | 13.45 |
| 08-00230-10027 | | | 12 | | | | | 50 | 7,200 | 12.64 | 13.20 | 13.82 | 14.51 | 16.11 |
| 08-00230-10031 | | R0.1 | 3 | | | | | 50 | 7,200 | 3.25 | 3.39 | 3.54 | 3.72 | 4.12 |
| 08-00230-10032 | | | 4 | | | | | 50 | 7,200 | 4.29 | 4.48 | 4.69 | 4.91 | 5.45 |
| 08-00230-10033 | | | 5 | | | | | 50 | 7,200 | 5.33 | 5.57 | 5.83 | 6.11 | 6.78 |
| 08-00230-10034 | | | 6 | | | | | 50 | 7,200 | 6.38 | 6.66 | 6.97 | 7.31 | 8.11 |
| 08-00230-10035 | | | 8 | | | | | 50 | 7,200 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00230-10036 | | | 10 | | | | | 50 | 7,200 | 10.55 | 11.02 | 11.53 | 12.10 | 13.43 |
| 08-00230-10037 | | | 12 | | | | | 50 | 7,200 | 12.63 | 13.20 | 13.82 | 14.50 | 16.10 |
| 08-00230-10041 | | R0.2 | 3 | | | | | 50 | 7,200 | 3.24 | 3.38 | 3.53 | 3.70 | 4.08 |
| 08-00230-10042 | | | 4 | | | | | 50 | 7,200 | 4.29 | 4.47 | 4.67 | 4.89 | 5.42 |
| 08-00230-10043 | | | 5 | | | | | 50 | 7,200 | 5.33 | 5.56 | 5.81 | 6.09 | 6.75 |
| 08-00230-10044 | | | 6 | | | | | 50 | 7,200 | 6.37 | 6.65 | 6.95 | 7.29 | 8.08 |
| 08-00230-10045 | | | 8 | | | | | 50 | 7,200 | 8.46 | 8.83 | 9.24 | 9.69 | 10.74 |
| 08-00230-10046 | | | 10 | | | | | 50 | 7,200 | 10.54 | 11.01 | 11.52 | 12.08 | 13.40 |
| 08-00230-10047 | | | 12 | | | | | 50 | 7,200 | 12.63 | 13.19 | 13.80 | 14.48 | 16.06 |
| 08-00230-10051 | | R0.3 | 3 | | | | | 50 | 7,200 | 3.24 | 3.37 | 3.52 | 3.68 | 4.05 |
| 08-00230-10052 | | | 4 | | | | | 50 | 7,200 | 4.28 | 4.46 | 4.66 | 4.87 | 5.38 |
| 08-00230-10053 | | | 5 | | | | | 50 | 7,200 | 5.32 | 5.55 | 5.80 | 6.07 | 6.71 |
| 08-00230-10054 | | | 6 | | | | | 50 | 7,200 | 6.37 | 6.64 | 6.94 | 7.27 | 8.04 |
| 08-00230-10055 | | | 8 | | | | | 50 | 7,200 | 8.45 | 8.82 | 9.22 | 9.67 | 10.71 |
| 08-00230-10056 | | | 10 | | | | | 50 | 7,200 | 10.54 | 11.00 | 11.51 | 12.06 | 13.37 |
| 08-00230-10057 | | | 12 | | | | | 50 | 7,200 | 12.62 | 13.18 | 13.79 | 14.46 | 16.03 |
| 08-00230-12031 | 1.2 | R0.1 | 5 | 1 | 1.14 | 12° | 4 | 50 | 7,600 | 5.33 | 5.57 | 5.83 | 6.11 | 6.78 |
| 08-00230-12032 | | | 10 | | | | | 50 | 7,600 | 10.55 | 11.02 | 11.53 | 12.10 | 13.43 |
| 08-00230-12033 | | | 15 | | | | | 60 | 11,400 | 15.76 | 16.47 | 17.24 | 18.09 | 20.09 |

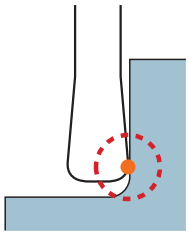
**オーダー方法** MHR430R 刃径(D)×コーナー半径(R)×有効長(ℓ1)を指示してください。
When you order, indicate MHR430R (D)×(R)×(ℓ1).

※(γ)は参考値です。
※(γ) is reference value.

- 切削条件表はF-038に記載
- Recommended Milling Conditions are shown on page F-038.

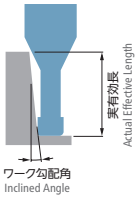


SEVKET OĞLU MAKINA TICARET VE SAN. LTD. ŞTI.



切削抵抗の少ない点当たりで面粗度アップ!!

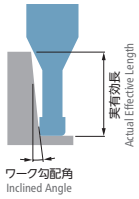
Point milling with reducing the machining load to realize fine surface.




| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 30′ | 1° | 1°30′ | 2° | 3° |
| 08-00230-12041 | 1.2 | R0.2 | 5 | 1 | 1.14 | 12° | 4 | 50 | 7,600 | 5.33 | 5.56 | 5.81 | 6.09 | 6.75 |
| 08-00230-12042 | | | 10 | | | | | 50 | 7,600 | 10.54 | 11.01 | 11.52 | 12.08 | 13.40 |
| 08-00230-12043 | | | 15 | | | | | 60 | 11,400 | 15.76 | 16.46 | 17.23 | 18.07 | 20.06 |
| 08-00230-12051 | | R0.3 | 5 | | | | | 50 | 7,600 | 5.32 | 5.55 | 5.80 | 6.07 | 6.71 |
| 08-00230-12052 | | | 10 | | | | | 50 | 7,600 | 10.54 | 11.00 | 11.51 | 12.06 | 13.37 |
| 08-00230-12053 | | | 15 | | | | | 60 | 11,400 | 15.75 | 16.45 | 17.21 | 18.05 | 20.02 |
| 08-00230-15031 | 1.5 | R0.1 | 6 | 1.2 | 1.45 | 12° | 4 | 50 | 7,600 | 6.38 | 6.66 | 6.97 | 7.31 | 8.11 |
| 08-00230-15032 | | | 12 | | | | | 50 | 7,600 | 12.63 | 13.20 | 13.82 | 14.50 | 16.10 |
| 08-00230-15033 | | | 18 | | | | | 60 | 7,600 | 18.89 | 19.74 | 20.66 | 21.69 | 24.08 |
| 08-00230-15041 | | R0.2 | 6 | | | | | 50 | 7,600 | 6.37 | 6.65 | 6.95 | 7.29 | 8.08 |
| 08-00230-15042 | | | 12 | | | | | 50 | 7,600 | 12.63 | 13.19 | 13.80 | 14.48 | 16.06 |
| 08-00230-15043 | | | 18 | | | | | 60 | 7,600 | 18.89 | 19.73 | 20.65 | 21.67 | 24.05 |
| 08-00230-15051 | | R0.3 | 6 | | | | | 50 | 7,600 | 6.37 | 6.64 | 6.94 | 7.27 | 8.04 |
| 08-00230-15052 | | | 12 | | | | | 50 | 7,600 | 12.62 | 13.18 | 13.79 | 14.46 | 16.03 |
| 08-00230-15053 | | | 18 | | | | | 60 | 7,600 | 18.88 | 19.72 | 20.64 | 21.65 | 24.01 |
| 08-00230-15061 | | R0.5 | 6 | | | | | 50 | 7,600 | 6.36 | 6.62 | 6.91 | 7.23 | 7.98 |
| 08-00230-15062 | | | 12 | | | | | 50 | 7,600 | 12.62 | 13.16 | 13.76 | 14.42 | 15.96 |
| 08-00230-15063 | | | 18 | | | | | 60 | 7,600 | 18.87 | 19.70 | 20.61 | 21.61 | 23.95 |
| 08-00230-20031 | 2 | R0.1 | 8 | 1.6 | 1.91 | 12° | 4 | 50 | 7,600 | 8.49 | 8.86 | 9.28 | 9.73 | 10.80 |
| 08-00230-20032 | | | 12 | | | | | 50 | 7,600 | 12.66 | 13.22 | 13.84 | 14.53 | 16.13 |
| 08-00230-20033 | | | 16 | | | | | 60 | 7,600 | 16.83 | 17.58 | 18.41 | 19.32 | Free |
| 08-00230-20034 | | | 20 | | | | | 60 | 7,600 | 21.00 | 21.94 | 22.97 | 24.11 | Free |
| 08-00230-20035 | | | 24 | | | | | 70 | 7,600 | 25.17 | 26.30 | 27.54 | 28.90 | Free |
| 08-00230-20041 | | R0.2 | 8 | | | | | 50 | 7,600 | 8.48 | 8.85 | 9.26 | 9.71 | 10.77 |
| 08-00230-20042 | | | 12 | | | | | 50 | 7,600 | 12.65 | 13.21 | 13.83 | 14.51 | 16.09 |
| 08-00230-20043 | | | 16 | | | | | 60 | 7,600 | 16.83 | 17.57 | 18.39 | 19.30 | Free |
| 08-00230-20044 | | | 20 | | | | | 60 | 7,600 | 21.00 | 21.93 | 22.96 | 24.09 | Free |
| 08-00230-20045 | | | 24 | | | | | 70 | 7,600 | 25.17 | 26.29 | 27.52 | 28.88 | Free |
| 08-00230-20051 | | R0.3 | 8 | | | | | 50 | 7,600 | 8.48 | 8.85 | 9.25 | 9.70 | 10.74 |
| 08-00230-20052 | | | 12 | | | | | 50 | 7,600 | 12.65 | 13.20 | 13.81 | 14.49 | 16.06 |
| 08-00230-20053 | | | 16 | | | | | 60 | 7,600 | 16.82 | 17.56 | 18.38 | 19.28 | Free |
| 08-00230-20054 | | | 20 | | | | | 60 | 7,600 | 20.99 | 21.92 | 22.95 | 24.07 | Free |
| 08-00230-20055 | | | 24 | | | | | 70 | 7,600 | 25.16 | 26.28 | 27.51 | 28.86 | Free |
| 08-00230-20061 | | R0.5 | 8 | | | | | 50 | 7,600 | 8.47 | 8.83 | 9.22 | 9.66 | 10.67 |
| 08-00230-20062 | | | 12 | | | | | 50 | 7,600 | 12.64 | 13.19 | 13.79 | 14.45 | 15.98 |
| 08-00230-20063 | | | 16 | | | | | 60 | 7,600 | 16.81 | 17.55 | 18.35 | 19.24 | Free |
| 08-00230-20064 | | | 20 | | | | | 60 | 7,600 | 20.98 | 21.91 | 22.92 | 24.03 | Free |
| 08-00230-20065 | | | 24 | | | | | 70 | 7,600 | 25.16 | 26.26 | 27.48 | 28.82 | Free |

# MHR430R

## 無限コーティング 4枚刃ロングネックラジアスエンドミル
MUGEN-COATING 4-Flute Long Neck Radius End Mill




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

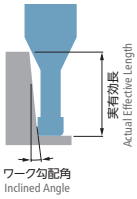
| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. 30′ | 1° | 1°30′ | 2° | 3° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00230-25031 | 2.5 | R0.1 | 10 | 2 | 2.39 | 12° | 4 | 50 | 8,000 | 10.67 | 11.15 | 11.67 | 12.24 | 13.59 |
| 08-00230-25032 | | | 20 | | | | | 60 | 8,000 | 21.10 | 22.04 | 23.08 | Free | Free |
| 08-00230-25033 | | | 30 | | | | | 70 | 8,400 | 31.53 | 32.94 | Free | Free | Free |
| 08-00230-25041 | | R0.2 | 10 | | | | | 50 | 8,000 | 10.67 | 11.14 | 11.65 | 12.22 | 13.56 |
| 08-00230-25042 | | | 20 | | | | | 60 | 8,000 | 21.10 | 22.04 | 23.07 | Free | Free |
| 08-00230-25043 | | | 30 | | | | | 70 | 8,400 | 31.52 | 32.93 | Free | Free | Free |
| 08-00230-25051 | | R0.3 | 10 | | | | | 50 | 8,000 | 10.66 | 11.13 | 11.64 | 12.20 | 13.53 |
| 08-00230-25052 | | | 20 | | | | | 60 | 8,000 | 21.09 | 22.03 | 23.05 | Free | Free |
| 08-00230-25053 | | | 30 | | | | | 70 | 8,400 | 31.52 | 32.92 | Free | Free | Free |
| 08-00230-25061 | | R0.5 | 10 | | | | | 50 | 8,000 | 10.65 | 11.11 | 11.61 | 12.16 | 13.46 |
| 08-00230-25062 | | | 20 | | | | | 60 | 8,000 | 21.08 | 22.01 | 23.02 | Free | Free |
| 08-00230-25063 | | | 30 | | | | | 70 | 8,400 | 31.51 | 32.91 | Free | Free | Free |
| 08-00230-30031 | 3 | R0.1 | 12 | 2.5 | 2.85 | 12° | 6 | 50 | 10,400 | 12.88 | 13.45 | 14.09 | 14.78 | 16.41 |
| 08-00230-30032 | | | 18 | | | | | 60 | 10,400 | 19.14 | 19.99 | 20.93 | 21.97 | 24.40 |
| 08-00230-30033 | | | 24 | | | | | 70 | 11,000 | 25.39 | 26.53 | 27.78 | 29.16 | Free |
| 08-00230-30034 | | | 30 | | | | | 70 | 11,000 | 31.65 | 33.07 | 34.63 | 36.35 | Free |
| 08-00230-30035 | | | 36 | | | | | 80 | 11,400 | 37.91 | 39.61 | 41.48 | 43.54 | Free |
| 08-00230-30041 | | R0.2 | 12 | | | | | 50 | 10,400 | 12.87 | 13.45 | 14.07 | 14.76 | 16.38 |
| 08-00230-30042 | | | 18 | | | | | 60 | 10,400 | 19.13 | 19.98 | 20.92 | 21.95 | 24.36 |
| 08-00230-30043 | | | 24 | | | | | 70 | 11,000 | 25.39 | 26.52 | 27.77 | 29.14 | Free |
| 08-00230-30044 | | | 30 | | | | | 70 | 11,400 | 31.65 | 33.06 | 34.62 | 36.33 | Free |
| 08-00230-30045 | | | 36 | | | | | 80 | 11,400 | 37.90 | 39.60 | 41.46 | 43.52 | Free |
| 08-00230-30051 | | R0.3 | 12 | | | | | 50 | 10,400 | 12.87 | 13.44 | 14.06 | 14.74 | 16.34 |
| 08-00230-30052 | | | 20 | | | | | 60 | 10,400 | 21.21 | 22.15 | 23.19 | 24.33 | 26.99 |
| 08-00230-30053 | | | 24 | | | | | 70 | 11,000 | 25.39 | 26.51 | 27.75 | 29.12 | Free |
| 08-00230-30054 | | | 30 | | | | | 70 | 11,400 | 31.64 | 33.05 | 34.60 | 36.31 | Free |
| 08-00230-30055 | | | 36 | | | | | 80 | 11,400 | 37.90 | 39.59 | 41.45 | 43.50 | Free |
| 08-00230-30061 | | R0.5 | 12 | | | | | 50 | 10,400 | 12.86 | 13.42 | 14.03 | 14.70 | 16.28 |
| 08-00230-30062 | | | 20 | | | | | 60 | 10,400 | 21.21 | 22.14 | 23.16 | 24.29 | 26.93 |
| 08-00230-30063 | | | 24 | | | | | 70 | 11,000 | 25.38 | 26.50 | 27.72 | 29.08 | Free |
| 08-00230-30064 | | | 30 | | | | | 70 | 11,400 | 31.63 | 33.03 | 34.57 | 36.27 | Free |
| 08-00230-30065 | | | 36 | | | | | 80 | 11,400 | 37.89 | 39.57 | 41.42 | 43.46 | Free |
| 08-00230-30071 | | R1 | 12 | | | | | 50 | 10,400 | 12.84 | 13.37 | 13.96 | 14.60 | 16.11 |
| 08-00230-30072 | | | 20 | | | | | 60 | 10,400 | 21.18 | 22.09 | 23.09 | 24.19 | 26.76 |
| 08-00230-30073 | | | 24 | | | | | 70 | 11,000 | 25.36 | 26.45 | 27.65 | 28.98 | Free |
| 08-00230-30074 | | | 30 | | | | | 70 | 11,400 | 31.61 | 32.99 | 34.50 | 36.17 | Free |
| 08-00230-30075 | | | 36 | | | | | 80 | 11,400 | 37.87 | 39.53 | 41.35 | 43.36 | Free |

**オーダー方法**
MHR430R 刃径(D)×コーナー半径(R)×有効長(ℓ1)を指示してください。 ※(γ)は参考値です。
When you order, indicate MHR430R (D)×(R)×(ℓ1). ※(γ) is reference value.

●切削条件表はF-038に記載
●Recommended Milling Conditions are shown on page F-038.



SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.




| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (ℓ1)有効長 Effective Length | (ℓ)刃長 Length of Cut | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price | ワーク勾配角に対する実有効長 Actual effective length depending on inclined angle of workpiece. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00230-40031 | 4 | R0.1 | 16 | 3.2 | 3.8 | 12° | 6 | 60 | 10,400 | 17.17 | 17.94 | 18.79 | 19.72 | Free |
| 08-00230-40032 | | | 24 | | | | | 70 | 10,400 | 25.52 | 26.66 | 27.92 | 29.30 | Free |
| 08-00230-40033 | | | 32 | | | | | 70 | 10,400 | 33.86 | 35.38 | 37.05 | Free | Free |
| 08-00230-40034 | | | 48 | | | | | 100 | 16,600 | 50.55 | 52.82 | Free | Free | Free |
| 08-00230-40041 | | R0.2 | 16 | | | | | 60 | 10,400 | 17.17 | 17.93 | 18.77 | 19.70 | Free |
| 08-00230-40042 | | | 24 | | | | | 70 | 10,400 | 25.51 | 26.65 | 27.90 | 29.28 | Free |
| 08-00230-40043 | | | 32 | | | | | 70 | 10,400 | 33.86 | 35.37 | 37.03 | Free | Free |
| 08-00230-40044 | | | 48 | | | | | 100 | 16,600 | 50.54 | 52.81 | Free | Free | Free |
| 08-00230-40051 | | R0.3 | 16 | | | | | 60 | 10,400 | 17.16 | 17.92 | 18.76 | 19.68 | Free |
| 08-00230-40052 | | | 24 | | | | | 70 | 10,400 | 25.51 | 26.64 | 27.89 | 29.26 | Free |
| 08-00230-40053 | | | 32 | | | | | 70 | 10,400 | 33.85 | 35.36 | 37.02 | Free | Free |
| 08-00230-40054 | | | 48 | | | | | 100 | 16,600 | 50.54 | 52.80 | Free | Free | Free |
| 08-00230-40061 | | R0.5 | 16 | | | | | 60 | 10,400 | 17.16 | 17.91 | 18.73 | 19.64 | Free |
| 08-00230-40062 | | | 24 | | | | | 70 | 10,400 | 25.50 | 26.62 | 27.86 | 29.22 | Free |
| 08-00230-40063 | | | 32 | | | | | 70 | 10,400 | 33.84 | 35.34 | 36.99 | Free | Free |
| 08-00230-40064 | | | 48 | | | | | 100 | 16,600 | 50.53 | 52.78 | Free | Free | Free |
| 08-00230-40071 | | R1 | 16 | | | | | 60 | 10,400 | 17.13 | 17.86 | 18.66 | 19.54 | Free |
| 08-00230-40072 | | | 24 | | | | | 70 | 10,400 | 25.48 | 26.58 | 27.79 | 29.12 | Free |
| 08-00230-40073 | | | 32 | | | | | 70 | 10,400 | 33.82 | 35.30 | 36.92 | Free | Free |
| 08-00230-40074 | | | 48 | | | | | 100 | 16,600 | 50.51 | 52.73 | Free | Free | Free |
| 08-00230-50031 | 5 | R0.1 | 20 | 4 | 4.75 | 12° | 6 | 70 | 13,000 | 21.35 | 22.30 | Free | Free | Free |
| 08-00230-50032 | | | 40 | | | | | 90 | 16,600 | 42.20 | Free | Free | Free | Free |
| 08-00230-50041 | | R0.2 | 20 | | | | | 70 | 13,000 | 21.34 | 22.29 | Free | Free | Free |
| 08-00230-50042 | | | 40 | | | | | 90 | 16,600 | 42.20 | Free | Free | Free | Free |
| 08-00230-50051 | | R0.3 | 20 | | | | | 70 | 13,000 | 21.34 | 22.28 | Free | Free | Free |
| 08-00230-50052 | | | 40 | | | | | 90 | 16,600 | 42.19 | Free | Free | Free | Free |
| 08-00230-50061 | | R0.5 | 20 | | | | | 70 | 13,000 | 21.33 | 22.27 | Free | Free | Free |
| 08-00230-50062 | | | 40 | | | | | 90 | 16,600 | 42.19 | Free | Free | Free | Free |
| 08-00230-50071 | | R1 | 20 | | | | | 70 | 13,000 | 21.31 | 22.22 | Free | Free | Free |
| 08-00230-50072 | | | 40 | | | | | 90 | 16,600 | 42.16 | Free | Free | Free | Free |
| 08-00230-60031 | 6 | R0.1 | 24 | 5 | 5.7 | – | 6 | 90 | 13,000 | Free | Free | Free | Free | Free |
| 08-00230-60032 | | | 48 | | | | | 110 | 20,600 | Free | Free | Free | Free | Free |
| 08-00230-60041 | | R0.2 | 24 | | | | | 90 | 13,000 | Free | Free | Free | Free | Free |
| 08-00230-60042 | | | 48 | | | | | 110 | 20,600 | Free | Free | Free | Free | Free |
| 08-00230-60051 | | R0.3 | 24 | | | | | 90 | 13,000 | Free | Free | Free | Free | Free |
| 08-00230-60052 | | | 48 | | | | | 110 | 20,600 | Free | Free | Free | Free | Free |
| 08-00230-60061 | | R0.5 | 24 | | | | | 90 | 13,000 | Free | Free | Free | Free | Free |
| 08-00230-60062 | | | 48 | | | | | 110 | 20,600 | Free | Free | Free | Free | Free |
| 08-00230-60071 | | R1 | 24 | | | | | 90 | 13,000 | Free | Free | Free | Free | Free |
| 08-00230-60072 | | | 48 | | | | | 110 | 20,600 | Free | Free | Free | Free | Free |

# MHR230R

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK55・NAK80・HPM-1 (～43HRC) | | | | 焼き入れ鋼 Hardened Steels HPM-38・STAVAX・SKD61 (～55HRC) | | | | 銅・アルミニウム合金 Copper・Aluminum Alloy | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | コーナー半径 Corner Radius | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | | min-1 | mm/min | ∂p mm | ∂e mm | min-1 | mm/min | ∂p mm | ∂e mm | min-1 | mm/min | ∂p mm | ∂e mm |
| 0.2 | 0.05 | 0.5 | 30,000 | 200 | 0.01 | 0.05 | 30,000 | 150 | 0.003 | 0.04 | 30,000 | 250 | 0.012 | 0.05 |
| | | 1 | 30,000 | 150 | 0.007 | 0.05 | 30,000 | 100 | 0.003 | 0.04 | 30,000 | 200 | 0.008 | 0.05 |
| | | 1.5 | 30,000 | 100 | 0.005 | 0.05 | 30,000 | 80 | 0.002 | 0.04 | 30,000 | 135 | 0.006 | 0.05 |
| | | 2 | 30,000 | 50 | 0.003 | 0.05 | 30,000 | 50 | 0.002 | 0.04 | 30,000 | 75 | 0.004 | 0.05 |
| 0.3 | 0.05 | 1 | 30,000 | 200 | 0.02 | 0.1 | 30,000 | 180 | 0.003 | 0.08 | 30,000 | 300 | 0.024 | 0.1 |
| | | 1.5 | 30,000 | 180 | 0.015 | 0.1 | 30,000 | 130 | 0.003 | 0.08 | 30,000 | 260 | 0.018 | 0.1 |
| | | 2 | 30,000 | 150 | 0.01 | 0.1 | 30,000 | 100 | 0.003 | 0.08 | 30,000 | 250 | 0.012 | 0.1 |
| | | 2.5 | 30,000 | 120 | 0.007 | 0.1 | 25,000 | 80 | 0.002 | 0.08 | 30,000 | 240 | 0.008 | 0.1 |
| | | 3 | 30,000 | 100 | 0.005 | 0.1 | 25,000 | 50 | 0.002 | 0.08 | 30,000 | 220 | 0.006 | 0.1 |
| 0.4 | 0.05<br>0.1 | 1 | 30,000 | 350 | 0.025 | 0.12 | 30,000 | 300 | 0.005 | 0.1 | 30,000 | 450 | 0.03 | 0.12 |
| | | 1.5 | 30,000 | 300 | 0.022 | 0.12 | 30,000 | 270 | 0.005 | 0.1 | 30,000 | 400 | 0.027 | 0.12 |
| | | 2 | 30,000 | 250 | 0.02 | 0.12 | 25,000 | 180 | 0.005 | 0.1 | 30,000 | 360 | 0.024 | 0.12 |
| | | 3 | 30,000 | 220 | 0.015 | 0.12 | 25,000 | 150 | 0.004 | 0.1 | 30,000 | 300 | 0.018 | 0.12 |
| | | 4 | 25,000 | 160 | 0.01 | 0.12 | 20,000 | 100 | 0.003 | 0.1 | 30,000 | 240 | 0.012 | 0.12 |
| 0.5 | 0.05<br>0.1 | 1 | 30,000 | 500 | 0.03 | 0.14 | 25,000 | 400 | 0.01 | 0.12 | 30,000 | 650 | 0.036 | 0.14 |
| | | 2 | 30,000 | 400 | 0.025 | 0.14 | 25,000 | 300 | 0.01 | 0.12 | 30,000 | 600 | 0.03 | 0.14 |
| | | 3 | 30,000 | 340 | 0.02 | 0.14 | 25,000 | 250 | 0.008 | 0.12 | 30,000 | 480 | 0.024 | 0.14 |
| | | 4 | 25,000 | 280 | 0.015 | 0.14 | 20,000 | 180 | 0.005 | 0.12 | 30,000 | 430 | 0.018 | 0.14 |
| | | 5 | 25,000 | 230 | 0.01 | 0.14 | 20,000 | 150 | 0.004 | 0.12 | 30,000 | 360 | 0.012 | 0.14 |
| | | 6 | 20,000 | 180 | 0.008 | 0.14 | 16,000 | 100 | 0.003 | 0.12 | 25,000 | 270 | 0.01 | 0.14 |
| 0.6 | 0.05<br>0.1<br>0.2 | 2 | 30,000 | 600 | 0.035 | 0.16 | 25,000 | 400 | 0.02 | 0.13 | 30,000 | 800 | 0.04 | 0.16 |
| | | 3 | 30,000 | 500 | 0.03 | 0.16 | 25,000 | 350 | 0.015 | 0.13 | 30,000 | 750 | 0.035 | 0.16 |
| | | 4 | 25,000 | 400 | 0.025 | 0.16 | 20,000 | 250 | 0.015 | 0.13 | 30,000 | 650 | 0.03 | 0.16 |
| | | 6 | 20,000 | 250 | 0.015 | 0.16 | 16,000 | 150 | 0.008 | 0.13 | 25,000 | 400 | 0.018 | 0.16 |
| | | 8 | 18,000 | 180 | 0.01 | 0.16 | 14,000 | 100 | 0.005 | 0.13 | 20,000 | 300 | 0.012 | 0.16 |
| 0.7 | 0.05<br>0.1 | 4 | 25,000 | 600 | 0.03 | 0.2 | 20,000 | 400 | 0.02 | 0.16 | 30,000 | 1,000 | 0.04 | 0.2 |
| | | 6 | 20,000 | 450 | 0.02 | 0.2 | 16,000 | 250 | 0.01 | 0.16 | 25,000 | 700 | 0.025 | 0.2 |
| 0.8 | 0.05<br>0.1<br>0.2 | 4 | 25,000 | 1,000 | 0.045 | 0.25 | 20,000 | 600 | 0.025 | 0.2 | 30,000 | 1,400 | 0.055 | 0.25 |
| | | 6 | 20,000 | 700 | 0.03 | 0.25 | 16,000 | 400 | 0.02 | 0.2 | 25,000 | 1,000 | 0.04 | 0.25 |
| | | 8 | 18,000 | 400 | 0.02 | 0.25 | 14,000 | 250 | 0.01 | 0.2 | 22,000 | 600 | 0.025 | 0.25 |
| 0.9 | 0.1 | 4 | 25,000 | 1,100 | 0.05 | 0.3 | 20,000 | 700 | 0.03 | 0.24 | 30,000 | 1,500 | 0.06 | 0.3 |
| | | 8 | 18,000 | 500 | 0.03 | 0.3 | 14,000 | 350 | 0.01 | 0.24 | 22,000 | 800 | 0.04 | 0.3 |
| 1 | 0.05<br>0.1<br>0.2<br>0.3 | 2 | 25,000 | 1,600 | 0.065 | 0.35 | 20,000 | 900 | 0.05 | 0.28 | 30,000 | 2,200 | 0.08 | 0.35 |
| | | 3 | 25,000 | 1,500 | 0.06 | 0.35 | 20,000 | 850 | 0.05 | 0.28 | 30,000 | 2,100 | 0.07 | 0.35 |
| | | 4 | 25,000 | 1,400 | 0.055 | 0.35 | 20,000 | 800 | 0.04 | 0.28 | 30,000 | 2,000 | 0.065 | 0.35 |
| | | 5 | 22,000 | 1,200 | 0.05 | 0.35 | 18,000 | 700 | 0.03 | 0.28 | 27,000 | 1,700 | 0.06 | 0.35 |
| | | 6 | 20,000 | 1,000 | 0.045 | 0.35 | 16,000 | 600 | 0.02 | 0.28 | 25,000 | 1,500 | 0.055 | 0.35 |
| | | 8 | 18,000 | 700 | 0.035 | 0.35 | 14,000 | 450 | 0.02 | 0.28 | 22,000 | 1,000 | 0.045 | 0.35 |
| | | 10 | 16,000 | 600 | 0.025 | 0.35 | 13,000 | 350 | 0.01 | 0.28 | 20,000 | 800 | 0.03 | 0.35 |
| | | 12 | 14,000 | 350 | 0.02 | 0.35 | 12,000 | 250 | 0.008 | 0.28 | 18,000 | 600 | 0.025 | 0.35 |
| | | 16 | 12,000 | 250 | 0.01 | 0.35 | 10,000 | 150 | 0.005 | 0.28 | 14,000 | 350 | 0.012 | 0.35 |
| | | 20 | 11,000 | 150 | 0.005 | 0.35 | 9,000 | 100 | 0.003 | 0.28 | 13,000 | 250 | 0.006 | 0.35 |
| 1.2 | 0.1<br>0.2<br>0.3 | 5 | 22,000 | 1,500 | 0.055 | 0.4 | 18,000 | 850 | 0.03 | 0.32 | 26,000 | 2,200 | 0.065 | 0.4 |
| | | 6 | 20,000 | 1,300 | 0.05 | 0.4 | 17,000 | 750 | 0.03 | 0.32 | 25,000 | 2,000 | 0.06 | 0.4 |
| | | 8 | 18,000 | 1,100 | 0.04 | 0.4 | 15,000 | 600 | 0.025 | 0.32 | 22,000 | 1,600 | 0.05 | 0.4 |
| | | 10 | 16,000 | 900 | 0.03 | 0.4 | 13,000 | 500 | 0.02 | 0.32 | 20,000 | 1,400 | 0.04 | 0.4 |
| | | 12 | 14,000 | 700 | 0.025 | 0.4 | 11,000 | 400 | 0.015 | 0.32 | 17,000 | 1,000 | 0.03 | 0.4 |
| | | 15 | 12,000 | 360 | 0.018 | 0.4 | 10,000 | 210 | 0.01 | 0.32 | 14,000 | 520 | 0.022 | 0.4 |
| | | 16 | 12,000 | 350 | 0.015 | 0.4 | 10,000 | 200 | 0.008 | 0.32 | 14,000 | 500 | 0.02 | 0.4 |
| | | 20 | 10,000 | 230 | 0.01 | 0.4 | 8,000 | 150 | 0.005 | 0.32 | 12,000 | 330 | 0.012 | 0.4 |



SEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| 被削材 Work Material | | | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK55・NAK80・HPM-1 (～43HRC) | | | | 焼き入れ鋼 Hardened Steels HPM-38・STAVAX・SKD61 (～55HRC) | | | | 銅・アルミニウム合金 Copper・Aluminum Alloy | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | コーナー半径 Corner Radius | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | ae mm |
| 1.5 | 0.1 0.2 0.3 0.5 | 4 | 22,000 | 1,600 | 0.09 | 0.45 | 18,000 | 1,000 | 0.05 | 0.36 | 26,000 | 2,300 | 0.1 | 0.45 |
| | | 6 | 20,000 | 1,400 | 0.08 | 0.45 | 16,000 | 850 | 0.045 | 0.36 | 24,000 | 2,000 | 0.09 | 0.45 |
| | | 8 | 18,000 | 1,200 | 0.07 | 0.45 | 15,000 | 700 | 0.04 | 0.36 | 22,000 | 1,800 | 0.08 | 0.45 |
| | | 10 | 16,000 | 1,000 | 0.06 | 0.45 | 13,000 | 550 | 0.035 | 0.36 | 20,000 | 1,500 | 0.07 | 0.45 |
| | | 12 | 14,000 | 800 | 0.05 | 0.45 | 11,000 | 450 | 0.03 | 0.36 | 17,000 | 1,200 | 0.06 | 0.45 |
| | | 16 | 12,000 | 600 | 0.035 | 0.45 | 10,000 | 350 | 0.018 | 0.36 | 15,000 | 900 | 0.04 | 0.45 |
| | | 18 | 11,000 | 450 | 0.03 | 0.45 | 9,000 | 280 | 0.01 | 0.36 | 13,000 | 650 | 0.035 | 0.45 |
| | | 20 | 10,000 | 300 | 0.02 | 0.45 | 8,000 | 200 | 0.005 | 0.36 | 12,000 | 450 | 0.025 | 0.45 |
| 2 | 0.1 0.2 0.3 0.5 | 4 | 16,000 | 2,200 | 0.13 | 0.5 | 14,000 | 1,000 | 0.06 | 0.4 | 20,000 | 3,000 | 0.15 | 0.5 |
| | | 6 | 16,000 | 2,100 | 0.12 | 0.5 | 14,000 | 900 | 0.055 | 0.4 | 20,000 | 2,800 | 0.14 | 0.5 |
| | | 8 | 16,000 | 2,000 | 0.11 | 0.5 | 13,000 | 800 | 0.05 | 0.4 | 20,000 | 2,600 | 0.13 | 0.5 |
| | | 10 | 16,000 | 1,800 | 0.1 | 0.5 | 13,000 | 750 | 0.045 | 0.4 | 20,000 | 2,300 | 0.12 | 0.5 |
| | | 12 | 14,000 | 1,500 | 0.09 | 0.5 | 11,000 | 600 | 0.04 | 0.4 | 17,000 | 1,900 | 0.11 | 0.5 |
| | | 16 | 12,000 | 1,200 | 0.07 | 0.5 | 10,000 | 500 | 0.03 | 0.4 | 15,000 | 1,600 | 0.085 | 0.5 |
| | | 20 | 10,000 | 800 | 0.05 | 0.5 | 8,000 | 350 | 0.02 | 0.4 | 12,000 | 1,000 | 0.06 | 0.5 |
| | | 24 | 9,000 | 700 | 0.03 | 0.5 | 7,000 | 280 | 0.01 | 0.4 | 11,000 | 900 | 0.04 | 0.5 |
| | | 26 | 9,000 | 600 | 0.025 | 0.5 | 7,000 | 250 | 0.008 | 0.4 | 11,000 | 850 | 0.03 | 0.5 |
| | | 30 | 8,000 | 400 | 0.02 | 0.5 | 6,400 | 200 | 0.005 | 0.4 | 9,000 | 550 | 0.025 | 0.5 |
| 2.5 | 0.1 0.2 0.3 0.5 | 10 | 13,000 | 1,800 | 0.14 | 0.8 | 11,000 | 900 | 0.07 | 0.65 | 16,000 | 3,000 | 0.17 | 0.8 |
| | | 20 | 9,000 | 1,000 | 0.08 | 0.8 | 7,000 | 450 | 0.05 | 0.65 | 11,000 | 1,600 | 0.1 | 0.8 |
| | | 30 | 7,000 | 500 | 0.03 | 0.8 | 5,600 | 250 | 0.01 | 0.65 | 8,500 | 850 | 0.035 | 0.8 |
| 3 | 0.1 0.2 0.3 0.5 1 | 12 | 11,000 | 1,800 | 0.16 | 0.9 | 9,000 | 900 | 0.08 | 0.75 | 13,000 | 3,000 | 0.2 | 0.9 |
| | | 18 | 10,000 | 1,400 | 0.12 | 0.9 | 8,000 | 700 | 0.07 | 0.75 | 12,000 | 2,400 | 0.14 | 0.9 |
| | | 24 | 8,000 | 1,000 | 0.08 | 0.9 | 6,400 | 500 | 0.05 | 0.75 | 10,000 | 1,800 | 0.1 | 0.9 |
| | | 30 | 7,000 | 800 | 0.06 | 0.9 | 5,600 | 400 | 0.03 | 0.75 | 8,500 | 1,300 | 0.07 | 0.9 |
| | | 36 | 6,000 | 500 | 0.03 | 0.9 | 4,800 | 300 | 0.01 | 0.75 | 7,200 | 1,000 | 0.04 | 0.9 |
| 4 | 0.1 0.2 0.3 0.5 1 | 16 | 8,000 | 2,000 | 0.2 | 1.2 | 6,400 | 850 | 0.1 | 1 | 10,000 | 3,200 | 0.3 | 1.2 |
| | | 24 | 7,000 | 1,500 | 0.12 | 1.2 | 5,600 | 700 | 0.08 | 1 | 8,500 | 2,400 | 0.18 | 1.2 |
| | | 32 | 6,000 | 800 | 0.08 | 1.2 | 4,800 | 500 | 0.04 | 1 | 8,000 | 1,800 | 0.14 | 1.2 |
| | | 48 | 4,000 | 400 | 0.04 | 1.2 | 3,200 | 300 | 0.01 | 1 | 4,800 | 700 | 0.05 | 1.2 |
| 5 | 0.1 0.2 0.3 0.5 1 | 20 | 6,000 | 1,800 | 0.25 | 1.6 | 4,800 | 800 | 0.1 | 1.3 | 7,200 | 3,000 | 0.36 | 1.6 |
| | | 40 | 4,000 | 700 | 0.07 | 1.6 | 3,200 | 400 | 0.05 | 1.3 | 4,800 | 1,300 | 0.16 | 1.6 |
| 6 | 0.1 0.2 0.3 0.5 1 | 24 | 4,500 | 1,500 | 0.3 | 2.1 | 3,600 | 700 | 0.15 | 1.7 | 5,400 | 2,600 | 0.48 | 2.1 |
| | | 48 | 3,000 | 600 | 0.1 | 2.1 | 2,400 | 350 | 0.05 | 1.7 | 3,600 | 1,000 | 0.18 | 2.1 |

**備　考 Notes**

※実際の加工形状および使用機械等にて切削条件を調整してください。
※切り込み量の ap は切り込み深さ、ae は切り込み幅を示します。
※焼き入れ鋼を切削加工する場合は、オイルミストクーラントをお奨めします。
※ Z 切り込み時のアプローチ方法として、ヘリカル（螺旋）及びランプ（傾斜）での切削加工をお奨めします。
※ L(有効長)/D(刃径)が 8 倍を超える場合は立ち壁付近の送り速度を 50%以下、切り込み量：ae を 30%以下に調整してください。
※溝切削は、切削条件表を参考に ap 切り込み深さ及び送り速度を 50%以下に設定し、往復切削をお奨めします。
※ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。また、主軸回転数が足りない場合も同様に同じ割合で下げてください。
※ Adjust milling conditions according to milling shape and machine type.
※ ap : Axial Depth of Cut, ae : Radial Depth of Cut.
※ Recommend to use oil mist coolant for machining hardened steels.
※ Recommend to apply helical or ramping for approaching into axial direction.
※ Adjust feed rate 50% lower and cutting depth (ae) 30% lower for milling deep wall area when L/D exceeds 8 for stable milling.
※ For slotting, recommend reciprocating milling by adjusting feed & ap in below 50% of recommended milling condition.
※ Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.

# MHR430R

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK55・NAK80・HPM-1 (～43HRC) | | | | 焼き入れ鋼 Hardened Steels HPM-38・STAVAX・SKD61 (～55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・PD613 (～62HRC) | | | | 銅・アルミニウム合金 Copper・Aluminum Alloy | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | コーナー半径 Corner Radius | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | | $min^{-1}$ | mm/min | ap mm | ae mm | $min^{-1}$ | mm/min | ap mm | ae mm | $min^{-1}$ | mm/min | ap mm | ae mm | $min^{-1}$ | mm/min | ap mm | ae mm |
| 1 | 0.05 0.1 0.2 0.3 | 3 | 16,000 | 1,800 | 0.06 | 0.35 | 12,800 | 1,260 | 0.045 | 0.3 | 10,800 | 1,000 | 0.03 | 0.25 | 16,000 | 1,800 | 0.2 | 0.23 |
| | | 4 | 16,000 | 1,500 | 0.05 | 0.35 | 12,800 | 1,050 | 0.04 | 0.3 | 10,800 | 840 | 0.03 | 0.25 | 16,000 | 1,500 | 0.15 | 0.23 |
| | | 5 | 16,000 | 1,410 | 0.045 | 0.35 | 12,800 | 990 | 0.035 | 0.25 | 10,800 | 800 | 0.02 | 0.2 | 16,000 | 1,410 | 0.13 | 0.23 |
| | | 6 | 14,500 | 1,200 | 0.04 | 0.25 | 11,600 | 840 | 0.03 | 0.25 | 8,900 | 680 | 0.015 | 0.2 | 14,500 | 1,200 | 0.12 | 0.2 |
| | | 8 | 14,500 | 870 | 0.03 | 0.25 | 11,600 | 620 | 0.02 | 0.2 | 8,900 | 500 | 0.012 | 0.16 | 14,500 | 870 | 0.09 | 0.2 |
| | | 10 | 11,100 | 660 | 0.025 | 0.25 | 8,900 | 470 | 0.015 | 0.1 | 7,100 | 370 | 0.01 | 0.1 | 11,100 | 660 | 0.075 | 0.15 |
| | | 12 | 11,100 | 300 | 0.02 | 0.2 | 8,900 | 210 | 0.01 | 0.08 | 7,100 | 160 | 0.005 | 0.06 | 11,100 | 300 | 0.06 | 0.15 |
| 1.2 | 0.1 0.2 0.3 | 5 | 15,500 | 1,740 | 0.06 | 0.4 | 12,400 | 1,220 | 0.045 | 0.35 | 10,000 | 970 | 0.025 | 0.25 | 15,500 | 1,740 | 0.18 | 0.28 |
| | | 10 | 12,000 | 1,290 | 0.04 | 0.35 | 9,600 | 900 | 0.03 | 0.25 | 8,000 | 720 | 0.01 | 0.15 | 12,000 | 1,290 | 0.12 | 0.28 |
| | | 15 | 10,600 | 480 | 0.02 | 0.25 | 8,500 | 330 | 0.01 | 0.1 | 6,600 | 270 | 0.005 | 0.08 | 10,600 | 480 | 0.07 | 0.23 |
| 1.5 | 0.1 0.2 0.3 0.5 | 6 | 14,000 | 1,910 | 0.08 | 0.53 | 11,200 | 1,340 | 0.05 | 0.4 | 8,500 | 1,070 | 0.03 | 0.3 | 14,000 | 1,910 | 0.24 | 0.35 |
| | | 12 | 11,500 | 1,250 | 0.06 | 0.42 | 9,000 | 870 | 0.04 | 0.3 | 6,400 | 700 | 0.01 | 0.2 | 11,500 | 1,250 | 0.18 | 0.3 |
| | | 18 | 8,500 | 560 | 0.02 | 0.3 | 6,800 | 390 | 0.01 | 0.15 | 5,400 | 320 | 0.005 | 0.1 | 8,500 | 560 | 0.08 | 0.25 |
| 2 | 0.1 0.2 0.3 0.5 | 8 | 11,100 | 2,150 | 0.08 | 0.6 | 8,800 | 1,500 | 0.05 | 0.5 | 7,000 | 1,200 | 0.03 | 0.4 | 11,100 | 2,150 | 0.24 | 0.45 |
| | | 12 | 11,100 | 1,800 | 0.065 | 0.6 | 8,800 | 1,260 | 0.045 | 0.5 | 5,600 | 1,000 | 0.027 | 0.4 | 11,100 | 1,800 | 0.2 | 0.43 |
| | | 16 | 9,600 | 1,500 | 0.05 | 0.5 | 7,700 | 1,050 | 0.04 | 0.35 | 4,800 | 840 | 0.01 | 0.2 | 9,600 | 1,500 | 0.15 | 0.39 |
| | | 20 | 9,600 | 900 | 0.03 | 0.45 | 7,700 | 630 | 0.015 | 0.25 | 4,500 | 500 | 0.01 | 0.1 | 9,600 | 900 | 0.12 | 0.35 |
| | | 24 | 6,400 | 740 | 0.02 | 0.4 | 5,100 | 510 | 0.01 | 0.2 | 4,100 | 400 | 0.005 | 0.1 | 6,400 | 740 | 0.1 | 0.3 |
| 2.5 | 0.1 0.2 0.3 0.5 | 10 | 9,200 | 2,280 | 0.1 | 0.85 | 7,400 | 1,590 | 0.07 | 0.7 | 6,000 | 1,280 | 0.04 | 0.5 | 9,200 | 2,280 | 0.3 | 0.5 |
| | | 20 | 8,300 | 1,580 | 0.08 | 0.6 | 6,600 | 1,110 | 0.05 | 0.4 | 4,000 | 900 | 0.01 | 0.2 | 8,300 | 1,580 | 0.24 | 0.43 |
| | | 30 | 5,400 | 710 | 0.025 | 0.45 | 4,300 | 500 | 0.01 | 0.2 | 3,200 | 400 | 0.005 | 0.1 | 5,400 | 710 | 0.1 | 0.33 |
| 3 | 0.1 0.2 0.3 0.5 1 | 12 | 8,000 | 2,400 | 0.12 | 0.9 | 6,400 | 1,680 | 0.08 | 0.8 | 5,200 | 1,350 | 0.05 | 0.65 | 8,000 | 2,400 | 0.36 | 0.55 |
| | | 18 | 7,800 | 2,000 | 0.11 | 0.8 | 6,200 | 1,410 | 0.07 | 0.7 | 3,700 | 1,100 | 0.03 | 0.4 | 7,800 | 2,010 | 0.33 | 0.5 |
| | | 20 | 7,700 | 1,850 | 0.1 | 0.8 | 6,200 | 1,250 | 0.06 | 0.6 | 3,600 | 1,000 | 0.03 | 0.3 | 7,700 | 1,850 | 0.3 | 0.5 |
| | | 24 | 7,500 | 1,620 | 0.1 | 0.7 | 6,000 | 1,140 | 0.06 | 0.5 | 3,400 | 900 | 0.02 | 0.2 | 7,500 | 1,620 | 0.3 | 0.45 |
| | | 30 | 6,000 | 1,050 | 0.05 | 0.6 | 4,800 | 740 | 0.03 | 0.4 | 3,000 | 600 | 0.005 | 0.1 | 6,000 | 1,050 | 0.15 | 0.4 |
| | | 36 | 4,200 | 710 | 0.03 | 0.5 | 3,400 | 500 | 0.01 | 0.3 | 2,500 | 400 | 0.005 | 0.1 | 4,200 | 710 | 0.1 | 0.35 |
| 4 | 0.1 0.2 0.3 0.5 1 | 16 | 6,000 | 2,520 | 0.15 | 1.2 | 4,800 | 1,770 | 0.1 | 1 | 4,000 | 1,400 | 0.06 | 0.8 | 6,000 | 2,520 | 0.45 | 0.75 |
| | | 24 | 5,400 | 2,030 | 0.12 | 1 | 4,300 | 1,430 | 0.085 | 0.8 | 2,800 | 1,140 | 0.05 | 0.65 | 5,400 | 2,030 | 0.39 | 0.7 |
| | | 32 | 4,800 | 1,350 | 0.08 | 0.9 | 3,800 | 950 | 0.04 | 0.7 | 2,300 | 750 | 0.01 | 0.1 | 4,800 | 1,350 | 0.25 | 0.6 |
| | | 48 | 3,200 | 570 | 0.04 | 0.8 | 2,600 | 410 | 0.01 | 0.35 | 1,500 | 330 | 0.005 | 0.1 | 3,200 | 570 | 0.12 | 0.5 |
| 5 | 0.1 0.2 0.5 1 | 20 | 5,100 | 2,300 | 0.17 | 1.6 | 4,100 | 1,610 | 0.12 | 1.2 | 3,300 | 1,280 | 0.07 | 1 | 5,100 | 2,300 | 0.52 | 1 |
| | | 40 | 3,200 | 1,020 | 0.07 | 1.2 | 2,600 | 720 | 0.05 | 0.9 | 1,500 | 570 | 0.02 | 0.1 | 3,200 | 1,020 | 0.25 | 0.8 |
| 6 | 0.1 0.2 0.5 1 | 24 | 3,700 | 2,100 | 0.2 | 2.1 | 3,000 | 1,470 | 0.12 | 1.5 | 2,700 | 1,170 | 0.07 | 1.2 | 3,700 | 2,100 | 0.6 | 1.2 |
| | | 48 | 2,600 | 950 | 0.09 | 1.5 | 2,100 | 660 | 0.05 | 1.2 | 1,200 | 520 | 0.03 | 0.2 | 2,600 | 950 | 0.32 | 0.9 |

**備考 Notes**

※実際の加工形状および使用機械等にて切削条件を調整してください。
※切り込み量の ap は切り込み深さ、ae は切り込み幅を示します。
※焼き入れ鋼を切削加工する場合は、オイルミストクーラントをお奨めします。
※ Z 切り込み時のアプローチ方法として、ヘリカル（螺旋）及びランプ（傾斜）での切削加工をお奨めします。
※ L(有効長)/D(刃径)が 8 倍を超える場合は立ち壁付近の送り速度を 50%以下、切り込み量：ae を 30%以下に調整してください。
※溝切削は、切削条件表を参考に切り込み量：ap 及び送り速度を 50%以下に設定し、往復切削をお奨めします。
※ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。また、主軸回転数が足りない場合も同様に同じ割合で下げてください。

※ Adjust milling conditions according to milling shape and machine type.
※ ap : Axial Depth of Cut, ae : Radial Depth of Cut.
※ Recommend to use oil mist coolant for machining hardened steels.
※ Recommend to apply herical or ramping for approaching into axial direction.
※ Adjust feed rate 50% lower and cutting depth(ae) 30% lower for milling deep wall area. When L/D exceeds 8 for stable milling.
※ For slotting, recommend reciprocating milling by adjusting feed & ap in below 50% of recommended milling condition.
※ Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.



ŞEVKET ÖLÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MHR430R

## 高速切削条件参考表 Recommended High Speed Milling Conditions

| 被削材 Work Material | | | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK55・NAK80・HPM-1 (～43HRC) | | | | 焼き入れ鋼 Hardened Steels HPM-38・STAVAX・SKD61 (～55HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・PD613 (～62HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | コーナー半径 Corner Radius | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | ae mm |
| 2 | 0.5 | 8 | 22,000 | 6,200 | 0.06 | 0.4 | 16,000 | 4,500 | 0.04 | 0.3 | 12,800 | 3,000 | 0.03 | 0.2 |
| 2.5 | 0.5 | 10 | 18,000 | 6,400 | 0.08 | 0.65 | 13,000 | 4,600 | 0.05 | 0.5 | 10,200 | 3,600 | 0.03 | 0.3 |
| 3 | 1 | 12 | 15,000 | 7,100 | 0.1 | 0.7 | 11,000 | 5,100 | 0.06 | 0.6 | 8,500 | 3,700 | 0.04 | 0.4 |
| 4 | 1 | 16 | 11,000 | 7,100 | 0.13 | 1 | 8,000 | 5,100 | 0.08 | 0.8 | 6,300 | 3,800 | 0.05 | 0.5 |
| 5 | 1 | 20 | 9,000 | 8,200 | 0.15 | 1.4 | 6,500 | 5,200 | 0.1 | 1 | 5,100 | 3,700 | 0.05 | 0.7 |
| 6 | 1 | 24 | 7,500 | 7,700 | 0.18 | 1.8 | 5,300 | 5,300 | 0.1 | 1.3 | 4,200 | 3,100 | 0.06 | 0.8 |

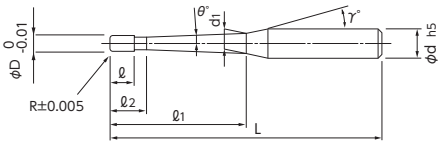
**備　考 Notes**

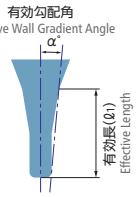
※実際の加工形状および使用機械等にて切削条件を調整してください。
※切り込み量の ap は切り込み深さ、ae は切り込み幅を示します。
※焼き入れ鋼を切削加工する場合は、オイルミストクーラントをお奨めします。
※立ち壁付近の送り速度を 50%以下、切り込み量：ae を 30%以下に調整してください。
※ Z 切り込み時のアプローチ方法として、ヘリカル（螺旋）及びランプ（傾斜）での切削加工をお奨めします。
※ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。また、主軸回転数が足りない場合も同様に同じ割合で下げてください。

※Adjust milling conditions according to milling shape and machine type.
※ap : Axial Depth of Cut, ae : Radial Depth of Cut.
※Recommend to use oil mist coolant for machining hardened steels.
※Adjust feed rate 50% lower and cutting depth (ae) 30% lower for milling deep wall area.
※Recommend to apply herical or ramping for approaching into axial direction.
※Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.

# MSTNR230

## 無限コーティング ロングテーパーネックラジアスエンドミル
MUGEN-COATING 2-Flute Long Taper Neck Radius End Mill




- 中荒加工～精密仕上げ加工まで、ビビリを抑え安定した高速切削加工が可能で仕上げ面精度が向上。
- R 精度は±5μm の超高精度！
- チューニングされた無限コーティングにより、焼き入れ鋼・調質鋼の直彫り加工から銅電極加工まで、幅広い領域で威力を発揮。
- Improve surface overall accuracy brought by high speed cutting with minimal chattering in roughing to finishing process.
- High R-Accuracy : ±5μm.
- Better performance in wide range of machining of direct carving on Hardened Steels, Prehardened Steels and Copper Electrode.

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | | ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (α)有効勾配角 Effective Wall Gradient Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00770-02211 | 0.2 | R0.05 | 1° | 1 | 0.23 | 0.15 | 0.4 | 12° | 0°38′ | 4 | 50 | 13,000 |
| 08-00770-02212 | | | | 2 | 0.26 | | | | 0°49′ | | 50 | 13,000 |
| 08-00770-02231 | | | 3° | 1 | 0.27 | | | | 1°54′ | | 50 | 13,000 |
| 08-00770-02232 | | | | 2 | 0.37 | | | | 2°28′ | | 50 | 13,000 |
| 08-00770-02251 | | | 5° | 1 | 0.31 | | | | 3°10′ | | 50 | 13,000 |
| 08-00770-02252 | | | | 2 | 0.48 | | | | 4°07′ | | 50 | 13,000 |
| 08-00770-03211 | 0.3 | R0.05 | 1° | 2 | 0.35 | 0.25 | 0.6 | 12° | 0°43′ | 4 | 50 | 13,000 |
| 08-00770-03212 | | | | 3 | 0.39 | | | | 0°49′ | | 50 | 13,000 |
| 08-00770-03231 | | | 3° | 2 | 0.45 | | | | 2°10′ | | 50 | 13,000 |
| 08-00770-03232 | | | | 3 | 0.56 | | | | 2°27′ | | 50 | 13,000 |
| 08-00770-03251 | | | 5° | 2 | 0.55 | | | | 3°35′ | | 50 | 13,000 |
| 08-00770-03252 | | | | 3 | 0.72 | | | | 4°04′ | | 50 | 13,000 |
| 08-00770-04211 | 0.4 | R0.05 | 1° | 3 | 0.48 | 0.3 | 0.8 | 12° | 0°45′ | 4 | 50 | 9,700 |
| 08-00770-04212 | | | | 4 | 0.52 | | | | 0°49′ | | 50 | 9,700 |
| 08-00770-04231 | | | 3° | 3 | 0.64 | | | | 2°14′ | | 50 | 9,700 |
| 08-00770-04232 | | | | 4 | 0.74 | | | | 2°26′ | | 50 | 9,700 |
| 08-00770-04251 | | | 5° | 3 | 0.79 | | | | 3°44′ | | 50 | 9,700 |
| 08-00770-04252 | | | | 4 | 0.96 | | | | 4°03′ | | 50 | 9,700 |
| 08-00770-04311 | | R0.1 | 1° | 3 | 0.48 | | | | 0°46′ | | 50 | 9,700 |
| 08-00770-04312 | | | | 4 | 0.52 | | | | 0°49′ | | 50 | 9,700 |
| 08-00770-04331 | | | 3° | 3 | 0.64 | | | | 2°17′ | | 50 | 9,700 |
| 08-00770-04332 | | | | 4 | 0.74 | | | | 2°28′ | | 50 | 9,700 |
| 08-00770-04351 | | | 5° | 3 | 0.79 | | | | 3°48′ | | 50 | 9,700 |
| 08-00770-04352 | | | | 4 | 0.96 | | | | 4°07′ | | 50 | 9,700 |
| 08-00770-05211 | 0.5 | R0.05 | 1° | 3 | 0.57 | 0.4 | 1 | 12° | 0°41′ | 4 | 50 | 8,900 |
| 08-00770-05212 | | | | 5 | 0.64 | | | | 0°49′ | | 50 | 9,300 |
| 08-00770-05213 | | | | 8 | 0.75 | | | | 0°53′ | | 50 | 9,600 |
| 08-00770-05214 | | | | 10 | 0.82 | | | | 0°54′ | | 50 | 10,600 |
| 08-00770-05215 | | | | 12 | 0.89 | | | | 0°55′ | | 50 | 10,600 |

**オーダー方法**
MSTNR230 刃径(D)×コーナー半径(R)×首角(θ)×有効長(ℓ1)を指示してください。 ※(γ)は参考値です。
When you order, indicate MSTNR230 (D)×(R)×(θ)×(ℓ1). ※(γ) is reference value.

- 切削条件表はF-045に記載
- Recommended Milling Conditions are shown on page F-045.



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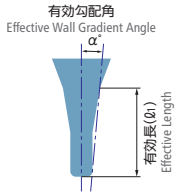
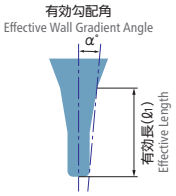



| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (α)有効勾配角 Effective Wall Gradient Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00770-05231 | 0.5 | R0.05 | 3° | 3 | 0.71 | 0.4 | 1 | 12° | 2°02′ | 4 | 50 | 9,600 |
| 08-00770-05232 | | | | 5 | 0.92 | | | | 2°25′ | | 50 | 9,600 |
| 08-00770-05233 | | | | 8 | 1.24 | | | | 2°38′ | | 50 | 10,600 |
| 08-00770-05234 | | | | 10 | 1.45 | | | | 2°43′ | | 50 | 10,600 |
| 08-00770-05235 | | | | 12 | 1.66 | | | | 2°46′ | | 50 | 10,600 |
| 08-00770-05251 | | | 5° | 3 | 0.85 | | | | 3°23′ | | 50 | 9,600 |
| 08-00770-05252 | | | | 5 | 1.2 | | | | 4°02′ | | 50 | 9,600 |
| 08-00770-05253 | | | | 8 | 1.73 | | | | 4°25′ | | 50 | 10,600 |
| 08-00770-05254 | | | | 10 | 2.08 | | | | 4°32′ | | 50 | 10,600 |
| 08-00770-05311 | | R0.1 | 1° | 3 | 0.57 | | | | 0°41′ | | 50 | 8,900 |
| 08-00770-05312 | | | | 5 | 0.64 | | | | 0°49′ | | 50 | 9,300 |
| 08-00770-05313 | | | | 8 | 0.75 | | | | 0°53′ | | 50 | 9,600 |
| 08-00770-05314 | | | | 10 | 0.82 | | | | 0°55′ | | 50 | 10,600 |
| 08-00770-05315 | | | | 12 | 0.89 | | | | 0°55′ | | 50 | 10,600 |
| 08-00770-05331 | | | 3° | 3 | 0.71 | | | | 2°04′ | | 50 | 9,600 |
| 08-00770-05332 | | | | 5 | 0.92 | | | | 2°27′ | | 50 | 9,600 |
| 08-00770-05333 | | | | 8 | 1.24 | | | | 2°40′ | | 50 | 10,600 |
| 08-00770-05334 | | | | 10 | 1.45 | | | | 2°44′ | | 50 | 10,600 |
| 08-00770-05335 | | | | 12 | 1.66 | | | | 2°46′ | | 50 | 10,600 |
| 08-00770-05351 | | | 5° | 3 | 0.85 | | | | 3°27′ | | 50 | 9,600 |
| 08-00770-05352 | | | | 5 | 1.2 | | | | 4°05′ | | 50 | 9,600 |
| 08-00770-05353 | | | | 8 | 1.73 | | | | 4°26′ | | 50 | 10,600 |
| 08-00770-05354 | | | | 10 | 2.08 | | | | 4°33′ | | 50 | 10,600 |
| 08-00770-08211 | 0.8 | R0.05 | 1° | 5 | 0.92 | 0.65 | 1.6 | 12° | 0°41′ | 4 | 50 | 9,200 |
| 08-00770-08212 | | | | 8 | 1.03 | | | | 0°48′ | | 50 | 9,600 |
| 08-00770-08231 | | | 3° | 5 | 1.16 | | | | 2°04′ | | 50 | 10,000 |
| 08-00770-08232 | | | | 8 | 1.48 | | | | 2°25′ | | 50 | 10,400 |
| 08-00770-08311 | | R0.1 | 1° | 5 | 0.92 | | | | 0°42′ | | 50 | 9,200 |
| 08-00770-08312 | | | | 8 | 1.03 | | | | 0°49′ | | 50 | 9,600 |
| 08-00770-08331 | | | 3° | 5 | 1.16 | | | | 2°05′ | | 50 | 10,000 |
| 08-00770-08332 | | | | 8 | 1.48 | | | | 2°26′ | | 50 | 10,400 |
| 08-00770-08411 | | R0.2 | 1° | 5 | 0.92 | | | | 0°43′ | | 50 | 9,200 |
| 08-00770-08412 | | | | 8 | 1.03 | | | | 0°49′ | | 50 | 9,600 |
| 08-00770-08431 | | | 3° | 5 | 1.16 | | | | 2°07′ | | 50 | 10,000 |
| 08-00770-08432 | | | | 8 | 1.48 | | | | 2°28′ | | 50 | 10,400 |
| 08-00770-10211 | 1 | R0.05 | 1° | 6 | 1.14 | 0.8 | 2 | 12° | 0°40′ | 4 | 50 | 8,000 |
| 08-00770-10212 | | | | 10 | 1.28 | | | | 0°48′ | | 60 | 8,000 |
| 08-00770-10213 | | | | 15 | 1.46 | | | | 0°52′ | | 60 | 8,400 |
| 08-00770-10214 | | | | 20 | 1.63 | | | | 0°54′ | | 60 | 9,500 |

# MSTNR230

## 無限コーティング ロングテーパーネックラジアスエンドミル
MUGEN-COATING 2-Flute Long Taper Neck Radius End Mill




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

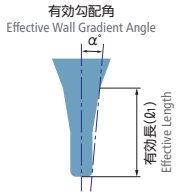
| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (α)有効勾配角 Effective Wall Gradient Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00770-10215 | 1 | R0.05 | 1° | 25 | 1.81 | 0.8 | 2 | 12° | 0°55′ | 4 | 70 | 11,200 |
| 08-00770-10216 | | | | 30 | 1.98 | | | | 0°56′ | | 80 | 11,600 |
| 08-00770-10217 | | | | 35 | 2.16 | | | | 0°56′ | | 80 | 13,800 |
| 08-00770-10231 | | | 3° | 6 | 1.42 | | | | 2°01′ | | 50 | 8,000 |
| 08-00770-10232 | | | | 10 | 1.84 | | | | 2°25′ | | 60 | 8,000 |
| 08-00770-10311 | | R0.1 | 1° | 6 | 1.14 | | | | 0°41′ | | 50 | 8,000 |
| 08-00770-10312 | | | | 10 | 1.28 | | | | 0°49′ | | 60 | 8,000 |
| 08-00770-10313 | | | | 15 | 1.46 | | | | 0°52′ | | 60 | 8,400 |
| 08-00770-10314 | | | | 20 | 1.63 | | | | 0°54′ | | 60 | 9,500 |
| 08-00770-10315 | | | | 25 | 1.81 | | | | 0°55′ | | 70 | 11,200 |
| 08-00770-10316 | | | | 30 | 1.98 | | | | 0°56′ | | 80 | 11,600 |
| 08-00770-10317 | | | | 35 | 2.16 | | | | 0°57′ | | 80 | 13,800 |
| 08-00770-10331 | | | 3° | 6 | 1.42 | | | | 2°02′ | | 50 | 8,000 |
| 08-00770-10332 | | | | 10 | 1.84 | | | | 2°26′ | | 60 | 8,000 |
| 08-00770-10411 | | R0.2 | 1° | 6 | 1.14 | | | | 0°41′ | | 50 | 8,000 |
| 08-00770-10412 | | | | 10 | 1.28 | | | | 0°49′ | | 60 | 8,000 |
| 08-00770-10413 | | | | 15 | 1.46 | | | | 0°53′ | | 60 | 8,400 |
| 08-00770-10414 | | | | 20 | 1.63 | | | | 0°55′ | | 60 | 9,500 |
| 08-00770-10415 | | | | 25 | 1.81 | | | | 0°56′ | | 70 | 11,200 |
| 08-00770-10416 | | | | 30 | 1.98 | | | | 0°56′ | | 80 | 11,600 |
| 08-00770-10417 | | | | 35 | 2.16 | | | | 0°57′ | | 80 | 13,800 |
| 08-00770-10431 | | | 3° | 6 | 1.42 | | | | 2°04′ | | 50 | 8,000 |
| 08-00770-10432 | | | | 10 | 1.84 | | | | 2°27′ | | 60 | 8,000 |
| 08-00770-10511 | | R0.3 | 1° | 6 | 1.14 | | | | 0°42′ | | 50 | 8,000 |
| 08-00770-10512 | | | | 10 | 1.28 | | | | 0°49′ | | 60 | 8,000 |
| 08-00770-10513 | | | | 15 | 1.46 | | | | 0°53′ | | 60 | 8,400 |
| 08-00770-10514 | | | | 20 | 1.63 | | | | 0°55′ | | 60 | 9,500 |
| 08-00770-10515 | | | | 25 | 1.81 | | | | 0°56′ | | 70 | 11,200 |
| 08-00770-10516 | | | | 30 | 1.98 | | | | 0°56′ | | 80 | 11,600 |
| 08-00770-10517 | | | | 35 | 2.16 | | | | 0°57′ | | 80 | 13,800 |
| 08-00770-10531 | | | 3° | 6 | 1.42 | | | | 2°06′ | | 50 | 8,000 |
| 08-00770-10532 | | | | 10 | 1.84 | | | | 2°29′ | | 60 | 8,000 |
| 08-00770-15311 | 1.5 | R0.1 | 1° | 10 | 1.75 | 1.2 | 3 | 12° | 0°43′ | 4 | 60 | 8,600 |
| 08-00770-15312 | | | | 15 | 1.92 | | | | 0°49′ | | 60 | 9,400 |
| 08-00770-15313 | | | | 20 | 2.1 | | | | 0°51′ | | 60 | 10,300 |
| 08-00770-15314 | | | | 25 | 2.27 | | | | 0°53′ | | 70 | 10,800 |
| 08-00770-15315 | | | | 30 | 2.45 | | | | 0°54′ | | 80 | 13,000 |
| 08-00770-15331 | | | 3° | 10 | 2.24 | | | | 2°07′ | | 60 | 8,600 |
| 08-00770-15332 | | | | 15 | 2.76 | | | | 2°25′ | | 60 | 9,400 |

**オーダー方法** MSTNR230 刃径(D)×コーナー半径(R)×首角(θ)×有効長(ℓ1)を指示してください。 ※(γ)は参考値です。
When you order, indicate MSTNR230 (D)×(R)×(θ)×(ℓ1). ※(γ) is reference value.

●切削条件表はF-045に記載
●Recommended Milling Conditions are shown on page F-045.



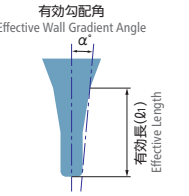
ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.




| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (α)有効勾配角 Effective Wall Gradient Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00770-15411 | 1.5 | R0.2 | 1° | 10 | 1.75 | 1.2 | 3 | 12° | 0°43′ | 4 | 60 | 8,600 |
| 08-00770-15412 | | | | 15 | 1.92 | | | | 0°49′ | | 60 | 9,400 |
| 08-00770-15413 | | | | 20 | 2.1 | | | | 0°52′ | | 60 | 10,300 |
| 08-00770-15414 | | | | 25 | 2.27 | | | | 0°53′ | | 70 | 10,800 |
| 08-00770-15415 | | | | 30 | 2.45 | | | | 0°55′ | | 80 | 13,000 |
| 08-00770-15431 | | | 3° | 10 | 2.24 | | | | 2°08′ | | 60 | 8,600 |
| 08-00770-15432 | | | | 15 | 2.76 | | | | 2°26′ | | 60 | 9,400 |
| 08-00770-15511 | | R0.3 | 1° | 10 | 1.75 | | | | 0°43′ | | 60 | 8,600 |
| 08-00770-15512 | | | | 15 | 1.92 | | | | 0°49′ | | 60 | 9,400 |
| 08-00770-15513 | | | | 20 | 2.1 | | | | 0°52′ | | 60 | 10,300 |
| 08-00770-15514 | | | | 25 | 2.27 | | | | 0°53′ | | 70 | 10,800 |
| 08-00770-15515 | | | | 30 | 2.45 | | | | 0°55′ | | 80 | 13,000 |
| 08-00770-15531 | | | 3° | 10 | 2.24 | | | | 2°10′ | | 60 | 8,600 |
| 08-00770-15532 | | | | 15 | 2.76 | | | | 2°27′ | | 60 | 9,400 |
| 08-00770-20311 | 2 | R0.1 | 1° | 15 | 2.39 | 1.6 | 4 | 12° | 0°44′ | 4 | 60 | 8,600 |
| 08-00770-20312 | | | | 20 | 2.56 | | | | 0°48′ | | 60 | 8,600 |
| 08-00770-20313 | | | | 25 | 2.74 | | | | 0°50′ | | 70 | 10,200 |
| 08-00770-20314 | | | | 30 | 2.91 | | | | 0°52′ | | 80 | 11,500 |
| 08-00770-20315 | | | | 40 | 3.26 | | | | 0°54′ | | 80 | 15,400 |
| 08-00770-20316 | | | | 50 | 3.61 | | | | 0°55′ | | 100 | 17,100 |
| 08-00770-20331 | | | 3° | 15 | 3.16 | | | | 2°13′ | | 60 | 8,600 |
| 08-00770-20332 | | | | 20 | 3.68 | | | | 2°25′ | | 60 | 8,600 |
| 08-00770-20411 | | R0.2 | 1° | 15 | 2.39 | | | | 0°44′ | | 60 | 8,600 |
| 08-00770-20412 | | | | 20 | 2.56 | | | | 0°49′ | | 60 | 8,600 |
| 08-00770-20413 | | | | 25 | 2.74 | | | | 0°51′ | | 70 | 10,200 |
| 08-00770-20414 | | | | 30 | 2.91 | | | | 0°52′ | | 80 | 11,500 |
| 08-00770-20415 | | | | 40 | 3.26 | | | | 0°54′ | | 80 | 15,400 |
| 08-00770-20416 | | | | 50 | 3.61 | | | | 0°55′ | | 100 | 17,100 |
| 08-00770-20431 | | | 3° | 15 | 3.16 | | | | 2°14′ | | 60 | 8,600 |
| 08-00770-20432 | | | | 20 | 3.68 | | | | 2°25′ | | 60 | 8,600 |
| 08-00770-20511 | | R0.3 | 1° | 15 | 2.39 | | | | 0°45′ | | 60 | 8,600 |
| 08-00770-20512 | | | | 20 | 2.56 | | | | 0°49′ | | 60 | 8,600 |
| 08-00770-20513 | | | | 25 | 2.74 | | | | 0°51′ | | 70 | 10,200 |
| 08-00770-20514 | | | | 30 | 2.91 | | | | 0°53′ | | 80 | 11,500 |
| 08-00770-20515 | | | | 40 | 3.26 | | | | 0°55′ | | 80 | 15,400 |
| 08-00770-20516 | | | | 50 | 3.61 | | | | 0°56′ | | 100 | 17,100 |
| 08-00770-20531 | | | 3° | 15 | 3.16 | | | | 2°15′ | | 60 | 8,600 |
| 08-00770-20532 | | | | 20 | 3.68 | | | | 2°26′ | | 60 | 8,600 |

# MSTNR230

## 無限コーティング ロングテーパーネックラジアスエンドミル
MUGEN-COATING 2-Flute Long Taper Neck Radius End Mill




単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (R)コーナー半径 Corner Radius | (θ)首角 Neck Taper Angle | (ℓ1)有効長 Effective Length | (d1)首元径 Neck Dia. | (ℓ)刃長 Length of Cut | (ℓ2)首下長 Under Neck Taper Length | (γ)首角2 Neck Taper Angle 2 | (α)有効勾配角 Effective Wall Gradient Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08-00770-20611 | 2 | R0.5 | 1° | 15 | 2.39 | 1.6 | 4 | 12° | 0° 46′ | 4 | 60 | 8,600 |
| 08-00770-20612 | | | | 20 | 2.56 | | | | 0° 49′ | | 60 | 8,600 |
| 08-00770-20613 | | | | 25 | 2.74 | | | | 0° 52′ | | 70 | 10,200 |
| 08-00770-20614 | | | | 30 | 2.91 | | | | 0° 53′ | | 80 | 11,500 |
| 08-00770-20615 | | | | 40 | 3.26 | | | | 0° 55′ | | 80 | 15,400 |
| 08-00770-20616 | | | | 50 | 3.61 | | | | 0° 56′ | | 100 | 17,100 |
| 08-00770-20631 | | | 3° | 15 | 3.16 | | | | 2° 17′ | | 60 | 8,600 |
| 08-00770-20632 | | | | 20 | 3.68 | | | | 2° 28′ | | 60 | 8,600 |
| 08-00770-30411 | 3 | R0.2 | 1° | 15 | 3.32 | 2.5 | 6 | 12° | 0° 37′ | 6 | 60 | 12,800 |
| 08-00770-30412 | | | | 20 | 3.49 | | | | 0° 43′ | | 60 | 12,800 |
| 08-00770-30413 | | | | 30 | 3.84 | | | | 0° 49′ | | 80 | 12,800 |
| 08-00770-30414 | | | | 40 | 4.19 | | | | 0° 51′ | | 80 | 13,800 |
| 08-00770-30415 | | | | 50 | 4.54 | | | | 0° 53′ | | 100 | 16,000 |
| 08-00770-30416 | | | | 60 | 4.89 | | | | 0° 54′ | | 110 | 17,100 |
| 08-00770-30611 | | R0.5 | 1° | 15 | 3.32 | | | | 0° 37′ | | 60 | 12,800 |
| 08-00770-30612 | | | | 20 | 3.49 | | | | 0° 43′ | | 60 | 12,800 |
| 08-00770-30613 | | | | 30 | 3.84 | | | | 0° 49′ | | 80 | 12,800 |
| 08-00770-30614 | | | | 40 | 4.19 | | | | 0° 52′ | | 80 | 13,800 |
| 08-00770-30615 | | | | 50 | 4.54 | | | | 0° 53′ | | 100 | 16,000 |
| 08-00770-30616 | | | | 60 | 4.89 | | | | 0° 55′ | | 110 | 17,100 |

**オーダー方法**
MSTNR230 刃径(D)×コーナー半径(R)×首角(θ)×有効長(ℓ1)を指示してください。 ※(γ)は参考値です。
When you order, indicate MSTNR230 (D)×(R)×(θ)×(ℓ1). ※(γ) is reference value.

●切削条件表はF-045に記載
●Recommended Milling Conditions are shown on page F-045.



SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

# MSTNR230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | | | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK55・NAK80・HPM-1 (～43HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・SKD61・STAVAX・HPM-38 (～55HRC) | | | | 銅・アルミニウム合金 Copper・Aluminum Alloy | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | コーナー半径 Corner Radius | 首角 Neck Taper Angle | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | | | min-1 | mm/min | ap mm | ae mm | min-1 | mm/min | ap mm | ae mm | min-1 | mm/min | ap mm | ae mm |
| 0.2 | 0.05 | 1° | 1 | 30,000 | 200 | 0.005 | 0.02 | 30,000 | 150 | 0.005 | 0.02 | 30,000 | 250 | 0.015 | 0.06 |
| | | | 2 | 30,000 | 200 | 0.005 | 0.02 | 30,000 | 150 | 0.005 | 0.02 | 30,000 | 250 | 0.015 | 0.06 |
| | | 3° | 1 | 30,000 | 300 | 0.005 | 0.03 | 30,000 | 200 | 0.005 | 0.02 | 30,000 | 360 | 0.02 | 0.06 |
| | | | 2 | 30,000 | 300 | 0.005 | 0.03 | 30,000 | 200 | 0.005 | 0.02 | 30,000 | 360 | 0.02 | 0.06 |
| | | 5° | 1 | 30,000 | 350 | 0.01 | 0.03 | 30,000 | 250 | 0.01 | 0.03 | 30,000 | 420 | 0.04 | 0.06 |
| | | | 2 | 30,000 | 350 | 0.01 | 0.03 | 30,000 | 250 | 0.01 | 0.03 | 30,000 | 420 | 0.04 | 0.06 |
| 0.3 | 0.05 | 1° | 2 | 30,000 | 200 | 0.007 | 0.03 | 30,000 | 150 | 0.005 | 0.03 | 30,000 | 250 | 0.02 | 0.06 |
| | | | 3 | 30,000 | 200 | 0.007 | 0.03 | 30,000 | 150 | 0.005 | 0.03 | 30,000 | 250 | 0.02 | 0.06 |
| | | 3° | 2 | 30,000 | 300 | 0.01 | 0.05 | 30,000 | 200 | 0.01 | 0.03 | 30,000 | 360 | 0.03 | 0.15 |
| | | | 3 | 30,000 | 300 | 0.01 | 0.05 | 30,000 | 200 | 0.01 | 0.03 | 30,000 | 360 | 0.03 | 0.15 |
| | | 5° | 2 | 30,000 | 350 | 0.02 | 0.06 | 30,000 | 250 | 0.02 | 0.05 | 30,000 | 420 | 0.06 | 0.15 |
| | | | 3 | 30,000 | 350 | 0.02 | 0.06 | 30,000 | 250 | 0.02 | 0.05 | 30,000 | 420 | 0.06 | 0.15 |
| 0.4 | 0.05<br>0.1 | 1° | 3 | 30,000 | 300 | 0.015 | 0.05 | 30,000 | 200 | 0.01 | 0.04 | 30,000 | 360 | 0.03 | 0.15 |
| | | | 4 | 30,000 | 300 | 0.015 | 0.05 | 30,000 | 200 | 0.01 | 0.04 | 30,000 | 360 | 0.03 | 0.15 |
| | | 3° | 3 | 30,000 | 350 | 0.02 | 0.06 | 30,000 | 250 | 0.02 | 0.05 | 30,000 | 420 | 0.06 | 0.15 |
| | | | 4 | 30,000 | 350 | 0.02 | 0.06 | 30,000 | 250 | 0.02 | 0.05 | 30,000 | 420 | 0.06 | 0.15 |
| | | 5° | 3 | 30,000 | 450 | 0.03 | 0.07 | 30,000 | 300 | 0.03 | 0.06 | 30,000 | 540 | 0.09 | 0.15 |
| | | | 4 | 30,000 | 450 | 0.03 | 0.07 | 30,000 | 300 | 0.03 | 0.06 | 30,000 | 540 | 0.09 | 0.15 |
| 0.5 | 0.05<br>0.1 | 1° | 3 | 30,000 | 500 | 0.02 | 0.1 | 30,000 | 350 | 0.02 | 0.1 | 30,000 | 600 | 0.06 | 0.24 |
| | | | 5 | 30,000 | 500 | 0.015 | 0.1 | 30,000 | 350 | 0.015 | 0.1 | 30,000 | 600 | 0.045 | 0.24 |
| | | | 8 | 30,000 | 500 | 0.01 | 0.08 | 30,000 | 350 | 0.01 | 0.05 | 30,000 | 600 | 0.03 | 0.24 |
| | | | 10 | 24,000 | 400 | 0.007 | 0.06 | 24,000 | 250 | 0.007 | 0.04 | 24,000 | 480 | 0.02 | 0.18 |
| | | | 12 | 24,000 | 300 | 0.005 | 0.05 | 24,000 | 150 | 0.005 | 0.03 | 24,000 | 360 | 0.015 | 0.15 |
| | | 3° | 3 | 30,000 | 600 | 0.03 | 0.1 | 30,000 | 400 | 0.03 | 0.1 | 30,000 | 700 | 0.09 | 0.25 |
| | | | 5 | 30,000 | 600 | 0.02 | 0.1 | 30,000 | 400 | 0.02 | 0.1 | 30,000 | 700 | 0.06 | 0.25 |
| | | | 8 | 30,000 | 600 | 0.02 | 0.08 | 30,000 | 400 | 0.02 | 0.05 | 30,000 | 700 | 0.06 | 0.24 |
| | | | 10 | 24,000 | 500 | 0.015 | 0.08 | 24,000 | 350 | 0.01 | 0.05 | 24,000 | 600 | 0.03 | 0.24 |
| | | | 12 | 24,000 | 350 | 0.015 | 0.05 | 24,000 | 200 | 0.01 | 0.03 | 24,000 | 420 | 0.03 | 0.15 |
| | | 5° | 3 | 30,000 | 750 | 0.05 | 0.15 | 30,000 | 500 | 0.05 | 0.1 | 30,000 | 900 | 0.15 | 0.25 |
| | | | 5 | 30,000 | 750 | 0.03 | 0.15 | 30,000 | 500 | 0.03 | 0.1 | 30,000 | 900 | 0.09 | 0.25 |
| | | | 8 | 24,000 | 750 | 0.03 | 0.11 | 24,000 | 500 | 0.03 | 0.08 | 24,000 | 900 | 0.09 | 0.25 |
| | | | 10 | 24,000 | 600 | 0.02 | 0.08 | 24,000 | 400 | 0.02 | 0.06 | 24,000 | 720 | 0.06 | 0.25 |
| 0.8 | 0.05<br>0.1<br>0.2 | 1° | 5 | 26,000 | 1,000 | 0.06 | 0.2 | 21,000 | 700 | 0.06 | 0.1 | 26,000 | 1,200 | 0.18 | 0.3 |
| | | | 8 | 24,000 | 800 | 0.04 | 0.2 | 19,000 | 560 | 0.04 | 0.1 | 24,000 | 950 | 0.12 | 0.3 |
| | | 3° | 5 | 26,000 | 1,200 | 0.08 | 0.3 | 21,000 | 840 | 0.08 | 0.3 | 26,000 | 1,400 | 0.24 | 0.35 |
| | | | 8 | 24,000 | 1,000 | 0.06 | 0.3 | 19,000 | 700 | 0.06 | 0.3 | 24,000 | 1,200 | 0.18 | 0.35 |

# MSTNR230

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | | | 炭素鋼・調質鋼 Carbon Steels・Prehardened Steels S50C・NAK55・NAK80・HPM-1 (～43HRC) | | | | 焼き入れ鋼 Hardened Steels SKD11・SKD61・STAVAX・HPM-38 (～55HRC) | | | | 銅・アルミニウム合金 Copper・Aluminum Alloy | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 刃径 Dia. | コーナー半径 Corner Radius | 首角 Neck Taper Angle | 有効長 Effective Length | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | |
| | | | | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | ae mm |
| 1 | 0.05 0.1 0.2 0.3 | 1° | 6 | 22,000 | 1,300 | 0.08 | 0.35 | 17,000 | 900 | 0.06 | 0.35 | 22,000 | 1,500 | 0.24 | 0.5 |
| | | | 10 | 18,000 | 1,000 | 0.05 | 0.35 | 14,000 | 700 | 0.05 | 0.35 | 18,000 | 1,200 | 0.15 | 0.5 |
| | | | 15 | 18,000 | 850 | 0.03 | 0.2 | 14,000 | 600 | 0.03 | 0.13 | 18,000 | 1,000 | 0.09 | 0.5 |
| | | | 20 | 14,000 | 700 | 0.025 | 0.1 | 11,000 | 500 | 0.025 | 0.06 | 14,000 | 850 | 0.075 | 0.3 |
| | | | 25 | 14,000 | 600 | 0.02 | 0.05 | 11,000 | 400 | 0.02 | 0.03 | 14,000 | 700 | 0.06 | 0.15 |
| | | | 30 | 10,000 | 480 | 0.015 | 0.03 | 8,000 | 300 | 0.015 | 0.02 | 10,000 | 600 | 0.045 | 0.09 |
| | | | 35 | 10,000 | 350 | 0.01 | 0.02 | 8,000 | 250 | 0.01 | 0.01 | 10,000 | 400 | 0.03 | 0.06 |
| | | 3° | 6 | 22,000 | 1,500 | 0.1 | 0.35 | 17,600 | 1,000 | 0.1 | 0.35 | 22,000 | 1,800 | 0.3 | 0.5 |
| | | | 10 | 18,000 | 1,200 | 0.08 | 0.35 | 14,400 | 800 | 0.08 | 0.35 | 18,000 | 1,400 | 0.24 | 0.5 |
| 1.5 | 0.1 0.2 0.3 | 1° | 10 | 16,000 | 1,300 | 0.1 | 0.55 | 12,800 | 900 | 0.1 | 0.55 | 16,000 | 1,500 | 0.3 | 0.6 |
| | | | 15 | 14,000 | 1,000 | 0.07 | 0.55 | 11,200 | 700 | 0.07 | 0.55 | 14,000 | 1,200 | 0.2 | 0.6 |
| | | | 20 | 14,000 | 800 | 0.05 | 0.3 | 11,200 | 550 | 0.05 | 0.2 | 14,000 | 900 | 0.16 | 0.5 |
| | | | 25 | 14,000 | 600 | 0.03 | 0.1 | 11,200 | 400 | 0.03 | 0.06 | 14,000 | 700 | 0.1 | 0.3 |
| | | | 30 | 12,000 | 450 | 0.03 | 0.05 | 9,600 | 300 | 0.03 | 0.03 | 12,000 | 550 | 0.09 | 0.15 |
| | | 3° | 10 | 16,000 | 1,500 | 0.15 | 0.55 | 12,800 | 1,000 | 0.15 | 0.55 | 16,000 | 1,800 | 0.45 | 0.6 |
| | | | 15 | 14,000 | 1,200 | 0.1 | 0.55 | 11,200 | 850 | 0.1 | 0.55 | 14,000 | 1,400 | 0.3 | 0.6 |
| 2 | 0.1 0.2 0.3 0.5 | 1° | 15 | 14,000 | 1,200 | 0.1 | 0.7 | 11,200 | 850 | 0.07 | 0.7 | 14,000 | 1,400 | 0.3 | 0.7 |
| | | | 20 | 12,000 | 1,200 | 0.07 | 0.7 | 9,600 | 850 | 0.07 | 0.7 | 12,000 | 1,400 | 0.2 | 0.7 |
| | | | 25 | 12,000 | 1,000 | 0.05 | 0.5 | 9,600 | 700 | 0.04 | 0.5 | 12,000 | 1,200 | 0.15 | 0.7 |
| | | | 30 | 10,000 | 750 | 0.04 | 0.3 | 8,000 | 500 | 0.03 | 0.3 | 10,000 | 900 | 0.13 | 0.7 |
| | | | 40 | 8,000 | 400 | 0.03 | 0.2 | 6,400 | 300 | 0.02 | 0.2 | 8,000 | 500 | 0.1 | 0.5 |
| | | | 50 | 6,000 | 350 | 0.015 | 0.1 | 4,800 | 250 | 0.01 | 0.1 | 6,000 | 400 | 0.05 | 0.3 |
| | | 3° | 15 | 20,000 | 2,000 | 0.2 | 0.7 | 16,000 | 1,400 | 0.2 | 0.7 | 20,000 | 2,400 | 0.6 | 0.7 |
| | | | 20 | 16,000 | 1,600 | 0.1 | 0.7 | 12,800 | 1,100 | 0.1 | 0.7 | 16,000 | 2,000 | 0.4 | 0.7 |
| 3 | 0.2 0.5 | 1° | 15 | 11,000 | 1,600 | 0.15 | 1.05 | 8,800 | 1,100 | 0.1 | 1.05 | 11,000 | 1,900 | 0.6 | 1.1 |
| | | | 20 | 11,000 | 1,600 | 0.13 | 1.05 | 8,800 | 1,100 | 0.1 | 1.05 | 11,000 | 1,900 | 0.45 | 1.1 |
| | | | 30 | 9,000 | 1,200 | 0.1 | 1.05 | 7,200 | 850 | 0.07 | 1.05 | 9,000 | 1,400 | 0.3 | 1.1 |
| | | | 40 | 9,000 | 1,000 | 0.07 | 0.6 | 7,200 | 700 | 0.05 | 0.6 | 9,000 | 1,200 | 0.21 | 0.9 |
| | | | 50 | 8,000 | 640 | 0.05 | 0.35 | 6,400 | 450 | 0.04 | 0.35 | 8,000 | 750 | 0.15 | 0.8 |
| | | | 60 | 8,000 | 480 | 0.03 | 0.2 | 6,400 | 300 | 0.02 | 0.2 | 8,000 | 550 | 0.1 | 0.7 |

**備考 Notes**

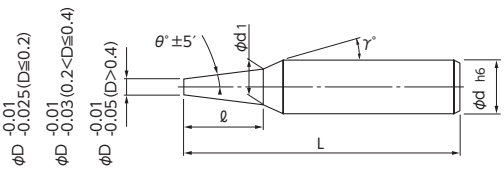
※実際の加工形状および使用機械等にて切削条件を調整してください。
※ビビリが発生する場合は、回転数と送り速度を同じ割合で下げてください。また、主軸回転数が足りない場合も同様に同じ割合で下げてください。
※焼き入れ鋼を切削加工する場合は、オイルミストクーラントをお奨めします。
※深い部分を加工する際は、クーラントの給油および切りくずの排出性に十分注意してください。
※Adjust milling conditions according to machining profile and machine status.
※Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.
※Recommend to use oil mist coolant for machining hardened steels.
※Coolant supply and chip disposal are important for machining deep-rib.



SEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MTE230

## 無限コーティング テーパーエンドミル
MUGEN-COATING 2-Flute Taper End Mill




●無限コーティングの採用で、テーパー加工も長寿命。
●サイズはφ0.2～φ10、片角30′～20°(φ6以下)までシリーズ化。
●MUGEN-COATING realizes long tool life at tapered cutting.
● Available from Dia. 0.2mm to Dia. 10mm and taper angle are from 30′ to 20° (less than dia. 6).

Side | Slot | MG | ∞ | 2 | 30° | ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | | ○ | ○ | ○ | ◎ | ○ |

単位 [寸法：mm / 価格：円]
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 08-00300-00202 | 0.2 | 30′ | 0.8 | 0.21 | 9° | 4 | 45 | 13,000 |
| 08-00300-00204 | | 1° | 0.8 | 0.23 | 9° | 4 | 45 | 13,000 |
| 08-00300-00205 | | 1°30′ | 0.8 | 0.24 | 9° | 4 | 45 | 13,000 |
| 08-00300-00206 | | 2° | 0.8 | 0.26 | 9° | 4 | 45 | 13,000 |
| 08-00300-00208 | | 3° | 0.8 | 0.28 | 9° | 4 | 45 | 13,000 |
| 08-00300-00212 | | 5° | 0.8 | 0.34 | 9° | 4 | 45 | 15,300 |
| 08-00300-00219 | | 10° | 0.8 | 0.48 | 10° | 4 | 45 | 18,300 |
| 08-00300-00302 | 0.3 | 30′ | 1.2 | 0.32 | 9° | 4 | 45 | 10,800 |
| 08-00300-00304 | | 1° | 1.2 | 0.34 | 9° | 4 | 45 | 10,800 |
| 08-00300-00305 | | 1°30′ | 1.2 | 0.36 | 9° | 4 | 45 | 10,800 |
| 08-00300-00306 | | 2° | 1.2 | 0.38 | 9° | 4 | 45 | 10,800 |
| 08-00300-00308 | | 3° | 1.2 | 0.43 | 9° | 4 | 45 | 10,800 |
| 08-00300-00312 | | 5° | 1.2 | 0.51 | 9° | 4 | 45 | 12,600 |
| 08-00300-00319 | | 10° | 1.2 | 0.72 | 10° | 4 | 45 | 15,300 |
| 08-00300-00402 | 0.4 | 30′ | 1.6 | 0.43 | 9° | 4 | 45 | 13,100 |
| 08-00300-00404 | | 1° | 1.6 | 0.46 | 9° | 4 | 45 | 13,100 |
| 08-00300-00405 | | 1°30′ | 1.6 | 0.48 | 9° | 4 | 45 | 13,100 |
| 08-00300-00406 | | 2° | 1.6 | 0.51 | 9° | 4 | 45 | 13,100 |
| 08-00300-00408 | | 3° | 1.6 | 0.57 | 9° | 4 | 45 | 13,100 |
| 08-00300-00412 | | 5° | 1.6 | 0.68 | 9° | 4 | 45 | 15,300 |
| 08-00300-00419 | | 10° | 1.6 | 0.96 | 10° | 4 | 45 | 18,600 |
| 08-00300-00502 | 0.5 | 30′ | 2 | 0.53 | 9° | 4 | 45 | 10,800 |
| 08-00300-00504 | | 1° | 2 | 0.57 | 9° | 4 | 45 | 10,800 |
| 08-00300-00505 | | 1°30′ | 2 | 0.60 | 9° | 4 | 45 | 10,800 |
| 08-00300-00506 | | 2° | 2 | 0.64 | 9° | 4 | 45 | 10,800 |
| 08-00300-00508 | | 3° | 2 | 0.71 | 9° | 4 | 45 | 10,800 |
| 08-00300-00510 | | 4° | 2 | 0.78 | 9° | 4 | 45 | 11,700 |
| 08-00300-00512 | | 5° | 2 | 0.85 | 9° | 4 | 45 | 12,600 |
| 08-00300-00514 | | 6° | 2 | 0.92 | 9° | 4 | 45 | 13,500 |
| 08-00300-00516 | | 7° | 2 | 0.99 | 9° | 4 | 45 | 14,400 |
| 08-00300-00519 | | 10° | 2 | 1.21 | 10° | 4 | 45 | 15,300 |
| 08-00300-00524 | | 15° | 2 | 1.57 | 15° | 4 | 45 | 16,400 |
| 08-00300-00525 | | 20° | 2 | 1.96 | 15° | 4 | 45 | 18,000 |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 08-00300-00602 | 0.6 | 30′ | 2 | 0.63 | 9° | 4 | 45 | 10,100 |
| 08-00300-00604 | | 1° | 2 | 0.67 | 9° | 4 | 45 | 10,100 |
| 08-00300-00605 | | 1°30′ | 2 | 0.70 | 9° | 4 | 45 | 10,100 |
| 08-00300-00606 | | 2° | 2 | 0.74 | 9° | 4 | 45 | 10,100 |
| 08-00300-00608 | | 3° | 2 | 0.81 | 9° | 4 | 45 | 10,100 |
| 08-00300-00610 | | 4° | 2 | 0.88 | 9° | 4 | 45 | 11,000 |
| 08-00300-00612 | | 5° | 2 | 0.95 | 9° | 4 | 45 | 11,900 |
| 08-00300-00614 | | 6° | 2 | 1.02 | 9° | 4 | 45 | 12,800 |
| 08-00300-00616 | | 7° | 2 | 1.09 | 9° | 4 | 45 | 13,700 |
| 08-00300-00619 | | 10° | 2 | 1.31 | 10° | 4 | 45 | 14,600 |
| 08-00300-00624 | | 15° | 2 | 1.67 | 15° | 4 | 45 | 15,500 |
| 08-00300-00625 | | 20° | 2 | 2.06 | 15° | 4 | 45 | 16,400 |
| 08-00300-00702 | 0.7 | 30′ | 2 | 0.73 | 9° | 4 | 45 | 12,300 |
| 08-00300-00704 | | 1° | 2 | 0.77 | 9° | 4 | 45 | 12,300 |
| 08-00300-00705 | | 1°30′ | 2 | 0.80 | 9° | 4 | 45 | 12,300 |
| 08-00300-00706 | | 2° | 2 | 0.84 | 9° | 4 | 45 | 12,300 |
| 08-00300-00708 | | 3° | 2 | 0.91 | 9° | 4 | 45 | 12,300 |
| 08-00300-00710 | | 4° | 2 | 0.98 | 9° | 4 | 45 | 13,400 |
| 08-00300-00712 | | 5° | 2 | 1.05 | 9° | 4 | 45 | 14,500 |
| 08-00300-00714 | | 6° | 2 | 1.12 | 9° | 4 | 45 | 15,600 |
| 08-00300-00716 | | 7° | 2 | 1.19 | 9° | 4 | 45 | 16,700 |
| 08-00300-00719 | | 10° | 2 | 1.41 | 10° | 4 | 45 | 17,800 |
| 08-00300-00724 | | 15° | 2 | 1.77 | 15° | 4 | 45 | 18,900 |
| 08-00300-00725 | | 20° | 2 | 2.16 | 15° | 4 | 45 | 20,000 |
| 08-00300-00802 | 0.8 | 30′ | 3 | 0.85 | 9° | 4 | 45 | 10,100 |
| 08-00300-00804 | | 1° | 3 | 0.90 | 9° | 4 | 45 | 10,100 |
| 08-00300-00805 | | 1°30′ | 3 | 0.96 | 9° | 4 | 45 | 10,100 |
| 08-00300-00806 | | 2° | 3 | 1.01 | 9° | 4 | 45 | 10,100 |
| 08-00300-00808 | | 3° | 3 | 1.11 | 9° | 4 | 45 | 10,100 |
| 08-00300-00810 | | 4° | 3 | 1.21 | 9° | 4 | 45 | 11,000 |
| 08-00300-00812 | | 5° | 3 | 1.32 | 9° | 4 | 45 | 11,900 |
| 08-00300-00814 | | 6° | 3 | 1.43 | 9° | 4 | 45 | 12,800 |
| 08-00300-00816 | | 7° | 3 | 1.54 | 9° | 4 | 45 | 13,700 |
| 08-00300-00819 | | 10° | 3 | 1.86 | 10° | 4 | 45 | 14,600 |
| 08-00300-00824 | | 15° | 3 | 2.41 | 15° | 4 | 45 | 15,500 |
| 08-00300-00825 | | 20° | 3 | 2.98 | 20° | 4 | 45 | 16,400 |

**オーダー方法** MTE230 先端径(D)×片角(θ)を指示してください。
When you order, indicate MTE230 (D)×(θ).

※(d1)及び(γ)は参考値です。
※(d1) and (γ) is reference value.

●切削条件表はG-004に記載
●Recommended Milling Conditions are shown on page G-004.

ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MTE230

## 無限コーティング テーパーエンドミル
MUGEN-COATING 2-Flute Taper End Mill

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 08-00300-00902 | 0.9 | 30′ | 3 | 0.95 | 9° | 4 | 45 | 12,300 |
| 08-00300-00904 | | 1° | 3 | 1.00 | 9° | 4 | 45 | 12,300 |
| 08-00300-00905 | | 1°30′ | 3 | 1.06 | 9° | 4 | 45 | 12,300 |
| 08-00300-00906 | | 2° | 3 | 1.11 | 9° | 4 | 45 | 12,300 |
| 08-00300-00908 | | 3° | 3 | 1.21 | 9° | 4 | 45 | 12,300 |
| 08-00300-00910 | | 4° | 3 | 1.32 | 9° | 4 | 45 | 13,400 |
| 08-00300-00912 | | 5° | 3 | 1.42 | 9° | 4 | 45 | 14,500 |
| 08-00300-00914 | | 6° | 3 | 1.53 | 9° | 4 | 45 | 15,600 |
| 08-00300-00916 | | 7° | 3 | 1.64 | 9° | 4 | 45 | 16,700 |
| 08-00300-00919 | | 10° | 3 | 1.96 | 10° | 4 | 45 | 17,800 |
| 08-00300-00924 | | 15° | 3 | 2.51 | 15° | 4 | 45 | 18,900 |
| 08-00300-00925 | | 20° | 3 | 3.08 | 20° | 4 | 45 | 20,000 |
| 08-00300-01002 | 1 | 30′ | 4 | 1.07 | 9° | 4 | 45 | 7,900 |
| 08-00300-01004 | | 1° | 4 | 1.14 | 9° | 4 | 45 | 7,900 |
| 08-00300-01005 | | 1°30′ | 4 | 1.21 | 9° | 4 | 45 | 7,900 |
| 08-00300-01006 | | 2° | 4 | 1.28 | 9° | 4 | 45 | 7,900 |
| 08-00300-01008 | | 3° | 4 | 1.42 | 9° | 4 | 45 | 8,100 |
| 08-00300-01010 | | 4° | 4 | 1.56 | 9° | 4 | 45 | 9,800 |
| 08-00300-01012 | | 5° | 4 | 1.70 | 9° | 4 | 45 | 9,800 |
| 08-00300-01014 | | 6° | 4 | 1.84 | 9° | 4 | 45 | 11,500 |
| 08-00300-01016 | | 7° | 4 | 1.98 | 9° | 4 | 45 | 13,100 |
| 08-00300-01019 | | 10° | 4 | 2.41 | 10° | 4 | 45 | 14,000 |
| 08-00300-01024 | | 15° | 4 | 3.14 | 15° | 6 | 50 | 15,600 |
| 08-00300-01025 | | 20° | 4 | 3.91 | 15° | 6 | 50 | 17,200 |
| 08-00300-01502 | 1.5 | 30′ | 5 | 1.59 | 9° | 4 | 45 | 7,900 |
| 08-00300-01504 | | 1° | 5 | 1.67 | 9° | 4 | 45 | 7,900 |
| 08-00300-01505 | | 1°30′ | 5 | 1.76 | 9° | 4 | 45 | 7,900 |
| 08-00300-01506 | | 2° | 5 | 1.85 | 9° | 4 | 45 | 7,900 |
| 08-00300-01508 | | 3° | 5 | 2.02 | 9° | 4 | 45 | 8,100 |
| 08-00300-01510 | | 4° | 5 | 2.20 | 9° | 4 | 45 | 9,800 |
| 08-00300-01512 | | 5° | 5 | 2.37 | 9° | 4 | 45 | 9,800 |
| 08-00300-01514 | | 6° | 5 | 2.55 | 9° | 4 | 45 | 11,500 |
| 08-00300-01516 | | 7° | 5 | 2.73 | 9° | 4 | 45 | 13,100 |
| 08-00300-01519 | | 10° | 5 | 3.26 | 10° | 4 | 45 | 14,000 |
| 08-00300-01524 | | 15° | 5 | 4.18 | 15° | 6 | 50 | 15,600 |
| 08-00300-01525 | | 20° | 5 | 5.14 | 20° | 6 | 50 | 17,200 |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 08-00300-02002 | 2 | 30′ | 6 | 2.10 | 9° | 4 | 45 | 7,900 |
| 08-00300-02004 | | 1° | 6 | 2.21 | 9° | 4 | 45 | 7,900 |
| 08-00300-02005 | | 1°30′ | 6 | 2.31 | 9° | 4 | 45 | 7,900 |
| 08-00300-02006 | | 2° | 6 | 2.41 | 9° | 4 | 45 | 7,900 |
| 08-00300-02008 | | 3° | 6 | 2.62 | 9° | 4 | 45 | 8,100 |
| 08-00300-02010 | | 4° | 6 | 2.84 | 9° | 4 | 45 | 8,400 |
| 08-00300-02012 | | 5° | 6 | 3.05 | 9° | 4 | 45 | 9,800 |
| 08-00300-02014 | | 6° | 6 | 3.26 | 9° | 4 | 45 | 11,500 |
| 08-00300-02016 | | 7° | 6 | 3.47 | 7° | 4 | 45 | 13,100 |
| 08-00300-02019 | | 10° | 6 | 4.11 | 10° | 6 | 50 | 15,600 |
| 08-00300-02024 | | 15° | 6 | 5.22 | 15° | 6 | 50 | 17,200 |
| 08-00300-02025 | | 20° | 6 | 6.37 | – | 6 | 50 | 20,800 |
| 08-00300-02502 | 2.5 | 30′ | 8 | 2.64 | 9° | 4 | 45 | 9,600 |
| 08-00300-02504 | | 1° | 8 | 2.78 | 9° | 4 | 45 | 9,600 |
| 08-00300-02505 | | 1°30′ | 8 | 2.91 | 9° | 4 | 45 | 9,600 |
| 08-00300-02506 | | 2° | 8 | 3.05 | 9° | 4 | 45 | 9,600 |
| 08-00300-02508 | | 3° | 8 | 3.33 | 9° | 4 | 45 | 9,900 |
| 08-00300-02510 | | 4° | 8 | 3.62 | 4° | 4 | 45 | 10,200 |
| 08-00300-02512 | | 5° | 8 | 3.90 | 5° | 4 | 45 | 11,900 |
| 08-00300-02514 | | 6° | 8 | 4.18 | – | 4 | 50 | 12,000 |
| 08-00300-02516 | | 7° | 8 | 4.46 | – | 4 | 50 | 14,000 |
| 08-00300-02519 | | 10° | 8 | 5.32 | 10° | 6 | 50 | 21,000 |
| 08-00300-02524 | | 15° | 8 | 6.79 | – | 6 | 50 | 25,300 |
| 08-00300-02525 | | 20° | 8 | 8.32 | – | 8 | 60 | 29,700 |
| 08-00300-03002 | 3 | 30′ | 10 | 3.17 | 9° | 6 | 50 | 8,300 |
| 08-00300-03004 | | 1° | 10 | 3.35 | 9° | 6 | 50 | 8,300 |
| 08-00300-03005 | | 1°30′ | 10 | 3.52 | 9° | 6 | 50 | 8,300 |
| 08-00300-03006 | | 2° | 10 | 3.69 | 9° | 6 | 50 | 8,300 |
| 08-00300-03008 | | 3° | 10 | 4.05 | 9° | 6 | 50 | 8,500 |
| 08-00300-03010 | | 4° | 10 | 4.40 | 9° | 6 | 50 | 8,700 |
| 08-00300-03012 | | 5° | 10 | 4.75 | 9° | 6 | 50 | 9,300 |
| 08-00300-03014 | | 6° | 10 | 5.10 | 6° | 6 | 50 | 12,300 |
| 08-00300-03016 | | 7° | 10 | 5.46 | 7° | 6 | 50 | 16,400 |
| 08-00300-03019 | | 10° | 10 | 6.53 | – | 6 | 50 | 20,800 |
| 08-00300-03024 | | 15° | 10 | 8.36 | – | 8 | 60 | 24,400 |
| 08-00300-03025 | | 20° | 10 | 10.30 | – | 10 | 70 | 27,100 |

**オーダー方法** MTE230 先端径(D)×片角(θ)を指示してください。
When you order, indicate MTE230 (D)×(θ).

※(d1)及び(γ)は参考値です。
※(d1) and (γ) is reference value.

●切削条件表はG-004に記載
●Recommended Milling Conditions are shown on page G-004.

SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 08-00300-04002 | 4 | 30′ | 15 | 4.26 | 9° | 6 | 50 | 8,600 |
| 08-00300-04004 | | 1° | 15 | 4.52 | 9° | 6 | 50 | 8,600 |
| 08-00300-04005 | | 1°30′ | 15 | 4.79 | 9° | 6 | 50 | 8,600 |
| 08-00300-04006 | | 2° | 15 | 5.04 | 9° | 6 | 50 | 8,600 |
| 08-00300-04008 | | 3° | 15 | 5.57 | 9° | 6 | 50 | 9,000 |
| 08-00300-04010 | | 4° | 15 | 6.10 | – | 6 | 55 | 11,400 |
| 08-00300-04012 | | 5° | 15 | 6.62 | – | 6 | 55 | 12,500 |
| 08-00300-04014 | | 6° | 15 | 7.15 | – | 6 | 55 | 14,500 |
| 08-00300-04016 | | 7° | 15 | 7.68 | – | 6 | 55 | 18,100 |
| 08-00300-04019 | | 10° | 15 | 9.29 | – | 8 | 60 | 24,400 |
| 08-00300-04024 | | 15° | 15 | 12.04 | – | 12 | 80 | 33,000 |
| 08-00300-04025 | | 20° | 15 | 14.92 | – | 12 | 80 | 38,500 |
| 08-00300-05002 | 5 | 30′ | 20 | 5.34 | 9° | 6 | 55 | 12,000 |
| 08-00300-05004 | | 1° | 20 | 5.70 | 9° | 6 | 55 | 12,000 |
| 08-00300-05005 | | 1°30′ | 20 | 6.04 | – | 6 | 55 | 14,300 |
| 08-00300-05006 | | 2° | 20 | 6.39 | – | 6 | 55 | 14,300 |
| 08-00300-05008 | | 3° | 20 | 7.10 | – | 6 | 55 | 14,900 |
| 08-00300-05010 | | 4° | 20 | 7.80 | – | 6 | 60 | 16,500 |
| 08-00300-05012 | | 5° | 20 | 8.50 | – | 8 | 60 | 22,000 |
| 08-00300-05014 | | 6° | 20 | 9.20 | – | 8 | 60 | 25,300 |
| 08-00300-05016 | | 7° | 20 | 9.91 | 7° | 10 | 70 | 27,500 |
| 08-00300-05019 | | 10° | 20 | 12.05 | – | 12 | 80 | 33,000 |
| 08-00300-05024 | | 15° | 20 | 15.72 | 15° | 16 | 90 | 44,000 |
| 08-00300-05025 | | 20° | 20 | 19.56 | 20° | 20 | 100 | 49,500 |
| 08-00300-06002 | 6 | 30′ | 20 | 6.35 | – | 6 | 55 | 16,000 |
| 08-00300-06004 | | 1° | 20 | 6.70 | – | 6 | 55 | 16,000 |
| 08-00300-06005 | | 1°30′ | 20 | 7.05 | – | 6 | 55 | 17,100 |
| 08-00300-06006 | | 2° | 20 | 7.40 | – | 6 | 55 | 17,100 |
| 08-00300-06008 | | 3° | 20 | 8.10 | – | 8 | 60 | 17,600 |
| 08-00300-06010 | | 4° | 20 | 8.80 | – | 8 | 65 | 19,300 |
| 08-00300-06012 | | 5° | 20 | 9.50 | – | 8 | 65 | 23,100 |
| 08-00300-06014 | | 6° | 20 | 10.20 | – | 10 | 70 | 27,500 |
| 08-00300-06016 | | 7° | 20 | 10.91 | – | 10 | 70 | 30,800 |
| 08-00300-06019 | | 10° | 20 | 13.05 | – | 12 | 80 | 35,200 |
| 08-00300-06024 | | 15° | 20 | 16.72 | – | 16 | 90 | 46,200 |
| 08-00300-06025 | | 20° | 20 | 20.56 | – | 20 | 100 | 51,700 |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 08-00300-08002 | 8 | 30′ | 25 | 8.44 | – | 8 | 65 | 20,900 |
| 08-00300-08004 | | 1° | 25 | 8.87 | – | 8 | 65 | 20,900 |
| 08-00300-08005 | | 1°30′ | 25 | 9.31 | – | 8 | 65 | 22,600 |
| 08-00300-08006 | | 2° | 25 | 9.74 | – | 8 | 65 | 23,700 |
| 08-00300-08008 | | 3° | 25 | 10.62 | – | 10 | 70 | 27,500 |
| 08-00300-08012 | | 5° | 25 | 12.37 | – | 12 | 90 | 44,000 |
| 08-00300-10002 | 10 | 30′ | 35 | 10.61 | – | 10 | 85 | 33,000 |
| 08-00300-10004 | | 1° | 35 | 11.22 | – | 10 | 85 | 33,000 |
| 08-00300-10005 | | 1°30′ | 35 | 11.83 | – | 10 | 85 | 36,300 |
| 08-00300-10006 | | 2° | 35 | 12.44 | – | 12 | 90 | 40,700 |
| 08-00300-10008 | | 3° | 35 | 13.67 | – | 12 | 90 | 48,400 |
| 08-00300-10012 | | 5° | 35 | 16.12 | – | 16 | 90 | 55,000 |

# MTE230

## 切削条件参考表 Recommended Milling Conditions

[φ0.5～1溝切削 Slotting]

| 被削材 Work Material | | 炭素鋼・合金鋼・調質鋼 Carbon Steels・Alloy Steels・Prehardened Steels (～40HRC) | | アルミニウム合金 Aluminum Alloy | | 銅 Copper | |
|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | | 40～70m/min | | 150～300m/min | | 80～150m/min | |
| 先端径 Dia. | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | mm | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 0.5 | 0.005~0.01 | 38,000 | 300 | 50,000 | 400 | 25,000 | 200 |
| 0.6 | 0.01~0.02 | 32,000 | 300 | 50,000 | 400 | 25,000 | 200 |
| 0.7 | 0.01~0.03 | 27,000 | 300 | 50,000 | 500 | 25,000 | 250 |
| 0.8 | 0.02~0.04 | 24,000 | 400 | 50,000 | 650 | 25,000 | 330 |
| 0.9 | 0.03~0.06 | 21,000 | 400 | 50,000 | 800 | 25,000 | 400 |
| 1 | 0.03~0.08 | 19,000 | 400 | 50,000 | 1,000 | 25,000 | 500 |
| 備　考 Notes | | ※切削油を使用してください。<br>※加工面の傾斜角によっては、回転数や送り速度を調整してください。<br>※コーナー部での送り速度は 30 ～ 50%下げてください。<br>※回転数が上がらない場合は同じ割合で送り速度を調整し、切り込み量も調整してください。<br>※往復切削をお奨めします。<br>※Use cutting fluid.<br>※Adjust spindle speed and feed according to inclined angle.<br>※When corner processing, reduce the feed by approximately 50%～30%.<br>※Adjust spindle speed and feed at the same rate also reduce depth of cut, if the machine spindle speed insufficient.<br>※Recommend reciprocating cutting. | | | | | |



ŞEVKET ÖĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

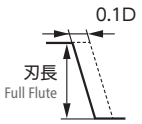
[φ1.5～10側面切削 Side Milling]

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼・工具鋼・調質鋼 Alloy Steels・Tool Steels・Prehardened Steels SKD・HPM・NAK | | 調質鋼 Prehardened Steels NAK80(～45HRC) | |
|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 50～70m/min | | 40～60m/min | | 30～50m/min | |
| 先端径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1.5 | 12,700 | 330 | 10,600 | 250 | 8,500 | 200 |
| 2 | 9,600 | 400 | 8,000 | 300 | 6,400 | 270 |
| 2.5 | 7,600 | 450 | 6,400 | 330 | 5,100 | 300 |
| 3 | 6,400 | 450 | 5,300 | 330 | 4,300 | 300 |
| 4 | 4,800 | 450 | 4,000 | 330 | 3,200 | 300 |
| 5 | 3,800 | 450 | 3,200 | 330 | 2,600 | 300 |
| 6 | 3,200 | 450 | 2,700 | 330 | 2,200 | 300 |
| 8 | 2,400 | 480 | 2,000 | 360 | 1,600 | 330 |
| 10 | 1,900 | 480 | 1,600 | 360 | 1,300 | 330 |

切り込み量 Depth of Cut

(D:先端径 Dia.)

テーパー側面 Taper Side Milling



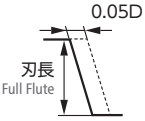
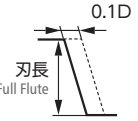

備　考 Notes

※切削油を使用してください。
※加工面の傾斜角によっては、回転数や送り速度を調整してください。
※コーナー部での送り速度は 30 ～ 50%下げてください。
※回転数が上がらない場合は同じ割合で送り速度を調整し、切り込み量も調整してください。
※Use cutting fluid.
※Adjust spindle speed and feed according to inclined angle.
※When corner processing, reduce the feed by approximately 50%～30%.
※Adjust spindle speed and feed at the same rate also reduce depth of cut, if the machine spindle speed insufficient.

# MTE230

## 切削条件参考表 Recommended Milling Conditions

［φ1.5 ～ 10 側面切削 Side Milling］

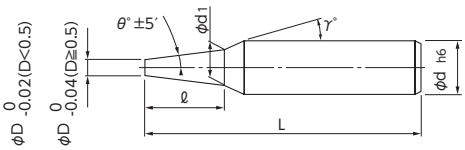
| 被削材 Work Material | 焼き入れ鋼 Hardened Steels (～55HRC) | | アルミニウム合金 Aluminum Alloy | | 銅 Copper | |
|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 20m/min | | 150～300m/min | | 80～150m/min | |
| 先端径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1.5 | 4,300 | 110 | 50,000 | 1,300 | 25,000 | 650 |
| 2 | 3,200 | 130 | 48,000 | 2,000 | 24,000 | 1,000 |
| 2.5 | 2,700 | 150 | 38,200 | 2,200 | 19,100 | 1,100 |
| 3 | 2,200 | 150 | 32,000 | 2,200 | 16,000 | 1,100 |
| 4 | 1,600 | 150 | 24,000 | 2,200 | 12,000 | 1,100 |
| 5 | 1,300 | 150 | 19,100 | 2,200 | 9,600 | 1,100 |
| 6 | 1,100 | 150 | 16,000 | 2,200 | 8,000 | 1,100 |
| 8 | 800 | 160 | 12,000 | 2,200 | 6,000 | 1,100 |
| 10 | 650 | 160 | 9,600 | 2,200 | 4,800 | 1,100 |
| 切り込み量 Depth of Cut (D：先端径 Dia.) | テーパー側面 Taper Side Milling 0.05D   | | テーパー側面 Taper Side Milling 0.1D   | | | |
| 備　考 Notes | ※切削油を使用してください。<br>※加工面の傾斜角によっては、回転数や送り速度を調整してください。<br>※コーナー部での送り速度は 30 ～ 50%下げてください。<br>※回転数が上がらない場合は同じ割合で送り速度を調整し、切り込み量も調整してください。<br>※Use cutting fluid.<br>※Adjust spindle speed and feed according to inclined angle.<br>※When corner processing, reduce the feed by approximately 50%～30%.<br>※Adjust spindle speed and feed at the same rate also reduce depth of cut, if the machine spindle speed insufficient. | | | | | |



ŞEVKET ÖĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MRT425

## 無限コーティング 深リブ用テーパーエンドミル
MUGEN-COATING 4-Flute Taper End Mill for Deep Rib




(底刃2枚刃)
2 cutting edges on end.

●NS 独自の高剛性設計により、高精度・高能率な加工が可能。
●It is possible for high precision and efficiency cutting by NS original design.

Slot | MG | ∞ | 4 | 25° | ≦55 HRC

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹 脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | | ○ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 08-00310-02022 | 0.2 | 30′ | 2 | 0.23 | 15° | 3 | 40 | 11,700 |
| 08-00310-02023 | | 1° | | 0.27 | 15° | 3 | 40 | 11,700 |
| 08-00310-02024 | | 1°30′ | | 0.30 | 15° | 3 | 40 | 11,700 |
| 08-00310-02025 | | 2° | | 0.34 | 15° | 3 | 40 | 11,700 |
| 08-00310-03032 | 0.3 | 30′ | 3 | 0.35 | 15° | 3 | 40 | 8,600 |
| 08-00310-03033 | | 1° | | 0.40 | 15° | 3 | 40 | 8,600 |
| 08-00310-03034 | | 1°30′ | | 0.46 | 15° | 3 | 40 | 8,600 |
| 08-00310-03035 | | 2° | | 0.51 | 15° | 3 | 40 | 8,600 |
| 08-00310-04042 | 0.4 | 30′ | 4 | 0.47 | 15° | 3 | 40 | 8,600 |
| 08-00310-04043 | | 1° | | 0.54 | 15° | 3 | 40 | 8,600 |
| 08-00310-04044 | | 1°30′ | | 0.61 | 15° | 3 | 40 | 8,600 |
| 08-00310-04045 | | 2° | | 0.68 | 15° | 3 | 40 | 8,600 |
| 08-00310-05042 | 0.5 | 30′ | 4 | 0.57 | 15° | 3 | 40 | 7,800 |
| 08-00310-05043 | | 1° | | 0.64 | 15° | 3 | 40 | 7,800 |
| 08-00310-05044 | | 1°30′ | | 0.71 | 15° | 3 | 40 | 7,800 |
| 08-00310-05045 | | 2° | | 0.78 | 15° | 3 | 40 | 7,800 |
| 08-00310-05062 | | 30′ | 6 | 0.60 | 15° | 3 | 40 | 7,800 |
| 08-00310-05063 | | 1° | | 0.71 | 15° | 3 | 40 | 7,800 |
| 08-00310-05064 | | 1°30′ | | 0.81 | 15° | 3 | 40 | 7,800 |
| 08-00310-05065 | | 2° | | 0.92 | 15° | 3 | 40 | 7,800 |
| 08-00310-06042 | 0.6 | 30′ | 4 | 0.67 | 15° | 3 | 40 | 7,800 |
| 08-00310-06043 | | 1° | | 0.74 | 15° | 3 | 40 | 7,800 |
| 08-00310-06044 | | 1°30′ | | 0.81 | 15° | 3 | 40 | 7,800 |
| 08-00310-06045 | | 2° | | 0.88 | 15° | 3 | 40 | 7,800 |
| 08-00310-06062 | | 30′ | 6 | 0.70 | 15° | 3 | 40 | 7,800 |
| 08-00310-06063 | | 1° | | 0.81 | 15° | 3 | 40 | 7,800 |
| 08-00310-06064 | | 1°30′ | | 0.91 | 15° | 3 | 40 | 7,800 |
| 08-00310-06065 | | 2° | | 1.02 | 15° | 3 | 40 | 7,800 |
| 08-00310-07062 | 0.7 | 30′ | 6 | 0.80 | 15° | 3 | 40 | 10,700 |
| 08-00310-07063 | | 1° | | 0.91 | 15° | 3 | 40 | 10,700 |
| 08-00310-07064 | | 1°30′ | | 1.01 | 15° | 3 | 40 | 10,700 |
| 08-00310-07065 | | 2° | | 1.12 | 15° | 3 | 40 | 10,700 |
| 08-00310-07082 | | 30′ | 8 | 0.84 | 15° | 3 | 45 | 10,700 |
| 08-00310-07083 | | 1° | | 0.98 | 15° | 3 | 45 | 10,700 |
| 08-00310-07084 | 0.7 | 1°30′ | 8 | 1.12 | 15° | 3 | 45 | 10,700 |
| 08-00310-07085 | | 2° | | 1.26 | 15° | 3 | 45 | 10,700 |
| 08-00310-08041 | 0.8 | 15′ | 4 | 0.83 | 15° | 4 | 45 | 7,800 |
| 08-00310-08042 | | 30′ | | 0.87 | 15° | 4 | 45 | 7,800 |
| 08-00310-08043 | | 1° | | 0.94 | 15° | 4 | 45 | 7,800 |
| 08-00310-08044 | | 1°30′ | | 1.01 | 15° | 4 | 45 | 7,800 |
| 08-00310-08045 | | 2° | | 1.08 | 15° | 4 | 45 | 7,800 |
| 08-00310-08061 | | 15′ | 6 | 0.85 | 15° | 4 | 45 | 7,800 |
| 08-00310-08062 | | 30′ | | 0.90 | 15° | 4 | 45 | 7,800 |
| 08-00310-08063 | | 1° | | 1.01 | 15° | 4 | 45 | 7,800 |
| 08-00310-08064 | | 1°30′ | | 1.11 | 15° | 4 | 45 | 7,800 |
| 08-00310-08065 | | 2° | | 1.22 | 15° | 4 | 45 | 7,800 |
| 08-00310-08081 | | 15′ | 8 | 0.87 | 15° | 4 | 45 | 7,800 |
| 08-00310-08082 | | 30′ | | 0.94 | 15° | 4 | 45 | 7,800 |
| 08-00310-08083 | | 1° | | 1.08 | 15° | 4 | 45 | 7,800 |
| 08-00310-08084 | | 1°30′ | | 1.22 | 15° | 4 | 45 | 7,800 |
| 08-00310-08085 | | 2° | | 1.36 | 15° | 4 | 45 | 7,800 |
| 08-00310-08101 | | 15′ | 10 | 0.89 | 15° | 4 | 45 | 7,800 |
| 08-00310-08102 | | 30′ | | 0.97 | 15° | 4 | 45 | 7,800 |
| 08-00310-08103 | | 1° | | 1.15 | 15° | 4 | 45 | 7,800 |
| 08-00310-08104 | | 1°30′ | | 1.32 | 15° | 4 | 45 | 7,800 |
| 08-00310-08105 | | 2° | | 1.50 | 15° | 4 | 45 | 7,800 |
| 08-00310-08122 | | 30′ | 12 | 1.01 | 15° | 4 | 50 | 7,800 |
| 08-00310-08123 | | 1° | | 1.22 | 15° | 4 | 50 | 7,800 |
| 08-00310-08124 | | 1°30′ | | 1.43 | 15° | 4 | 50 | 7,800 |
| 08-00310-08125 | | 2° | | 1.64 | 15° | 4 | 50 | 7,800 |
| 08-00310-10061 | 1 | 15′ | 6 | 1.05 | 15° | 4 | 45 | 7,800 |
| 08-00310-10062 | | 30′ | | 1.10 | 15° | 4 | 45 | 7,800 |
| 08-00310-10063 | | 1° | | 1.21 | 15° | 4 | 45 | 7,800 |
| 08-00310-10064 | | 1°30′ | | 1.31 | 15° | 4 | 45 | 7,800 |
| 08-00310-10065 | | 2° | | 1.42 | 15° | 4 | 45 | 7,800 |
| 08-00310-10081 | | 15′ | 8 | 1.07 | 15° | 4 | 45 | 7,800 |
| 08-00310-10082 | | 30′ | | 1.14 | 15° | 4 | 45 | 7,800 |
| 08-00310-10083 | | 1° | | 1.28 | 15° | 4 | 45 | 7,800 |

**オーダー方法**
MRT425 先端径(D)×片角(θ)×刃長(ℓ)を指示してください。
When you order, indicate MRT425 (D)×(θ)×(ℓ).

※(d1)及び(γ)は参考値です。
※(d1) and (γ) is reference value.

●切削条件表はG-010に記載
●Recommended Milling Conditions are shown on page G-010.





SEVKET GÜLÜ MAKINA TICARET VE SAN. LTD. ŞTI.

# MRT425

## 無限コーティング 深リブ用テーパーエンドミル
MUGEN-COATING 4-Flute Taper End Mill for Deep Rib

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 08-00310-10084 | 1 | 1°30′ | 8 | 1.42 | 15° | 4 | 45 | 7,800 |
| 08-00310-10085 | | 2° | | 1.56 | 15° | 4 | 45 | 7,800 |
| 08-00310-10101 | | 15′ | 10 | 1.09 | 15° | 4 | 45 | 7,800 |
| 08-00310-10102 | | 30′ | | 1.17 | 15° | 4 | 45 | 7,800 |
| 08-00310-10103 | | 1° | | 1.35 | 15° | 4 | 45 | 7,800 |
| 08-00310-10104 | | 1°30′ | | 1.52 | 15° | 4 | 45 | 7,800 |
| 08-00310-10105 | | 2° | | 1.70 | 15° | 4 | 45 | 7,800 |
| 08-00310-10121 | | 15′ | 12 | 1.10 | 15° | 4 | 50 | 8,000 |
| 08-00310-10122 | | 30′ | | 1.21 | 15° | 4 | 50 | 8,000 |
| 08-00310-10123 | | 1° | | 1.42 | 15° | 4 | 50 | 8,000 |
| 08-00310-10124 | | 1°30′ | | 1.63 | 15° | 4 | 50 | 8,000 |
| 08-00310-10125 | | 2° | | 1.84 | 15° | 4 | 50 | 8,000 |
| 08-00310-10163 | | 1° | 16 | 1.56 | 15° | 4 | 55 | 8,000 |
| 08-00310-10164 | | 1°30′ | | 1.84 | 15° | 4 | 55 | 8,000 |
| 08-00310-10165 | | 2° | | 2.12 | 15° | 4 | 55 | 8,000 |
| 08-00310-12061 | 1.2 | 15′ | 6 | 1.25 | 15° | 4 | 45 | 10,700 |
| 08-00310-12062 | | 30′ | | 1.30 | 15° | 4 | 45 | 10,700 |
| 08-00310-12063 | | 1° | | 1.41 | 15° | 4 | 45 | 10,700 |
| 08-00310-12064 | | 1°30′ | | 1.51 | 15° | 4 | 45 | 10,700 |
| 08-00310-12065 | | 2° | | 1.62 | 15° | 4 | 45 | 10,700 |
| 08-00310-12101 | | 15′ | 10 | 1.29 | 15° | 4 | 45 | 10,700 |
| 08-00310-12102 | | 30′ | | 1.37 | 15° | 4 | 45 | 10,700 |
| 08-00310-12103 | | 1° | | 1.55 | 15° | 4 | 45 | 10,700 |
| 08-00310-12104 | | 1°30′ | | 1.72 | 15° | 4 | 45 | 10,700 |
| 08-00310-12105 | | 2° | | 1.90 | 15° | 4 | 45 | 10,700 |
| 08-00310-12121 | | 15′ | 12 | 1.30 | 15° | 4 | 50 | 10,900 |
| 08-00310-12122 | | 30′ | | 1.41 | 15° | 4 | 50 | 10,900 |
| 08-00310-12123 | | 1° | | 1.62 | 15° | 4 | 50 | 10,900 |
| 08-00310-12124 | | 1°30′ | | 1.83 | 15° | 4 | 50 | 10,900 |
| 08-00310-12125 | | 2° | | 2.04 | 15° | 4 | 50 | 10,900 |
| 08-00310-12161 | | 15′ | 16 | 1.34 | 15° | 4 | 55 | 11,100 |
| 08-00310-12162 | | 30′ | | 1.48 | 15° | 4 | 55 | 11,100 |
| 08-00310-12163 | | 1° | | 1.76 | 15° | 4 | 55 | 11,100 |
| 08-00310-12164 | | 1°30′ | | 2.04 | 15° | 4 | 55 | 11,100 |
| 08-00310-12165 | | 2° | | 2.32 | 15° | 4 | 55 | 11,100 |
| 08-00310-12203 | | 1° | 20 | 1.90 | 15° | 4 | 55 | 11,100 |
| 08-00310-12204 | | 1°30′ | | 2.25 | 15° | 4 | 55 | 11,100 |
| 08-00310-12205 | | 2° | | 2.60 | 15° | 4 | 55 | 11,100 |
| 08-00310-13122 | 1.3 | 30′ | 12 | 1.51 | 15° | 4 | 50 | 10,900 |
| 08-00310-13123 | | 1° | | 1.72 | 15° | 4 | 50 | 10,900 |
| 08-00310-13124 | | 1°30′ | | 1.93 | 15° | 4 | 50 | 10,900 |
| 08-00310-13125 | | 2° | | 2.14 | 15° | 4 | 50 | 10,900 |
| 08-00310-14122 | 1.4 | 30′ | 12 | 1.61 | 15° | 4 | 50 | 10,900 |
| 08-00310-14123 | | 1° | | 1.82 | 15° | 4 | 50 | 10,900 |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 08-00310-14124 | 1.4 | 1°30′ | 12 | 2.03 | 15° | 4 | 50 | 10,900 |
| 08-00310-14125 | | 2° | | 2.24 | 15° | 4 | 50 | 10,900 |
| 08-00310-15061 | 1.5 | 15′ | 6 | 1.55 | 15° | 4 | 45 | 10,900 |
| 08-00310-15062 | | 30′ | | 1.60 | 15° | 4 | 45 | 10,900 |
| 08-00310-15063 | | 1° | | 1.71 | 15° | 4 | 45 | 10,900 |
| 08-00310-15064 | | 1°30′ | | 1.81 | 15° | 4 | 45 | 10,900 |
| 08-00310-15065 | | 2° | | 1.92 | 15° | 4 | 45 | 10,900 |
| 08-00310-15081 | | 15′ | 8 | 1.57 | 15° | 4 | 45 | 10,900 |
| 08-00310-15082 | | 30′ | | 1.64 | 15° | 4 | 45 | 10,900 |
| 08-00310-15083 | | 1° | | 1.78 | 15° | 4 | 45 | 10,900 |
| 08-00310-15084 | | 1°30′ | | 1.92 | 15° | 4 | 45 | 10,900 |
| 08-00310-15085 | | 2° | | 2.06 | 15° | 4 | 45 | 10,900 |
| 08-00310-15101 | | 15′ | 10 | 1.59 | 15° | 4 | 45 | 10,900 |
| 08-00310-15102 | | 30′ | | 1.67 | 15° | 4 | 45 | 10,900 |
| 08-00310-15103 | | 1° | | 1.85 | 15° | 4 | 45 | 10,900 |
| 08-00310-15104 | | 1°30′ | | 2.02 | 15° | 4 | 45 | 10,900 |
| 08-00310-15105 | | 2° | | 2.20 | 15° | 4 | 45 | 10,900 |
| 08-00310-15121 | | 15′ | 12 | 1.60 | 15° | 4 | 50 | 10,900 |
| 08-00310-15122 | | 30′ | | 1.71 | 15° | 4 | 50 | 10,900 |
| 08-00310-15123 | | 1° | | 1.92 | 15° | 4 | 50 | 10,900 |
| 08-00310-15124 | | 1°30′ | | 2.13 | 15° | 4 | 50 | 10,900 |
| 08-00310-15125 | | 2° | | 2.34 | 15° | 4 | 50 | 10,900 |
| 08-00310-15161 | | 15′ | 16 | 1.64 | 15° | 4 | 55 | 11,100 |
| 08-00310-15162 | | 30′ | | 1.78 | 15° | 4 | 55 | 11,100 |
| 08-00310-15163 | | 1° | | 2.06 | 15° | 4 | 55 | 11,100 |
| 08-00310-15164 | | 1°30′ | | 2.34 | 15° | 4 | 55 | 11,100 |
| 08-00310-15165 | | 2° | | 2.62 | 15° | 4 | 55 | 11,100 |
| 08-00310-15201 | | 15′ | 20 | 1.67 | 15° | 4 | 55 | 11,800 |
| 08-00310-15202 | | 30′ | | 1.85 | 15° | 4 | 55 | 11,800 |
| 08-00310-15203 | | 1° | | 2.20 | 15° | 4 | 55 | 11,800 |
| 08-00310-15204 | | 1°30′ | | 2.55 | 15° | 4 | 55 | 11,800 |
| 08-00310-15205 | | 2° | | 2.90 | 15° | 4 | 55 | 11,800 |
| 08-00310-15253 | | 1° | 25 | 2.37 | 15° | 4 | 60 | 11,800 |
| 08-00310-15254 | | 1°30′ | | 2.81 | 15° | 4 | 60 | 11,800 |
| 08-00310-15255 | | 2° | | 3.25 | 15° | 4 | 60 | 11,800 |
| 08-00310-16082 | 1.6 | 30′ | 8 | 1.74 | 15° | 4 | 45 | 10,900 |
| 08-00310-16083 | | 1° | | 1.88 | 15° | 4 | 45 | 10,900 |
| 08-00310-16084 | | 1°30′ | | 2.02 | 15° | 4 | 45 | 10,900 |
| 08-00310-16085 | | 2° | | 2.16 | 15° | 4 | 45 | 10,900 |
| 08-00310-16122 | | 30′ | 12 | 1.81 | 15° | 4 | 50 | 11,800 |
| 08-00310-16123 | | 1° | | 2.02 | 15° | 4 | 50 | 11,800 |
| 08-00310-16124 | | 1°30′ | | 2.23 | 15° | 4 | 50 | 11,800 |
| 08-00310-16125 | | 2° | | 2.44 | 15° | 4 | 50 | 11,800 |
| 08-00310-16162 | | 30′ | 16 | 1.88 | 15° | 4 | 55 | 11,800 |

**オーダー方法**
MRT425 先端径(D)×片角(θ)×刃長(ℓ)を指示してください。
When you order, indicate MRT425 (D)×(θ)×(ℓ).

※(d1)及び(γ)は参考値です。
※(d1) and (γ) is reference value.

●切削条件表はG-010に記載
●Recommended Milling Conditions are shown on page G-010.



SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 08-00310-16163 | 1.6 | 1° | 16 | 2.16 | 15° | 4 | 55 | 11,800 |
| 08-00310-16164 | | 1°30′ | | 2.44 | 15° | 4 | 55 | 11,800 |
| 08-00310-16165 | | 2° | | 2.72 | 15° | 4 | 55 | 11,800 |
| 08-00310-16202 | | 30′ | 20 | 1.95 | 15° | 4 | 55 | 11,800 |
| 08-00310-16203 | | 1° | | 2.30 | 15° | 4 | 55 | 11,800 |
| 08-00310-16204 | | 1°30′ | | 2.65 | 15° | 4 | 55 | 11,800 |
| 08-00310-16205 | | 2° | | 3.00 | 15° | 4 | 55 | 11,800 |
| 08-00310-18081 | 1.8 | 15′ | 8 | 1.87 | 15° | 4 | 45 | 11,800 |
| 08-00310-18082 | | 30′ | | 1.94 | 15° | 4 | 45 | 11,800 |
| 08-00310-18083 | | 1° | | 2.08 | 15° | 4 | 45 | 11,800 |
| 08-00310-18084 | | 1°30′ | | 2.22 | 15° | 4 | 45 | 11,800 |
| 08-00310-18085 | | 2° | | 2.36 | 15° | 4 | 45 | 11,800 |
| 08-00310-18161 | | 15′ | 16 | 1.94 | 15° | 4 | 55 | 11,800 |
| 08-00310-18162 | | 30′ | | 2.08 | 15° | 4 | 55 | 11,800 |
| 08-00310-18163 | | 1° | | 2.36 | 15° | 4 | 55 | 11,800 |
| 08-00310-18164 | | 1°30′ | | 2.64 | 15° | 4 | 55 | 11,800 |
| 08-00310-18165 | | 2° | | 2.92 | 15° | 4 | 55 | 11,800 |
| 08-00310-18241 | | 15′ | 24 | 2.01 | 15° | 4 | 60 | 11,800 |
| 08-00310-18242 | | 30′ | | 2.22 | 15° | 4 | 60 | 11,800 |
| 08-00310-18243 | | 1° | | 2.64 | 15° | 4 | 60 | 11,800 |
| 08-00310-18244 | | 1°30′ | | 3.06 | 15° | 4 | 60 | 11,800 |
| 08-00310-18245 | | 2° | | 3.48 | 15° | 4 | 60 | 11,800 |
| 08-00310-20081 | 2 | 15′ | 8 | 2.07 | 15° | 4 | 45 | 11,800 |
| 08-00310-20082 | | 30′ | | 2.14 | 15° | 4 | 45 | 11,800 |
| 08-00310-20083 | | 1° | | 2.28 | 15° | 4 | 45 | 11,800 |
| 08-00310-20084 | | 1°30′ | | 2.42 | 15° | 4 | 45 | 11,800 |
| 08-00310-20085 | | 2° | | 2.56 | 15° | 4 | 45 | 11,800 |
| 08-00310-20101 | | 15′ | 10 | 2.09 | 15° | 4 | 45 | 11,800 |
| 08-00310-20102 | | 30′ | | 2.17 | 15° | 4 | 45 | 11,800 |
| 08-00310-20103 | | 1° | | 2.35 | 15° | 4 | 45 | 11,800 |
| 08-00310-20104 | | 1°30′ | | 2.52 | 15° | 4 | 45 | 11,800 |
| 08-00310-20105 | | 2° | | 2.70 | 15° | 4 | 45 | 11,800 |
| 08-00310-20121 | | 15′ | 12 | 2.10 | 15° | 4 | 50 | 11,800 |
| 08-00310-20122 | | 30′ | | 2.21 | 15° | 4 | 50 | 11,800 |
| 08-00310-20123 | | 1° | | 2.42 | 15° | 4 | 50 | 11,800 |
| 08-00310-20124 | | 1°30′ | | 2.63 | 15° | 4 | 50 | 11,800 |
| 08-00310-20125 | | 2° | | 2.84 | 15° | 4 | 50 | 11,800 |
| 08-00310-20127 | | 3° | | 3.26 | 15° | 4 | 50 | 11,800 |
| 08-00310-20161 | | 15′ | 16 | 2.14 | 15° | 4 | 55 | 11,800 |
| 08-00310-20162 | | 30′ | | 2.28 | 15° | 4 | 55 | 11,800 |
| 08-00310-20163 | | 1° | | 2.56 | 15° | 4 | 55 | 11,800 |
| 08-00310-20164 | | 1°30′ | | 2.84 | 15° | 4 | 55 | 11,800 |
| 08-00310-20165 | | 2° | | 3.12 | 15° | 4 | 55 | 11,800 |
| 08-00310-20167 | | 3° | | 3.68 | 15° | 4 | 55 | 11,800 |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 08-00310-20201 | 2 | 15′ | 20 | 2.17 | 15° | 4 | 55 | 11,800 |
| 08-00310-20202 | | 30′ | | 2.35 | 15° | 4 | 55 | 11,800 |
| 08-00310-20203 | | 1° | | 2.70 | 15° | 4 | 55 | 11,800 |
| 08-00310-20204 | | 1°30′ | | 3.05 | 15° | 4 | 55 | 11,800 |
| 08-00310-20205 | | 2° | | 3.40 | 15° | 4 | 55 | 11,800 |
| 08-00310-20207 | | 3° | | 4.10 | 15° | 6 | 55 | 11,800 |
| 08-00310-20251 | | 15′ | 25 | 2.22 | 15° | 4 | 60 | 12,700 |
| 08-00310-20252 | | 30′ | | 2.44 | 15° | 4 | 60 | 12,700 |
| 08-00310-20253 | | 1° | | 2.87 | 15° | 4 | 60 | 12,700 |
| 08-00310-20254 | | 1°30′ | | 3.31 | 15° | 4 | 60 | 12,700 |
| 08-00310-20255 | | 2° | | 3.75 | 15° | 4 | 60 | 12,700 |
| 08-00310-20257 | | 3° | | 4.62 | 15° | 6 | 60 | 12,700 |
| 08-00310-20302 | | 30′ | 30 | 2.52 | 15° | 4 | 65 | 12,700 |
| 08-00310-20303 | | 1° | | 3.05 | 15° | 4 | 65 | 12,700 |
| 08-00310-20304 | | 1°30′ | | 3.57 | 15° | 4 | 65 | 12,700 |
| 08-00310-20305 | | 2° | | 4.10 | 15° | 6 | 65 | 12,700 |
| 08-00310-20307 | | 3° | | 5.14 | 15° | 6 | 65 | 12,700 |
| 08-00310-25102 | 2.5 | 30′ | 10 | 2.67 | 15° | 4 | 45 | 12,900 |
| 08-00310-25103 | | 1° | | 2.85 | 15° | 4 | 45 | 12,900 |
| 08-00310-25104 | | 1°30′ | | 3.02 | 15° | 4 | 45 | 12,900 |
| 08-00310-25105 | | 2° | | 3.20 | 15° | 4 | 45 | 12,900 |
| 08-00310-25162 | | 30′ | 16 | 2.78 | 15° | 4 | 50 | 12,900 |
| 08-00310-25163 | | 1° | | 3.06 | 15° | 4 | 50 | 12,900 |
| 08-00310-25164 | | 1°30′ | | 3.34 | 15° | 4 | 50 | 12,900 |
| 08-00310-25165 | | 2° | | 3.62 | 15° | 4 | 50 | 12,900 |
| 08-00310-25202 | | 30′ | 20 | 2.85 | 15° | 4 | 55 | 12,900 |
| 08-00310-25203 | | 1° | | 3.20 | 15° | 4 | 55 | 12,900 |
| 08-00310-25204 | | 1°30′ | | 3.55 | 15° | 4 | 55 | 12,900 |
| 08-00310-25205 | | 2° | | 3.90 | 15° | 4 | 55 | 12,900 |
| 08-00310-25252 | | 30′ | 25 | 2.94 | 15° | 4 | 60 | 14,100 |
| 08-00310-25253 | | 1° | | 3.37 | 15° | 4 | 60 | 14,100 |
| 08-00310-25254 | | 1°30′ | | 3.81 | 15° | 4 | 60 | 14,100 |
| 08-00310-25255 | | 2° | | 4.25 | 15° | 6 | 60 | 14,100 |
| 08-00310-25302 | | 30′ | 30 | 3.02 | 15° | 4 | 65 | 14,100 |
| 08-00310-25303 | | 1° | | 3.55 | 15° | 4 | 65 | 14,100 |
| 08-00310-25304 | | 1°30′ | | 4.07 | 15° | 6 | 65 | 14,100 |
| 08-00310-25305 | | 2° | | 4.60 | 15° | 6 | 65 | 14,100 |
| 08-00310-30252 | 3 | 30′ | 25 | 3.44 | 15° | 6 | 65 | 14,100 |
| 08-00310-30253 | | 1° | | 3.87 | 15° | 6 | 65 | 14,100 |
| 08-00310-30254 | | 1°30′ | | 4.31 | 15° | 6 | 65 | 14,100 |
| 08-00310-30255 | | 2° | | 4.75 | 15° | 6 | 65 | 14,100 |
| 08-00310-30402 | | 30′ | 40 | 3.70 | 15° | 6 | 80 | 15,500 |
| 08-00310-30403 | | 1° | | 4.40 | 15° | 6 | 80 | 15,500 |
| 08-00310-30404 | | 1°30′ | | 5.09 | 15° | 6 | 80 | 15,500 |
| 08-00310-30405 | | 2° | | 5.79 | 15° | 6 | 80 | 15,500 |

# MRT425

## 切削条件参考表 Recommended Milling Conditions

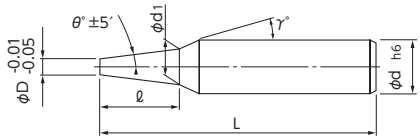
| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼・調質鋼 Alloy Steels・Prehardened Steels SKD・HPM・NAK (～40HRC) | | | 焼き入れ鋼 Hardened Steels SKD61 (45～52HRC) | | |
|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 10～80m/min （φ0.2～φ0.5）<br>25～100m/min（φ0.6～φ0.8）<br>40～70m/min （φ1～φ3） | | | 10～80m/min （φ0.2～φ0.5）<br>25～100m/min（φ0.6～φ0.8）<br>35～65m/min （φ1～φ3） | | | 10～65m/min（φ0.2～φ0.4）<br>25～50m/min（φ0.5～φ0.8）<br>25～40m/min（φ1～φ3） | | |
| 先端径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed | 切り込み量 Depth of Cut |
| | $min^{-1}$ | mm/min | mm | $min^{-1}$ | mm/min | mm | $min^{-1}$ | mm/min | mm |
| 0.2 | 20,000~50,000 | 300~ 800 | 0.001~0.002 | 20,000~50,000 | 250~700 | 0.001~0.002 | 20,000~50,000 | 200~400 | 0.001~0.002 |
| 0.3 | 20,000~50,000 | 300~ 800 | 0.002~0.003 | 20,000~50,000 | 250~700 | 0.002~0.003 | 20,000~50,000 | 200~400 | 0.002~0.003 |
| 0.4 | 20,000~50,000 | 300~ 800 | 0.002~0.004 | 20,000~50,000 | 250~700 | 0.002~0.004 | 20,000~50,000 | 200~400 | 0.002~0.004 |
| 0.5 | 20,000~50,000 | 300~ 800 | 0.01~0.025 | 20,000~50,000 | 250~700 | 0.01~0.025 | 15,000~30,000 | 200~400 | 0.005~0.01 |
| 0.6 | 15,000~40,000 | 350~ 900 | 0.012~0.03 | 15,000~40,000 | 300~700 | 0.012~0.03 | 15,000~30,000 | 200~400 | 0.006~0.012 |
| 0.7 | 15,000~40,000 | 350~ 900 | 0.014~0.035 | 15,000~40,000 | 300~700 | 0.014~0.035 | 10,000~20,000 | 200~400 | 0.007~0.014 |
| 0.8 | 15,000~40,000 | 350~ 900 | 0.016~0.04 | 15,000~40,000 | 300~700 | 0.016~0.04 | 10,000~20,000 | 200~400 | 0.008~0.016 |
| 1 | 14,000~20,000 | 500~1,000 | 0.02~0.05 | 12,000~20,000 | 400~700 | 0.02~0.05 | 8,000~11,000 | 200~400 | 0.01~0.02 |
| 1.2 | 12,000~17,000 | 500~1,000 | 0.024~0.06 | 10,000~16,000 | 400~700 | 0.024~0.06 | 7,000~ 9,500 | 200~400 | 0.012~0.024 |
| 1.3 | 10,000~16,000 | 500~1,000 | 0.026~0.065 | 9,000~15,000 | 400~700 | 0.026~0.065 | 6,500~ 8,500 | 200~400 | 0.013~0.026 |
| 1.4 | 9,000~15,000 | 500~1,000 | 0.028~0.07 | 8,000~14,000 | 400~700 | 0.028~0.07 | 6,000~ 8,000 | 200~400 | 0.014~0.028 |
| 1.5 | 8,000~14,000 | 500~1,000 | 0.03~0.075 | 7,000~13,000 | 400~700 | 0.03~0.075 | 5,500~ 7,500 | 200~400 | 0.015~0.03 |
| 1.6 | 7,000~13,000 | 500~1,000 | 0.032~0.08 | 6,000~12,000 | 400~700 | 0.032~0.08 | 5,000~ 7,000 | 200~400 | 0.016~0.032 |
| 1.8 | 6,500~12,000 | 500~1,000 | 0.036~0.09 | 5,000~11,000 | 400~700 | 0.036~0.09 | 4,500~ 6,000 | 200~400 | 0.018~0.036 |
| 2 | 6,500~11,000 | 500~1,000 | 0.04~0.1 | 5,000~10,000 | 400~700 | 0.04~0.1 | 4,000~ 5,500 | 200~400 | 0.02~0.04 |
| 2.5 | 6,000~ 9,000 | 500~1,000 | 0.05~0.125 | 4,000~ 8,000 | 400~700 | 0.05~0.125 | 3,500~ 4,500 | 200~400 | 0.025~0.05 |
| 3 | 5,000~ 7,000 | 500~1,000 | 0.06~0.15 | 4,000~ 6,500 | 400~700 | 0.06~0.15 | 3,000~ 4,000 | 200~400 | 0.03~0.06 |
| 備　考 Notes | ※切削条件を設定する際、各サイズ刃長の長いタイプは回転数・送り速度・切り込み量を上記切削条件表範囲の低めで設定してください。<br>※コーナー部での送り速度は 50% に調整してください。<br>※切削油は発煙性の少ないものを使用してください。<br>※往復切削をお奨めします。<br>※When length of cut is long, reduce the conditions listed above.<br>※When cutting at the corner, reduce the feed by 50% from the above values.<br>※Use cutting fluid with smoke retardant.<br>※Recommend reciprocating cutting. | | | | | | | | |



ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# NTE-2X

## Xコーティング テーパーエンドミル
X-COATING 2-Flute Taper End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

Side Slot MG X 2 30°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | | | ○ | | ○ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00316-00051 | 0.5 | 30′ | 2 | 0.53 | 9° | 3 | 35 | 15,000 ▌ |
| 01-00316-00052 | | 1° | 2 | 0.57 | 9° | 3 | 35 | 15,000 ▌ |
| 01-00316-00053 | | 1°30′ | 2 | 0.60 | 9° | 3 | 35 | 15,000 ▌ |
| 01-00316-00054 | | 2° | 2 | 0.64 | 9° | 3 | 35 | 15,000 ▌ |
| 01-00316-00056 | | 3° | 2 | 0.71 | 9° | 3 | 35 | 15,000 ▌ |
| 01-00316-00061 | 0.6 | 30′ | 2 | 0.63 | 9° | 3 | 35 | 15,000 ▌ |
| 01-00316-00062 | | 1° | 2 | 0.67 | 9° | 3 | 35 | 15,000 ▌ |
| 01-00316-00063 | | 1°30′ | 2 | 0.70 | 9° | 3 | 35 | 15,000 ▌ |
| 01-00316-00064 | | 2° | 2 | 0.74 | 9° | 3 | 35 | 15,000 ▌ |
| 01-00316-00066 | | 3° | 2 | 0.81 | 9° | 3 | 35 | 15,000 ▌ |
| 01-00316-00071 | 0.7 | 30′ | 2 | 0.73 | 9° | 3 | 35 | 15,000 ▌ |
| 01-00316-00072 | | 1° | 2 | 0.77 | 9° | 3 | 35 | 15,000 ▌ |
| 01-00316-00073 | | 1°30′ | 2 | 0.80 | 9° | 3 | 35 | 15,000 ▌ |
| 01-00316-00074 | | 2° | 2 | 0.84 | 9° | 3 | 35 | 15,000 ▌ |
| 01-00316-00076 | | 3° | 2 | 0.91 | 9° | 3 | 35 | 15,000 ▌ |
| 01-00316-00081 | 0.8 | 30′ | 3 | 0.85 | 9° | 3 | 35 | 13,700 ▌ |
| 01-00316-00082 | | 1° | 3 | 0.90 | 9° | 3 | 35 | 13,700 ▌ |
| 01-00316-00083 | | 1°30′ | 3 | 0.96 | 9° | 3 | 35 | 13,700 ▌ |
| 01-00316-00084 | | 2° | 3 | 1.01 | 9° | 3 | 35 | 13,700 ▌ |
| 01-00316-00086 | | 3° | 3 | 1.11 | 9° | 3 | 35 | 13,700 ▌ |
| 01-00316-00091 | 0.9 | 30′ | 3 | 0.95 | 9° | 3 | 35 | 13,700 ▌ |
| 01-00316-00092 | | 1° | 3 | 1.00 | 9° | 3 | 35 | 13,700 ▌ |
| 01-00316-00093 | | 1°30′ | 3 | 1.06 | 9° | 3 | 35 | 13,700 ▌ |
| 01-00316-00094 | | 2° | 3 | 1.11 | 9° | 3 | 35 | 13,700 ▌ |
| 01-00316-00096 | | 3° | 3 | 1.21 | 9° | 3 | 35 | 13,700 ▌ |
| 01-00316-00101 | 1 | 30′ | 4 | 1.07 | 9° | 4 | 45 | 11,800 ▌ |
| 01-00316-00102 | | 1° | 4 | 1.14 | 9° | 4 | 45 | 11,800 ▌ |
| 01-00316-00103 | | 1°30′ | 4 | 1.21 | 9° | 4 | 45 | 15,400 ▌ |
| 01-00316-00104 | | 2° | 4 | 1.28 | 9° | 4 | 45 | 11,800 ▌ |
| 01-00316-00106 | | 3° | 4 | 1.42 | 9° | 4 | 45 | 11,800 ▌ |
| 01-00316-00107 | | 5° | 4 | 1.70 | 9° | 4 | 45 | 17,600 ▌ |

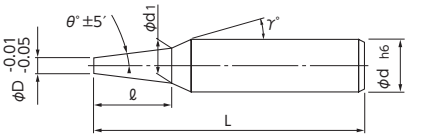
| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00316-00151 | 1.5 | 30′ | 5 | 1.59 | 9° | 4 | 45 | 12,000 ▌ |
| 01-00316-00152 | | 1° | 5 | 1.67 | 9° | 4 | 45 | 12,000 ▌ |
| 01-00316-00153 | | 1°30′ | 5 | 1.76 | 9° | 4 | 45 | 15,400 ▌ |
| 01-00316-00154 | | 2° | 5 | 1.85 | 9° | 4 | 45 | 12,000 ▌ |
| 01-00316-00156 | | 3° | 5 | 2.02 | 9° | 4 | 45 | 12,000 ▌ |
| 01-00316-00157 | | 5° | 5 | 2.37 | 9° | 4 | 45 | 14,800 ▌ |
| 01-00316-00201 | 2 | 30′ | 6 | 2.10 | 9° | 4 | 45 | 11,800 ▌ |
| 01-00316-00202 | | 1° | 6 | 2.21 | 9° | 4 | 45 | 11,800 ▌ |
| 01-00316-00203 | | 1°30′ | 6 | 2.31 | 9° | 4 | 45 | 14,500 ▌ |
| 01-00316-00204 | | 2° | 6 | 2.41 | 9° | 4 | 45 | 11,800 ▌ |
| 01-00316-00206 | | 3° | 6 | 2.62 | 9° | 4 | 45 | 11,800 ▌ |
| 01-00316-00207 | | 5° | 6 | 3.05 | 5° | 4 | 45 | 12,500 ▌ |
| 01-00316-00251 | 2.5 | 30′ | 8 | 2.64 | 9° | 4 | 45 | 12,000 ▌ |
| 01-00316-00252 | | 1° | 8 | 2.78 | 9° | 4 | 45 | 12,000 ▌ |
| 01-00316-00253 | | 1°30′ | 8 | 2.92 | 9° | 4 | 45 | 14,500 ▌ |
| 01-00316-00254 | | 2° | 8 | 3.05 | 9° | 4 | 45 | 12,000 ▌ |
| 01-00316-00256 | | 3° | 8 | 3.33 | 3° | 4 | 45 | 12,000 ▌ |
| 01-00316-00257 | | 5° | 8 | 3.90 | 5° | 4 | 45 | 12,700 ▌ |

**オーダー方法** NTE-2X 先端径(D)×片角(θ)を指示してください。
When you order, indicate NTE-2X (D)×(θ).

※(d1)及び(γ)は参考値です。
※(d1) and (γ) is reference value.
●切削条件表はG-013に記載
●Recommended Milling Conditions are shown on page G-013.

# NTE-4X

## Xコーティング テーパーエンドミル
X-COATING 4-Flute Taper End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

Side L | Slot | MG | X | 4 | 30°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | | | ○ | | ○ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00317-00301 | 3 | 30′ | 10 | 3.17 | 9° | 6 | 50 | 12,000 ▌ |
| 01-00317-00302 | | 1° | 10 | 3.35 | 9° | 6 | 50 | 12,000 ▌ |
| 01-00317-00303 | | 1°30′ | 10 | 3.52 | 9° | 6 | 50 | 15,400 ▌ |
| 01-00317-00304 | | 2° | 10 | 3.69 | 9° | 6 | 50 | 12,000 ▌ |
| 01-00317-00306 | | 3° | 10 | 4.05 | 9° | 6 | 50 | 12,000 ▌ |
| 01-00317-00307 | | 5° | 10 | 4.75 | 9° | 6 | 50 | 13,000 ▌ |
| 01-00317-00401 | 4 | 30′ | 15 | 4.26 | 9° | 6 | 50 | 12,400 ▌ |
| 01-00317-00402 | | 1° | 15 | 4.52 | 9° | 6 | 50 | 12,400 ▌ |
| 01-00317-00403 | | 1°30′ | 15 | 4.79 | 9° | 6 | 50 | 16,000 ▌ |
| 01-00317-00404 | | 2° | 15 | 5.04 | 9° | 6 | 50 | 12,400 ▌ |
| 01-00317-00406 | | 3° | 15 | 5.57 | 9° | 6 | 50 | 12,400 ▌ |
| 01-00317-00407 | | 5° | 15 | 6.62 | – | 6 | 55 | 19,200 ▌ |
| 01-00317-00501 | 5 | 30′ | 20 | 5.34 | 9° | 6 | 55 | 14,500 ▌ |
| 01-00317-00502 | | 1° | 20 | 5.70 | 9° | 6 | 55 | 14,500 ▌ |
| 01-00317-00503 | | 1°30′ | 20 | 6.05 | – | 6 | 55 | 21,800 ▌ |
| 01-00317-00504 | | 2° | 20 | 6.39 | – | 6 | 55 | 16,900 ▌ |
| 01-00317-00506 | | 3° | 20 | 7.10 | – | 6 | 55 | 16,900 ▌ |
| 01-00317-00507 | | 5° | 20 | 8.50 | – | 8 | 60 | 25,600 ▌ |
| 01-00317-00601 | 6 | 30′ | 20 | 6.35 | – | 6 | 55 | 18,600 ▌ |
| 01-00317-00602 | | 1° | 20 | 6.70 | – | 6 | 55 | 18,600 ▌ |
| 01-00317-00603 | | 1°30′ | 20 | 7.05 | – | 6 | 55 | 24,100 ▌ |
| 01-00317-00604 | | 2° | 20 | 7.40 | – | 6 | 55 | 18,600 ▌ |
| 01-00317-00606 | | 3° | 20 | 8.10 | – | 8 | 60 | 18,600 ▌ |
| 01-00317-00607 | | 5° | 20 | 9.50 | – | 8 | 65 | 27,400 ▌ |
| 01-00317-00801 | 8 | 30′ | 25 | 8.44 | – | 8 | 55 | 26,300 ▌ |
| 01-00317-00802 | | 1° | 25 | 8.87 | – | 8 | 65 | 27,100 ▌ |
| 01-00317-00803 | | 1°30′ | 25 | 9.31 | – | 8 | 65 | 29,100 ▌ |
| 01-00317-00804 | | 2° | 25 | 9.75 | – | 8 | 65 | 30,600 ▌ |
| 01-00317-00806 | | 3° | 25 | 10.62 | – | 10 | 70 | 35,600 ▌ |
| 01-00317-00807 | | 5° | 25 | 12.37 | – | 12 | 90 | 65,300 ▌ |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00317-01001 | 10 | 30′ | 35 | 10.61 | – | 10 | 85 | 44,500 ▌ |
| 01-00317-01002 | | 1° | 35 | 11.22 | – | 10 | 85 | 47,200 ▌ |
| 01-00317-01003 | | 1°30′ | 35 | 11.83 | – | 10 | 85 | 50,300 ▌ |
| 01-00317-01004 | | 2° | 35 | 12.44 | – | 12 | 90 | 61,200 ▌ |
| 01-00317-01006 | | 3° | 35 | 13.67 | – | 12 | 90 | 71,400 ▌ |
| 01-00317-01007 | | 5° | 35 | 16.12 | – | 16 | 90 | 85,600 ▌ |

**オーダー方法** NTE-4X 先端径(D)×片角(θ)を指示してください。
When you order, indicate NTE-4X (D)×(θ).

※(d1)及び(γ)は参考値です。
※(d1) and (γ) is reference value.

●切削条件表はG-013に記載
●Recommended Milling Conditions are shown on page G-013.



ŞEVKET ÖLÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# NTE-2X

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM･SKD･SUS | | 調質鋼 Prehardened Steels HPM･NAK | |
|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 35～45m/min | | 30～40m/min | | 25～30m/min | |
| 先端径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 11,000 | 160 | 9,500 | 130 | 8,000 | 100 |
| 1.5 | 7,400 | 160 | 6,400 | 130 | 5,300 | 100 |
| 2 | 5,600 | 160 | 4,800 | 130 | 4,000 | 100 |
| 2.5 | 4,500 | 160 | 3,800 | 130 | 3,200 | 100 |
| 切り込み量 Depth of Cut (D:先端径 Dia.) | テーパー側面 Taper Side Milling 0.1D 刃長 Full Flute | | | | | |
| 備　考 Notes | ※切削油の使用をお奨めします。<br>※回転数と送り速度は同じ割合で調整してください。<br>※側面加工ではダウンカットをお奨めします。<br>※Use cutting fluid.<br>※Adjust both spindle speed and feed at the same rate.<br>※We recommend a down-cut at side milling. | | | | | |

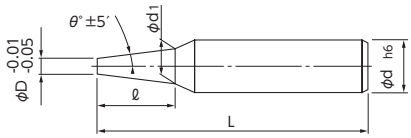
# NTE-4X

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM･SKD･SUS | | 調質鋼 Prehardened Steels HPM･NAK | |
|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 35～45m/min | | 30～40m/min | | 25～30m/min | |
| 先端径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 3 | 3,700 | 220 | 3,200 | 180 | 2,650 | 130 |
| 4 | 2,800 | 220 | 2,400 | 180 | 2,000 | 130 |
| 5 | 2,200 | 220 | 1,900 | 180 | 1,600 | 130 |
| 6 | 1,900 | 220 | 1,600 | 180 | 1,300 | 130 |
| 切り込み量 Depth of Cut (D:先端径 Dia.) | テーパー側面 Taper Side Milling 0.1D 刃長 Full Flute | | | | | |
| 備　考 Notes | ※切削油の使用をお奨めします。<br>※回転数と送り速度は同じ割合で調整してください。<br>※側面加工ではダウンカットをお奨めします。<br>※Use cutting fluid.<br>※Adjust both spindle speed and feed at the same rate.<br>※We recommend a down-cut at side milling. | | | | | |

# NTEM-2X

## Xコーティング テーパーミディアム刃エンドミル
X-COATING 2-Flute Medium Taper End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

Side Slot MG X 2 30°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | | | ○ | | ○ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 01-00336-00502 | 0.5 | 30′ | 4 | 0.57 | 3 | 35 | 15,400 ▌ |
| 01-00336-00504 | | 1° | 4 | 0.64 | 3 | 35 | 15,400 ▌ |
| 01-00336-00505 | | 1°30′ | 4 | 0.71 | 3 | 35 | 15,400 ▌ |
| 01-00336-00506 | | 2° | 4 | 0.78 | 3 | 35 | 15,400 ▌ |
| 01-00336-00508 | | 3° | 4 | 0.92 | 3 | 35 | 15,400 ▌ |
| 01-00336-00510 | | 4° | 4 | 1.06 | 3 | 35 | 16,900 ▌ |
| 01-00336-00512 | | 5° | 4 | 1.20 | 3 | 35 | 21,700 ▌ |
| 01-00336-00802 | 0.8 | 30′ | 5 | 0.89 | 3 | 35 | 14,700 ▌ |
| 01-00336-00804 | | 1° | 5 | 0.97 | 3 | 35 | 14,700 ▌ |
| 01-00336-00805 | | 1°30′ | 5 | 1.06 | 3 | 35 | 14,700 ▌ |
| 01-00336-00806 | | 2° | 5 | 1.15 | 3 | 35 | 14,700 ▌ |
| 01-00336-00808 | | 3° | 5 | 1.32 | 3 | 35 | 14,700 ▌ |
| 01-00336-00810 | | 4° | 5 | 1.50 | 3 | 35 | 17,000 ▌ |
| 01-00336-00812 | | 5° | 5 | 1.67 | 3 | 35 | 21,700 ▌ |
| 01-00336-01002 | 1 | 30′ | 6 | 1.10 | 4 | 45 | 14,000 ▌ |
| 01-00336-01004 | | 1° | 6 | 1.21 | 4 | 45 | 14,000 ▌ |
| 01-00336-01005 | | 1°30′ | 6 | 1.31 | 4 | 45 | 14,000 ▌ |
| 01-00336-01006 | | 2° | 6 | 1.42 | 4 | 45 | 14,000 ▌ |
| 01-00336-01008 | | 3° | 6 | 1.63 | 4 | 45 | 14,000 ▌ |
| 01-00336-01010 | | 4° | 6 | 1.84 | 4 | 45 | 16,500 ▌ |
| 01-00336-01012 | | 5° | 6 | 2.05 | 4 | 45 | 21,000 ▌ |
| 01-00336-01016 | | 7° | 6 | 2.47 | 4 | 45 | 22,400 ▌ |
| 01-00336-01019 | | 10° | 6 | 3.12 | 4 | 45 | 23,000 ▌ |
| 01-00336-01024 | | 15° | 6 | 4.22 | 6 | 45 | 26,400 ▌ |
| 01-00336-01502 | 1.5 | 30′ | 8 | 1.64 | 4 | 45 | 14,000 ▌ |
| 01-00336-01504 | | 1° | 8 | 1.78 | 4 | 45 | 14,000 ▌ |
| 01-00336-01505 | | 1°30′ | 8 | 1.92 | 4 | 45 | 14,000 ▌ |
| 01-00336-01506 | | 2° | 8 | 2.06 | 4 | 45 | 14,000 ▌ |
| 01-00336-01508 | | 3° | 8 | 2.34 | 4 | 45 | 14,000 ▌ |
| 01-00336-01510 | | 4° | 8 | 2.62 | 4 | 45 | 15,700 ▌ |
| 01-00336-01512 | | 5° | 8 | 2.90 | 4 | 45 | 18,000 ▌ |
| 01-00336-01516 | | 7° | 8 | 3.46 | 4 | 45 | 20,400 ▌ |
| 01-00336-01519 | | 10° | 8 | 4.32 | 6 | 45 | 22,400 ▌ |
| 01-00336-01524 | | 15° | 8 | 5.79 | 6 | 45 | 25,400 ▌ |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 01-00336-02002 | 2 | 30′ | 10 | 2.17 | 4 | 50 | 13,500 ▌ |
| 01-00336-02004 | | 1° | 10 | 2.35 | 4 | 50 | 13,500 ▌ |
| 01-00336-02005 | | 1°30′ | 10 | 2.52 | 4 | 50 | 13,500 ▌ |
| 01-00336-02006 | | 2° | 10 | 2.70 | 4 | 50 | 13,500 ▌ |
| 01-00336-02008 | | 3° | 10 | 3.05 | 4 | 50 | 13,500 ▌ |
| 01-00336-02010 | | 4° | 10 | 3.40 | 4 | 50 | 14,200 ▌ |
| 01-00336-02012 | | 5° | 10 | 3.75 | 4 | 50 | 14,500 ▌ |
| 01-00336-02016 | | 7° | 10 | 4.46 | 6 | 50 | 17,400 ▌ |
| 01-00336-02019 | | 10° | 10 | 5.53 | 6 | 50 | 21,000 ▌ |
| 01-00336-02024 | | 15° | 10 | 7.36 | 6 | 55 | 27,500 ▌ |
| 01-00336-02502 | 2.5 | 30′ | 12 | 2.71 | 4 | 50 | 13,500 ▌ |
| 01-00336-02504 | | 1° | 12 | 2.92 | 4 | 50 | 13,500 ▌ |
| 01-00336-02505 | | 1°30′ | 12 | 3.13 | 4 | 50 | 13,500 ▌ |
| 01-00336-02506 | | 2° | 12 | 3.34 | 4 | 50 | 13,500 ▌ |
| 01-00336-02508 | | 3° | 12 | 3.76 | 4 | 50 | 13,500 ▌ |
| 01-00336-02510 | | 4° | 12 | 4.18 | 6 | 50 | 14,200 ▌ |
| 01-00336-02512 | | 5° | 12 | 4.60 | 6 | 50 | 14,500 ▌ |
| 01-00336-02516 | | 7° | 12 | 5.45 | 6 | 50 | 17,400 ▌ |
| 01-00336-02519 | | 10° | 12 | 6.73 | 8 | 60 | 24,500 ▌ |
| 01-00336-02524 | | 15° | 12 | 8.93 | 8 | 60 | 29,100 ▌ |
| 01-00336-03002 | 3 | 30′ | 15 | 3.26 | 6 | 55 | 14,500 ▌ |
| 01-00336-03004 | | 1° | 15 | 3.52 | 6 | 55 | 14,500 ▌ |
| 01-00336-03005 | | 1°30′ | 15 | 3.79 | 6 | 55 | 14,500 ▌ |
| 01-00336-03006 | | 2° | 15 | 4.05 | 6 | 55 | 14,500 ▌ |
| 01-00336-03008 | | 3° | 15 | 4.57 | 6 | 55 | 14,500 ▌ |
| 01-00336-03010 | | 4° | 15 | 5.10 | 6 | 55 | 15,400 ▌ |
| 01-00336-03012 | | 5° | 15 | 5.62 | 6 | 55 | 15,700 ▌ |
| 01-00336-03016 | | 7° | 15 | 6.68 | 6 | 55 | 20,400 ▌ |
| 01-00336-03019 | | 10° | 15 | 8.29 | 8 | 60 | 23,700 ▌ |
| 01-00336-03024 | | 15° | 15 | 11.04 | 10 | 65 | 29,100 ▌ |
| 01-00336-04002 | 4 | 30′ | 20 | 4.35 | 6 | 55 | 14,900 ▌ |
| 01-00336-04004 | | 1° | 20 | 4.70 | 6 | 55 | 14,900 ▌ |
| 01-00336-04005 | | 1°30′ | 20 | 5.05 | 6 | 55 | 14,900 ▌ |
| 01-00336-04006 | | 2° | 20 | 5.40 | 6 | 55 | 14,900 ▌ |

**オーダー方法**
NTEM-2X 先端径(D)×片角(θ)を指示してください。
When you order, indicate NTEM-2X (D)×(θ).

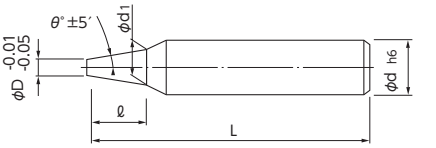


SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 01-00336-04008 | 4 | 3° | 20 | 6.10 | 6 | 55 | 17,300 |
| 01-00336-04010 | | 4° | 20 | 6.80 | 8 | 60 | 20,900 |
| 01-00336-04012 | | 5° | 20 | 7.50 | 8 | 60 | 21,700 |
| 01-00336-04016 | | 7° | 20 | 8.91 | 10 | 65 | 24,500 |
| 01-00336-04019 | | 10° | 20 | 11.05 | 10 | 70 | 28,600 |
| 01-00336-04024 | | 15° | 20 | 14.72 | 12 | 80 | 42,800 |
| 01-00336-05002 | 5 | 30′ | 25 | 5.44 | 6 | 65 | 17,700 |
| 01-00336-05004 | | 1° | 25 | 5.87 | 6 | 65 | 17,700 |
| 01-00336-05005 | | 1°30′ | 25 | 6.31 | 6 | 65 | 20,500 |
| 01-00336-05006 | | 2° | 25 | 6.75 | 6 | 65 | 20,500 |
| 01-00336-05008 | | 3° | 25 | 7.62 | 6 | 65 | 20,500 |
| 01-00336-05010 | | 4° | 25 | 8.50 | 8 | 70 | 25,200 |
| 01-00336-05012 | | 5° | 25 | 9.37 | 8 | 70 | 28,300 |
| 01-00336-05016 | | 7° | 25 | 11.14 | 10 | 70 | 32,200 |
| 01-00336-05019 | | 10° | 25 | 13.82 | 12 | 80 | 45,400 |
| 01-00336-05024 | | 15° | 25 | 18.40 | 16 | 90 | 62,900 |
| 01-00336-06002 | 6 | 30′ | 30 | 6.52 | 8 | 70 | 22,500 |
| 01-00336-06004 | | 1° | 30 | 7.05 | 8 | 70 | 22,500 |
| 01-00336-06005 | | 1°30′ | 30 | 7.57 | 8 | 70 | 22,500 |
| 01-00336-06006 | | 2° | 30 | 8.10 | 8 | 70 | 22,500 |
| 01-00336-06008 | | 3° | 30 | 9.14 | 10 | 80 | 22,500 |
| 01-00336-06010 | | 4° | 30 | 10.20 | 10 | 80 | 27,900 |
| 01-00336-06012 | | 5° | 30 | 11.25 | 10 | 80 | 31,000 |
| 01-00336-06016 | | 7° | 30 | 13.37 | 12 | 80 | 38,400 |
| 01-00336-06019 | | 10° | 30 | 16.58 | 16 | 90 | 59,600 |
| 01-00336-06024 | | 15° | 30 | 22.08 | 20 | 90 | 86,700 |

# NER-2

## 台形ランナーエンドミル
2-Flute Taper End Mill for Runner




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

Side Slot MG 2 30°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 01-00712-02001 | 2 | 7° | 5 | 3.22 | 4 | 45 | 11,700 ▌ |
| 01-00712-02501 | 2.5 | | 6 | 3.97 | 4 | 45 | 11,700 ▌ |
| 01-00712-03001 | 3 | | 7 | 4.71 | 6 | 55 | 12,500 ▌ |
| 01-00712-03501 | 3.5 | | 7 | 5.21 | 6 | 55 | 12,700 ▌ |
| 01-00712-04001 | 4 | | 8 | 5.96 | 6 | 55 | 12,700 ▌ |
| 01-00712-04501 | 4.5 | | 9 | 6.71 | 8 | 60 | 21,300 ▌ |
| 01-00712-05001 | 5 | | 10 | 7.45 | 8 | 60 | 22,000 ▌ |
| 01-00712-06001 | 6 | | 12 | 8.94 | 10 | 70 | 29,400 ▌ |
| 01-00712-02002 | 2 | 10° | 5 | 3.76 | 4 | 45 | 12,300 ▌ |
| 01-00712-02502 | 2.5 | | 6 | 4.61 | 6 | 55 | 13,700 ▌ |
| 01-00712-03002 | 3 | | 7 | 5.46 | 6 | 55 | 13,700 ▌ |
| 01-00712-03502 | 3.5 | | 7 | 5.96 | 6 | 55 | 15,000 ▌ |
| 01-00712-04002 | 4 | | 8 | 6.82 | 8 | 60 | 22,000 ▌ |
| 01-00712-04502 | 4.5 | | 9 | 7.67 | 8 | 60 | 22,000 ▌ |
| 01-00712-05002 | 5 | | 10 | 8.52 | 10 | 70 | 31,100 ▌ |
| 01-00712-06002 | 6 | | 12 | 10.23 | 10 | 70 | 34,000 ▌ |
| 01-00712-02003 | 2 | 12° | 5 | 4.12 | 4 | 45 | 13,000 ▌ |
| 01-00712-02503 | 2.5 | | 6 | 5.05 | 6 | 55 | 14,300 ▌ |
| 01-00712-03003 | 3 | | 7 | 5.97 | 6 | 55 | 14,300 ▌ |
| 01-00712-03503 | 3.5 | | 7 | 6.47 | 8 | 60 | 23,300 ▌ |
| 01-00712-04003 | 4 | | 8 | 7.40 | 8 | 60 | 23,300 ▌ |
| 01-00712-04503 | 4.5 | | 9 | 8.32 | 8 | 60 | 26,800 ▌ |
| 01-00712-05003 | 5 | | 10 | 9.25 | 10 | 70 | 33,700 ▌ |
| 01-00712-06003 | 6 | | 12 | 11.10 | 10 | 70 | 36,800 ▌ |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 01-00712-02004 | 2 | 15° | 5 | 4.68 | 6 | 55 | 13,700 ▌ |
| 01-00712-02504 | 2.5 | | 6 | 5.71 | 6 | 55 | 13,700 ▌ |
| 01-00712-03004 | 3 | | 7 | 6.75 | 6 | 55 | 17,400 ▌ |
| 01-00712-03504 | 3.5 | | 7 | 7.25 | 8 | 60 | 25,200 ▌ |
| 01-00712-04004 | 4 | | 8 | 8.28 | 8 | 60 | 25,200 ▌ |
| 01-00712-04504 | 4.5 | | 9 | 9.32 | 10 | 70 | 35,700 ▌ |
| 01-00712-05004 | 5 | | 10 | 10.35 | 10 | 70 | 35,700 ▌ |
| 01-00712-06004 | 6 | | 12 | 12.43 | 12 | 75 | 42,800 ▌ |

**オーダー方法** NER-2 先端径(D)×片角(θ)を指示してください。
When you order, indicate NER-2 (D)×(θ).

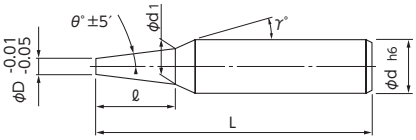
●切削条件表はG-024に記載
●Recommended Milling Conditions are shown on page G-024.



ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# NTE-2

## テーパーエンドミル
2-Flute Taper End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

Side Slot MG 2 30°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00312-00051 | 0.5 | 30′ | 2 | 0.53 | 9° | 3 | 35 | 12,000 ▌ |
| 01-00312-00052 | | 1° | 2 | 0.57 | 9° | 3 | 35 | 12,000 ▌ |
| 01-00312-00053 | | 1°30′ | 2 | 0.60 | 9° | 3 | 35 | 12,000 ▌ |
| 01-00312-00054 | | 2° | 2 | 0.64 | 9° | 3 | 35 | 12,000 ▌ |
| 01-00312-00055 | | 2°30′ | 2 | 0.67 | 9° | 3 | 35 | 12,000 ▌ |
| 01-00312-00056 | | 3° | 2 | 0.71 | 9° | 3 | 35 | 12,000 ▌ |
| 01-00313-00052 | | 5° | 2 | 0.85 | 9° | 3 | 35 | 19,700 ▌ |
| 01-00313-00054 | | 10° | 2 | 1.21 | 10° | 3 | 35 | 23,300 ▌ |
| 01-00313-00055 | | 15° | 2 | 1.57 | 15° | 3 | 35 | 27,900 ▌ |
| 01-00312-00061 | 0.6 | 30′ | 2 | 0.63 | 9° | 3 | 35 | 12,300 ▌ |
| 01-00312-00062 | | 1° | 2 | 0.67 | 9° | 3 | 35 | 12,300 ▌ |
| 01-00312-00063 | | 1°30′ | 2 | 0.70 | 9° | 3 | 35 | 12,300 ▌ |
| 01-00312-00064 | | 2° | 2 | 0.74 | 9° | 3 | 35 | 12,300 ▌ |
| 01-00312-00065 | | 2°30′ | 2 | 0.78 | 9° | 3 | 35 | 12,300 ▌ |
| 01-00312-00066 | | 3° | 2 | 0.81 | 9° | 3 | 35 | 12,300 ▌ |
| 01-00312-00071 | 0.7 | 30′ | 2 | 0.73 | 9° | 3 | 35 | 12,300 ▌ |
| 01-00312-00072 | | 1° | 2 | 0.77 | 9° | 3 | 35 | 12,300 ▌ |
| 01-00312-00073 | | 1°30′ | 2 | 0.80 | 9° | 3 | 35 | 12,300 ▌ |
| 01-00312-00074 | | 2° | 2 | 0.84 | 9° | 3 | 35 | 12,300 ▌ |
| 01-00312-00075 | | 2°30′ | 2 | 0.88 | 9° | 3 | 35 | 12,300 ▌ |
| 01-00312-00076 | | 3° | 2 | 0.91 | 9° | 3 | 35 | 12,300 ▌ |
| 01-00312-00081 | 0.8 | 30′ | 3 | 0.85 | 9° | 3 | 35 | 11,000 ▌ |
| 01-00312-00082 | | 1° | 3 | 0.90 | 9° | 3 | 35 | 11,000 ▌ |
| 01-00312-00083 | | 1°30′ | 3 | 0.96 | 9° | 3 | 35 | 11,000 ▌ |
| 01-00312-00084 | | 2° | 3 | 1.01 | 9° | 3 | 35 | 11,000 ▌ |
| 01-00312-00085 | | 2°30′ | 3 | 1.06 | 9° | 3 | 35 | 11,000 ▌ |
| 01-00312-00086 | | 3° | 3 | 1.11 | 9° | 3 | 35 | 11,000 ▌ |
| 01-00312-00091 | 0.9 | 30′ | 3 | 0.95 | 9° | 3 | 35 | 11,200 ▌ |
| 01-00312-00092 | | 1° | 3 | 1.00 | 9° | 3 | 35 | 11,200 ▌ |
| 01-00312-00093 | | 1°30′ | 3 | 1.06 | 9° | 3 | 35 | 11,200 ▌ |
| 01-00312-00094 | | 2° | 3 | 1.11 | 9° | 3 | 35 | 11,200 ▌ |
| 01-00312-00095 | | 2°30′ | 3 | 1.16 | 9° | 3 | 35 | 11,200 ▌ |
| 01-00312-00096 | | 3° | 3 | 1.21 | 9° | 3 | 35 | 11,200 ▌ |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00312-00101 | 1 | 30′ | 4 | 1.07 | 9° | 4 | 45 | 9,600 ▌ |
| 01-00312-00102 | | 1° | 4 | 1.14 | 9° | 4 | 45 | 9,600 ▌ |
| 01-00312-00103 | | 1°30′ | 4 | 1.21 | 9° | 4 | 45 | 9,600 ▌ |
| 01-00312-00104 | | 2° | 4 | 1.28 | 9° | 4 | 45 | 9,600 ▌ |
| 01-00312-00105 | | 2°30′ | 4 | 1.35 | 9° | 4 | 45 | 9,600 ▌ |
| 01-00312-00106 | | 3° | 4 | 1.42 | 9° | 4 | 45 | 9,600 ▌ |
| 01-00313-00101 | | 4° | 4 | 1.56 | 9° | 4 | 45 | 14,600 ▌ |
| 01-00312-00107 | | 5° | 4 | 1.70 | 9° | 4 | 45 | 15,000 ▌ |
| 01-00313-00103 | | 7° | 4 | 1.98 | 7° | 4 | 45 | 17,400 ▌ |
| 01-00312-00108 | | 10° | 4 | 2.41 | 10° | 4 | 45 | 16,000 ▌ |
| 01-00313-00105 | | 15° | 4 | 3.14 | 15° | 6 | 45 | 19,000 ▌ |
| 01-00313-00106 | | 20° | 4.12 | 4.00 | 20° | 6 | 45 | 28,800 ▌ |
| 01-00312-00151 | 1.5 | 30′ | 5 | 1.59 | 9° | 4 | 45 | 9,800 ▌ |
| 01-00312-00152 | | 1° | 5 | 1.67 | 9° | 4 | 45 | 9,800 ▌ |
| 01-00312-00153 | | 1°30′ | 5 | 1.76 | 9° | 4 | 45 | 9,800 ▌ |
| 01-00312-00154 | | 2° | 5 | 1.85 | 9° | 4 | 45 | 9,800 ▌ |
| 01-00312-00155 | | 2°30′ | 5 | 1.94 | 9° | 4 | 45 | 9,800 ▌ |
| 01-00312-00156 | | 3° | 5 | 2.02 | 9° | 4 | 45 | 9,800 ▌ |
| 01-00313-00151 | | 4° | 5 | 2.20 | 9° | 4 | 45 | 13,900 ▌ |
| 01-00312-00157 | | 5° | 5 | 2.37 | 9° | 4 | 45 | 12,700 ▌ |
| 01-00313-00153 | | 7° | 5 | 2.73 | 7° | 4 | 45 | 16,100 ▌ |
| 01-00312-00158 | | 10° | 5 | 3.26 | 10° | 4 | 45 | 16,000 ▌ |
| 01-00313-00155 | | 15° | 5 | 4.18 | 15° | 6 | 45 | 19,000 ▌ |
| 01-00313-00156 | | 20° | 6.18 | 6.00 | 20° | 6 | 50 | 31,700 ▌ |
| 01-00312-00201 | 2 | 30′ | 6 | 2.10 | 9° | 4 | 45 | 9,600 ▌ |
| 01-00312-00202 | | 1° | 6 | 2.21 | 9° | 4 | 45 | 9,600 ▌ |
| 01-00312-00203 | | 1°30′ | 6 | 2.31 | 9° | 4 | 45 | 9,600 ▌ |
| 01-00312-00204 | | 2° | 6 | 2.42 | 9° | 4 | 45 | 9,600 ▌ |
| 01-00312-00205 | | 2°30′ | 6 | 2.52 | 9° | 4 | 45 | 9,600 ▌ |
| 01-00312-00206 | | 3° | 6 | 2.63 | 9° | 4 | 45 | 9,600 ▌ |
| 01-00313-00201 | | 4° | 6 | 2.84 | 9° | 4 | 45 | 11,200 ▌ |
| 01-00312-00207 | | 5° | 6 | 3.05 | 5° | 4 | 45 | 10,000 ▌ |
| 01-00313-00203 | | 7° | 6 | 3.47 | 7° | 4 | 45 | 16,900 ▌ |
| 01-00312-00208 | | 10° | 6 | 4.12 | 10° | 6 | 45 | 16,000 ▌ |
| 01-00313-00205 | | 15° | 6 | 5.22 | 15° | 6 | 45 | 19,000 ▌ |
| 01-00313-00206 | | 20° | 6.5 | 6.73 | – | 6 | 50 | 36,800 ▌ |

オーダー方法 NTE-2 先端径(D)×片角(θ)を指示してください。
When you order, indicate NTE-2 (D)×(θ).

※(d1)及び(γ)は参考値です。
※(d1) and (γ) is reference value.

●切削条件表はG-025に記載
●Recommended Milling Conditions are shown on page G-025.





ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# NTE-2

## テーパーエンドミル
2-Flute Taper End Mill

● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00312-00251 | 2.5 | 30′ | 8 | 2.64 | 9° | 4 | 45 | 9,700 ▌ |
| 01-00312-00252 | | 1° | 8 | 2.78 | 9° | 4 | 45 | 9,700 ▌ |
| 01-00312-00253 | | 1°30′ | 8 | 2.92 | 9° | 4 | 45 | 9,700 ▌ |
| 01-00312-00254 | | 2° | 8 | 3.06 | 9° | 4 | 45 | 9,700 ▌ |
| 01-00312-00255 | | 2°30′ | 8 | 3.20 | 9° | 4 | 45 | 9,700 ▌ |
| 01-00312-00256 | | 3° | 8 | 3.34 | 3° | 4 | 45 | 9,700 ▌ |
| 01-00313-00251 | | 4° | 8 | 3.62 | 4° | 4 | 45 | 11,200 ▌ |
| 01-00312-00257 | | 5° | 8 | 3.90 | 5° | 4 | 45 | 10,600 ▌ |
| 01-00313-00253 | | 7° | 8 | 4.46 | 7° | 6 | 50 | 14,700 ▌ |
| 01-00313-00254 | | 10° | 8 | 5.32 | 10° | 6 | 50 | 16,300 ▌ |
| 01-00312-00301 | 3 | 30′ | 10 | 3.17 | 9° | 6 | 50 | 10,000 ▌ |
| 01-00312-00302 | | 1° | 10 | 3.35 | 9° | 6 | 50 | 10,000 ▌ |
| 01-00312-00303 | | 1°30′ | 10 | 3.52 | 9° | 6 | 50 | 10,000 ▌ |
| 01-00312-00304 | | 2° | 10 | 3.69 | 9° | 6 | 50 | 10,000 ▌ |
| 01-00312-00305 | | 2°30′ | 10 | 3.87 | 9° | 6 | 50 | 10,000 ▌ |
| 01-00312-00306 | | 3° | 10 | 4.05 | 9° | 6 | 50 | 10,000 ▌ |
| 01-00313-00301 | | 4° | 10 | 4.40 | 9° | 6 | 50 | 13,600 ▌ |
| 01-00313-00302 | | 5° | 10 | 4.75 | 5° | 6 | 50 | 11,200 ▌ |
| 01-00313-00303 | | 7° | 10 | 5.46 | 7° | 6 | 50 | 15,600 ▌ |
| 01-00313-00304 | | 10° | 10 | 6.53 | – | 6 | 50 | 24,500 ▌ |
| 01-00313-00305 | | 15° | 10 | 8.36 | – | 8 | 50 | 27,700 ▌ |
| 01-00313-00306 | | 20° | 10 | 10.28 | – | 10 | 70 | 44,400 ▌ |
| 01-00312-00401 | 4 | 30′ | 15 | 4.26 | 9° | 6 | 50 | 10,600 ▌ |
| 01-00312-00402 | | 1° | 15 | 4.52 | 9° | 6 | 50 | 10,600 ▌ |
| 01-00312-00403 | | 1°30′ | 15 | 4.79 | 9° | 6 | 50 | 10,600 ▌ |
| 01-00312-00404 | | 2° | 15 | 5.04 | 9° | 6 | 50 | 10,600 ▌ |
| 01-00312-00405 | | 2°30′ | 15 | 5.31 | 2°30′ | 6 | 50 | 10,600 ▌ |
| 01-00312-00406 | | 3° | 15 | 5.57 | 3° | 6 | 50 | 10,600 ▌ |
| 01-00313-00401 | | 4° | 15 | 6.10 | – | 6 | 55 | 19,200 ▌ |
| 01-00313-00402 | | 5° | 15 | 6.62 | – | 6 | 55 | 16,400 ▌ |
| 01-00313-00403 | | 7° | 15 | 7.68 | – | 6 | 55 | 24,500 ▌ |
| 01-00313-00404 | | 10° | 15 | 9.29 | – | 8 | 60 | 27,000 ▌ |
| 01-00312-00501 | 5 | 30′ | 20 | 5.34 | 9° | 6 | 55 | 12,400 ▌ |
| 01-00312-00502 | | 1° | 20 | 5.70 | 9° | 6 | 55 | 12,400 ▌ |
| 01-00312-00503 | | 1°30′ | 20 | 6.04 | – | 6 | 55 | 14,500 ▌ |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00312-00504 | 5 | 2° | 20 | 6.39 | – | 6 | 55 | 14,500 ▌ |
| 01-00312-00505 | | 2°30′ | 20 | 6.74 | – | 6 | 55 | 14,500 ▌ |
| 01-00312-00506 | | 3° | 20 | 7.10 | – | 6 | 55 | 14,500 ▌ |
| 01-00313-00501 | | 4° | 20 | 7.80 | – | 6 | 60 | 21,900 ▌ |
| 01-00313-00502 | | 5° | 20 | 8.50 | – | 8 | 60 | 22,000 ▌ |
| 01-00313-00503 | | 7° | 20 | 9.91 | – | 8 | 60 | 30,700 ▌ |
| 01-00313-00504 | | 10° | 20 | 12.05 | – | 12 | 70 | 40,000 ▌ |
| 01-00312-00601 | 6 | 30′ | 20 | 6.35 | – | 6 | 55 | 16,100 ▌ |
| 01-00312-00602 | | 1° | 20 | 6.70 | – | 6 | 55 | 16,100 ▌ |
| 01-00312-00603 | | 1°30′ | 20 | 7.05 | – | 6 | 55 | 16,100 ▌ |
| 01-00312-00604 | | 2° | 20 | 7.40 | – | 6 | 55 | 16,100 ▌ |
| 01-00312-00605 | | 2°30′ | 20 | 7.75 | – | 6 | 55 | 16,100 ▌ |
| 01-00312-00606 | | 3° | 20 | 8.10 | – | 8 | 60 | 16,100 ▌ |
| 01-00313-00601 | | 4° | 20 | 8.80 | – | 8 | 65 | 24,700 ▌ |
| 01-00313-00602 | | 5° | 20 | 9.50 | – | 8 | 65 | 24,000 ▌ |
| 01-00313-00603 | | 7° | 20 | 10.91 | – | 10 | 70 | 32,800 ▌ |
| 01-00313-00604 | | 10° | 20 | 13.05 | – | 12 | 80 | 54,800 ▌ |
| 01-00312-00801 | 8 | 30′ | 25 | 8.44 | – | 8 | 65 | 21,700 ▌ |
| 01-00312-00802 | | 1° | 25 | 8.87 | – | 8 | 65 | 22,500 ▌ |
| 01-00312-00803 | | 1°30′ | 25 | 9.31 | – | 8 | 65 | 24,000 ▌ |
| 01-00312-00804 | | 2° | 25 | 9.74 | – | 8 | 65 | 25,200 ▌ |
| 01-00312-00805 | | 2°30′ | 25 | 10.18 | – | 10 | 70 | 27,500 ▌ |
| 01-00312-00806 | | 3° | 25 | 10.62 | – | 10 | 70 | 29,900 ▌ |
| 01-00313-00801 | | 4° | 25 | 11.50 | – | 10 | 80 | 47,900 ▌ |
| 01-00313-00802 | | 5° | 25 | 12.37 | – | 12 | 90 | 53,200 ▌ |
| 01-00313-00803 | | 7° | 25 | 14.14 | – | 12 | 90 | 67,900 ▌ |
| 01-00313-00804 | | 10° | 25 | 16.81 | – | 16 | 90 | 80,900 ▌ |
| 01-00312-01001 | 10 | 30′ | 35 | 10.61 | – | 10 | 85 | 35,700 ▌ |
| 01-00312-01002 | | 1° | 35 | 11.22 | – | 10 | 85 | 38,300 ▌ |
| 01-00312-01003 | | 1°30′ | 35 | 11.83 | – | 10 | 85 | 41,100 ▌ |
| 01-00312-01004 | | 2° | 35 | 12.44 | – | 12 | 90 | 49,900 ▌ |
| 01-00312-01005 | | 2°30′ | 35 | 13.06 | – | 12 | 90 | 53,200 ▌ |
| 01-00312-01006 | | 3° | 35 | 13.67 | – | 12 | 90 | 58,000 ▌ |
| 01-00313-01001 | | 4° | 35 | 14.89 | – | 12 | 90 | 73,600 ▌ |
| 01-00313-01002 | | 5° | 35 | 16.12 | – | 16 | 90 | 70,200 ▌ |
| 01-00313-01003 | | 7° | 35 | 18.59 | – | 16 | 90 | 88,500 ▌ |
| 01-00313-01004 | | 10° | 35 | 22.34 | – | 20 | 110 | 108,300 ▌ |

**オーダー方法** NTE-2 先端径(D)×片角(θ)を指示してください。
When you order, indicate NTE-2 (D)×(θ).

※(d1)及び(γ)は参考値です。
※(d1) and (γ) is reference value.

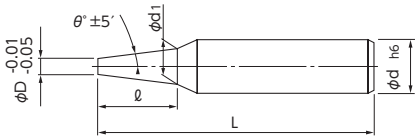
●切削条件表はG-025に記載
●Recommended Milling Conditions are shown on page G-025.



SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

# NTEM-2

## テーパーミディアム刃エンドミル
2-Flute Medium Taper End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

Side Slot MG 2 30°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

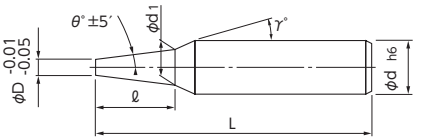
| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 01-00332-01010 | 1 | 4° | 5 | 1.70 | 4 | 50 | 10,500 ▌ |
| 01-00332-01016 | | 7° | 5 | 2.23 | 4 | 50 | 17,000 ▌ |
| 01-00332-01024 | | 15° | 5 | 3.68 | 4 | 50 | 22,400 ▌ |
| 01-00332-01510 | 1.5 | 4° | 7.5 | 2.55 | 4 | 50 | 14,900 ▌ |
| 01-00332-01516 | | 7° | 7.5 | 3.34 | 4 | 50 | 15,800 ▌ |
| 01-00332-01524 | | 15° | 7.5 | 5.52 | 6 | 50 | 22,400 ▌ |
| 01-00332-02010 | 2 | 4° | 10 | 3.40 | 4 | 50 | 12,000 ▌ |
| 01-00332-02016 | | 7° | 10 | 4.46 | 6 | 50 | 18,000 ▌ |
| 01-00332-02024 | | 15° | 10 | 7.36 | 8 | 55 | 26,000 ▌ |
| 01-00332-02510 | 2.5 | 4° | 12.5 | 4.25 | 6 | 50 | 12,000 ▌ |
| 01-00332-02516 | | 7° | 12.5 | 5.57 | 6 | 50 | 15,800 ▌ |
| 01-00332-02519 | | 10° | 12.5 | 6.91 | 6 | 55 | 20,300 ▌ |
| 01-00332-02524 | | 15° | 12.5 | 9.20 | 10 | 60 | 26,200 ▌ |
| 01-00332-02525 | | 20° | 12.5 | 11.60 | 12 | 65 | 44,400 ▌ |
| 01-00332-03002 | 3 | 30′ | 15 | 3.26 | 4 | 55 | 10,500 ▌ |
| 01-00332-03004 | | 1° | 15 | 3.52 | 4 | 55 | 10,500 ▌ |
| 01-00332-03005 | | 1°30′ | 15 | 3.79 | 4 | 55 | 10,500 ▌ |
| 01-00332-03006 | | 2° | 15 | 4.05 | 6 | 55 | 10,500 ▌ |
| 01-00332-03008 | | 3° | 15 | 4.57 | 6 | 55 | 10,500 ▌ |
| 01-00332-03010 | | 4° | 15 | 5.10 | 6 | 60 | 14,600 ▌ |
| 01-00332-03012 | | 5° | 15 | 5.62 | 6 | 60 | 11,400 ▌ |
| 01-00332-03016 | | 7° | 15 | 6.68 | 6 | 60 | 19,400 ▌ |
| 01-00332-03019 | | 10° | 15 | 8.29 | 8 | 65 | 20,900 ▌ |
| 01-00332-03024 | | 15° | 15 | 11.04 | 10 | 70 | 27,500 ▌ |
| 01-00332-03025 | | 20° | 15 | 13.92 | 12 | 75 | 46,800 ▌ |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 01-00332-04002 | 4 | 30′ | 20 | 4.35 | 6 | 60 | 10,800 ▌ |
| 01-00332-04004 | | 1° | 20 | 4.70 | 6 | 60 | 10,800 ▌ |
| 01-00332-04005 | | 1°30′ | 20 | 5.05 | 6 | 60 | 10,800 ▌ |
| 01-00332-04006 | | 2° | 20 | 5.40 | 6 | 60 | 10,800 ▌ |
| 01-00332-04008 | | 3° | 20 | 6.10 | 6 | 60 | 12,600 ▌ |
| 01-00332-04010 | | 4° | 20 | 6.80 | 6 | 60 | 19,500 ▌ |
| 01-00332-04012 | | 5° | 20 | 7.50 | 8 | 65 | 16,800 ▌ |
| 01-00332-04016 | | 7° | 20 | 8.91 | 8 | 70 | 24,900 ▌ |
| 01-00332-04019 | | 10° | 20 | 11.05 | 10 | 70 | 27,300 ▌ |
| 01-00332-04024 | | 15° | 20 | 14.72 | 12 | 75 | 36,000 ▌ |
| 01-00332-04025 | | 20° | 20 | 18.56 | 16 | 90 | 54,400 ▌ |

**オーダー方法**
NTEM-2 先端径(D)×片角(θ)を指示してください。
When you order, indicate NTEM-2 (D)×(θ).

# NTEL-2

## テーパーロング刃エンドミル
2-Flute Long Taper End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

Side Slot MG 2 40°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00322-00101 | 1 | 30′ | 10 | 1.17 | 9° | 4 | 45 | 12,500 ▌ |
| 01-00322-00102 | | 1° | 10 | 1.35 | 9° | 4 | 45 | 12,500 ▌ |
| 01-00322-00103 | | 1°30′ | 10 | 1.52 | 9° | 4 | 45 | 12,500 ▌ |
| 01-00322-00104 | | 2° | 10 | 1.70 | 9° | 4 | 45 | 12,500 ▌ |
| 01-00322-00105 | | 2°30′ | 10 | 1.87 | 9° | 4 | 45 | 12,500 ▌ |
| 01-00322-00106 | | 3° | 10 | 2.05 | 9° | 4 | 45 | 12,500 ▌ |
| 01-00323-00102 | | 5° | 10 | 2.75 | 9° | 4 | 45 | 20,600 ▌ |
| 01-00323-00104 | | 10° | 10 | 4.53 | 10° | 6 | 50 | 25,200 ▌ |
| 01-00323-00105 | | 15° | 9.3 | 6.00 | 15° | 6 | 60 | 32,500 ▌ |
| 01-00323-00106 | | 20° | 8 | 6.82 | – | 6 | 60 | 42,200 ▌ |
| 01-00322-00151 | 1.5 | 30′ | 10 | 1.67 | 9° | 4 | 45 | 12,500 ▌ |
| 01-00322-00152 | | 1° | 10 | 1.85 | 9° | 4 | 45 | 12,500 ▌ |
| 01-00322-00153 | | 1°30′ | 10 | 2.02 | 9° | 4 | 45 | 12,500 ▌ |
| 01-00322-00154 | | 2° | 10 | 2.20 | 9° | 4 | 45 | 12,500 ▌ |
| 01-00322-00155 | | 2°30′ | 10 | 2.37 | 9° | 4 | 45 | 12,500 ▌ |
| 01-00322-00156 | | 3° | 10 | 2.55 | 9° | 4 | 45 | 12,500 ▌ |
| 01-00323-00152 | | 5° | 10 | 3.25 | 9° | 4 | 45 | 17,300 ▌ |
| 01-00323-00154 | | 10° | 10 | 5.03 | 10° | 6 | 50 | 25,900 ▌ |
| 01-00323-00155 | | 15° | 10 | 6.86 | – | 6 | 60 | 39,200 ▌ |
| 01-00323-00156 | | 20° | 10 | 8.78 | – | 8 | 65 | 45,500 ▌ |
| 01-00322-00201 | 2 | 30′ | 13 | 2.22 | 9° | 4 | 50 | 12,500 ▌ |
| 01-00322-00202 | | 1° | 13 | 2.45 | 9° | 4 | 50 | 12,500 ▌ |
| 01-00322-00203 | | 1°30′ | 13 | 2.68 | 9° | 4 | 50 | 12,500 ▌ |
| 01-00322-00204 | | 2° | 13 | 2.90 | 9° | 4 | 50 | 12,500 ▌ |
| 01-00322-00205 | | 2°30′ | 13 | 3.13 | 9° | 4 | 50 | 12,500 ▌ |
| 01-00322-00206 | | 3° | 13 | 3.36 | 3° | 4 | 50 | 12,500 ▌ |
| 01-00322-00207 | | 5° | 13 | 4.27 | 9° | 6 | 50 | 14,100 ▌ |
| 01-00323-00204 | | 10° | 13 | 6.58 | – | 6 | 60 | 30,000 ▌ |
| 01-00323-00205 | | 15° | 13 | 8.97 | – | 8 | 65 | 42,200 ▌ |
| 01-00323-00206 | | 20° | 13 | 11.46 | – | 10 | 80 | 52,700 ▌ |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00322-00251 | 2.5 | 30′ | 15 | 2.76 | 9° | 4 | 55 | 12,700 ▌ |
| 01-00322-00252 | | 1° | 15 | 3.03 | 9° | 4 | 55 | 12,700 ▌ |
| 01-00322-00253 | | 1°30′ | 15 | 3.29 | 9° | 4 | 55 | 12,700 ▌ |
| 01-00322-00254 | | 2° | 15 | 3.55 | 2° | 4 | 55 | 12,700 ▌ |
| 01-00322-00255 | | 2°30′ | 15 | 3.81 | 2°30′ | 4 | 55 | 12,700 ▌ |
| 01-00322-00256 | | 3° | 15 | 4.07 | – | 4 | 55 | 12,700 ▌ |
| 01-00322-00257 | | 5° | 15 | 5.13 | 5° | 6 | 55 | 14,100 ▌ |
| 01-00323-00304 | 3 | 10° | 20 | 10.05 | – | 10 | 70 | 49,100 ▌ |
| 01-00323-00305 | | 15° | 20 | 13.72 | – | 12 | 80 | 66,300 ▌ |
| 01-00323-00306 | | 20° | 20 | 17.56 | – | 16 | 100 | 107,300 ▌ |

オーダー方法 NTEL-2 先端径(D)×片角(θ)を指示してください。
When you order, indicate NTEL-2 (D)×(θ).

※(d1)及び(γ)は参考値です。
※(d1) and (γ) is reference value.

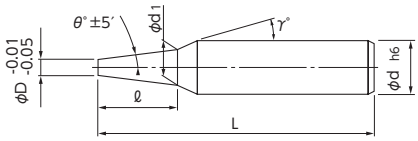
●切削条件表はG-026に記載
●Recommended Milling Conditions are shown on page G-026.



SEVKET GÜLÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# NTE-4

## テーパーエンドミル
4-Flute Taper End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

Side Slot MG 4 30°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ○ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00314-00301 | 3 | 30′ | 10 | 3.17 | 9° | 6 | 50 | 10,000 ▌ |
| 01-00314-00302 | | 1° | 10 | 3.35 | 9° | 6 | 50 | 10,000 ▌ |
| 01-00314-00303 | | 1°30′ | 10 | 3.52 | 9° | 6 | 50 | 10,000 ▌ |
| 01-00314-00304 | | 2° | 10 | 3.69 | 9° | 6 | 50 | 10,000 ▌ |
| 01-00314-00305 | | 2°30′ | 10 | 3.87 | 9° | 6 | 50 | 10,000 ▌ |
| 01-00314-00306 | | 3° | 10 | 4.05 | 9° | 6 | 50 | 10,000 ▌ |
| 01-00315-00301 | | 4° | 10 | 4.40 | 9° | 6 | 50 | 13,600 ▌ |
| 01-00314-00307 | | 5° | 10 | 4.75 | 5° | 6 | 50 | 11,200 ▌ |
| 01-00315-00303 | | 7° | 10 | 5.46 | 7° | 6 | 50 | 15,600 ▌ |
| 01-00315-00304 | | 10° | 10 | 6.53 | – | 6 | 50 | 19,500 ▌ |
| 01-00315-00305 | | 15° | 10 | 8.36 | – | 8 | 50 | 23,800 ▌ |
| 01-00314-00401 | 4 | 30′ | 15 | 4.26 | 9° | 6 | 50 | 10,600 ▌ |
| 01-00314-00402 | | 1° | 15 | 4.52 | 9° | 6 | 50 | 10,600 ▌ |
| 01-00314-00403 | | 1°30′ | 15 | 4.79 | 9° | 6 | 50 | 10,600 ▌ |
| 01-00314-00404 | | 2° | 15 | 5.04 | 9° | 6 | 50 | 10,600 ▌ |
| 01-00314-00405 | | 2°30′ | 15 | 5.31 | 2°30′ | 6 | 50 | 10,600 ▌ |
| 01-00314-00406 | | 3° | 15 | 5.57 | 3° | 6 | 50 | 10,600 ▌ |
| 01-00315-00401 | | 4° | 15 | 6.10 | – | 6 | 55 | 19,200 ▌ |
| 01-00314-00407 | | 5° | 15 | 6.62 | – | 6 | 55 | 16,400 ▌ |
| 01-00315-00403 | | 7° | 15 | 7.68 | – | 6 | 55 | 24,500 ▌ |
| 01-00315-00404 | | 10° | 15 | 9.29 | – | 8 | 60 | 27,000 ▌ |
| 01-00314-00501 | 5 | 30′ | 20 | 5.34 | 9° | 6 | 55 | 12,400 ▌ |
| 01-00314-00502 | | 1° | 20 | 5.70 | 9° | 6 | 55 | 12,400 ▌ |
| 01-00314-00503 | | 1°30′ | 20 | 6.04 | – | 6 | 55 | 14,500 ▌ |
| 01-00314-00504 | | 2° | 20 | 6.39 | – | 6 | 55 | 14,500 ▌ |
| 01-00314-00505 | | 2°30′ | 20 | 6.74 | – | 6 | 55 | 14,500 ▌ |
| 01-00314-00506 | | 3° | 20 | 7.10 | – | 6 | 55 | 14,500 ▌ |
| 01-00315-00501 | | 4° | 20 | 7.80 | – | 6 | 60 | 21,900 ▌ |
| 01-00314-00507 | | 5° | 20 | 8.50 | – | 8 | 60 | 22,000 ▌ |
| 01-00315-00503 | | 7° | 20 | 9.91 | – | 8 | 60 | 30,700 ▌ |
| 01-00315-00504 | | 10° | 20 | 12.05 | – | 12 | 70 | 40,000 ▌ |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00314-00601 | 6 | 30′ | 20 | 6.35 | – | 6 | 55 | 16,100 ▌ |
| 01-00314-00602 | | 1° | 20 | 6.70 | – | 6 | 55 | 16,100 ▌ |
| 01-00314-00603 | | 1°30′ | 20 | 7.05 | – | 6 | 55 | 16,100 ▌ |
| 01-00314-00604 | | 2° | 20 | 7.40 | – | 6 | 55 | 16,100 ▌ |
| 01-00314-00605 | | 2°30′ | 20 | 7.75 | – | 6 | 55 | 16,100 ▌ |
| 01-00314-00606 | | 3° | 20 | 8.10 | – | 8 | 60 | 16,100 ▌ |
| 01-00315-00601 | | 4° | 20 | 8.80 | – | 8 | 65 | 24,700 ▌ |
| 01-00314-00607 | | 5° | 20 | 9.50 | – | 8 | 65 | 24,000 ▌ |
| 01-00315-00603 | | 7° | 20 | 10.91 | – | 10 | 70 | 32,800 ▌ |
| 01-00315-00604 | | 10° | 20 | 13.05 | – | 12 | 80 | 54,800 ▌ |
| ▲ 01-00314-00801 | 8 | 30′ | 25 | 8.44 | – | 8 | 65 | 19,700 ▌ |
| ▲ 01-00314-00802 | | 1° | 25 | 8.87 | – | 8 | 65 | 20,400 ▌ |
| ▲ 01-00314-00803 | | 1°30′ | 25 | 9.31 | – | 8 | 65 | 21,800 ▌ |
| ▲ 01-00314-00804 | | 2° | 25 | 9.74 | – | 8 | 65 | 22,900 ▌ |
| ▲ 01-00314-00805 | | 2°30′ | 25 | 10.18 | – | 10 | 70 | 25,000 ▌ |
| ▲ 01-00314-00806 | | 3° | 25 | 10.62 | – | 10 | 70 | 27,100 ▌ |
| 01-00315-00801 | | 4° | 25 | 11.50 | – | 10 | 80 | 47,900 ▌ |
| ▲ 01-00314-00807 | | 5° | 25 | 12.37 | – | 12 | 90 | 48,300 ▌ |
| 01-00315-00803 | | 7° | 25 | 14.14 | – | 12 | 90 | 67,900 ▌ |
| 01-00315-00804 | | 10° | 25 | 16.81 | – | 16 | 90 | 80,900 ▌ |
| ▲ 01-00314-01001 | 10 | 30′ | 35 | 10.61 | – | 10 | 85 | 32,400 ▌ |
| ▲ 01-00314-01002 | | 1° | 35 | 11.22 | – | 10 | 85 | 34,800 ▌ |
| ▲ 01-00314-01003 | | 1°30′ | 35 | 11.83 | – | 10 | 85 | 37,300 ▌ |
| ▲ 01-00314-01004 | | 2° | 35 | 12.44 | – | 12 | 90 | 45,300 ▌ |
| ▲ 01-00314-01005 | | 2°30′ | 35 | 13.06 | – | 12 | 90 | 48,300 ▌ |
| ▲ 01-00314-01006 | | 3° | 35 | 13.67 | – | 12 | 90 | 52,700 ▌ |
| 01-00315-01001 | | 4° | 35 | 14.89 | – | 12 | 90 | 73,600 ▌ |
| ▲ 01-00314-01007 | | 5° | 35 | 16.12 | – | 16 | 90 | 63,800 ▌ |
| 01-00315-01003 | | 7° | 35 | 18.59 | – | 16 | 90 | 88,500 ▌ |
| 01-00315-01004 | | 10° | 35 | 22.34 | – | 20 | 110 | 108,300 ▌ |

**オーダー方法** NTE-4 先端径(D)×片角(θ)を指示してください。
When you order, indicate NTE-4 (D)×(θ).

※(d1)及び(γ)は参考値です。
※(d1) and (γ) is reference value.
●切削条件表はG-027に記載
●Recommended Milling Conditions are shown on page G-027.





SEVKET GÜLÜ MAKINA TICARET VE SAN. LTD. ŞTI.

# NTE-4

## テーパーエンドミル
4-Flute Taper End Mill

● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00314-01201 | 12 | 30′ | 55 | 12.96 | – | 12 | 110 | 82,800 ▌ |
| 01-00314-01202 | | 1° | 55 | 13.92 | – | 12 | 110 | 91,900 ▌ |
| 01-00314-01203 | | 1°30′ | 55 | 14.88 | – | 12 | 110 | 105,900 ▌ |
| 01-00314-01204 | | 2° | 55 | 15.84 | 2° | 16 | 110 | 110,300 ▌ |
| 01-00314-01205 | | 2°30′ | 55 | 16.80 | – | 16 | 110 | 119,500 ▌ |
| 01-00314-01206 | | 3° | 55 | 17.76 | – | 16 | 110 | 132,800 ▌ |
| 01-00315-01201 | | 4° | 55 | 19.69 | 4° | 20 | 110 | 165,500 ▌ |
| 01-00315-01202 | | 5° | 55 | 21.62 | – | 20 | 120 | 202,200 ▌ |
| 01-00315-01203 | | 7° | 55 | 25.51 | – | 25 | 120 | 247,800 ▌ |
| 01-00315-01204 | | 10° | 55 | 31.39 | – | 25 | 120 | 313,300 ▌ |
| 01-00314-01601 | 16 | 30′ | 65 | 17.13 | – | 16 | 130 | 149,000 ▌ |
| 01-00314-01602 | | 1° | 65 | 18.27 | – | 16 | 130 | 158,300 ▌ |
| 01-00314-01603 | | 1°30′ | 65 | 19.40 | – | 16 | 130 | 168,200 ▌ |
| 01-00314-01604 | | 2° | 65 | 20.53 | – | 20 | 130 | 201,800 ▌ |
| 01-00314-01605 | | 2°30′ | 65 | 21.68 | – | 20 | 130 | 211,500 ▌ |
| 01-00314-01606 | | 3° | 65 | 22.81 | – | 20 | 130 | 235,400 ▌ |
| 01-00315-01601 | | 4° | 65 | 25.09 | – | 25 | 140 | 277,800 ▌ |
| 01-00315-01602 | | 5° | 65 | 27.37 | – | 25 | 140 | 321,900 ▌ |
| 01-00315-01603 | | 7° | 65 | 31.96 | 7° | 32 | 140 | 427,400 ▌ |
| 01-00315-01604 | | 10° | 65 | 38.92 | – | 32 | 140 | 557,000 ▌ |

**オーダー方法** NTE-4 先端径(D)×片角(θ)を指示してください。
When you order, indicate NTE-4 (D)×(θ).

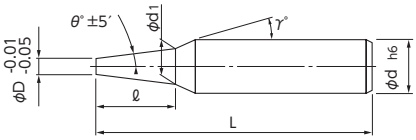
※($d_1$)及び(γ)は参考値です。
※($d_1$) and (γ) is reference value.
●切削条件表はG-027に記載
●Recommended Milling Conditions are shown on page G-027.



ŞEVKET ÖĞÜT® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# NTEL-4

## テーパーロング刃エンドミル
4-Flute Long Taper End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

Side Slot MG 4 40°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00324-00301 | 3 | 30′ | 20 | 3.35 | 9° | 6 | 60 | 14,100 ▌ |
| 01-00324-00302 | | 1° | 20 | 3.70 | 9° | 6 | 60 | 14,100 ▌ |
| 01-00324-00303 | | 1°30′ | 20 | 4.05 | 9° | 6 | 60 | 14,100 ▌ |
| 01-00324-00304 | | 2° | 20 | 4.40 | 9° | 6 | 60 | 14,100 ▌ |
| 01-00324-00305 | | 2°30′ | 20 | 4.75 | 9° | 6 | 60 | 14,100 ▌ |
| 01-00324-00306 | | 3° | 20 | 5.10 | 3° | 6 | 60 | 14,100 ▌ |
| 01-00325-00301 | | 4° | 20 | 5.80 | 4° | 6 | 60 | 16,700 ▌ |
| 01-00324-00307 | | 5° | 20 | 6.50 | – | 6 | 60 | 19,200 ▌ |
| 01-00324-00401 | 4 | 30′ | 25 | 4.44 | 9° | 6 | 60 | 16,500 ▌ |
| 01-00324-00402 | | 1° | 25 | 4.88 | 9° | 6 | 60 | 16,500 ▌ |
| 01-00324-00403 | | 1°30′ | 25 | 5.31 | 9° | 6 | 60 | 16,500 ▌ |
| 01-00324-00404 | | 2° | 25 | 5.75 | 2° | 6 | 60 | 16,500 ▌ |
| 01-00324-00405 | | 2°30′ | 25 | 6.19 | – | 6 | 60 | 19,200 ▌ |
| 01-00324-00406 | | 3° | 25 | 6.62 | 9° | 8 | 60 | 22,400 ▌ |
| 01-00325-00401 | | 4° | 25 | 7.50 | 4° | 8 | 65 | 26,100 ▌ |
| 01-00324-00407 | | 5° | 25 | 8.38 | – | 8 | 65 | 23,800 ▌ |
| 01-00324-00501 | 5 | 30′ | 30 | 5.52 | 9° | 6 | 65 | 17,700 ▌ |
| 01-00324-00502 | | 1° | 30 | 6.05 | – | 6 | 65 | 20,600 ▌ |
| 01-00324-00503 | | 1°30′ | 30 | 6.57 | 9° | 8 | 65 | 23,800 ▌ |
| 01-00324-00504 | | 2° | 30 | 7.09 | 9° | 8 | 70 | 23,800 ▌ |
| 01-00324-00505 | | 2°30′ | 30 | 7.62 | 2°30′ | 8 | 70 | 24,500 ▌ |
| 01-00324-00506 | | 3° | 30 | 8.14 | – | 8 | 75 | 24,500 ▌ |
| 01-00325-00501 | | 4° | 30 | 9.20 | 4° | 10 | 80 | 32,500 ▌ |
| 01-00324-00507 | | 5° | 30 | 10.25 | – | 10 | 80 | 29,600 ▌ |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00324-00601 | 6 | 30′ | 35 | 6.61 | 9° | 8 | 70 | 23,800 ▌ |
| 01-00324-00602 | | 1° | 35 | 7.22 | 9° | 8 | 70 | 23,800 ▌ |
| 01-00324-00603 | | 1°30′ | 35 | 7.83 | 1°30′ | 8 | 70 | 23,800 ▌ |
| 01-00324-00604 | | 2° | 35 | 8.44 | – | 8 | 80 | 28,600 ▌ |
| 01-00324-00605 | | 2°30′ | 35 | 9.05 | 9° | 10 | 85 | 34,100 ▌ |
| 01-00324-00606 | | 3° | 35 | 9.67 | – | 10 | 85 | 34,100 ▌ |
| 01-00325-00601 | | 4° | 35 | 10.89 | – | 10 | 90 | 54,500 ▌ |
| 01-00324-00607 | | 5° | 35 | 12.12 | – | 12 | 90 | 57,600 ▌ |

**オーダー方法** NTEL-4 先端径(D)×片角(θ)を指示してください。
When you order, indicate NTEL-4 (D)×(θ).

※(d1)及び(γ)は参考値です。
※(d1) and (γ) is reference value.

●切削条件表はG-027に記載
●Recommended Milling Conditions are shown on page G-027.

# NER-2

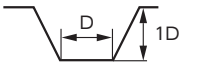
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM・SKD・SUS | | | 調質鋼 Prehardened Steels HPM・NAK | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | | 33～37m/min | | | 30～32m/min | | | 16～20m/min | | |
| 先端径 Dia. | 片　角 Taper Angle | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting | min$^{-1}$ | mm/min 側面 Side Milling | mm/min 溝 Slotting |
| 2 | 7～10° | 4,300 | 120 | 60 | 3,700 | 100 | 50 | 3,100 | 70 | 35 |
| | 12～15° | 3,800 | 130 | 65 | 3,200 | 110 | 55 | 2,700 | 80 | 40 |
| 2.5 | 7～10° | 3,400 | 120 | 60 | 3,000 | 100 | 50 | 2,450 | 70 | 35 |
| | 12～15° | 3,000 | 130 | 65 | 2,600 | 110 | 55 | 2,150 | 80 | 40 |
| 3 | 7～10° | 2,900 | 120 | 60 | 2,450 | 100 | 50 | 2,050 | 70 | 35 |
| | 12～15° | 2,500 | 130 | 65 | 2,150 | 110 | 55 | 1,800 | 80 | 40 |
| 3.5 | 7～10° | 2,450 | 120 | 60 | 2,100 | 100 | 50 | 1,750 | 70 | 35 |
| | 12～15° | 2,100 | 130 | 65 | 1,800 | 110 | 55 | 1,500 | 80 | 40 |
| 4 | 7～10° | 2,100 | 120 | 60 | 1,800 | 100 | 50 | 1,500 | 70 | 35 |
| | 12～15° | 1,900 | 130 | 65 | 1,600 | 110 | 55 | 1,350 | 80 | 40 |
| 4.5 | 7～10° | 1,900 | 120 | 60 | 1,600 | 100 | 50 | 1,400 | 70 | 35 |
| | 12～15° | 1,650 | 130 | 65 | 1,400 | 110 | 55 | 1,200 | 80 | 40 |
| 5 | 7～10° | 1,700 | 120 | 60 | 1,500 | 100 | 50 | 1,250 | 70 | 35 |
| | 12～15° | 1,500 | 130 | 65 | 1,300 | 110 | 55 | 1,100 | 80 | 40 |
| 6 | 7～10° | 1,400 | 120 | 60 | 1,200 | 100 | 50 | 1,000 | 70 | 35 |
| | 12～15° | 1,250 | 130 | 65 | 1,100 | 110 | 55 | 900 | 80 | 40 |

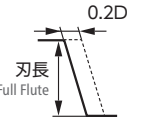
切り込み量 Depth of Cut

(D:先端径 Dia.)

テーパー溝切削 Taper Slotting




テーパー側面 Taper Side Milling




備　考 Notes

※剛性及び精度の高いチャック、機械を使用してください。
※切削油を必ず使用してください。
※回転数と送り速度は、同じ割合で調整してください。
※Use a high rigid and precise machine and chuck holder.
※Use cutting fluid.
※Adjust both spindle speed and feed at the same rate.



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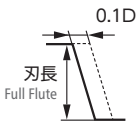
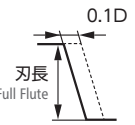
# NTE-2

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM・SKD・SUS | | 調質鋼 Prehardened Steels HPM・NAK | |
|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 35m/min | | 30m/min | | 25m/min | |
| 先端径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 0.5 | 22,000 | 70 | 19,000 | 45 | 16,000 | 30 |
| 0.6 | 19,000 | 70 | 16,000 | 45 | 13,000 | 30 |
| 0.7 | 16,000 | 70 | 13,600 | 45 | 11,400 | 30 |
| 0.8 | 14,000 | 110 | 12,000 | 70 | 10,000 | 50 |
| 0.9 | 12,400 | 110 | 10,600 | 70 | 8,800 | 50 |
| 1 | 11,000 | 160 | 9,500 | 130 | 8,000 | 100 |
| 1.5 | 7,400 | 160 | 6,400 | 130 | 5,300 | 100 |
| 2 | 5,600 | 160 | 4,800 | 130 | 4,000 | 100 |
| 2.5 | 4,500 | 160 | 3,800 | 130 | 3,200 | 100 |
| 切り込み量 Depth of Cut (D:先端径 Dia.) | テーパー側面 Taper Side Milling   | | | | | |
| 備　考 Notes | ※切削油を使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※側面加工ではダウンカットをお奨めします。<br>※Use cutting fluid.<br>※Adjust both spindle speed and feed at the same rate.<br>※We recommend a down-cut at side milling. | | | | | |

# NTEL-2

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM・SKD・SUS | | 調質鋼 Prehardened Steels HPM・NAK | |
|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 17m/min | | 15m/min | | 12m/min | |
| 先端径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 0.5 | 11,000 | 35 | 9,500 | 20 | 8,000 | 15 |
| 0.6 | 9,500 | 35 | 8,000 | 20 | 6,500 | 15 |
| 0.7 | 8,000 | 35 | 6,800 | 20 | 5,700 | 15 |
| 0.8 | 7,000 | 55 | 6,000 | 35 | 5,000 | 25 |
| 0.9 | 6,200 | 55 | 5,300 | 35 | 4,400 | 25 |
| 1 | 5,500 | 80 | 4,750 | 65 | 4,000 | 50 |
| 1.5 | 3,700 | 80 | 3,200 | 65 | 2,650 | 50 |
| 2 | 2,800 | 80 | 2,400 | 65 | 2,000 | 50 |
| 2.5 | 2,250 | 80 | 1,900 | 65 | 1,600 | 50 |
| 切り込み量 Depth of Cut (D:先端径 Dia.) | テーパー側面 Taper Side Milling   | | | | | |
| 備　考 Notes | ※切削油を使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※側面加工ではダウンカットをお奨めします。<br>※Use cutting fluid.<br>※Adjust both spindle speed and feed at the same rate.<br>※We recommend a down-cut at side milling. | | | | | |



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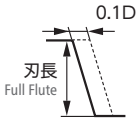
# NTE-4

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM･SKD･SUS | | 調質鋼 Prehardened Steels HPM･NAK | |
|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 35m/min | | 30m/min | | 25m/min | |
| 先端径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 3 | 3,700 | 220 | 3,200 | 180 | 2,650 | 130 |
| 4 | 2,800 | 220 | 2,400 | 180 | 2,000 | 130 |
| 5 | 2,200 | 220 | 1,900 | 180 | 1,600 | 130 |
| 6 | 1,900 | 220 | 1,600 | 180 | 1,300 | 130 |
| 8 | 1,400 | 220 | 1,200 | 180 | 1,000 | 130 |
| 10 | 1,100 | 220 | 950 | 180 | 800 | 130 |

切り込み量 Depth of Cut (D:先端径 Dia.)

テーパー側面 Taper Side Milling




備　考 Notes

※切削油を使用してください。
※回転数と送り速度は、同じ割合で調整してください。
※側面加工ではダウンカットをお奨めします。
※Use cutting fluid.
※Adjust both spindle speed and feed at the same rate.
※We recommend a down-cut at side milling.

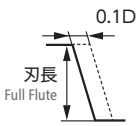
# NTEL-4

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | 合金鋼 Alloy Steels SCM･SKD･SUS | | 調質鋼 Prehardened Steels HPM･NAK | |
|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 17m/min | | 15m/min | | 12m/min | |
| 先端径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 3 | 1,850 | 110 | 1,600 | 90 | 1,300 | 65 |
| 4 | 1,400 | 110 | 1,200 | 90 | 1,000 | 65 |
| 5 | 1,100 | 110 | 950 | 90 | 800 | 65 |
| 6 | 950 | 110 | 800 | 90 | 650 | 65 |

切り込み量 Depth of Cut (D:先端径 Dia.)

テーパー側面 Taper Side Milling

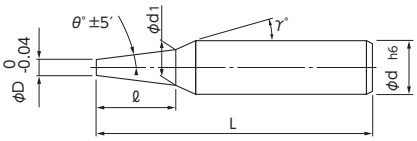



備　考 Notes

※切削油を使用してください。
※回転数と送り速度は、同じ割合で調整してください。
※側面加工ではダウンカットをお奨めします。
※Use cutting fluid.
※Adjust both spindle speed and feed at the same rate.
※We recommend a down-cut at side milling.

# NRF-4

## 深リブ用 リブフィニッシュテーパーエンドミル
4-Flute Taper End Mill for Deep Rib




(φ0.5のみ底刃2枚刃)
2 cutting edges on end. (D=0.5)

● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

Slot MG 4 -11°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | | | | | | | |

### ▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| ▲ 01-00425-00502 | 0.5 | 30′ | 2 | 0.53 | 9° | 4 | 55 | 10,500 ▌ |
| ▲ 01-00425-00504 | | 1° | | 0.57 | 9° | 4 | 55 | 10,500 ▌ |
| ▲ 01-00425-00505 | | 1°30′ | | 0.60 | 9° | 4 | 55 | 10,500 ▌ |
| ▲ 01-00425-00506 | | 2° | | 0.64 | 9° | 4 | 55 | 11,000 ▌ |
| ▲ 01-00425-00512 | | 30′ | 4 | 0.57 | 9° | 4 | 55 | 11,000 ▌ |
| ▲ 01-00425-00514 | | 1° | | 0.64 | 9° | 4 | 55 | 11,000 ▌ |
| ▲ 01-00425-00515 | | 1°30′ | | 0.71 | 9° | 4 | 55 | 11,000 ▌ |
| ▲ 01-00425-00516 | | 2° | | 0.78 | 9° | 4 | 55 | 11,500 ▌ |
| ▲ 01-00425-00518 | | 3° | | 0.92 | 9° | 4 | 55 | 11,500 ▌ |
| ▲ 01-00425-00522 | | 30′ | 6 | 0.60 | 9° | 4 | 55 | 12,000 ▌ |
| ▲ 01-00425-00524 | | 1° | | 0.71 | 9° | 4 | 55 | 11,500 ▌ |
| ▲ 01-00425-00525 | | 1°30′ | | 0.81 | 9° | 4 | 55 | 11,500 ▌ |
| ▲ 01-00425-00526 | | 2° | | 0.92 | 9° | 4 | 55 | 12,000 ▌ |
| ▲ 01-00425-00528 | | 3° | | 1.13 | 9° | 4 | 55 | 12,000 ▌ |
| ▲ 01-00425-00538 | | 3° | 8 | 1.34 | 9° | 4 | 60 | 13,000 ▌ |
| ▲ 01-00425-00812 | 0.8 | 30′ | 4 | 0.87 | 9° | 4 | 55 | 10,000 ▌ |
| ▲ 01-00425-00814 | | 1° | | 0.94 | 9° | 4 | 55 | 10,000 ▌ |
| ▲ 01-00425-00815 | | 1°30′ | | 1.01 | 9° | 4 | 55 | 10,000 ▌ |
| ▲ 01-00425-00822 | | 30′ | 6 | 0.90 | 9° | 4 | 55 | 10,500 ▌ |
| ▲ 01-00425-00824 | | 1° | | 1.01 | 9° | 4 | 55 | 10,500 ▌ |
| ▲ 01-00425-00825 | | 1°30′ | | 1.11 | 9° | 4 | 55 | 10,500 ▌ |
| ▲ 01-00425-00826 | | 2° | | 1.22 | 9° | 4 | 55 | 10,500 ▌ |
| ▲ 01-00425-00828 | | 3° | | 1.43 | 9° | 4 | 55 | 10,500 ▌ |
| ▲ 01-00425-00836 | | 2° | 8 | 1.36 | 9° | 4 | 60 | 11,000 ▌ |
| ▲ 01-00425-00838 | | 3° | | 1.64 | 9° | 4 | 60 | 11,000 ▌ |
| ▲ 01-00425-00842 | | 30′ | 10 | 0.97 | 9° | 4 | 60 | 11,000 ▌ |
| ▲ 01-00425-00844 | | 1° | | 1.15 | 9° | 4 | 60 | 11,000 ▌ |
| ▲ 01-00425-00845 | | 1°30′ | | 1.32 | 9° | 4 | 60 | 11,000 ▌ |
| ▲ 01-00425-00856 | | 2° | 12 | 1.64 | 9° | 4 | 60 | 11,500 ▌ |
| ▲ 01-00425-00858 | | 3° | | 2.06 | 9° | 4 | 60 | 11,500 ▌ |
| ▲ 01-00425-01012 | 1 | 30′ | 4 | 1.07 | 9° | 4 | 60 | 9,200 ▌ |
| ▲ 01-00425-01014 | | 1° | | 1.14 | 9° | 4 | 60 | 9,200 ▌ |
| ▲ 01-00425-01022 | | 30′ | 6 | 1.10 | 9° | 4 | 60 | 9,200 ▌ |
| ▲ 01-00425-01024 | | 1° | | 1.21 | 9° | 4 | 60 | 9,200 ▌ |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| ▲ 01-00425-01035 | 1 | 1°30′ | 8 | 1.42 | 9° | 4 | 60 | 9,400 ▌ |
| ▲ 01-00425-01036 | | 2° | | 1.56 | 9° | 4 | 60 | 9,400 ▌ |
| ▲ 01-00425-01038 | | 3° | | 1.84 | 9° | 4 | 60 | 10,000 ▌ |
| ▲ 01-00425-01052 | | 30′ | 12 | 1.21 | 9° | 4 | 60 | 9,400 ▌ |
| ▲ 01-00425-01054 | | 1° | | 1.42 | 9° | 4 | 60 | 9,400 ▌ |
| ▲ 01-00425-01055 | | 1°30′ | | 1.63 | 9° | 4 | 60 | 9,400 ▌ |
| ▲ 01-00425-01056 | | 2° | | 1.84 | 9° | 4 | 60 | 9,400 ▌ |
| ▲ 01-00425-01058 | | 3° | | 2.26 | 9° | 4 | 60 | 10,000 ▌ |
| ▲ 01-00425-01075 | | 1°30′ | 21 | 2.10 | 9° | 4 | 70 | 12,000 ▌ |
| ▲ 01-00425-01076 | | 2° | | 2.47 | 9° | 4 | 70 | 12,000 ▌ |
| ▲ 01-00425-01078 | | 3° | | 3.20 | 3° | 4 | 70 | 12,000 ▌ |
| ▲ 01-00425-01212 | 1.2 | 30′ | 4 | 1.27 | 9° | 4 | 60 | 9,200 ▌ |
| ▲ 01-00425-01214 | | 1° | | 1.34 | 9° | 4 | 60 | 9,200 ▌ |
| ▲ 01-00425-01222 | | 30′ | 6 | 1.30 | 9° | 4 | 60 | 9,200 ▌ |
| ▲ 01-00425-01224 | | 1° | | 1.41 | 9° | 4 | 60 | 9,200 ▌ |
| ▲ 01-00425-01235 | | 1°30′ | 8 | 1.62 | 9° | 4 | 60 | 9,400 ▌ |
| ▲ 01-00425-01236 | | 2° | | 1.76 | 9° | 4 | 60 | 9,400 ▌ |
| ▲ 01-00425-01238 | | 3° | | 2.04 | 9° | 4 | 60 | 10,000 ▌ |
| ▲ 01-00425-01252 | | 30′ | 12 | 1.41 | 9° | 4 | 60 | 9,400 ▌ |
| ▲ 01-00425-01254 | | 1° | | 1.62 | 9° | 4 | 60 | 9,400 ▌ |
| ▲ 01-00425-01255 | | 1°30′ | | 1.83 | 9° | 4 | 60 | 9,400 ▌ |
| ▲ 01-00425-01256 | | 2° | | 2.04 | 9° | 4 | 60 | 9,400 ▌ |
| ▲ 01-00425-01258 | | 3° | | 2.46 | 9° | 4 | 60 | 10,000 ▌ |
| ▲ 01-00425-01275 | | 1°30′ | 21 | 2.30 | 9° | 4 | 70 | 12,000 ▌ |
| ▲ 01-00425-01276 | | 2° | | 2.67 | 9° | 4 | 70 | 12,000 ▌ |
| ▲ 01-00425-01278 | | 3° | | 3.40 | 3° | 4 | 70 | 12,000 ▌ |
| ▲ 01-00425-01412 | 1.4 | 30′ | 8 | 1.54 | 9° | 4 | 60 | 9,400 ▌ |
| ▲ 01-00425-01414 | | 1° | | 1.68 | 9° | 4 | 60 | 9,400 ▌ |
| ▲ 01-00425-01425 | | 1°30′ | 10 | 1.92 | 9° | 4 | 60 | 9,400 ▌ |
| ▲ 01-00425-01432 | | 30′ | 12 | 1.61 | 9° | 4 | 60 | 9,400 ▌ |
| ▲ 01-00425-01434 | | 1° | | 1.82 | 9° | 4 | 60 | 9,400 ▌ |
| ▲ 01-00425-01436 | | 2° | | 2.24 | 9° | 4 | 60 | 9,600 ▌ |
| ▲ 01-00425-01438 | | 3° | | 2.66 | 9° | 4 | 60 | 9,600 ▌ |

**オーダー方法** NRF-4 先端径(D)×片角(θ)×刃長(ℓ)を指示してください。
When you order, indicate NRF-4 (D)×(θ)×(ℓ).

※(d1)及び(γ)は参考値です。
※(d1) and (γ) is reference value.

●切削条件表はG-030に記載
●Recommended Milling Conditions are shown on page G-030.



ŞEVKET ÖĞLÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| ▲ 01-00425-01442 | 1.4 | 30′ | 16 | 1.68 | 9° | 4 | 65 | 9,600 |
| ▲ 01-00425-01445 | | 1°30′ | | 2.24 | 9° | 4 | 65 | 9,600 |
| ▲ 01-00425-01454 | | 1° | 21 | 2.13 | 9° | 4 | 70 | 10,000 |
| ▲ 01-00425-01456 | | 2° | | 2.87 | 9° | 4 | 70 | 10,000 |
| ▲ 01-00425-01458 | | 3° | | 3.60 | 3° | 4 | 70 | 11,000 |
| ▲ 01-00425-01465 | | 1°30′ | 26 | 2.76 | 9° | 4 | 75 | 12,000 |
| ▲ 01-00425-01476 | | 2° | 31 | 3.57 | 2° | 4 | 80 | 13,500 |
| ▲ 01-00425-01478 | | 3° | | 4.65 | 9° | 6 | 80 | 15,500 |
| ▲ 01-00425-01512 | 1.5 | 30′ | 8 | 1.64 | 30′ | 4 | 60 | 9,400 |
| ▲ 01-00425-01514 | | 1° | | 1.78 | 9° | 4 | 60 | 9,400 |
| ▲ 01-00425-01525 | | 1°30′ | 10 | 2.02 | 9° | 4 | 60 | 9,400 |
| ▲ 01-00425-01532 | | 30′ | 12 | 1.71 | 9° | 4 | 60 | 9,400 |
| ▲ 01-00425-01534 | | 1° | | 1.92 | 9° | 4 | 60 | 9,400 |
| ▲ 01-00425-01536 | | 2° | | 2.34 | 9° | 4 | 60 | 9,600 |
| ▲ 01-00425-01538 | | 3° | | 2.76 | 9° | 4 | 60 | 9,600 |
| ▲ 01-00425-01542 | | 30′ | 16 | 1.78 | 9° | 4 | 65 | 9,600 |
| ▲ 01-00425-01545 | | 1°30′ | | 2.34 | 9° | 4 | 65 | 9,600 |
| ▲ 01-00425-01554 | | 1° | 21 | 2.23 | 9° | 4 | 70 | 10,000 |
| ▲ 01-00425-01556 | | 2° | | 2.97 | 9° | 4 | 70 | 10,000 |
| ▲ 01-00425-01558 | | 3° | | 3.70 | 3° | 4 | 70 | 11,000 |
| ▲ 01-00425-01565 | | 1°30′ | 26 | 2.86 | 9° | 4 | 75 | 12,000 |
| ▲ 01-00425-01576 | | 2° | 31 | 3.67 | 2° | 4 | 80 | 13,500 |
| ▲ 01-00425-01578 | | 3° | | 4.75 | 9° | 6 | 80 | 15,500 |
| ▲ 01-00425-01812 | 1.8 | 30′ | 8 | 1.94 | 9° | 4 | 60 | 9,800 |
| ▲ 01-00425-01824 | | 1° | 10 | 2.15 | 9° | 4 | 60 | 9,800 |
| ▲ 01-00425-01825 | | 1°30′ | | 2.32 | 9° | 4 | 60 | 9,800 |
| ▲ 01-00425-01832 | | 30′ | 12 | 2.01 | 9° | 4 | 60 | 10,000 |
| ▲ 01-00425-01836 | | 2° | | 2.64 | 9° | 4 | 60 | 9,800 |
| ▲ 01-00425-01838 | | 3° | | 3.06 | 3° | 4 | 60 | 9,800 |
| ▲ 01-00425-01844 | | 1° | 16 | 2.36 | 9° | 4 | 65 | 10,000 |
| ▲ 01-00425-01845 | | 1°30′ | | 2.64 | 9° | 4 | 65 | 10,000 |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| ▲ 01-00425-01852 | 1.8 | 30′ | 21 | 2.17 | 9° | 4 | 70 | 10,300 |
| ▲ 01-00425-01856 | | 2° | | 3.27 | 2° | 4 | 70 | 10,000 |
| ▲ 01-00425-01858 | | 3° | | 4.00 | 9° | 6 | 70 | 10,000 |
| ▲ 01-00425-01864 | | 1° | 26 | 2.71 | 9° | 4 | 75 | 11,000 |
| ▲ 01-00425-01875 | | 1°30′ | 31 | 3.42 | 1°30′ | 4 | 80 | 13,500 |
| ▲ 01-00425-01886 | | 2° | 36 | 4.31 | 9° | 6 | 85 | 14,500 |
| ▲ 01-00425-01888 | | 3° | | 5.57 | 3° | 6 | 85 | 15,500 |
| ▲ 01-00425-02012 | 2 | 30′ | 8 | 2.14 | 9° | 4 | 60 | 9,800 |
| ▲ 01-00425-02024 | | 1° | 10 | 2.35 | 9° | 4 | 60 | 9,800 |
| ▲ 01-00425-02025 | | 1°30′ | | 2.52 | 9° | 4 | 60 | 9,800 |
| ▲ 01-00425-02032 | | 30′ | 12 | 2.21 | 9° | 4 | 65 | 10,000 |
| ▲ 01-00425-02036 | | 2° | | 2.84 | 9° | 4 | 65 | 9,800 |
| ▲ 01-00425-02038 | | 3° | | 3.26 | 3° | 4 | 65 | 9,800 |
| ▲ 01-00425-02044 | | 1° | 16 | 2.56 | 9° | 4 | 65 | 10,000 |
| ▲ 01-00425-02045 | | 1°30′ | | 2.84 | 9° | 4 | 65 | 10,000 |
| ▲ 01-00425-02052 | | 30′ | 21 | 2.37 | 9° | 4 | 70 | 10,300 |
| ▲ 01-00425-02056 | | 2° | | 3.47 | 2° | 4 | 70 | 10,000 |
| ▲ 01-00425-02058 | | 3° | | 4.20 | 9° | 6 | 70 | 10,000 |
| ▲ 01-00425-02064 | | 1° | 26 | 2.91 | 9° | 4 | 75 | 11,000 |
| ▲ 01-00425-02075 | | 1°30′ | 31 | 3.62 | 1°30′ | 4 | 80 | 13,500 |
| ▲ 01-00425-02086 | | 2° | 36 | 4.51 | 9° | 6 | 85 | 14,500 |
| ▲ 01-00425-02088 | | 3° | | 5.77 | 3° | 6 | 85 | 15,500 |

# NRF-4

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | | | 炭素鋼・合金鋼・調質鋼 Carbon Steels・Alloy Steels・Prehardened Steels S50C・SKD・HPM・NAK | | |
|---|---|---|---|---|---|
| 切削速度 Cutting Speed | | | 40～70m/min | | |
| 先端径 Dia. | 片角 Taper Angle | 刃長 Length of Cut | 切り込み量 Depth of Cut | 回転数 Spindle Speed | 送り速度 Feed |
| | | | mm | $min^{-1}$ | mm/min |
| 0.5 | 30′～1° | 2～ 6 | 0.005～0.02 | 25,000～44,000 | 300～ 800 |
| | 1°30′～3° | 2～ 8 | 0.015～0.05 | 25,000～44,000 | 300～ 800 |
| 1 | 30′～1° | 4～12 | 0.015～0.06 | 13,000～22,000 | 400～1,000 |
| | 1°30′～3° | 8～21 | 0.015～0.1 | 13,000～22,000 | 400～1,000 |
| 1.2 | 30′～1° | 4～12 | 0.015～0.06 | 10,600～18,000 | 400～1,000 |
| | 1°30′～3° | 8～21 | 0.02 ～0.1 | 10,600～18,000 | 400～1,000 |
| 1.5 | 30′～1° | 8～21 | 0.015～0.07 | 8,500～15,000 | 400～1,000 |
| | 1°30′～3° | 10～31 | 0.03 ～0.15 | 8,500～15,000 | 400～1,000 |
| 2 | 30′～1° | 8～26 | 0.02 ～0.1 | 6,400～11,000 | 400～1,000 |
| | 1°30′～3° | 10～36 | 0.05 ～0.2 | 6,400～11,000 | 400～1,000 |
| 備 考 Notes | | | ※切削油を必ず使用してください。不水溶性切削油をお奨めします。<br>※刃物の振れに特に注意してください。<br>※ミーリングチャック、機械は出来るだけ剛性のあるものをお奨めします。<br>※往復切削をお奨めします。<br>※Water-insoluble cutting fluid is recommended.<br>※Take a special care of the runout of the endmills.<br>※Use a rigid machine and holder.<br>※Recommend reciprocating cutting. | | |



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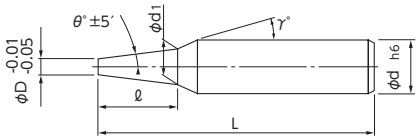
# DTE

## 銅電極・アルミ・プラ用 テーパーエンドミル
2-Flute Taper End Mill for Nonferrous




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

Side Slot SMG 2 25°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ◎ | ◎ | ◎ |

### ▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 07-00313-00101 | 1 | 30′ | 4 | 1.07 | 9° | 4 | 45 | 9,600 ▌ |
| 07-00313-00102 | | 1° | 4 | 1.14 | 9° | 4 | 45 | 9,600 ▌ |
| 07-00313-00103 | | 1°30′ | 4 | 1.21 | 9° | 4 | 45 | 9,600 ▌ |
| 07-00313-00104 | | 2° | 4 | 1.28 | 9° | 4 | 45 | 9,600 ▌ |
| 07-00313-00105 | | 3° | 4 | 1.42 | 9° | 4 | 45 | 9,600 ▌ |
| 07-00313-00106 | | 4° | 4 | 1.56 | 9° | 4 | 45 | 11,000 ▌ |
| 07-00313-00107 | | 5° | 4 | 1.70 | 9° | 4 | 45 | 11,000 ▌ |
| 07-00313-00151 | 1.5 | 30′ | 5 | 1.59 | 9° | 4 | 45 | 9,300 ▌ |
| 07-00313-00152 | | 1° | 5 | 1.67 | 9° | 4 | 45 | 9,300 ▌ |
| 07-00313-00153 | | 1°30′ | 5 | 1.76 | 9° | 4 | 45 | 9,300 ▌ |
| 07-00313-00154 | | 2° | 5 | 1.85 | 9° | 4 | 45 | 9,300 ▌ |
| 07-00313-00155 | | 3° | 5 | 2.02 | 9° | 4 | 45 | 9,300 ▌ |
| 07-00313-00156 | | 4° | 5 | 2.20 | 9° | 4 | 45 | 11,000 ▌ |
| 07-00313-00157 | | 5° | 5 | 2.37 | 5° | 4 | 45 | 11,000 ▌ |
| 07-00313-00201 | 2 | 30′ | 6 | 2.10 | 9° | 4 | 45 | 9,300 ▌ |
| 07-00313-00202 | | 1° | 6 | 2.21 | 9° | 4 | 45 | 9,300 ▌ |
| 07-00313-00203 | | 1°30′ | 6 | 2.31 | 9° | 4 | 45 | 9,300 ▌ |
| 07-00313-00204 | | 2° | 6 | 2.42 | 9° | 4 | 45 | 9,300 ▌ |
| 07-00313-00205 | | 3° | 6 | 2.63 | 9° | 4 | 45 | 9,300 ▌ |
| 07-00313-00206 | | 4° | 6 | 2.84 | 4° | 4 | 45 | 11,000 ▌ |
| 07-00313-00207 | | 5° | 6 | 3.05 | 5° | 4 | 45 | 11,000 ▌ |
| 07-00313-00251 | 2.5 | 30′ | 8 | 2.64 | 9° | 4 | 45 | 9,300 ▌ |
| 07-00313-00252 | | 1° | 8 | 2.78 | 9° | 4 | 45 | 9,300 ▌ |
| 07-00313-00253 | | 1°30′ | 8 | 2.92 | 9° | 4 | 45 | 9,300 ▌ |
| 07-00313-00254 | | 2° | 8 | 3.06 | 9° | 4 | 45 | 9,300 ▌ |
| 07-00313-00255 | | 3° | 8 | 3.34 | 3° | 4 | 45 | 9,300 ▌ |
| 07-00313-00256 | | 4° | 8 | 3.62 | 4° | 4 | 45 | 11,000 ▌ |
| 07-00313-00257 | | 5° | 8 | 3.90 | 5° | 4 | 45 | 11,000 ▌ |
| 07-00313-00301 | 3 | 30′ | 10 | 3.17 | 9° | 6 | 50 | 10,000 ▌ |
| 07-00313-00302 | | 1° | 10 | 3.35 | 9° | 6 | 50 | 10,000 ▌ |
| 07-00313-00303 | | 1°30′ | 10 | 3.52 | 9° | 6 | 50 | 10,000 ▌ |
| 07-00313-00304 | | 2° | 10 | 3.70 | 9° | 6 | 50 | 10,000 ▌ |
| 07-00313-00305 | | 3° | 10 | 4.05 | 9° | 6 | 50 | 10,000 ▌ |
| 07-00313-00306 | | 4° | 10 | 4.40 | 9° | 6 | 50 | 11,000 ▌ |
| 07-00313-00307 | | 5° | 10 | 4.75 | 5° | 6 | 50 | 11,000 ▌ |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 07-00313-00401 | 4 | 30′ | 15 | 4.26 | 9° | 6 | 50 | 10,000 ▌ |
| 07-00313-00402 | | 1° | 15 | 4.52 | 9° | 6 | 50 | 10,000 ▌ |
| 07-00313-00403 | | 1°30′ | 15 | 4.79 | 9° | 6 | 50 | 10,000 ▌ |
| 07-00313-00404 | | 2° | 15 | 5.05 | 9° | 6 | 50 | 10,000 ▌ |
| 07-00313-00405 | | 3° | 15 | 5.57 | 3° | 6 | 50 | 10,000 ▌ |
| 07-00313-00406 | | 4° | 15 | 6.10 | – | 6 | 55 | 14,200 ▌ |
| 07-00313-00407 | | 5° | 15 | 6.62 | – | 6 | 55 | 14,200 ▌ |
| 07-00313-00501 | 5 | 30′ | 20 | 5.35 | 9° | 6 | 55 | 11,000 ▌ |
| 07-00313-00502 | | 1° | 20 | 5.70 | 1° | 6 | 55 | 11,000 ▌ |
| 07-00313-00503 | | 1°30′ | 20 | 6.05 | – | 6 | 55 | 12,800 ▌ |
| 07-00313-00504 | | 2° | 20 | 6.39 | – | 6 | 55 | 12,800 ▌ |
| 07-00313-00505 | | 3° | 20 | 7.10 | – | 6 | 55 | 12,800 ▌ |
| 07-00313-00506 | | 4° | 20 | 7.80 | 4° | 8 | 60 | 15,700 ▌ |
| 07-00313-00507 | | 5° | 20 | 8.50 | – | 8 | 60 | 16,100 ▌ |
| 07-00313-00601 | 6 | 30′ | 20 | 6.35 | – | 6 | 60 | 14,200 ▌ |
| 07-00313-00602 | | 1° | 20 | 6.70 | – | 6 | 60 | 14,200 ▌ |
| 07-00313-00603 | | 1°30′ | 20 | 7.05 | – | 6 | 60 | 14,200 ▌ |
| 07-00313-00604 | | 2° | 20 | 7.40 | – | 6 | 60 | 14,200 ▌ |
| 07-00313-00605 | | 3° | 20 | 8.10 | – | 8 | 60 | 14,200 ▌ |
| 07-00313-00606 | | 4° | 20 | 8.80 | – | 8 | 65 | 18,100 ▌ |
| 07-00313-00607 | | 5° | 20 | 9.50 | – | 8 | 65 | 20,600 ▌ |
| ▲ 07-00313-00801 | 8 | 30′ | 25 | 8.44 | – | 8 | 70 | 21,100 ▌ |
| ▲ 07-00313-00802 | | 1° | 25 | 8.87 | – | 8 | 70 | 21,100 ▌ |
| ▲ 07-00313-00803 | | 1°30′ | 25 | 9.31 | – | 8 | 70 | 23,900 ▌ |
| ▲ 07-00313-00804 | | 2° | 25 | 9.74 | – | 8 | 70 | 23,900 ▌ |
| ▲ 07-00313-00805 | | 3° | 25 | 10.62 | – | 10 | 70 | 29,500 ▌ |
| ▲ 07-00313-00806 | | 4° | 25 | 11.50 | – | 10 | 80 | 35,200 ▌ |
| ▲ 07-00313-00807 | | 5° | 25 | 12.37 | – | 12 | 80 | 41,200 ▌ |
| ▲ 07-00313-01001 | 10 | 30′ | 35 | 10.61 | – | 10 | 85 | 29,100 ▌ |
| ▲ 07-00313-01002 | | 1° | 35 | 11.22 | – | 10 | 85 | 29,100 ▌ |
| ▲ 07-00313-01003 | | 1°30′ | 35 | 11.83 | – | 10 | 85 | 35,000 ▌ |
| ▲ 07-00313-01004 | | 2° | 35 | 12.44 | – | 12 | 90 | 36,900 ▌ |
| ▲ 07-00313-01005 | | 3° | 35 | 13.67 | – | 12 | 90 | 42,300 ▌ |
| ▲ 07-00313-01006 | | 4° | 35 | 14.89 | – | 12 | 90 | 49,200 ▌ |
| ▲ 07-00313-01007 | | 5° | 35 | 16.12 | – | 16 | 90 | 55,600 ▌ |

**オーダー方法**
DTE 先端径(D)×片角(θ)を指示してください。
When you order, indicate DTE (D)×(θ).

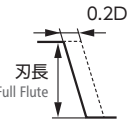
※(d1)及び(γ)は参考値です。
※(d1) and (γ) is reference value.

●切削条件表はG-032に記載
●Recommended Milling Conditions are shown on page G-032.

ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# DTE

## 切削条件参考表 Recommended Milling Conditions

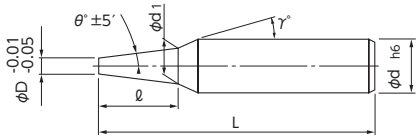
| 被削材 Work Material | 銅 Copper | | アルミニウム合金 Aluminum Alloy | |
|---|---|---|---|---|
| 切削速度 Cutting Speed | 20～30m/min | | 60～90m/min | |
| 先端径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 9,600 | 110 | 28,800 | 330 |
| 1.5 | 6,400 | 110 | 19,200 | 330 |
| 2 | 4,800 | 120 | 14,400 | 360 |
| 2.5 | 3,800 | 120 | 11,400 | 360 |
| 3 | 3,200 | 120 | 9,600 | 360 |
| 4 | 2,400 | 120 | 7,200 | 360 |
| 5 | 1,900 | 130 | 5,700 | 390 |
| 6 | 1,600 | 130 | 4,800 | 390 |
| 8 | 1,200 | 130 | 3,600 | 390 |
| 10 | 1,000 | 130 | 3,000 | 390 |
| 切り込み量 Depth of Cut (D:先端径 Dia.) | テーパー側面 Taper Side Milling   | | | |
| 備　考 Notes | ※切削油を使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※鋼には、絶対に使用しないでください。<br>※Use cutting fluid.<br>※Adjust both spindle speed and feed at the same rate.<br>※Don' t use for cutting steels. | | | |



SEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# DTEL

## 銅電極・アルミ・プラ用 テーパーロングエンドミル
2-Flute Long Taper End Mill for Nonferrous




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

Side Slot SMG 2 25°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ◎ | ◎ | ◎ |

### ▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 07-00322-00101 | 1 | 30′ | 8 | 1.14 | 9° | 4 | 50 | 13,400 ▌ |
| 07-00322-00102 | | 1° | 8 | 1.28 | 9° | 4 | 50 | 13,400 ▌ |
| 07-00322-00103 | | 1°30′ | 8 | 1.42 | 9° | 4 | 50 | 13,400 ▌ |
| 07-00322-00104 | | 2° | 8 | 1.56 | 9° | 4 | 50 | 13,400 ▌ |
| 07-00322-00105 | | 3° | 8 | 1.84 | 9° | 4 | 50 | 13,400 ▌ |
| 07-00322-00106 | | 4° | 8 | 2.12 | 9° | 4 | 50 | 14,400 ▌ |
| 07-00322-00107 | | 5° | 8 | 2.40 | 5° | 4 | 50 | 14,400 ▌ |
| 07-00322-00151 | 1.5 | 30′ | 12 | 1.71 | 9° | 4 | 50 | 15,500 ▌ |
| 07-00322-00152 | | 1° | 12 | 1.92 | 9° | 4 | 50 | 15,500 ▌ |
| 07-00322-00153 | | 1°30′ | 12 | 2.13 | 9° | 4 | 50 | 15,500 ▌ |
| 07-00322-00154 | | 2° | 12 | 2.34 | 9° | 4 | 50 | 15,500 ▌ |
| 07-00322-00155 | | 3° | 12 | 2.76 | 9° | 4 | 50 | 15,500 ▌ |
| 07-00322-00156 | | 4° | 12 | 3.18 | 4° | 4 | 50 | 16,700 ▌ |
| 07-00322-00157 | | 5° | 12 | 3.60 | 5° | 4 | 50 | 16,700 ▌ |
| 07-00322-00201 | 2 | 30′ | 16 | 2.28 | 9° | 4 | 50 | 16,700 ▌ |
| 07-00322-00202 | | 1° | 16 | 2.56 | 9° | 4 | 50 | 16,700 ▌ |
| 07-00322-00203 | | 1°30′ | 16 | 2.84 | 9° | 4 | 50 | 16,700 ▌ |
| 07-00322-00204 | | 2° | 16 | 3.12 | 9° | 4 | 50 | 16,700 ▌ |
| 07-00322-00205 | | 3° | 16 | 3.68 | 3° | 4 | 50 | 16,700 ▌ |
| 07-00322-00206 | | 4° | 16 | 4.24 | – | 4 | 50 | 24,000 ▌ |
| 07-00322-00207 | | 5° | 16 | 4.80 | – | 4 | 60 | 24,000 ▌ |
| 07-00322-00251 | 2.5 | 30′ | 20 | 2.85 | 9° | 4 | 60 | 19,200 ▌ |
| 07-00322-00252 | | 1° | 20 | 3.20 | 9° | 4 | 60 | 19,200 ▌ |
| 07-00322-00253 | | 1°30′ | 20 | 3.55 | 9° | 4 | 60 | 19,200 ▌ |
| 07-00322-00254 | | 2° | 20 | 3.90 | 2° | 4 | 60 | 19,200 ▌ |
| 07-00322-00255 | | 3° | 20 | 4.60 | – | 4 | 60 | 19,200 ▌ |
| 07-00322-00256 | | 4° | 20 | 5.30 | – | 4 | 60 | 26,400 ▌ |
| 07-00322-00257 | | 5° | 20 | 6.00 | – | 6 | 60 | 26,400 ▌ |
| 07-00322-00301 | 3 | 30′ | 24 | 3.42 | 9° | 4 | 60 | 24,000 ▌ |
| 07-00322-00302 | | 1° | 24 | 3.84 | 1° | 4 | 60 | 24,000 ▌ |
| 07-00322-00303 | | 1°30′ | 24 | 4.26 | – | 4 | 60 | 24,000 ▌ |
| 07-00322-00304 | | 2° | 24 | 4.68 | – | 4 | 60 | 24,000 ▌ |
| 07-00322-00305 | | 3° | 24 | 5.52 | – | 4 | 60 | 24,000 ▌ |
| 07-00322-00306 | | 4° | 24 | 6.36 | – | 6 | 60 | 34,800 ▌ |
| 07-00322-00307 | | 5° | 24 | 7.20 | – | 6 | 60 | 34,800 ▌ |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 07-00322-00401 | 4 | 30′ | 32 | 4.56 | – | 4 | 80 | 30,000 ▌ |
| 07-00322-00402 | | 1° | 32 | 5.12 | – | 4 | 80 | 30,000 ▌ |
| 07-00322-00403 | | 1°30′ | 32 | 5.68 | – | 4 | 80 | 30,000 ▌ |
| 07-00322-00404 | | 2° | 32 | 6.23 | – | 6 | 80 | 34,800 ▌ |
| 07-00322-00405 | | 3° | 32 | 7.35 | – | 6 | 80 | 36,000 ▌ |
| 07-00322-00406 | | 4° | 32 | 8.48 | – | 8 | 80 | 41,400 ▌ |
| 07-00322-00407 | | 5° | 32 | 9.60 | 5° | 10 | 90 | 44,600 ▌ |
| 07-00322-00501 | 5 | 30′ | 40 | 5.70 | – | 4 | 80 | 33,000 ▌ |
| 07-00322-00502 | | 1° | 40 | 6.40 | – | 6 | 80 | 38,300 ▌ |
| 07-00322-00503 | | 1°30′ | 40 | 7.09 | – | 6 | 80 | 38,300 ▌ |
| 07-00322-00504 | | 2° | 40 | 7.79 | – | 6 | 80 | 38,300 ▌ |
| 07-00322-00505 | | 3° | 40 | 9.19 | – | 8 | 90 | 44,600 ▌ |
| 07-00322-00506 | | 4° | 40 | 10.59 | – | 10 | 90 | 47,500 ▌ |
| 07-00322-00507 | | 5° | 40 | 12.00 | – | 12 | 90 | 52,100 ▌ |
| 07-00322-00601 | 6 | 30′ | 48 | 6.84 | – | 6 | 100 | 41,700 ▌ |
| 07-00322-00602 | | 1° | 48 | 7.68 | – | 6 | 100 | 41,700 ▌ |
| 07-00322-00603 | | 1°30′ | 48 | 8.51 | – | 8 | 100 | 41,700 ▌ |
| 07-00322-00604 | | 2° | 48 | 9.35 | – | 8 | 100 | 41,700 ▌ |
| 07-00322-00605 | | 3° | 48 | 11.03 | – | 10 | 100 | 47,500 ▌ |
| 07-00322-00606 | | 4° | 48 | 12.71 | – | 12 | 100 | 52,100 ▌ |
| 07-00322-00607 | | 5° | 48 | 14.40 | – | 12 | 100 | 58,800 ▌ |
| ▲ 07-00322-00801 | 8 | 30′ | 64 | 9.12 | – | 8 | 120 | 40,500 ▌ |
| ▲ 07-00322-00802 | | 1° | 64 | 10.23 | – | 10 | 120 | 40,500 ▌ |
| ▲ 07-00322-00803 | | 1°30′ | 64 | 11.35 | – | 10 | 120 | 40,500 ▌ |
| ▲ 07-00322-00804 | | 2° | 64 | 12.47 | – | 12 | 120 | 42,700 ▌ |
| ▲ 07-00322-00805 | | 3° | 64 | 14.71 | – | 12 | 120 | 48,300 ▌ |
| ▲ 07-00322-00806 | | 4° | 64 | 16.95 | – | 16 | 125 | 53,400 ▌ |
| ▲ 07-00322-00807 | | 5° | 64 | 19.20 | – | 20 | 130 | 66,700 ▌ |

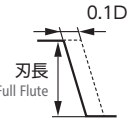
**オーダー方法**
DTEL 先端径(D)×片角(θ)を指示してください。
When you order, indicate DTEL (D)×(θ).

※(d1)及び(γ)は参考値です。
※(d1) and (γ) is reference value.

●切削条件表はG-034に記載
●Recommended Milling Conditions are shown on page G-034.

# DTEL

## 切削条件参考表 Recommended Milling Conditions

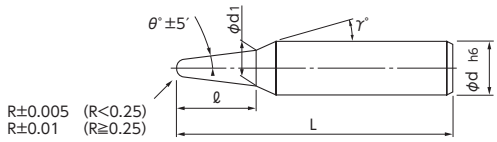
| 被削材 Work Material | 銅 Copper | | アルミニウム合金 Aluminum Alloy | |
|---|---|---|---|---|
| 切削速度 Cutting Speed | 20～30m/min | | 40～60m/min | |
| 先端径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 1 | 6,400 | 110 | 12,800 | 220 |
| 1.5 | 4,300 | 110 | 8,600 | 220 |
| 2 | 3,200 | 120 | 6,400 | 240 |
| 2.5 | 2,600 | 120 | 5,200 | 240 |
| 3 | 2,100 | 120 | 4,200 | 240 |
| 4 | 1,600 | 120 | 3,200 | 240 |
| 5 | 1,300 | 130 | 2,600 | 260 |
| 6 | 1,000 | 130 | 2,000 | 260 |
| 8 | 800 | 130 | 1,600 | 260 |
| 切り込み量 Depth of Cut (D:先端径 Dia.) | テーパー側面 Taper Side Milling   | | | |
| 備　考 Notes | ※切削油を使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※鋼には絶対に使用しないでください。<br>※Use cutting fluid.<br>※Adjust both spindle speed and feed at the same rate.<br>※Don' t use for cutting steels. | | | |



ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MTB230

## 無限コーティング テーパーボールエンドミル
MUGEN-COATING 2-Flute Taper Ball End Mill




●テーパー加工とボール加工が同時に可能。
●サイズは最小 R0.1 から、片角は最大 15°までシリーズ化。
●It is possible to cut both taper and ball simultaneously.
●The available sizes are from radius 0.1 and single angles up to 15°.

Side | Slot | 3D | MG | ∞ | 2 | 30° | ≦55 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | | ○ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 08-00540-01004 | R0.1 | 1° | 1 | 0.23 | 9° | 4 | 50 | 25,000 |
| 08-00540-01006 | | 2° | 1 | 0.26 | 9° | 4 | 50 | 25,000 |
| 08-00540-01008 | | 3° | 1 | 0.29 | 9° | 4 | 50 | 25,000 |
| 08-00540-01012 | | 5° | 1 | 0.36 | 9° | 4 | 50 | 25,000 |
| 08-00540-01016 | | 7° | 1 | 0.42 | 9° | 4 | 50 | 26,500 |
| 08-00540-01019 | | 10° | 1 | 0.52 | 10° | 4 | 50 | 30,000 |
| 08-00540-01504 | R0.15 | 1° | 1.5 | 0.35 | 9° | 4 | 50 | 20,000 |
| 08-00540-01506 | | 2° | 1.5 | 0.39 | 9° | 4 | 50 | 20,000 |
| 08-00540-01508 | | 3° | 1.5 | 0.44 | 9° | 4 | 50 | 20,000 |
| 08-00540-01512 | | 5° | 1.5 | 0.54 | 9° | 4 | 50 | 20,000 |
| 08-00540-01516 | | 7° | 1.5 | 0.63 | 9° | 4 | 50 | 21,500 |
| 08-00540-01519 | | 10° | 1.5 | 0.78 | 10° | 4 | 50 | 23,500 |
| 08-00540-01524 | | 15° | 1.5 | 1.03 | 15° | 4 | 50 | 29,000 |
| 08-00540-02004 | R0.2 | 1° | 2 | 0.46 | 9° | 4 | 50 | 15,000 |
| 08-00540-02006 | | 2° | 2 | 0.53 | 9° | 4 | 50 | 15,000 |
| 08-00540-02008 | | 3° | 2 | 0.59 | 9° | 4 | 50 | 15,000 |
| 08-00540-02012 | | 5° | 2 | 0.72 | 9° | 4 | 50 | 15,500 |
| 08-00540-02016 | | 7° | 2 | 0.84 | 9° | 4 | 50 | 16,500 |
| 08-00540-02019 | | 10° | 2 | 1.04 | 10° | 4 | 50 | 18,500 |
| 08-00540-02024 | | 15° | 2 | 1.38 | 15° | 4 | 50 | 23,000 |
| 08-00540-02504 | R0.25 | 1° | 2.5 | 0.58 | 9° | 4 | 50 | 14,000 |
| 08-00540-02506 | | 2° | 2.5 | 0.66 | 9° | 4 | 50 | 14,000 |
| 08-00540-02508 | | 3° | 2.5 | 0.74 | 9° | 4 | 50 | 14,000 |
| 08-00540-02512 | | 5° | 2.5 | 0.90 | 9° | 4 | 50 | 14,500 |
| 08-00540-02516 | | 7° | 2.5 | 1.06 | 9° | 4 | 50 | 15,500 |
| 08-00540-02519 | | 10° | 2.5 | 1.30 | 10° | 4 | 50 | 17,500 |
| 08-00540-02524 | | 15° | 2.5 | 1.72 | 15° | 4 | 50 | 22,000 |
| 08-00540-03004 | R0.3 | 1° | 3 | 0.69 | 9° | 4 | 50 | 13,000 |
| 08-00540-03006 | | 2° | 3 | 0.79 | 9° | 4 | 50 | 13,000 |
| 08-00540-03008 | | 3° | 3 | 0.88 | 9° | 4 | 50 | 13,000 |
| 08-00540-03012 | | 5° | 3 | 1.07 | 9° | 4 | 50 | 13,500 |
| 08-00540-03016 | | 7° | 3 | 1.27 | 9° | 4 | 50 | 14,500 |
| 08-00540-03019 | | 10° | 3 | 1.56 | 10° | 4 | 50 | 16,500 |
| 08-00540-03024 | | 15° | 3 | 2.07 | 15° | 4 | 50 | 21,000 |

| コードNo. Code No. | (R)ボール半径 Radius | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 08-00540-03504 | R0.35 | 1° | 3.5 | 0.81 | 9° | 4 | 50 | 13,000 |
| 08-00540-03506 | | 2° | 3.5 | 0.92 | 9° | 4 | 50 | 13,000 |
| 08-00540-03508 | | 3° | 3.5 | 1.03 | 9° | 4 | 50 | 13,000 |
| 08-00540-03512 | | 5° | 3.5 | 1.25 | 9° | 4 | 50 | 13,500 |
| 08-00540-03516 | | 7° | 3.5 | 1.48 | 9° | 4 | 50 | 14,500 |
| 08-00540-03519 | | 10° | 3.5 | 1.82 | 10° | 4 | 50 | 16,500 |
| 08-00540-03524 | | 15° | 3.5 | 2.41 | 15° | 4 | 50 | 21,000 |
| 08-00540-04004 | R0.4 | 1° | 4 | 0.93 | 9° | 4 | 50 | 13,000 |
| 08-00540-04006 | | 2° | 4 | 1.05 | 9° | 4 | 50 | 13,000 |
| 08-00540-04008 | | 3° | 4 | 1.18 | 9° | 4 | 50 | 13,000 |
| 08-00540-04012 | | 5° | 4 | 1.43 | 9° | 4 | 50 | 13,500 |
| 08-00540-04016 | | 7° | 4 | 1.69 | 9° | 4 | 50 | 14,500 |
| 08-00540-04019 | | 10° | 4 | 2.08 | 10° | 4 | 50 | 16,500 |
| 08-00540-04024 | | 15° | 4 | 2.76 | 15° | 4 | 50 | 21,000 |
| 08-00540-04504 | R0.45 | 1° | 4 | 1.02 | 9° | 4 | 50 | 13,000 |
| 08-00540-04506 | | 2° | 4 | 1.15 | 9° | 4 | 50 | 13,000 |
| 08-00540-04508 | | 3° | 4 | 1.27 | 9° | 4 | 50 | 13,000 |
| 08-00540-04512 | | 5° | 4 | 1.52 | 9° | 4 | 50 | 13,500 |
| 08-00540-04516 | | 7° | 4 | 1.74 | 9° | 4 | 50 | 14,500 |
| 08-00540-04519 | | 10° | 4 | 2.17 | 10° | 4 | 50 | 16,500 |
| 08-00540-04524 | | 15° | 4 | 2.83 | 15° | 4 | 50 | 21,000 |
| 08-00540-05004 | R0.5 | 1° | 4 | 1.12 | 9° | 4 | 55 | 12,500 |
| 08-00540-05006 | | 2° | 4 | 1.25 | 9° | 4 | 55 | 12,500 |
| 08-00540-05008 | | 3° | 4 | 1.37 | 9° | 4 | 55 | 12,500 |
| 08-00540-05012 | | 5° | 4 | 1.62 | 9° | 4 | 55 | 13,000 |
| 08-00540-05016 | | 7° | 4 | 1.87 | 9° | 4 | 55 | 14,000 |
| 08-00540-05019 | | 10° | 4 | 2.25 | 10° | 4 | 55 | 16,000 |
| 08-00540-05024 | | 15° | 4 | 2.91 | 15° | 4 | 55 | 20,000 |
| 08-00540-06004 | R0.6 | 1° | 5 | 1.35 | 9° | 4 | 55 | 12,500 |
| 08-00540-06006 | | 2° | 5 | 1.50 | 9° | 4 | 55 | 12,500 |
| 08-00540-06008 | | 3° | 5 | 1.66 | 9° | 4 | 55 | 12,500 |
| 08-00540-06012 | | 5° | 5 | 1.97 | 9° | 4 | 55 | 13,000 |
| 08-00540-06016 | | 7° | 5 | 2.29 | 9° | 4 | 55 | 14,000 |
| 08-00540-06019 | | 10° | 5 | 2.77 | 10° | 4 | 55 | 16,000 |
| 08-00540-06024 | | 15° | 5 | 3.60 | 15° | 4 | 55 | 20,000 |

**オーダー方法** MTB230 ボール半径(R)×片角(θ)を指示してください。
When you order, indicate MTB230 (R)×(θ).

※($d_1$)及び(γ)は参考値です。
※($d_1$) and (γ) is reference value.

# MTB230

## 無限コーティング テーパーボールエンドミル
MUGEN-COATING 2-Flute Taper Ball End Mill

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 08-00540-07504 | R0.75 | 1° | 6 | 1.68 | 9° | 4 | 55 | 12,500 |
| 08-00540-07506 | | 2° | 6 | 1.87 | 9° | 4 | 55 | 12,500 |
| 08-00540-07508 | | 3° | 6 | 2.05 | 9° | 4 | 55 | 12,500 |
| 08-00540-07512 | | 5° | 6 | 2.42 | 9° | 4 | 55 | 13,000 |
| 08-00540-07516 | | 7° | 6 | 2.80 | 9° | 4 | 55 | 14,000 |
| 08-00540-07519 | | 10° | 6 | 3.37 | 10° | 4 | 55 | 16,000 |
| 08-00540-07524 | | 15° | 6 | 4.37 | – | 4 | 55 | 20,000 |
| 08-00540-08004 | R0.8 | 1° | 6 | 1.78 | 9° | 4 | 55 | 12,500 |
| 08-00540-08006 | | 2° | 6 | 1.96 | 9° | 4 | 55 | 12,500 |
| 08-00540-08008 | | 3° | 6 | 2.15 | 9° | 4 | 55 | 12,500 |
| 08-00540-08012 | | 5° | 6 | 2.52 | 9° | 4 | 55 | 13,000 |
| 08-00540-08016 | | 7° | 6 | 2.89 | 9° | 4 | 55 | 14,000 |
| 08-00540-08019 | | 10° | 6 | 3.46 | 10° | 4 | 55 | 16,000 |
| 08-00540-08024 | | 15° | 6 | 4.44 | – | 4 | 55 | 22,000 |
| 08-00540-10004 | R1 | 1° | 8 | 2.24 | 9° | 4 | 60 | 13,000 |
| 08-00540-10006 | | 2° | 8 | 2.49 | 9° | 4 | 60 | 13,000 |
| 08-00540-10008 | | 3° | 8 | 2.74 | 9° | 4 | 60 | 13,000 |
| 08-00540-10012 | | 5° | 8 | 3.23 | 9° | 4 | 60 | 13,500 |
| 08-00540-10016 | | 7° | 8 | 3.73 | 7° | 4 | 60 | 14,500 |
| 08-00540-10019 | | 10° | 8 | 4.50 | 10° | 6 | 60 | 16,500 |
| 08-00540-10024 | | 15° | 8 | 5.82 | 15° | 6 | 60 | 21,000 |
| 08-00540-12504 | R1.25 | 1° | 10 | 2.81 | 9° | 4 | 60 | 13,500 |
| 08-00540-12506 | | 2° | 10 | 3.11 | 9° | 4 | 60 | 13,500 |
| 08-00540-12508 | | 3° | 10 | 3.42 | 9° | 4 | 60 | 13,500 |
| 08-00540-12512 | | 5° | 10 | 4.04 | 9° | 6 | 60 | 14,000 |
| 08-00540-12516 | | 7° | 10 | 4.67 | 9° | 6 | 60 | 15,000 |
| 08-00540-12519 | | 10° | 10 | 5.62 | 10° | 6 | 60 | 16,000 |
| 08-00540-12524 | | 15° | 10 | 7.28 | – | 6 | 60 | 25,600 |
| 08-00540-15004 | R1.5 | 1° | 12 | 3.37 | 9° | 4 | 60 | 14,000 |
| 08-00540-15006 | | 2° | 12 | 3.74 | 2° | 4 | 60 | 14,000 |
| 08-00540-15008 | | 3° | 12 | 4.10 | 9° | 6 | 60 | 14,000 |
| 08-00540-15012 | | 5° | 12 | 4.85 | 9° | 6 | 60 | 14,500 |
| 08-00540-15016 | | 7° | 12 | 5.60 | 7° | 6 | 60 | 15,500 |
| 08-00540-15019 | | 10° | 12 | 6.75 | – | 6 | 60 | 19,200 |
| 08-00540-15024 | | 15° | 12 | 8.73 | – | 8 | 60 | 24,500 |

| コードNo. Code No. | (R)ボール半径 Radius | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 08-00540-20004 | R2 | 1° | 16 | 4.49 | 9° | 6 | 65 | 14,500 |
| 08-00540-20006 | | 2° | 16 | 4.98 | 9° | 6 | 65 | 14,500 |
| 08-00540-20008 | | 3° | 16 | 5.47 | 9° | 6 | 65 | 14,500 |
| 08-00540-20012 | | 5° | 16 | 6.46 | – | 6 | 65 | 16,900 |
| 08-00540-20016 | | 7° | 16 | 7.47 | 7° | 8 | 65 | 20,400 |
| 08-00540-20019 | | 10° | 16 | 9.00 | – | 8 | 65 | 23,300 |
| 08-00540-20024 | | 15° | 16 | 11.64 | – | 10 | 70 | 29,100 |

**オーダー方法** MTB230 ボール半径(R)×片角(θ)を指示してください。
When you order, indicate MTB230 (R)×(θ).

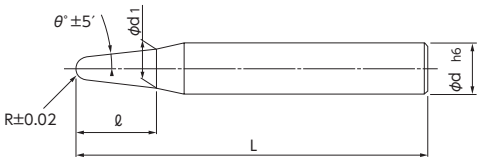
※(d1)及び(γ)は参考値です。
※(d1) and (γ) is reference value.



ŞEVKET GÜLÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# NERB-2

## 台形ランナー用テーパーボールエンドミル
2-Flute Taper Ball End Mill for Runner




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

Side Slot 3D MG 2 30°

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ○ | ○ | ○ | | |

| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|
| ○ | | ◎ | ◎ | ◎ |

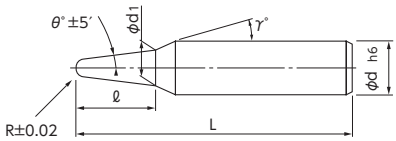
単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 01-00722-01002 | R1 | 10° | 4 | 3.09 | 4 | 50 | 17,700 ▌ |
| 01-00722-01004 | | 15° | 4 | 3.68 | 4 | 50 | 25,300 ▌ |
| 01-00722-01005 | | 20° | 4 | 4.31 | 6 | 55 | 28,300 ▌ |
| 01-00722-01252 | R1.25 | 10° | 5 | 3.86 | 4 | 50 | 19,700 ▌ |
| 01-00722-01254 | | 15° | 5 | 4.60 | 6 | 55 | 24,000 ▌ |
| 01-00722-01255 | | 20° | 5 | 5.39 | 6 | 55 | 29,000 ▌ |
| 01-00722-01502 | R1.5 | 10° | 6 | 4.63 | 6 | 55 | 20,700 ▌ |
| 01-00722-01504 | | 15° | 6 | 5.52 | 6 | 55 | 24,400 ▌ |
| 01-00722-01505 | | 20° | 6 | 6.47 | 8 | 60 | 34,100 ▌ |
| 01-00722-01752 | R1.75 | 10° | 7 | 5.41 | 6 | 55 | 20,700 ▌ |
| 01-00722-01754 | | 15° | 7 | 6.44 | 8 | 60 | 28,300 ▌ |
| 01-00722-01755 | | 20° | 7 | 7.55 | 8 | 60 | 34,800 ▌ |
| 01-00722-02002 | R2 | 10° | 8 | 6.18 | 6 | 55 | 26,300 ▌ |
| 01-00722-02004 | | 15° | 8 | 7.36 | 8 | 60 | 32,200 ▌ |
| 01-00722-02005 | | 20° | 8 | 8.62 | 10 | 70 | 36,700 ▌ |
| 01-00722-02502 | R2.5 | 10° | 10 | 7.72 | 8 | 60 | 44,500 ▌ |
| 01-00722-02504 | | 15° | 10 | 9.20 | 10 | 70 | 51,700 ▌ |
| 01-00722-02505 | | 20° | 10 | 10.78 | 12 | 80 | 56,100 ▌ |
| 01-00722-03002 | R3 | 10° | 12 | 9.27 | 10 | 70 | 48,800 ▌ |
| 01-00722-03004 | | 15° | 12 | 11.03 | 12 | 80 | 59,100 ▌ |
| 01-00722-03005 | | 20° | 12 | 12.94 | 12 | 90 | 66,000 ▌ |

**オーダー方法** NERB-2 ボール半径(R)×片角(θ)を指示してください。
When you order, indicate NERB-2 (R)×(θ).

# NTB-2

## テーパーボールエンドミル
2-Flute Taper Ball End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

Side Slot 3D MG 2 35°

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ○ | ○ | ○ | | |

| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|
| ○ | | ◎ | ◎ | ◎ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R)ボール半径 Radius | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00352-00501 | R0.5 | 30′ | 10 | 1.17 | 9° | 4 | 50 | 17,000 ▌ |
| 01-00352-00502 | | 1° | 10 | 1.33 | 9° | 4 | 50 | 17,000 ▌ |
| 01-00352-00503 | | 1°30′ | 10 | 1.50 | 9° | 4 | 50 | 17,000 ▌ |
| 01-00352-00504 | | 2° | 10 | 1.66 | 9° | 4 | 50 | 17,000 ▌ |
| 01-00352-00505 | | 3° | 10 | 2.00 | 9° | 4 | 50 | 17,000 ▌ |
| 01-00352-00506 | | 4° | 10 | 2.33 | 9° | 4 | 50 | 17,000 ▌ |
| 01-00352-00507 | | 5° | 10 | 2.67 | 9° | 4 | 50 | 17,000 ▌ |
| 01-00352-00508 | | 7° | 10 | 3.34 | 7° | 4 | 50 | 17,000 ▌ |
| 01-00352-00509 | | 10° | 10 | 4.37 | – | 4 | 50 | 20,000 ▌ |
| 01-00352-00751 | R0.75 | 30′ | 10 | 1.66 | 9° | 4 | 50 | 16,000 ▌ |
| 01-00352-00752 | | 1° | 10 | 1.82 | 9° | 4 | 50 | 16,000 ▌ |
| 01-00352-00753 | | 1°30′ | 10 | 1.99 | 9° | 4 | 50 | 16,000 ▌ |
| 01-00352-00754 | | 2° | 10 | 2.15 | 9° | 4 | 50 | 16,000 ▌ |
| 01-00352-00755 | | 3° | 10 | 2.47 | 9° | 4 | 50 | 16,000 ▌ |
| 01-00352-00756 | | 4° | 10 | 2.80 | 9° | 4 | 50 | 16,000 ▌ |
| 01-00352-00757 | | 5° | 10 | 3.12 | 9° | 4 | 50 | 16,000 ▌ |
| 01-00352-00758 | | 7° | 10 | 3.78 | 7° | 4 | 50 | 16,000 ▌ |
| 01-00352-00759 | | 10° | 10 | 4.79 | – | 4 | 50 | 18,200 ▌ |
| 01-00352-01001 | R1 | 30′ | 13 | 2.21 | 9° | 4 | 55 | 13,500 ▌ |
| 01-00352-01002 | | 1° | 13 | 2.42 | 9° | 4 | 55 | 13,500 ▌ |
| 01-00352-01003 | | 1°30′ | 13 | 2.63 | 9° | 4 | 55 | 13,500 ▌ |
| 01-00352-01004 | | 2° | 13 | 2.84 | 9° | 4 | 55 | 13,500 ▌ |
| 01-00352-01005 | | 3° | 13 | 3.26 | 9° | 4 | 55 | 13,500 ▌ |
| 01-00352-01006 | | 4° | 13 | 3.68 | 4° | 4 | 55 | 17,000 ▌ |
| 01-00352-01007 | | 5° | 13 | 4.11 | – | 4 | 55 | 17,000 ▌ |
| 01-00352-01008 | | 7° | 13 | 4.96 | – | 4 | 55 | 17,000 ▌ |
| 01-00352-01009 | | 10° | 13 | 6.26 | – | 6 | 55 | 23,300 ▌ |

**オーダー方法** NTB-2 ボール半径(R)×片角(θ)を指示してください。
When you order, indicate NTB-2 (R)×(θ).

※(d1)及び(γ)は参考値です。
※(d1) and (γ) is reference value.

SEVKET GÜLER MAKINA TICARET VE SAN. LTD. ŞTI.

# NTB-2

## テーパーボールエンドミル
2-Flute Taper Ball End Mill

● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▲の規格は在庫が無くなり次第、販売終了となります。
● ▌: Semi-standard item, please inquire for price and delivery.
● ▲: The sizes will no longer be capable being sold after the stock runs out.

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

▲ 生産終了品 Discontinued Item

| コードNo. Code No. | (R)ボール半径 Radius | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00352-01251 | R1.25 | 30′ | 15 | 2.74 | 9° | 4 | 55 | 16,400 ▌ |
| 01-00352-01252 | | 1° | 15 | 2.98 | 9° | 4 | 55 | 16,400 ▌ |
| 01-00352-01253 | | 1°30′ | 15 | 3.22 | 9° | 4 | 55 | 16,400 ▌ |
| 01-00352-01254 | | 2° | 15 | 3.46 | 9° | 4 | 55 | 16,400 ▌ |
| 01-00352-01255 | | 3° | 15 | 3.94 | 3° | 4 | 55 | 16,400 ▌ |
| 01-00352-01256 | | 4° | 15 | 4.43 | – | 4 | 55 | 16,400 ▌ |
| 01-00352-01257 | | 5° | 15 | 4.92 | – | 4 | 55 | 17,200 ▌ |
| 01-00352-01258 | | 7° | 15 | 5.90 | 7° | 6 | 55 | 17,200 ▌ |
| 01-00352-01259 | | 10° | 15 | 7.39 | – | 6 | 55 | 25,200 ▌ |
| 01-00352-01501 | R1.5 | 30′ | 20 | 3.32 | 9° | 4 | 60 | 16,000 ▌ |
| 01-00352-01502 | | 1° | 20 | 3.65 | 9° | 4 | 60 | 16,000 ▌ |
| 01-00352-01503 | | 1°30′ | 20 | 3.97 | 1°30′ | 4 | 60 | 16,000 ▌ |
| 01-00352-01504 | | 2° | 20 | 4.29 | – | 4 | 60 | 16,000 ▌ |
| 01-00352-01505 | | 3° | 20 | 4.94 | – | 4 | 60 | 16,000 ▌ |
| 01-00352-01506 | | 4° | 20 | 5.60 | 4° | 6 | 60 | 17,000 ▌ |
| 01-00352-01507 | | 5° | 20 | 6.25 | – | 6 | 65 | 20,900 ▌ |
| 01-00352-01508 | | 7° | 20 | 7.57 | 7° | 8 | 65 | 20,900 ▌ |
| 01-00352-01509 | | 10° | 20 | 9.57 | 10° | 10 | 70 | 25,200 ▌ |
| 01-00352-02001 | R2 | 30′ | 25 | 4.40 | – | 4 | 60 | 16,800 ▌ |
| 01-00352-02002 | | 1° | 25 | 4.80 | – | 4 | 60 | 16,800 ▌ |
| 01-00352-02003 | | 1°30′ | 25 | 5.21 | 9° | 6 | 60 | 16,800 ▌ |
| 01-00352-02004 | | 2° | 25 | 5.61 | 2° | 6 | 60 | 16,800 ▌ |
| 01-00352-02005 | | 3° | 25 | 6.42 | – | 6 | 60 | 19,500 ▌ |
| 01-00352-02006 | | 4° | 25 | 7.23 | 4° | 8 | 65 | 22,000 ▌ |
| 01-00352-02007 | | 5° | 25 | 8.04 | – | 8 | 65 | 24,500 ▌ |
| 01-00352-02008 | | 7° | 25 | 9.68 | 7° | 10 | 70 | 31,400 ▌ |
| 01-00352-02009 | | 10° | 25 | 12.17 | – | 12 | 70 | 42,200 ▌ |
| 01-00352-02501 | R2.5 | 30′ | 30 | 5.48 | 9° | 6 | 65 | 18,000 ▌ |
| 01-00352-02502 | | 1° | 30 | 5.96 | 1° | 6 | 65 | 18,000 ▌ |
| 01-00352-02503 | | 1°30′ | 30 | 6.44 | – | 6 | 65 | 20,900 ▌ |
| 01-00352-02504 | | 2° | 30 | 6.92 | – | 6 | 65 | 20,900 ▌ |
| 01-00352-02505 | | 3° | 30 | 7.89 | 3° | 8 | 70 | 25,200 ▌ |
| 01-00352-02506 | | 4° | 30 | 8.86 | – | 8 | 75 | 31,400 ▌ |
| 01-00352-02507 | | 5° | 30 | 9.83 | 5° | 10 | 80 | 35,700 ▌ |
| 01-00352-02508 | | 7° | 30 | 11.79 | 7° | 12 | 85 | 42,100 ▌ |
| 01-00352-02509 | | 10° | 30 | 14.78 | 10° | 16 | 90 | 57,800 ▌ |

| コードNo. Code No. | (R)ボール半径 Radius | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00352-03001 | R3 | 30′ | 35 | 6.56 | – | 6 | 70 | 25,200 ▌ |
| 01-00352-03002 | | 1° | 35 | 7.12 | – | 6 | 70 | 25,200 ▌ |
| 01-00352-03003 | | 1°30′ | 35 | 7.68 | – | 6 | 70 | 25,200 ▌ |
| 01-00352-03004 | | 2° | 35 | 8.24 | – | 8 | 80 | 27,500 ▌ |
| 01-00352-03005 | | 3° | 35 | 9.36 | – | 8 | 85 | 35,900 ▌ |
| 01-00352-03006 | | 4° | 35 | 10.49 | – | 10 | 90 | 40,100 ▌ |
| 01-00352-03007 | | 5° | 35 | 11.62 | 5° | 12 | 90 | 54,700 ▌ |
| 01-00352-03008 | | 7° | 35 | 13.90 | – | 12 | 95 | 86,500 ▌ |
| 01-00352-03009 | | 10° | 35 | 17.38 | – | 16 | 100 | 124,300 ▌ |
| ▲ 01-00352-04001 | R4 | 30′ | 40 | 8.63 | – | 8 | 90 | 32,600 ▌ |
| ▲ 01-00352-04002 | | 1° | 40 | 9.26 | – | 8 | 90 | 32,600 ▌ |
| ▲ 01-00352-04003 | | 1°30′ | 40 | 9.89 | 1°30′ | 10 | 90 | 36,400 ▌ |
| ▲ 01-00352-04004 | | 2° | 40 | 10.52 | – | 10 | 90 | 36,400 ▌ |
| ▲ 01-00352-04005 | | 3° | 40 | 11.78 | 3° | 12 | 100 | 38,400 ▌ |
| ▲ 01-00352-04006 | | 4° | 40 | 13.05 | – | 12 | 100 | 54,500 ▌ |
| ▲ 01-00352-04007 | | 5° | 40 | 14.33 | – | 12 | 100 | 72,700 ▌ |
| ▲ 01-00352-04008 | | 7° | 40 | 16.90 | – | 16 | 110 | 82,700 ▌ |
| ▲ 01-00352-04009 | | 10° | 40 | 20.82 | – | 20 | 110 | 120,800 ▌ |
| ▲ 01-00352-05001 | R5 | 30′ | 45 | 10.70 | – | 10 | 105 | 36,400 ▌ |
| ▲ 01-00352-05002 | | 1° | 45 | 11.40 | – | 10 | 105 | 38,200 ▌ |
| ▲ 01-00352-05003 | | 1°30′ | 45 | 12.10 | – | 12 | 105 | 40,300 ▌ |
| ▲ 01-00352-05004 | | 2° | 45 | 12.80 | – | 12 | 110 | 52,700 ▌ |
| ▲ 01-00352-05005 | | 3° | 45 | 14.20 | – | 12 | 110 | 60,500 ▌ |
| ▲ 01-00352-05006 | | 4° | 45 | 15.62 | 4° | 16 | 120 | 70,800 ▌ |
| ▲ 01-00352-05007 | | 5° | 45 | 17.04 | – | 16 | 120 | 74,500 ▌ |
| ▲ 01-00352-05008 | | 7° | 45 | 19.90 | 7° | 20 | 130 | 100,800 ▌ |
| ▲ 01-00352-05009 | | 10° | 45 | 24.26 | 10° | 25 | 140 | 141,200 ▌ |

**オーダー方法** NTB-2 ボール半径(R)×片角(θ)を指示してください。
When you order, indicate NTB-2 (R)×(θ).

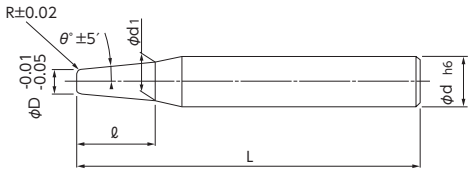
※(d1)及び(γ)は参考値です。
※(d1) and (γ) is reference value.



SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

# NERR-2X

## Xコーティング 台形ランナー用ラジアスエンドミル
X-COATING 2-Flute Taper Radius End Mill for Runner




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

Face Side Slot MG X 2 30°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | | | ○ | | ○ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00732-20103 | 2 | 7° | R0.3 | 5 | 3.23 | 4 | 45 | 17,700 ▌ |
| 01-00732-20105 | | | R0.5 | 5 | 3.23 | 4 | 45 | 17,700 ▌ |
| 01-00732-25103 | 2.5 | | R0.3 | 6 | 3.97 | 4 | 45 | 17,700 ▌ |
| 01-00732-25105 | | | R0.5 | 6 | 3.97 | 4 | 45 | 17,700 ▌ |
| 01-00732-30103 | 3 | | R0.3 | 7 | 4.72 | 6 | 55 | 19,000 ▌ |
| 01-00732-30105 | | | R0.5 | 7 | 4.72 | 6 | 55 | 19,000 ▌ |
| 01-00732-30110 | | | R1 | 7 | 4.72 | 6 | 55 | 19,700 ▌ |
| 01-00732-35103 | 3.5 | | R0.3 | 7 | 5.22 | 6 | 55 | 19,000 ▌ |
| 01-00732-35105 | | | R0.5 | 7 | 5.22 | 6 | 55 | 19,000 ▌ |
| 01-00732-35110 | | | R1 | 7 | 5.22 | 6 | 55 | 19,700 ▌ |
| 01-00732-40103 | 4 | | R0.3 | 8 | 5.96 | 6 | 55 | 19,000 ▌ |
| 01-00732-40105 | | | R0.5 | 8 | 5.96 | 6 | 55 | 19,000 ▌ |
| 01-00732-40110 | | | R1 | 8 | 5.96 | 6 | 55 | 19,700 ▌ |
| 01-00732-45103 | 4.5 | | R0.3 | 9 | 6.71 | 8 | 60 | 29,900 ▌ |
| 01-00732-45105 | | | R0.5 | 9 | 6.71 | 8 | 60 | 29,900 ▌ |
| 01-00732-45110 | | | R1 | 9 | 6.71 | 8 | 60 | 30,600 ▌ |
| 01-00732-50103 | 5 | | R0.3 | 10 | 7.46 | 8 | 60 | 30,600 ▌ |
| 01-00732-50105 | | | R0.5 | 10 | 7.46 | 8 | 60 | 30,600 ▌ |
| 01-00732-50110 | | | R1 | 10 | 7.46 | 8 | 60 | 31,400 ▌ |
| 01-00732-50115 | | | R1.5 | 10 | 7.46 | 8 | 60 | 32,200 ▌ |
| 01-00732-60103 | 6 | | R0.3 | 12 | 8.95 | 10 | 70 | 39,900 ▌ |
| 01-00732-60105 | | | R0.5 | 12 | 8.95 | 10 | 70 | 39,900 ▌ |
| 01-00732-60110 | | | R1 | 12 | 8.95 | 10 | 70 | 40,600 ▌ |
| 01-00732-60115 | | | R1.5 | 12 | 8.95 | 10 | 70 | 41,400 ▌ |
| 01-00732-60120 | | | R2 | 12 | 8.95 | 10 | 70 | 42,200 ▌ |
| 01-00732-20203 | 2 | 10° | R0.3 | 5 | 3.76 | 4 | 45 | 18,000 ▌ |
| 01-00732-20205 | | | R0.5 | 5 | 3.76 | 4 | 45 | 18,000 ▌ |
| 01-00732-25203 | 2.5 | | R0.3 | 6 | 4.62 | 6 | 55 | 20,000 ▌ |
| 01-00732-25205 | | | R0.5 | 6 | 4.62 | 6 | 55 | 20,000 ▌ |
| 01-00732-30203 | 3 | | R0.3 | 7 | 5.47 | 6 | 55 | 20,000 ▌ |
| 01-00732-30205 | | | R0.5 | 7 | 5.47 | 6 | 55 | 20,000 ▌ |
| 01-00732-30210 | | | R1 | 7 | 5.47 | 6 | 55 | 20,700 ▌ |
| 01-00732-35203 | 3.5 | | R0.3 | 7 | 5.97 | 6 | 55 | 20,000 ▌ |
| 01-00732-35205 | | | R0.5 | 7 | 5.97 | 6 | 55 | 20,000 ▌ |
| 01-00732-35210 | | | R1 | 7 | 5.97 | 6 | 55 | 20,700 ▌ |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00732-40203 | 4 | 10° | R0.3 | 8 | 6.82 | 8 | 60 | 30,600 ▌ |
| 01-00732-40205 | | | R0.5 | 8 | 6.82 | 8 | 60 | 30,600 ▌ |
| 01-00732-40210 | | | R1 | 8 | 6.82 | 8 | 60 | 31,400 ▌ |
| 01-00732-45203 | 4.5 | | R0.3 | 9 | 7.67 | 8 | 60 | 30,600 ▌ |
| 01-00732-45205 | | | R0.5 | 9 | 7.67 | 8 | 60 | 30,600 ▌ |
| 01-00732-45210 | | | R1 | 9 | 7.67 | 8 | 60 | 31,400 ▌ |
| 01-00732-50203 | 5 | | R0.3 | 10 | 8.53 | 10 | 70 | 41,400 ▌ |
| 01-00732-50205 | | | R0.5 | 10 | 8.53 | 10 | 70 | 41,400 ▌ |
| 01-00732-50210 | | | R1 | 10 | 8.53 | 10 | 70 | 42,200 ▌ |
| 01-00732-50215 | | | R1.5 | 10 | 8.53 | 10 | 70 | 42,900 ▌ |
| 01-00732-60203 | 6 | | R0.3 | 12 | 10.23 | 10 | 70 | 44,900 ▌ |
| 01-00732-60205 | | | R0.5 | 12 | 10.23 | 10 | 70 | 44,900 ▌ |
| 01-00732-60210 | | | R1 | 12 | 10.23 | 10 | 70 | 45,700 ▌ |
| 01-00732-60215 | | | R1.5 | 12 | 10.23 | 10 | 70 | 46,500 ▌ |
| 01-00732-60220 | | | R2 | 12 | 10.23 | 10 | 70 | 47,200 ▌ |
| 01-00732-20303 | 2 | 12° | R0.3 | 5 | 4.13 | 4 | 45 | 18,700 ▌ |
| 01-00732-20305 | | | R0.5 | 5 | 4.13 | 4 | 45 | 18,700 ▌ |
| 01-00732-25303 | 2.5 | | R0.3 | 6 | 5.05 | 6 | 55 | 21,000 ▌ |
| 01-00732-25305 | | | R0.5 | 6 | 5.05 | 6 | 55 | 21,000 ▌ |
| 01-00732-30303 | 3 | | R0.3 | 7 | 5.98 | 6 | 55 | 21,000 ▌ |
| 01-00732-30305 | | | R0.5 | 7 | 5.98 | 6 | 55 | 21,000 ▌ |
| 01-00732-30310 | | | R1 | 7 | 5.98 | 6 | 55 | 21,700 ▌ |
| 01-00732-35303 | 3.5 | | R0.3 | 7 | 6.48 | 8 | 60 | 31,400 ▌ |
| 01-00732-35305 | | | R0.5 | 7 | 6.48 | 8 | 60 | 31,400 ▌ |
| 01-00732-35310 | | | R1 | 7 | 6.48 | 8 | 60 | 32,200 ▌ |
| 01-00732-40303 | 4 | | R0.3 | 8 | 7.40 | 8 | 60 | 31,400 ▌ |
| 01-00732-40305 | | | R0.5 | 8 | 7.40 | 8 | 60 | 31,400 ▌ |
| 01-00732-40310 | | | R1 | 8 | 7.40 | 8 | 60 | 32,200 ▌ |
| 01-00732-45303 | 4.5 | | R0.3 | 9 | 8.33 | 8 | 60 | 31,400 ▌ |
| 01-00732-45305 | | | R0.5 | 9 | 8.33 | 8 | 60 | 31,400 ▌ |
| 01-00732-45310 | | | R1 | 9 | 8.33 | 8 | 60 | 32,200 ▌ |
| 01-00732-50303 | 5 | | R0.3 | 10 | 9.25 | 10 | 70 | 44,500 ▌ |
| 01-00732-50305 | | | R0.5 | 10 | 9.25 | 10 | 70 | 44,500 ▌ |
| 01-00732-50310 | | | R1 | 10 | 9.25 | 10 | 70 | 45,300 ▌ |
| 01-00732-50315 | | | R1.5 | 10 | 9.25 | 10 | 70 | 46,000 ▌ |

**オーダー方法**
NERR-2X 先端径(D)×片角(θ)×コーナー半径(R)
を指示してください。
When you order, indicate NERR-2X (D)×(θ)×(R).





SEVKET ÖLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

# NERR-2X

## Xコーティング 台形ランナー用ラジアスエンドミル
X-COATING 2-Flute Taper Radius End Mill for Runner



● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (d1)大端径 Dia at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00732-60303 | 6 | 12° | R0.3 | 12 | 11.10 | 10 | 70 | 47,600 ▌ |
| 01-00732-60305 | | | R0.5 | 12 | 11.10 | 10 | 70 | 47,600 ▌ |
| 01-00732-60310 | | | R1 | 12 | 11.10 | 10 | 70 | 48,300 ▌ |
| 01-00732-60315 | | | R1.5 | 12 | 11.10 | 10 | 70 | 49,100 ▌ |
| 01-00732-60320 | | | R2 | 12 | 11.10 | 10 | 70 | 49,900 ▌ |
| 01-00732-20403 | 2 | 15° | R0.3 | 5 | 4.68 | 6 | 55 | 20,000 ▌ |
| 01-00732-20405 | | | R0.5 | 5 | 4.68 | 6 | 55 | 20,000 ▌ |
| 01-00732-25403 | 2.5 | | R0.3 | 6 | 5.72 | 6 | 55 | 20,000 ▌ |
| 01-00732-25405 | | | R0.5 | 6 | 5.72 | 6 | 55 | 20,000 ▌ |
| 01-00732-30403 | 3 | | R0.3 | 7 | 6.75 | 6 | 55 | 25,200 ▌ |
| 01-00732-30405 | | | R0.5 | 7 | 6.75 | 6 | 55 | 25,200 ▌ |
| 01-00732-30410 | | | R1 | 7 | 6.75 | 6 | 55 | 26,000 ▌ |
| 01-00732-35403 | 3.5 | | R0.3 | 7 | 7.25 | 8 | 60 | 32,500 ▌ |
| 01-00732-35405 | | | R0.5 | 7 | 7.25 | 8 | 60 | 32,500 ▌ |
| 01-00732-35410 | | | R1 | 7 | 7.25 | 8 | 60 | 33,300 ▌ |
| 01-00732-40403 | 4 | | R0.3 | 8 | 8.29 | 8 | 60 | 45,700 ▌ |
| 01-00732-40405 | | | R0.5 | 8 | 8.29 | 8 | 60 | 45,700 ▌ |
| 01-00732-40410 | | | R1 | 8 | 8.29 | 8 | 60 | 46,500 ▌ |
| 01-00732-45403 | 4.5 | | R0.3 | 9 | 9.32 | 10 | 70 | 47,600 ▌ |
| 01-00732-45405 | | | R0.5 | 9 | 9.32 | 10 | 70 | 47,600 ▌ |
| 01-00732-45410 | | | R1 | 9 | 9.32 | 10 | 70 | 48,300 ▌ |
| 01-00732-50403 | 5 | | R0.3 | 10 | 10.36 | 10 | 70 | 47,600 ▌ |
| 01-00732-50405 | | | R0.5 | 10 | 10.36 | 10 | 70 | 47,600 ▌ |
| 01-00732-50410 | | | R1 | 10 | 10.36 | 10 | 70 | 48,300 ▌ |
| 01-00732-50415 | | | R1.5 | 10 | 10.36 | 10 | 70 | 49,100 ▌ |
| 01-00732-60403 | 6 | | R0.3 | 12 | 12.43 | 12 | 75 | 56,400 ▌ |
| 01-00732-60405 | | | R0.5 | 12 | 12.43 | 12 | 75 | 56,400 ▌ |
| 01-00732-60410 | | | R1 | 12 | 12.43 | 12 | 75 | 57,100 ▌ |
| 01-00732-60415 | | | R1.5 | 12 | 12.43 | 12 | 75 | 57,900 ▌ |
| 01-00732-60420 | | | R2 | 12 | 12.43 | 12 | 75 | 58,800 ▌ |

**オーダー方法**

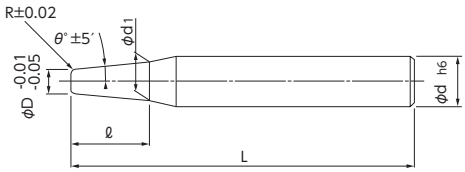
NERR-2X 先端径(D)×片角(θ)×コーナー半径(R)
を指示してください。
When you order, indicate NERR-2X (D)×(θ)×(R).



SEVKET GÜLÜ® MAKINA TICARET VE SAN. LTD. ŞTI.

# NTER-2X

## Xコーティング テーパーラジアスエンドミル
X-COATING 2-Flute Taper Radius End Mill




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

Face Side Slot MG X 2 30°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | | | ○ | | ○ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00362-10102 | 1 | 30′ | R0.2 | 4 | 1.07 | 4 | 45 | 16,700 ▌ |
| 01-00362-10103 | | | R0.3 | 4 | 1.07 | 4 | 45 | 16,700 ▌ |
| 01-00362-10202 | | 1° | R0.2 | 4 | 1.14 | 4 | 45 | 16,700 ▌ |
| 01-00362-10203 | | | R0.3 | 4 | 1.14 | 4 | 45 | 16,700 ▌ |
| 01-00362-10302 | | 1°30′ | R0.2 | 4 | 1.21 | 4 | 45 | 16,700 ▌ |
| 01-00362-10303 | | | R0.3 | 4 | 1.21 | 4 | 45 | 16,700 ▌ |
| 01-00362-10402 | | 2° | R0.2 | 4 | 1.28 | 4 | 45 | 16,700 ▌ |
| 01-00362-10403 | | | R0.3 | 4 | 1.28 | 4 | 45 | 16,700 ▌ |
| 01-00362-10502 | | 3° | R0.2 | 4 | 1.42 | 4 | 45 | 16,700 ▌ |
| 01-00362-10503 | | | R0.3 | 4 | 1.42 | 4 | 45 | 16,700 ▌ |
| 01-00362-10602 | | 4° | R0.2 | 4 | 1.56 | 4 | 45 | 19,200 ▌ |
| 01-00362-10603 | | | R0.3 | 4 | 1.56 | 4 | 45 | 19,200 ▌ |
| 01-00362-10702 | | 5° | R0.2 | 4 | 1.70 | 4 | 45 | 23,700 ▌ |
| 01-00362-10703 | | | R0.3 | 4 | 1.70 | 4 | 45 | 23,700 ▌ |
| 01-00362-10802 | | 7° | R0.2 | 4 | 1.98 | 4 | 45 | 25,000 ▌ |
| 01-00362-10803 | | | R0.3 | 4 | 1.98 | 4 | 45 | 25,000 ▌ |
| 01-00362-10902 | | 10° | R0.2 | 4 | 2.41 | 4 | 45 | 25,700 ▌ |
| 01-00362-10903 | | | R0.3 | 4 | 2.41 | 4 | 45 | 25,700 ▌ |
| 01-00362-15102 | 1.5 | 30′ | R0.2 | 5 | 1.59 | 4 | 45 | 16,700 ▌ |
| 01-00362-15103 | | | R0.3 | 5 | 1.59 | 4 | 45 | 16,700 ▌ |
| 01-00362-15105 | | | R0.5 | 5 | 1.59 | 4 | 45 | 16,700 ▌ |
| 01-00362-15202 | | 1° | R0.2 | 5 | 1.67 | 4 | 45 | 16,700 ▌ |
| 01-00362-15203 | | | R0.3 | 5 | 1.67 | 4 | 45 | 16,700 ▌ |
| 01-00362-15205 | | | R0.5 | 5 | 1.67 | 4 | 45 | 16,700 ▌ |
| 01-00362-15302 | | 1°30′ | R0.2 | 5 | 1.76 | 4 | 45 | 16,700 ▌ |
| 01-00362-15303 | | | R0.3 | 5 | 1.76 | 4 | 45 | 16,700 ▌ |
| 01-00362-15305 | | | R0.5 | 5 | 1.76 | 4 | 45 | 16,700 ▌ |
| 01-00362-15402 | | 2° | R0.2 | 5 | 1.85 | 4 | 45 | 16,700 ▌ |
| 01-00362-15403 | | | R0.3 | 5 | 1.85 | 4 | 45 | 16,700 ▌ |
| 01-00362-15405 | | | R0.5 | 5 | 1.85 | 4 | 45 | 16,700 ▌ |
| 01-00362-15502 | | 3° | R0.2 | 5 | 2.02 | 4 | 45 | 16,700 ▌ |
| 01-00362-15503 | | | R0.3 | 5 | 2.02 | 4 | 45 | 16,700 ▌ |
| 01-00362-15505 | | | R0.5 | 5 | 2.02 | 4 | 45 | 16,700 ▌ |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00362-15602 | 1.5 | 4° | R0.2 | 5 | 2.20 | 4 | 45 | 18,400 ▌ |
| 01-00362-15603 | | | R0.3 | 5 | 2.20 | 4 | 45 | 18,400 ▌ |
| 01-00362-15605 | | | R0.5 | 5 | 2.20 | 4 | 45 | 18,400 ▌ |
| 01-00362-15702 | | 5° | R0.2 | 5 | 2.37 | 4 | 45 | 20,700 ▌ |
| 01-00362-15703 | | | R0.3 | 5 | 2.37 | 4 | 45 | 20,700 ▌ |
| 01-00362-15705 | | | R0.5 | 5 | 2.37 | 4 | 45 | 20,700 ▌ |
| 01-00362-15802 | | 7° | R0.2 | 5 | 2.73 | 4 | 45 | 23,000 ▌ |
| 01-00362-15803 | | | R0.3 | 5 | 2.73 | 4 | 45 | 23,000 ▌ |
| 01-00362-15805 | | | R0.5 | 5 | 2.73 | 4 | 45 | 23,000 ▌ |
| 01-00362-15902 | | 10° | R0.2 | 5 | 3.26 | 4 | 45 | 25,000 ▌ |
| 01-00362-15903 | | | R0.3 | 5 | 3.26 | 4 | 45 | 25,000 ▌ |
| 01-00362-15905 | | | R0.5 | 5 | 3.26 | 4 | 45 | 25,000 ▌ |
| 01-00362-20102 | 2 | 30′ | R0.2 | 6 | 2.10 | 4 | 45 | 16,200 ▌ |
| 01-00362-20103 | | | R0.3 | 6 | 2.10 | 4 | 45 | 16,200 ▌ |
| 01-00362-20105 | | | R0.5 | 6 | 2.10 | 4 | 45 | 16,200 ▌ |
| 01-00362-20202 | | 1° | R0.2 | 6 | 2.21 | 4 | 45 | 16,200 ▌ |
| 01-00362-20203 | | | R0.3 | 6 | 2.21 | 4 | 45 | 16,200 ▌ |
| 01-00362-20205 | | | R0.5 | 6 | 2.21 | 4 | 45 | 16,200 ▌ |
| 01-00362-20302 | | 1°30′ | R0.2 | 6 | 2.31 | 4 | 45 | 16,200 ▌ |
| 01-00362-20303 | | | R0.3 | 6 | 2.31 | 4 | 45 | 16,200 ▌ |
| 01-00362-20305 | | | R0.5 | 6 | 2.31 | 4 | 45 | 16,200 ▌ |
| 01-00362-20402 | | 2° | R0.2 | 6 | 2.42 | 4 | 45 | 16,200 ▌ |
| 01-00362-20403 | | | R0.3 | 6 | 2.42 | 4 | 45 | 16,200 ▌ |
| 01-00362-20405 | | | R0.5 | 6 | 2.42 | 4 | 45 | 16,200 ▌ |
| 01-00362-20502 | | 3° | R0.2 | 6 | 2.63 | 4 | 45 | 16,200 ▌ |
| 01-00362-20503 | | | R0.3 | 6 | 2.63 | 4 | 45 | 16,200 ▌ |
| 01-00362-20505 | | | R0.5 | 6 | 2.63 | 4 | 45 | 16,200 ▌ |
| 01-00362-20602 | | 4° | R0.2 | 6 | 2.84 | 4 | 45 | 16,900 ▌ |
| 01-00362-20603 | | | R0.3 | 6 | 2.84 | 4 | 45 | 16,900 ▌ |
| 01-00362-20605 | | | R0.5 | 6 | 2.84 | 4 | 45 | 16,900 ▌ |
| 01-00362-20702 | | 5° | R0.2 | 6 | 3.05 | 4 | 45 | 17,200 ▌ |
| 01-00362-20703 | | | R0.3 | 6 | 3.05 | 4 | 45 | 17,200 ▌ |
| 01-00362-20705 | | | R0.5 | 6 | 3.05 | 4 | 45 | 17,200 ▌ |
| 01-00362-20802 | | 7° | R0.2 | 6 | 3.47 | 4 | 45 | 20,000 ▌ |
| 01-00362-20803 | | | R0.3 | 6 | 3.47 | 4 | 45 | 20,000 ▌ |
| 01-00362-20805 | | | R0.5 | 6 | 3.47 | 4 | 45 | 20,000 ▌ |

**オーダー方法**
NTER-2X 先端径(D)×片角(θ)×コーナー半径(R)を指示してください。
When you order, indicate NTER-2X (D)×(θ)×(R).

# NTER-2X

## Xコーティング テーパーラジアスエンドミル
X-COATING 2-Flute Taper Radius End Mill

● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00362-20902 | 2 | 10° | R0.2 | 6 | 4.12 | 6 | 45 | 23,700 ▌ |
| 01-00362-20903 | | | R0.3 | 6 | 4.12 | 6 | 45 | 23,700 ▌ |
| 01-00362-20905 | | | R0.5 | 6 | 4.12 | 6 | 45 | 23,700 ▌ |
| 01-00362-25102 | 2.5 | 30′ | R0.2 | 8 | 2.64 | 4 | 45 | 16,200 ▌ |
| 01-00362-25103 | | | R0.3 | 8 | 2.64 | 4 | 45 | 16,200 ▌ |
| 01-00362-25105 | | | R0.5 | 8 | 2.64 | 4 | 45 | 16,200 ▌ |
| 01-00362-25202 | | 1° | R0.2 | 8 | 2.78 | 4 | 45 | 16,200 ▌ |
| 01-00362-25203 | | | R0.3 | 8 | 2.78 | 4 | 45 | 16,200 ▌ |
| 01-00362-25205 | | | R0.5 | 8 | 2.78 | 4 | 45 | 16,200 ▌ |
| 01-00362-25302 | | 1°30′ | R0.2 | 8 | 2.92 | 4 | 45 | 16,200 ▌ |
| 01-00362-25303 | | | R0.3 | 8 | 2.92 | 4 | 45 | 16,200 ▌ |
| 01-00362-25305 | | | R0.5 | 8 | 2.92 | 4 | 45 | 16,200 ▌ |
| 01-00362-25402 | | 2° | R0.2 | 8 | 3.06 | 4 | 45 | 16,200 ▌ |
| 01-00362-25403 | | | R0.3 | 8 | 3.06 | 4 | 45 | 16,200 ▌ |
| 01-00362-25405 | | | R0.5 | 8 | 3.06 | 4 | 45 | 16,200 ▌ |
| 01-00362-25502 | | 3° | R0.2 | 8 | 3.34 | 4 | 45 | 16,200 ▌ |
| 01-00362-25503 | | | R0.3 | 8 | 3.34 | 4 | 45 | 16,200 ▌ |
| 01-00362-25505 | | | R0.5 | 8 | 3.34 | 4 | 45 | 16,200 ▌ |
| 01-00362-25602 | | 4° | R0.2 | 8 | 3.62 | 4 | 45 | 16,900 ▌ |
| 01-00362-25603 | | | R0.3 | 8 | 3.62 | 4 | 45 | 16,900 ▌ |
| 01-00362-25605 | | | R0.5 | 8 | 3.62 | 4 | 45 | 16,900 ▌ |
| 01-00362-25702 | | 5° | R0.2 | 8 | 3.90 | 4 | 45 | 17,200 ▌ |
| 01-00362-25703 | | | R0.3 | 8 | 3.90 | 4 | 45 | 17,200 ▌ |
| 01-00362-25705 | | | R0.5 | 8 | 3.90 | 4 | 45 | 17,200 ▌ |
| 01-00362-25802 | | 7° | R0.2 | 8 | 4.46 | 6 | 50 | 20,200 ▌ |
| 01-00362-25803 | | | R0.3 | 8 | 4.46 | 6 | 50 | 20,200 ▌ |
| 01-00362-25805 | | | R0.5 | 8 | 4.46 | 6 | 50 | 20,200 ▌ |
| 01-00362-25902 | | 10° | R0.2 | 8 | 5.32 | 6 | 50 | 23,700 ▌ |
| 01-00362-25903 | | | R0.3 | 8 | 5.32 | 6 | 50 | 23,700 ▌ |
| 01-00362-25905 | | | R0.5 | 8 | 5.32 | 6 | 50 | 23,700 ▌ |
| 01-00362-30102 | 3 | 30′ | R0.2 | 10 | 3.17 | 6 | 50 | 17,200 ▌ |
| 01-00362-30103 | | | R0.3 | 10 | 3.17 | 6 | 50 | 17,200 ▌ |
| 01-00362-30105 | | | R0.5 | 10 | 3.17 | 6 | 50 | 17,200 ▌ |
| 01-00362-30110 | | | R1 | 10 | 3.17 | 6 | 50 | 17,900 ▌ |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00362-30202 | 3 | 1° | R0.2 | 10 | 3.35 | 6 | 50 | 17,200 ▌ |
| 01-00362-30203 | | | R0.3 | 10 | 3.35 | 6 | 50 | 17,200 ▌ |
| 01-00362-30205 | | | R0.5 | 10 | 3.35 | 6 | 50 | 17,200 ▌ |
| 01-00362-30210 | | | R1 | 10 | 3.35 | 6 | 50 | 17,900 ▌ |
| 01-00362-30302 | | 1°30′ | R0.2 | 10 | 3.52 | 6 | 50 | 17,200 ▌ |
| 01-00362-30303 | | | R0.3 | 10 | 3.52 | 6 | 50 | 17,200 ▌ |
| 01-00362-30305 | | | R0.5 | 10 | 3.52 | 6 | 50 | 17,200 ▌ |
| 01-00362-30310 | | | R1 | 10 | 3.52 | 6 | 50 | 17,900 ▌ |
| 01-00362-30402 | | 2° | R0.2 | 10 | 3.70 | 6 | 50 | 17,200 ▌ |
| 01-00362-30403 | | | R0.3 | 10 | 3.70 | 6 | 50 | 17,200 ▌ |
| 01-00362-30405 | | | R0.5 | 10 | 3.70 | 6 | 50 | 17,200 ▌ |
| 01-00362-30410 | | | R1 | 10 | 3.70 | 6 | 50 | 17,900 ▌ |
| 01-00362-30502 | | 3° | R0.2 | 10 | 4.05 | 6 | 50 | 17,200 ▌ |
| 01-00362-30503 | | | R0.3 | 10 | 4.05 | 6 | 50 | 17,200 ▌ |
| 01-00362-30505 | | | R0.5 | 10 | 4.05 | 6 | 50 | 17,200 ▌ |
| 01-00362-30510 | | | R1 | 10 | 4.05 | 6 | 50 | 17,900 ▌ |
| 01-00362-30602 | | 4° | R0.2 | 10 | 4.40 | 6 | 50 | 18,000 ▌ |
| 01-00362-30603 | | | R0.3 | 10 | 4.40 | 6 | 50 | 18,000 ▌ |
| 01-00362-30605 | | | R0.5 | 10 | 4.40 | 6 | 50 | 18,000 ▌ |
| 01-00362-30610 | | | R1 | 10 | 4.40 | 6 | 50 | 18,700 ▌ |
| 01-00362-30702 | | 5° | R0.2 | 10 | 4.75 | 6 | 50 | 18,400 ▌ |
| 01-00362-30703 | | | R0.3 | 10 | 4.75 | 6 | 50 | 18,400 ▌ |
| 01-00362-30705 | | | R0.5 | 10 | 4.75 | 6 | 50 | 18,400 ▌ |
| 01-00362-30710 | | | R1 | 10 | 4.75 | 6 | 50 | 19,000 ▌ |
| 01-00362-30802 | | 7° | R0.2 | 10 | 5.46 | 6 | 50 | 20,200 ▌ |
| 01-00362-30803 | | | R0.3 | 10 | 5.46 | 6 | 50 | 20,200 ▌ |
| 01-00362-30805 | | | R0.5 | 10 | 5.46 | 6 | 50 | 20,200 ▌ |
| 01-00362-30810 | | | R1 | 10 | 5.46 | 6 | 50 | 20,900 ▌ |
| 01-00362-30902 | | 10° | R0.2 | 10 | 6.53 | 6 | 50 | 26,800 ▌ |
| 01-00362-30903 | | | R0.3 | 10 | 6.53 | 6 | 50 | 26,800 ▌ |
| 01-00362-30905 | | | R0.5 | 10 | 6.53 | 6 | 50 | 26,800 ▌ |
| 01-00362-30910 | | | R1 | 10 | 6.53 | 6 | 50 | 27,500 ▌ |
| 01-00362-40102 | 4 | 30′ | R0.2 | 15 | 4.26 | 6 | 50 | 17,400 ▌ |
| 01-00362-40103 | | | R0.3 | 15 | 4.26 | 6 | 50 | 17,400 ▌ |
| 01-00362-40105 | | | R0.5 | 15 | 4.26 | 6 | 50 | 17,400 ▌ |
| 01-00362-40110 | | | R1 | 15 | 4.26 | 6 | 50 | 18,000 ▌ |

**オーダー方法**

NTER-2X 先端径(D)×片角(θ)×コーナー半径(R)を指示してください。
When you order, indicate NTER-2X (D)×(θ)×(R).



SEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00362-40202 | 4 | 1° | R0.2 | 15 | 4.52 | 6 | 50 | 17,500 |
| 01-00362-40203 | | | R0.3 | 15 | 4.52 | 6 | 50 | 17,500 |
| 01-00362-40205 | | | R0.5 | 15 | 4.52 | 6 | 50 | 17,500 |
| 01-00362-40210 | | | R1 | 15 | 4.52 | 6 | 50 | 18,200 |
| 01-00362-40302 | | 1°30′ | R0.2 | 15 | 4.79 | 6 | 50 | 17,500 |
| 01-00362-40303 | | | R0.3 | 15 | 4.79 | 6 | 50 | 17,500 |
| 01-00362-40305 | | | R0.5 | 15 | 4.79 | 6 | 50 | 17,500 |
| 01-00362-40310 | | | R1 | 15 | 4.79 | 6 | 50 | 18,200 |
| 01-00362-40402 | | 2° | R0.2 | 15 | 5.05 | 6 | 50 | 17,500 |
| 01-00362-40403 | | | R0.3 | 15 | 5.05 | 6 | 50 | 17,500 |
| 01-00362-40405 | | | R0.5 | 15 | 5.05 | 6 | 50 | 17,500 |
| 01-00362-40410 | | | R1 | 15 | 5.05 | 6 | 50 | 18,200 |
| 01-00362-40502 | | 3° | R0.2 | 15 | 5.57 | 6 | 50 | 17,500 |
| 01-00362-40503 | | | R0.3 | 15 | 5.57 | 6 | 50 | 17,500 |
| 01-00362-40505 | | | R0.5 | 15 | 5.57 | 6 | 50 | 17,500 |
| 01-00362-40510 | | | R1 | 15 | 5.57 | 6 | 50 | 18,200 |
| 01-00362-40602 | | 4° | R0.2 | 15 | 6.10 | 6 | 55 | 24,000 |
| 01-00362-40603 | | | R0.3 | 15 | 6.10 | 6 | 55 | 24,000 |
| 01-00362-40605 | | | R0.5 | 15 | 6.10 | 6 | 55 | 24,000 |
| 01-00362-40610 | | | R1 | 15 | 6.10 | 6 | 55 | 24,800 |
| 01-00362-40702 | | 5° | R0.2 | 15 | 6.62 | 6 | 55 | 24,800 |
| 01-00362-40703 | | | R0.3 | 15 | 6.62 | 6 | 55 | 24,800 |
| 01-00362-40705 | | | R0.5 | 15 | 6.62 | 6 | 55 | 24,800 |
| 01-00362-40710 | | | R1 | 15 | 6.62 | 6 | 55 | 25,600 |
| 01-00362-40802 | | 7° | R0.2 | 15 | 7.68 | 6 | 55 | 27,500 |
| 01-00362-40803 | | | R0.3 | 15 | 7.68 | 6 | 55 | 27,500 |
| 01-00362-40805 | | | R0.5 | 15 | 7.68 | 6 | 55 | 27,500 |
| 01-00362-40810 | | | R1 | 15 | 7.68 | 6 | 55 | 28,300 |
| 01-00362-40902 | | 10° | R0.2 | 15 | 9.29 | 8 | 60 | 31,700 |
| 01-00362-40903 | | | R0.3 | 15 | 9.29 | 8 | 60 | 31,700 |
| 01-00362-40905 | | | R0.5 | 15 | 9.29 | 8 | 60 | 31,700 |
| 01-00362-40910 | | | R1 | 15 | 9.29 | 8 | 60 | 32,500 |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00362-50102 | 5 | 30′ | R0.2 | 20 | 5.35 | 6 | 55 | 20,000 |
| 01-00362-50103 | | | R0.3 | 20 | 5.35 | 6 | 55 | 20,000 |
| 01-00362-50105 | | | R0.5 | 20 | 5.35 | 6 | 55 | 20,000 |
| 01-00362-50110 | | | R1 | 20 | 5.35 | 6 | 55 | 20,700 |
| 01-00362-50115 | | | R1.5 | 20 | 5.35 | 6 | 55 | 21,400 |
| 01-00362-50202 | | 1° | R0.2 | 20 | 5.70 | 6 | 55 | 20,000 |
| 01-00362-50203 | | | R0.3 | 20 | 5.70 | 6 | 55 | 20,000 |
| 01-00362-50205 | | | R0.5 | 20 | 5.70 | 6 | 55 | 20,000 |
| 01-00362-50210 | | | R1 | 20 | 5.70 | 6 | 55 | 20,700 |
| 01-00362-50215 | | | R1.5 | 20 | 5.70 | 6 | 55 | 21,400 |
| 01-00362-50302 | | 1°30′ | R0.2 | 20 | 6.05 | 6 | 55 | 23,300 |
| 01-00362-50303 | | | R0.3 | 20 | 6.05 | 6 | 55 | 23,300 |
| 01-00362-50305 | | | R0.5 | 20 | 6.05 | 6 | 55 | 23,300 |
| 01-00362-50310 | | | R1 | 20 | 6.05 | 6 | 55 | 24,000 |
| 01-00362-50315 | | | R1.5 | 20 | 6.05 | 6 | 55 | 24,800 |
| 01-00362-50402 | | 2° | R0.2 | 20 | 6.40 | 6 | 55 | 23,300 |
| 01-00362-50403 | | | R0.3 | 20 | 6.40 | 6 | 55 | 23,300 |
| 01-00362-50405 | | | R0.5 | 20 | 6.40 | 6 | 55 | 23,300 |
| 01-00362-50410 | | | R1 | 20 | 6.40 | 6 | 55 | 24,000 |
| 01-00362-50415 | | | R1.5 | 20 | 6.40 | 6 | 55 | 24,800 |
| 01-00362-50502 | | 3° | R0.2 | 20 | 7.10 | 6 | 55 | 23,300 |
| 01-00362-50503 | | | R0.3 | 20 | 7.10 | 6 | 55 | 23,300 |
| 01-00362-50505 | | | R0.5 | 20 | 7.10 | 6 | 55 | 23,300 |
| 01-00362-50510 | | | R1 | 20 | 7.10 | 6 | 55 | 24,000 |
| 01-00362-50515 | | | R1.5 | 20 | 7.10 | 6 | 55 | 24,800 |
| 01-00362-50602 | | 4° | R0.2 | 20 | 7.80 | 6 | 60 | 28,300 |
| 01-00362-50603 | | | R0.3 | 20 | 7.80 | 6 | 60 | 28,300 |
| 01-00362-50605 | | | R0.5 | 20 | 7.80 | 6 | 60 | 28,300 |
| 01-00362-50610 | | | R1 | 20 | 7.80 | 6 | 60 | 29,100 |
| 01-00362-50615 | | | R1.5 | 20 | 7.80 | 6 | 60 | 29,900 |
| 01-00362-50702 | | 5° | R0.2 | 20 | 8.50 | 8 | 60 | 31,400 |
| 01-00362-50703 | | | R0.3 | 20 | 8.50 | 8 | 60 | 31,400 |
| 01-00362-50705 | | | R0.5 | 20 | 8.50 | 8 | 60 | 31,400 |
| 01-00362-50710 | | | R1 | 20 | 8.50 | 8 | 60 | 32,200 |
| 01-00362-50715 | | | R1.5 | 20 | 8.50 | 8 | 60 | 32,900 |

# NTER-2X

## Xコーティング テーパーラジアスエンドミル
X-COATING 2-Flute Taper Radius End Mill

● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00362-50802 | 5 | 7° | R0.2 | 20 | 9.91 | 8 | 60 | 35,200 ▌ |
| 01-00362-50803 | | | R0.3 | 20 | 9.91 | 8 | 60 | 35,200 ▌ |
| 01-00362-50805 | | | R0.5 | 20 | 9.91 | 8 | 60 | 35,200 ▌ |
| 01-00362-50810 | | | R1 | 20 | 9.91 | 8 | 60 | 36,000 ▌ |
| 01-00362-50815 | | | R1.5 | 20 | 9.91 | 8 | 60 | 36,800 ▌ |
| 01-00362-50902 | | 10° | R0.2 | 20 | 12.05 | 12 | 70 | 48,600 ▌ |
| 01-00362-50903 | | | R0.3 | 20 | 12.05 | 12 | 70 | 48,600 ▌ |
| 01-00362-50905 | | | R0.5 | 20 | 12.05 | 12 | 70 | 48,600 ▌ |
| 01-00362-50910 | | | R1 | 20 | 12.05 | 12 | 70 | 49,400 ▌ |
| 01-00362-50915 | | | R1.5 | 20 | 12.05 | 12 | 70 | 50,200 ▌ |
| 01-00362-60102 | 6 | 30′ | R0.2 | 20 | 6.35 | 6 | 55 | 25,200 ▌ |
| 01-00362-60103 | | | R0.3 | 20 | 6.35 | 6 | 55 | 25,200 ▌ |
| 01-00362-60105 | | | R0.5 | 20 | 6.35 | 6 | 55 | 25,200 ▌ |
| 01-00362-60110 | | | R1 | 20 | 6.35 | 6 | 55 | 26,000 ▌ |
| 01-00362-60115 | | | R1.5 | 20 | 6.35 | 6 | 55 | 26,800 ▌ |
| 01-00362-60120 | | | R2 | 20 | 6.35 | 6 | 55 | 27,500 ▌ |
| 01-00362-60202 | | 1° | R0.2 | 20 | 6.70 | 6 | 55 | 25,200 ▌ |
| 01-00362-60203 | | | R0.3 | 20 | 6.70 | 6 | 55 | 25,200 ▌ |
| 01-00362-60205 | | | R0.5 | 20 | 6.70 | 6 | 55 | 25,200 ▌ |
| 01-00362-60210 | | | R1 | 20 | 6.70 | 6 | 55 | 26,000 ▌ |
| 01-00362-60215 | | | R1.5 | 20 | 6.70 | 6 | 55 | 26,800 ▌ |
| 01-00362-60220 | | | R2 | 20 | 6.70 | 6 | 55 | 27,500 ▌ |
| 01-00362-60302 | | 1°30′ | R0.2 | 20 | 7.05 | 6 | 55 | 25,200 ▌ |
| 01-00362-60303 | | | R0.3 | 20 | 7.05 | 6 | 55 | 25,200 ▌ |
| 01-00362-60305 | | | R0.5 | 20 | 7.05 | 6 | 55 | 25,200 ▌ |
| 01-00362-60310 | | | R1 | 20 | 7.05 | 6 | 55 | 26,000 ▌ |
| 01-00362-60315 | | | R1.5 | 20 | 7.05 | 6 | 55 | 26,800 ▌ |
| 01-00362-60320 | | | R2 | 20 | 7.05 | 6 | 55 | 27,500 ▌ |
| 01-00362-60402 | | 2° | R0.2 | 20 | 7.40 | 6 | 55 | 25,200 ▌ |
| 01-00362-60403 | | | R0.3 | 20 | 7.40 | 6 | 55 | 25,200 ▌ |
| 01-00362-60405 | | | R0.5 | 20 | 7.40 | 6 | 55 | 25,200 ▌ |
| 01-00362-60410 | | | R1 | 20 | 7.40 | 6 | 55 | 26,000 ▌ |
| 01-00362-60415 | | | R1.5 | 20 | 7.40 | 6 | 55 | 26,800 ▌ |
| 01-00362-60420 | | | R2 | 20 | 7.40 | 6 | 55 | 27,500 ▌ |

| コードNo. Code No. | (D)先端径 Dia. | (θ)片角 Taper Angle | (R)コーナー半径 Corner Radius | (ℓ)刃長 Length of Cut | (d1)大端径 Dia. at Large End | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 01-00362-60502 | 6 | 3° | R0.2 | 20 | 8.10 | 8 | 60 | 25,200 ▌ |
| 01-00362-60503 | | | R0.3 | 20 | 8.10 | 8 | 60 | 25,200 ▌ |
| 01-00362-60505 | | | R0.5 | 20 | 8.10 | 8 | 60 | 25,200 ▌ |
| 01-00362-60510 | | | R1 | 20 | 8.10 | 8 | 60 | 26,000 ▌ |
| 01-00362-60515 | | | R1.5 | 20 | 8.10 | 8 | 60 | 26,800 ▌ |
| 01-00362-60520 | | | R2 | 20 | 8.10 | 8 | 60 | 27,500 ▌ |
| 01-00362-60602 | | 4° | R0.2 | 20 | 8.80 | 8 | 65 | 31,000 ▌ |
| 01-00362-60603 | | | R0.3 | 20 | 8.80 | 8 | 65 | 31,000 ▌ |
| 01-00362-60605 | | | R0.5 | 20 | 8.80 | 8 | 65 | 31,000 ▌ |
| 01-00362-60610 | | | R1 | 20 | 8.80 | 8 | 65 | 31,700 ▌ |
| 01-00362-60615 | | | R1.5 | 20 | 8.80 | 8 | 65 | 32,500 ▌ |
| 01-00362-60620 | | | R2 | 20 | 8.80 | 8 | 65 | 33,300 ▌ |
| 01-00362-60702 | | 5° | R0.2 | 20 | 9.50 | 8 | 65 | 34,000 ▌ |
| 01-00362-60703 | | | R0.3 | 20 | 9.50 | 8 | 65 | 34,000 ▌ |
| 01-00362-60705 | | | R0.5 | 20 | 9.50 | 8 | 65 | 34,000 ▌ |
| 01-00362-60710 | | | R1 | 20 | 9.50 | 8 | 65 | 34,800 ▌ |
| 01-00362-60715 | | | R1.5 | 20 | 9.50 | 8 | 65 | 35,600 ▌ |
| 01-00362-60720 | | | R2 | 20 | 9.50 | 8 | 65 | 36,300 ▌ |
| 01-00362-60802 | | 7° | R0.2 | 20 | 10.91 | 10 | 70 | 39,400 ▌ |
| 01-00362-60803 | | | R0.3 | 20 | 10.91 | 10 | 70 | 39,400 ▌ |
| 01-00362-60805 | | | R0.5 | 20 | 10.91 | 10 | 70 | 39,400 ▌ |
| 01-00362-60810 | | | R1 | 20 | 10.91 | 10 | 70 | 40,200 ▌ |
| 01-00362-60815 | | | R1.5 | 20 | 10.91 | 10 | 70 | 41,000 ▌ |
| 01-00362-60820 | | | R2 | 20 | 10.91 | 10 | 70 | 41,700 ▌ |
| 01-00362-60902 | | 10° | R0.2 | 20 | 13.05 | 12 | 80 | 63,600 ▌ |
| 01-00362-60903 | | | R0.3 | 20 | 13.05 | 12 | 80 | 63,600 ▌ |
| 01-00362-60905 | | | R0.5 | 20 | 13.05 | 12 | 80 | 63,600 ▌ |
| 01-00362-60910 | | | R1 | 20 | 13.05 | 12 | 80 | 64,500 ▌ |
| 01-00362-60915 | | | R1.5 | 20 | 13.05 | 12 | 80 | 65,300 ▌ |
| 01-00362-60920 | | | R2 | 20 | 13.05 | 12 | 80 | 66,000 ▌ |

**オーダー方法**

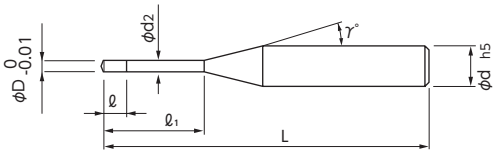
NTER-2X 先端径(D)×片角(θ)×コーナー半径(R)
を指示してください。
When you order, indicate NTER-2X (D)×(θ)×(R).



ŞEVKET ÇELİK® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# MSDH

## 無限コーティングプレミアム 小径高硬度加工用ドリル
MUGEN-COATING PREMIUM Precision Drill for Hardened Steel




先端角150°(特殊形状採用)
Point Angle 150°(Original design)

●小径ドリルで焼き入れ鋼 65HRC への穴あけ加工が可能！
●ばらつきの少ない穴径と、安定した長寿命を実現！
●φ0.1 から切削での高硬度材穴あけ加工が可能！
●Precise drilling on hardened steel (65HRC)!
●Equable hole accuracy and stably long tool life!
●Drilling on high hardened steel (φ0.1～)!

Drill | MG | ∞ Premium | 2 | 20° | ≦65 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | ○ | ◎ | ◎ | | | | | |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)直径 Dia. | (ℓ)溝長 Flute Length | (ℓ1)有効長 Effective Length | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 04-00050-01000 | 0.1 | 0.2 | 1 | 0.085 | 15° | 4 | 45 | 14,000 |
| 04-00050-01500 | 0.15 | 0.3 | 1.5 | 0.13 | 15° | 4 | 45 | 14,000 |
| 04-00050-02000 | 0.2 | 0.4 | 2 | 0.18 | 15° | 4 | 45 | 13,000 |
| 04-00050-02500 | 0.25 | 0.5 | 2.5 | 0.23 | 15° | 4 | 45 | 13,000 |
| 04-00050-03000 | 0.3 | 0.6 | 3 | 0.28 | 15° | 4 | 45 | 12,000 |
| 04-00050-03500 | 0.35 | 0.7 | 3.5 | 0.32 | 15° | 4 | 45 | 12,000 |
| 04-00050-04000 | 0.4 | 0.8 | 4 | 0.37 | 15° | 4 | 45 | 9,600 |
| 04-00050-04500 | 0.45 | 0.9 | 4.5 | 0.41 | 15° | 4 | 45 | 9,600 |
| 04-00050-05000 | 0.5 | 1 | 5 | 0.46 | 15° | 4 | 45 | 8,500 |
| 04-00050-05500 | 0.55 | 1.1 | 5.5 | 0.51 | 15° | 4 | 45 | 8,500 |
| 04-00050-06000 | 0.6 | 1.2 | 6 | 0.56 | 15° | 4 | 45 | 7,800 |
| 04-00050-06500 | 0.65 | 1.3 | 6.5 | 0.61 | 15° | 4 | 45 | 7,800 |
| 04-00050-07000 | 0.7 | 1.4 | 7 | 0.66 | 15° | 4 | 45 | 7,200 |
| 04-00050-07500 | 0.75 | 1.5 | 7.5 | 0.71 | 15° | 4 | 45 | 7,200 |
| 04-00050-08000 | 0.8 | 1.6 | 8 | 0.76 | 15° | 4 | 45 | 6,800 |
| 04-00050-08500 | 0.85 | 1.7 | 8.5 | 0.81 | 15° | 4 | 45 | 6,800 |
| 04-00050-09000 | 0.9 | 1.8 | 9 | 0.86 | 15° | 4 | 45 | 6,500 |
| 04-00050-09500 | 0.95 | 1.9 | 9.5 | 0.9 | 15° | 4 | 45 | 6,500 |
| 04-00050-10000 | 1 | 2 | 10 | 0.95 | 15° | 4 | 45 | 6,000 |

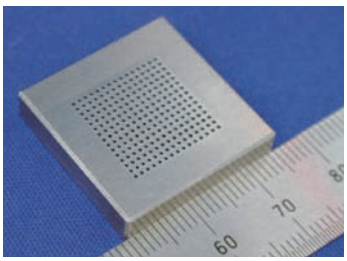
**オーダー方法** MSDH 直径(D)を指示してください。
When you order, indicate MSDH (D)

※(γ)は参考値です。
※(γ) is reference value.

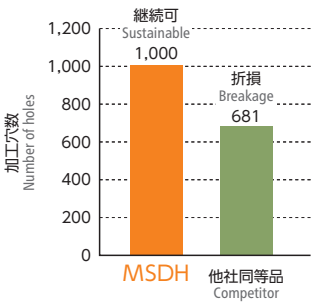
●切削条件表はH-002に記載
●Recommended Drilling Conditions are shown on page H-002.

## 加工事例 Technical Data

被削材：DC53 60HRC
Material : DC53 60HRC



ワークサイズ：25×25×4.9mm
Work Size : 25×25×4.9mm




| | |
|---|---|
| 使用工具 Tool | MSDH φ0.5 |
| 回転数 Spindle speed | 15,000 $min^{-1}$ |
| 送り速度 Feed | 50 mm/min |
| ステップ量 Step feed | 0.025 mm |
| 穴深さ Depth of hole | 4.9 mm(貫通) Through |
| クーラント Coolant | オイルミスト Oil mist |
| 加工穴数 Number of holes | 1,000 穴 1,000 holes |
| 加工時間 Cutting time | 1 分 25 秒／1 穴 1min 25sec / 1 hole |

# MSDH

## 切削条件参考表 Recommended Drilling Conditions

| 被削材 Work Material | 焼き入れ鋼 Hardened Steels HPM-38・STAVAX・SKD61 (~55HRC) | | | 焼き入れ鋼 Hardened Steels SKD11・PD613 (~62HRC) | | | ハイス High Speed Tool Steels SKH (~65HRC) | | |
|---|---|---|---|---|---|---|---|---|---|
| 直 径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | ステップ量 Step Feed | 回転数 Spindle Speed | 送り速度 Feed | ステップ量 Step Feed | 回転数 Spindle Speed | 送り速度 Feed | ステップ量 Step Feed |
| | $min^{-1}$ | mm/min | mm | $min^{-1}$ | mm/min | mm | $min^{-1}$ | mm/min | mm |
| 0.1 | 40,000 | 10 | 0.005 | 40,000 | 5 | 0.003 | 40,000 | 3 | 0.001 |
| 0.15 | 40,000 | 10 | 0.005 | 40,000 | 5 | 0.003 | 40,000 | 3 | 0.001 |
| 0.2 | 30,000 | 20 | 0.01 | 30,000 | 15 | 0.005 | 30,000 | 5 | 0.003 |
| 0.25 | 30,000 | 20 | 0.01 | 30,000 | 15 | 0.005 | 30,000 | 5 | 0.003 |
| 0.3 | 20,000 | 30 | 0.02 | 20,000 | 25 | 0.01 | 20,000 | 15 | 0.005 |
| 0.35 | 20,000 | 30 | 0.02 | 20,000 | 25 | 0.01 | 20,000 | 15 | 0.005 |
| 0.4 | 20,000 | 40 | 0.04 | 20,000 | 40 | 0.02 | 20,000 | 40 | 0.007 |
| 0.45 | 20,000 | 40 | 0.04 | 20,000 | 40 | 0.02 | 20,000 | 40 | 0.007 |
| 0.5 | 15,000 | 50 | 0.05 | 15,000 | 50 | 0.03 | 15,000 | 50 | 0.01 |
| 0.55 | 15,000 | 50 | 0.05 | 15,000 | 50 | 0.03 | 15,000 | 50 | 0.01 |
| 0.6 | 15,000 | 70 | 0.05 | 15,000 | 70 | 0.03 | 15,000 | 70 | 0.01 |
| 0.65 | 15,000 | 70 | 0.05 | 15,000 | 70 | 0.03 | 15,000 | 70 | 0.01 |
| 0.7 | 12,000 | 130 | 0.06 | 12,000 | 120 | 0.04 | 12,000 | 100 | 0.02 |
| 0.75 | 12,000 | 130 | 0.06 | 12,000 | 120 | 0.04 | 12,000 | 100 | 0.02 |
| 0.8 | 12,000 | 160 | 0.06 | 12,000 | 150 | 0.04 | 12,000 | 140 | 0.02 |
| 0.85 | 12,000 | 160 | 0.06 | 12,000 | 150 | 0.04 | 12,000 | 140 | 0.02 |
| 0.9 | 10,000 | 200 | 0.07 | 10,000 | 200 | 0.05 | 10,000 | 180 | 0.03 |
| 0.95 | 10,000 | 200 | 0.07 | 10,000 | 200 | 0.05 | 10,000 | 180 | 0.03 |
| 1 | 10,000 | 200 | 0.07 | 10,000 | 200 | 0.05 | 10,000 | 180 | 0.03 |

**備 考 Notes**

※被削材・加工内容に適したクーラントをご使用ください。
※回転数は極力振動の少ない回転数に設定し、チャッキングの振れを極力抑えてください。
（可能ならば使用される回転数での動的振れ精度を確認してください）
※加工面を極力平坦にして、加工を開始してください。
※工具の取り出し時や、チャッキング時には細心の注意をお願いします。
※Use appropriate coolant for work material and machining description.
※Minimize chucking runout by setting spindle speed at minimum oscillation.
(Recommend to measure actual runout at activated Spindle Speed.)
※Set up flat surface before start machining.
※Take extra care when chucking in and out.



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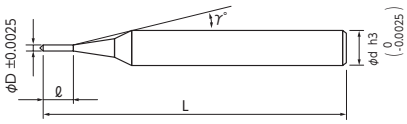
# NSMD-M

## 無限マイクロコーティング マイクロドリル
MUGEN MICRO COATING Micro Drill

先端角120°
Point Angle 120°




●溝長は刃径の10倍を採用した標準タイプ。
●マイクロドリル専用の薄膜コーティングの採用で、ステンレス鋼などへの穴あけに優れた性能を発揮。
●先端部にシンニングを採用し、切削抵抗を低減。穴あけ精度が安定。（φ0.02 以上）
●L/D=10 standard type.
●Special thin film coating for Micro Drill exercise high drilling performance on steels include stainless steels.
●Thinning on the cutting edge to reduce cutting forces for accurate drilling. (Dia. 0.02～)

Drill SMG Micro 2 30°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | | | ◎ | ◎ | ○ | ○ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

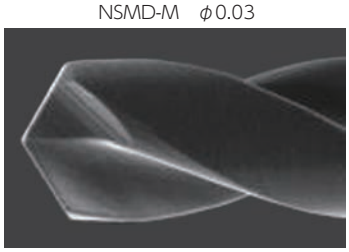
| コードNo. Code No. | (D)直径 Dia. | (ℓ)溝長 Flute Length | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 04-00002-00100 | 0.01 | 0.1 | 15° | 4 | 40 | 58,500 |
| 04-00002-00150 | 0.015 | 0.15 | 15° | 4 | 40 | 58,500 |
| 04-00002-00200 | 0.02 | 0.2 | 15° | 4 | 40 | 46,800 |
| 04-00002-00250 | 0.025 | 0.25 | 15° | 4 | 40 | 46,800 |
| 04-00002-00300 | 0.03 | 0.3 | 15° | 4 | 40 | 27,300 |
| 04-00002-00350 | 0.035 | 0.4 | 15° | 4 | 40 | 27,300 |
| 04-00002-00400 | 0.04 | 0.4 | 15° | 4 | 40 | 18,500 |
| 04-00002-00450 | 0.045 | 0.5 | 15° | 4 | 40 | 18,500 |
| 04-00002-00500 | 0.05 | 0.5 | 15° | 4 | 40 | 14,800 |
| 04-00002-00550 | 0.055 | 0.6 | 15° | 4 | 40 | 14,800 |
| 04-00002-00600 | 0.06 | 0.6 | 15° | 4 | 40 | 13,500 |
| 04-00002-00650 | 0.065 | 0.7 | 15° | 4 | 40 | 13,500 |
| 04-00002-00700 | 0.07 | 0.7 | 15° | 4 | 40 | 10,800 |
| 04-00002-00750 | 0.075 | 0.8 | 15° | 4 | 40 | 10,800 |
| 04-00002-00800 | 0.08 | 0.8 | 15° | 4 | 40 | 7,200 |
| 04-00002-00850 | 0.085 | 0.9 | 15° | 4 | 40 | 7,200 |
| 04-00002-00900 | 0.09 | 0.9 | 15° | 4 | 40 | 7,200 |
| 04-00002-00950 | 0.095 | 1 | 15° | 4 | 40 | 7,200 |
| 04-00002-01000 | 0.1 | 1 | 15° | 4 | 40 | 6,600 |

オーダー方法 NSMD-M 直径(D)を指示してください。
When you order, indicate NSMD-M (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はH-009に記載
●Recommended Drilling Conditions are shown on page H-009.

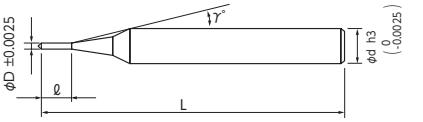
NSMD-M φ0.03



# NSMD-MS

## 無限マイクロコーティング マイクロドリル ショート
MUGEN MICRO COATING Micro Drill Short

先端角120°
Point Angle 120°




●溝長は刃径の 6 倍を採用したショートタイプ。
●マイクロドリル専用の薄膜コーティングの採用で、ステンレス鋼などへの穴あけに優れた性能を発揮。
●先端部にシンニングを採用し、切削抵抗を低減。穴あけ精度が安定。（φ0.02 以上）
●L/D=6 short type.
●Special thin film coating for Micro Drill exercise high drilling performance on steels include stainless steels.
●Thinning on the cutting edge to reduce cutting forces for accurate drilling. (Dia. 0.02~)

Drill
SMG
Micro
2
30°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹 脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ | | | | | |
| ◎ | ◎ | ◎ | | | ◎ | ◎ | ○ | ○ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)直径 Dia. | (ℓ)溝長 Flute Length | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 04-00006-00100 | **0.01** | 0.06 | 15° | 4 | 40 | 49,800 |
| 04-00006-00150 | **0.015** | 0.09 | 15° | 4 | 40 | 49,800 |
| 04-00006-00200 | **0.02** | 0.12 | 15° | 4 | 40 | 33,200 |
| 04-00006-00250 | **0.025** | 0.15 | 15° | 4 | 40 | 33,200 |
| 04-00006-00300 | **0.03** | 0.18 | 15° | 4 | 40 | 25,500 |
| 04-00006-00350 | **0.035** | 0.24 | 15° | 4 | 40 | 25,500 |
| 04-00006-00400 | **0.04** | 0.24 | 15° | 4 | 40 | 19,500 |
| 04-00006-00450 | **0.045** | 0.3 | 15° | 4 | 40 | 19,500 |
| 04-00006-00500 | **0.05** | 0.3 | 15° | 4 | 40 | 13,000 |

**オーダー方法** NSMD-MS 直径(D)を指示してください。
When you order, indicate NSMD-MS (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はH-009に記載
●Recommended Drilling Conditions are shown on page H-009.

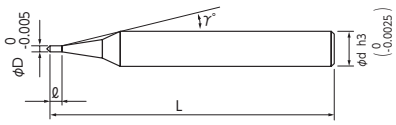


SEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# NSPD-M

## 無限マイクロコーティング マイクロポイントドリル（下穴加工用）
MUGEN MICRO COATING Micro Point Drill (Drill for Guide Hole)

先端角120°
Point Angle 120°




●マイクロドリルの下穴加工に対応。
●マイクロドリル専用の薄膜コーティングの採用で、ステンレス鋼などへの穴あけに優れた性能を発揮。
●先端部にシンニングを採用し、切削抵抗を低減。穴あけ精度が安定。（φ0.025 以上）
● Guide hole for Micro Drill.
● Special thin film coating for Micro Drill exercise high drilling performance on steels include stainless steels.
● Thinning on the cutting edge to reduce cutting forces for accurate drilling. (Dia. 0.025～)

Drill SMG Micro 2 30°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | | | ◎ | ◎ | ○ | ○ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)直径 Dia. | (ℓ)溝長 Flute Length | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 04-00012-00100 | **0.01** | 0.015 | 15° | 4 | 40 | 58,500 |
| 04-00012-00150 | **0.015** | 0.025 | 15° | 4 | 40 | 58,500 |
| 04-00012-00200 | **0.02** | 0.04 | 15° | 4 | 40 | 46,800 |
| 04-00012-00250 | **0.025** | 0.05 | 15° | 4 | 40 | 46,800 |
| 04-00012-00300 | **0.03** | 0.06 | 15° | 4 | 40 | 27,300 |
| 04-00012-00400 | **0.04** | 0.08 | 15° | 4 | 40 | 18,500 |
| 04-00012-00500 | **0.05** | 0.1 | 15° | 4 | 40 | 14,800 |
| 04-00012-00600 | **0.06** | 0.12 | 15° | 4 | 40 | 13,500 |
| 04-00012-00700 | **0.07** | 0.14 | 15° | 4 | 40 | 10,800 |
| 04-00012-00800 | **0.08** | 0.16 | 15° | 4 | 40 | 7,200 |
| 04-00012-00900 | **0.09** | 0.18 | 15° | 4 | 40 | 7,200 |
| 04-00012-01000 | **0.1** | 0.2 | 15° | 4 | 40 | 6,600 |

オーダー方法 NSPD-M 直径(D)を指示してください。
When you order, indicate NSPD-M (D).

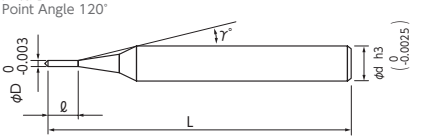
※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はH-009に記載
●Recommended Drilling Conditions are shown on page H-009.

# NSMD

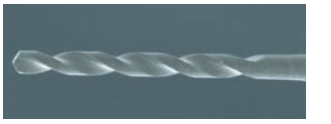
## マイクロドリル
Micro Drill

先端角120°
Point Angle 120°




シンニング先端部
Thinning

NSMD φ0.01



●NS の製造技術の全てを結集。先端径φ0.01より標準化を実現！
●ドリルによる穴あけ加工の新たな領域を開拓。
●先端部にシンニングを採用し、切削抵抗を低減。穴あけ精度が安定。（φ0.02 以上）
●溝長は刃径の10倍を採用した標準タイプ。
●Standardized from dia. 0.01mm by concentrating NS manufacturing technology!
●Micro Drill develops new drilling capability.
●Thinning on the cutting edge to reduce cutting forces for accurate drilling. (Dia. 0.02～)
●L/D=10 standard type.

Drill SMG 2 30°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)直径 Dia. | (ℓ)溝長 Flute Length | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 04-00001-00100 | **0.01** | 0.1 | 15° | 4 | 40 | 45,000 |
| 04-00001-00150 | **0.015** | 0.15 | 15° | 4 | 40 | 45,000 |
| 04-00001-00200 | **0.02** | 0.2 | 15° | 4 | 40 | 36,000 |
| 04-00001-00250 | **0.025** | 0.25 | 15° | 4 | 40 | 36,000 |
| 04-00001-00300 | **0.03** | 0.3 | 15° | 4 | 40 | 21,000 |
| 04-00001-00400 | **0.04** | 0.4 | 15° | 4 | 40 | 14,200 |
| 04-00001-00500 | **0.05** | 0.5 | 15° | 4 | 40 | 12,000 |
| 04-00001-00600 | **0.06** | 0.6 | 15° | 4 | 40 | 11,000 |
| 04-00001-00700 | **0.07** | 0.7 | 15° | 4 | 40 | 9,900 |
| 04-00001-00800 | **0.08** | 0.8 | 15° | 4 | 40 | 6,800 |
| 04-00001-00900 | **0.09** | 0.9 | 15° | 4 | 40 | 6,800 |
| 04-00001-01000 | **0.1** | 1 | 15° | 4 | 40 | 5,000 |

**オーダー方法** NSMD 直径(D)を指示してください。
When you order, indicate NSMD (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はH-009に記載
●Recommended Drilling Conditions are shown on page H-009.

### 加工事例 1 Technical Data 1

アルミ材 Aluminum Alloy

■加工穴形状：φ 0.01mm 止り穴 深さ 0.1mm (L/D = 10)
Hole description: φ0.01mm (Blind hole) Depth 0.1mm (L/D=10)

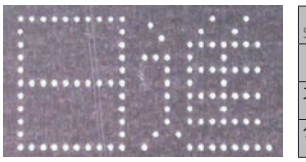
| | |
|---|---|
| 回転数 Spindle speed | 60,000min$^{-1}$ |
| 送り速度 Feed | 2mm/min |
| ステップ量 Step feed | 0.2μm |
| クーラント Coolant | オイルミスト Oil mist |

使用サイズ：φ 0.01
Drill size : φ 0.01
被削材：A5052
Material : A5052
加工穴数：10 穴
No. of holes: 10holes
加工時間：1 時間 20 分
Drilling time: 1hr 20min

### 加工事例 2 Technical Data 2

SUS304 SUS304

■加工穴形状: φ 0.03mm 貫通穴 板厚 0.15mm (L/D = 5)
Hole description: φ0.03mm (Through hole) Depth 0.15mm (L/D=5)



| | |
|---|---|
| 回転数 Spindle speed | 60,000min$^{-1}$ |
| 送り速度 Feed | 1mm/min |
| ステップ量 Step feed | 1μm |
| クーラント Coolant | オイルミスト Oil mist |

使用サイズ: φ 0.03
Drill size : φ 0.03
被削材：SUS304
Material : SUS304
加工穴数：105 穴
No. of holes: 105holes
加工時間：16 時間
Drilling time: 16hr



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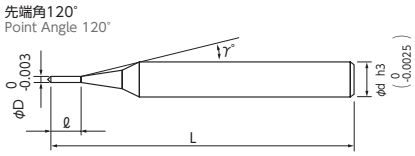
# NSMD-S

## マイクロドリル ショート
Micro Drill Short




●溝長は刃径の6倍を採用したショートタイプで、安定した加工が可能。
●先端部にシンニングを採用し、切削抵抗を低減。穴あけ精度が安定。（φ0.02 以上）
●L/D=6 short type, realized stable drilling.
●Thinning on the cutting edge to reduce cutting forces for accurate drilling. (Dia. 0.02～)

Drill SMG 2 30°

### 被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹 脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ | | | | | |
| | | | | | | | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)直径 Dia. | (ℓ)溝長 Flute Length | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 04-00005-00100 | **0.01** | 0.06 | 15° | 4 | 40 | 45,000 |
| 04-00005-00150 | **0.015** | 0.09 | 15° | 4 | 40 | 45,000 |
| 04-00005-00200 | **0.02** | 0.12 | 15° | 4 | 40 | 36,000 |
| 04-00005-00250 | **0.025** | 0.15 | 15° | 4 | 40 | 36,000 |
| 04-00005-00300 | **0.03** | 0.18 | 15° | 4 | 40 | 21,000 |
| 04-00005-00400 | **0.04** | 0.24 | 15° | 4 | 40 | 14,200 |
| 04-00005-00500 | **0.05** | 0.3 | 15° | 4 | 40 | 12,000 |

**オーダー方法** NSMD-S 直径(D)を指示してください。
When you order, indicate NSMD-S (D).

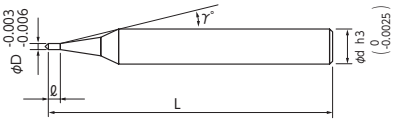
※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はH-009に記載
●Recommended Drilling Conditions are shown on page H-009.

# NSPD

## マイクロポイントドリル（下穴加工用）
Micro Point Drill (Drill for Guide Hole)

先端角120°
Point Angle 120°




●マイクロドリルの下穴加工に対応。
●先端部にシンニングを採用し、切削抵抗を低減。穴あけ精度が安定。（φ0.025 以上）
●Micro Point Drill for guide hole.
●Thinning on the cutting edge to reduce cutting forces for accurate drilling. (Dia. 0.025～)

Drill SMG 2 30°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ | | | | | |
| | | | | | | | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

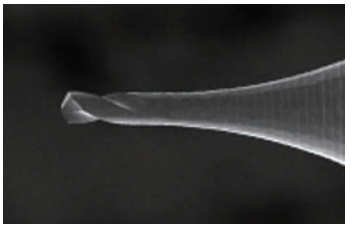
| コードNo. Code No. | (D)直径 Dia. | (ℓ)溝長 Flute Length | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 04-00010-00100 | **0.01** | 0.015 | 15° | 4 | 40 | 45,000 |
| 04-00010-00150 | **0.015** | 0.025 | 15° | 4 | 40 | 45,000 |
| 04-00010-00200 | **0.02** | 0.04 | 15° | 4 | 40 | 36,000 |
| 04-00010-00250 | **0.025** | 0.05 | 15° | 4 | 40 | 36,000 |
| 04-00010-00300 | **0.03** | 0.06 | 15° | 4 | 40 | 21,000 |
| 04-00010-00400 | **0.04** | 0.08 | 15° | 4 | 40 | 14,200 |
| 04-00010-00500 | **0.05** | 0.1 | 15° | 4 | 40 | 12,000 |
| 04-00010-00600 | **0.06** | 0.12 | 15° | 4 | 40 | 11,000 |
| 04-00010-00700 | **0.07** | 0.14 | 15° | 4 | 40 | 9,900 |
| 04-00010-00800 | **0.08** | 0.16 | 15° | 4 | 40 | 6,800 |
| 04-00010-00900 | **0.09** | 0.18 | 15° | 4 | 40 | 6,800 |
| 04-00010-01000 | **0.1** | 0.2 | 15° | 4 | 40 | 5,000 |

**オーダー方法**
NSPD 直径(D)を指示してください。
When you order, indicate NSPD (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はH-009に記載
●Recommended Drilling Conditions are shown on page H-009.

NSPD　φ0.03





ŞEVKET ÖĞÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# NSMD-M・NSMD-MS・NSMD・NSMD-S

## 切削条件参考表 Recommended Drilling Conditions

| 被削材 Work Material | ステンレス鋼 Stainless Steels SUS304 | | | アルミニウム合金 Aluminum Alloy A5052 | | |
|---|---|---|---|---|---|---|
| 直　径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | ステップ量 Step Feed | 回転数 Spindle Speed | 送り速度 Feed | ステップ量 Step Feed |
| | $min^{-1}$ | mm/min | μm | $min^{-1}$ | mm/min | μm |
| **0.01** | 20,000 | 1 | 0.1 | 30,000 | 2 | 0.5 |
| **0.03** | 20,000 | 2 | 0.5 | 30,000 | 3 | 1.5 |
| **0.05** | 20,000 | 2 | 3 | 30,000 | 4 | 5 |
| **0.1** | 20,000 | 5 | 5 | 25,000 | 10 | 10 |

**備　考 Notes**

※被削材・加工内容に適したクーラントをご使用ください。
※回転数は極力振動の少ない回転数に設定し、チャッキングの振れを極力抑えてください。
（可能ならば使用される回転数での動的振れ精度を確認してください）
※加工面を極力平坦にして、加工を開始してください。
※工具の取り出し時や、チャッキング時には細心の注意をお願いします。
※Use appropriate coolant for work material and machining description.
※Minimize chucking runout by setting spindle speed at minimum oscillation.
(Recommend to measure actual runout at activated Spindle Speed.)
※Set up flat surface before start machining.
※Take extra care when chucking in and out.

# NSPD-M・NSPD

## 切削条件参考表 Recommended Drilling Conditions

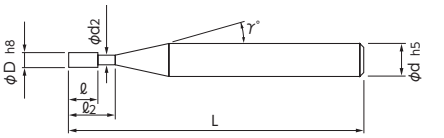
| 被削材 Work Material | ステンレス鋼 Stainless Steels SUS304 | | | アルミニウム合金 Aluminum Alloy A5052 | | |
|---|---|---|---|---|---|---|
| 直　径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | ステップ量 Step Feed | 回転数 Spindle Speed | 送り速度 Feed | ステップ量 Step Feed |
| | $min^{-1}$ | mm/min | μm | $min^{-1}$ | mm/min | μm |
| **0.01** | 20,000 | 1 | 0.1 | 20,000 | 1 | 0.1 |
| **0.03** | 20,000 | 2 | 0.5 | 20,000 | 2 | 0.5 |
| **0.05** | 20,000 | 2 | 1 | 20,000 | 2 | 1 |
| **0.1** | 20,000 | 5 | 2 | 25,000 | 5 | 2 |

**備　考 Notes**

※被削材・加工内容に適したクーラントをご使用ください。
※回転数は極力振動の少ない回転数に設定し、チャッキングの振れを極力抑えてください。
（可能ならば使用される回転数での動的振れ精度を確認してください）
※加工面を極力平坦にして、加工を開始してください。
※工具の取り出し時や、チャッキング時には細心の注意をお願いします。
※Use appropriate coolant for work material and machining description.
※Minimize chucking runout by setting spindle speed at minimum oscillation.
(Recommend to measure actual runout at activated rpm)
※Set up flat surface before start machining.
※Take extra care when chucking in and out.

# MFD

## 無限コーティング フラットドリル
MUGEN-COATING Flat Drill




●斜面や曲面など加工面の形状を問わず、安定した穴あけ加工ができます。
●高能率座ぐり加工が可能です。
●裏バリの抑制が可能です。
●Stable drilling is realized in various scenes such as inclined surface and curved surface!
●High efficient counter boring.
●Possible to reduce rear burr.

技術資料 K-033

Drill MG ∞ 2 30°

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ○ | | | ◎ | ○ | ◎ | ◎ | |

★再研磨可能(詳細はお問い合わせください。)

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)直径 Dia. | (ℓ)溝長 Flute Length | (ℓ2)首下長 Under Neck Taper Length | (d2)首下径 Neck Dia. | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|
| 04-00230-00100 | 1 | 2 | 3 | 0.95 | 9° | 4 | 55 | 6,100 |
| 04-00230-00110 | 1.1 | 2.2 | 3.3 | 1.05 | 9° | 4 | 55 | 6,100 |
| 04-00230-00120 | 1.2 | 2.4 | 3.6 | 1.15 | 9° | 4 | 55 | 6,100 |
| 04-00230-00130 | 1.3 | 2.6 | 3.9 | 1.25 | 9° | 4 | 55 | 6,100 |
| 04-00230-00140 | 1.4 | 2.8 | 4.2 | 1.35 | 9° | 4 | 55 | 6,100 |
| 04-00230-00150 | 1.5 | 3 | 4.5 | 1.45 | 9° | 4 | 55 | 6,100 |
| 04-00230-00160 | 1.6 | 3.2 | 4.8 | 1.55 | 9° | 4 | 55 | 6,100 |
| 04-00230-00170 | 1.7 | 3.4 | 5.1 | 1.65 | 9° | 4 | 55 | 6,100 |
| 04-00230-00180 | 1.8 | 3.6 | 5.4 | 1.75 | 9° | 4 | 55 | 6,100 |
| 04-00230-00190 | 1.9 | 3.8 | 5.7 | 1.84 | 9° | 4 | 55 | 6,100 |
| 04-00230-00200 | 2 | 4 | 6 | 1.94 | 9° | 4 | 55 | 5,400 |
| 04-00230-00210 | 2.1 | 4.2 | 6.3 | 2 | 9° | 4 | 60 | 5,400 |
| 04-00230-00220 | 2.2 | 4.4 | 6.6 | 2.1 | 9° | 4 | 60 | 5,400 |
| 04-00230-00230 | 2.3 | 4.6 | 6.9 | 2.2 | 9° | 4 | 60 | 5,400 |
| 04-00230-00240 | 2.4 | 4.8 | 7.2 | 2.3 | 9° | 4 | 60 | 5,400 |
| 04-00230-00250 | 2.5 | 5 | 7.5 | 2.4 | 9° | 4 | 60 | 5,400 |
| 04-00230-00260 | 2.6 | 5.2 | 7.8 | 2.45 | 9° | 4 | 60 | 5,400 |
| 04-00230-00270 | 2.7 | 5.4 | 8.1 | 2.55 | 9° | 4 | 60 | 5,400 |
| 04-00230-00280 | 2.8 | 5.6 | 8.4 | 2.65 | 9° | 4 | 60 | 5,400 |
| 04-00230-00290 | 2.9 | 5.8 | 8.7 | 2.75 | 9° | 4 | 60 | 5,400 |
| ★ 04-00230-00300 | 3 | 6 | 9 | 2.85 | 9° | 6 | 60 | 5,400 |
| ★ 04-00230-00310 | 3.1 | 6.2 | 9.3 | 2.9 | 9° | 6 | 60 | 5,800 |
| ★ 04-00230-00320 | 3.2 | 6.4 | 9.6 | 3 | 9° | 6 | 60 | 5,800 |
| ★ 04-00230-00330 | 3.3 | 6.6 | 9.9 | 3.1 | 9° | 6 | 60 | 5,800 |
| ★ 04-00230-00340 | 3.4 | 6.8 | 10.2 | 3.2 | 9° | 6 | 60 | 5,800 |
| ★ 04-00230-00350 | 3.5 | 7 | 10.5 | 3.3 | 9° | 6 | 60 | 5,800 |
| ★ 04-00230-00360 | 3.6 | 7.2 | 10.8 | 3.4 | 9° | 6 | 60 | 6,100 |
| ★ 04-00230-00370 | 3.7 | 7.4 | 11.1 | 3.5 | 9° | 6 | 60 | 6,100 |
| ★ 04-00230-00380 | 3.8 | 7.6 | 11.4 | 3.6 | 9° | 6 | 60 | 6,100 |
| ★ 04-00230-00390 | 3.9 | 7.8 | 11.7 | 3.7 | 9° | 6 | 60 | 6,100 |
| ★ 04-00230-00400 | 4 | 8 | 12 | 3.8 | 9° | 6 | 60 | 6,100 |
| ★ 04-00230-00410 | 4.1 | 8.2 | 12.3 | 3.9 | 9° | 6 | 60 | 6,500 |
| ★ 04-00230-00420 | 4.2 | 8.4 | 12.6 | 4 | 9° | 6 | 60 | 6,500 |
| ★ 04-00230-00430 | 4.3 | 8.6 | 12.9 | 4.1 | 9° | 6 | 60 | 6,500 |
| ★ 04-00230-00440 | 4.4 | 8.8 | 13.2 | 4.2 | 9° | 6 | 60 | 6,500 |
| ★ 04-00230-00450 | 4.5 | 9 | 13.5 | 4.3 | 9° | 6 | 60 | 6,500 |
| ★ 04-00230-00460 | 4.6 | 9.2 | 13.8 | 4.4 | 9° | 6 | 60 | 7,000 |
| ★ 04-00230-00470 | 4.7 | 9.4 | 14.1 | 4.5 | 9° | 6 | 60 | 7,000 |
| ★ 04-00230-00480 | 4.8 | 9.6 | 14.4 | 4.6 | 9° | 6 | 60 | 7,000 |
| ★ 04-00230-00490 | 4.9 | 9.8 | 14.7 | 4.7 | 9° | 6 | 60 | 7,000 |
| ★ 04-00230-00500 | 5 | 10 | 15 | 4.8 | 9° | 6 | 60 | 7,000 |
| ★ 04-00230-00510 | 5.1 | 10.2 | 15.3 | 4.9 | 9° | 6 | 60 | 7,400 |
| ★ 04-00230-00520 | 5.2 | 10.4 | 15.6 | 5 | 9° | 6 | 60 | 7,400 |
| ★ 04-00230-00530 | 5.3 | 10.6 | 15.9 | 5.1 | 9° | 6 | 60 | 7,400 |
| ★ 04-00230-00540 | 5.4 | 10.8 | 16.2 | 5.2 | 9° | 6 | 60 | 7,400 |
| ★ 04-00230-00550 | 5.5 | 11 | 16.5 | 5.3 | 9° | 6 | 60 | 7,400 |
| ★ 04-00230-00560 | 5.6 | 11.2 | 16.8 | 5.4 | 9° | 6 | 60 | 7,700 |
| ★ 04-00230-00570 | 5.7 | 11.4 | 17.1 | 5.5 | 9° | 6 | 60 | 7,700 |
| ★ 04-00230-00580 | 5.8 | 11.6 | 17.4 | 5.6 | 9° | 6 | 60 | 7,700 |
| ★ 04-00230-00590 | 5.9 | 11.8 | 17.7 | 5.7 | 9° | 6 | 60 | 7,700 |
| ★ 04-00230-00600 | 6 | 12 | 18 | 5.8 | - | 6 | 60 | 7,700 |

オーダー方法

MFD 直径(D)を指示してください。
When you order, indicate MFD (D).

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はH-011に記載
●Recommended Drilling Conditions are shown on page H-011.

SEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

## 切削条件参考表 Recommended Drilling Conditions

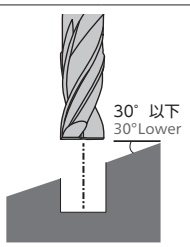
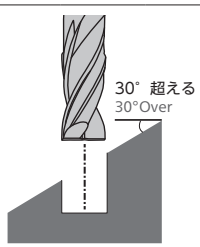
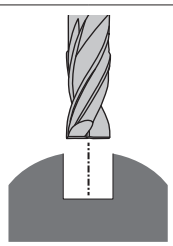
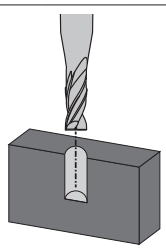
技術資料 K-033

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM440 | | | ステンレス鋼 Stainless Steels SUS304 | | | アルミニウム合金 Aluminum Alloy A5052 | | | アルミニウム合金ダイカスト Aluminum Alloy Die Casting ADC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 60～75m/min | | | 55～70m/min | | | 20～30m/min | | | 60～145m/min | | | 60～125m/min | | |
| 直径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 1回転送り量 Feed per Revolution | 回転数 Spindle Speed | 送り速度 Feed | 1回転送り量 Feed per Revolution | 回転数 Spindle Speed | 送り速度 Feed | 1回転送り量 Feed per Revolution | 回転数 Spindle Speed | 送り速度 Feed | 1回転送り量 Feed per Revolution | 回転数 Spindle Speed | 送り速度 Feed | 1回転送り量 Feed per Revolution |
| | $min^{-1}$ | mm/min | mm/rev | $min^{-1}$ | mm/min | mm/rev | $min^{-1}$ | mm/min | mm/rev | $min^{-1}$ | mm/min | mm/rev | $min^{-1}$ | mm/min | mm/rev |
| 1 | 19,000 | 250 | 0.013 | 18,000 | 180 | 0.01 | 6,500 | 35 | 0.005 | 20,000 | 360 | 0.018 | 20,000 | 300 | 0.015 |
| 2 | 10,500 | 370 | 0.035 | 10,000 | 200 | 0.02 | 3,600 | 35 | 0.01 | 20,000 | 720 | 0.036 | 20,000 | 600 | 0.03 |
| 3 | 8,000 | 430 | 0.054 | 6,800 | 300 | 0.044 | 2,500 | 40 | 0.016 | 15,000 | 1,000 | 0.067 | 13,000 | 760 | 0.058 |
| 4 | 6,000 | 430 | 0.072 | 5,200 | 320 | 0.062 | 2,400 | 60 | 0.025 | 11,000 | 1,000 | 0.091 | 10,000 | 760 | 0.076 |
| 5 | 4,800 | 430 | 0.09 | 4,200 | 320 | 0.076 | 1,900 | 60 | 0.032 | 9,000 | 1,000 | 0.111 | 8,000 | 760 | 0.095 |
| 6 | 4,000 | 430 | 0.108 | 3,600 | 320 | 0.089 | 1,600 | 80 | 0.05 | 7,500 | 1,000 | 0.133 | 6,600 | 760 | 0.115 |

### 備考 Notes

※推奨穴深さは 2D（工具径× 2）です。
※クーラントは加工点やドリル溝へ十分に供給するよう設定してください。
※機械剛性、ホルダー剛性およびワーククランプ剛性を考慮し、切削条件を調整してください。
※斜面、曲面への加工および半割れ加工に際しては、下記の図表を目安に切削条件を設定してください。
※工具装着時の振れは極力抑えてください。
※加工中に切りくず詰まりが発生する場合は、ステップ加工をお奨めします。
※クーラントは水溶性切削油をお奨めします。
※Recommend drilling depth is 2D.
※Coolant must supply correctly to the point of drilling or flute.
※Adjust drilling condition conforming to machine rigidity, holder rigidity and clamping condition.
※Refer below table for recommended drilling condition in case of drilling on curved surface, inclined surface or semicircular hole.
※Minimize chacking runout.
※When chip can not be disposed, apply step feed.
※Water soluble cutting fluid is recommended.

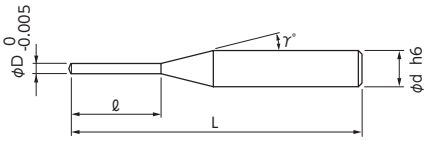
加工形状別　切削条件目安
Recommended Drilling Conditions Depending on Work Shape

| 斜面（傾斜角30°以下） Slope (Inclination angle 30° lower) | | 斜面（傾斜角30°超える） Slope (Inclination angle 30° over) | | | 曲面 Curved Surface | | 半割れ加工 Semicircular Hole | | |
|---|---|---|---|---|---|---|---|---|---|
|   | |   | | |  | |  | | |
| 直径 Dia. | 送り速度 Feed | 直径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | 直径 Dia. | 送り速度 Feed | 直径 Dia. | 回転数 Spindle Speed | 送り速度 Feed |
| φ1～4.5 | 70% | φ1～4.5 | 80% | 50% | φ1～6 | 90% | φ1～4.5 | 80% | 40% |
| φ4.6～6 | 40% | φ4.6～6 | 80% | 30% | | | φ4.6～6 | 80% | 30% |

# MDR-R

## 無限コーティング ミニチュアドリル
MUGEN-COATING Miniature Drill

先端角 120°
Point Angle 120°




●無限コーティングの採用により、長寿命で安定した穴加工を実現！
●精密部品加工に適した高精度仕様。直径許容差　0 ～ -0.005mm
●Stable and long-life drill realized by MUGEN-COATING.
●High accuracy suitable for precision machining. Tolerance of diameter : 0/-0.005mm.

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ |

単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)直径 Dia. | (ℓ)溝長 Flute Length | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 04-00200-00100 | 0.1 | 1.2 | 15° | 3 | 38 | 6,000 |
| 04-00200-00110 | 0.11 | 1.2 | 15° | 3 | 38 | 6,000 |
| 04-00200-00120 | 0.12 | 1.4 | 15° | 3 | 38 | 6,000 |
| 04-00200-00130 | 0.13 | 1.4 | 15° | 3 | 38 | 6,000 |
| 04-00200-00140 | 0.14 | 1.4 | 15° | 3 | 38 | 6,000 |
| 04-00200-00150 | 0.15 | 1.8 | 15° | 3 | 38 | 5,100 |
| 04-00200-00160 | 0.16 | 1.8 | 15° | 3 | 38 | 5,400 |
| 04-00200-00170 | 0.17 | 1.8 | 15° | 3 | 38 | 5,400 |
| 04-00200-00180 | 0.18 | 2.1 | 15° | 3 | 38 | 5,400 |
| 04-00200-00190 | 0.19 | 2.1 | 15° | 3 | 38 | 5,400 |
| 04-00200-00200 | 0.2 | 2.4 | 15° | 3 | 38 | 4,400 |
| 04-00200-00210 | 0.21 | 2.4 | 15° | 3 | 38 | 5,000 |
| 04-00200-00220 | 0.22 | 2.6 | 15° | 3 | 38 | 5,000 |
| 04-00200-00230 | 0.23 | 2.6 | 15° | 3 | 38 | 5,000 |
| 04-00200-00240 | 0.24 | 2.6 | 15° | 3 | 38 | 5,000 |
| 04-00200-00250 | 0.25 | 3 | 15° | 3 | 38 | 5,000 |
| 04-00200-00260 | 0.26 | 3 | 15° | 3 | 38 | 4,700 |
| 04-00200-00270 | 0.27 | 3 | 15° | 3 | 38 | 4,700 |
| 04-00200-00280 | 0.28 | 3.3 | 15° | 3 | 38 | 4,700 |
| 04-00200-00290 | 0.29 | 3.3 | 15° | 3 | 38 | 4,700 |
| 04-00200-00300 | 0.3 | 5 | 15° | 3 | 38 | 3,900 |
| 04-00200-00310 | 0.31 | 5 | 15° | 3 | 38 | 4,700 |
| 04-00200-00320 | 0.32 | 5 | 15° | 3 | 38 | 4,700 |
| 04-00200-00330 | 0.33 | 5 | 15° | 3 | 38 | 4,700 |
| 04-00200-00340 | 0.34 | 5 | 15° | 3 | 38 | 4,700 |
| 04-00200-00350 | 0.35 | 5 | 15° | 3 | 38 | 4,200 |
| 04-00200-00360 | 0.36 | 5 | 15° | 3 | 38 | 4,700 |
| 04-00200-00370 | 0.37 | 5 | 15° | 3 | 38 | 4,700 |
| 04-00200-00380 | 0.38 | 5 | 15° | 3 | 38 | 4,700 |
| 04-00200-00390 | 0.39 | 5 | 15° | 3 | 38 | 4,700 |

| コードNo. Code No. | (D)直径 Dia. | (ℓ)溝長 Flute Length | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 04-00200-00400 | 0.4 | 6 | 15° | 3 | 38 | 3,900 |
| 04-00200-00410 | 0.41 | 6 | 15° | 3 | 38 | 4,700 |
| 04-00200-00420 | 0.42 | 6 | 15° | 3 | 38 | 4,700 |
| 04-00200-00430 | 0.43 | 6 | 15° | 3 | 38 | 4,700 |
| 04-00200-00440 | 0.44 | 6 | 15° | 3 | 38 | 4,700 |
| 04-00200-00450 | 0.45 | 6 | 15° | 3 | 38 | 4,200 |
| 04-00200-00460 | 0.46 | 6 | 15° | 3 | 38 | 4,700 |
| 04-00200-00470 | 0.47 | 6 | 15° | 3 | 38 | 4,700 |
| 04-00200-00480 | 0.48 | 6 | 15° | 3 | 38 | 4,700 |
| 04-00200-00490 | 0.49 | 6 | 15° | 3 | 38 | 4,700 |
| 04-00200-00500 | 0.5 | 6 | 15° | 3 | 38 | 4,200 |
| 04-00200-00510 | 0.51 | 6 | 15° | 3 | 38 | 4,200 |
| 04-00200-00520 | 0.52 | 6 | 15° | 3 | 38 | 4,200 |
| 04-00200-00530 | 0.53 | 6 | 15° | 3 | 38 | 4,200 |
| 04-00200-00540 | 0.54 | 6 | 15° | 3 | 38 | 4,200 |
| 04-00200-00550 | 0.55 | 6 | 15° | 3 | 38 | 3,400 |
| 04-00200-00560 | 0.56 | 6 | 15° | 3 | 38 | 4,200 |
| 04-00200-00570 | 0.57 | 6 | 15° | 3 | 38 | 4,200 |
| 04-00200-00580 | 0.58 | 6 | 15° | 3 | 38 | 4,200 |
| 04-00200-00590 | 0.59 | 6 | 15° | 3 | 38 | 4,200 |
| 04-00200-00600 | 0.6 | 7 | 15° | 3 | 38 | 2,900 |
| 04-00200-00610 | 0.61 | 7 | 15° | 3 | 38 | 4,200 |
| 04-00200-00620 | 0.62 | 7 | 15° | 3 | 38 | 4,200 |
| 04-00200-00630 | 0.63 | 7 | 15° | 3 | 38 | 4,200 |
| 04-00200-00640 | 0.64 | 7 | 15° | 3 | 38 | 4,200 |
| 04-00200-00650 | 0.65 | 7 | 15° | 3 | 38 | 3,400 |
| 04-00200-00660 | 0.66 | 7 | 15° | 3 | 38 | 4,200 |
| 04-00200-00670 | 0.67 | 7 | 15° | 3 | 38 | 4,200 |
| 04-00200-00680 | 0.68 | 7 | 15° | 3 | 38 | 4,200 |
| 04-00200-00690 | 0.69 | 7 | 15° | 3 | 38 | 4,200 |

オーダー方法
MDR-R 直径(D)を指示してください。
When you order, indicate MDR-R (D).

※(γ)は参考値です。
※(γ) is reference value

●切削条件表はH-014に記載
●Recommended Drilling Conditions are shown on page H-014.



ŞEVKET ÖLÜ® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

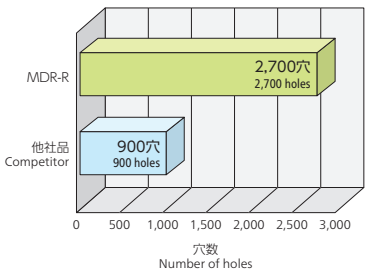
| コードNo. Code No. | (D)直径 Dia. | (ℓ)溝長 Flute Length | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 04-00200-00700 | 0.7 | 8 | 15° | 3 | 38 | 2,900 |
| 04-00200-00710 | 0.71 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00720 | 0.72 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00730 | 0.73 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00740 | 0.74 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00750 | 0.75 | 8 | 15° | 3 | 38 | 3,400 |
| 04-00200-00760 | 0.76 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00770 | 0.77 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00780 | 0.78 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00790 | 0.79 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00800 | 0.8 | 8 | 15° | 3 | 38 | 2,900 |
| 04-00200-00810 | 0.81 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00820 | 0.82 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00830 | 0.83 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00840 | 0.84 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00850 | 0.85 | 8 | 15° | 3 | 38 | 3,400 |

| コードNo. Code No. | (D)直径 Dia. | (ℓ)溝長 Flute Length | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 04-00200-00860 | 0.86 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00870 | 0.87 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00880 | 0.88 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00890 | 0.89 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00900 | 0.9 | 8 | 15° | 3 | 38 | 2,900 |
| 04-00200-00910 | 0.91 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00920 | 0.92 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00930 | 0.93 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00940 | 0.94 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00950 | 0.95 | 8 | 15° | 3 | 38 | 3,400 |
| 04-00200-00960 | 0.96 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00970 | 0.97 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00980 | 0.98 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-00990 | 0.99 | 8 | 15° | 3 | 38 | 4,200 |
| 04-00200-01000 | 1 | 10 | 15° | 3 | 38 | 2,900 |

## 加工事例 1 Technical Data 1

S50C 貫通穴加工 Through hole drilling

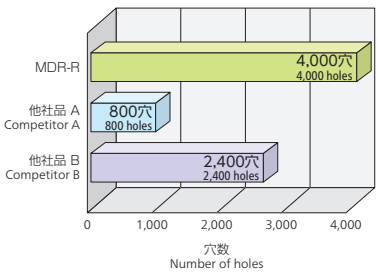
| | |
|---|---|
| 使用工具 Tool | MDR-R φ1 |
| 回転数 Spindle speed | 10,000 $min^{-1}$ |
| 送り速度 Feed | 500 mm/min |
| ステップ量 Step feed | 0.5 mm |
| 穴深さ Depth of hole | 9 mm (貫通) Through |
| クーラント Coolant | 水溶性切削油 Water soluble fluid |




## 加工事例 2 Technical Data 2

SUS304 貫通穴加工 Through hole drilling

| | |
|---|---|
| 使用工具 Tool | MDR-R φ0.5 |
| 回転数 Spindle speed | 7,000 $min^{-1}$ |
| 送り速度 Feed | 105 mm/min |
| ステップ量 Step feed | 0.1 mm |
| 穴深さ Depth of hole | 4 mm (貫通) Through |
| クーラント Coolant | 水溶性切削油 Water soluble fluid |



# MDR-R

## 切削条件参考表 Recommended Drilling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM·SKD | | | 調質鋼 Prehardened Steels HPM·NAK (～40HRC) | | | アルミニウム合金 Aluminum Alloy A5052 | | | ステンレス鋼 Stainless Steels SUS304 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 直径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | ステップ量 Step Feed | 回転数 Spindle Speed | 送り速度 Feed | ステップ量 Step Feed | 回転数 Spindle Speed | 送り速度 Feed | ステップ量 Step Feed | 回転数 Spindle Speed | 送り速度 Feed | ステップ量 Step Feed | 回転数 Spindle Speed | 送り速度 Feed | ステップ量 Step Feed |
| | $min^{-1}$ | mm/min | mm | $min^{-1}$ | mm/min | mm | $min^{-1}$ | mm/min | mm | $min^{-1}$ | mm/min | mm | $min^{-1}$ | mm/min | mm |
| 0.1 | 25,000 | 50 | 0.02 | 20,000 | 40 | 0.02 | 17,000 | 35 | 0.02 | 25,000 | 50 | 0.05 | 15,000 | 30 | 0.005 |
| 0.15 | 25,000 | 50 | 0.02 | 20,000 | 40 | 0.02 | 17,000 | 35 | 0.02 | 25,000 | 50 | 0.05 | 15,000 | 30 | 0.005 |
| 0.2 | 25,000 | 75 | 0.04 | 20,000 | 60 | 0.04 | 17,000 | 50 | 0.04 | 25,000 | 100 | 0.1 | 15,000 | 45 | 0.01 |
| 0.25 | 25,000 | 75 | 0.04 | 20,000 | 60 | 0.04 | 17,000 | 50 | 0.04 | 25,000 | 100 | 0.2 | 15,000 | 45 | 0.01 |
| 0.3 | 20,000 | 120 | 0.05 | 15,000 | 60 | 0.05 | 13,000 | 50 | 0.05 | 22,000 | 400 | 0.3 | 11,000 | 45 | 0.02 |
| 0.35 | 20,000 | 120 | 0.05 | 15,000 | 60 | 0.05 | 13,000 | 50 | 0.05 | 22,000 | 400 | 0.3 | 11,000 | 45 | 0.02 |
| 0.4 | 20,000 | 160 | 0.06 | 15,000 | 75 | 0.06 | 13,000 | 65 | 0.06 | 22,000 | 700 | 0.4 | 8,500 | 45 | 0.04 |
| 0.45 | 20,000 | 160 | 0.06 | 15,000 | 75 | 0.06 | 13,000 | 65 | 0.06 | 22,000 | 700 | 0.4 | 8,500 | 45 | 0.07 |
| 0.5 | 18,000 | 180 | 0.1 | 13,000 | 100 | 0.1 | 10,000 | 80 | 0.1 | 20,000 | 1,000 | 0.5 | 7,000 | 55 | 0.1 |
| 0.55 | 18,000 | 180 | 0.1 | 13,000 | 100 | 0.1 | 10,000 | 80 | 0.1 | 20,000 | 1,000 | 0.5 | 7,000 | 55 | 0.1 |
| 0.6 | 18,000 | 360 | 0.15 | 13,000 | 100 | 0.15 | 10,000 | 80 | 0.15 | 20,000 | 1,000 | 0.6 | 7,000 | 55 | 0.12 |
| 0.65 | 18,000 | 360 | 0.15 | 13,000 | 100 | 0.15 | 10,000 | 80 | 0.15 | 20,000 | 1,000 | 0.6 | 7,000 | 55 | 0.12 |
| 0.7 | 16,000 | 480 | 0.2 | 11,000 | 110 | 0.2 | 8,000 | 80 | 0.2 | 18,000 | 1,100 | 0.7 | 6,000 | 60 | 0.14 |
| 0.75 | 16,000 | 480 | 0.2 | 11,000 | 110 | 0.2 | 8,000 | 80 | 0.2 | 18,000 | 1,100 | 0.7 | 6,000 | 60 | 0.14 |
| 0.8 | 16,000 | 640 | 0.3 | 11,000 | 220 | 0.3 | 8,000 | 160 | 0.3 | 18,000 | 1,100 | 0.8 | 6,000 | 120 | 0.16 |
| 0.85 | 16,000 | 640 | 0.3 | 11,000 | 220 | 0.3 | 8,000 | 160 | 0.3 | 18,000 | 1,100 | 0.8 | 6,000 | 120 | 0.16 |
| 0.9 | 15,000 | 750 | 0.4 | 9,000 | 270 | 0.4 | 7,000 | 210 | 0.4 | 16,000 | 1,200 | 0.8 | 5,000 | 150 | 0.18 |
| 0.95 | 15,000 | 750 | 0.4 | 9,000 | 270 | 0.4 | 7,000 | 210 | 0.4 | 16,000 | 1,200 | 0.8 | 5,000 | 150 | 0.18 |
| 1 | 15,000 | 750 | 0.5 | 9,000 | 270 | 0.5 | 7,000 | 210 | 0.5 | 16,000 | 1,200 | 1 | 5,000 | 150 | 0.2 |

**備考 Notes**

※被削材・加工内容に適したクーラントをご使用ください。
※回転数は極力振動の少ない回転数に設定し、チャッキングの振れを極力抑えてください。
（可能ならば使用される回転数での動的振れ精度を確認してください。）
※加工面を極力平坦にして、加工を開始してください。
※工具の取り出し時や、チャッキング時には細心の注意をお願いします。
※Use appropriate coolant for work material and machining description.
※Minimize chucking runout by setting spindle speed at minimum oscillation.
(Recommend to measure actual runout at activated Spindle Speed.)
※Set up flat surface before start machining.
※Take extra care when chucking in and out.



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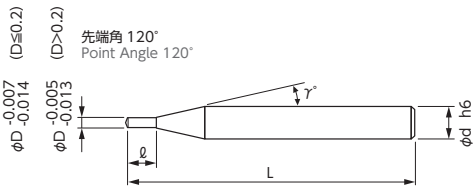
# MDR-PD

## 無限コーティング ポイントドリル（下穴加工用）
MUGEN-COATING Point Drill (Drill for Guide Hole)




●無限ミニチュアドリルの下穴加工用ドリルです。薄板の穴あけ加工にも使用可能。
●シンニングの採用により穴位置精度が向上、安定した穴あけ加工が可能。
●Aiming at guide hole for Mugen miniature drill. Also used for drilling on thin materials.
●Positioning of drill center is improved by web thinning which brings stable drilling.

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

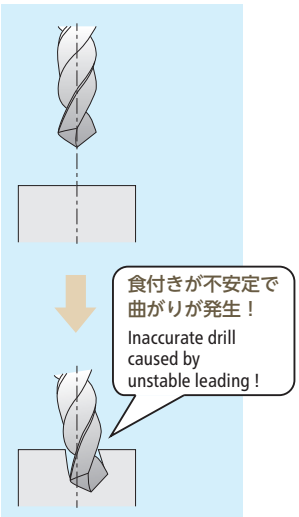
| コードNo. Code No. | (D)直径 Dia. | (ℓ)溝長 Flute Length | (γ)首角 Neck Taper Angle | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 04-00210-00100 | 0.1 | 0.2 | 15° | 3 | 38 | 8,200 |
| 04-00210-00200 | 0.2 | 0.4 | 15° | 3 | 38 | 7,400 |
| 04-00210-00300 | 0.3 | 0.6 | 15° | 3 | 38 | 6,300 |
| 04-00210-00400 | 0.4 | 0.6 | 15° | 3 | 38 | 6,300 |
| 04-00210-00500 | 0.5 | 1 | 15° | 3 | 38 | 6,300 |
| 04-00210-00600 | 0.6 | 1 | 15° | 3 | 38 | 6,300 |
| 04-00210-00700 | 0.7 | 1.2 | 15° | 3 | 38 | 6,300 |
| 04-00210-00800 | 0.8 | 1.2 | 15° | 3 | 38 | 6,300 |
| 04-00210-00900 | 0.9 | 1.8 | 15° | 3 | 38 | 6,300 |
| 04-00210-01000 | 1 | 2 | 15° | 3 | 38 | 6,300 |

**オーダー方法** MDR-PD 直径(D)を指示してください。 ※(γ)は参考値です。
When you order, indicate MDR-PD (D). ※(γ) is reference value.

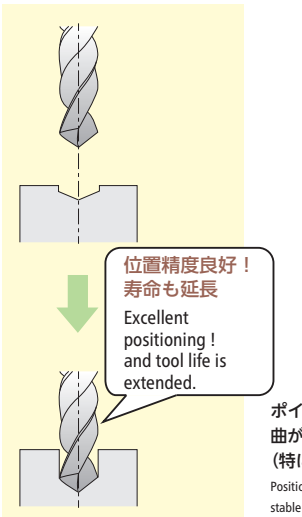
●切削条件表はH-016に記載
●Recommended Drilling Conditions are shown on page H-016.

## ポイントドリルの使用効果 Effect of Point drill

**ポイントドリル未使用**
Without Point drill




**ポイントドリル使用**
With Point drill




ポイントドリルの使用により加工穴位置精度が向上し、
曲がりを抑え、バラつきのない安定した加工が可能です。
(特に曲面への穴あけ加工には不可欠です。)
Positioning of drill center is improved by point drill which brings stable drilling. (Point drill is required for drilling on a curved surface.)

# MDR-PD

## 切削条件参考表 Recommended Drilling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM·SKD | | | 調質鋼 Prehardened Steels HPM·NAK (～40HRC) | | | アルミニウム合金 Aluminum Alloy A5052 | | | ステンレス鋼 Stainless Steels SUS304 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 直径 Dia. | 回転数 Spindle Speed | 送り速度 Feed | ステップ量 Step Feed | 回転数 Spindle Speed | 送り速度 Feed | ステップ量 Step Feed | 回転数 Spindle Speed | 送り速度 Feed | ステップ量 Step Feed | 回転数 Spindle Speed | 送り速度 Feed | ステップ量 Step Feed | 回転数 Spindle Speed | 送り速度 Feed | ステップ量 Step Feed |
| | $min^{-1}$ | mm/min | mm | $min^{-1}$ | mm/min | mm | $min^{-1}$ | mm/min | mm | $min^{-1}$ | mm/min | mm | $min^{-1}$ | mm/min | mm |
| **0.1** | 20,000 | 20 | 0.01 | 16,000 | 16 | 0.01 | 14,000 | 10 | 0.01 | 25,000 | 25 | 0.01 | 10,000 | 10 | 0.003 |
| **0.2** | 20,000 | 40 | 0.02 | 16,000 | 32 | 0.02 | 14,000 | 25 | 0.02 | 25,000 | 50 | 0.02 | 10,000 | 20 | 0.005 |
| **0.3** | 16,000 | 48 | 0.02 | 12,000 | 35 | 0.02 | 10,000 | 30 | 0.02 | 22,000 | 110 | 0.02 | 8,000 | 20 | 0.01 |
| **0.4** | 16,000 | 64 | 0.03 | 12,000 | 40 | 0.03 | 10,000 | 30 | 0.03 | 22,000 | 440 | 0.03 | 8,000 | 25 | 0.02 |
| **0.5** | 14,000 | 70 | 0.05 | 10,000 | 40 | 0.05 | 8,000 | 35 | 0.05 | 20,000 | 500 | 0.05 | 5,000 | 25 | 0.05 |
| **0.6** | 14,000 | 140 | 0.07 | 10,000 | 40 | 0.07 | 8,000 | 35 | 0.07 | 20,000 | 500 | 0.07 | 5,000 | 25 | 0.06 |
| **0.7** | 12,000 | 180 | 0.1 | 8,000 | 40 | 0.1 | 6,000 | 30 | 0.1 | 18,000 | 540 | 0.1 | 4,000 | 20 | 0.07 |
| **0.8** | 12,000 | 240 | 0.15 | 8,000 | 80 | 0.15 | 6,000 | 60 | 0.15 | 18,000 | 540 | 0.15 | 4,000 | 40 | 0.08 |
| **0.9** | 10,000 | 250 | 0.2 | 6,000 | 90 | 0.2 | 5,000 | 75 | 0.2 | 16,000 | 560 | 0.2 | 3,000 | 45 | 0.09 |
| **1** | 10,000 | 250 | 0.2 | 6,000 | 90 | 0.2 | 5,000 | 75 | 0.2 | 16,000 | 560 | 0.2 | 3,000 | 45 | 0.1 |

**備考 Notes**

※被削材・加工内容に適したクーラントをご使用ください。
※回転数は極力振動の少ない回転数に設定し、チャッキングの振れを極力抑えてください。
（可能ならば使用される回転数での動的振れ精度を確認してください。）
※加工面を極力平坦にして、加工を開始してください。
※工具の取り出し時や、チャッキング時には細心の注意をお願いします。
※Use appropriate coolant for work material and machining description.
※Minimize chucking runout by setting spindle speed at minimum oscillation.
(Recommend to measure actual runout at activated Spindle Speed.)
※Set up flat surface before start machining.
※Take extra care when chucking in and out.



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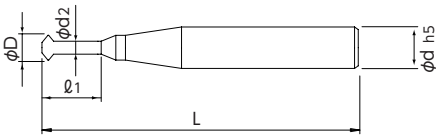
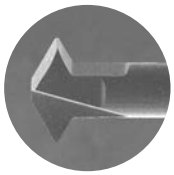
# MMTS

## 無限コーティング マイクロねじ切り工具（めねじ用）
MUGEN-COATING Micro Thread Cutting Tool (for Internal Thread)



●世界最小、呼び径 0.1mm の、めねじ加工が可能。
●ヘリカルにねじ切り加工を行い、下穴径よりも工具径が小さい為、折損時は取り出し・再加工が可能。
●無限コーティングの採用により長寿命化を実現。
●World smallest threaded size 0.1mm is possible to cut.
●When the tool is broken during thread milling, the wreckages can be easily removed as the tool diameter is smaller than the pilot hole.
●MUGEN-COATING realized long tool life.

Thread

MG ∞ 2

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ | | | | | |
| ◎ | ◎ | ◎ | | | ◎ | ◎ | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | 呼び Thread Size | (D) 刃径 Dia. | (ℓ1) 有効長 Effective Length | (d2) 首下径 Neck Dia. | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|
| 06-00001-01000 | S0.1 | 0.066 | 0.15 | 0.032 | 4 | 45 | 35,000 |
| 06-00001-02000 | S0.2 | 0.14 | 0.31 | 0.07 | 4 | 45 | 32,000 |
| 06-00001-03000 | S0.3 | 0.2 | 0.48 | 0.085 | 4 | 45 | 25,000 |
| 06-00001-04000 | S0.4 | 0.28 | 0.61 | 0.15 | 4 | 45 | 20,000 |
| 06-00001-05000 | S0.5 | 0.35 | 0.77 | 0.17 | 4 | 45 | 17,000 |
| 06-00001-06000 | S0.6 | 0.43 | 0.93 | 0.22 | 4 | 45 | 15,000 |
| 06-00001-08000 | S0.8 | 0.58 | 1.24 | 0.31 | 4 | 45 | 13,000 |
| 06-00001-10000 | S1.0 | 0.73 | 1.55 | 0.41 | 4 | 45 | 11,000 |
| 06-00001-10001 | | 0.73 | 3.17 | 0.41 | 4 | 45 | 11,000 |
| 06-00001-12000 | S1.2 | 0.93 | 1.6 | 0.61 | 4 | 45 | 10,000 |
| 06-00001-12001 | | 0.93 | 3.22 | 0.61 | 4 | 45 | 10,000 |
| 06-00001-14000 | S1.4 | 1.08 | 1.9 | 0.7 | 4 | 45 | 10,000 |
| 06-00001-14001 | | 1.08 | 3.86 | 0.7 | 4 | 45 | 10,000 |

**オーダー方法** MMTS　呼び×有効長(ℓ)を指示してください。
When you order, indicate MMTS Thread Size×(ℓ).

●ミニチュアねじのJIS規格はS0.3からのため、S0.1、S0.2は日進工具㈱オリジナル規格です。
●S0.1 and S0.2 are original standard by NS Tool Co., LTD. as a miniature thread standard of JIS is from S0.3.
●切削条件表はI-002に記載
●Recommended Milling Conditions are shown on page I-002.

### NCプログラム作成ソフトを弊社ホームページにて配布中

ホームページURL
https://www.ns-tool.com/ja/download/mmts_mmtm_nc.html
※使用前はマニュアルをお読みください。

# MMTS

## 切削条件参考表 Recommended Milling Conditions

| 呼び Thread Size | 刃径 Dia. | ピッチ Pitch | NS推奨下穴径 Recommended pilot hole Dia. | NS推奨加工ヘリカルR*1 Recommended procces Helical R | ステンレス鋼 Stainless Steels SUS304 | | アルミニウム合金 Aluminum Alloy A5052 | | 純チタン Titanium Ti | | 炭素鋼 Carbon Steels S50C | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed | 回転数 Spindle Speed | 送り速度 Feed |
| | | | mm | mm | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| **S0.1** | **0.066** | 0.025 | 0.075 | R0.017*2 | 20,000 | 5 | 20,000 | 5 | 20,000 | 5 | 20,000 | 5 |
| **S0.2** | **0.14** | 0.05 | 0.15 | R0.035*2 | 20,000 | 5 | 20,000 | 5 | 20,000 | 5 | 20,000 | 5 |
| **S0.3** | **0.2** | 0.08 | 0.23 | R0.061*2 | 20,000 | 5 | 20,000 | 5 | 20,000 | 5 | 20,000 | 5 |
| **S0.4** | **0.28** | 0.1 | 0.32 | R0.070 | 18,000 | 5 | 18,000 | 5 | 18,000 | 5 | 18,000 | 5 |
| **S0.5** | **0.35** | 0.125 | 0.4 | R0.088 | 15,000 | 10 | 15,000 | 10 | 15,000 | 10 | 15,000 | 10 |
| **S0.6** | **0.43** | 0.15 | 0.48 | R0.110 | 12,000 | 10 | 12,000 | 10 | 12,000 | 10 | 12,000 | 10 |
| **S0.8** | **0.58** | 0.2 | 0.64 | R0.130 | 10,000 | 20 | 10,000 | 20 | 10,000 | 20 | 10,000 | 20 |
| **S1.0** | **0.73** | 0.25 | 0.8 | R0.155 | 7,000 | 50 | 7,000 | 50 | 7,000 | 50 | 7,000 | 50 |
| **S1.2** | **0.93** | 0.25 | 1 | R0.155 | 6,000 | 80 | 6,000 | 80 | 6,000 | 80 | 6,000 | 80 |
| **S1.4** | **1.08** | 0.3 | 1.15 | R0.190 | 5,000 | 100 | 5,000 | 100 | 5,000 | 100 | 5,000 | 100 |

**備　考 Notes**

＊1　回転時振れや使用機械等により、半径方向の切込みを複数回に分けて加工しなければならない場合があります。
＊2　S0.1、S0.2、S0.3 サイズを使用する際は、必ず半径方向の切込みを複数回に分けて加工してください。
※加工ヘリカル R の最終的な設定値は、可能であれば実刃径測定値を基に調整してください。
※下穴径について、使用するドリルと回転させた際の振れによって径が変動しますので、ご注意ください。
※加工ヘリカル R は、本工具でヘリカル加工を行う際の、実際に動く円弧の R になります。
※加工したねじがテーパーになった場合は、ゼロカットを行ってください。
※工具突出し量は出来るだけ短くしてください。
※工具の着脱や工具測長時には細心の注意を払ってください。
※被削材に適したクーラントをご使用ください。
※切りくずの排出に注意してください。
＊1 Radial depth of cut may be divided into multiple cutting approaches by condition of spindle runout and machine.
＊2 Radial depth of cut must be divided into multiple cutting approaches for the sizes, S0.1, S0.2, and S0.3.
※Adjust process helical final value based on measured actual Dia. of the tool if possible.
※Care differences of actual pilot hole Dia. caused by runout of a pilot drill and rotation.
※Process Helical is a circular radius value of actual tool movement when helical process by MMTS.
※Add zero-cut process in case completed thread left deflection angle.
※Tool overhang to be as short as possible.
※Extra care of handling when tool setting and measuring.
※Choose appropriate coolant for each working material.
※Care with cutting chip removal.

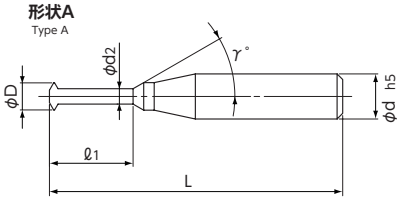


ŞEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

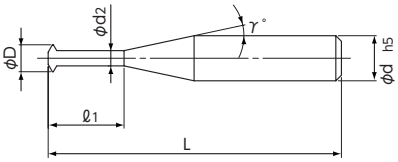
# MMTM

## 無限コーティング Mスレッドミル（めねじ用）
MUGEN-COATING M-Thread Mill (for Internal Thread)

形状A
Type A




形状B
Type B




技術資料 K-036

●切れ味を重視した刃形状を採用し、加工精度が向上。
●無限コーティングの採用により長寿命化を実現。
●Improvement of cutting accuracy by adoption of tool design focusing on sharpness.
●MUGEN-COATING realized long tool life.

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ | | | | | |
| ◎ | ◎ | ◎ | | | ◎ | ◎ | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | 呼び Thread Size | (D) 刃径 Dia. | (ℓ1) 有効長 Effective Length | 形状 Type | (d2) 首下径 Neck Dia. | (γ) 首角 Neck Taper Angle | (d) シャンク径 Shank Dia. | (L) 全長 Overall Length | 刃数 Number of Flutes | 加工サイズ Thread Milling Size | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 06-00002-00100 | M1 | 0.72 | 2.64 | A | 0.36 | 30° | 4 | 45 | 4 | M1 M1.1 | 9,000 |
| 06-00002-00120 | M1.2 | 0.92 | 2.67 | A | 0.56 | 30° | 4 | 45 | 4 | M1.2 | 9,000 |
| 06-00002-00140 | M1.4 | 1.05 | 3.18 | A | 0.62 | 30° | 4 | 45 | 4 | M1.4 | 9,000 |
| 06-00002-00160 | M1.6 | 1.20 | 3.71 | A | 0.68 | 30° | 4 | 45 | 4 | M1.6 | 9,000 |
| 06-00002-00170 | M1.7 | 1.30 | 3.71 | A | 0.78 | 30° | 4 | 45 | 4 | M1.7 M1.8 | 9,000 |
| 06-00002-00200 | M2 | 1.50 | 5.02 | B | 0.89 | 12° | 4 | 45 | 6 | M2 M2.3 | 15,000 |
| 06-00002-00250 | M2.5 | 1.95 | 5.7 | B | 1.28 | 12° | 4 | 45 | 6 | M2.5 M2.6 | 15,000 |
| 06-00002-00300 | M3 | 2.36 | 6.3 | B | 1.63 | 12° | 4 | 45 | 6 | M3 | 15,000 |
| 06-00002-00400 | M4 | 3.08 | 8.8 | B | 2.08 | 12° | 6 | 60 | 6 | M4 | 16,500 |
| 06-00002-00500 | M5 | 3.97 | 10.1 | B | 2.86 | 12° | 6 | 60 | 6 | M5 | 16,500 |
| 06-00002-00600 | M6 | 4.72 | 12.6 | B | 3.35 | 12° | 6 | 60 | 6 | M6 | 16,500 |

オーダー方法
MMTM 呼びを指示してください。
When you order, indicate MMTM Thread Size.

※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はI-004に記載
●Recommended Milling Conditions are shown on page I-004.

NCプログラム作成ソフトを弊社ホームページにて配布中

ホームページURL
https://www.ns-tool.com/ja/download/mmts_mmtm_nc.html

※使用前はマニュアルをお読みください。

## 切削条件参考表 Recommended Milling Conditions

技術資料 K-036

| 呼び Thread Size | 加工サイズ Thread Cutting Size | 刃径 Dia. | ピッチ Pitch | ヘリカルR Helical R | NS推奨加工方向 Recommended Process | 炭素鋼 Carbon Steels S50C | | | ステンレス鋼 Stainless Steels SUS304 | | | チタン合金 Titanium Alloy Ti-6Al-4V | | | アルミニウム合金 Aluminum Alloy A5052 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 回転数 Spindle Speed | 送り速度 Feed | 一刃送り Feed per Tooth | 回転数 Spindle Speed | 送り速度 Feed | 一刃送り Feed per Tooth | 回転数 Spindle Speed | 送り速度 Feed | 一刃送り Feed per Tooth | 回転数 Spindle Speed | 送り速度 Feed | 一刃送り Feed per Tooth |
| | | | | | | $min^{-1}$ | mm/min | mm/tooth | $min^{-1}$ | mm/min | mm/tooth | $min^{-1}$ | mm/min | mm/tooth | $min^{-1}$ | mm/min | mm/tooth |
| **M1** | M1 | 0.72 | 0.25 | R0.155 | アップカット Up-cut | 35,000 | 600 | 0.004 | 35,000 | 600 | 0.004 | 18,000 | 150 | 0.002 | 45,000 | 1,000 | 0.006 |
| **M1** | M1.1 | 0.72 | 0.25 | R0.205 | アップカット Up-cut | 35,000 | 600 | 0.004 | 35,000 | 600 | 0.004 | 18,000 | 150 | 0.002 | 45,000 | 1,000 | 0.006 |
| **M1.2** | M1.2 | 0.92 | 0.25 | R0.155 | アップカット Up-cut | 27,000 | 600 | 0.005 | 27,000 | 600 | 0.005 | 14,000 | 160 | 0.003 | 35,000 | 1,000 | 0.007 |
| **M1.4** | M1.4 | 1.05 | 0.3 | R0.195 | アップカット Up-cut | 24,000 | 600 | 0.006 | 24,000 | 600 | 0.006 | 12,000 | 180 | 0.004 | 30,000 | 1,000 | 0.008 |
| **M1.6** | M1.6 | 1.2 | 0.35 | R0.22 | アップカット Up-cut | 21,000 | 600 | 0.007 | 21,000 | 600 | 0.007 | 10,000 | 220 | 0.005 | 26,000 | 1,000 | 0.01 |
| **M1.7** | M1.7 | 1.3 | 0.35 | R0.22 | アップカット Up-cut | 20,000 | 600 | 0.007 | 20,000 | 600 | 0.007 | 10,000 | 250 | 0.006 | 24,000 | 1,000 | 0.01 |
| **M1.7** | M1.8 | 1.3 | 0.35 | R0.27 | アップカット Up-cut | 20,000 | 600 | 0.007 | 20,000 | 600 | 0.007 | 10,000 | 250 | 0.006 | 24,000 | 1,000 | 0.01 |
| **M2** | M2 | 1.5 | 0.4 | R0.28 | ダウンカット Down-cut | 12,000 | 600 | 0.008 | 12,000 | 600 | 0.008 | 10,000 | 500 | 0.008 | 20,000 | 1,200 | 0.01 |
| **M2** | M2.3 | 1.5 | 0.4 | R0.43 | ダウンカット Down-cut | 12,000 | 600 | 0.008 | 12,000 | 600 | 0.008 | 10,000 | 500 | 0.008 | 20,000 | 1,200 | 0.01 |
| **M2.5** | M2.5 | 1.95 | 0.45 | R0.305 | ダウンカット Down-cut | 12,000 | 600 | 0.008 | 12,000 | 600 | 0.008 | 10,000 | 500 | 0.008 | 16,000 | 1,200 | 0.012 |
| **M2.5** | M2.6 | 1.95 | 0.45 | R0.355 | ダウンカット Down-cut | 12,000 | 600 | 0.008 | 12,000 | 600 | 0.008 | 10,000 | 500 | 0.008 | 16,000 | 1,200 | 0.012 |
| **M3** | M3 | 2.36 | 0.5 | R0.36 | ダウンカット Down-cut | 8,000 | 600 | 0.012 | 8,000 | 600 | 0.012 | 8,000 | 500 | 0.01 | 10,000 | 1,200 | 0.02 |
| **M4** | M4 | 3.08 | 0.7 | R0.5 | ダウンカット Down-cut | 5,700 | 400 | 0.012 | 5,700 | 400 | 0.012 | 4,600 | 350 | 0.013 | 7,000 | 800 | 0.019 |
| **M5** | M5 | 3.97 | 0.8 | R0.555 | ダウンカット Down-cut | 4,000 | 400 | 0.017 | 4,000 | 400 | 0.017 | 3,200 | 350 | 0.018 | 5,500 | 800 | 0.024 |
| **M6** | M6 | 4.72 | 1 | R0.68 | ダウンカット Down-cut | 3,200 | 400 | 0.021 | 3,200 | 400 | 0.021 | 3,000 | 350 | 0.019 | 4,500 | 800 | 0.03 |

**備　考**
**Notes**

※NC プログラム作成ソフトを弊社ホームページにて配布中。
※この切削条件は水溶性切削油で、切り込みを 2 回に分けて加工した場合の条件の目安です。
※事前にドリル等を用いて、下穴加工を行ってください。
※環境に応じて一刃送りを基にした回転数・送り速度の調整やパス回数、方向の調整を行ってください。
※ヘリカル R は M1.4 以下が 5H、M1.6 以上が 6H（従来の JIS2 級相当）のねじを加工するための目安で、最終切り込み時の R 値です。
※条件表のヘリカル R を使用する場合は、首下部と下穴が干渉しないような下穴径を設定してください。
※ねじがテーパーになった場合はゼロカットを行ってください。
※被削材に適したクーラントをご使用ください。
※Software for generating NC program Will be provided on NS web site.
※The above Recommended Milling Conditions is provided as a guide for cutting when the depth of cut is divided into twice with water soluble cutting fluid.
※Recommend making pilot hole in advance by using drill, etc.
※Depending on environment, adjustments of spindle speed based on feed per tooth, feed, number of paths and cutting direction are needed.
※Helical R, 5H for M1.4 and under and 6H for more than M1.6, is a guideline for thread milling and it is R value in the final cutting.
※When use helical R in the Recommended Milling Conditions, set pilot hole dia. for avoiding interference between the area of under neck and pilot hole.
※Add zero-cut process in case completed thread left deflection angle.
※Choose appropriate coolant for each working material.





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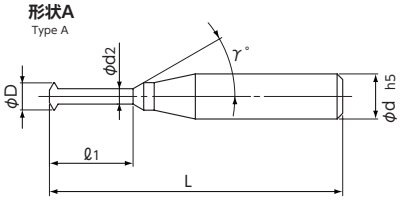
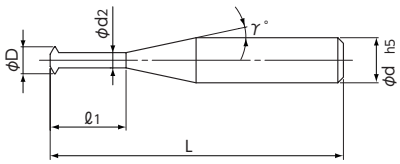
# MMTU

## 無限コーティングプレミアム ねじ切り工具（ユニファイ・めねじ用）
MUGEN-COATING PREMIUM Thread Cutting Tool (Unify : for Internal Thread)

形状A
Type A




形状B
Type B




●切れ味を重視した刃形状を採用し、加工精度が向上。
●無限コーティングプレミアムの採用により長寿命化を実現。
●ユニファイ規格用
●▌の規格・サイズは、特定商社在庫となります。詳しくはお問い合わせください。
●Improvement of cutting accuracy by adoption of tool design focusing on sharpness.
●MUGEN-COATING PREMIUM realized long tool life.
●Unify Standard
●▌: Semi-standard item, please inquire for price and delivery.

Thread ねじ切り　MG　Premium　4　6

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹　脂 Resin | 超耐熱合金 Heat Resistance Alloy |
|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | 呼び Thread Size | (D) 刃径 Dia. | (ℓ1) 有効長 Effective Length | 形状 Type | (d2) 首下径 Neck Dia. | (γ) 首角 Neck Taper Angle | (d) シャンク径 Shank Dia. | (L) 全長 Overall Length | 刃数 Number of Flutes | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|---|
| 06-00003-00800 | No.0-80UNF | 1.16 | 3.28 | A | 0.72 | 30° | 4 | 45 | 4 | 10,800 ▌ |
| 06-00003-01640 | No.1-64UNC | 1.4 | 3.98 | B | 0.84 | 12° | 4 | 45 | 6 | 18,000 ▌ |
| 06-00003-01720 | No.1-72UNF | 1.45 | 3.97 | B | 0.93 | 12° | 4 | 45 | 6 | 18,000 ▌ |
| 06-00003-02560 | No.2-56UNC | 1.63 | 4.67 | B | 0.99 | 12° | 4 | 45 | 6 | 18,000 ▌ |
| 06-00003-02640 | No.2-64UNF | 1.69 | 4.67 | B | 1.11 | 12° | 4 | 45 | 6 | 18,000 ▌ |
| 06-00003-03480 | No.3-48UNC | 1.88 | 5.37 | B | 1.15 | 12° | 4 | 45 | 6 | 18,000 ▌ |
| 06-00003-03560 | No.3-56UNF | 1.96 | 5.36 | B | 1.31 | 12° | 4 | 45 | 6 | 18,000 ▌ |
| 06-00003-04400 | No.4-40UNC | 2.09 | 6.08 | B | 1.23 | 12° | 4 | 45 | 6 | 18,000 ▌ |
| 06-00003-04480 | No.4-48UNF | 2.21 | 6.06 | B | 1.46 | 12° | 4 | 45 | 6 | 18,000 ▌ |
| 06-00003-05400 | No.5-40UNC | 2.38 | 6.76 | B | 1.52 | 12° | 4 | 45 | 6 | 18,000 ▌ |
| 06-00003-05440 | No.5-44UNF | 2.45 | 6.75 | B | 1.65 | 12° | 4 | 45 | 6 | 18,000 ▌ |
| 06-00003-06320 | No.6-32UNC | 2.54 | 7.48 | B | 1.50 | 12° | 4 | 45 | 6 | 18,000 ▌ |
| 06-00003-06400 | No.6-40UNF | 2.72 | 7.45 | B | 1.86 | 12° | 4 | 45 | 6 | 18,000 ▌ |
| 06-00003-08320 | No.8-32UNC | 3.14 | 8.86 | B | 2.04 | 12° | 6 | 60 | 6 | 19,800 ▌ |
| 06-00003-08360 | No.8-36UNF | 3.24 | 8.84 | B | 2.24 | 12° | 6 | 60 | 6 | 19,800 ▌ |
| 06-00003-10240 | No.10-24UNC | 3.52 | 10.29 | B | 2.14 | 12° | 6 | 60 | 6 | 19,800 ▌ |
| 06-00003-10320 | No.10-32UNF | 3.8 | 10.22 | B | 2.70 | 12° | 6 | 60 | 6 | 19,800 ▌ |
| 06-00003-12240 | No.12-24UNC | 4.14 | 11.65 | B | 2.72 | 12° | 6 | 60 | 6 | 19,800 ▌ |
| 06-00003-12280 | No.12-28UNF | 4.29 | 11.62 | B | 3.02 | 12° | 6 | 60 | 6 | 19,800 ▌ |
| 06-00003-14200 | 1/4-20UNC | 4.77 | 13.48 | B | 3.12 | 12° | 6 | 60 | 6 | 19,800 ▌ |
| 06-00003-14280 | 1/4-28UNF | 5.16 | 13.39 | B | 3.89 | 12° | 6 | 60 | 6 | 21,600 ▌ |

オーダー方法　MMTU　呼びを指示してください。
When you order, indicate MMTU Thread Size.

●切削条件表はI-006に記載
●Recommended Milling Conditions are shown on page I-006.

**NCプログラム作成ソフトを弊社ホームページにて配布中**

ホームページURL
https://www.ns-tool.com/ja/download/mmts_mmtm_nc.html

※使用前はマニュアルをお読みください。

# MMTU

## 切削条件参考表 Recommended Milling Conditions

| 呼び Thread Size | 刃径 Dia. | ピッチ Pitch | ヘリカルR Helical R | ステンレス鋼 Stainless Steels SUS304 | | | チタン合金 Titanium Alloy Ti-6Al-4V | | | 超耐熱合金 Heat Resistance Alloy Inconel® | | | アルミニウム合金 Aluminum Alloy A7075 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 回転数 Spindle Speed | 送り速度 Feed | 一刃送り Feed per Tooth | 回転数 Spindle Speed | 送り速度 Feed | 一刃送り Feed per Tooth | 回転数 Spindle Speed | 送り速度 Feed | 一刃送り Feed per Tooth | 回転数 Spindle Speed | 送り速度 Feed | 一刃送り Feed per Tooth |
| | | | | $min^{-1}$ | mm/min | mm/tooth | $min^{-1}$ | mm/min | mm/tooth | $min^{-1}$ | mm/min | mm/tooth | $min^{-1}$ | mm/min | mm/tooth |
| No.0-80UNF | 1.16 | 0.318 | R0.21 | 12,000 | 250 | 0.005 | 12,000 | 200 | 0.004 | 6,800 | 120 | 0.004 | 20,000 | 400 | 0.005 |
| No.1-64UNC | 1.4 | 0.397 | R0.26 | 10,000 | 300 | 0.005 | 8,000 | 240 | 0.005 | 5,600 | 150 | 0.004 | 15,000 | 450 | 0.005 |
| No.1-72UNF | 1.45 | 0.353 | R0.23 | 10,000 | 300 | 0.005 | 8,000 | 240 | 0.005 | 5,600 | 150 | 0.004 | 15,000 | 450 | 0.005 |
| No.2-56UNC | 1.63 | 0.454 | R0.32 | 8,000 | 300 | 0.006 | 6,400 | 240 | 0.006 | 4,500 | 150 | 0.005 | 12,000 | 600 | 0.008 |
| No.2-64UNF | 1.69 | 0.397 | R0.28 | 8,000 | 300 | 0.006 | 6,400 | 240 | 0.006 | 4,500 | 150 | 0.005 | 12,000 | 600 | 0.008 |
| No.3-48UNC | 1.88 | 0.529 | R0.36 | 8,000 | 300 | 0.006 | 6,400 | 240 | 0.006 | 4,500 | 150 | 0.006 | 12,000 | 600 | 0.008 |
| No.3-56UNF | 1.96 | 0.454 | R0.31 | 8,000 | 300 | 0.006 | 6,400 | 240 | 0.006 | 4,500 | 150 | 0.006 | 12,000 | 600 | 0.008 |
| No.4-40UNC | 2.09 | 0.635 | R0.43 | 6,000 | 300 | 0.008 | 4,800 | 240 | 0.008 | 3,400 | 150 | 0.007 | 9,000 | 600 | 0.011 |
| No.4-48UNF | 2.21 | 0.529 | R0.36 | 6,000 | 300 | 0.008 | 4,800 | 240 | 0.008 | 3,400 | 150 | 0.007 | 9,000 | 600 | 0.011 |
| No.5-40UNC | 2.38 | 0.635 | R0.45 | 6,000 | 300 | 0.008 | 4,800 | 240 | 0.008 | 3,400 | 150 | 0.007 | 9,000 | 600 | 0.011 |
| No.5-44UNF | 2.45 | 0.577 | R0.4 | 6,000 | 300 | 0.008 | 4,800 | 240 | 0.008 | 3,400 | 150 | 0.007 | 9,000 | 600 | 0.011 |
| No.6-32UNC | 2.54 | 0.794 | R0.55 | 5,500 | 300 | 0.009 | 4,300 | 240 | 0.009 | 3,000 | 150 | 0.008 | 7,700 | 600 | 0.013 |
| No.6-40UNF | 2.72 | 0.635 | R0.44 | 5,500 | 300 | 0.009 | 4,300 | 240 | 0.009 | 3,000 | 150 | 0.008 | 7,700 | 600 | 0.013 |
| No.8-32UNC | 3.14 | 0.794 | R0.57 | 5,000 | 300 | 0.01 | 4,000 | 240 | 0.01 | 2,800 | 150 | 0.009 | 7,700 | 600 | 0.013 |
| No.8-36UNF | 3.24 | 0.706 | R0.51 | 5,000 | 300 | 0.01 | 4,000 | 240 | 0.01 | 2,800 | 150 | 0.009 | 7,700 | 600 | 0.013 |
| No.10-24UNC | 3.52 | 1.058 | R0.72 | 4,200 | 300 | 0.012 | 3,400 | 240 | 0.012 | 2,400 | 150 | 0.01 | 6,300 | 600 | 0.016 |
| No.10-32UNF | 3.8 | 0.794 | R0.57 | 4,200 | 300 | 0.012 | 3,400 | 240 | 0.012 | 2,400 | 150 | 0.01 | 6,300 | 600 | 0.016 |
| No.12-24UNC | 4.14 | 1.058 | R0.74 | 4,200 | 300 | 0.012 | 3,400 | 240 | 0.012 | 2,400 | 150 | 0.01 | 6,300 | 600 | 0.016 |
| No.12-28UNF | 4.29 | 0.907 | R0.65 | 4,200 | 300 | 0.012 | 3,400 | 240 | 0.012 | 2,400 | 150 | 0.01 | 6,300 | 600 | 0.016 |
| 1/4-20UNC | 4.77 | 1.27 | R0.86 | 2,600 | 300 | 0.019 | 2,200 | 240 | 0.018 | 1,500 | 150 | 0.017 | 3,800 | 600 | 0.026 |
| 1/4-28UNF | 5.16 | 0.907 | R0.65 | 2,600 | 300 | 0.019 | 2,200 | 240 | 0.018 | 1,500 | 150 | 0.017 | 3,800 | 600 | 0.026 |

**備　考**
Notes

※この切削条件は水溶性切削油で、切り込みを 2 回に分けて加工した場合の条件目安です。尚、1/4 サイズは 3 回に分けて加工した場合の条件目安です。
※加工方法はダウンカットをお奨めします。
※事前にドリル等を用いて、下穴加工を行ってください。
※環境に応じて一刃送りを基にした回転数、送り速度の調整やパス回数、方向の調整を行ってください。
※条件表のヘリカル R を使用する場合は首下部と下穴が干渉しない下穴径を設定してください。
※ねじがテーパーになった場合はゼロカットを行ってください。
※被削材に適したクーラントをご使用ください。

※The above milling conditions are provided as a reference for cutting when the depth of cut is divided into twice with water soluble cutting fluid. Also milling conditions for size 1/4 are for reference when it is divided into three times.
※Down-cut is recommended.
※Recommend making pilot hole in advance by using drill, etc.
※Depending on environment, adjustments of spindle speed based on fee per tooth, feed, number of paths and cutting direction are needed.
※When use helical R in the Recommended Milling Conditions, setting of pilot hole dia. for avoiding interference between the area of under neck and pilot hole is required.
※Add zero-cut process in case completed thread has deflection.
※Choose appropriate coolant for each working material.



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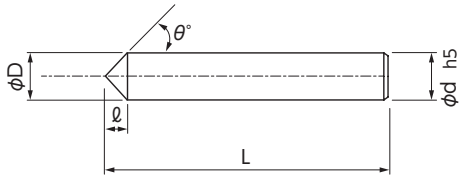
# NSCV-M

## 無限コーティング C面取りカッター
MUGEN-COATING Chamfer Cutter




●C面取りが簡単に加工出来ます。
●無限コーティングを採用し飛躍的に耐久性を向上。
●It can be cut at the corner easily.
●Tool life is exceptionally as MUGEN-COATING provides additional wear resistance.

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| ◎ | ◎ | ◎ | | |

| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|
| ◎ | ○ | ○ | ○ | ○ |

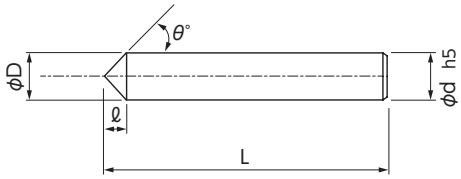
単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 04-00260-00400 | 4 | 45° | 2 | 4 | 60 | 11,000 |
| 04-00260-00600 | 6 | 45° | 3 | 6 | 70 | 12,000 |

**オーダー方法** NSCV-M 刃径(D)を指示してください。
When you order, indicate NSCV-M (D).
●切削条件表はJ-002に記載
●Recommended Milling Conditions are shown on page J-002.

# NSCV

## C面取りカッター
Chamfer Cutter




●C面取りが簡単に加工出来ます。
●It can be cut at the corner easily.

**被削材** Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ |
|---|---|---|---|---|
| | | | | |

| ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|
| | | ◎ | ◎ | ◎ |

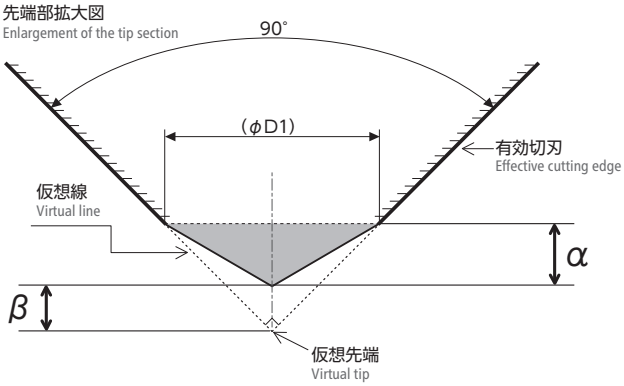
単位［寸法：mm / 価格：円］
Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (D)刃径 Dia. | (θ)片角 Taper Angle | (ℓ)刃長 Length of Cut | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|
| 04-00250-00400 | 4 | 45° | 2 | 4 | 60 | 9,500 |
| 04-00250-00600 | 6 | 45° | 3 | 6 | 70 | 10,500 |

**オーダー方法** NSCV 刃径(D)を指示してください。
When you order, indicate NSCV (D).
●切削条件表はJ-002に記載
●Recommended Milling Conditions are shown on page J-002.

### 使用上の注意
Precaution for use

先端部拡大図
Enlargement of the tip section




単位［mm］
Unit [mm]

| 刃径 Dia. | α | β | (φD1) |
|---|---|---|---|
| 4 | 0.15 | 0.06 | 0.42 |
| 6 | 0.45 | 0.15 | 1.2 |

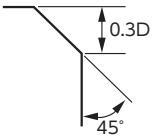
※工具先端α部は切刃ではないため、α部を使用しないようカットポイントを調整してください。
※工具先端α部は先端角90°となっていないため、仮想の先端が基準となるよう、ap方向にβの数値分オフセットして加工をしてください。そのまま加工を行った場合、狙い値より大きいC面になるため注意が必要です。
※Required adjustments of the cut points to avoid using α part because its tool tip has no cutting edges.
※Because the tool tip α part of point angle is not 90°, the value of β must be offset in the ap direction during machining on virtual tip basis.
In case of no adjustments, it requires attention because chamfer will be bigger than targeted value.

# NSCV-M・NSCV

## 切削条件参考表 Recommended Milling Conditions

| 刃径 Dia. | NSCV-M 炭素鋼 Carbon Steels S50C 回転数 Spindle Speed | 送り速度 Feed | ステンレス鋼 Stainless Steels SUS304 回転数 Spindle Speed | 送り速度 Feed | 調質鋼 Prehardened Steels HPM・NAK 回転数 Spindle Speed | 送り速度 Feed | NSCV アルミニウム合金 Aluminum Alloy A5052 回転数 Spindle Speed | 送り速度 Feed |
|---|---|---|---|---|---|---|---|---|
| | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min | $min^{-1}$ | mm/min |
| 4 | 6,500 | 580 | 6,000 | 540 | 4,500 | 400 | 11,000 | 2,400 |
| 6 | 4,300 | 380 | 4,000 | 360 | 3,000 | 270 | 7,500 | 1,800 |

**切り込み量 Depth of Cut**




D:刃径

**備　考 Notes**

※本条件の工具突出し量は、4D の参考値です。それ以上長くなる場合は、条件を調整してください。
※回転数と送り速度は、同じ割合で調整してください。
※ミーリングチャック・機械はできるだけ剛性のあるものを使用してください。
※被削材に適したクーラントをご使用ください。
※The above milling conditions are the value of reference for 4D, it needs adjustments of the conditions when it is longer.
※Adjust both spindle speed and feed at the same rate.
※Machine, tool chuck must be sufficiently rigid.
※Choose appropriate coolant for each working material.



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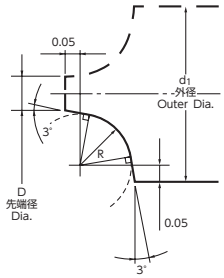
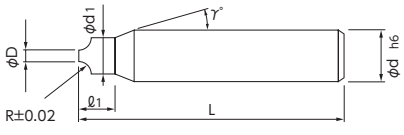
# MIR200

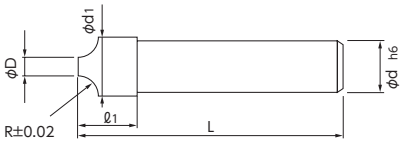
## 無限コーティング インナーRカッター
MUGEN-COATING 2-Flute Inner Radius Cutter




形状 A Type A




形状 B Type B




- NC、MC 対応。R 面取りが簡単に加工できます。
- 無限コーティングを採用し飛躍的に耐久性を向上。
- It is suitable for both processing NC and MC and can be cut at the corner radius easily.
- Tool life is exceptionally extended as MUGEN-COATING provides additional wear resistance.

SMG ∞ 2 ≦55 HRC

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹 脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ | | | | | |
| ◎ | ◎ | ◎ | | | ◎ | ○ | ○ | ◎ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R) R Radius | (D)先端径 Dia. | (d1)外径 Outer Dia. | (ℓ1)外径長さ Outer Dia. Length | (γ)首角 Neck Taper Angle | 形状 Type | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 08-00900-00100 | R0.1 | 0.5 | 0.8 | 3 | 12° | A | 4 | 45 | 13,200 |
| 08-00900-00150 | R0.15 | 0.5 | 0.9 | 3 | 12° | A | 4 | 45 | 13,200 |
| 08-00900-00200 | R0.2 | 0.5 | 1 | 3 | 12° | A | 4 | 45 | 13,200 |
| 08-00900-00250 | R0.25 | 0.5 | 1.1 | 3 | 12° | A | 4 | 45 | 13,200 |
| 08-00900-00300 | R0.3 | 0.5 | 1.2 | 3 | 12° | A | 4 | 45 | 10,800 |
| 08-00900-00350 | R0.35 | 0.5 | 1.3 | 3 | 12° | A | 4 | 45 | 10,800 |
| 08-00900-00400 | R0.4 | 0.5 | 1.4 | 3 | 12° | A | 4 | 45 | 10,800 |
| 08-00900-00450 | R0.45 | 0.5 | 1.5 | 3 | 12° | A | 4 | 45 | 10,800 |
| 08-00900-00500 | R0.5 | 0.5 | 1.6 | 5 | 12° | A | 4 | 45 | 10,800 |
| 08-00900-00550 | R0.55 | 0.5 | 1.7 | 5 | 12° | A | 4 | 45 | 10,800 |
| 08-00900-00600 | R0.6 | 0.5 | 1.8 | 5 | 12° | A | 4 | 45 | 8,100 |
| 08-00900-00650 | R0.65 | 0.5 | 1.9 | 5 | 12° | A | 4 | 45 | 8,100 |
| 08-00900-00700 | R0.7 | 0.5 | 2 | 5 | 12° | A | 4 | 45 | 8,100 |
| 08-00900-00750 | R0.75 | 0.5 | 2.1 | 5 | 12° | A | 4 | 45 | 8,100 |
| 08-00900-00800 | R0.8 | 0.8 | 2.5 | 5 | 12° | A | 4 | 45 | 8,100 |
| 08-00900-00850 | R0.85 | 0.8 | 2.6 | 5 | 12° | A | 4 | 45 | 8,100 |
| 08-00900-00900 | R0.9 | 0.8 | 2.7 | 5 | 12° | A | 4 | 45 | 8,100 |
| 08-00900-00950 | R0.95 | 0.8 | 2.8 | 5 | 12° | A | 4 | 45 | 8,100 |
| 08-00900-01000 | R1 | 0.8 | 2.9 | 8 | 12° | A | 4 | 45 | 9,300 |
| 08-00900-01250 | R1.25 | 0.8 | 3.4 | 8 | 12° | A | 4 | 45 | 9,300 |
| 08-00900-01500 | R1.5 | 1.5 | 4.6 | 8 | – | B | 4 | 45 | 9,300 |
| 08-00900-01750 | R1.75 | 1.5 | 5.1 | 8 | – | B | 4 | 45 | 9,300 |
| 08-00900-02000 | R2 | 1.5 | 5.6 | 10 | – | B | 4 | 45 | 9,300 |
| 08-00900-02500 | R2.5 | 1.5 | 6.6 | 10 | – | B | 6 | 45 | 11,800 |
| 08-00900-03000 | R3 | 1.5 | 7.6 | 12 | 45° | A | 8 | 55 | 12,000 |
| 08-00900-03500 | R3.5 | 2 | 9.1 | 12 | 45° | A | 10 | 55 | 15,100 |
| 08-00900-04000 | R4 | 2 | 10.1 | 12 | – | B | 10 | 55 | 13,100 |
| 08-00900-04500 | R4.5 | 2 | 11.1 | 15 | 45° | A | 12 | 65 | 16,100 |
| 08-00900-05000 | R5 | 2 | 12.1 | 15 | – | B | 12 | 65 | 14,800 |

オーダー方法 MIR200 R寸法(R)を指示してください。
When you order, indicate MIR200 (R).

※(γ)は参考値です。
※(γ) is reference value.

- 切削条件表はJ-004に記載
- Recommended Milling Conditions are shown on page J-004.

# MIR200

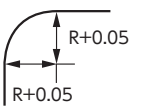
## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM・SKD・SUS | | | 調質鋼 Prehardened Steels HPM・NAK | | |
|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 30～40m/min | | | 20～30m/min | | | 15～25m/min | | |
| R | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min$^{-1}$ | mm/min | | min$^{-1}$ | mm/min | | min$^{-1}$ | mm/min | |
| | | 荒取り Roughing | 仕上げ Finishing | | 荒取り Roughing | 仕上げ Finishing | | 荒取り Roughing | 仕上げ Finishing |
| 0.1 | 18,500 | 60 | 100 | 13,300 | 50 | 70 | 10,600 | 40 | 60 |
| 0.2 | 16,000 | 60 | 100 | 11,400 | 50 | 70 | 9,100 | 40 | 60 |
| 0.3 | 14,000 | 60 | 100 | 10,000 | 50 | 70 | 8,000 | 40 | 60 |
| 0.4 | 12,500 | 60 | 100 | 8,800 | 50 | 70 | 7,100 | 40 | 60 |
| 0.5 | 11,000 | 60 | 100 | 8,000 | 50 | 70 | 6,400 | 40 | 60 |
| 0.75 | 9,000 | 60 | 100 | 6,400 | 50 | 70 | 5,100 | 40 | 60 |
| 0.8 | 7,000 | 60 | 100 | 5,000 | 50 | 70 | 4,900 | 40 | 60 |
| 1 | 6,200 | 60 | 100 | 4,400 | 50 | 70 | 4,200 | 40 | 60 |
| 1.25 | 5,400 | 60 | 100 | 3,900 | 50 | 70 | 3,600 | 40 | 60 |
| 1.5 | 3,700 | 60 | 100 | 2,700 | 50 | 70 | 3,200 | 40 | 60 |
| 1.75 | 3,400 | 60 | 100 | 2,400 | 50 | 70 | 2,800 | 40 | 60 |
| 2 | 3,200 | 60 | 100 | 2,300 | 50 | 70 | 2,500 | 40 | 60 |
| 2.5 | 2,800 | 60 | 100 | 2,000 | 50 | 70 | 2,100 | 40 | 60 |
| 3 | 2,500 | 60 | 100 | 1,800 | 50 | 70 | 1,800 | 40 | 60 |
| 3.5 | 2,000 | 60 | 100 | 1,400 | 50 | 70 | 1,600 | 40 | 60 |
| 4 | 1,850 | 60 | 100 | 1,300 | 50 | 70 | 1,400 | 40 | 60 |
| 4.5 | 1,700 | 60 | 100 | 1,200 | 50 | 70 | 1,300 | 40 | 60 |
| 5 | 1,600 | 60 | 100 | 1,100 | 50 | 70 | 1,200 | 40 | 60 |

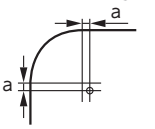
切り込み量 Depth of Cut

(R:R寸法 Radius)

荒取り Roughing




仕上げ Finishing




a
R 0.1～0.4=0.02mm
R 0.5～5=0.05mm

備　考 Notes

※切削油の使用をお奨めします。
※切り込みは数回に分けて加工してください。
※Use cutting fluid.
※Divide the cutting depth into several paths.



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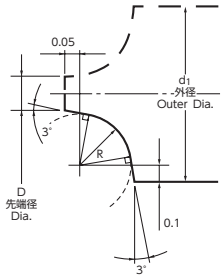
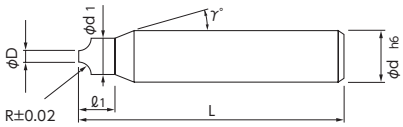
# NCR-2X

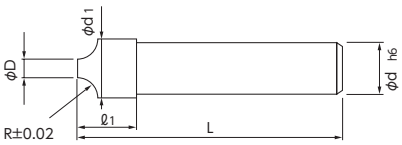
## Xコーティング ミニチュアインナーRカッター
X-COATING 2-Flute Inner Radius Cutter




形状 A Type A




形状 B Type B




● ▌の規格・サイズは、特定商社在庫となります。詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹 脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ | | | | | |
| ◎ | ◎ | ◎ | | | ○ | | ○ | ○ | ○ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

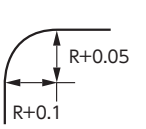
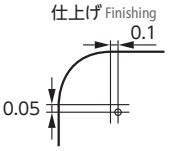
| コードNo. Code No. | (R) R Radius | (D)先端径 Dia. | ($d_1$)外径 Outer Dia. | ($\ell_1$)外径長さ Outer Dia. Length | (γ)首角 Neck Taper Angle | 形状 Type | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00913-00500 | R0.5 | 1.5 | 2.7 | 4 | 9° | A | 4 | 45 | 10,000 ▌ |
| 01-00913-00750 | R0.75 | 1.5 | 3.2 | 4 | 9° | A | 4 | 45 | 10,000 ▌ |
| 01-00913-01000 | R1 | 1.5 | 3.7 | 4 | 9° | A | 4 | 45 | 10,000 ▌ |
| 01-00913-01250 | R1.25 | 1.5 | 4.2 | 4 | – | B | 4 | 45 | 10,000 ▌ |
| 01-00913-01500 | R1.5 | 1.5 | 4.7 | 4 | 9° | A | 6 | 45 | 14,800 ▌ |
| 01-00913-01750 | R1.75 | 1.5 | 5.2 | 4 | 9° | A | 6 | 45 | 14,800 ▌ |
| 01-00913-02000 | R2 | 1.5 | 5.7 | 4 | 9° | A | 6 | 45 | 14,800 ▌ |
| 01-00913-02500 | R2.5 | 1.5 | 6.7 | 6 | – | B | 6 | 50 | 17,600 ▌ |
| 01-00913-03000 | R3 | 1.5 | 7.7 | 6 | 9° | A | 8 | 50 | 24,000 ▌ |

オーダー方法 NCR-2X R寸法(R)を指示してください。
When you order, indicate NCR-2X (R).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はJ-006に記載
●Recommended Milling Conditions are shown on page J-006.

# NCR-2X

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM・SKD・SUS | | | 調質鋼 Prehardened Steels HPM・NAK | | |
|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 25～35m/min | | | 20～30m/min | | | 15～25m/min | | |
| R | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | min$^{-1}$ | mm/min | | min$^{-1}$ | mm/min | | min$^{-1}$ | mm/min | |
| | | 荒取り Roughing | 仕上げ Finishing | | 荒取り Roughing | 仕上げ Finishing | | 荒取り Roughing | 仕上げ Finishing |
| 0.5 | 4,800 | 55 | 80 | 4,000 | 40 | 60 | 3,200 | 30 | 45 |
| 0.75 | 4,250 | 55 | 80 | 3,500 | 40 | 60 | 2,800 | 30 | 45 |
| 1 | 3,800 | 55 | 80 | 3,200 | 40 | 60 | 2,550 | 30 | 45 |
| 1.25 | 3,500 | 55 | 80 | 2,900 | 40 | 60 | 2,300 | 30 | 45 |
| 1.5 | 3,200 | 55 | 80 | 2,650 | 40 | 60 | 2,100 | 30 | 45 |
| 1.75 | 2,950 | 55 | 80 | 2,450 | 40 | 60 | 1,950 | 30 | 45 |
| 2 | 2,700 | 55 | 80 | 2,300 | 40 | 60 | 1,800 | 30 | 45 |
| 2.5 | 2,400 | 55 | 80 | 2,000 | 40 | 60 | 1,600 | 30 | 45 |
| 3 | 2,100 | 55 | 80 | 1,750 | 40 | 60 | 1,400 | 30 | 45 |
| 切り込み量 Depth of Cut (R:R寸法 Radius) | 荒取り Roughing   仕上げ Finishing   | | | | | | | | |
| 備　考 Notes | ※切削油の使用をお奨めします。<br>※切り込みは数回に分けて加工してください。<br>※Use cutting fluid.<br>※Divide the cutting depth into several paths. | | | | | | | | |



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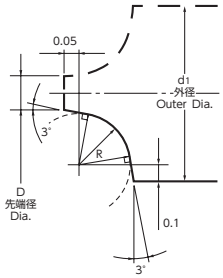
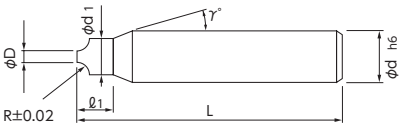
# NCR-2

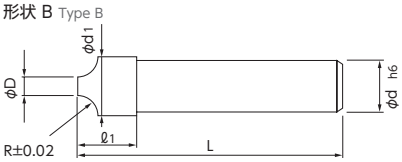
## ミニチュアインナーRカッター
2-Flute Inner Radius Cutter




形状 A Type A




形状 B Type B




● ▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
● ▌: Semi-standard item, please inquire for price and delivery.

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels | | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | ～55HRC | 55HRC～ | | | | | |
| ○ | ○ | ○ | | | ○ | | ◎ | ◎ | ◎ |

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

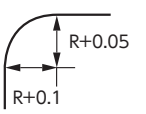
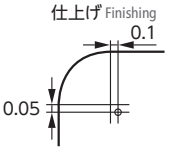
| コードNo. Code No. | (R) R Radius | (D)先端径 Dia. | (d1)外径 Outer Dia. | (ℓ1)外径長さ Outer Dia. Length | (γ)首角 Neck Taper Angle | 形状 Type | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 01-00912-00500 | R0.5 | 1.5 | 2.7 | 4 | 9° | A | 4 | 45 | 8,000 ▌ |
| 01-00912-00750 | R0.75 | 1.5 | 3.2 | 4 | 9° | A | 4 | 45 | 8,000 ▌ |
| 01-00912-01000 | R1 | 1.5 | 3.7 | 4 | 9° | A | 4 | 45 | 8,000 ▌ |
| 01-00912-01250 | R1.25 | 1.5 | 4.2 | 4 | – | B | 4 | 45 | 8,000 ▌ |
| 01-00912-01500 | R1.5 | 1.5 | 4.7 | 4 | 9° | A | 6 | 45 | 12,000 ▌ |
| 01-00912-01750 | R1.75 | 1.5 | 5.2 | 4 | 9° | A | 6 | 45 | 12,000 ▌ |
| 01-00912-02000 | R2 | 1.5 | 5.7 | 4 | 9° | A | 6 | 45 | 12,000 ▌ |
| 01-00912-02250 | R2.25 | 1.5 | 6.2 | 6 | – | B | 6 | 50 | 16,800 ▌ |
| 01-00912-02500 | R2.5 | 1.5 | 6.7 | 6 | – | B | 6 | 50 | 14,800 ▌ |
| 01-00912-02750 | R2.75 | 1.5 | 7.2 | 6 | 9° | A | 8 | 70 | 23,300 ▌ |
| 01-00912-03000 | R3 | 1.5 | 7.7 | 6 | 9° | A | 8 | 50 | 20,200 ▌ |
| 01-00912-03250 | R3.25 | 3 | 9.7 | 12 | 9° | A | 10 | 75 | 40,100 ▌ |
| 01-00912-03500 | R3.5 | 3 | 10.2 | 11.5 | – | B | 10 | 75 | 40,100 ▌ |
| 01-00912-03750 | R3.75 | 3 | 10.7 | 15 | – | B | 10 | 75 | 40,100 ▌ |
| 01-00912-04000 | R4 | 3 | 11.2 | 14.5 | – | B | 10 | 75 | 34,800 ▌ |
| 01-00912-04250 | R4.25 | 3 | 11.7 | 14.5 | – | B | 10 | 80 | 53,400 ▌ |
| 01-00912-04500 | R4.5 | 3.5 | 12.7 | 14.5 | – | B | 12 | 80 | 56,400 ▌ |
| 01-00912-04750 | R4.75 | 3.5 | 13.2 | 14.5 | – | B | 12 | 80 | 56,400 ▌ |
| 01-00912-05000 | R5 | 3.5 | 13.7 | 14.5 | – | B | 12 | 80 | 49,000 ▌ |

**オーダー方法** NCR-2 R寸法(R)を指示してください。
When you order, indicate NCR-2 (R).

※(γ)は参考値です。
※(γ) is reference value.
●切削条件表はJ-008に記載
●Recommended Milling Conditions are shown on page J-008.

# NCR-2

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 炭素鋼 Carbon Steels S50C | | | 合金鋼 Alloy Steels SCM･SKD･SUS | | | 調質鋼 Prehardened Steels HPM･NAK | | |
|---|---|---|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 25～35m/min | | | 20～30m/min | | | 15～25m/min | | |
| R | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | $min^{-1}$ | mm/min | | $min^{-1}$ | mm/min | | $min^{-1}$ | mm/min | |
| | | 荒取り Roughing | 仕上げ Finishing | | 荒取り Roughing | 仕上げ Finishing | | 荒取り Roughing | 仕上げ Finishing |
| 0.5 | 4,800 | 55 | 80 | 4,000 | 40 | 60 | 3,200 | 30 | 45 |
| 0.75 | 4,250 | 55 | 80 | 3,500 | 40 | 60 | 2,800 | 30 | 45 |
| 1 | 3,800 | 55 | 80 | 3,200 | 40 | 60 | 2,550 | 30 | 45 |
| 1.25 | 3,500 | 55 | 80 | 2,900 | 40 | 60 | 2,300 | 30 | 45 |
| 1.5 | 3,200 | 55 | 80 | 2,650 | 40 | 60 | 2,100 | 30 | 45 |
| 1.75 | 2,950 | 55 | 80 | 2,450 | 40 | 60 | 1,950 | 30 | 45 |
| 2 | 2,700 | 55 | 80 | 2,300 | 40 | 60 | 1,800 | 30 | 45 |
| 2.5 | 2,400 | 55 | 80 | 2,000 | 40 | 60 | 1,600 | 30 | 45 |
| 3 | 2,100 | 55 | 80 | 1,750 | 40 | 60 | 1,400 | 30 | 45 |
| 切り込み量 Depth of Cut (R:R寸法 Radius) | 荒取り Roughing   仕上げ Finishing   | | | | | | | | |
| 備　考 Notes | ※切削油の使用をお奨めします。<br>※切り込みは数回に分けて加工してください。<br>※Use cutting fluid.<br>※Divide the cutting depth into several paths. | | | | | | | | |





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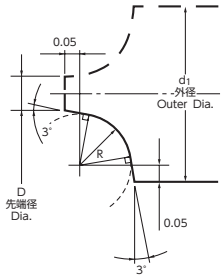
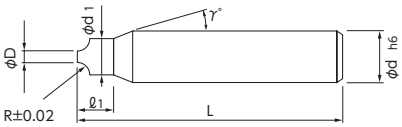
# DIR

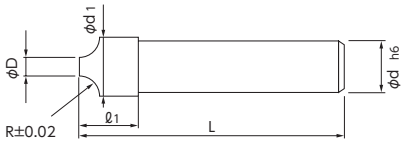
## 銅電極・アルミ・プラ用 インナーRカッター
2-Flute Inner Radius Cutter for Nonferrous




形状 A Type A




形状 B Type B




●▌の規格・サイズは、特定商社在庫となります。
詳しくはお問い合わせください。
●▲の規格は在庫が無くなり次第、販売終了となります。
●▌: Semi-standard item, please inquire for price and delivery.
●▲: The sizes will no longer be capable being sold after the stock runs out.

被削材 Work Material

| 炭素鋼 Carbon Steels | 合金鋼・工具鋼 Alloy Steels・Tool Steels | 調質鋼 Prehardened Steels | 焼き入れ鋼 Hardened Steels ～55HRC | 焼き入れ鋼 Hardened Steels 55HRC～ | ステンレス鋼 Stainless Steels | チタン合金 Titanium Alloy | アルミニウム合金 Aluminum Alloy | 銅 Copper | 樹脂 Resin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ◎ | ◎ | ◎ |

▲ 生産終了品 Discontinued Item

単位［寸法：mm / 価格：円］ Unit [Size : mm / Retail Price : JPY]

| コードNo. Code No. | (R) R Radius | (D)先端径 Dia. | (d1)外径 Outer Dia. | (ℓ1)外径長さ Outer Dia. Length | (γ)首角 Neck Taper Angle | 形状 Type | (d)シャンク径 Shank Dia. | (L)全長 Overall Length | 標準価格 Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| 07-00913-00100 | R0.1 | 0.5 | 0.8 | 3 | 12° | A | 4 | 45 | 11,000 ▌ |
| 07-00913-00150 | R0.15 | 0.5 | 0.9 | 3 | 12° | A | 4 | 45 | 11,000 ▌ |
| 07-00913-00200 | R0.2 | 0.5 | 1 | 3 | 12° | A | 4 | 45 | 11,000 ▌ |
| 07-00913-00250 | R0.25 | 0.5 | 1.1 | 3 | 12° | A | 4 | 45 | 11,000 ▌ |
| 07-00913-00300 | R0.3 | 0.5 | 1.2 | 3 | 12° | A | 4 | 45 | 9,000 ▌ |
| 07-00913-00350 | R0.35 | 0.5 | 1.3 | 3 | 12° | A | 4 | 45 | 9,000 ▌ |
| 07-00913-00400 | R0.4 | 0.5 | 1.4 | 3 | 12° | A | 4 | 45 | 9,000 ▌ |
| 07-00913-00450 | R0.45 | 0.5 | 1.5 | 3 | 12° | A | 4 | 45 | 9,000 ▌ |
| 07-00913-00500 | R0.5 | 0.5 | 1.6 | 5 | 12° | A | 4 | 45 | 9,000 ▌ |
| 07-00913-00550 | R0.55 | 0.5 | 1.7 | 5 | 12° | A | 4 | 45 | 9,000 ▌ |
| 07-00913-00600 | R0.6 | 0.5 | 1.8 | 5 | 12° | A | 4 | 45 | 6,700 ▌ |
| 07-00913-00650 | R0.65 | 0.5 | 1.9 | 5 | 12° | A | 4 | 45 | 6,700 ▌ |
| 07-00913-00700 | R0.7 | 0.5 | 2 | 5 | 12° | A | 4 | 45 | 6,700 ▌ |
| 07-00913-00750 | R0.75 | 0.5 | 2.1 | 5 | 12° | A | 4 | 45 | 6,700 ▌ |
| 07-00913-00800 | R0.8 | 0.8 | 2.5 | 5 | 12° | A | 4 | 45 | 6,700 ▌ |
| 07-00913-00850 | R0.85 | 0.8 | 2.6 | 5 | 12° | A | 4 | 45 | 6,700 ▌ |
| 07-00913-00900 | R0.9 | 0.8 | 2.7 | 5 | 12° | A | 4 | 45 | 6,700 ▌ |
| 07-00913-00950 | R0.95 | 0.8 | 2.8 | 5 | 12° | A | 4 | 45 | 6,700 ▌ |
| 07-00913-01000 | R1 | 0.8 | 2.9 | 8 | 12° | A | 4 | 45 | 7,700 ▌ |
| 07-00913-01250 | R1.25 | 0.8 | 3.4 | 8 | 12° | A | 4 | 45 | 7,700 ▌ |
| 07-00913-01500 | R1.5 | 1.5 | 4.6 | 8 | – | B | 4 | 45 | 7,700 ▌ |
| 07-00913-01750 | R1.75 | 1.5 | 5.1 | 8 | – | B | 4 | 45 | 7,700 ▌ |
| 07-00913-02000 | R2 | 1.5 | 5.6 | 10 | – | B | 4 | 45 | 7,700 ▌ |
| 07-00913-02500 | R2.5 | 1.5 | 6.6 | 10 | – | B | 6 | 45 | 9,800 ▌ |
| 07-00913-03000 | R3 | 1.5 | 7.6 | 12 | 45° | A | 8 | 55 | 10,100 ▌ |
| ▲ 07-00913-03500 | R3.5 | 2 | 9.1 | 12 | 45° | A | 10 | 55 | 11,400 ▌ |
| ▲ 07-00913-04000 | R4 | 2 | 10.1 | 12 | – | B | 10 | 55 | 9,900 ▌ |
| ▲ 07-00913-04500 | R4.5 | 2 | 11.1 | 15 | 45° | A | 12 | 65 | 12,200 ▌ |
| ▲ 07-00913-05000 | R5 | 2 | 12.1 | 15 | – | B | 12 | 65 | 11,200 ▌ |

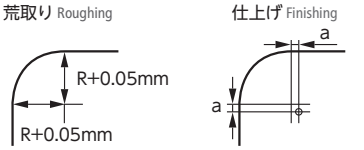
オーダー方法
DIR R寸法(R)を指示してください。
When you order, indicate DIR (R).
※(γ)は参考値です。
※(γ) is reference value.

●切削条件表はJ-010に記載
●Recommended Milling Conditions are shown on page J-010.

# DIR

## 切削条件参考表 Recommended Milling Conditions

| 被削材 Work Material | 銅 Copper | | | アルミニウム合金 Aluminum Alloy | | |
|---|---|---|---|---|---|---|
| 切削速度 Cutting Speed | 80m/min | | | 80～150m/min | | |
| R | 回転数 Spindle Speed | 送り速度 Feed | | 回転数 Spindle Speed | 送り速度 Feed | |
| | $min^{-1}$ | mm/min | | $min^{-1}$ | mm/min | |
| | | 荒取り Roughing | 仕上げ Finishing | | 荒取り Roughing | 仕上げ Finishing |
| 0.1 | 32,000 | 300 | 450 | 50,000 | 470 | 860 |
| 0.2 | 26,000 | 300 | 450 | 50,000 | 470 | 860 |
| 0.3 | 21,000 | 300 | 450 | 42,000 | 600 | 900 |
| 0.4 | 18,000 | 200 | 300 | 36,000 | 400 | 600 |
| 0.5 | 16,000 | 200 | 300 | 32,000 | 400 | 600 |
| 0.6 | 14,000 | 200 | 300 | 28,000 | 400 | 600 |
| 0.7 | 13,000 | 200 | 300 | 26,000 | 400 | 600 |
| 0.8 | 10,000 | 200 | 300 | 20,000 | 400 | 600 |
| 0.9 | 9,500 | 200 | 300 | 19,000 | 400 | 600 |
| 1 | 8,800 | 200 | 300 | 17,600 | 400 | 600 |
| 1.25 | 7,500 | 200 | 300 | 15,000 | 400 | 600 |
| 1.5 | 5,600 | 150 | 250 | 11,200 | 300 | 500 |
| 1.75 | 5,000 | 150 | 250 | 10,000 | 300 | 500 |
| 2 | 4,600 | 150 | 250 | 9,200 | 300 | 500 |
| 2.5 | 3,900 | 150 | 250 | 7,800 | 300 | 500 |
| 3 | 3,400 | 150 | 250 | 6,800 | 300 | 500 |
| 3.5 | 2,800 | 120 | 200 | 5,600 | 240 | 400 |
| 4 | 2,500 | 120 | 200 | 5,000 | 240 | 400 |
| 4.5 | 2,300 | 120 | 200 | 4,600 | 240 | 400 |
| 5 | 2,100 | 120 | 200 | 4,200 | 240 | 400 |
| 切り込み量 Depth of Cut (R:R寸法 Radius) | 荒取り Roughing | | | 仕上げ Finishing | | |




a
R 0.1～0.4=0.02mm
R 0.5～5=0.05mm

| 備考 Notes | |
|---|---|
| | ※切削油を使用してください。<br>※回転数と送り速度は、同じ割合で調整してください。<br>※鋼には絶対に使用しないでください。<br>※Use cutting fluid.<br>※Adjust both spindle speed and feed at the same rate.<br>※Don't use for cutting steels. |



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# 3

# 技術資料

NS TOOL製品の技術資料です

## Technical Data


NS TOOL製品の特長 K-002
Features of NS End Mill

加工データ K-007
Machining Data

# NS エンドミルの特長
## Features of NS End Mill

### CBN エンドミル　CBN End Mill

CBN（Cubic Boron Nitride ／立方晶窒化硼素）焼結体は、下記表のようにダイヤモンドの次に硬く、超硬合金と比較しても約 3 倍の硬さを持ち、更に耐熱性・熱伝導性も極めて高い工具材料です。しかしながら、強度・靱性は低くチッピングし易い欠点も合わせ持っています。従いまして、工具刃先に強い力を受ける荒加工にはチッピングし易く不向きですが、切削負荷の少ない仕上げ加工においては CBN の硬さ・耐熱性の優位性により工具摩耗を抑え驚異的な工具寿命が得られ、特に高硬度材の加工に適しています。

CBN(Cubic Boron Nitride) sintered alloy is 3 times harder than Tungsten carbide, second hardest material next to diamond, moreover strong heat-resistant and high thermal conductivity. However less tough characteristic of CBN often causes chipping of tool edge easily. Accordingly, CBN is recommended for finishing of hard materials with less cutting load on the tool edge, which guarantees extra long tool life.

### PCD エンドミル　PCD End Mill

PCD は、マイクロサイズの人工ダイヤモンドパウダーに結合材（Co など）の粉末を添加し、超高圧、高温で焼結したダイヤモンドのことで、多結晶ダイヤモンドとも呼ばれています。単結晶ダイヤモンド同様に硬度が高く、耐摩耗性に優れています。熱に弱く使用用途が限られます。主に脆性材の加工に用いられます。

PCD consists micron-size artificial diamond powders sintered with binding materials such as Co and etc. at high pressure and temperature. PCD is as hard as Monocrystalline Diamond featuring strong wear-resistance. However the use is limited as being fragile against heat. It is mostly used for the machining of brittle materials.

### 単結晶ダイヤモンドエンドミル　Monocrystalline Diamond End Mill

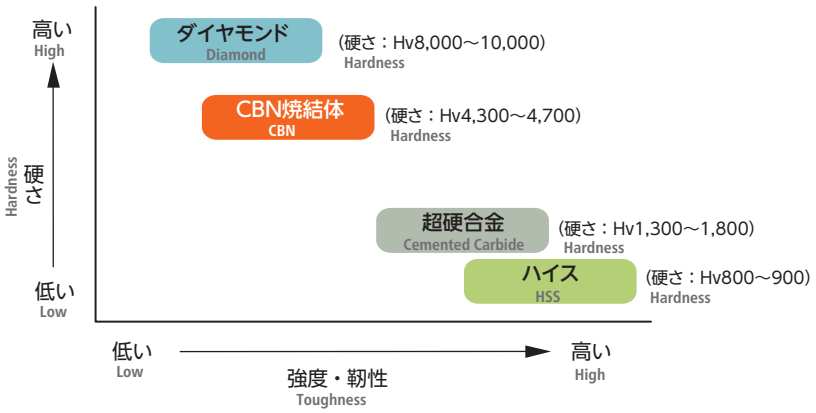
地球上でもっとも固い物質のダイヤモンドを工具材料としたエンドミルです。PCD と違い結合材が介在せず 1 つのダイヤモンド結晶で刃先が出来ています。切れ刃のエッジがとてもシャープで切削抵抗の低い切削が可能ですが、被削材によって摩耗形態に大きな差があるため切削工具の適用範囲が限定されます。主に脆性材や一部の非鉄加工に用いられます。

Monocrystalline Diamond End Mill by the hardest material on earth is made by a single crystal on flute unlike PCD consisting various binding materials. Its perfect sharp edge allows milling stress at minimum, while its application range may be limited due to behavior gap of flute wearing against material types. It is mostly used for the machining of brittle materials and nonferrous metals.

### 超硬合金エンドミル　Cemented Carbide End Mill

超硬合金エンドミルとは WC（炭化タングステン）を主成分とし Co（コバルト）などの粉末原料を高温焼結した超硬合金を工具素材に使用したものを言います。ハイス（高速度工具鋼）に比べ、硬度が高く、耐摩耗性において有利な工具です。荒加工から仕上げ加工まで、幅広く対応できます。

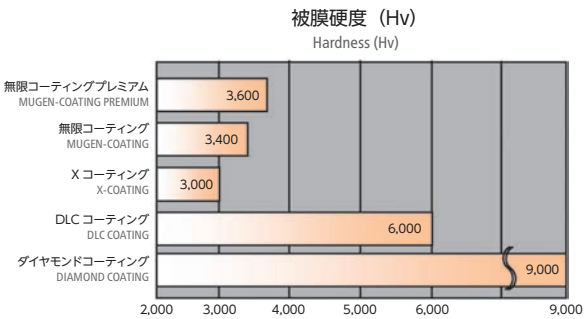
Cemented Carbide End Mill is made by WC (Tungsten carbide) -based sintered metal composed with power materials of Co (Cobalt) and etc. Its hardness higher than HSS (High speed steel) takes advantage on wear-resistance. It is widely used for the machining of various materials from Roughing to Finishing.

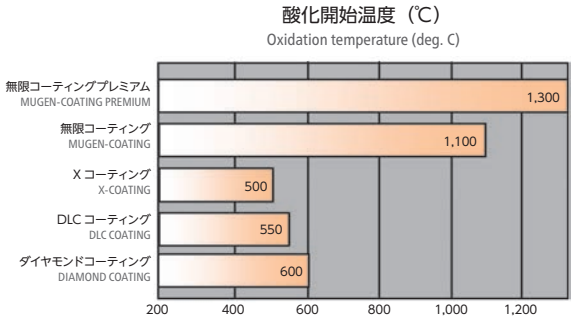


## ■コーティング超硬合金エンドミル　Coated Cemented Carbide End Mill

コーティング超硬合金エンドミルは、超硬合金エンドミルの刃部表面に、炭化物、窒化物、酸化物、ダイヤモンドなどを１層又は多層に、化学的又は物理的に被覆させたエンドミルです。コーティングには様々な種類があり、用途・被削材に応じて最適なものを選択することが出来ます。

Coated Cemented Carbide End Mill is the cutting tool that one or more layers of coating materials such as carbide, nitride, oxide or diamond are chemically or physically adhered on flutes. Most suitable type of coating can be selected from among variety of coatings, which should be fit for the work material.




## ■ 無限コーティングプレミアム　MUGEN-COATING PREMIUM

無限コーティングプレミアムは、従来の無限コーティングを更に改良し、高硬度材直彫り加工時の工具寿命を飛躍的に延ばしたコーティングです。被膜硬度 Hv3,600、酸化開始温度 1,300℃と極めて高く 48 ～ 65HRC の高硬度材に適しています。

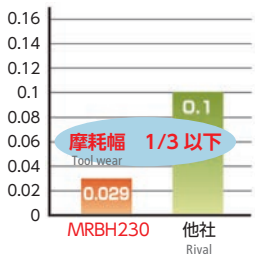
MUGEN-COATING PREMIUM, improved from existing MUGEN-COATING is suited for direct machining of hardened steels with extended tool life. By the hardness Hv3,600 and the oxidation temperature 1,300deg.C, it is recommended for hard materials from 48 to 65 HRC.

### HAP40 65HRC（粉末ハイス）Powder HSS

MRBH230 R1 × 6

他社 高硬度用
Rival

n：20,000min$^{-1}$　Vf：1,600mm/min　ap0.15mm × ae0.3mm
オイルミスト　加工時間：18 分　加工距離：25m
Oil mist　Cutting time : 18min　Cutting length : 25m



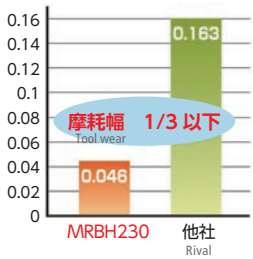

摩耗幅比較
Comparison of tool wear

### PD613 60HRC（SKD11）

MRBH230 R1 × 6

他社 高硬度用
Rival

n：25,000min$^{-1}$　Vf：2,000mm/min　ap0.2mm × ae0.3mm
オイルミスト　加工時間：62 分　加工距離：100m
Oil mist　Cutting time : 62min　Cutting length : 100m




摩耗幅比較
Comparison of tool wear

# NS エンドミルの特長
## Features of NS End Mill

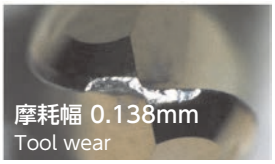
### ■ 無限コーティング　MUGEN-COATING

無限コーティングは TiAlN（チタンアルミナイトライド）ベースのコーティングでありながら、被膜硬度 Hv3,400、酸化開始温度 1,100℃と高い特性を持っています。焼き入れ鋼（60HRC）・調質鋼・生材・銅などに対しても強い耐摩耗性と潤滑性を有しています。更に、クーラントも水溶性・不水溶性切削油・エアーブロー・オイルミストなどにも対応し、『被削材、クーラント』を選ばない優れたコーティングとなっています。

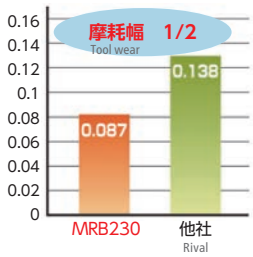
MUGEN-COATING with the hardness Hv3,400 and the oxidation temperature 1,100deg.C, based on TiAlN (Titanium Aluminum Nitride) is recommended for various materials such as hardened steel(60HRC),pre-hardened steel, raw steel and copper because of strong wear-resistance and high lubricity. In addition, any kind of cutting fluid is available such as water soluble, oil, air blow and oil mist.

#### STAVAX 52HRC（SUS420J2 改）

MRB230 R1 × 10



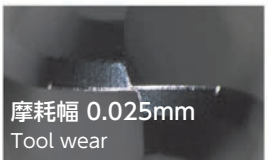

他社
Rival




摩耗幅比較
Comparison of tool wear

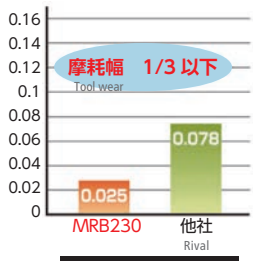
n：10,000min$^{-1}$　Vf：1,500mm/min　ap0.1mm × ae0.2mm
水溶性切削油　加工時間：132 分　加工距離：150m
Water soluble fluid　Cutting time : 132min　Cutting length : 150m

#### 銅　Copper




MRB230 R1 × 20

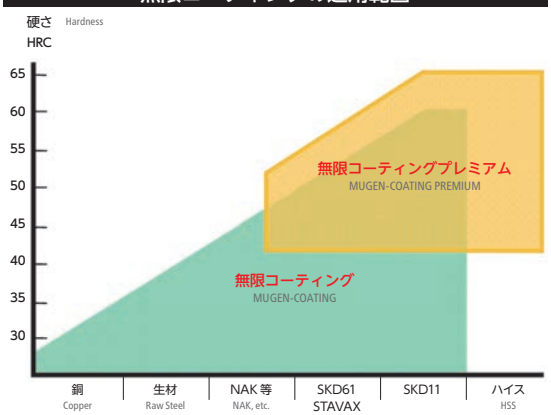
他社 CrN
Rival




摩耗幅比較
Comparison of tool wear

荒取り n：12,000min$^{-1}$　Vf：1,200mm/min　ap0.2mm × ae0.3mm
Roughing
仕上げ n：5,000min$^{-1}$　Vf：700mm/min　ap0.05mm × ae0.03mm
Finishing
水溶性切削油　加工時間：8 時間 54 分
Water soluble fluid　Cutting time : 8hr 54min

**無限コーティングの適用範囲**



## 無限マイクロコーティング　MUGEN MICRO COATING

マイクロドリル専用に開発した極薄膜のコーティングです。被膜表面に異物の付着が殆どなく、膜厚も1μm以下と極めて薄いため、極小径のマイクロドリルへ施しても形状精度が保てます。鋼材－SUS材への穴あけ加工で、長寿命化が図れるなど、優れた性能を発揮します。

The ultra thin Micro Coating is exclusively developed for Micro Drill series. Under 1μm thickness with no impure substances on the surface maintains the precise shape accuracy of Micro Drill as well as high performance by extended drilling life on steels include stainless steels.

## X コーティング（TiCN 系）　X-COATING (TiCN)

X コーティングは、TiCN（チタンカーボンナイトライド）系のコーティングです。被膜硬度 Hv3,000 と高く、その密着力も優れたコーティングですが、耐熱性が 500℃と低い為、切削速度 100m/min 以上の高速加工領域では切削加工時に発生する切削熱に対応できない欠点もあります。従って、切削熱を緩和する湿式クーラントを用いた一般的な切削加工（切削速度 100m/min 以下）で威力を発揮します。

X-COATING is based on TiCN(Titanium Carbon Nitride). The hardness is Hv3,000 with strong adhesion but cutting speed higher than 100m/min is not recommended because the oxidation temperature is low at 500deg.C. Accordingly X-COATING performs well at medium cutting speed lower than 100m/min with water soluble cutting fluid.

## DLC コーティング　DLC COATING

DLC（ダイヤモンドライクカーボン）コーティングは、ダイヤモンドに似た性質を持つ炭素膜で、ダイヤモンドとグラファイトの両方を持つアモルファス（非結晶）構造のコーティングです。特長として硬度が Hv6,000 と高く、摩擦係数は 0.1 と低く、膜の表面粗さ Ra0.02μm と非常に滑らかであり、耐溶着性も優れ、アルミ合金等の加工で良好な仕上面を維持しつつ長い工具寿命を得ることができます。しかし、炭素被膜であるが故に鉄系材料を切削加工するとそれに含まれる炭素と親和性が極めて高く鉄系材料の加工には不向きです。従いまして、非鉄系金属材料、特にアルミ合金等の加工に適しています。

DLC (Diamond Like Carbon) COATING is very hard amorphous coating with similar characteristic as diamond. It is recommended for the finishing of aluminum alloy as being high hardness Hv6,000, friction coefficient 0.1, smooth surface roughness Ra0.02μm and with anti-welding feature. However it is not suited for steel materials but good for nonferrous metals because DLC is the carbon base coating.

## ダイヤモンドコーティング　DIAMOND COATING

ダイヤモンドコーティングは微細なダイヤモンド結晶の集まりからなる多結晶膜です。天然ダイヤモンドに準ずる硬さを有しており、耐摩耗性に優れています。超硬工具表面にダイヤモンドコーティングを施すため、工具形状における自由度が高いです。結合材・不純物を含まない高純度ダイヤモンドによる優れた耐摩耗性と高密着化技術により、グラファイトから、今まで困難だった硬脆材の切削加工において、高い工具寿命安定性を実現しています。

DIAMOND COATING is a minute polycrystalline film, as hard as natural diamond and with strong wear-resistance. There is no limit of tool shape as DIAMOND COATING is given on the Cemented Carbide surface. Stable coating quality has been ensured long tool life against graphite and brittle materials by strong wear-resistance and adherence brought by pure diamond without binders and impurities.

# NS エンドミルの特長
## Features of NS End Mill

### 各種コーティングの被削材適用表 Recommended coatings for various materials

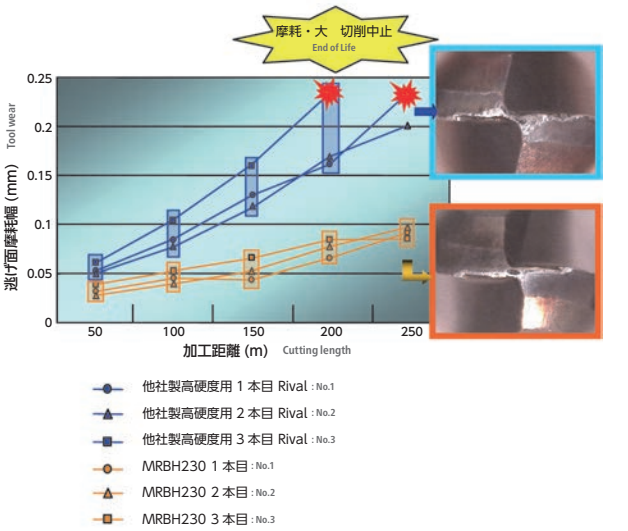
| コーティング種類 Coating | | 無限コーティングプレミアム MUGEN-COATING PREMIUM | 無限コーティング MUGEN-COATING | X コーティング X-COATING | DLC コーティング DLC COATING | ダイヤモンドコーティング DIAMOND COATING |
|---|---|---|---|---|---|---|
| 被削材 Materials | 焼き入れ鋼 56～65HRC Hardened Steels | ◎ | | | | |
| | 焼き入れ鋼 45～55HRC Hardened Steels | ◎ | ○ | | | |
| | 調質鋼 Prehardened Steels | ◎ | ◎ | ○ | | |
| | 生材 Raw Steels | ○ | ◎ | ○ | | |
| | 銅 Copper | | ○ | | ◎ | |
| | アルミニウム合金 Aluminum Alloy | | | | ◎ | |
| | 硬脆材 Hard Brittle materials | | | | | ◎ |
| | グラファイト Graphite | | | | | ◎ |

**NS のコーティングは、製品性能のバラつきが少なく、安心して使用頂けます。**
Steady quality assures reliable use.

**SKD11 60HRC** 切削時の他社品との比較 Comparison with competitor

使用工具 Tool
MRBH230 R1 × 10 ／他社製同等品 R1 × 10 Rival

| | |
|---|---|
| 回転数 Spindle speed | 20,000 $min^{-1}$ |
| 送り速度 Feed | 2,000 mm/min |
| 切り込み量 Depth of cut | ap 0.1mm×ae 0.3mm |
| 加工距離 Cutting length | 55m/1個 55m/pc |
| 加工時間 Cutting time | 40分/1個 40min/pc |
| クーラント Coolant | オイルミスト Oil mist |





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# SSE600 CBN スクエアエンドミル
CBN Square End Mill

B-003

## 加工事例 1 コネクタモデル
Cutting Example 1 : Connector model

- 被削材：**HAP40（粉末ハイス）64HRC** Material : HAP40 (Powder HSS) 64HRC
- クーラント：**オイルミスト** Coolant : Oil mist
- 総加工時間：**13 時間 32 分** Total cutting time : 13hr 32min

| 加工工程 Cutting process | 荒取り Roughing | 中仕上げ Semi-finishing | | 仕上げ Finishing | |
|---|---|---|---|---|---|
| | | 側面（等高線） Side (contour) | 平面（走査線） Plane (scanline) | 側面（等高線） Side (contour) | 平面（走査線） Plane (scanline) |
| 使用工具 Tool | SSR200※1 φ0.5×R0.05×2.5 | SSR200 φ0.5×R0.05×2.5 | | SSE600 φ0.5×2.5 | |
| 回転数 [min-1] Spindle speed | 30,000 | | | | |
| 送り速度 [mm/min] Feed | 500 | 500 | 300 | 400 | 300 |
| 切り込み量 ap×ae[mm] Depth of cut | 0.005×0.2 | 0.005×0.01 | 0.01×0.01 | 0.005×0.002 | 0.002×0.01 |
| 加工時間 Cutting time | 7時間20分 7hr 20min | 2時間52分 2hr 52min | | 3時間20分 3hr 20min | |

※1 荒取りは工具を2本使用しています。

ワークサイズ：
15 × 15mm（加工深さ2mm）
Work size : 15×15×2mm

### ◎ 加工寸法測定結果 Measurement of work

| | 狙い値 [mm] Target | 実測値 [mm] Actual |
|---|---|---|
| 溝幅 Slot width | 0.600 | 0.598～0.601 |
| 立壁幅 Width of remained wall | 0.600 | 0.598～0.602 |
| 加工深さ Depth | 2.000 | 2.002 |

### ◎ 面粗さ Surface roughness

| 平面部 Top Surface | 底面部 Bottom Surface | 側面部 Side |
|---|---|---|
| Ra 0.05μm | Ra 0.15μm | Ra 0.12μm |

**3 時間 20 分の仕上げ加工後でも、実測値は狙い値に対して±2μm 以内。面粗さも Ra で 0.2μm 以下と良好な面品位が得られています。**

Difference between Target and Actual work dimension within ± 2μm and Surface roughness all within Ra0.2μm after 3hr 20mim finishing process.

# SSB200 CBNスーパースピードボールエンドミル
CBN Super Speed Ball End Mill

B-011

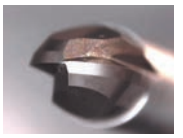
## 加工事例 1 ゲーム機コントローラー コア
Cutting Example 1 : Game Controller Model (Core)

- 被削材：**DC53 62HRC** Material : DC53 62HRC
- クーラント：**オイルミスト** Coolant : Oil mist
- 総加工時間：**4 時間 10 分** Total cutting time : 4hr 10min

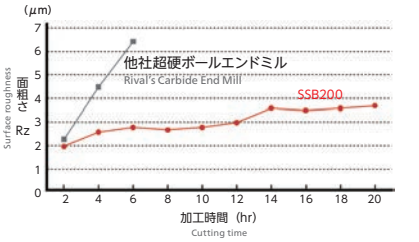
ワークサイズ：55 × 85mm
Work size : 55×85mm

| 加工工程 Cutting process | 荒取り＋中仕上げ Roughing+ Semi-finishing | 取り残し Stock removal | 仕上げ Finishing |
|---|---|---|---|
| 使用工具 Tool | MACH225 R2 | MACH225 R1 | SSB200 R1 |
| 回転数 [$min^{-1}$] Spindle speed | 10,000 | 20,000 | 40,000 |
| 送り速度 [mm/min] Feed | 2,500 | 2,000 | 1,600 |
| 切り込み量 ap×ae[mm] Depth of cut | 0.3×1 | 0.2×0.2 | 0.05×0.05～0.1 |
| 加工時間 Cutting time | 105 分 105min | 10 分 10min | 120 分 120min |

SSB200



切りくず排出性が非常に良好で、切り込み量を超硬（仕上げ）と同等に多くとることが可能で高能率な加工に最適です。
Bigger cutting depth was realized with better chip disposal.



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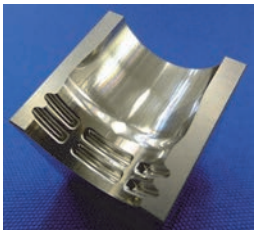
# SSPB220 CBNスーパースパイラルボールエンドミル
CBN Super Spiral Ball End Mill

B-007

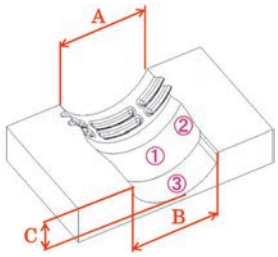
## 加工事例 1 ボトルネックモデル
Cutting Example 1 : Bottleneck Model

- 被削材：**ELMAX 59HRC** Material : ELMAX 59HRC
- クーラント：**オイルミスト** Coolant : Oil mist
- 総加工時間：**3 時間 25 分** Total cutting time : 3hr 25min



ワークサイズ：30 × 30 × 30mm
Work size : 30×30×30mm

| 加工工程 Cutting process | 荒取り Roughing | 中仕上げ Semi-finishing | 仕上げ(溝) Finishing (Slot) | 仕上げ(曲面) Finishing (curving face) |
|---|---|---|---|---|
| 使用工具 Tool | MRBH230 R1×6 | MRBH230 R0.5×5 | SSPB220 R0.5×2.5 | SSPB220 R1×5 |
| 回転数 [min⁻¹] Spindle speed | 25,000 | 35,000 | 40,000 | 40,000 |
| 送り速度 [mm/min] Feed | 2,000 | 1,600 | 1,500 | 1,500 |
| 切り込み量 ap×ae[mm] Depth of cut | 0.2×0.3 | 0.04×0.1 | 0.01×0.007 | 0.01×0.005 |
| 加工時間 Cutting time | 45分 45min | 45分 45min | 35分 35min | 1時間20分 1hr 20min |




【加工寸法】単位：mm [Measurement] : mm

| | 幅A Width A | 幅B Width B | 高さC Height C |
|---|---|---|---|
| 狙い値 Target | 22.000 | 22.557 | 8.134 |
| 実測値 Actual | 21.998 | 22.554 | 8.133 |
| 誤差 Error | -0.002 | -0.003 | -0.001 |

測定器：光学顕微鏡×100倍
Measuring equipment : optical microscope×100

【面粗さ】単位：μm [Surface roughness] : μm

| 測定位置 Measurement Position | ① | ② | ③ |
|---|---|---|---|
| Rz | 0.34 | 0.55 | 0.27 |
| Ra | 0.05 | 0.08 | 0.04 |

測定機：Taylor Hobson社製フォームタリサーフ
Measuring equipment : Taylor Hobson, Form Talysurf

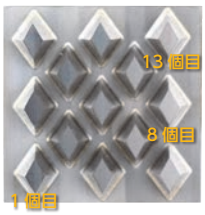
**寸法誤差 3μm、面粗さ Rz0.5μm 程度、光沢のある高品位な加工面を実現！**
Differences in dimension 3μm, surface roughness Rz0.5μm, glossy high quality surface!

## 加工事例 2 ハイス HAP40 パンチモデル
Cutting Example 2 : HSS HAP40 Punch Model

- 被削材：**HAP40（粉末ハイス）64HRC** Material : HAP40 (Powder HSS) 64HRC
- クーラント：**オイルミスト** Coolant : Oil mist
- 総加工時間：**20 時間 39 分** Total cutting time : 20hr 39min

ワークサイズ：30 × 30mm（加工高さ 5mm 勾配 10°）
Work size : 30×30mm (Height : 5mm, Inclined angle : 10°)

| 加工工程 Cutting process | 荒取り Roughing | 中仕上げ① Semi-finishing ① | 取り残し Stock removal | 中仕上げ② Semi-finishing ② | 仕上げ Finishing |
|---|---|---|---|---|---|
| 使用工具 Tool | MRBH230 R1×6 | MRBH230 R1×6 | MRBH230 R0.5×2.5 | SSB200 R0.5 | SSPB220 R0.5×2.5 |
| 回転数 [min⁻¹] Spindle speed | 30,000 | 30,000 | 40,000 | 40,000 | 40,000 |
| 送り速度 [mm/min] Feed | 1,000 | 800 | 500 | 700 | 600 |
| 切り込み量 ap×ae[mm] Depth of cut | 0.1×0.3 | 等高線：0.01×0.015 Contour 走査線：0.015×0.01 Scanline | 0.03×0.1 | 等高線：0.01×ゼロカット Contour : 0.01×Zero-cut 走査線：ゼロカット×0.01 Scanline : Zero-cut×0.01 | 等高線：0.01×0.005 Contour 走査線：0.005×0.01 Scanline |
| 残し代 [mm] Stock | 0.02 | 0.005 | 0.005 | 0.005 | — |
| 加工時間 Cutting time | 3時間20分 3hr 20min | 4時間4分 4hr 4min | 57分 57min | 5時間40分 5hr 40min | 6時間38分 6hr 38min |




| 側面部 Side | 面粗さ（μm） Surface roughness | |
|---|---|---|
| | Rz | Ra |
| 1個目 1st | 0.57 | 0.09 |
| 8個目 8th | 0.47 | 0.07 |
| 13個目 13th | 0.44 | 0.07 |

**加工側面において、面粗さ：Rz0.6μm 未満光沢のある仕上げ面を実現！**
Realized glossy surface roughness Rz0.6μm and under on side face!

# SSPB220 CBNスーパースパイラルボールエンドミル
CBN Super Spiral Ball End Mill

B-007

## 加工事例 3 パンチモデル
Cutting Example 3 : Punch Model

- 被削材：**HAP40(65HRC)** Material : HAP40(65HRC)
- クーラント：**オイルミスト** Coolant : Oil mist
- 総加工時間：**4 時間 36 分** Total cutting time : 4hr 36min

ワークサイズ：φ25（加工深さ 30 mm）
Work size : φ25 (Depth 30mm)

| 加工工程 Cutting process | 荒取り Roughing | 中仕上げ Semi-finishing | 仕上げ Finishing |
|---|---|---|---|
| 使用工具 Tool | MRBH230 R3×20 | MRBH230 R3×20 | SSPB220 R3×18 |
| 回転数 [$min^{-1}$] Spindle speed | 6,000 | 6,000 | 6,000 |
| 送り速度 [mm/min] Feed | 1,000 | 800 | 600 |
| 切り込み量 ap×ae[mm] Depth of cut | 0.15×0.8 | 0.05×0.08 | 0.05×0.05 |
| 残し代[mm] Stock | 0.1 | 0.05 | – |
| 加工時間 Cutting time | 1時間43分 1hr 43min | 55分 55min | 1時間58分 1hr 58min |

### 加工精度 [mm] Machining accuracy

| | 加工数 Machined pcs | 1個目 1pc | 6個目 6pc |
|---|---|---|---|
| ① | 実測値 Actual | 23.006 | 23.008 |
| | 誤差 Difference | +0.006 | +0.008 |
| ② | 実測値 Actual | 3.005 | 3.008 |
| | 誤差 Difference | +0.005 | +0.008 |

### 面粗さ [μm] Roughness

| 加工数 Machined pcs | 1個目 1pc | 6個目 6pc |
|---|---|---|
| 上面 Top | Ra:0.145 | Ra:0.162 |
| | Rz:1.054 | Rz:1.122 |
| 側面 Side | Ra:0.167 | Ra:0.185 |
| | Rz:1.355 | Rz:1.355 |

**仕上げ工具 1 本。6 個加工後（加工時間約 12 時間）でも安定した面粗さ・加工精度を得られます！**
Used 1 end mill for finishing. Realized stable surface roughness and machining accuracy even after 6pcs of finishing (about 12 hours of process)!

# SSPBL220 CBNスーパースパイラルロングネックボールエンドミル
CBN Super Spiral Long Neck Ball End Mill

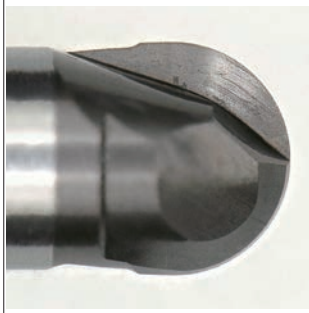
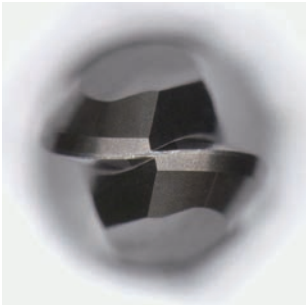
B-008

## 加工事例 1 熱間鍛造金型モデル
Cutting Example 1 : Hot Forging Mold

- 被削材：**YXR3 60HRC** Material : YXR3 60HRC
- クーラント：**オイルミスト** Coolant : Oil mist
- 加工時間：**4 時間（仕上げ加工のみ）** Cutting time : 4hr

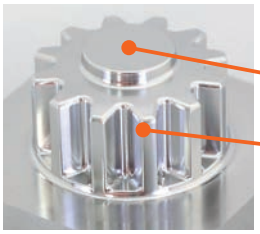
ワークサイズ：50 × 50mm
（加工深さ 18.2mm）
Work size : 50×50×18.2mm

| | |
|---|---|
| 加工工程<br>Cutting process | 仕上げ<br>Finishing |
| 使用工具<br>Tool | SSPBL220<br>R1×14 |
| 回転数 [$min^{-1}$]<br>Spindle speed | 6,000 |
| 送り速度 [mm/min]<br>Feed | 500 |
| 切り込み量 ap×ae[mm]<br>Depth of cut | 0.03×0.03 |
| 取り代 [mm]<br>Stock | 0.01 |
| 加工時間<br>Cutting time | 4時間<br>4hr |

| スクイ面<br>Rake Side | 外周刃<br>Peripheral Flute | R先端部<br>R End |
|---|---|---|
|  | |  |
| 刃径後退量＝2μm<br>Dia. Recession Amount | | |

撮影機：キーエンス社製　VHX-2000
Microscope: Keyence VHX-2000

### 仕上げ加工後の工具摩耗状態
Tool wear after finishing



上面部面粗さ：Rz1.36μm
Top Surface Roughness
側面部面粗さ：Rz1.20μm
Side Surface Roughness

面粗さ測定器：キーエンス社製　VK-X250
Mesuring Instrument: Keyence VK-X250

# SSPBTN220 CBNスーパースパイラルロングテーパーネックボールエンドミル
## CBN Super Spiral Long Taper Neck Ball End Mill

B-009

## 加工事例 1 深彫り仕上げサンプル Cutting Example 1 : Deep Milling Finish Sample

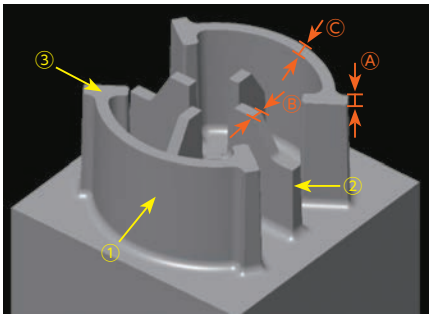
- 被削材：**ELMAX（60HRC）** Material : ELMAX（60HRC）
- クーラント：**オイルミスト** Coolant : Oil mist
- 総加工時間：**18 時間 14 分** Total cutting time : 18hr 14min

ワークサイズ：30 × 30mm
（加工深さ 15mm）
Work size : 30×30mm
(Cutting depth 15mm)

| 加工工程 Cutting process | 荒取り※ Roughing | 取り残し Stock removal | 中仕上げ Semi-finishing | 仕上げ Finishing |
|---|---|---|---|---|
| 使用工具 Tool | MRBTNH345 R1.5×1°×15 | MRBTNH345 R1×1°×16 | | SSPBTN220 R1×1°×16 |
| 回転数 [$min^{-1}$] Spindle speed | 15,000 | 10,000 | 10,000 | 16,000 |
| 送り速度 [mm/min] Feed | 1,600 | 1,000 | 1,000 | 800 |
| 切り込み量 ap×ae[mm] Depth of cut | 0.1×0.3 残し代:0.06 Stock | 0.1×0.1 残し代:0.06 Stock | ap0.05 残し代:0.01 Stock | ap0.01 |
| 加工時間 Cutting time | 7時間4分 7hr 4min | 22分 22min | 1時間56分 1hr 56min | 8時間47分 8hr 47min |

※荒取りは工具 2 本使用
※ 2 end mills used for roughing process

## 測定データ Measurement data




### 加工面粗さ
Surface roughness [μm]

| 測定箇所 Measured Position | Ra | Rz |
|---|---|---|
| ①壁部1 Side1 | 0.051 | 0.423 |
| ②壁部2 Side2 | 0.084 | 0.532 |
| ③平面 Top Surface | 0.149 | 1.086 |

測定機：三鷹光器　NH-3SP
Measuring instrument: Mitaka Kohki NH-3SP

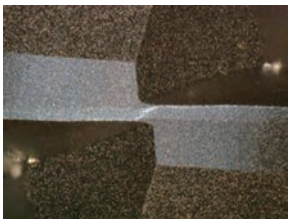
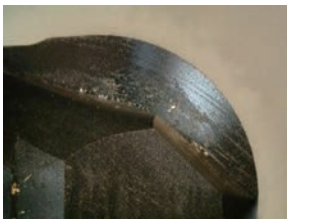
### 加工精度
Machining accuracy [mm]

| 測定位置 Measured Part | 狙い値 Target | 実測値 Actual | 誤差 Difference |
|---|---|---|---|
| Ⓐ | 2.160 | 2.164 | +0.004 |
| Ⓑ | 1.660 | 1.666 | +0.006 |
| Ⓒ | 1.660 | 1.664 | +0.004 |

測定機：ニコン　MM40（顕微鏡）
Measuring instrument: Nikon MM40

## 仕上げ加工後工具摩耗状態 Tool wear after finishing
（SSPBTN220　R1×1°×16）

**R後退量：2μm**
R Wear : 2μm

| 底刃×1,000 End Teeth | 稜線1×500 Ridgeline | スクイ×200 Rake side |
|---|---|---|
|  | |  |



SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

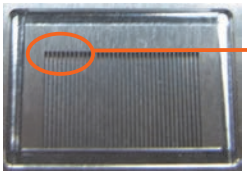
New
# SSR200 CBN スーパースピードラジアスエンドミル
## CBN Super Speed Radius End Mill

B-020

## 加工事例 1 微細複合加工形状 Cutting Example 1 : Combined Micro-machining.

- 被削材：**PD613 60HRC** Material : PD613 60HRC
- クーラント：**オイルミスト** Coolant : Oil mist
- 総加工時間：**14 時間 47 分（荒取り時間含む）** Total cutting time : 14hr 47min including roughing

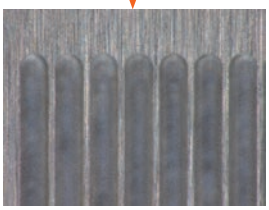
ワークサイズ：30 × 30mm
Work size : 30×30mm

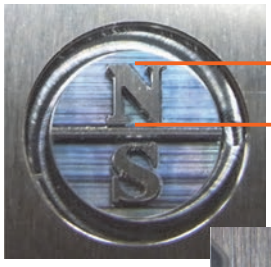


① 溝形状
Slot

溝幅：0.2mm
Slot width
深さ：0.5mm
Depth
長さ：5mm
Length
溝数：36 本
Number of groove

拡大写真
Magnified photo





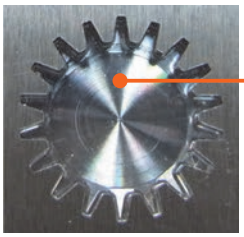
2.001mm
（狙い値 2.000mm）
Target

② 文字形状
NS Logo

鋭角コーナー部拡大写真
Magnified photo for corner edge

上面
Top

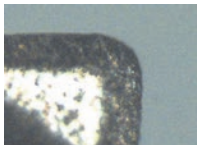
底面
Bottom



底面部面粗さ
Bottom surface roughness
Rz 0.25 μm

仕上げ加工後の工具
Corner radius after finishing

③ 歯車形状
Gear
（歯車直径：8mm）
Gear dia.



撮影倍率：1,000
Magnification rate

| 加工部位 Cutting part | ① 溝形状 Slot | | ② 文字形状 NS Logo | | ③ 歯車形状 Gear | |
|---|---|---|---|---|---|---|
| 加工工程 Cutting process | 溝加工 Z-0.03まで Slotting (to Z-0.03) | 溝加工 Z-0.5まで Slotting (to Z-0.5) | 側面仕上げ Finishing (Side) | 底面仕上げ Finishing (Bottom) | 側面仕上げ Finishing (Side) | 底面仕上げ Finishing (Bottom) |
| 使用工具 Tool | SSR200 φ0.2×R0.02×0.5 | | | | SSR200 φ0.2×R0.02×1 | |
| 回転数 [min⁻¹] Spindle speed | 40,000 | | | | | |
| 送り速度 [mm/min] Feed | 100 | 300 | 300 | | 200 | |
| 切り込み量 ap×ae[mm] Depth of cut | ap 0.001 | ap 0.003 | 0.001×0.005 | 0.005×0.005 | 0.003×0.005 | 0.005×0.005 |
| 加工時間 Cutting time | 1時間8分 1hr 8min | 2時間19分 2hr 19min | 1時間55分 1hr 55min | 20分 20min | 1時間45分 1hr 45min | 30分 30min |

- **60HRC の高硬度材加工において、φ0.2 と極小径でありながら CBN エンドミルは長時間加工しても安定した面品位と良好な加工精度が得られます。**
  SSR200, CBN End Mill ensures high quality surface and accuracy for a long time machining of hardened steels (60HRC) even with 0.2mm cutter diameter.

## 加工事例 2 高硬度材微細溝加工 Cutting Example 2 : Micro-Slotting

- 被削材：**YXR7 63HRC** Material : YXR7 63HRC
- クーラント：**オイルミスト** Coolant : Oil mist
- 総加工時間：**3 時間 51 分** Total cutting time : 3hr 51min

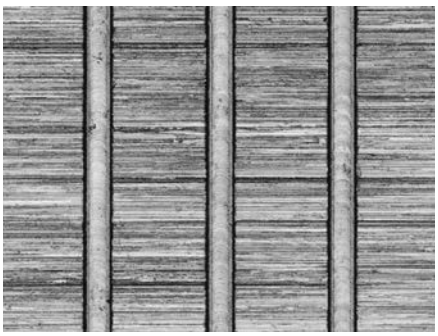
ワークサイズ：30 × 15mm（加工深さ 0.2mm）
Work size : 30×15×0.2mm

※溝 3 本につき工具 1 本使用（計 3 本使用）
Using 1pc tool to finish 3 slotting parts (total 3pcs).

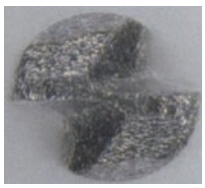
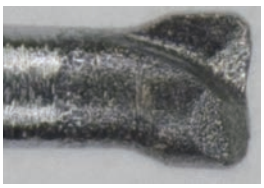
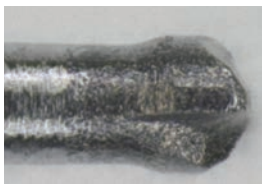
| | |
|---|---|
| 使用工具<br>Tool | SSR200 φ0.1×R0.02×0.2 |
| 回転数 [$min^{-1}$]<br>Spindle speed | 31,000 |
| 送り速度 [mm/min]<br>Feed | 50 |
| 切り込み量[mm]<br>Cutting depth | ap 0.001 |

### 加工精度 Measurement of work

| | 狙い値(mm)<br>Target | 実測値(mm)<br>Actual |
|---|---|---|
| 溝幅<br>Slot width | 0.988 | 0.999 |
| 溝深さ<br>Depth | 0.2 | 0.198 |



### 工具の摩耗状態 Tool ware after machining

| | | | |
|---|---|---|---|
| 加工前<br>Before machining | | | |
| 1時間17分<br>加工後<br>After machining 1hr 17min |  |  |  |

**CBN 工具なら、極微細径φ 0.1 でも焼入れ後のハイス材を精度良く加工できます。**
CBN end mill, even extra small diameter φ0.1, can machine a harden steel with a high-accuracy.

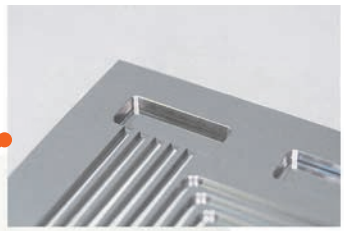

SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

## 加工事例 3 燃料電池用金属セパレータ プレス型モデル

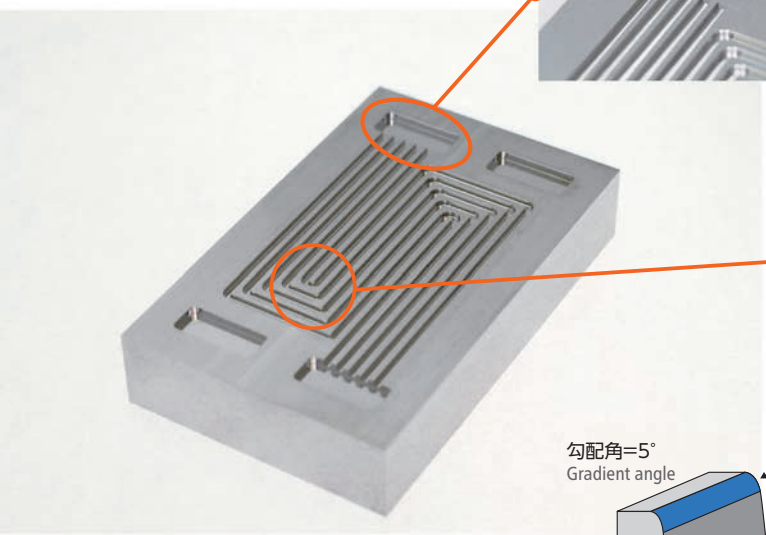
Cutting Example 3 : Fuel Cell Separator Press Mold

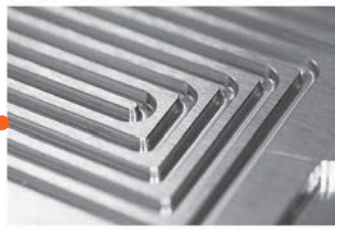
- 被削材：**YXR7（マトリックスハイス）64HRC** Material : YXR7(Matrix HSS) 64HRC
- クーラント：**オイルミスト** Coolant : Oil mist
- 総加工時間：**11 時間 24 分（荒取り時間含む）** Total cutting time : 11hr 24min including roughing

| 加工工程<br>Cutting process | 仕上げ<br>Finishing | |
|---|---|---|
| 加工部位<br>Cutting part | 側面部<br>Side | 底面部<br>Bottom |
| 使用工具<br>Tool | SSR200 φ1×R0.1×3 | |
| 回転数 [$min^{-1}$]<br>Spindle speed | 30,000 | |
| 送り速度 [mm/min]<br>Feed | 1,200 | 600 |
| 切り込み量 ap×ae[mm]<br>Depth of cut | 0.01×0.01 | 0.01×0.03 |
| 加工時間<br>Cutting time | 3時間<br>3hr | |

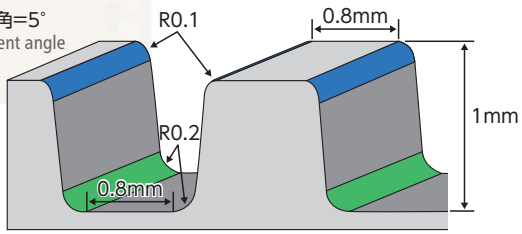


**ポケット底面部**
Bottom surface of pocket
**面粗さ Rz 0.25μm**
Surface roughness





ワークサイズ：50 × 80mm
Work size : 50×80mm



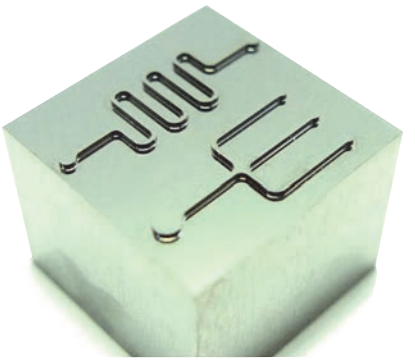

**CBN ラジアスエンドミルの使用で、安定した高精度仕上げ加工を実現できます。**
CBN Super Speed Radius End Mill will realize stable and accurate machining.

# PCDSE PCDスクエアエンドミル
PCD Square End Mill

C-001

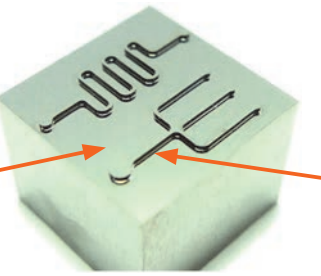
## 加工事例 1 超硬合金リアクター金型モデル
Cutting Example 1 : Cemented Carbide Reactor Mold

- 被削材：**超硬合金 92.5HRA** Material : Cemented Carbide 92.5HRA
- クーラント：**不水溶性切削油** Coolant : Water insoluble fluid
- 総加工時間：**12 時間 50 分** Total cutting time : 12hr 50min



ワークサイズ：10 × 10mm（加工深さ 0.25mm）
Work size : 10×10mm (Cutting depth 0.25mm)

| 加工工程<br>Cutting process | 等高線仕上げ<br>Contour line finishing | 走査線仕上げ<br>Scanning line finishing |
|---|---|---|
| 使用工具<br>Tool | PCDSE　φ0.5 | PCDSE　φ0.5 |
| 回転数 [$min^{-1}$]<br>Spindle speed | 56,000 | 56,000 |
| 送り速度 [mm/min]<br>Feed | 70 | 50 |
| 切り込み量 ap×ae[mm]<br>Depth of cut | 0.001×0.002 | 0.001×0.01 |
| 加工時間<br>Cutting time | 5時間<br>5hr | 7時間50分（2面分）<br>7hr 50min (2 Surfaces) |



**底面面粗さ**
Bottom surface roughness
**Ra：2nm，Rz：38nm**

※ノイズを除いた測定値
Measured value except noise

**流路幅**
Passage width
**狙い値：0.180mm**
Target
**実測値：0.182mm**
Actual



SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

# PCDボールエンドミル
PCD Ball End Mill

C-003

## 加工事例 1 テールランプモデル
Cutting Example 1 : Taillight Model

- 被削材：**STAVAX 52HRC** Material : STAVAX 52HRC
- クーラント：**不水溶性切削油** Coolant : Water insoluble cutting oil
- 総加工時間：**158 時間 8 分** Total cutting time : 158hr 8min

ワークサイズ:
200×100mm (加工深さ 38.02mm)
Work size : 200×100mm (Cutting depth 38.02mm)

| 加工工程 Cutting process | 荒取り Roughing | | 中仕上げ Semi-finishing | 仕上げ Finishing |
|---|---|---|---|---|
| 使用工具 Tool | MRBH230 R2×8 | MRBH230 R1×6 | SSPB220 R1×5 | PCDRB R1×5 |
| 回転数 [$min^{-1}$] Spindle speed | 20,000 | 20,000 | 40,000 | 40,000 |
| 送り速度 [mm/min] Feed | 2,000 | 1,500 | 1,000 | 1,000 |
| 切り込み量 ap×ae[mm] Depth of cut | 0.2×1.5 | 0.05×0.05 | 0.02×0.02 | 0.005×0.005 |
| 残し代[mm] Stock | 0.05 | 0.02 | 0.005 | – |
| 加工時間 Cutting time | 9時間49分 9hr 49min | 6時間33分 6hr 33min | 26時間57分 26hr 57min | 114時間49分 114hr 49min |

測定機：三鷹光器製 NH-3SP
Measuring Instrument: Mitaka Kohki NH-3SP

### 面粗さ Roughness

| 測定箇所 Measured position | Ra[μm] |
|---|---|
| ①PL面 Parting face | 0.028 |
| ②製品面 Main part surface | 0.026 |

- 鏡面のような“ツルツル・すべすべ・ピカピカ”な仕上げ面。面粗さ Ra 30nm を高速加工機で実現しました！
  Finished surface looks "smooth, even and shiny" such as the mirror surface. Realized the roughness: Ra 30nm with a high-speed machining center!

# MSBH230 MRBH230

無限コーティングプレミアム　高硬度用2枚刃ボールエンドミル
MUGEN-COATING PREMIUM 2-Flute Ball End Mill for Hardened Steel
無限コーティングプレミアム　高硬度用2枚刃ロングネックボールエンドミル
MUGEN-COATING PREMIUM 2-Flute Long Neck Ball End Mill for Hardened Steel

E-001
E-021

## 加工事例 1　ダイカット＆パンチモデル　Cutting Example 1 : Cutting & Punch Die Model

### *MRBH230*

- 被削材：**HAP40（粉末ハイス）65HRC**　Material : HAP40 (Powder HSS) 65HRC
- クーラント：**オイルミスト**　Coolant : Oil mist
- 総加工時間：**9 時間 42 分**（荒取り時間含む）　Cutting time : 9hr 42min including roughing

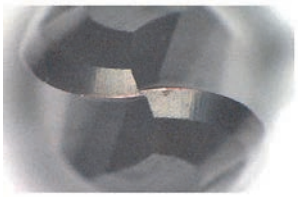
### ◎ 仕上げ加工　Finishing

| 加工部位 Cutting part | ダイカット部 Cutting die part | パンチ部 Punch die part |
|---|---|---|
| 使用工具 Tool | MRBH230　R1×4 | MRBH230　R1×8 |
| 回転数 [min⁻¹] Spindle speed | 20,000 | 12,000 |
| 送り速度 [mm/min] Feed | 1,200 | 550 |
| 切り込み量 ap×ae[mm] Depth of cut | 平面 Bottom surface | 0.01×0.02 |
| | 側面 Side | 0.02×0.03 |
| 加工時間 Cutting time | 2時間45分 2hr 45min | 5時間25分 5hr 25min |

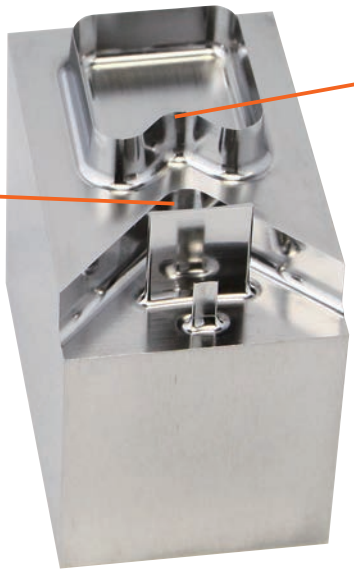
平面部面粗さ Rz 0.744μm
Bottom surface roughness

面粗さ
Surface roughness
平面部 Rz 0.712μm
Bottom
側面部 Rz 0.669μm
Side

R1 × 8 加工後工具写真
Cutting edge after machining

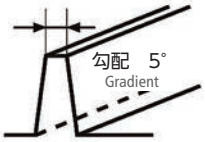


工具摩耗量 0.014mm
Tool wear

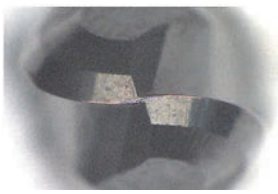


ワークサイズ：30 × 20mm（加工深さ8mm）
Work size : 30×20×8mm

狙い値 0.050mm →実測値 0.057mm
Target　Actual




R1 × 4 加工後工具写真
Cutting edge after machining



工具摩耗量 0.025mm
Tool wear

● 粉末ハイスの加工において、寸法狙い値 0.050 →実測値 0.057mm と安定して加工できます。
Actual measurement 0.057mm against the target 0.050mm on Powder HSS.

## 加工事例 2 マウス キャビティ Cutting Example 2 : Mouse Cavity Model

### *MSBH230・MRBH230*

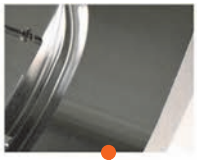
- 被削材：**STAVAX（SUS420J2 改）52HRC** Material : STAVAX (SUS420J2) 52HRC
- クーラント：**オイルミスト** Coolant : Oil mist
- 総加工時間：**32 時間 10 分**（荒取り時間含む） Cutting time : 32hr 10min including roughing

### ◎ 製品部仕上げ Main part finishing

| | |
|---|---|
| 使用工具 Tool | MRBH230 R1×6 |
| 回転数 [min$^{-1}$] Spindle speed | 18,000 |
| 送り速度 [mm/min] Feed | 720 |
| 切り込み量 Rmax [mm] Depth of cut | 0.001 |
| 取り代 [mm] Stock | 0.03 |
| 加工時間 Cutting time | 6時間4分 6hr 4min |

面粗さ
Surface roughness
Rz 1.492μm

面粗さ
Surface roughness
Rz 0.909μm



### ◎ PL 面仕上げ
Parting face part finishing

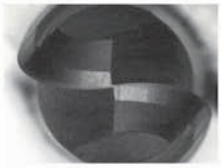
| | |
|---|---|
| 使用工具 Tool | MSBH230 R3 |
| 回転数 [min$^{-1}$] Spindle speed | 12,000 |
| 送り速度 [mm/min] Feed | 1,120 |
| 切り込み量 Rmax [mm] Depth of cut | 0.001 |
| 取り代 [mm] Stock | 0.05 |
| 加工時間 Cutting time | 2時間20分 2hr 20min |

R1 × 6 加工後工具写真
Cutting edge after machining

工具摩耗量 0.008mm
Tool wear

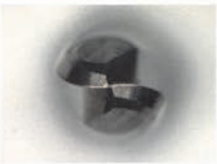
ワークサイズ：
135 × 95mm
Work size : 135×95mm

R3 加工後工具写真
Cutting edge after machining



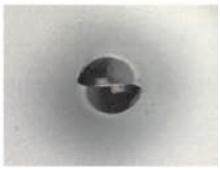
工具摩耗量 0.008mm
Tool wear

R0.5 × 6 加工後工具写真
Cutting edge after machining



工具摩耗量 0.010mm
Tool wear

R0.3 × 4 加工後工具写真
Cutting edge after machining

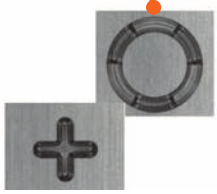


工具摩耗量 0.008mm
Tool wear

### ◎ 製品部仕上げ Main part finishing

面粗さ
Surface roughness
Rz 0.607μm

| | |
|---|---|
| 使用工具 Tool | MRBH230 R0.5×6 |
| 回転数 [min$^{-1}$] Spindle speed | 18,000 |
| 送り速度 [mm/min] Feed | 720 |
| 切り込み量 Rmax [mm] Depth of cut | 0.001 |
| 取り代 [mm] Stock | 0.025 |
| 加工時間 Cutting time | 2時間43分 2hr 43min |



勾配 1° Gradient　深さ 4mm Depth

### ◎ 溝部仕上げ（L/D=6.6）
Gutter finishing

| | |
|---|---|
| 使用工具 Tool | MRBH230 R0.3×4 |
| 回転数 [min$^{-1}$] Spindle speed | 18,000 |
| 送り速度 [mm/min] Feed | 300 |
| 切り込み量 ap×ae[mm] Depth of cut | 0.01×0.015 |
| 加工時間 Cutting time | 2時間10分 2hr 10min |

**高硬度材へ長時間加工を行っても安定した切削面を得られます。**
**小径リブ溝加工も安定して行うことができます。**
Cutting surface is accurately maintained for a long time on hard materials.
Slotting by small-size end mill is also consistent.

# MRBTNH230 無限コーティングプレミアム ロングテーパーネック2枚刃ボールエンドミル
MUGEN-COATING PREMIUM 2-Flute Long Taper Neck Ball End Mill

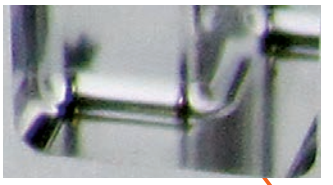
E-048

## 加工事例 1 微細深彫りモデル
Cutting Example 1 : Deep Micro Machining Model

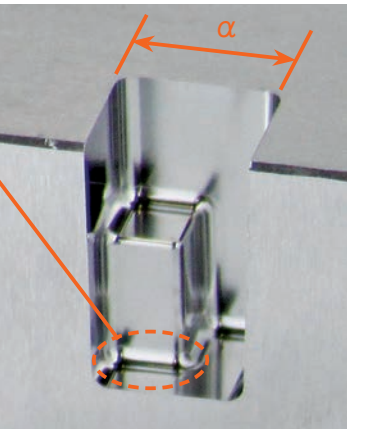
- 被削材：**STAVAX(52HRC)** Material : STAVAX(52HRC)
- クーラント：**オイルミスト** Coolant : Oil mist
- 総加工時間：**2 時間 48 分** Total cutting time : 2hr 48min

ワークサイズ：
7.5 × 7mm (加工深さ12mm)
Work size : 7.5×7×12mm

| 加工工程 Cutting process | 荒取り Roughing | 取り残し Stock removal | 中仕上げ Semi-finishing | 仕上げ Finishing |
|---|---|---|---|---|
| 使用工具 Tool | MRBTNH230 R1×1°30′×12 | MRBTNH230 R0.5×1°30′×12 | | MRBTNH230 R0.5×1°30′×12 |
| 回転数 [min⁻¹] Spindle speed | 18,000 | 15,000 | 12,000 | 12,000 |
| 送り速度 [mm/min] Feed | 2000 | 600 | 500 | 300 |
| 切り込み量 ap×ae[mm] Depth of cut | 0.15×0.35 | 0.025×0.08 | 0.02×0.02 | 0.01 ×0.01 |
| 残し代 [mm] Stock | 0.03 | 0.03 | 0.01 | – |
| 加工時間 Cutting time | 14分 14min | 12分 12min | 23分 23min | 1時間37分 1hr 37min |



ビビリの無い加工面を実現！
Realized fine surface without chattering.




### α寸法 Measurment

| | |
|---|---|
| 狙い値 Target | 7mm |
| 測定値 Actual | 6.996mm |
| 誤差 Difference | -0.004mm |

**最適化したテーパーネック形状と無限コーティングプレミアムにより、ビビリがなく、ほぼ狙い値通りの加工が実現！**
Realized accurate machining nearly to the target value without chattering by the optimized taper-neck design and MUGEN-COATING PREMIUM.



SEVKET OĞLU® MAKINA TİCARET VE SAN. LTD. ŞTİ.

# MRBTNH345 無限コーティングプレミアム ロングテーパーネック3枚刃ボールエンドミル

MUGEN-COATING PREMIUM 3-Flute Long Taper Neck Ball End Mill

E-056

## 加工事例 1 LED ランプハウジング アルミダイキャスト金型モデル

Cutting Example 1 : LED Lamp Housing Aluminium Die-casting Mold

- 被削材：**DH31-S 48HRC** Material : DH31-S 48HRC
- クーラント：**水溶性切削油** Coolant : Water soluble fluid
- 総加工時間：**7 時間 13 分** Total cutting time : 7hr 13min

側面部面粗さ Rz 1.52μm
Side surface roughness

ワークサイズ：
50 × 50mm
Work size : 50×50mm

| | 寸法精度 Dimension (上面部) Top | 倒れ精度 Deflection (側面部) Side |
|---|---|---|
| 狙い値 Target | | |
| 実測値 Actual | 3.455mm | 2°01' |

| 加工工程 Cutting process | 大荒取り Pre-roughing | 荒取り Roughing | 中仕上げ Semi-finishing | 仕上げ Finishing 側面全体 Side | 仕上げ Finishing 平面 Plane | 仕上げ Finishing 曲面 Curved Surface |
|---|---|---|---|---|---|---|
| 使用工具 Tool | MHRH430R φ6×R1×24 | MRBTNH345 R1×2°×20 | | MRBTNH345 R1×2°×20 | | |
| 回転数 [min⁻¹] Spindle speed | 5,000 | 10,000 | | 5,000 | | |
| 送り速度 [mm/min] Feed | 5,000 | 1,200 | 600 | 600 | | 300 |
| 切り込み量 ap×ae[mm] Depth of cut | 0.15×1.5 | 0.1×0.35 | ap 0.05 | 0.05×0.05 | 0.05×0.03 | ap 0.03 |
| 残し代 [mm] Stock | 0.05 | 0.05 | | – | | |
| 加工時間 Cutting time | 12分 12min | 3時間1分 3hr 1min | | 4時間 4hr | | |

## 加工事例 2 バルブボディ

Cutting Example 2 : Valve Body

- 被削材：**DH31-S 48HRC** Material : DH31-S 48HRC
- クーラント：**オイルミスト** Coolant : Oil mist
- 総加工時間：**10 時間 47 分** Total cutting time : 10hr 47min

ワークサイズ：50 × 50 × 50mm
Work size : 50×50×50mm
(加工高さ 30mm)
Cutting depth

| 加工工程 Cutting process | 大荒取り Pre-Roughing | 荒取り Roughing | 中荒取り Semi-Roughing | 中仕上げ① Semi-Finishing① | 中仕上げ② Semi-Finishing② | 仕上げ Finishing |
|---|---|---|---|---|---|---|
| 使用工具 Tool | MHDH645 φ6×18 | MHDH645R φ6×R1×12 | MRBTNH345 R1.5×1°×30 | MRBTNH345 R1×1°×20 | MRBTNH345 R1×1°×30 | MRBTNH345 R1×1°×30 |
| 回転数 [min⁻¹] Spindle speed | 9,000 | 6,000 | 10,000 | 10,000 | 10,000 | 6,000 |
| 送り速度 [mm/min] Feed | 3,000 | 3,000 | 1,600 | 1,000 | 1,000 | 800 |
| 切り込み量 ap×ae[mm] Depth of cut | 9×0.2 | 0.1×4 | ap 0.1 | ap 0.1 | ap 0.05 | 側面:0.15×0.05 Side 底面:0.05×0.1 Bottom |
| 残し代[mm] Stock | 0.2 | 0.2 | 0.2 | 0.05 | 0.05 | – |
| 加工時間 Cutting time | 35分 35min | 15分 15min | 1時間17分 1hr 17min | 2時間6分 2hr 6min | 3時間40分 3hr 40min | 2時間54分 2hr 54min |

**高能率加工に対応する工具剛性を高めるテーパーネックと長寿命化を目的とした無限コーティングプレミアムの採用により、側面部及び、加工深部においても安定した加工品位が得られます。**

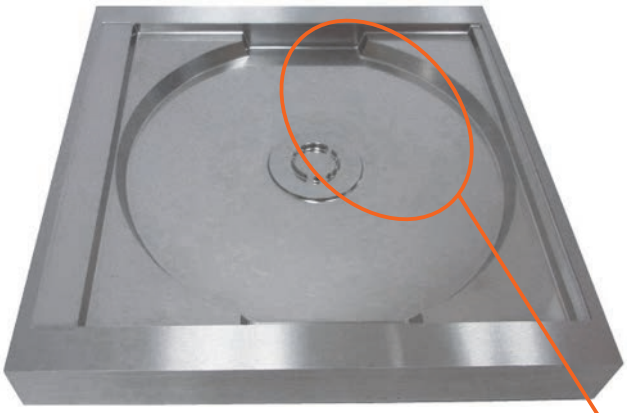
MUGEN-COATING PREMIUM performing for high efficient 3D milling by it's original design and tool life improvement realized stable and quality finish even at side and deep profiles.

New
# MHRH430R 無限コーティングプレミアム 高硬度用4枚刃ロングネックラジアスエンドミル
MUGEN-COATING PREMIUM 4-Flute Long Neck Radius End Mill for Hardened Steel

F-012

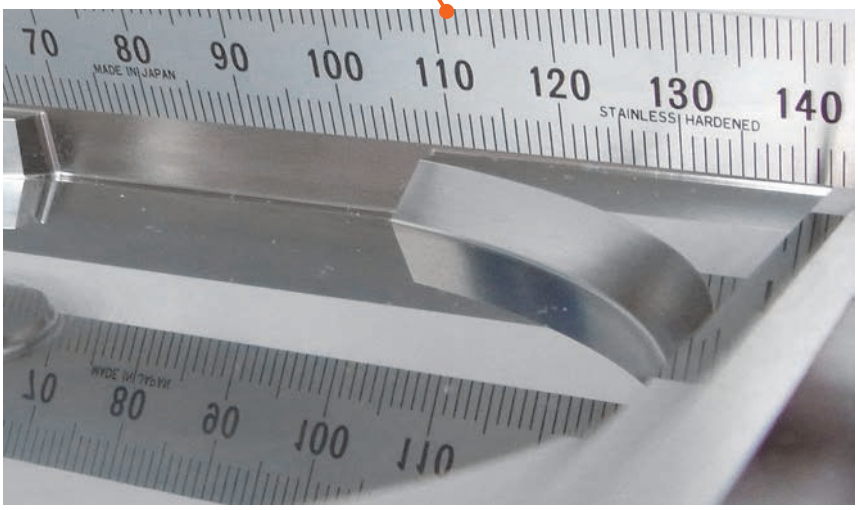
## 加工事例 1 DVD ケース（鏡面加工） Cutting Example 1 : DVD Case (Mirror surface)

- 被削材：**STAVAX 52HRC** Material : STAVAX 52HRC
- クーラント：**オイルミスト** Coolant : Oil mist
- 総加工時間：**11 時間 20 分**（荒取り時間含む） Total cutting time : 11hr 20min including roughing



ワークサイズ：150 × 150mm
Work size : 150×150mm

| 加工工程 Cutting process | 仕上げ Finishing | |
|---|---|---|
| 加工部位 Cutting part | 側面部 Side | 底面部 Bottom |
| 使用工具 Tool | MHRH430R φ2×R0.5×8 | |
| 回転数 [min⁻¹] Spindle speed | 40,000 | |
| 送り速度 [mm/min] Feed | 3,000 | 2,000 |
| 切り込み量 ap×ae[mm] Depth of cut | 0.02×0.01 | 0.01×0.03 |
| 加工時間 Cutting time | 1時間30分 1hr 30min | 7時間30分 7hr 30min |

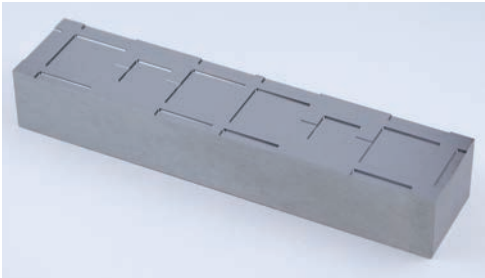



**面粗さ（底面部）**
Bottom surface roughness
**Rz 0.3μm**

**無限コーティングプレミアムシリーズを使用し、ステンレス系焼入れ鋼の直彫り切削加工において、加工環境の安定と切削抵抗の低減を図り、面粗さ向上と、光沢のある仕上げ面を得る事ができました。**
Material of this cutting example is hardened STAVAX. Mirror surface has been realized through direct cutting by MHRH430R under the optimum cutting conditions.

## 加工事例 2 封止金型モデル Cutting Example 2 : Sealed Mold

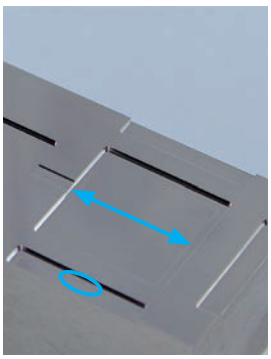
- 被削材：**HPM31 60HRC** Material : HPM31 60HRC
- クーラント：**オイルミスト** Coolant : Oil mist
- 総加工時間：**3 時間 59 分** Total cutting time : 3hr 59min



ワークサイズ：90 ×20mm（加工深さ 0.35mm）
Work size : 90×20×0.35mm

| 加工工程 Cutting Process | 荒取り Roughing | 上面部仕上げ Finising of top surface | 中仕上げ Semi-finishing | 仕上げ Finishing | |
|---|---|---|---|---|---|
| | | | | 側面・隅部 Side・Fillet | 底面 Bottom |
| 使用工具 Tool | MHRH430R φ1×R0.05×2 | | MHRH430R φ0.8×R0.02×2 | MHRH430R φ0.8×R0.02×2 | MHRH430R φ0.8×R0.1×2 |
| 回転数[$min^{-1}$] Spindle Speed | 21,000 | | 21,000 | 31,000 | 31,000 |
| 送り速度[mm/min] Feed | 2,000 | | 1,800 | 1,200 | 1,200 |
| 切り込み量[mm] Depth of cut | ap 0.04 ae 0.25 | ap 0.01 ae 0.05 | ap 0.015 ae 0.1 | ap 0.01 | ae 0.01 |
| 残し代[mm] Stock | 0.02 | 0 | 0.01 | 0 | 0 |
| 加工時間 Cutting time | 1時間16分 1hr 16min | | 25分 25min | 39分 39min | 1時間39分 1hr 39min |
| 加工距離[m] Cutting distance | 103 | | 24.2 | 36 | 91 |

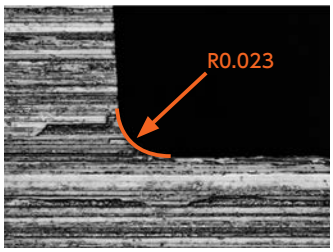
### 加工精度 Measurement of work



| | 狙い値(mm) Target | 実測値(mm) Actual |
|---|---|---|
| 加工幅 width | 0.988 | 0.999 |
| 面粗さ Bottom surface roughness | Ra 0.046μm | Rz 0.247μm |

### 底R部形状 Bottom corner R

底R0.02狙い 斜面勾配角3°
Target R0.02 / Gradient angle 3°



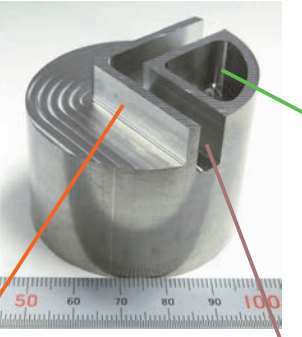

- **荒取り後の工具で上面部が仕上がるほど、摩耗の進行はありませんでした。**
  Minimum progress of tool wearing as the tool used for roughing process is also doable for finishing of top surface.
- **底面の仕上げでは、コーナー R を大きくし、面質の向上を図っています。**
  At the bottom finishing processing, achieve a high precision surface by using larger corner R end mill.
- **1本あたりの加工時間が短いならば、コーテッド超硬工具でも十分仕上がります。**
  If the cutting time of each tool is short, the coated cemented carbide end mill is also sufficient for finishing.

# MSXH440R 無限コーティングプレミアム パワーラジアスエンドミル
MUGEN-COATING PREMIUM Power Radius End Mill

F-001

## 加工事例 1 6-4 チタン高能率加工
Cutting Example 1 : High efficient Ti-6Al-4V cutting

- 使用工具：**MSXH440R φ6 × R0.5** Tool : MSXH440R φ6 × R0.5
- 被削材：**Ti-6Al-4V** Material : Ti-6Al-4V
- クーラント：**水溶性切削油** Coolant : Water soluble fluid
- 総加工時間：**3 分 9 秒** Total cutting time : 3min 9sec



ワークサイズ：φ50 × 40（mm）
Work size : φ50×40mm

| 加工部位 Cutting part | ポケット Pocket | |
|---|---|---|
| 加工工程 Cutting process | 荒取り Roughing | 仕上げ Finishing |
| 回転数 [min⁻¹] Spindle speed | 3,600 | |
| 送り速度 [mm/min] Feed | 400 | |
| 切り込み量 ap×ae[mm] Depth of cut | 6×3 | 12×0.1 |
| 加工時間 Cutting time | 51秒 51sec | 9秒 9sec |
| 総加工時間 Total Cutting time | 60秒 60sec | |

| 加工部位 Cutting part | 側面 Side | |
|---|---|---|
| 加工工程 Cutting process | 荒取り Roughing | 仕上げ Finishing |
| 回転数 [min⁻¹] Spindle speed | 3,600 | |
| 送り速度 [mm/min] Feed | 1,000 | 400 |
| 切り込み量 ap×ae[mm] Depth of cut | 9×1.2 | 9×0.1 |
| 加工時間 Cutting time | 65秒 65sec | 14秒 14sec |
| 総加工時間 Total Cutting time | 79秒 79sec | |

| 加工部位 Cutting part | 溝 Slot | |
|---|---|---|
| 加工工程 Cutting process | 荒取り Roughing | 仕上げ Finishing |
| 回転数 [min⁻¹] Spindle speed | 3,600 | |
| 送り速度 [mm/min] Feed | 400 | |
| 切り込み量 ap×ae[mm] Depth of cut | ap 6 | 12×0.1 |
| 加工時間 Cutting time | 25秒 25sec | 25秒 25sec |
| 総加工時間 Total Cutting time | 50秒 50sec | |

**約3分、工具１本で加工完了します。**
Completed with just 1 tool, in 3 minutes.

## 加工事例 2 タービンノズルモデル
Cutting Example 2 : Turbine Nozzle Model

- 使用工具：**MSXH440R φ6 × R0.5** Tool : MSXH440R φ6 × R0.5
- 被削材：**Alloy718 (Inconel 718® 相当)** Material : Alloy718
- クーラント：**水溶性切削油** Coolant : Water soluble fluid
- 総加工時間：**1 時間 45 分** Total cutting time : 1hr 45min

ワークサイズ：φ 80 × 35（mm）
Work size : φ80×35mm

| 加工部位 Cutting part | 外周 Outer profile | 内周 Inner profile | ノズル部 Blades | 全体 Whole |
|---|---|---|---|---|
| 加工工程 Cutting process | 荒取り Roughing | | | 仕上げ Finishing |
| 回転数 [min⁻¹] Spindle speed | 2,100 | | 溝:1,800 Slot 側面:2,100 Side | 2,100 |
| 送り速度 [mm/min] Feed | 500 | ヘリカル:300 Helical 側面:500 Side | 溝:300 Slot 側面:500 Side | 250 |
| 切り込み量 ap×ae[mm] Depth of cut | 8.95×0.2 | ヘリカル:ap 0.16 Helical 側面:8.95×0.2 Side | 溝:ap 0.6 Slot 側面:5.95×0.2 Side | 側面:3~6×0.05 Side 底面:0.05×1.5 Bottom |
| 加工時間 Cutting time | 15分 15min | 20分 20min | 50分 50min | 20分 20min |

**耐熱性に優れた無限コーティングプレミアムを採用、さらにスパイラル形状のコーナー R を設け、不等リードと大きな不等分割により、ビビリを抑制し高能率で安定した加工を実現します。**
By employing high heat-resistible MUGEN-COATING PREMIUM, original spiral form at corner radius, and improved design of unequal helix angle as well as flute spacing, high efficient and steady machining has been realized to reduce harmful vibration.



SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

## 加工事例 1　MSZ345 φ3 様々な被削材での高能率加工

Cutting Example 1 : MSZ345 φ3 High efficient cutting for various materials

・被削材：**S50C、NAK80（40HC）、SKD61（生）、SUS304 の 4 種類**
Material : S50C, NAK80(40HC), SKD61(Raw), SUS304

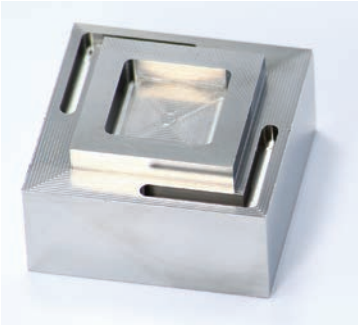
・クーラント：**エアーブロー（SUS304 のみ水溶性切削油）**　Coolant : Air blow (Water soluble fluid for SUS304)

### ◎ S50C 加工条件　S50C Milling condition

| 使用工具 Tool | | MSZ345φ3 |
|---|---|---|
| 回転数 [min⁻¹] Spindle speed | | 9,600 |
| 送り速度 [mm/min] Feed | 突込み Plunging | 200 |
| | ポケット Pocket milling | 800 |
| | 溝 Slotting | 550 |
| | 側面 Side milling | 800 |
| 切り込み量 ap×ae[mm] Depth of cut | ポケット Pocket milling | 4.5×0.9 |
| | 溝 Slotting | ap 3 |
| | 側面 Side milling | 4.5×0.9 |
| 加工時間 Cutting time | | 4分 4min |

### ◎ NAK80 加工条件　NAK80 Milling condition

| 使用工具 Tool | | MSZ345φ3 |
|---|---|---|
| 回転数 [min⁻¹] Spindle speed | | 5,800 |
| 送り速度 [mm/min] Feed | 突込み Plunging | 100 |
| | ポケット Pocket milling | 400 |
| | 溝 Slotting | 250 |
| | 側面 Side milling | 400 |
| 切り込み量 ap×ae[mm] Depth of cut | ポケット Pocket milling | 4.5×0.9 |
| | 溝 Slotting | ap 3 |
| | 側面 Side milling | 4.5×0.9 |
| 加工時間 Cutting time | | 8分 8min |



ワークサイズ：45 × 45mm
Work size : 45×45mm

### ◎ SKD61（生）加工条件　SKD61 (Raw) Milling condition

| 使用工具 Tool | | MSZ345φ3 |
|---|---|---|
| 回転数 [min⁻¹] Spindle speed | | 4,200 |
| 送り速度 [mm/min] Feed | 突込み Plunging | 70 |
| | ポケット Pocket milling | 350 |
| | 溝 Slotting | 200 |
| | 側面 Side milling | 550 |
| 切り込み量 ap×ae[mm] Depth of cut | ポケット Pocket milling | 2.25×0.9 |
| | 溝 Slotting | ap 1.5 |
| | 側面 Side milling | 4.5×0.9 |
| 加工時間 Cutting time | | 9分 9min |

### ◎ SUS304 加工条件　SUS304 Milling condition

| 使用工具 Tool | | MSZ345φ3 |
|---|---|---|
| 回転数 [min⁻¹] Spindle speed | | 3,600 |
| 送り速度 [mm/min] Feed | 突込み Plunging | 30 |
| | ポケット Pocket milling | 200 |
| | 溝 Slotting | 100 |
| | 側面 Side milling | 250 |
| 切り込み量 ap×ae[mm] Depth of cut | ポケット Pocket milling | 2.25×0.6 |
| | 溝 Slotting | ap 1.5 |
| | 側面 Side milling | 4.5×0.6 |
| 加工時間 Cutting time | | 20分 20min |

● **特殊刃形状（特許取得）により様々な被削材で安定した高能率加工が可能です。**
Original flute design (Patented) made it possible for efficient cutting of various materials.

New
# ALZ345
# AL5D-2

## アルミ用高能率重切削エンドミル
3-Flute Power "Z" End Mill for Aluminum

## アルミ専用エンドミル（5倍刃長タイプ）
2-Flute Long End Mill for Aluminum

D-140
D-137

## 加工事例 1　他社 3 枚刃アルミ用エンドミルとの切削性能比較
Cutting Example 1 : Comparison of performance with rival manufacturers

**ALZ345**

・被削材：**アルミニウム合金（A5052）**　Material : Aluminum Alloy (A5052)
・クーラント：**水溶性切削油**　Coolant : Water soluble fluid

| | 条件①<br>Case 1 | 条件②<br>Case 2 | 条件③<br>Case 3 | 条件④<br>Case 4 |
|---|---|---|---|---|
| 使用工具<br>Tool | ALZ345 φ6 | | | |
| 加工工程<br>Cutting process | 穴→溝（溝長30mm）<br>Hole → Slot(Slot width 30mm) | | | 側面<br>Side milling |
| 回転数 [min⁻¹]<br>Spindle speed | 5,000 | 10,000 | 20,000 | 20,000 |
| Z 送り速度 [mm/min]<br>Feed (Plunge) | 250 | 500 | 700 | — |
| 送り速度 [mm/min]<br>Feed | 1,500 | 3,000 | 6,000 | 10,000 |
| 切り込み量 ap×ae[mm]<br>Depth of cut | ap 6 | | | 6×3 |

◎ テスト結果

| | 条件①<br>Case 1 | 条件②<br>Case 2 | 条件③<br>Case 3 | 条件④<br>Case 4 |
|---|---|---|---|---|
| NS | ○ | ○ | ○ | ○ |
| A 社<br>Company A | △ | △ | △ | △ |
| B 社<br>Company B | × | □ | □ | ○ |

【○：カケ、ビビリなし　No chipping, no chattering　△：ビビリあり　Chattering　□：カケあり　Chipping　×：折損　Breakage】

● ALZ345 が全ての条件で安定しているのに対し、A 社は絶えずビビリがあり、また B 社はカケが発生し、折損し易い結果となりました。
ALZ345 resulted in excellent performance in all cases, while abnormal chattering happened at Company A and chipping at Company B which may cause breakage.

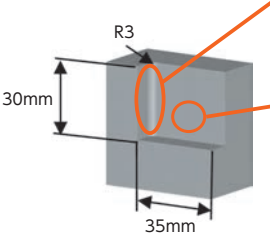
## 加工事例 2　アルミ加工用ロング刃長（L／D=5）ビビリ比較
Cutting Example 2 : Comparison of chattering at long length of cut (L/D=5)

**AL5D-2**

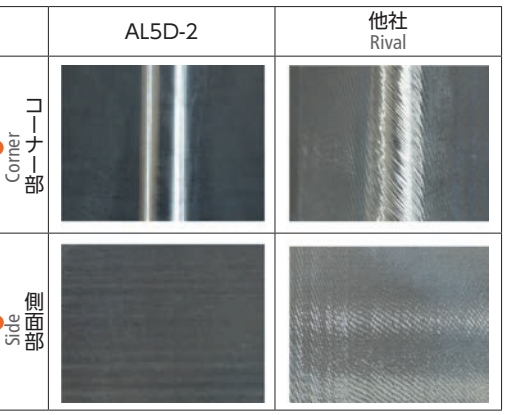
・被削材：**アルミニウム合金（A5052）**　Material : Aluminum Alloy (A5052)
・クーラント：**水溶性切削油**　Coolant : Water soluble fluid

| 加工工程<br>Cutting process | 仕上げ<br>Finishing | |
|---|---|---|
| 使用工具<br>Tool | AL5D-2　φ6 | 他社 Rival　φ6 |
| 回転数 [min⁻¹]<br>Spindle speed | 12,000 | |
| 送り速度 [mm/min]<br>Feed | 800 | |
| 切り込み量 ap×ae[mm]<br>Depth of cut | 30×0.06 | |

ワークサイズ：
35 × 50mm
Work size : 35×50mm




**仕上げ面の状態**
Surface after finishing




● アルミ加工において、AL シリーズはビビリの無い、高品位な仕上げ面が得られます。
AL-series realize fine surface on aluminum cutting without chattering.


SEVKET OĞLU®
MAKINA TICARET VE SAN. LTD. ŞTI.

New
# ALZ345
# AL3D-2

## アルミ用高能率重切削エンドミル
3-Flute Power "Z" End Mill for Aluminum

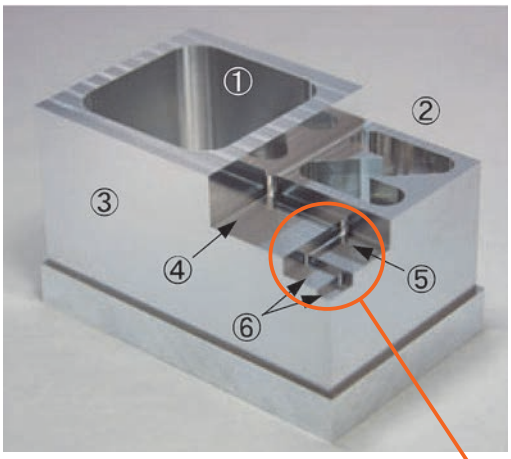
## アルミ専用エンドミル（3倍刃長タイプ）
2-Flute Medium End Mill for Aluminum

D-140
D-136

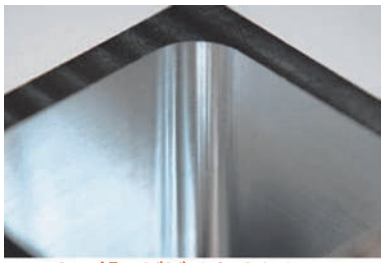
## 加工事例 3　アルミ高能率加工
Cutting Example 3 : High efficient cutting on Aluminum

- 被削材：**アルミニウム合金（A5052）** Material : Aluminum Alloy (A5052)
- クーラント：**水溶性切削油** Coolant : Water soluble fluid
- 総加工時間：**6 分** Cutting time : 6min

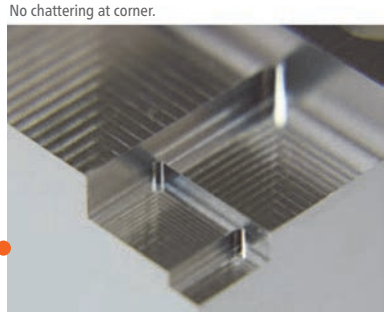
| | | ① | ② | ③ | ④ | ⑤ | ⑥ |
|---|---|---|---|---|---|---|---|
| 加工工程 Cutting process | | ポケット Pocket | 溝 Slot | 側面 Side | 平面 Plane surface | | |
| 使用工具 Tool | | ALZ345 | | AL3D-2 | ALZ345 | | |
| | | φ10 | φ6 | φ10 | φ3 | φ2 | φ1 |
| 回転数 [min⁻¹] Spindle speed | 荒取り Roughing | 11,000 | 18,600 | 10,500 | 20,000 | 20,000 | 20,000 |
| | 仕上げ Finishing | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 |
| 送り速度 [mm/min] Feed | 突込み Plunging | 300 | 400 | — | — | — | — |
| | 荒取り Roughing | 3,000 | 2,200 | 1,700 | 2,200 | 1,500 | 1,100 |
| | 仕上げ Finishing | 2,000 | 1,100 | 2,000 | 1,100 | 700 | 500 |
| 切り込み量 ap×ae[mm] Depth of cut | 荒取り Roughing | 10×3 | ap 5.95 | 30×0.5 | 3×0.9 | 2×0.6 | 1×0.3 |
| | 仕上げ Finishing | 15×0.01 | 6×0.05 | 30×0.01 | 3×0.01 | 2×0.01 | 1×0.005 |




ワークサイズ：40 × 63.5 × 38mm
Work size : 40×63.5×38mm



**コーナー部でビビりません！**
No chattering at corner.



**立壁の段差がありません**
No difference in level at side face.

- **ビビリの発生が無く、倒れ精度は 2μm 以内、面粗さ Rz1μm 以下の加工精度を実現！**
  Deflection of side wall is within 2μm, surface roughness is within Rz 1μm.

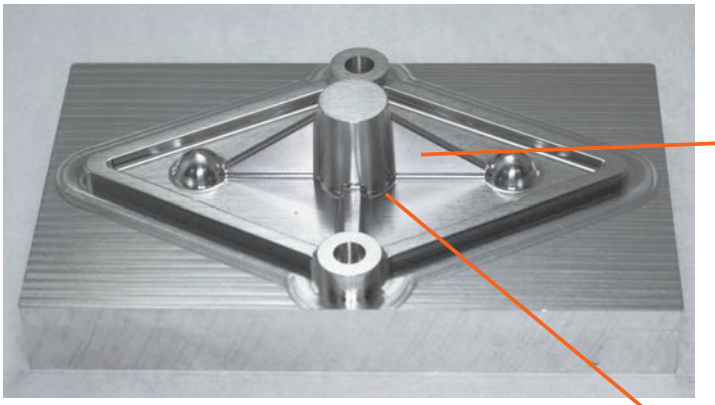
# ALB225 アルミ用ボールエンドミル
Ball End Mill for Aluminum

E-082

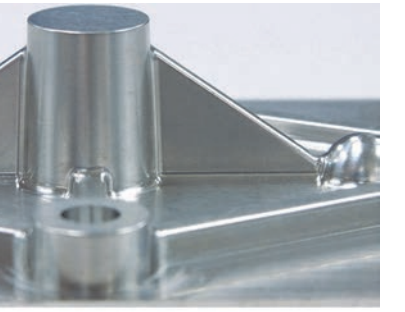
## 加工事例 1 アルミ部品モデル
Cutting Example 1 : Aluminum Parts Model

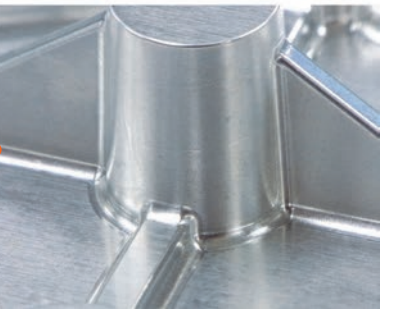
- 被削材：**アルミニウム合金（A5052）** Material : Aluminum Alloy (A5052)
- クーラント：**水溶性切削油** Coolant : Water soluble fluid
- 総加工時間：**3 時間 20 分** Total cutting time : 3hr 20min

| 加工工程<br>Cutting process | 荒取り<br>Roughing | 中仕上げ<br>Semi-finishing | 取り残し<br>Stock removal | 取り残し<br>Stock removal | 仕上げ<br>Finishing |
|---|---|---|---|---|---|
| 使用工具<br>Tool | ALB225 R3×12 | | ALB225<br>R1.5×2.5×15 | ALB225 R1×1.5×20 | |
| 回転数 [$min^{-1}$]<br>Spindle speed | 20,000 | | 18,000 | 12,000 | |
| 送り速度 [mm/min]<br>Feed | 7,500 | 3,000 | 2,000 | 1,200 | 2,000 |
| 切り込み量 ap×ae [mm]<br>Depth of cut | 1×2 | 0.2×0.2 | 0.6×0.6 | 0.1×0.1 | 0.05×0.05 |
| 残し代 [mm]<br>Stock | 0.1 | 0.05 | 0.05 | 0.05 | – |
| 加工時間<br>Cutting time | 14分<br>14min | 24分<br>24min | 8分<br>8min | 24分<br>24min | 2時間10分<br>2hr 10min |



ワークサイズ：60 × 100mm
Work size : 60×100mm





● 新開発の刃形状により、ビビリの無い、良好な仕上げ面を得られます。
特に立ち壁やコーナー部において、威力を発揮します。
New chatter-free flute design brought an excellent surface roughness especially for the cutting of side wall and at corner.



SEVKET OĞLU® MAKINA TICARET VE SAN. LTD. ŞTI.

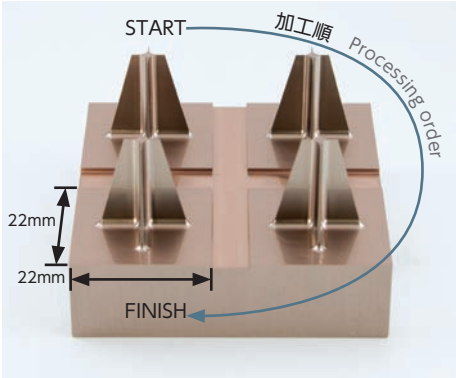
New
# DRB230 銅電極加工用ロングネックボールエンドミル
## Long Neck Ball End Mill for Copper Electrode

E-087

## 加工事例 1 銅タングステン加工 Cutting Example 1 : Copper Tungsten Electrode

- 被削材：**銅タングステン** Material : Copper Tungsten (W70% -Cu30% )
- クーラント：**不水溶性切削油** Coolant : Water insoluble fluid
- 総加工時間：**51 時間 28 分（全 4 か所）** Total cutting time : 51hr 28min (total 4 places)

| 加工工程 Cutting process | 荒取り Roughing | 仕上げ Finishing |
|---|---|---|
| 使用工具 Tool | DRB230 R1×16 | DRB230 R1×16 |
| 回転数 [$min^{-1}$] Spindle speed | 7,000 | 7,000 |
| 送り速度 [mm/min] Feed | 800 | 上面 500 Top<br>側面 100 Side<br>底面 500 Bottom |
| 切り込み量 [mm] ap×ae Depth of cut | 0.15×0.25 | 上面 ae 0.03 Top<br>側面 ap 0.015 Side<br>底面 ae 0.03 Bottom |
| 残し代 [mm] Stock | 0.05 | — |
| 加工時間 Cutting time | 4時間37分 4hr 37min | 上面 6分 Top 6min<br>側面 7時間 Side 7hr<br>底面 1時間9分 Bottom 1hr 9min |



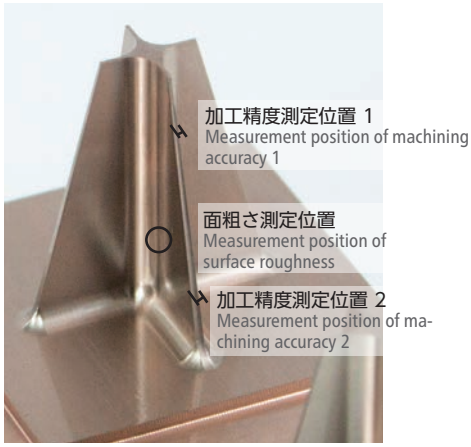

- 加工サイズ（1か所あたり）：**22 × 22mm（加工深さ 16.0mm）**
  Work size : 22 × 22mm (Cutting depth 16.0mm)

### ●加工精度測定結果 Results of machining accuracy measurement
### 狙い値に対する精度誤差 Accuracy error with respect to target value

単位 [mm] Unit [mm]

| | 測定位置 1 Measurement position 1 | 測定位置2 Measurement position 2 |
|---|---|---|
| 狙い値 Target | 0.2 | 0.444 |
| START | 0.002 | 0.004 |
| FINISH | 0.003 | 0.006 |

測定器：光学顕微鏡×100
Mesuring Instrument : Optical microscope x 100




### 面粗さ測定値 Surface roughness measurement value

単位 [μm] Unit [μm]

| | |
|---|---|
| START | Ra:0.082 Rz:0.783 |
| FINISH | Ra:0.089 Rz:0.854 |

測定機：三鷹光器製 NH-3SP
Mesuring Instrument : Mitaka Kohki NH-3SP

4か所すべてを荒加工、仕上げ加工1本ずつの計2本で加工しました。
工具への負担が大きい難削材の銅タングステンの加工においても、高精度・高品質な加工が長時間にわたって可能です。

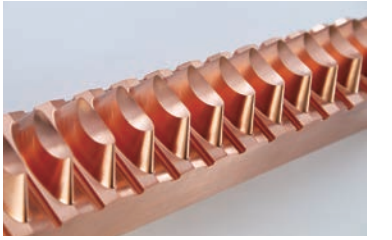
Processing all four places with total two tools that one for roughing, the other for finishing.
High-precision, high-quality processing is possible even in the long processing of difficult-to-cut material, copper tungsten.

New
# DRB230 銅電極加工用ロングネックボールエンドミル
Long Neck Ball End Mill for Copper Electrode

E-087

## 加工事例 2 タフピッチ銅寿命比較
Cutting Example 2 : Tool Life Comparison on Tough-Pitch Copper

・被削材：**タフピッチ銅** Material : Tough-Pitch Copper
・クーラント：**不水溶性切削油** Coolant : Water-insoluble fluid

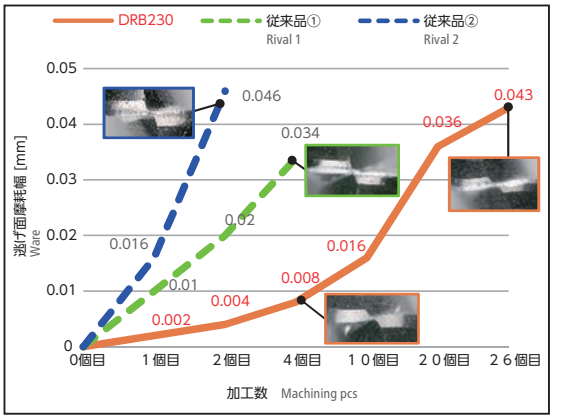


ワークサイズ：11 × 40mm（加工深さ 15.2mm）
Work size : 11×40×15.2mm

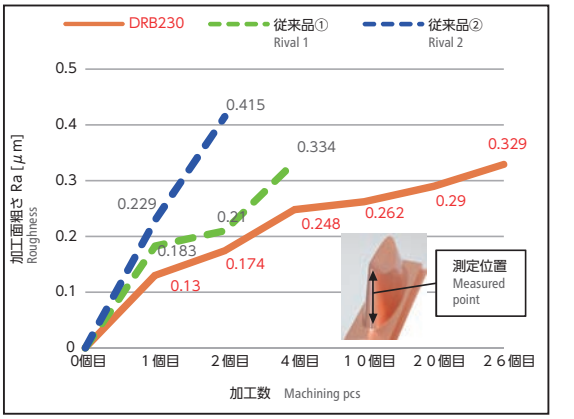
| 加工工程<br>Cutting Process | 荒取り<br>Roughing | 中仕上げ<br>Semi-finishing | 仕上げ<br>Finishing |
|---|---|---|---|
| 使用工具サイズ<br>Tool size | R0.5×4 | | |
| 回転数[$min^{-1}$]<br>Spindle Speed | 40,000 | 30,000<br>30,000 | |
| 送り速度[mm/min]<br>Feed | 2,400 | 2,000 | 1,500 |
| 切り込み量[mm]<br>Depth of cut | ap 0.2<br>ae 0.4 | ap 0.05<br>ae 0.05 | ap 0.03<br>ae 0.03 |
| 残し代[mm]<br>Stock | 0.07 | 0.03 | 0 |
| 加工時間<br>Cutting time | 55分<br>55min | 50分<br>50min | |

### 比較結果 Results of comparison

◎ 摩耗量比較 Measurement of wear




◎ 面粗さ比較 Measurement of roughness




**新開発した工具設計で従来品に対し、大幅な寿命延長が可能になりました。**
Comparing to the conventional products, the new product-- DRB230 realized a longer life machining.



SEVKET OĞLU® MAKİNA TİCARET VE SAN. LTD. ŞTİ.

# RSES230 樹脂用スクエアエンドミル
End Mill for Resin

D-154

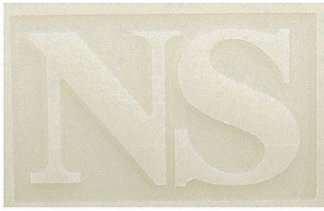
## 加工事例 1 ABS 樹脂トレイ
Cutting Example 1 : ABS Resin Tray

- 被削材：**ABS 樹脂** Material : ABS Resin
- クーラント：**エアーブロー** Coolant : Air blow
- 総加工時間：**1 時間 1 分** Total cutting time : 1hr 1min

厚みは 2mm！
Thickness 2mm

ワークサイズ：150 × 100 × 14mm
Work size : 150 × 100 × 14mm
（加工後のワーク：146 × 94 × 9mm）
(Work size after machining : 146 × 94 × 9mm)

拡大
Magnified



NS ロゴ
NS logo
加工深さ：0.15mm
Cutting depth

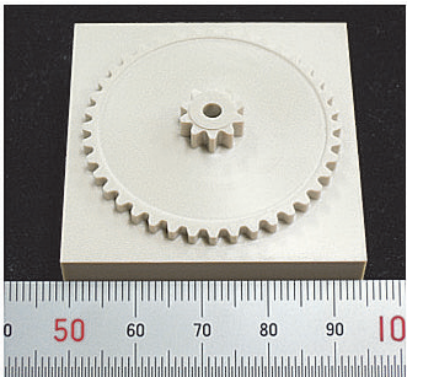
| 加工部位 Cutting part | ワーク外輪郭部 Outer contouring | | ポケット部 Pocket | | NSロゴ NS logo | |
|---|---|---|---|---|---|---|
| 加工工程 Cutting process | 荒取り Roughing | 仕上げ Finishing | 荒取り Roughing | 仕上げ Finishing | 荒取り Roughing | 仕上げ Finishing |
| 使用工具 Tool | RSES230 ϕ6×9 | | | | RSES230 ϕ0.5×0.75 | |
| 回転数 [$min^{-1}$] Spindle speed | 3,000 | | 3,000 | | 20,000 | |
| 送り速度 [mm/min] Feed | 1,250 | 600 | 1,250 | 600 | 350 | 側面：150 Side 底面：350 Bottom |
| 切り込み量 ap×ae [mm] Depth of cut | 9×0.1 | 側面：9×0.1 Side 平面：0.1×3 Top | 2×3 | 側面：7×0.1 Side 底面：0.1×3 Bottom | 0.1×0.2 | 側面：0.15×0.05 Side 底面：0.05×0.2 Bottom |
| 残し代 [mm] Stock | 0.1 | — | 0.1 | — | 0.05 | — |
| 加工時間 Cutting time | 7分 7min | 25分 25min | 13分 13min | 9分 9min | 7分 7min | |

- **樹脂加工用エンドミル RSES230（ショート刃長）の使用でビビリを抑制し、薄板形状でも安定した加工が可能です！**

Short flute RSES230 assures stable machining also for thin work-pieces by reducing chattering.

## 加工事例 2 PEEK 樹脂ギア形状加工 Cutting Example 2 : Gear Profile Model

- 被削材：**PEEK** Material : PEEK Resin
- クーラント：**水溶性切削油** Coolant : Water soluble fluid
- 総加工時間：**1 時間 40 分** Total cutting time : 1hr 40min




ワークサイズ：45 × 45 × 20mm
Work size : 45×45×20mm
( 形状高さ：6.5mm)
Profile height : 6.5mm

| 加工工程<br>Cutting process | 荒取り<br>Roughing | 中仕上げ<br>Semi-finishing | 仕上げ<br>Finishing |
|---|---|---|---|
| 使用工具<br>Tool | RSES230 φ6×9 | RSES230 φ1×1.5×4 | RSES230 φ1×1.5×4 |
| 回転数 [$min^{-1}$]<br>Spindle speed | 3,000 | 20,000 | 20,000 |
| 送り速度 [mm/min]<br>Feed | 1,250 | 800 | 400 |
| 切り込み量 ap×ae [mm]<br>Depth of cut | 6.47×1 | 0.3×0.5 | 側面:0.3×0.03<br>Side<br>平面:0.03×0.3<br>Plane surface |
| 残し代 [mm]<br>Stock | 0.03 | 0.03 | — |
| 加工時間<br>Cutting time | 4分30秒<br>4min 30sec | 7分<br>7min | 1時間28分30秒<br>1hr 28min 30sec |

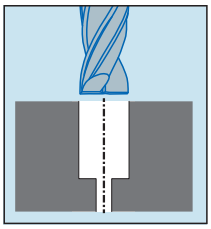
- **ロングネックタイプでも RSES230 はショート刃長の採用で、ビビリが発生しやすいコーナー部においても良好な切削面が得られます！**
  Short flute on the long neck RSES230 type suppress chattering to obtain excellent surface even at corners.

# MFD 無限フラットドリル
## MUGEN-COATING Flat Drill

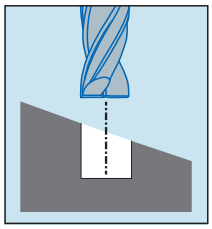
H-010

## 斜面や曲面など様々な場面での高能率で安定した穴あけが可能！

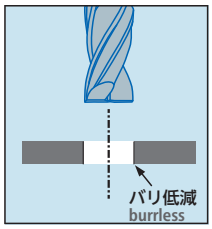
High efficient and stable drilling is realized in various scenes such as inclined surface and curved surface!



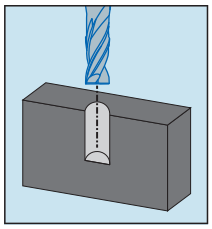
座ぐり加工
Counter Boring



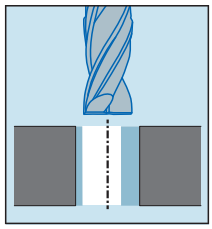
斜面への加工
Inclined Surface



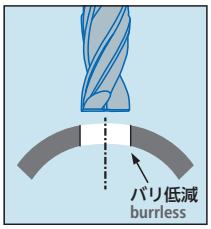

薄板への加工
Thin Plate



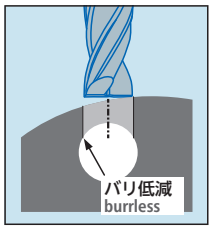
半割り加工
Semicircular Hole



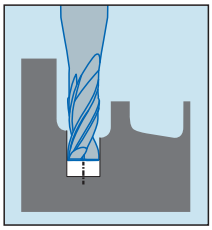
偏心穴の矯正
Correction of Eccentric Hole



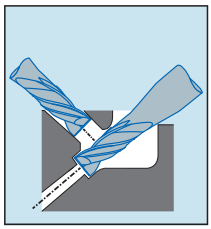

曲面貫通加工
Through Hole
in Curved Surface



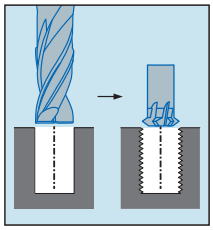

交差穴加工
Cross Hole



ロングネック形状
での際部穴加工
Drilling of Shoulder



進入角を問わない穴加工
Angled Holes



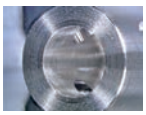
ネジ下穴加工
Pre-hole for Threading

## 加工事例 1 SUS304 部品モデル

Cutting Example 1 : SUS304 Parts Model

- 被削材：**SUS304** Material : SUS304
- クーラント：**不水溶性切削油** Coolant : Water insoluble fluid
- 総加工時間：**3 分 11 秒** Total cutting time : 3min 11sec

ワークサイズ：φ10×20mm
Work size : φ10×20mm



穴径 6.024mm
Hole diameter

径 2.020mm
Diameter

穴径 3.016mm
Hole diameter

**穴精度 H9 をクリア！**
Hole precision : H9 (JIS)

**バリ発生を抑制した穴あけを実現します。**
Realization of drilling with burr improvement.

| 加工部位 Cutting part | φ6止まり穴 Blind hole | φ3通し穴 Through hole | | φ2半割り部 Semicircular hole |
|---|---|---|---|---|
| 加工位置形状 Machining position shape | 円筒端面(平面) Cylinder end face (Flat) | 円筒外周(曲面) Cylinder peripheral (Curved surface) | | 円筒端面(平面)からの半割り From cylinder end face(Flat) |
| 穴あけ位置 Hole position | ワーク回転中心位置 Work rotation center position | 中心位置 Central position | 偏芯位置 Eccentric position | 偏芯位置 Eccentric position |
| 使用工具 Tool | MFD φ6 | MFD φ3 | | MFD φ2 |
| 回転数 [$min^{-1}$] Spindle speed | 1,600 | 2,500 | | 2,900 |
| 送り速度[mm/min] Feed | 80 | 40 | 35 | 15 |
| 送り量[mm/rev] Feed per revolution | 0.05 | 0.016 | 0.014 | 0.005 |
| 加工深さ Cutting depth | 12mm(2D) | 最大3mm(1D) Max. 3mm (1D) | 最大6mm(2D) Max. 6mm (2D) | 4mm(2D) |
| 加工時間 Cutting time | 約9秒 9sec | 約5秒 × 2穴 5sec × 2holes | 約11秒 × 4穴 11sec × 4holes | 約16秒 × 8箇所 16sec × 8parts |

## 加工事例 2　5 軸加工サンプル　Cutting Example 2 : 5-axis Machining Sample

- 被削材：**S50C**　Material : S50C
- クーラント：**水溶性切削油**　Coolant : Water soluble fluid
- 加工時間：6 分（穴加工のみ）　Cutting time : 6min (Drilling only)

ワークサイズ：30 × 100mm
Work size : 30×100mm

| | | | | |
|---|---|---|---|---|
| 加工工程<br>Cutting process | 穴あけ<br>Drilling | | | |
| 使用工具<br>Tool | MFD<br>φ6 | | | |
| 切削速度 [m/min]<br>Cutting speed | 66 | | | |
| 回転数 [min$^{-1}$]<br>Spindle speed | 3,500 | | | |
| 送り速度 [mm/min]<br>Feed | 280 | 140 | 110 | |
| 送り量 [mm/rev]<br>Feed per revolution | 0.08 | 0.04 | 0.03 | |
| 工具に対する被削材形状<br>Profile on drilling | 平面<br>Flat surface | 斜面30°以下<br>Inclined angle 30°lower | 斜面30°超えて<br>Inclined angle 30°over | 半割り<br>隅R (5R)<br>Semicircular hole |
| 加工深さ<br>Cutting depth | 最大12mm (2D)<br>Maximum 12mm(2D) | | | |
| 加工時間 (2D深さ)<br>Cutting time (Cutting depth : 2D) | 約3秒 / 穴<br>3sec / hole | 約6秒 / 穴<br>6sec / hole | 約7秒 / 穴<br>7sec / hole | |

## 測定データ　Measurement data

### 加工面と抜けバリ状態
Drilling surface and through-end burr

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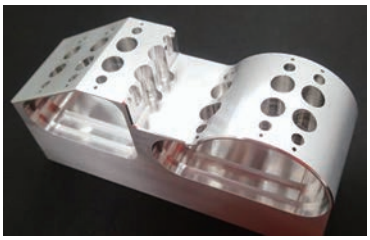
## 加工事例 3　3 軸加工サンプル　Cutting Example 3 : 3-axis Machining Sample



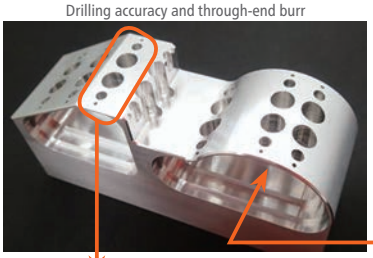
ワークサイズ：30 × 100mm
Work size : 30×100mm

- 被削材：**アルミニウム合金（A5052）**　Material : Aluminum Alloy (A5052)
- クーラント：**水溶性切削油**　Coolant : Water soluble fluid
- 加工時間：**1 分（穴加工のみ）**　Cutting time : 1min (Drilling only)

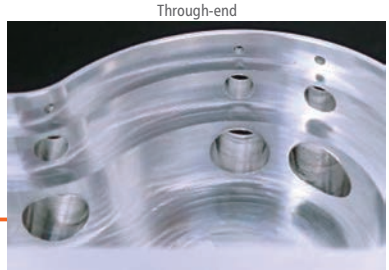
| 加工工程<br>Cutting process | 穴あけ<br>Drilling | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 使用工具<br>Tool | MFD<br>φ1 | | | MFD<br>φ3 | | | MFD<br>φ6 | | |
| 切削速度 [m/min]<br>Cutting speed | 65 | | | 140 | | | 140 | | |
| 回転数 [$min^{-1}$]<br>Spindle speed | 20,000 | | | 15,000 | | | 7,500 | | |
| 被削材形状<br>Profile on drilling | 平面<br>Flat surface | 斜面<br>曲面<br>Inclined / Curved surface | 半割り<br>Semicircular hole | 平面<br>Flat surface | 斜面<br>曲面<br>Inclined / Curved surface | 半割り<br>Semicircular hole | 平面<br>Flat surface | 斜面<br>曲面<br>Inclined / Curved surface | 半割り<br>Semicircular hole |
| 送り速度 [mm/min]<br>Feed | 250 | 140 | 100 | 800 | 480 | 330 | 800 | 300 | 240 |
| 平面時に対する送り速度割合<br>Feed adjusting ratio from flat surface drilling | 100% | 56% | 40% | 100% | 60% | 41% | 100% | 37% | 30% |
| 送り量 [mm/rev]<br>Feed per revolution | 0.013 | 0.007 | 0.005 | 0.053 | 0.032 | 0.022 | 0.107 | 0.04 | 0.032 |
| 加工深さ<br>Cutting depth | 貫通板厚：1mm（1D）<br>Through hole<br>止まり穴：最大2mm（2D）<br>Blind hole | | | 貫通板厚：3mm（1D）<br>Through hole<br>止まり穴：最大6mm（2D）<br>Blind hole | | | 貫通板厚：6mm（1D）<br>Through hole<br>止まり穴：最大12mm（2D）<br>Blind hole | | |
| 加工時間（2D深さ）<br>Cutting time (Cutting depth : 2D) | 約1秒／穴<br>1sec / hole | 約1秒／穴<br>1sec / hole | 約1秒／穴<br>1sec / hole | 約1秒／穴<br>1sec / hole | 約1秒／穴<br>1sec / hole | 約1秒／穴<br>1sec / hole | 約1秒／穴<br>1sec / hole | 約2秒／穴<br>2sec / hole | 約3秒／穴<br>3sec / hole |

### 測定データ　Measurement data

加工面と精度、抜けバリ高さ
Drilling accuracy and through-end burr



貫通部　抜け側
Through-end



抜けバリ高さ　最大 0.098mm
Through-end burr max. 0.098mm

φ1　φ3　φ6

加工精度 H8
Hole accuracy: H8(JIS)

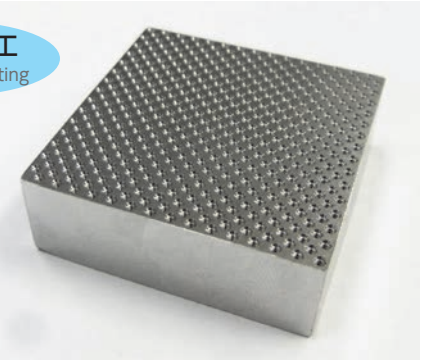
# MMTM Mスレッドミル
M-Thread Mill

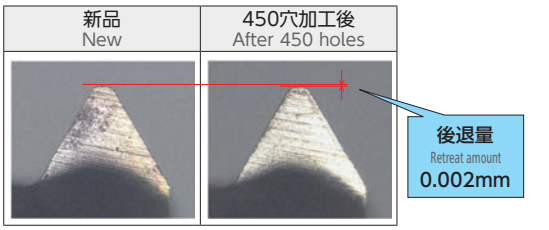
I-003

## 加工事例 1 M1 めねじ SUS316L 多数穴サンプル
Cutting Example 1 : M1 Internal Thread SUS316L Holes Sample

- 被削材：**SUS316L** Material : SUS316L
- クーラント：**水溶性切削油** Coolant : Water soluble fluid
- 総加工時間：**3 時間 20 分** Total cutting time : 3hr 20min

450 穴加工
450 Holes cutting






ワークサイズ：35 × 35mm
Work size : 35×35mm

| 加工工程 Cutting Process | センター穴 Center hole milling | 下穴 Pilot hole milling | ねじ切り Thread milling |
|---|---|---|---|
| 使用工具 Tool | MDR-PD φ0.7 | MDR-R φ0.76 | MMTM M1 |
| 回転数 [min⁻¹] Spindle speed | 6,000 | | 17,500 |
| 送り速度 [mm/min] Feed | 30 | 90 | 300 |
| 切り込み量 ae [mm] Depth of cut | ステップ量 0.05 Step amount 0.05 | ステップ量 0.1 Step amount 0.1 | 0.088×2 (最終ヘリカルR0.155) Final helical R0.155 |
| 加工深さ [mm] Cutting depth | 1.2 | 3.0 | 2.64 |
| 加工時間 Cutting time | 1時間21分5秒 1hr 21min 5sec | 1時間24分35秒 1hr 24min 35sec | 34分20秒 34min 20sec |

ねじ切り加工はアップカット
Thread milling: Up-cut

## 加工事例 2 M3 めねじ Alloy718
Cutting Example 2 : M3 Internal Thread Alloy718

- 被削材：**Alloy718 (Inconel718® 相当)**
  Material : Alloy718 (Equivalent of Inconel 718®)
- 加工時間：**約 18 秒 / 穴** Cutting time : About18sec/hole
- クーラント：**水溶性切削油** Coolant : Water soluble fluid

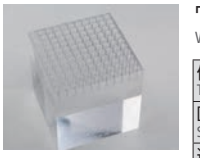
ワークサイズ：56 × 36 × 46mm
Work size : 56×36×46mm

| 使用工具 Tool | MMTM M3 |
|---|---|
| 回転数 [min⁻¹] Spindle speed | 3,000 |
| 送り速度 [mm/min] Feed | 200 |
| 切り込み量 ae[mm] Depth of cut | 0.145×2回+ゼロカット Zero-cut (最終ヘリカルR0.36) Helical |
| ねじ深さ(mm) Depth of thread | 6.0 |

※加工時間はねじ切り工程のみ
Cutting time is for thread milling only.

## 加工事例 3 M3 めねじ アクリル
Cutting Example 3 : M3 Internal Thread Acrylic

- 被削材：**アクリル** Material : Acrylic Resin
- 加工時間：**8 秒 / 穴** Cutting time : 8sec/hole
- クーラント：**オイルミスト** Coolant : Oil mist



ワークサイズ：50 × 50 × 50mm
Work size : 50×50×50mm

| 使用工具 Tool | MMTM M3 |
|---|---|
| 回転数 [min⁻¹] Spindle speed | 10,000 |
| 送り速度 [mm/min] Feed | 900 |
| 切り込み量 ae[mm] Depth of cut | 0.145×2回 (最終ヘリカルR0.36) Helical |
| ねじ深さ(mm) Depth of thread | 6.0 |

※加工時間はねじ切り工程のみ
Cutting time is for thread milling only.



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# 4

# 参考資料

エンドミルを使うための参考資料です

# Technical Guidance


切削速度・回転数・送り速度の求め方 K-038
Calculation for Cutting Speed, Spindle Speed and Feed

切削速度（Vc）について K-039
Cutting Speed (Vc)

一刃送り（fz）について K-039
Feed per Tooth (fz)

切りくず排出量 K-040
Metal Removal Rate

ボールエンドミルのボール半径（R）と
ピックフィード（ae）によるカスプハイト（理論表面粗さ） K-040
The value of cusp height based on radius (R) of ball end mill
and pick feed (ae) (theoretical surface finish)

刃数選定目安 K-040
Selection of Number of Flute

ネジレ角選定の目安 K-040
Selection of Helix Angle

切削方向（アップカットとダウンカット） K-041
Cutting Direction (Up-cut and Down-cut)

回転数表 K-042
Spindle Speed Table

ボールエンドミル実加工径早見表 K-043
Ball End Milling Actual Dia.

各種表面粗さと三角記号との関係 K-044
Measurement and Symbol of Surface Roughness

硬さ近似値対照表 K-045
Comparison Table of Hardness

エンドミル加工をする上でのポイント K-046
Factors for End Mill Operation

エンドミル加工におけるトラブルシューティング K-047
Troubleshooting for End Mill Operation

金型用被削材ブランド対照表 K-048
Comparison Table of Die and Mold Materials

# エンドミルの切削条件について (1)

## Explanation on Milling Conditions (1)

### 切削速度・回転数・送り速度の求め方 Calculation for Cutting Speed, Spindle Speed and Feed

| | | |
|---|---|---|
| 切削速度 (Vc)<br>Cutting Speed | = | $\frac{\pi \times D \times n}{1,000}$ |
| 回転数 (n)<br>Spindle Speed | = | $Vc \div \pi \div D \times 1,000$ |
| 送り速度 (Vf)<br>Feed | = | $n \times fz \times Z$ |
| 一刃送り (fz)<br>Feed per Tooth | = | $\frac{Vf}{n \times Z}$ |

**量記号一覧**

- **Vc** = 切削速度 (m/min) Cutting Speed
- **π** = 3.14 [円周率] The Circular Constant
- **D** = 刃径 (mm) Diameter
- **n** = 回転数 ($min^{-1}$) Spindle Speed
- **Vf** = 送り速度 (mm/min) Feed
- **fz** = 一刃送り (mm/tooth) Feed per Tooth
- **Z** = 刃数 Number of Flutes
- **ap** = 軸方向の切り込み量 (mm) Axial Depth of Cut
- **ae** = 半径方向の切り込み量(mm) Radial Depth of Cut

### 使用する機械が、切削条件参考表の回転数に満たない場合は…

下記の計算から、**回転数・送り速度を同じ割合で下げて**使用してください。

When maximum speed of the machine spindle less than value of recommended milling conditions, adjust conditions by calculation as follows.

● 使用する回転数[n]と切削条件表の回転数[n1]から割合[α]を算出します。

Rate (α) is calculated by chosen Spindle Speed (n) and Recommended Spindle Speed (n1).

$$n\ (min^{-1}) \div n1\ (min^{-1}) = \alpha$$

割合
Rate

● 上記割合[α]から切削条件表の送り速度[Vf1]を除算し、実際加工時の送り速度[Vf]を求めます。

Obtain Feed (Vf) for actual machining by dividing Recommended Feed (Vf1) from Rate (α).

$$Vf1\ (mm/min) \times \alpha = Vf\ (mm/min)$$

実際の加工時の送り速度
Feed for actual machining

**例題 Example** **MSE430 φ1を使用し被削材S50Cを加工する場合**

Machining S50C with MSE430 φ1

**切削条件参考表の条件**
Recommended milling condition

回転数 n ; 20,700 $min^{-1}$
Spindle Speed n

送り速度 Vf ; 330 mm/min
Feed Vf

**使用機械の回転数が最大10,000$min^{-1}$の場合**
In case Maximum Spindle Speed of the machine is 10,000$min^{-1}$...

**回転数10,000$min^{-1}$時の送り速度**
Feed for Spindle Speed 10,000$min^{-1}$

10,000÷20,700=0.483 (割合) (Rate)

330×0.483=159mm/min

**送り速度 Vf ; 159 mm/min**
Feed Vf



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## 切削速度（Vc）について Cutting Speed（Vc）

切削速度はエンドミルの材種･刃径･刃長･有効長、被削材、使用機械、ツーリングの剛性、加工形状･精度、切削油等によって異なりますが、おおまかにはエンドミルの材種と被削材の種類で表 1 のようになります。

Appropriate Cutting Speed should be decided by parameters such as tool material, diameter, length of cut, work material, cutting machine, rigidity of tool holder, machining configuration, accuracy, cutting fluid, and etc.
Generally tool material and work material are main factors to determine the Cutting Speed.

**表 1　切削速度**
Table 1. Cutting Speed

| 被削材 Materials | 切削速度 [m/min] Cutting Speed（m/min） | |
|---|---|---|
| | 超硬工具 Solid Carbide Tool | コーティング超硬工具 Coated Carbide Tool |
| 炭素鋼（S50C 等） Carbon Steels | 20 ～ 40 | 40 ～ 80 |
| 合金鋼（SCM, SKD 等） Alloy Steels | 20 ～ 35 | 35 ～ 60 |
| 調質鋼（NAK, HPM 等） Prehardened Steels | 15 ～ 30 | 30 ～ 50 |
| ステンレス鋼（SUS304 等） Stainless Steels | 5 ～ 20 | 10 ～ 30 |
| 焼き入れ鋼 (SKD61, STAVAX 等 45 ～ 60HRC) Hardened Steels | – | 20 ～ 40 |

## 一刃送り（fz）について Feed per Tooth（fz）

送り速度は加工能率を考えるときに重要な要因のひとつであり、その送り速度を決定する際の一刃送りはエンドミルの刃径・形状、被削材、使用機械、ツーリングの剛性、加工形状・精度、切り込み量によって異なりますが、ショート刃エンドミルでは刃径と刃数から表 2 のような目安となります。

Feed per Tooth is an important element for efficient machining which should be determined by parameters such as tool diameter, type, work material, cutting machine, rigidity of tool holder, machining configuration, accuracy and cutting depth.
Table 2 is a guideline of Feed per Tooth for short flute end mills.

**表 2　一刃送り**
Table 2. Feed per Tooth

| 刃径 [mm] Dia. (mm) | 一刃送り [mm/tooth] Feed per Tooth（mm/tooth） | |
|---|---|---|
| | 2 枚刃 2-Flutes | 4 枚刃 4-Flutes |
| 1 | 0.001 ～ 0.005 | |
| 6 | 0.02 ～ 0.04 | 0.01 ～ 0.03 |
| 10 | 0.04 ～ 0.08 | 0.03 ～ 0.06 |
| 20 | 0.08 ～ 0.12 | 0.06 ～ 0.1 |

※ショート刃エンドミル以外のエンドミルでは刃長や有効長によって一刃送りを表 2 の 80%以下にする必要があります。
※Note: Feed per Tooth for standard flute size end mills should be adjusted to 80% or less from table 2.

上記で述べた切削速度や一刃送りを参考に、加工形状・精度、使用機械、ツーリングの剛性等、切削に関わるすべての要因を考慮して回転数、送り速度を決定します。

Referring above parameters of Cutting Speed and Feed per Tooth, both Spindle Speed and Feed are calculated considering all other related factors as well.

# エンドミルの切削条件について (2)

## Explanation on Milling Conditions (2)

### 切りくず排出量 Metal Removal Rate

フライスの単位時間（1 分間）当たりに生成される切りくずの排出量は下記の式で計算します。
Metal removal rate (the volume of metal removed in cubic mm per minute) is calculated by the following formula.

$$Q = \frac{ap \times ae \times Vf}{1{,}000}$$

Q：切りくず排出量（$cm^3$/min）
ae：半径方向の切り込み量（mm）
ap：軸方向の切り込み量（mm）
Vf：送り速度（mm/min）

Q : Metal removal rate ($cm^3$/min)
ae : Radial depth of cut (mm)
ap : Axial depth of cut (mm)
Vf : Feed (mm/min)

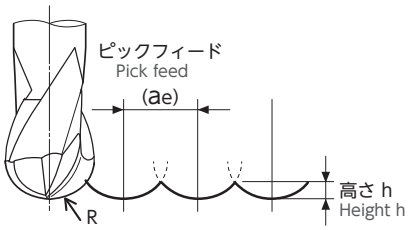
### ボールエンドミルのボール半径 (R) とピックフィード (ae) によるカスプハイト (理論表面粗さ)

The value of cusp height based on radius (R) of ball end mill and pick feed (ae) (theoretical surface finish)

ボールエンドミル加工においてボール半径とピックフィードによって形成される下図のような山状に削り残された部分の高さ h をカスプハイトやスキャロップハイトといい、この高さは理論上の表面粗さと考えられます。平坦部加工時はピックフィードと半径方向の切り込み量 ae が同じであるため、下記の式で計算できます。
In ball end mill milling, height h of the unmachined part like mountain shape below be formed by ball radius and pick feed, which are called cusp height or scallop height and which is considered theoretical surface finish. Since pick feed is the same ae radial depth of cut at the milling in flat part, it is calculated by the following formula.

$$h = \left(R - \sqrt{R^2 - \left(\frac{ae}{2}\right)^2}\right) \times 1000 \fallingdotseq ae^2 \times 1000 \div 8R$$

h：カスプハイト（μm）
h : Cusp height (μm)
R：ボール半径（mm）
R : Radius (mm)
ae：半径方向の切り込み量（mm）
ae : Radial depth of cut (mm)




カスプハイト早見表 Cusp Height Quick Reference Matrix　　単位 Unit：μm

| ボール半径 R Radius | 半径方向の切り込み量 ae[mm] Radial depth of cut ae [mm] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.005 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.08 | 0.1 | 0.15 | 0.2 | 0.3 |
| 0.05 | 0.06 | 0.25 | 1.01 | 2.30 | – | – | – | – | – | – | – |
| 0.1 | 0.03 | 0.13 | 0.50 | 1.13 | 2.02 | 3.18 | – | – | – | – | – |
| 0.3 | 0.01 | 0.04 | 0.17 | 0.38 | 0.67 | 1.04 | 2.68 | 4.20 | – | – | – |
| 0.5 | 0.01 以下 | 0.03 | 0.10 | 0.23 | 0.40 | 0.63 | 1.60 | 2.51 | 5.66 | – | – |
| 0.75 | – | 0.02 | 0.07 | 0.15 | 0.27 | 0.42 | 1.07 | 1.67 | 3.76 | 6.70 | – |
| 1 | – | 0.01 | 0.05 | 0.11 | 0.20 | 0.31 | 0.80 | 1.25 | 2.82 | 5.01 | – |
| 1.5 | – | 0.01 以下 | 0.03 | 0.08 | 0.13 | 0.21 | 0.53 | 0.83 | 1.88 | 3.34 | 7.52 |
| 2 | – | – | 0.03 | 0.06 | 0.10 | 0.16 | 0.40 | 0.63 | 1.41 | 2.50 | 5.63 |
| 2.5 | – | – | 0.02 | 0.05 | 0.08 | 0.13 | 0.32 | 0.50 | 1.13 | 2.00 | 4.50 |
| 3 | – | – | 0.02 | 0.04 | 0.07 | 0.10 | 0.27 | 0.42 | 0.94 | 1.67 | 3.75 |

※上記表はボールエンドミルを使用した平坦部仕上げ加工において半径方向の切り込み量 ae から算出される理論上の値です。
※ In finishing in flat part, the above values in the table are theoretical values by the radial depth of cut (ae).

### 刃数選定目安 Selection of Number of Flute

| | 2 枚刃 2-Flutes | 3 枚刃 3-Flutes | 4 枚刃 4-Flutes | 6 枚刃 6-Flutes |
|---|---|---|---|---|
| 溝加工 Slotting | ◎ | ◎ | ○ | × |
| 側面加工 Side Milling | ○ | ◎ | ◎ | ◎ |

一般的に切りくずを収容するチップポケットの大きい 2 枚刃および 3 枚刃が溝加工に向いています。
側面加工の場合は切りくずづまりの心配が少ないので刃数の多い 4 枚刃および 6 枚刃が有効です。
Generally 2-flutes and 3-flutes are selected for slotting because of the larger chip pocket.
4-flutes and 6-flutes are recommended for side milling as no problem of chip disposal.

### ネジレ角選定の目安 Selection of Helix Angle

| | | 25° ネジレ Helix 25° | 30° ネジレ Helix 30° | 35° ネジレ Helix 35° | 40° ネジレ Helix 40° | 45° ネジレ Helix 45° |
|---|---|---|---|---|---|---|
| 切れ味 Shearing ability | | ○ | ○ | ◎ | ◎ | ◎ |
| ビビリにくさ Chatter resistance | | ○ | ○ | ◎ | ◎ | ◎ |
| 加工面粗さ Surface roughness | | ○ | ○ | ◎ | ◎ | ◎ |
| 加工面倒れ量 Inclination | | ◎ | ◎ | ◎ | ○ | ○ |
| 加工面うねり量 Wave | | ◎ | ◎ | ◎ | ○ | ○ |
| 用途 Application | 溝加工 Slotting | ◎ | ◎ | ○ | ○ | △ |
| | 側面加工 Side milling | ○ | ◎ | ◎ | ◎ | ◎ |
| | 焼き入れ材 Hardened steels | △ | △ | ○ | ◎ | ◎ |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※備考 Remarks

● 25° ネジレ Helix 25°

溝加工には、加工面の倒れ・うねりが少ない 25° ネジレが有効。
Suitable for slotting.

● 30° ネジレ Helix 30°

溝・側面加工の両方に対応可能で汎用的。
Recommendable for both slotting and side milling.

● 35° ネジレ、40° ネジレ、45° ネジレ Helix 35°, Helix 40°, Helix 45°

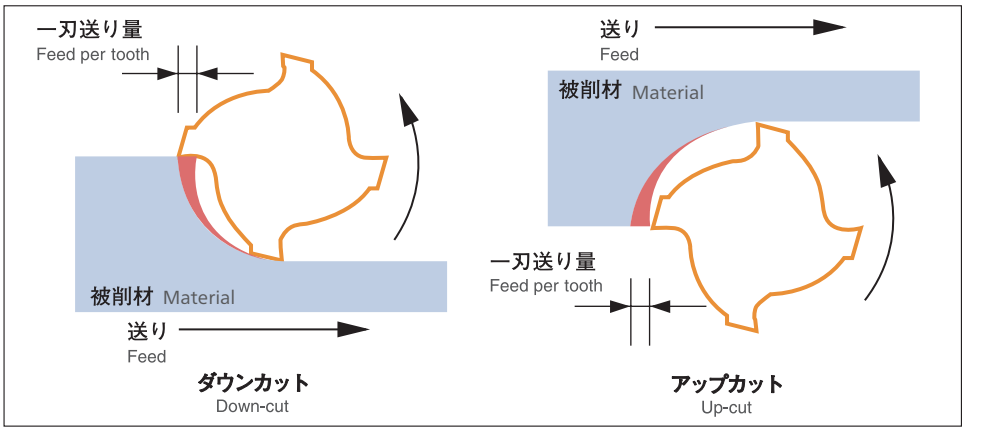
必要な加工面の倒れ量・うねり量に合わせて選定。
ネジレ角が強くなるに従い、切れ味が良くビビリが少なくなり、刃長を長くする事が可能。
Selectable within the required tolerance.
As larger angle gives higher shearing ability and reduce chattering, it is possible to relatively prolong the length of cut.

● 45° ネジレ Helix 45°

焼き入れ鋼、難削材の加工に有効。
Suitable for machining for hardened steels and tough materials.

## 切削方向（アップカットとダウンカット） Cutting Direction (Up-cut and Down-cut)

### アップカットとダウンカットの切削機構図 Cutting structure of Up-cut and Down-cut




### 切削方向の違いによる工具摩耗量比較写真 Difference of edge wear by cutting directions

(S50C を 50m 切削加工した状態 After cutting of 50m, S50C)

摩耗小 Small wear　　摩耗大 Large wear

ダウンカット
Down-cut

アップカット
Up-cut

ダウンカットは切り込みが厚い方から徐々に薄くなり、アップカットはその逆の機構で切削加工を行います。一般的に工具寿命は写真からも分かるとおりダウンカットの方が摩耗が少なく寿命が長いと言えます。
Down-cut tooth first cuts thicker then progressively thinner, while Up-cut goes the opposite. As shown by above photos, Down-cut is recommended since the wear of cutting edge is comparatively small and tool life is eventually longer.

# 回転数表

## Spindle Speed Table

| 刃径 (D) | (Vc) 切削速度【m/min】 Cutting Speed | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 120 | 140 | 150 | 180 | 200 | 250 | 300 |
| 0.2 | 31,850 | 47,770 | 63,690 | 79,620 | 95,540 | 111,460 | 127,390 | 143,310 | 159,240 | 191,080 | 222,930 | 238,850 | 286,620 | 318,470 | 398,090 | 477,710 |
| 0.3 | 21,230 | 31,850 | 42,460 | 53,080 | 63,690 | 74,310 | 84,930 | 95,540 | 106,160 | 127,390 | 148,620 | 159,240 | 191,080 | 212,310 | 265,390 | 318,470 |
| 0.4 | 15,920 | 23,890 | 31,850 | 39,810 | 47,770 | 55,730 | 63,690 | 71,660 | 79,620 | 95,540 | 111,460 | 119,430 | 143,310 | 159,240 | 199,040 | 238,850 |
| 0.5 | 12,740 | 19,110 | 25,480 | 31,850 | 38,220 | 44,590 | 50,960 | 57,320 | 63,690 | 76,430 | 89,170 | 95,540 | 114,650 | 127,390 | 159,240 | 191,080 |
| 0.6 | 10,620 | 15,920 | 21,230 | 26,540 | 31,850 | 37,150 | 42,460 | 47,770 | 53,080 | 63,690 | 74,310 | 79,620 | 95,540 | 106,160 | 132,700 | 159,240 |
| 0.7 | 9,100 | 13,650 | 18,200 | 22,750 | 27,300 | 31,850 | 36,400 | 40,950 | 45,500 | 54,590 | 63,690 | 68,240 | 81,890 | 90,990 | 113,740 | 136,490 |
| 0.8 | 7,960 | 11,940 | 15,920 | 19,900 | 23,890 | 27,870 | 31,850 | 35,830 | 39,810 | 47,770 | 55,730 | 59,710 | 71,660 | 79,620 | 99,520 | 119,430 |
| 0.9 | 7,080 | 10,620 | 14,150 | 17,690 | 21,230 | 24,770 | 28,310 | 31,850 | 35,390 | 42,640 | 49,540 | 53,080 | 63,690 | 70,770 | 88,460 | 106,160 |
| 1 | 6,370 | 9,550 | 12,740 | 15,920 | 19,110 | 22,290 | 25,480 | 28,660 | 31,850 | 38,220 | 44,590 | 47,770 | 57,320 | 63,390 | 79,620 | 95,540 |
| 1.4 | 4,550 | 6,820 | 9,100 | 11,370 | 13,650 | 15,920 | 18,200 | 20,470 | 22,750 | 27,300 | 31,850 | 34,120 | 40,950 | 45,500 | 56,870 | 68,240 |
| 1.6 | 3,980 | 5,970 | 7,960 | 9,950 | 11,940 | 13,390 | 15,920 | 17,910 | 19,900 | 23,890 | 27,870 | 29,860 | 35,830 | 39,810 | 49,760 | 59,710 |
| 1.8 | 3,540 | 5,310 | 7,080 | 8,850 | 10,620 | 12,380 | 14,150 | 15,920 | 17,690 | 21,230 | 24,770 | 26,540 | 31,850 | 35,390 | 44,230 | 53,080 |
| 2 | 3,180 | 4,780 | 6,370 | 7,960 | 9,550 | 11,150 | 12,740 | 14,330 | 15,920 | 19,110 | 22,290 | 23,890 | 28,660 | 31,850 | 39,810 | 47,770 |
| 2.2 | 2,900 | 4,340 | 5,790 | 7,240 | 8,690 | 10,130 | 11,580 | 13,030 | 14,480 | 17,370 | 20,270 | 21,710 | 26,060 | 28,950 | 36,190 | 43,430 |
| 2.4 | 2,650 | 3,980 | 5,310 | 6,630 | 7,960 | 9,290 | 10,620 | 11,940 | 13,270 | 15,920 | 18,580 | 19,900 | 23,890 | 26,540 | 33,170 | 39,810 |
| 2.6 | 2,450 | 3,670 | 4,900 | 6,120 | 7,350 | 8,570 | 9,800 | 11,020 | 12,250 | 14,700 | 17,150 | 18,370 | 22,050 | 24,500 | 30,620 | 36,750 |
| 2.8 | 2,270 | 3,410 | 4,550 | 5,690 | 6,820 | 7,960 | 9,100 | 10,240 | 11,370 | 13,650 | 15,920 | 17,060 | 20,470 | 22,750 | 28,430 | 34,120 |
| 3 | 2,120 | 3,180 | 4,250 | 5,310 | 6,370 | 7,430 | 8,490 | 9,550 | 10,620 | 12,740 | 14,860 | 15,920 | 19,110 | 21,230 | 26,540 | 31,850 |
| 4 | 1,590 | 2,390 | 3,180 | 3,980 | 4,780 | 5,570 | 6,370 | 7,170 | 7,960 | 9,550 | 11,150 | 11,940 | 14,330 | 15,920 | 19,900 | 23,890 |
| 5 | 1,270 | 1,910 | 2,550 | 3,180 | 3,820 | 4,460 | 5,100 | 5,730 | 6,370 | 7,640 | 8,920 | 9,550 | 11,460 | 12,740 | 15,920 | 19,110 |
| 6 | 1,060 | 1,590 | 2,120 | 2,650 | 3,180 | 3,720 | 4,250 | 4,780 | 5,310 | 6,370 | 7,430 | 7,960 | 9,550 | 10,620 | 13,270 | 15,920 |
| 7 | 910 | 1,360 | 1,820 | 2,270 | 2,730 | 3,180 | 3,640 | 4,090 | 4,550 | 5,460 | 6,370 | 6,820 | 8,190 | 9,100 | 11,370 | 13,650 |
| 8 | 800 | 1,190 | 1,590 | 1,990 | 2,390 | 2,790 | 3,180 | 3,580 | 3,980 | 4,780 | 5,570 | 5,970 | 7,170 | 7,960 | 9,950 | 11,940 |
| 9 | 710 | 1,060 | 1,420 | 1,770 | 2,120 | 2,480 | 2,830 | 3,180 | 3,540 | 4,250 | 4,950 | 5,310 | 6,370 | 7,080 | 8,850 | 10,620 |
| 10 | 640 | 960 | 1,270 | 1,590 | 1,910 | 2,230 | 2,550 | 2,870 | 3,180 | 3,820 | 4,460 | 4,780 | 5,730 | 6,370 | 7,960 | 9,550 |
| 11 | 580 | 870 | 1,160 | 1,450 | 1,740 | 2,030 | 2,320 | 2,610 | 2,900 | 3,470 | 4,050 | 4,340 | 5,210 | 5,790 | 7,240 | 8,690 |
| 12 | 530 | 800 | 1,060 | 1,330 | 1,590 | 1,860 | 2,120 | 2,390 | 2,650 | 3,180 | 3,720 | 3,980 | 4,780 | 5,310 | 6,630 | 7,960 |
| 13 | 490 | 730 | 980 | 1,220 | 1,470 | 1,710 | 1,960 | 2,200 | 2,450 | 2,940 | 3,430 | 3,670 | 4,410 | 4,900 | 6,120 | 7,350 |
| 14 | 450 | 680 | 910 | 1,140 | 1,360 | 1,590 | 1,820 | 2,050 | 2,270 | 2,730 | 3,180 | 3,410 | 4,090 | 4,550 | 5,690 | 6,820 |
| 15 | 420 | 640 | 850 | 1,060 | 1,270 | 1,490 | 1,700 | 1,910 | 2,120 | 2,550 | 2,970 | 3,180 | 3,820 | 4,250 | 5,310 | 6,370 |
| 16 | 400 | 600 | 800 | 1,000 | 1,190 | 1,390 | 1,590 | 1,790 | 1,990 | 2,390 | 2,790 | 2,990 | 3,580 | 3,980 | 4,980 | 5,970 |
| 17 | 370 | 560 | 750 | 940 | 1,120 | 1,310 | 1,500 | 1,690 | 1,870 | 2,250 | 2,620 | 2,810 | 3,370 | 3,750 | 4,680 | 5,620 |
| 18 | 350 | 530 | 710 | 880 | 1,060 | 1,240 | 1,420 | 1,590 | 1,770 | 2,120 | 2,480 | 2,650 | 3,180 | 3,540 | 4,420 | 5,310 |
| 19 | 340 | 500 | 670 | 840 | 1,010 | 1,170 | 1,340 | 1,510 | 1,680 | 2,020 | 2,350 | 2,510 | 3,020 | 3,350 | 4,190 | 5,030 |
| 20 | 320 | 480 | 640 | 800 | 960 | 1,110 | 1,270 | 1,430 | 1,590 | 1,910 | 2,230 | 2,390 | 2,870 | 3,180 | 3,980 | 4,780 |
| 21 | 300 | 450 | 610 | 760 | 910 | 1,060 | 1,210 | 1,360 | 1,520 | 1,820 | 2,120 | 2,270 | 2,730 | 3,030 | 3,790 | 4,550 |
| 22 | 290 | 430 | 580 | 720 | 870 | 1,010 | 1,160 | 1,300 | 1,450 | 1,740 | 2,030 | 2,170 | 2,610 | 2,900 | 3,620 | 4,340 |
| 23 | 280 | 420 | 550 | 690 | 830 | 970 | 1,100 | 1,250 | 1,380 | 1,660 | 1,940 | 2,080 | 2,490 | 2,770 | 3,460 | 4,150 |
| 24 | 270 | 400 | 530 | 660 | 800 | 930 | 1,060 | 1,190 | 1,330 | 1,590 | 1,860 | 1,990 | 2,390 | 2,650 | 3,320 | 3,980 |
| 25 | 250 | 380 | 510 | 640 | 760 | 890 | 1,020 | 1,150 | 1,270 | 1,530 | 1,780 | 1,910 | 2,290 | 2,550 | 3,180 | 3,820 |
| 26 | 240 | 370 | 490 | 610 | 730 | 860 | 980 | 1,100 | 1,220 | 1,470 | 1,710 | 1,840 | 2,200 | 2,450 | 3,060 | 3,670 |
| 27 | 240 | 350 | 470 | 590 | 710 | 830 | 940 | 1,060 | 1,180 | 1,420 | 1,650 | 1,770 | 2,120 | 2,360 | 2,950 | 3,540 |
| 28 | 230 | 340 | 450 | 570 | 680 | 800 | 910 | 1,020 | 1,140 | 1,360 | 1,590 | 1,710 | 2,050 | 2,270 | 2,840 | 3,410 |
| 29 | 220 | 330 | 440 | 550 | 660 | 770 | 880 | 990 | 1,100 | 1,320 | 1,540 | 1,650 | 1,980 | 2,200 | 2,750 | 3,290 |
| 30 | 210 | 320 | 420 | 530 | 640 | 740 | 850 | 960 | 1,060 | 1,270 | 1,490 | 1,590 | 1,910 | 2,120 | 2,650 | 3,180 |



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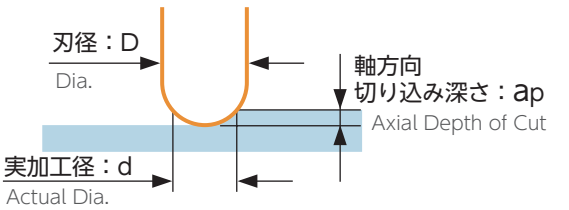
# ボールエンドミル実加工径早見表

## Ball End Milling Actual Dia.

| ボール半径 (R) | 刃径 (D) | 軸方向切り込み深さ【mm】 Axial Depth of Cut (ap) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Radius | Dia. | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.08 | 0.1 | 0.15 | 0.2 | 0.3 | 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 | | | | | |
| 0.5 | 1 | 0.199 | 0.28 | 0.341 | 0.392 | 0.436 | 0.54 | 0.6 | 0.71 | 0.8 | 0.92 | 1 | | | | |
| 1 | 2 | 0.282 | 0.398 | 0.486 | 0.56 | 0.624 | 0.78 | 0.87 | 1.05 | 1.2 | 1.43 | 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 | 2.24 | 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 | 2.65 | 3.2 | 3.46 | 4 | |
| 2.5 | 5 | 0.447 | 0.631 | 0.722 | 0.891 | 0.995 | 1.25 | 1.4 | 1.71 | 1.96 | 2.37 | 3 | 3.67 | 4 | 4.9 | |
| 3 | 6 | 0.489 | 0.692 | 0.846 | 0.977 | 1.091 | 1.38 | 1.54 | 1.87 | 2.15 | 2.62 | 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 | 3.87 | 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 | 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 | 4.8 | 5.99 | 6.63 | 8.94 | 10.39 |
| 7 | 14 | 0.748 | 1.058 | 1.295 | 1.495 | 1.67 | 2.11 | 2.36 | 2.88 | 3.32 | 4.05 | 5.2 | 6.5 | 7.21 | 9.8 | 11.49 |
| 8 | 16 | 0.8 | 1.131 | 1.384 | 1.598 | 1.786 | 2.26 | 2.52 | 3.08 | 3.56 | 4.34 | 5.57 | 6.97 | 7.75 | 10.58 | 12.49 |
| 9 | 18 | 0.848 | 1.199 | 1.468 | 1.695 | 1.895 | 2.39 | 2.68 | 3.27 | 3.77 | 4.61 | 5.92 | 7.42 | 8.25 | 11.31 | 13.42 |
| 10 | 20 | 0.894 | 1.264 | 1.548 | 1.787 | 1.997 | 2.52 | 2.82 | 3.45 | 3.98 | 4.86 | 6.24 | 7.84 | 8.72 | 12 | 14.28 |

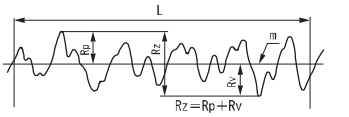
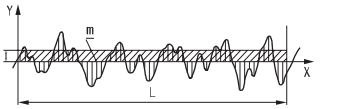
### ボールエンドミル実加工径の計算式 Calculation of Actual Dia.

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



# 各種表面粗さの求め方と三角記号との関係（JIS B 0601-2001より）

## Measurement and Symbol of Surface Roughness (Extract from JIS B 0601-2001)

| 種類<br>Type | 記号<br>Symbol | 求め方<br>Description | 説明図<br>Reference chart |
|---|---|---|---|
| 最大高さ<br>Maximum Height of the Profile | Rz | 粗さ曲線からその平均線の方向に基準長さだけ抜き取り、この抜き取り部分の山頂線と谷底線との間隔を粗さ曲線の縦倍率の方向に測定し、この値をマイクロメートル（μm）で表したものをいいます。キズとみなされるような、並外れた高い山や低い谷の無い部分から、基準長さだけ抜き取ります。<br>The maximum height of the profile is the distance between the maximum peak height and the maximum valley depth from the mean line in each sampling length. Rz（ISO/JIS）is the mean value of the maximum peak-to-valley heights in the evaluation length. |  |
| 算術平均粗さ<br>Arithmetic Mean Deviation of the Profile | Ra | 粗さ曲線からその平均線の方向に基準長さ L だけ抜き取り、この抜き取り部分の平均線の方向に x 軸を、縦倍率の方向に y 軸を取り、粗さ曲線を y=f (x) で表したときに、右記の式によって求められる値をマイクロメートル（μm）で表したものをいいます。<br>The arithmetic mean deviation of the profile is the arithmetic mean of the absolute values of distances from the mean line to the profile. |  <br>$Ra = \frac{1}{L}\int_0^L \lvert f(x)\rvert dx$<br>L ＝ 基準長さ<br>Evaluation Length |

| 最大高さ Rz の区分値<br>Value of Maximum Height of the Profile | 算術平均粗さ Ra の区分値<br>Value of Arithmetic Mean Deviation of the Profile | 従来の三角記号<br>Finishing Symbol | 表面性状の図示<br>(Raの例の場合による)<br>Indication of surface texture in technical product documentation |
|---|---|---|---|
| 0.05S<br>0.1S<br>0.2S<br>0.3S<br>0.8S | 0.012a<br>0.025a<br>0.05a<br>0.1a<br>0.2a | | Ra 0.012 ～ Ra 0.2 |
| 1.6S<br>3.2S<br>6.3S | 0.4a<br>0.8a<br>1.6a | | Ra 0.4 ～ Ra 1.6 |
| 12.5S<br>25S | 3.2a<br>6.3a | | Ra 3.2 ～ Ra 6.3 |
| 50S<br>100S | 12.5a<br>25a |  | Ra 12.5 ～ Ra 25 |

※Ra,Rz と三角記号との相互関係は、便宜上の関係を表したもので厳密性はありません。
※Note: Triangle Finishing Symbol Mark presents approximate surface roughness specified by Ra and Rz.



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# 硬さ近似値対照表

## Comparison Table of Hardness

| ロックウェル硬さ Cスケール Rockwell Hardness C Scale150kg Brale (HRC) | ビッカース硬さ Diamond Pyramid Hardness Number, Vickers (HV) | ブリネル硬さ 標準球 10㎜ / 球荷重 29.42kN Brinell Hardness Standard10mm Ball 29.42kN (HB) | ロックウェル硬さ Aスケール荷重 588.4N ダイヤモンド円錐圧子 Rockwell Hardness A Scale 60kg Brale (HRA) | ショア硬さ Shore Scleroscope Hardness Number (HS) | 引張強さ近似値 N/mm² Approx Tensile Strength N/mm² |
|---|---|---|---|---|---|
| 68 | 940 | – | 85.6 | 97 | – |
| 67 | 900 | – | 85.5 | 95 | – |
| 66 | 865 | – | 84.5 | 92 | – |
| 65 | 832 | – | 83.9 | 91 | – |
| 64 | 800 | – | 83.4 | 88 | – |
| 63 | 772 | – | 82.8 | 87 | – |
| 62 | 746 | – | 82.3 | 85 | – |
| 61 | 720 | – | 81.8 | 83 | – |
| 60 | 697 | – | 81.2 | 81 | – |
| 59 | 674 | – | 80.7 | 80 | – |
| 58 | 653 | – | 80.1 | 78 | – |
| 57 | 633 | – | 79.6 | 76 | – |
| 56 | 613 | – | 79.0 | 75 | – |
| 55 | 595 | – | 78.5 | 74 | 2079 |
| 54 | 577 | – | 78.0 | 72 | 2010 |
| 53 | 560 | – | 77.4 | 71 | 1952 |
| 52 | 544 | 500 | 76.8 | 69 | 1883 |
| 51 | 528 | 487 | 76.3 | 68 | 1824 |
| 50 | 513 | 475 | 75.9 | 67 | 1755 |
| 49 | 498 | 464 | 75.2 | 66 | 1687 |
| 48 | 484 | 451 | 74.7 | 64 | 1639 |
| 47 | 471 | 442 | 74.1 | 63 | 1578 |
| 46 | 458 | 432 | 73.6 | 62 | 1530 |
| 45 | 446 | 421 | 73.1 | 60 | 1481 |
| 44 | 434 | 409 | 72.5 | 58 | 1432 |
| 43 | 423 | 400 | 72.0 | 57 | 1383 |
| 42 | 412 | 390 | 71.5 | 56 | 1334 |
| 41 | 402 | 381 | 70.9 | 55 | 1294 |
| 40 | 392 | 371 | 70.4 | 54 | 1245 |
| 39 | 382 | 362 | 69.9 | 52 | 1216 |
| 38 | 372 | 353 | 69.4 | 51 | 1177 |
| 37 | 363 | 344 | 68.9 | 50 | 1157 |
| 36 | 354 | 336 | 68.4 | 49 | 1118 |
| 35 | 345 | 327 | 67.9 | 48 | 1079 |
| 34 | 336 | 319 | 67.4 | 47 | 1059 |
| 33 | 327 | 311 | 66.8 | 46 | 1030 |
| 32 | 318 | 301 | 66.3 | 44 | 1000 |
| 31 | 310 | 294 | 65.8 | 43 | 981 |
| 30 | 302 | 286 | 65.3 | 42 | 952 |
| 29 | 294 | 279 | 64.7 | 41 | 932 |
| 28 | 285 | 271 | 64.3 | 41 | 912 |
| 27 | 279 | 264 | 63.8 | 40 | 883 |
| 26 | 272 | 258 | 63.3 | 38 | 863 |
| 25 | 266 | 253 | 62.8 | 38 | 843 |
| 24 | 260 | 247 | 62.4 | 37 | 824 |
| 23 | 254 | 243 | 62.0 | 36 | 804 |
| 22 | 248 | 237 | 61.5 | 35 | 785 |
| 21 | 243 | 231 | 61.0 | 35 | 775 |
| 20 | 238 | 226 | 60.5 | 34 | 755 |
| (18) | 230 | 219 | – | 33 | 736 |
| (16) | 222 | 212 | – | 32 | 706 |
| (14) | 213 | 203 | – | 31 | 677 |
| (12) | 204 | 194 | – | 29 | 647 |
| (10) | 196 | 187 | – | 28 | 618 |
| ( 8) | 188 | 179 | – | 27 | 598 |
| ( 6) | 180 | 171 | – | 26 | 579 |
| ( 4) | 173 | 165 | – | 25 | 549 |
| ( 2) | 166 | 158 | – | 24 | 530 |
| ( 0) | 160 | 152 | – | 24 | 520 |

# エンドミル加工をする上でのポイント

## Factors for End Mill Operation

| ポイント<br>Factor | 注意点とお願い<br>Instruction and Advice |
|---|---|
| 機械の剛性<br>Rigidity of Machine | ① できるだけ剛性のある機械で加工してください。<br>Use a rigid machine.<br>② 剛性不足の場合は、切り込み量や切削条件を調整してください。<br>Adjust cutting conditions according to the rigidity of machine. |
| チャッキングと<br>エンドミルの振れ<br>Collet Chuck and Run out of End Mill | ① 剛性があり、精度の高いミーリングチャックを使用してください。<br>Use a rigid and precise collet chuck.<br>② エンドミルをチャッキングした時の、刃先の振れを極力小さくしてください。<br>Minimize the run out of end mill. |
| ワーククランプ<br>Work Clamp | ① ワークのクランプはしっかりと固定してください。<br>Work piece must be firmly clamped.<br>② クランプ状態が改善できない場合は、切り込み量など切削条件を調整してください。<br>In case work piece cannot be firmly clamped, relieve cutting condition. |
| 切削油と<br>切りくずの処理<br>Cutting Fluid and Chips | ① 切削油は十分にかけてください。<br>Give a sufficient cutting fluid.<br>② 重切削には、水溶性切削油をお奨めします。<br>Recommend water soluble fluid for heavy cutting.<br>③ 製品によっては、乾式専用のものがありますので、注意してください。<br>Some end mills apply dry cutting only.<br>④ 乾式切削では、エアーブローを使用してください。<br>Use air blow for dry cutting.<br>⑤ 切りくずはクーラントや加工の妨げにならないようにしてください。<br>Remove chips from working area. |
| エンドミルの選択<br>Selection of End Mill | ① 加工ワーク・加工形状によって、適切なエンドミルを使用してください。<br>Select most suitable end mills according to work material and dimension.<br>② 巻頭のインデックスを参考にしてください。<br>Refer to the index table on front page. |
| 切削条件<br>Cutting Conditions | ① 切削条件参考表をご覧ください。<br>Refer to recommended milling condition table.<br>② 機械剛性・ワークのクランプ状態によって、切削条件を調整してください。<br>It is necessary to adjust conditions according to the machine rigidity and clamping condition of work material. |
| エンドミルの<br>突出し量<br>Overhang of End Mill from Tool Holder | ① 加工上問題にならない範囲で、できるだけ短くチャッキングしてください。<br>Overhang of end mill must be as short as possible from tool holder.<br>② 突出し量が長い場合は、切り込み量や送り速度など切削条件を調整してください。<br>In case overhang cannot be shorten, relieve cutting condition . |



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# エンドミル加工におけるトラブルシューティング

## Troubleshooting for End Mill Operation

| トラブル現象 Symptoms of troubles | 原因 Cause | 対策 Solution |
|---|---|---|
| 切削中のビビリ<br>Chattering | ・回転数が速い。<br>・送り速度が速い。<br>・必要以上に有効長、突出し量が長い。<br>・被削材のクランプが弱い。<br>・切れ刃の摩耗が進行している。<br>・工具チャッキング振れ精度が出ていない。<br>・Excessive spindle speed<br>・Excessive feed<br>・Excessive long of effective length or overhang of end mill<br>・Work material is not firmly clamped<br>・Wear of cutting edge progressed<br>・Excessive chucking runout | ・回転数を下げる。<br>・送り速度を下げる。<br>・必要最小限の有効長、突出し量に調整する。<br>・被削材をしっかり固定する。<br>・新品を使用するか、再研磨する。<br>・工具チャッキング振れ精度を調整する。<br>・Reduce spindle speed<br>・Reduce feed<br>・Adjust effective length and overhang as short as possible<br>・Clamp work material firmly<br>・Use new end mill or regrind<br>・Adjust chucking runout |
| 切削中の折損<br>Breakage of End Mill | ・切り込み量が多い。<br>・切りくず詰まり。<br>・一刃の送り量が多い。<br>・切れ刃の摩耗が進行している。<br>・Excessive depth of cut<br>・Chips clogged<br>・Excessive feed per tooth<br>・Wear of cutting edge progressed | ・切り込み量を下げる。<br>・クーラントの当て方を調整し、切りくずの排出を良くする。<br>・一刃の送り量を下げる。<br>・新品を使用するか、再研磨する。<br>・Reduce depth of cut<br>・Adjust coolant nozzle to right direction to dispose chips<br>・Reduce feed per tooth<br>・Use new end mill or regrind |
| 切削中の刃かけ<br>(チッピング)<br>Chipping of Cutting Edge | ・切り込み量が多い。<br>・送り速度が速い。<br>・被削材のクランプが弱い。<br>・回転数が速い。<br>・必要以上に有効長、突出し量が長い。<br>・切れ刃の摩耗が進行している。<br>・構成刃先が発生。<br>・切削時の急冷による損傷。<br>・Excessive depth of cut<br>・Excessive feed<br>・Work material is not firmly clamped<br>・Excessive spindle speed<br>・Excessive long of effective length or overhang of end mill<br>・Wear of cutting edge progressed<br>・Built up edge<br>・Excessive cooling | ・切り込み量を下げる。<br>・送り速度を下げる。<br>・被削材をしっかり固定する。<br>・回転数を下げる。<br>・必要最小限の有効長、突出し量に調整する。<br>・新品を使用するか、再研磨する。<br>・最適なコーティング工具を使用する。<br>・水溶性切削油からエアブロー、オイルミストを使用する。<br>・Reduce depth of cut<br>・Reduce feed<br>・Clamp work material firmly<br>・Reduce spindle speed<br>・Adjust effective length and overhang as short as possible<br>・Use new end mill or regrind<br>・Choose appropriate coating<br>・Use air blow or oil mist |
| 切れ刃の異常摩耗<br>Abnormal Wear | ・回転数が速い。 ・Excessive spindle speed<br>・送り速度が遅い。 ・Too low feed | ・回転数を下げる。 ・Reduce spindle speed<br>・送り速度を上げる。 ・Increase feed |
| 切りくず詰まり・溶着<br>Clogging and Depositing | ・切りくずの排出が良くない。<br>・送り速度が速い。<br>・切り込み量が多い。<br>・刃数が多い。<br>・切れ刃の摩耗が進行している。<br>・Chips are not well disposed<br>・Excessive feed<br>・Excessive depth of cut<br>・Inappropriate number of flute<br>・Wear of cutting edge progressed | ・クーラントの当て方を調整し、切りくずの排出を良くする。<br>・送り速度を下げる。<br>・切り込み量を下げる。<br>・刃数を少なくする。<br>・新品を使用するか、再研磨する。<br>・Adjust coolant nozzle to right direction to dispose chips<br>・Reduce feed<br>・Reduce depth of cut<br>・Use fewer flutes end mill<br>・Use new end mill or regrind |
| 切削中の倒れ<br>Deflection of End Mill | ・送り速度が速い。<br>・切り込み量が多い。<br>・有効長、突出し量が長い。<br>・強ネジレの工具を使用している。<br>・Excessive feed<br>・Excessive depth of cut<br>・Excessive long of effective length or overhang of end mill<br>・Large helix angle of flutes | ・送り速度を下げる。<br>・切り込み量を下げる。<br>・必要最小限の有効長、突出し量に調整する。<br>・弱ネジレ工具を使用する。<br>・Reduce feed<br>・Reduce depth of cut<br>・Adjust effective length and overhang as short as possible<br>・Use smaller helix angle |
| 仕上げ面のバリ<br>Burr on Finished Surface | ・切れ刃の摩耗が進行している。<br>・弱ネジレ工具を使用している。<br>・切り込み量が多い。<br>・Wear of cutting edge progressed<br>・Small helix angle of flutes<br>・Excessive depth of cut | ・新品を使用するか、再研磨する。<br>・強ネジレ工具を使用する。<br>・切り込み量を下げる。<br>・Use new end mill or regrind<br>・Use larger helix angle<br>・Reduce depth of cut |
| 仕上げ面粗さの不良<br>Poor Surface Roughness | ・切れ刃の摩耗が進行している。<br>・切りくずの噛み込み。<br>・送り速度が速い。<br>・必要以上に有効長、突出し量が長い。<br>・回転数が遅い。<br>・仕上げ加工の取り代が一定でない。<br>・工具チャッキング振れ精度が出ていない。<br>・Wear of cutting edge progressed<br>・Chips bite<br>・Excessive feed<br>・Excessive long of effective length or overhang of end mill<br>・Too low spindle speed<br>・Stock removals vary for finishing<br>・Excessive chucking runout | ・新品を使用するか、再研磨する。<br>・クーラントを使用し、切りくずを切削位置から除去する。<br>・送り速度を下げる。<br>・必要最小限の有効長、突出し量に調整する。<br>・回転数を上げる。<br>・仕上げ加工前の残し代を一定にする。<br>・工具チャッキング振れ精度を調整する。<br>・Use new end mill or regrind<br>・Use coolant to remove chips<br>・Reduce feed<br>・Adjust effective length and overhang as short as possible<br>・Increase spindle speed<br>・Improve semi-finishing process<br>・Adjust chucking runout |
| 加工精度の不良<br>Poor Machining Accuracy | ・主軸の伸びが一定でない。<br>・仕上げ加工の取り代が一定でない。<br>・送り速度が速い。<br>・工具チャッキング振れ精度が出ていない。<br>・Inconsistent thermal extension of spindle<br>・Stock removals vary for finishing<br>・Excessive feed<br>・Excessive chucking runout | ・主軸を使用回転数で暖機させ、伸びを安定させる。<br>・仕上げ加工前の残し代を一定にする。<br>・送り速度を下げる。<br>・工具チャッキング振れ精度を調整する。<br>・Warm up spindle by idling before starting operation<br>・Improve semi-finishing process<br>・Reduce feed<br>・Adjust chucking runout |

# 金型用被削材ブランド対照表

## Comparison Table of Die and Mold Materials

### ● プラスチック金型用被削材 Plastic Mold Steels

| 分類 Classification | JIS 他 JIS and others | 使用時硬さ (HRC) Hardness | 愛知製鋼 AICHI STEEL | ウッデホルム UDDEHOLM | 神戸製鋼所 KOBE STEEL | 山陽特殊製鋼 SANYO SPECIAL STEEL | 大同特殊鋼 DAIDO STEEL | 日本高周波鋼業 NIPPON KOSHUHA STEEL | 日立金属 HITACHI METALS |
|---|---|---|---|---|---|---|---|---|---|
| プリハードン鋼 Prehardened steels | SC 系 | 13 | AUK1 | UHB11 | KTSM21・KTSM2A KTSM22・U2000 | PC55 | PXZ PDS1 | KPM1 KPMAX | |
| | SCM 系 | 28 | AUK11 | | KTSM31 KTSM3A U3000 | | PDS3 | | |
| | SCM (改)／AISI P20 | 33 | | PLAMAX IMPAX HH | KTSM3M U3500 | PCM30 | PXA30 PX5 PX7 | KPM30 | HPM2 HPM7 |
| | SUS 系 | | | STAVAX | KTSM60 | QPD1 | S-STAR D-STAR | 420M | HPM38 |
| | SUS 系 (快削) | | | RAMAX-S | | QPD5 | G-STAR | | HPM77 |
| | SUS 系 | 35 | | CORRAX | | QS630 | NAK101 | U630 | PSL |
| | SKD61 (改) | 40 | AUD61 | ORVAR-S | | QD6F | DH2F | | FDAC |
| | AISI P21 | | | | KTSM40EF KTSM40E | PCM40 PCM40S | NAK55 NAK80 | KAP65 KAP88 | HPM1 HPM50 HPM-PRO CENA1 |
| | その他 | 40 | | NIMAX | | | | | HPM-MAGIC |
| 焼き入れ焼戻し鋼 Hardened & Tempered steels | SKD11 (改) | 55 ～ 60 | AUD11 | RIGOR SLEIPNER CALDIE CALMAX | | QCM8 | PD613 | KD21 KD11S | HPM31 |
| | SUS 系 440C | 57 ～ 60 | | ELMAX (粉末) (Powder Metal) | | QPD5 SPC5 (粉末) (Powder Metal) | SUS440C DEX-P1 (粉末) (Powder Metal) | KSP2 | SUS440C ZDP282 (粉末) (Powder Metal) |
| | SUS 系 420 | 48 ～ 53 | | STAVAX MIRRAX ESR | | | S-STAR D-STAR G-STAR | KSP1 | HPM38 HPM77 |
| 時効処理鋼 Age-hardened steels | マルエージング Maraging Steel | 50 以上 | | | | QM300 | MAS1C | KMS18-20 | YAG |

### ● 熱間金型用被削材 Hot Die Steels

| 分類 Classification | JIS 他 JIS and others | 使用時硬さ (HRC) Hardness | 愛知製鋼 AICHI STEEL | ウッデホルム UDDEHOLM | 山陽特殊製鋼 SANYO SPECIAL STEEL | 大同特殊鋼 DAIDO STEEL | 日本高周波鋼業 NIPPON KOSHUHA STEEL | 日立金属 HITACHI METALS | 不二越 NACHI FUJIKOSHI |
|---|---|---|---|---|---|---|---|---|---|
| 合金工具鋼 Alloy steels | SKD4 | 40 ～ 50 | SKD4 | | | DH4 | KD4 | | |
| | SKD5 | 45 ～ 50 | SKD5 | | | DH5 | KD5 | | |
| | SKD6 | 40 ～ 52 | | VIDAR | | DH6 | KD6 | | |
| | SKD61 | 42 ～ 53 | SKD61 | ORVAR 2M | QD61 | DHA DHA1 | KDA | DAC | |
| | SKD61（改） | 42 ～ 53 | AUD61 AUD60A | ORVAR-S DIEVAR | QDA61 QDN | DHA2 DH21 DH31-S | KDA1 KDA1S KDAMAX | DAC3 DAC10 DAC55 DAC-MAGIC | |
| | SKD61（快削） | 38 ～ 42 | | | | DH2F | KAP90F | FDAC | |
| | SKD7 | 40 ～ 50 | AUD7 | | QD10 | DH72 | KDH1 | | |
| | SKD7（改） | 40 ～ 50 | AUD71 AUD72 | | QDH | DH32 DH71 DH73 | | DAC40 YEM-K | HDN1 DURO-N1 |
| | SKD8 | 40 ～ 50 | SKD8 | | | DH41 | KDF | | |
| | SKD8（改） | 40 ～ 50 | | | | DH42 | KDF4 | MDC-K DAC45 | |
| | SKT4 | 35 ～ 50 | SKT4A | ALVAR14 | QT41 | GFA | KTV | DM | |
| | SKT4（改） | 36 ～ 45 | AUD60 | | QDT | GF78 | TD3 | YHD28 | |
| | その他 | 40 ～ 50 | | | QF5 | | | | |
| 高速度工具鋼 High-Speed steels | マトリックス系 Matrix Type | 55 ～ 60 | | | QHZ | DRM1 DRM2 DRM3 | KMX1 | YXR3 YXR33 | MDS1 DURO-F1 |



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## 冷間金型用被削材 Cold Die Steels

| 分類<br>Classification | JIS 他<br>JIS and others | 使用時硬さ<br>(HRC)<br>Hardness | 愛知製鋼<br>AICHI STEEL | ウッデホルム<br>UDDEHOLM | 山陽特殊製鋼<br>SANYO SPECIAL STEEL | 大同特殊鋼<br>DAIDO STEEL | 日本高周波鋼業<br>NIPPON KOSHUHA STEEL | 日立金属<br>HITACHI METALS | 不二越<br>NACHI FUJIKOSHI |
|---|---|---|---|---|---|---|---|---|---|
| 炭素工具鋼<br>Carbon steels | SK105（旧 SK3） | 58～61 | SK3 | | QK3 | YK3 | | | |
| 合金工具鋼<br>Alloy steels | SKS93 | 55～62 | SK301 | | QK3M | YK30 | K3M | YCS3 | |
| | SKS3 | | SKS3 | ARNE | QKS3 | GOA | KS3 | SGT | |
| | SKD1 | | SKD1 | SVERKER3 | QC1 | | KD1 | CRD | |
| | SKD11 | | SKD11 | SVERKER21 | QC11 | DC11 | KD11 | SLD | CDS11 |
| | SKD11（改） | | AUD15 | SLEIPNER | QCM8 | DC53 | KD11S<br>KD21 | SLD8 | MDS9 |
| | SKD11（快削） | | SXACE | | QCM7 | DCMX | NOGA | ARK1<br>SLD-MAGIC | |
| | SKD12 | | SKD12 | RIGOR | | DC12 | KD12 | | CDS12 |
| | プリハードン<br>Prehardened | 38～42 | | IMPAX HH | | GO40F | KAP65 | HPM-MAGIC | |
| | | 48～52 | | | | CX1 | | | |
| | 火炎焼き入れ鋼<br>Flame hardening Steel | 55～62 | SX105V<br>SX4 | FERNO | QF3 | GO5 | FH5<br>KRCX | HMD5 | |
| | 低温空冷鋼<br>Low Temperature Air-cooled Steel | | AKS3 | | | GO4 | KSM | ACD37 | |
| 高速度工具鋼<br>High-Speed steels | SKH51 | 55～68 | | | QH51 | | H51 | YXM1 | SKH9 |
| | SKH55 | | | | | | HM35 | YXM4 | |
| | SKH57 系 | | | | | | MV10 | XVC5 | DURO-SP |
| | 粉末高速度工具鋼<br>Powder Metal High Speed Tool Steels | 58～72 | | ASP23<br>ASP30<br>ASP60 | SPM23<br>SPM30<br>SPM60 | DEX20 | | HAP5R<br>HAP10<br>HAP40<br>HAP50<br>HAP72 | FAX31<br>FAX55<br>FAXG2 |
| | マトリックス系<br>Matrix Type | 56～66 | | | QHZ | DRM1<br>DRM2<br>DRM3 | KMX1<br>KMX2<br>KMX3 | YXR3<br>YXR33<br>YXR7 | DURO-F1<br>DURO-F3<br>DURO-F7<br>DURO-V2<br>DURO-V5 |

# 安全にお使いいただくために

Read Following Precautions for Safe Use

警告
CAUTION

## 安全上の注意　Attention on Safety

●工具をケースから取り出す際は、工具の飛び出しや、刃先が素手に直接触れない様に、充分に注意してください。
When removing tools from cases, be careful of getting-out of tools and don't touch directly the cutting edges.

●切れ刃を直接素手で触れない様にしてください。
Never touch the cutting edges directly with bare hand.

●工具を使用する際は、破損する危険がありますので、必ずカバー・保護メガネ等を使用してください。
Use safety covers and eye protection, as tools may be broken.

●ホルダ等は、工具や加工内容に見合った物を使用してください。
工具はホルダにしっかりと固定し、振れを抑えるようにしてください。
Use holders, etc. that match the tools and nature of the processing operations.
The tool should be firmly attached to the holder to prevent shaking.

●被削材は、しっかり固定してください。
The work materials clamp firmly.

●工具及び被削材の寸法は、あらかじめ確認しておいてください。
Make sure of dimensions of tools and work pieces before starting operation.

●切削条件は、加工物や使用機械に合せて、調節する必要があります。
It is necessary to adjust conditions according to the dimensions of work materials and the machine.

●用途に応じて切削油を選定してください。不水溶性切削油を使用する場合は、加工時に発生する火花や破損で引火、火災の危険があります。防火対策を必ず行ってください。
Select a cutting fluid appropriate to the particular usage. Using a non-water cutting fluid could lead to fires due to sparks generated during processing or heat caused by breakage. Ensure that you take proper fire-prevention measures.

●使用中に異常（切削音・煙）が発生した場合は、直ちに機械を止めてください。
If abnormal sound, etc. occurs during processing, stop the machine immediately.

●工具の改造はしないでください。
Don't modify tools.

## 再研磨時の注意　Attention on Regrinding

●工具を再研磨しますと、粉塵が発生します。粉塵は健康を害する危険があります。再研磨時は保護メガネ等の保護具を使用してください。
When the tool is reground, grinding dust is generated which is dangerous to your health. Be sure to wear protective glasses and a dust proof mask.

●適正な時期に、再研磨を行ってください。
Regrind tools at proper period.


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発行　初版　2018年11月



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