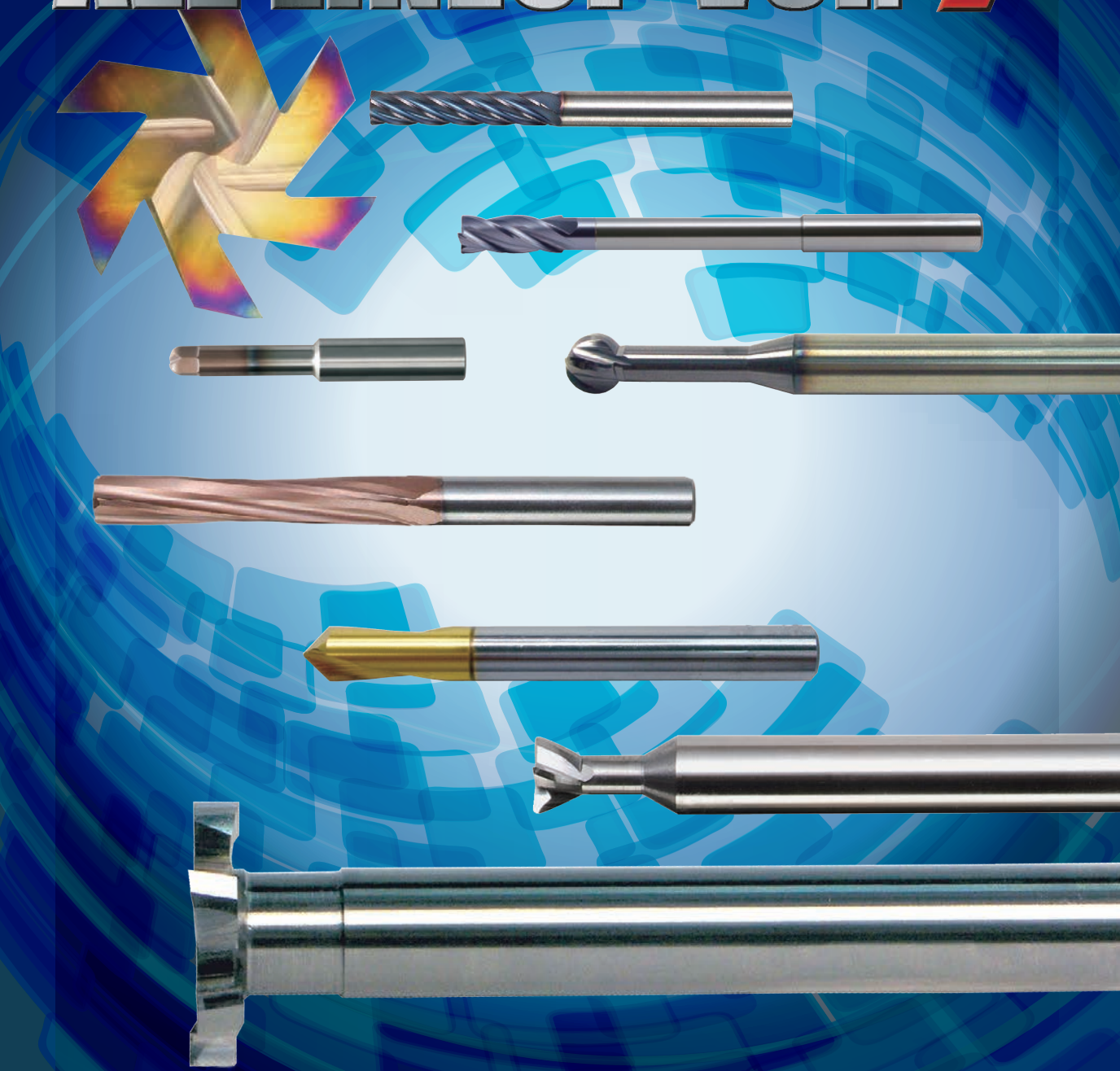
切削工具総合カタログ

# CUTTING TOOL ALL LINEUP Vol.7



EIKO 株式会社 栄工舎
EIKOSHA CO.,LTD.

# ご使用前に必ずお読み下さい

## 切削工具を安全にお使い頂く為の注意！

## Guide for safe use of cutting tools
## Before using EIKOSHA's cutting tools.

● 鋭利な切れ刃を素手で触るとけがの危険があります。切れ刃を素手で触らないで下さい。特にケースから取り出す際、機械への装着時には保護手袋等を使用して下さい。
Direct touch to the sharp cutting edges with bare hand may cause injury. Don't touch cutting edges directly with bare hand. When taking tools out of the case or setting up them to the machine, wear protective gloves.

● 加工前に工具の寸法測定、確認を必ずして下さい。
Make sure of dimensions of tools before starting operation.

● 工具に傷、割れ等があると使用中に破損し飛び散ることがあります。使用前に傷、割れ等ないことを確認して下さい。
Crack or other damages of tools may cause tools breakage or dispersion of broken pieces. Ensure that tools do not have crack or other damages before operation.

● 加工物の保持が不十分ですと、工具や加工物が破損し飛散する危険があります。加工物の保持は確実に行って下さい。
The work should be clamped firmly, otherwise breakage of the work and tools or dispersion of broken pieces will result, which is very dangerous.

● シャンク部の油分やごみをよく拭き取ってから装着して下さい。
Wipe off oil or other dust of the shank, before setting up the tool to the machine.

● モールステーパーシャンクの場合、ハンマーで叩いて装着することは止めて下さい。
In case of morse taper shank, don't use hammer when setting it up to the machine.

● ロウ付け工具は、ロウ付け面の疲労又は加工熱により強度の低下をまねき、使用中にロウ接部より脱落する恐れがあります。高温になるような条件では使用しないで下さい。
Deterioration of strength of brazed tools due to fatigue of brazed part or heat generated in processing may cause falling off the body. Please don't use brazed tools in the condition that requires high cutting temperature.

● 逆回転で使用しないで下さい。
Don't use tools in reverse rotating.

● 切削条件表の数値は、新しく作業を立ち上げる時の目安として下さい。加工物の形状や機械剛性に合わせて切削条件を調節する必要があります。
The cutting conditions shown in catalogue are just guidelines. Therefore, the cutting conditions should be adjusted according to the machining shape , machine rigidity and other work contents.

● 加工中に異常な振動等が発生した場合は、直ちに加工を中止して下さい。
When abnormal vibration, etc. occurs, stop the machine immediately.

● 用途に応じて切削油を選定して下さい。不水溶性切削油を使用する時は、加工時に発生する火花や、破損による発熱で引火、火災の危険があります。防火対策を必ず行って下さい。
Select cutting fluid appropriate to the particular use. Using oil base coolant may cause fire due to sparks generated during process or heat caused by breakage. Ensure that proper fire-prevention measures are taken.

● 加工直後の工具、加工物は高温になっている為、火傷をする危険があります。
During cutting operation, cutting tools and work pieces get very hot. Direct touch to tools and work pieces immediately after operation may cause burn.

● 工具を改造したり、本来の使用目的以外で使用すると、工具が破損、飛散し怪我をする危険があります。工具は改造しないで下さい、又本来の目的以外での使用は止めてください。
Remodeling tools or using tools except for the fixed application may cause breakage of tools or dispersion of broken pieces. Don't remodel tools. Use tools only for the specified purpose.

本カタログに掲載の商品仕様は、改善改良のため予告無く変更する場合がございます。
Specifications may change for improvement without notice.

# CUTTING TOOL ALL LINEUP

## 切削工具総合カタログ

掲載順 INDEX
用途別・形状別 INDEX
アルファベット順 INDEX



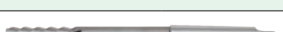
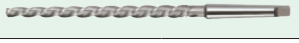
銀山湖（魚沼市）

## ■リーマ シリーズ

| | 型式<br>*Product Code* | 製品名称<br>*Product Name* | |
|---|---|---|---|
| 超硬リーマ<br>*Carbide Reamer* | CSUSR-A | 超硬ステンレス用リーマ<br>*Solid Carbide Reamer For Stainless Steel-A Coated* |  |
| | CNCR-C | 超硬自動旋盤用リーマ<br>*Solid Carbide Reamer For NC Lathe Machine* |  |
| | CSR-C | コーティング ソリッドリーマ<br>*TiCN2 Coated Solid Carbide Reamer* |  |
| | CSPR-C | コーティング ソリッドスパイラルリーマ<br>*TiCN2 Coated Solid Carbide Spiral Reamer* |  |
| | CSR-DLC | 超硬ソリッドアルミ用リーマ<br>*Solid Carbide Reamer DLC Coated For Aluminum* |  |
| | CSRH-P | ソリッド高硬度用リーマ（~HRC62）<br>*Solid Carbide Reamer For Hard Steel (~HRC62)* |  |
| | CSER-C | 超硬エンド刃付リーマ<br>*Solid Carbide End Mill Reamer For Blind Hole* |  |
| | CSOER | 超硬オイルホール付止穴用リーマ<br>*Solid Carbide Oil Hole Reamer For Blind Hole* |  |
| | CSGR-A | 超硬ソリッドリーマ シャンクスルークーラント<br>*Solid Carbide Reamer Shank Through Coolant* |  |
| | CSGR-DLC | 超硬ソリッドリーマ シャンクスルークーラント アルミ用<br>*Solid Carbide Reamer Shank Through Coolant For Aluminium* |  |
| | CSCER | 超硬エンド刃付クーラントリーマ（止まり穴用）<br>*Solid Carbide Coolant Reamer for Blind Hole* |  |
| | CSRR-3 | 超硬ルーマー型リーマ<br>*Solid Carbide Roumer Type Reamer* |  |
| | CSR-MC | 超硬ミクロンリーマ<br>*Solid Carbide Micron Reamer* |  |
| | CSR-ECO | 超硬高精度用リーマ<br>*Solid Carbide High Precision Reamer* |  |
| | CSR | ソリッドリーマ<br>*Solid Carbide Reamer* |  |
| | CSRM | ソリッドミディアムリーマ<br>*Solid Carbide Medium Reamer* |  |
| | CSLHR | ソリッドロングハンドリーマ<br>*Solid Carbide Long Hand Reamer* |  |
| | CSCRS | 超硬チャッキングリーマ<br>*Carbide Straight Shank Chucking Reamer* |  |
| | CSSPSCR | ソリッドスパイラルチャッキングリーマ<br>*Solid Carbide Spiral Chucking Reamer* |  |
| | CSCRL | 超硬ロングシャンクチャッキングリーマ<br>*Carbide Long Shank Chucking Reamer* |  |
| | CSHR | ソリッドヘリカルリーマ<br>*Solid Carbide Helical Reamer* |  |
| | CHHR | 超硬ハイヘリカルリーマ<br>*Carbide High Helical Reamer* |  |
| | CHHRT | 超硬ハイヘリカルリーマ（テーパーシャンク）<br>*Solid Carbide Head High Helical Reamer with Taper Shank* |  |
| | CSTPR | ソリッドテーパーピンリーマ<br>*Solid Carbide Taper Pin Reamer* |  |
| | CSPGR | ソリッドピンゲートリーマ<br>*Solid Carbide Pin Gate Reamer* |  |
| | CSPOTR | 超硬オイルホールスパイラルテーパーリーマ<br>*Solid Carbide Head Oil Hole Spiral Taper Reamer* |  |
| ハイスリーマ<br>*High Speed Steel Reamer* | ERR-TiN | エンド刃付止穴用リーマ<br>*End Mill Reamer For Blind Hole* |  |
| | NCR-C | 自動旋盤用リーマ<br>*Reamer For NC Lathe Machine* |  |
| | MCR-TiN | マシンチャッキングリーマ<br>*Machine Chucking Reamer* |  |
| | TiN-SR | TiNストレートリーマ<br>*TiN Straight Reamer* |  |

| 頁 Page | 切削条件表 Cutting Condition Table Page | 被削材別適合表 Work Material | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 非鉄金属 Nonferrous Metal | 炭素鋼 Carbon Steel | 合金鋼 Alloy Steel | 鋳鉄 Cast Iron | ダイス鋼 die Steel | 調質鋼 Prehadened Steel | 耐熱合金 Heat Resisting Alloy Steel | ステンレス Stainless Steel | チタン合金 Titanium Alloy | グラファイト Graphite |
| | | Al・Cu | S45C・S55C | SCM435 | FC20 | SKD11 | NAK80 | INCONEL | SUS304 | Ti-6Al-4V | |
| P1 | P133 | | ○ | ○ | ○ | ○ | ○ | ○ | ◎ | △ | |
| P4 | P133 | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | △ | |
| P6 | P133 | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | △ | |
| P9 | P133 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | △ | |
| P11 | P133 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | △ | |
| P13 | P133 | 硬度 HRC50 ～ 62 までの被削材に最適 | | | | | | | | | |
| P15 | P134 | ○ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | △ | |
| P17 | P134 | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | △ | |
| P19 | P134 | ○ | ◎ | ◎ | ◎ | ○ | △ | △ | △ | △ | |
| P20 | P135 | ◎ | ○ | ○ | ○ | ○ | △ | △ | △ | △ | |
| P21 | P135 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | | |
| P22 | P135 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | △ | |
| P23 | P135 | ◎ | ◎ | ◎ | ◎ | ○ | △ | △ | △ | | |
| P25 | P135 | ◎ | ◎ | ◎ | ◎ | ○ | △ | △ | △ | | |
| P27 | P135 | ◎ | ◎ | ◎ | ◎ | ○ | △ | △ | △ | | |
| P31 | P135 | ◎ | ◎ | ◎ | ◎ | ○ | △ | △ | △ | | |
| P33 | P135 | ◎ | ◎ | ◎ | ◎ | ○ | △ | △ | △ | | |
| P36 | P136 | ◎ | ◎ | ◎ | ○ | ○ | △ | △ | △ | | |
| P39 | P135 | ◎ | ◎ | ◎ | ◎ | ○ | △ | △ | △ | | |
| P40 | P136 | ◎ | ◎ | ◎ | ○ | ○ | △ | △ | △ | | |
| P42 | P136 | ◎ | ◎ | ◎ | ◎ | ○ | △ | △ | △ | | |
| P43 | P137 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | △ | |
| P45 | P137 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | △ | |
| P46 | P137 | ◎ | ◎ | ◎ | ○ | ○ | △ | △ | | | |
| P47 | P137 | ◎ | ◎ | ◎ | ○ | ○ | △ | △ | △ | | |
| P48 | P138 | ◎ | ◎ | ◎ | ◎ | ○ | △ | △ | △ | △ | |
| P49 | P139 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | △ | |
| P51 | P139 | ◎ | ◎ | ◎ | ○ | ○ | △ | △ | △ | | |
| P53 | P139 | ◎ | ◎ | ◎ | ○ | ○ | △ | △ | △ | | |
| P55 | P139 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | | | |

## ■リーマ シリーズ

| | 型式<br>*Product Code* | 製品名称<br>*Product Name* | |
|---|---|---|---|
| ハイスリーマ<br>*High Speed Steel Reamer* | **TiN-SPR** | TiNスパイラルリーマ<br>*TiN Spiral Reamer* |  |
| | **HR** | ハンドリーマ<br>*Hand Reamer* |  |
| | **SPHR** | スパイラルハンドリーマ<br>*Spiral Hand Reamer* |  |
| | **LHR** | ロングハンドリーマ<br>*Long Hand Reamer* |  |
| | **SPLHR** | スパイラルロングハンドリーマ<br>*Spiral Long Hand Reamer* |  |
| | **SCR** | ストレートシャンクチャッキングリーマ<br>*Straight Shank Chucking Reamer* |  |
| | **SPSCR** | ストレートシャンクスパイラルチャッキングリーマ<br>*Straight Shank Spiral Chucking Reamer* |  |
| | **SCRL** | ロングシャンクチャッキングリーマ<br>*Long Shank Chucking Reamer* |  |
| | **TCR** | テーパーシャンクチャッキングリーマ<br>*Taper Shank Chucking Reamer* |  |
| | **MR** | マシンリーマ<br>*Machine Reamer* |  |
| | **SPMR** | スパイラルマシンリーマ<br>*Spiral Machine Reamer* |  |
| | **LMR** | ロングマシンリーマ<br>*Long Machine Reamer* |  |
| | **SPLMR** | スパイラルロングマシンリーマ<br>*Spiral Long Machine Reamer* |  |
| | **HHHR** | ハイヘリカルリーマ<br>*High Helical Reamer* |  |
| | **HHHRT** | ハイヘリカルリーマ（テーパーシャンク）<br>*High Helical Reamer with Taper Shank* |  |
| | **HHHRL** | ロングハイヘリカルリーマ<br>*Long High Helical Reamer* |  |
| | **HHHRTL** | ロングハイヘリカルリーマ（テーパーシャンク）<br>*Long High Helical Reamer with Taper Shank* |  |
| | **DR** | ドリルリーマ<br>*Drill Reamer* |  |
| | **DRT** | ドリルリーマ（テーパーシャンク）<br>*Drill Reamer With Taper Shank* |  |
| | **TPR** | テーパーピンリーマ<br>*Taper Pin Reamer* |  |
| | **SPTPR** | スパイラルテーパーピンリーマ<br>*Spiral Taper Pin Reamer* |  |
| | **HTPR** | ヘリカルテーパーピンリーマ<br>*Helical Taper Pin Reamer* |  |
| | **TPRT** | マシン用テーパーピンリーマ<br>*Taper Pin Reamer With Taper Shank* |  |
| | **HTPRT** | マシン用ヘリカルテーパーピンリーマ<br>*Helical Taper Pin Reamer With Taper Shank* |  |
| | **SUR** | スプールリーマ<br>*Sprue Reamer* |  |
| | **SURN** | ニック付スプールリーマ<br>*Sprue Reamer With Nick* |  |
| | **SURH** | 半月スプールリーマ<br>*Half Sprue Reamer* |  |
| | **SUR2-R** | R付スプールリーマ 2枚刃<br>*Sprue Reamer With R Flute:2* |  |
| | **SP-SUR2-R** | R付スプールリーマ 2枚刃スパイラル<br>*Spiral Sprue Reamer With R Flute:2* |  |
| | **SUR3-R** | R付スプールリーマ 3枚刃<br>*Sprue Reamer With R Flute:3* |  |

| | 頁 Page | 切削条件表 Cutting Condition Table Page | 被削材別適合表 Work Material | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 非鉄金属 Nonferrous Metal | 炭素鋼 Carbon Steel | 合金鋼 Alloy Steel | 鋳鉄 Cast Iron | ダイス鋼 die Steel | 調質鋼 Prehadened Steel | 耐熱合金 Heat Resisting Alloy Steel | ステンレス Stainless Steel | チタン合金 Titanium Alloy | グラファイト Graphite |
| | | | Al・Cu | S45C・S55C | SCM435 | FC20 | SKD11 | NAK80 | INCONEL | SUS304 | Ti-6Al-4V | |
| | P58 | P139 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | | | |
| | P61 | P140 | ○ | ○ | ○ | ○ | △ | | | | | |
| | P68 | P140 | ○ | ○ | ○ | ○ | △ | | | | | |
| | P71 | P140 | ○ | ○ | ○ | ○ | △ | | | | | |
| | P75 | P140 | ○ | ○ | ○ | ○ | △ | | | | | |
| | P76 | P141 | ○ | ○ | ○ | ○ | △ | | | △ | | |
| | P80 | P141 | ○ | ○ | ○ | ○ | △ | | | | | |
| | P83 | P141 | ○ | ○ | ○ | ○ | △ | | | △ | | |
| | P85 | P141 | ○ | ○ | ○ | ○ | △ | | | | | |
| | P87 | P141 | ○ | ○ | ○ | ○ | △ | | | | | |
| | P91 | P141 | ○ | ○ | ○ | ○ | △ | | | | | |
| | P95 | P141 | ○ | ○ | ○ | ○ | △ | | | | | |
| | P98 | P141 | ○ | ○ | ○ | ○ | △ | | | | | |
| | P99 | P140 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P102 | P140 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P104 | P140 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P104 | P140 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P105 | P141 | ○ | ○ | ○ | ○ | △ | △ | | △ | | |
| | P106 | P141 | ○ | ○ | ○ | ○ | △ | △ | | △ | | |
| | P107,110 | P142 | ○ | ○ | ○ | △ | △ | | | | | |
| | P108,110 | P142 | ○ | ○ | ○ | △ | △ | | | | | |
| | P109,110 | P142 | ○ | ○ | ○ | ○ | △ | | | | | |
| | P111 | P142 | ○ | ○ | ○ | △ | △ | | | | | |
| | P112 | P142 | ○ | ○ | ○ | ○ | △ | | | | | |
| | P113 | P143 | ○ | ○ | ○ | ○ | △ | △ | | | | |
| | P116 | P143 | ○ | ○ | ○ | ○ | △ | △ | | | | |
| | P118 | P143 | ○ | ○ | ○ | ○ | △ | △ | | | | |
| | P121 | P143 | ○ | ○ | ○ | ○ | △ | △ | | | | |
| | P122 | P143 | ○ | ○ | ○ | ○ | △ | △ | | | | |
| | P123 | P143 | ○ | ○ | ○ | ○ | △ | △ | | | | |

## ■リーマ シリーズ


| | 型式 Product Code | 製品名称 Product Name | |
|---|---|---|---|
| ハイスリーマ High Speed Steel Reamer | SP-SUR3-R | R付スプールリーマ 3枚刃スパイラル<br>Spiral Sprue Reamer With R Flute:3 |  |
| | PGR | ピンゲートリーマ<br>Pin Gate Reamer |  |
| | MTR-F | モールステーパーリーマ（ハンド用）仕上用<br>Morse Taper Reamer (Hand) For Finish |  |
| | MTR-RF | モールステーパーリーマ（ハンド用）荒仕上用<br>Morse Taper Reamer (Hand) For Rough Finish |  |
| | MTRT-F | モールステーパーリーマ（マシン用）仕上用<br>Morse Taper Reamer (Machine) For Finish |  |
| | MTRT-RF | モールステーパーリーマ（マシン用）荒仕上用<br>Morse Taper Reamer (Machine) For Rough Finish |  |
| | SPTR-F | 1/10テーパー,スパイラルテーパーリーマ 仕上用<br>Spiral Taper Reamer 1/10T For Finish |  |
| | SPTR-RF | 1/10テーパー,スパイラルテーパーリーマ 荒仕上用<br>Spiral Taper Reamer 1/10T For Rough Finish |  |
| | PR | パイプリーマ<br>Pipe Reamer |  |
| | HSPTR | 粉末ハイス スパイラルテーパーリーマ<br>Powder Metallurgy Spiral Taper Reamer |  |
| リーマ　切削条件参考表 Reamer Cutting Condition Table | | P132 | 参考資料 Reference Data |


## ■カッター シリーズ


| | 型式 Product Code | 製品名称 Product Name | |
|---|---|---|---|
| 超硬カッター Carbide Cutter | CSQCS2-A | 超硬ソリッド球面カッター 2枚刃<br>Solid Carbide Spherical Cutter Flute:2 |  |
| | CSQCL2-A | 超硬ソリッド球面カッター 2枚刃 ロングタイプ<br>Solid Carbide Spherical Cutter Flute:2 Long |  |
| | CSQCS4-A | 超硬ソリッド球面カッター 4枚刃<br>Solid Carbide Spherical Cutter Flute:4 |  |
| | CSQCL4-A | 超硬ソリッド球面カッター 4枚刃 ロングタイプ<br>Solid Carbide Spherical Cutter Flute:4 Long |  |
| | CSMT-H | 超硬スーパーミニスロット 高硬度用<br>Solid Carbide Super Mini Slot Cutter For Hard Steel |  |
| | CSMT-Re | 超硬スーパーミニスロット 樹脂用<br>Solid Carbide Super Mini Slot Cutter For Resin |  |
| | CSMT-Al | 超硬スーパーミニスロット アルミ用<br>Solid Carbide Super Mini Slot Cutter For Aluminum |  |
| | CSMS-H | 超硬スーパーミニアンギュラ 高硬度用<br>Solid Carbide Super Mini Angular Cutter For Hard Steel |  |
| | CSMS-Re | 超硬スーパーミニアンギュラ 樹脂用<br>Solid Carbide Super Mini Angular Cutter For Resin |  |
| | CSMS-Al | 超硬スーパーミニアンギュラ アルミ用<br>Solid Carbide Super Mini Angular Cutter For Aluminum |  |
| | CSMW-H | 超硬スーパーミニWアンギュラ 高硬度用<br>Solid Carbide Super Mini W-Angular Cutter For Hard Steel |  |
| | CSMW-Re | 超硬スーパーミニWアンギュラ 樹脂用<br>Solid Carbide Super Mini W-Angular Cutter For Resin |  |
| | CSMW-Al | 超硬スーパーミニWアンギュラ アルミ用<br>Solid Carbide Super Mini W-Angular Cutter For Aluminum |  |
| | CSMK-Re | 超硬スーパーミニキーシードカッター 樹脂用<br>Solid Carbide Super Mini Keyseat Cutter For Resin |  |
| | CSMK-Al | 超硬スーパーミニキーシードカッター アルミ用<br>Solid Carbide Super Mini Keyseat Cutter For Aluminum |  |
| | CSMT-S | 超硬スーパーミニスロット スリムシャンク<br>Solid Carbide Super Mini Slot Cutter Slim Shank |  |

| | 頁 Page | 切削条件表 Cutting Condition Table Page | 被削材別適合表 Work Material | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 非鉄金属 Nonferrous Metal | 炭素鋼 Carbon Steel | 合金鋼 Alloy Steel | 鋳鉄 Cast Iron | ダイス鋼 die Steel | 調質鋼 Prehadened Steel | 耐熱合金 Heat Resisting Alloy Steel | ステンレス Stainless Steel | チタン合金 Titanium Alloy | グラファイト Graphite |
| | | | Al・Cu | S45C・S55C | SCM435 | FC20 | SKD11 | NAK80 | INCONEL | SUS304 | Ti-6Al-4V | |
| | P124 | P143 | ○ | ○ | ○ | ○ | △ | △ | | | | |
| | P125 | P143 | ○ | ○ | ○ | ○ | △ | △ | | | | |
| | P126 | P144 | ○ | ○ | ○ | △ | △ | | | | | |
| | P126 | P144 | ○ | ○ | ○ | △ | △ | | | | | |
| | P127 | P144 | ○ | ○ | ○ | △ | △ | | | | | |
| | P127 | P144 | ○ | ○ | ○ | △ | △ | | | | | |
| | P128 | P144 | ○ | ○ | ○ | ○ | △ | | | | | |
| | P128 | P144 | ○ | ○ | ○ | ○ | △ | | | | | |
| | P129 | P144 | ○ | ○ | ○ | △ | △ | | | | | |
| | P130 | P142 | ◎ | ◎ | ◎ | ○ | ○ | △ | | △ | | |
| | P370 | | | | | | | | | | | |

| | 頁 Page | 切削条件表 Cutting Condition Table Page | 被削材別適合表 Work Material | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 非鉄金属 Nonferrous Metal | 炭素鋼 Carbon Steel | 合金鋼 Alloy Steel | 鋳鉄 Cast Iron | ダイス鋼 die Steel | 調質鋼 Prehadened Steel | 耐熱合金 Heat Resisting Alloy Steel | ステンレス Stainless Steel | チタン合金 Titanium Alloy | グラファイト Graphite |
| | | | Al・Cu | S45C・S55C | SCM435 | FC20 | SKD11 | NAK80 | INCONEL | SUS304 | Ti-6Al-4V | |
| | P147 | P239 | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | ○ | △ |
| | P147 | P239 | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | ○ | △ |
| | P147 | P239 | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | ○ | △ |
| | P147 | P239 | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | ○ | △ |
| | P148 | P239 | 硬度 HRC ～ 62 までの被削材に最適 | | | | | | | | | |
| | P149 | P239 | 樹脂加工専用 | | | | | | | | | |
| | P150 | P240 | アルミ加工専用 | | | | | | | | | |
| | P151 | P240 | 硬度 HRC ～ 62 までの被削材に最適 | | | | | | | | | |
| | P151 | P240 | 樹脂加工専用 | | | | | | | | | |
| | P152 | P240 | アルミ加工専用 | | | | | | | | | |
| | P152 | P240 | 硬度 HRC ～ 62 までの被削材に最適 | | | | | | | | | |
| | P153 | P240 | 樹脂加工専用 | | | | | | | | | |
| | P153 | P241 | アルミ加工専用 | | | | | | | | | |
| | P154 | P241 | 樹脂加工専用 | | | | | | | | | |
| | P155 | P241 | アルミ加工専用 | | | | | | | | | |
| | P156 | P242 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |

## ■カッター シリーズ

| | 型式<br>*Product Code* | 製品名称<br>*Product Name* | |
|---|---|---|---|
| 超硬カッター<br>*Carbide Cutter* | CSMS-S | 超硬スーパーミニアンギュラ スリムシャンク<br>*Solid Carbide Super Mini Angular Cutter Slim Shank* |  |
| | CSMW-S | 超硬スーパーミニWアンギュラ スリムシャンク<br>*Solid Carbide Super Mini W-Angular Cutter Slim Shank* |  |
| | CSMU-S | 超硬スーパーミニコンベックス スリムシャンク<br>*Solid Carbide Super Mini Convex Cutter Slim Shank* |  |
| | CSMK-S | 超硬スーパーミニキーシードカッター スリムシャンク<br>*Solid Carbide Super Mini Keyseat Cutter Slim Shank* |  |
| | CSMT | 超硬スーパーミニスロット<br>*Solid Carbide Super Mini Slot Cutter* |  |
| | CSMTL-A | 超硬スーパーミニスロットロング<br>*Solid Carbide Super Mini Slot Cutter Long* |  |
| | CSMS | 超硬スーパーミニアンギュラ<br>*Solid Carbide Super Mini Angular Cutter* |  |
| | CSMSL-A | 超硬スーパーミニアンギュラロング<br>*Solid Carbide Super Mini Angular Cutter Long* |  |
| | CSMW | 超硬スーパーミニWアンギュラ<br>*Solid Carbide Super Mini W-Angular Cutter* |  |
| | CSMWL-A | 超硬スーパーミニWアンギュラロング<br>*Solid Carbide Super Mini W-Angular Cutter Long* |  |
| | CSMST2-P | 超硬ソリッドミニストロングアンギュラ 2枚刃<br>*Solid Carbide Mini Strong Angular Cutter Flute:2* |  |
| | CSMST4-P | 超硬ソリッドミニストロングアンギュラ 4枚刃<br>*Solid Carbide Mini Strong Angular Cutter Flute:4* |  |
| | CSMU | 超硬スーパーミニコンベックス<br>*Solid Carbide Super Mini Convex Cutter* |  |
| | CSMUL-A | 超硬スーパーミニコンベックスロング<br>*Solid Carbide Super Mini Convex Cutter Long* |  |
| | CSMV | 超硬スーパーミニコンケーブ<br>*Solid Carbide Super Mini Concave Cutter* |  |
| | CSWRC-A | 超硬ミニWR面取カッター<br>*Solid Carbide Mini Double R Cutter* |  |
| | CSWRCL-A | 超硬ミニWR面取カッターロング<br>*Solid Carbide Mini Double R Cutter With Long Straight Shank* |  |
| | CSMK | 超硬スーパーミニキーシードカッター<br>*Solid Carbide Super Mini Keyseat Cutter* |  |
| | CSMTKC | 超硬スーパーミニ千鳥刃キーシードカッター<br>*Solid Carbide Super Mini Staggered Tooth Keyseat Cutter* |  |
| | CSACS | 超硬ソリッドアンギュラカッター<br>*Solid Carbide Angular Cutter With Straight Shank* |  |
| | CSACLS | 超硬ソリッドアンギュラカッターロング<br>*Solid Carbide Angular Cutter With Long Straight Shank* |  |
| | CSTC | 超硬ソリッドTスロットカッター<br>*Solid Carbide T-Slot Cutter* |  |
| | CSTTC | 超硬ソリッド千鳥刃Tスロットカッター<br>*Solid Carbide Staggered Tooth T-Slot Cutter* |  |
| | CSTTCL | 超硬ソリッド千鳥刃Tスロットカッターロング<br>*Solid Carbide Staggered Tooth T-Slot Cutter With Long Straight Shank* |  |
| | CSKC | 超硬ソリッドキーシードカッター<br>*Solid Carbide Keyseat Cutter* |  |
| | CKC | 超硬キーシードカッター<br>*Solid Carbide Head Keyseat Cutter* |  |
| | CKC-AS | 超硬キーシードカッター ASタイプ<br>*Solid Carbide Head Keyseat Cutter AS-Type* |  |
| | CZCS | 超硬パイロット付ザグリカッター ストレートシャンク<br>*Carbide Tipped Counterbore With Straight Shank* |  |
| | CZCT | 超硬パイロット付ザグリカッター テーパーシャンク<br>*Carbide Tipped Counterbore With Taper Shank* |  |
| | CSSC | 超硬シート面カッター（PF規格／UNF規格）<br>*Carbide Tipped Seat Surface Cutter (PF Standard / UNF Standard)* |  |

| | 頁 Page | 切削条件表 Cutting Condition Table Page | 被削材別適合表 Work Material | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 非鉄金属 Nonferrous Metal | 炭素鋼 Carbon Steel | 合金鋼 Alloy Steel | 鋳鉄 Cast Iron | ダイス鋼 die Steel | 調質鋼 Prehadened Steel | 耐熱合金 Heat Resisting Alloy Steel | ステンレス Stainless Steel | チタン合金 Titanium Alloy | グラファイト Graphite |
| | | | Al・Cu | S45C・S55C | SCM435 | FC20 | SKD11 | NAK80 | INCONEL | SUS304 | Ti-6Al-4V | |
| | P157 | P242 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P157 | P243 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P158 | P243 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P159 | P243 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P160 | P244 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P161 | P244 | ◎ | ◎ | ○ | ○ | ○ | ○ | △ | ○ | | |
| | P162 | P244 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P162 | P245 | ◎ | ◎ | ○ | ○ | ○ | ○ | △ | ○ | | |
| | P163 | P245 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P163 | P246 | ◎ | ◎ | ○ | ○ | ○ | ○ | △ | ○ | | |
| | P164 | P246 | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | ○ | |
| | P165 | P247 | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | ○ | |
| | P167 | P247 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P168 | P248 | ◎ | ◎ | ○ | ○ | ○ | ○ | △ | ○ | | |
| | P169 | P248 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P170 | P249 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P170 | P249 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P171 | P249 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P173 | P250 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P175 | P250 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P175 | P250 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P176 | P244 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| | P177 | P250 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | △ | |
| | P177 | P250 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | △ | |
| | P178 | P251 | ◎ | ○ | ○ | ○ | ○ | △ | | | | |
| | P180 | P251 | ◎ | ○ | ○ | ○ | ○ | △ | | | | |
| | P182 | P251 | ◎ | ○ | ○ | ○ | ○ | △ | | | | |
| | P184 | P252 | ◎ | ○ | ○ | ○ | ○ | | | | | |
| | P184 | P252 | ◎ | ○ | ○ | ○ | ○ | | | | | |
| | P185 | P253 | ◎ | ◎ | ◎ | ○ | ○ | | | | | |

## ■カッター シリーズ


| | 型式<br>*Product Code* | 製品名称<br>*Product Name* | |
|---|---|---|---|
| 超硬カッター<br>*Carbide Cutter* | CSSZC | 超硬シート面ザグリカッター（PF規格／UNF規格）<br>*Carbide Counterbore With Seat Surface (PF Standard / UNF Standard)* |  |
| | CCB | 超硬沈めフライス<br>*Carbide Tipped Counterbore* |  |
| | CMCRC | 超硬ミニコーナーRカッター<br>*Carbide Mini Corner R Cutter* |  |
| | CCRC | 超硬コーナーRカッター<br>*Carbide Tipped Corner R Cutter* |  |
| | OAC4 | 超硬Oリング用アリ溝カッター 4枚刃 ステン用仕上げ<br>*Solid Carbide Angular Cutter For O Ring 4Flutes For Finishing Stainless* |  |
| | OAC4-R | 超硬Oリング用アリ溝カッター 4枚刃 ステン用荒<br>*Solid Carbide Angular Cutter For O Ring 4Flutes For Roughing Stainless* |  |
| | OAC2 | 超硬Oリング用アリ溝カッター 2枚刃 アルミ用<br>*Solid Carbide Angular Cutter For O Ring 2Flutes For Aluminum* |  |
| | OACR2 | 超硬R面取付Oリング用アリ溝カッター<br>*Solid Carbide Angular Cutter With Chamfering R For O Ring* |  |
| | CUKC-K10 | 超硬裏ザグリカッターK10<br>*Carbide Tipped Back Counterboring Cutter* |  |
| | CUKC-P20 | 超硬裏ザグリカッターP20<br>*Carbide Tipped Back Counterboring Cutter* |  |
| ハイスカッター<br>*High Speed Steel Cutter* | HOAC2-A | Oリング用アリ溝カッター 2枚刃<br>*Angular Cutter For O Ring 2Flutes* |  |
| | HOAC4-A | Oリング用アリ溝カッター 4枚刃<br>*Angular Cutter For O Ring 4Flutes* |  |
| | HOACR2-A | R面取付Oリング用アリ溝カッター 2枚刃<br>*Angular Cutter With Chamfering R For O Ring 2Flutes* |  |
| | BZC | スタンダード裏ザグリカッター<br>*Standard Back Counterboring Cutter* |  |
| | BDC | 深穴用裏ザグリカッター<br>*Back Counterboring Cutter For Deep Hole* |  |
| | BMC | 裏面取カッター<br>*Back Countersink* |  |
| | BZH | ガイドホルダー<br>*Guide Holder* |  |
| | UKC | 裏ザグリカッター<br>*Back Counterboring Cutter* |  |
| | UKCC | 裏ザグリカッター TiNコーティング<br>*Back Counterboring Cutter (TiN Coated)* |  |
| | KCNC-C | 自動旋盤用カッター TiCNコーティング<br>*Cutter For NC Lathe Machine TiCN Coated* |  |
| | KCNC | 自動旋盤用カッター<br>*Cutter For NC Lathe Machine* |  |
| | KC | キーシードカッター<br>*Keyseat Cutter* |  |
| | KCS | 側刃付キーシードカッター<br>*Keyseat Cutter With Side Cutting Edge* |  |
| | KCLS | ロングシャンクキーシードカッター<br>*Long Shank Keyseat Cutter* |  |
| | TKCLS | ロングシャンク千鳥刃キーシードカッター<br>*Long Shank Staggered Tooth Keyseat Cutter* |  |
| | MSS-TiN | 柄付メタルソー<br>*Metal Saw With Straight Shank (TiN Coated)* |  |
| | ACS | 柄付アンギュラカッター<br>*Angular Cutter With Straight Shank* |  |
| | ACSW | 柄付Wアンギュラカッター<br>*W Angular Cutter With Straight Shank* |  |
| | ACST 45°<br>60° | 強力型柄付アンギュラカッター<br>*Long Shank Strong Angular Cutter With Straight Shank* |  |

| 頁 Page | 切削条件表 Cutting Condition Table Page | 被削材別適合表 Work Material | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 非鉄金属 Nonferrous Metal | 炭素鋼 Carbon Steel | 合金鋼 Alloy Steel | 鋳鉄 Cast Iron | ダイス鋼 die Steel | 調質鋼 Prehadened Steel | 耐熱合金 Heat Resisting Alloy Steel | ステンレス Stainless Steel | チタン合金 Titanium Alloy | グラファイト Graphite |
| | | Al・Cu | S45C・S55C | SCM435 | FC20 | SKD11 | NAK80 | INCONEL | SUS304 | Ti-6Al-4V | |
| P185 | P253 | ◎ | ◎ | ◎ | ○ | ○ | | | | | |
| P186 | P253 | ◎ | ◎ | ◎ | ○ | ○ | △ | △ | | | |
| P186 | P254 | ◎ | ◎ | ○ | ○ | ○ | △ | △ | △ | | |
| P187 | P254 | ◎ | ◎ | ○ | ○ | ○ | △ | | △ | | |
| P188 | P254 | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | △ | |
| P189 | P255 | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | △ | |
| P190 | P255 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | △ | |
| P191 | P255 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | △ | |
| P192 | P256 | ◎ | ○ | ○ | ○ | △ | | | | | |
| P192 | P256 | ◎ | ○ | ○ | ○ | △ | | | | | |
| P193 | P256 | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | | |
| P193 | P256 | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | | |
| P194 | P256 | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | | |
| P195 | P257 | ○ | ○ | ○ | ○ | △ | | | | | |
| P195 | P257 | ○ | ○ | ○ | ○ | △ | | | | | |
| P195 | P257 | ○ | ○ | ○ | ○ | △ | | | | | |
| P195 | | | | | | | | | | | |
| P197 | P257 | ○ | ○ | ○ | △ | △ | | | | | |
| P197 | P257 | ○ | ○ | ○ | ○ | △ | | | | | |
| P198 | P258 | ○ | ○ | ○ | ○ | △ | | | | | |
| P199 | P258 | ○ | ○ | ○ | ○ | △ | | | | | |
| P200 | P258 | △ | ○ | ○ | ○ | △ | | | | | |
| P208 | P258 | △ | ○ | ○ | ○ | △ | | | | | |
| P209 | P259 | ○ | ○ | ○ | ○ | △ | | | | | |
| P211 | P259 | ○ | ○ | ○ | ○ | △ | | | | | |
| P212 | P259 | ◎ | ◎ | ○ | ○ | ○ | △ | | △ | | |
| P214 | P260 | ○ | ○ | ○ | △ | △ | | | | | |
| P216 | P261 | ○ | ○ | ○ | △ | △ | | | | | |
| P217 | P262 | ○ | ○ | ○ | △ | △ | | | | | |
| | | ○ | ○ | ○ | ○ | △ | | | | | |

## ■カッター シリーズ


| | 型式 Product Code | 製品名称 Product Name | |
|---|---|---|---|
| ハイスカッター High Speed Steel Cutter | PCS 60° | 柄付傘型カッター Parasol Cutter With Straight Shank |  |
| | 60°φ65～ | | |
| | 90° | | |
| | 90°φ65～ | | |
| | CF 60°・90° | センターフライス Countersink With Straight Shank |  |
| | 120° | | |
| | CFT | センターフライス（テーパーシャンク） Countersink With Taper Shank |  |
| | RC | R面取カッター（スプールブッシュ用） R Cutter (For Sprue Bushes) |  |
| | CC | センター面取カッター Center Chamfering Cutter |  |
| | MCRC | ミニコーナーRカッター（ハーフ） Mini Corner R Cutter |  |
| | CRC | コーナーRカッター Corner R Cutter |  |
| | ZCS | パイロット付ザグリカッター ストレートシャンク Counterbore With Straight Shank |  |
| | ZCT | パイロット付ザグリカッター テーパーシャンク Counterbore With Taper Shank |  |
| | ZCP | ザグリカッター用パイロット Guide For Counterbore |  |
| | CB | 六角穴付ボルト用沈めフライス ストレートシャンク Counterbore With Straight Shank |  |
| | CBT | 六角穴付ボルト用沈めフライス テーパーシャンク Counterbore With Taper Shank |  |
| | CBLS | 六角穴付ボルト用ロングシャンク沈めフライス Long Shank Counterbore |  |
| | CBH | 平小ネジ用沈めフライス Screw Counterbore |  |
| | CBS | 皿小ネジ用沈めフライス Screw Countersink |  |
| | CBO | 押出ピン用沈めフライス Push Pin Counterbore |  |
| | CB-JM | JIS沈めフライス Counterbore With JIS |  |
| | CB-TSM | TSM沈めフライス Counterbore With TSM |  |
| | DCB | 六角穴付ボルト用ドリル付沈めフライス Counterbore With Drill |  |
| | DCBS | 皿小ネジ用ドリル付沈めフライス Screw Countersink With Drill |  |
| | DCBTA | TAS六角穴付ボルト用ドリル付沈めフライス TAS Counterbore With Drill |  |
| | DCBSTA | TAS皿小ネジ用ドリル付沈めフライス TAS Screw Countersink With Drill |  |
| | DCB-TRM | 六角ボルト沈め用段付ドリル R型 Counterbore With Drill (Taper Shank) R-Type |  |
| | DCB-TZM | 六角ボルト沈め用段付ドリル Z型 Counterbore With Drill (Taper Shank) Z-Type |  |
| | DCB-SRM | 六角ボルト沈め用段付ドリル（ストレートシャンク）R型 Counterbore With Drill (Straight Shank) R-Type |  |
| | DCB-SHM | 平小ネジ沈め用段付ドリル（ストレートシャンク）H型 Screw Counterbore With Drill (Straight Shank) H-Type |  |

| | 頁 Page | 切削条件表 Cutting Condition Table Page | 被削材別適合表 Work Material | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 非鉄金属 Nonferrous Metal | 炭素鋼 Carbon Steel | 合金鋼 Alloy Steel | 鋳鉄 Cast Iron | ダイス鋼 die Steel | 調質鋼 Prehadened Steel | 耐熱合金 Heat Resisting Alloy Steel | ステンレス Stainless Steel | チタン合金 Titanium Alloy | グラファイト Graphite |
| | | | Al・Cu | S45C・S55C | SCM435 | FC20 | SKD11 | NAK80 | INCONEL | SUS304 | Ti-6Al-4V | |
| | P218 | P263 | △ | ○ | ○ | △ | △ | | | | | |
| | | | ○ | ○ | ○ | △ | △ | | | | | |
| | | | △ | ○ | ○ | △ | △ | | | | | |
| | | | ○ | ○ | ○ | △ | △ | | | | | |
| | P219 | P263 | ○ | ○ | ○ | △ | △ | | | | | |
| | | | ○ | ○ | ○ | ○ | △ | | | | | |
| | P220 | P263 | ○ | ○ | ○ | △ | △ | | | | | |
| | P221 | P263 | ○ | ○ | ○ | △ | | | | | | |
| | P222 | P264 | ○ | ◎ | ◎ | ◎ | ○ | △ | △ | △ | | |
| | P223 | P265 | ◎ | ◎ | ○ | ○ | △ | △ | | △ | | |
| | P223 | P265 | ◎ | ◎ | ○ | ○ | △ | | | | | |
| | P224 | P266 | ○ | ○ | ○ | ○ | △ | | | | | |
| | P225 | P266 | ○ | ○ | ○ | ○ | △ | | | | | |
| | P226 | | | | | | | | | | | |
| | P227 | P267 | ○ | ○ | ○ | ○ | △ | △ | | | | |
| | P227 | P267 | ○ | ○ | ○ | ○ | △ | △ | | | | |
| | P228 | P267 | ○ | ○ | ○ | ○ | △ | △ | | | | |
| | P228 | P267 | ○ | ○ | ○ | ○ | △ | △ | | | | |
| | P229 | P267 | ○ | ○ | ○ | ○ | △ | △ | | | | |
| | P229 | P268 | ○ | ○ | ○ | ○ | ○ | △ | | | | |
| | P230 | P268 | ○ | ○ | ○ | ○ | ○ | △ | | | | |
| | P230 | P268 | ○ | ○ | ○ | ○ | ○ | △ | | | | |
| | P231 | P269 | ○ | ○ | ○ | ○ | △ | △ | | | | |
| | P232 | P269 | ○ | ○ | ○ | ○ | △ | △ | | | | |
| | P232 | P269 | ○ | ○ | ○ | ○ | △ | △ | | | | |
| | P233 | P270 | ○ | ○ | ○ | ○ | △ | △ | | | | |
| | P234 | P270 | ○ | ◎ | ◎ | ○ | ○ | △ | | △ | | |
| | P234 | P270 | ○ | ◎ | ◎ | ○ | ○ | △ | | △ | | |
| | P235 | P269 | ○ | ◎ | ◎ | ○ | ○ | △ | | △ | | |
| | P235 | P269 | ○ | ◎ | ◎ | ○ | ○ | △ | | △ | | |

## ■カッター シリーズ


| | 型式 Product Code | 製品名称 Product Name | |
|---|---|---|---|
| ハイスカッター High Speed Steel Cutter | DCB-SSM | 皿小ネジ沈め用段付ドリル（ストレートシャンク）S型 Screw Counterbore With Drill (Straight Shank) S-Type |  |
| | SSC-TiN | シート面カッター（PF規格／UNF規格） Seat Surface Cutter (PF Standard / UNF Standard) |  |
| | SSZC-TiN | シート面ザグリカッター（PF規格／UNF規格） Counterbore With Seat Surface (PF Standard / UNF Standard) |  |
| カッター　切削条件参考表 Cutter Cutting Condition Table | | P238 | 参考資料 Reference Data |


## ■ドリル シリーズ


| | 型式 Product Code | 製品名称 Product Name | |
|---|---|---|---|
| 超硬ドリル Carbide Drill | CNCZ-C | 超硬フラットザグリドリル（自動旋盤用） Solid Carbide Flat Drill For Counterboring |  |
| | TR-P | タップ リムーバーPlus（レギュラーサイズ） Tap Remover Plus Regular Size |  |
| | TRL-P | タップ リムーバーPlus（ロングサイズ） Tap Remover Plus Long Size |  |
| | CSHD | 超硬半月ドリル Solid Carbide Half Drill |  |
| | CCTS | 超硬センタリングツール ショートタイプ Solid Carbide Head Centering Tool Short Type |  |
| | CCTL | 超硬センタリングツール ロングタイプ Solid Carbide Head Centering Tool Long Type |  |
| | CCTST | 超硬センタリングツール ショートタイプ（テーパーシャンク） Solid Carbide Head Centering Tool with Taper Shank Short Type |  |
| | CCTLT | 超硬センタリングツール ロングタイプ（テーパーシャンク） Solid Carbide Head Centering Tool with Taper Shank Long Type |  |
| ハイス ドリル High Speed Steel Drill | FZD-A | フラットザグリドリル Flat Drill For Counterboring |  |
| | GSS | スターティングドリル Starting Drill |  |
| | TPD | テーパーピンドリル（ストレートシャンク） Taper Pin Drill With Straight Shank |  |
| | TPDT | テーパーピンドリル（テーパーシャンク） Taper Pin Drill With Taper Shank |  |
| | SPTDN | ニック付スパイラルテーパーコアドリル Spiral Taper Core Drill With Nick |  |
| | PTDS | 管用ドリル（ストレートシャンク） Drill With Straight Shank For Pipe |  |
| | PTDT | 管用ドリル（テーパーシャンク） Drill With Taper Shank For Pipe |  |
| | CT | センタリングツール Centering Tool Point 90° • 118° |  |
| | CTT | センタリングツール（テーパーシャンク） Centering Tool With Taper Shank Point 90° • 118° |  |
| ドリル　切削条件参考表 Drill Cutting Condition Table | | P286 | 参考資料 Reference Data |

| | 頁 Page | 切削条件表 Cutting Condition Table Page | 被削材別適合表 Work Material | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 非鉄金属 Nonferrous Metal | 炭素鋼 Carbon Steel | 合金鋼 Alloy Steel | 鋳鉄 Cast Iron | ダイス鋼 die Steel | 調質鋼 Prehadened Steel | 耐熱合金 Heat Resisting Alloy Steel | ステンレス Stainless Steel | チタン合金 Titanium Alloy | グラファイト Graphite |
| | | | Al・Cu | S45C・S55C | SCM435 | FC20 | SKD11 | NAK80 | INCONEL | SUS304 | Ti-6Al-4V | |
| | P236 | P270 | ○ | ◎ | ◎ | ○ | ○ | △ | | △ | | |
| | P237 | P271 | ◎ | ◎ | ○ | ○ | △ | | | | | |
| | P237 | P271 | ◎ | ◎ | ○ | ○ | △ | | | | | |
| | P370 | | | | | | | | | | | |



| | 頁 Page | 切削条件表 Cutting Condition Table Page | 被削材別適合表 Work Material | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 非鉄金属 Nonferrous Metal | 炭素鋼 Carbon Steel | 合金鋼 Alloy Steel | 鋳鉄 Cast Iron | ダイス鋼 die Steel | 調質鋼 Prehadened Steel | 耐熱合金 Heat Resisting Alloy Steel | ステンレス Stainless Steel | チタン合金 Titanium Alloy | グラファイト Graphite |
| | | | Al・Cu | S45C・S55C | SCM435 | FC20 | SKD11 | NAK80 | INCONEL | SUS304 | Ti-6Al-4V | |
| | P273 | P287 | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | △ | |
| | P274 | P274 | ハイス破損タップ除去専用 | | | | | | | | | |
| | P274 | P274 | ハイス破損タップ除去専用 | | | | | | | | | |
| | P275 | P287 | ◎ | ◎ | ○ | ○ | ○ | △ | | | | |
| | P276 | P287 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | △ | △ | | |
| | P276 | P287 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | △ | △ | | |
| | P277 | P287 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | △ | △ | | |
| | P277 | P287 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | △ | △ | | |
| | P278 | P288 | ○ | ○ | ○ | ○ | △ | △ | | | | |
| | P280 | P288 | ○ | ○ | ○ | ○ | △ | △ | | | | |
| | P281 | P289 | ○ | ◎ | ◎ | ○ | ○ | △ | | △ | | |
| | P281 | P289 | ○ | ◎ | ◎ | ○ | ○ | △ | | △ | | |
| | P282 | P289 | ○ | ◎ | ◎ | ○ | ○ | △ | | △ | | |
| | P283 | P290 | ○ | ◎ | ◎ | ○ | ○ | △ | | △ | | |
| | P283 | P290 | ○ | ◎ | ◎ | ○ | ○ | △ | | △ | | |
| | P284 | P290 | ◎ | ◎ | ◎ | ◎ | ○ | △ | △ | △ | | |
| | P284 | P290 | ◎ | ◎ | ◎ | ◎ | ○ | △ | △ | △ | | |
| | P370 | | | | | | | | | | | |

## ■エンドミル シリーズ

| | 型式<br>*Product Code* | 製品名称<br>*Product Name* | |
|---|---|---|---|
| 超硬エンドミル<br>*Carbide End Mill* | CSFRPE-P | 超硬ソリッドファイバー用カッター底刃付タイプ コーティング付<br>*P Coated Solid Carbide Cutter For Fiber End Mill Type* |  |
| | CSFRPE | 超硬ソリッドファイバー用カッター底刃付タイプ<br>*Solid Carbide Cutter For Fiber End Mill Type* |  |
| | CSFRP-P | 超硬ソリッドファイバー用カッター コーティング付<br>*P Coated Solid Carbide Cutter For Fiber* |  |
| | CSFRP | 超硬ソリッドファイバー用カッター<br>*Solid Carbide Cutter For Fiber* |  |
| | GES2 | 超硬グラファイト ソリッドエンドミル 2枚刃 スタンダードタイプ<br>*Solid Carbide Graphite Standard End Mill Flute:2* |  |
| | GEL2 | 超硬グラファイト ソリッドエンドミル 2枚刃 ロングタイプ<br>*Solid Carbide Graphite Long End Mill Flute:2* |  |
| | GES4 | 超硬グラファイト ソリッドエンドミル 4枚刃 スタンダードタイプ<br>*Solid Carbide Graphite Standard End Mill Flute:4* |  |
| | GEL4 | 超硬グラファイト ソリッドエンドミル 4枚刃 ロングタイプ<br>*Solid Carbide Graphite Long End Mill Flute:4* |  |
| | GBES2 | 超硬グラファイト ソリッドボールエンドミル 2枚刃 スタンダードタイプ<br>*Solid Carbide Graphite Standard Ball End Mill Flute:2* |  |
| | GBEL2 | 超硬グラファイト ソリッドボールエンドミル 2枚刃 ロングタイプ<br>*Solid Carbide Graphite Long Ball End Mill Flute:2* |  |
| | GBES4 | 超硬グラファイト ソリッドボールエンドミル 4枚刃 スタンダードタイプ<br>*Solid Carbide Graphite Standard Ball End Mill Flute:4* |  |
| | GBEL4 | 超硬グラファイト ソリッドボールエンドミル 4枚刃 ロングタイプ<br>*Solid Carbide Graphite Long Ball End Mill Flute:4* |  |
| | GTE | 超硬グラファイト ソリッドテーパーエンドミル<br>*Solid Carbide Graphite Taper End Mill* |  |
| | GTBE | 超硬グラファイト ソリッドテーパーボールエンドミル<br>*Solid Carbide Graphite Taper Ball End Mill* |  |
| | AHES2 | 超硬エアーホールエンドミル 2枚刃 スタンダードタイプ<br>*Carbide Airhole Standard End Mill Flute:2* |  |
| | AHEL2 | 超硬エアーホールエンドミル 2枚刃 ロングタイプ<br>*Carbide Airhole Long End Mill Flute:2* |  |
| | AHES4 | 超硬エアーホールエンドミル 4枚刃 スタンダードタイプ<br>*Carbide Airhole Standard End Mill Flute:4* |  |
| | AHEL4 | 超硬エアーホールエンドミル 4枚刃 ロングタイプ<br>*Carbide Airhole Long End Mill Flute:4* |  |
| | AHBES2 | 超硬エアホールボールエンドミル 2枚刃 スタンダードタイプ<br>*Carbide Airhole Standard Ball End Mill Flute:2* |  |
| | AHBEL2 | 超硬エアホールボールエンドミル 2枚刃 ロングタイプ<br>*Carbide Airhole Long Ball End Mill Flute:2* |  |
| | AHBES4 | 超硬エアホールボールエンドミル 4枚刃 スタンダードタイプ<br>*Carbide Airhole Standard Ball End Mill Flute:4* |  |
| | AHBEL4 | 超硬エアホールボールエンドミル 4枚刃 ロングタイプ<br>*Carbide Airhole Long Ball End Mill Flute:4* |  |
| | AHTE | 超硬エアホールソリッドテーパーエンドミル<br>*Solid Carbide Airhole Taper End Mill* |  |
| | AHTBE | 超硬エアホールソリッドテーパーボールエンドミル<br>*Solid Carbide Airhole Taper Ball End Mill* |  |
| | CSBE | 超硬ソリッドボールエンドミル<br>*Solid Carbide Ball End Mill* |  |
| | CMBE | 超硬先ムクボールエンドミル<br>*Solid Carbide Head Ball End Mill* |  |
| | CSTE | 超硬ソリッドテーパーエンドミル<br>*Solid Carbide Taper End Mill* |  |
| | CSTEM | 超硬ソリッドテーパーエンドミル（ミディアム）<br>*Solid Carbide Taper End Mill (Medium)* |  |
| | CSTEL | 超硬ソリッドテーパーエンドミル（ロング）<br>*Solid Carbide Taper End Mill (Long)* |  |
| | CSTBE | 超硬ソリッドテーパーボールエンドミル<br>*Solid Carbide Taper Ball End Mill* |  |

| | 頁 Page | 切削条件表 Cutting Condition Table Page | 被削材別適合表 Work Material | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 非鉄金属 Nonferrous Metal | 炭素鋼 Carbon Steel | 合金鋼 Alloy Steel | 鋳鉄 Cast Iron | ダイス鋼 die Steel | 調質鋼 Prehadened Steel | 耐熱合金 Heat Resisting Alloy Steel | ステンレス Stainless Steel | チタン合金 Titanium Alloy | グラファイト Graphite |
| | | | Al・Cu | S45C・S55C | SCM435 | FC20 | SKD11 | NAK80 | INCONEL | SUS304 | Ti-6Al-4V | |
| | P293 | P347 | CFRP（カーボンファイバープラスチック）専用 | | | | | | | | | |
| | P293 | P347 | CFRP（カーボンファイバープラスチック）専用 | | | | | | | | | |
| | P293 | P347 | CFRP（カーボンファイバープラスチック）専用 | | | | | | | | | |
| | P293 | P347 | CFRP（カーボンファイバープラスチック）専用 | | | | | | | | | |
| | P294 | P347 | ◎ | △ | △ | | | | | | | ◎ |
| | P294 | P347 | ◎ | △ | △ | | | | | | | ◎ |
| | P295 | P348 | ◎ | △ | △ | | | | | | | ◎ |
| | P295 | P348 | ◎ | △ | △ | | | | | | | ◎ |
| | P296 | P349 | ◎ | △ | △ | | | | | | | ◎ |
| | P297 | P349 | ◎ | △ | △ | | | | | | | ◎ |
| | P298 | P350 | ◎ | △ | △ | | | | | | | ◎ |
| | P299 | P350 | ◎ | △ | △ | | | | | | | ◎ |
| | P300 | P350 | ◎ | △ | △ | | | | | | | ◎ |
| | P301 | P351 | ◎ | △ | △ | | | | | | | ◎ |
| | P302 | P351 | ◎ | ○ | ○ | △ | △ | | | | | ◎ |
| | P302 | P351 | ◎ | ○ | △ | △ | △ | | | | | ◎ |
| | P302 | P352 | ◎ | ○ | ○ | △ | △ | | | | | ◎ |
| | P302 | P352 | ◎ | ○ | △ | △ | △ | | | | | ◎ |
| | P303 | P352 | ◎ | ○ | ○ | △ | △ | | | | | ◎ |
| | P303 | P352 | ◎ | ○ | △ | △ | △ | | | | | ◎ |
| | P304 | P353 | ◎ | ○ | ○ | △ | △ | | | | | ◎ |
| | P304 | P353 | ◎ | ○ | △ | △ | △ | | | | | ◎ |
| | P305 | P353 | ◎ | ○ | ○ | △ | △ | | | | | ◎ |
| | P306 | P354 | ◎ | ○ | ○ | △ | △ | | | | | ◎ |
| | P307 | P354 | ◎ | ◎ | ◎ | ○ | ○ | ○ | △ | △ | | ○ |
| | P309 | P355 | ○ | ○ | △ | ○ | △ | | | | | ○ |
| | P310 | P356 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | △ | ○ |
| | P312 | P356 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | △ | ○ |
| | P314 | P356 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | △ | ○ |
| | P315 | P357 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | | ○ |

## ■エンドミル シリーズ


| | 型式 *Product Code* | 製品名称 *Product Name* | |
|---|---|---|---|
| 超硬エンドミル *Carbide End Mill* | CSTBEL | 超硬ソリッドロングテーパーボールエンドミル *Solid Carbide Long Taper Ball End Mill* |  |
| | CRM-2 | 超硬ソリッド台形ランナーエンドミル *Solid Carbide Taper End Mill For Runner* |  |
| | CRM-P | 超硬ソリッド台形ランナーエンドミル（Pコーティング） *P-Coated Solid Carbide Taper End Mill For Runner* |  |
| | CSRT-A | 超硬リバースカッター（超硬ソリッド逆テーパーエンドミル） *Solid Carbide Reverse Cutter* |  |
| | CSME2 | 超硬スーパーミニエンドミル 2枚刃 *Solid Carbide Super Mini End Mill Flute:2* |  |
| | CSME4 | 超硬スーパーミニエンドミル 4枚刃 *Solid Carbide Super Mini End Mill Flute:4* |  |
| ハイス エンドミル *High Speed Steel End Mill* | BE | ボールエンドミル *Ball End Mill* |  |
| | BEL | ロングボールエンドミル *Long Ball End Mill* |  |
| | BELS | ロングシャンクボールエンドミル *Long Shank Ball End Mill* |  |
| | HPBE | HPMボールエンドミル *HPM Ball End Mill* |  |
| | HPTBE | テーパーボールエンドミル *Taper Ball End Mill* |  |
| | CEM | C面付エンドミル *Corner C End Mill* |  |
| | SLEM | スロッチングエンドミル *Slotting End Mill* |  |
| | SLEML | ロングスロッチングエンドミル *Long Slotting End Mill* |  |
| | SLEMLS | ロングシャンクスロッチングエンドミル *Long Shank Slotting End Mill* |  |
| | HPSLEM | HPMスロッチングエンドミル *HPM Slotting End Mill* |  |
| | EXLE4 | 超ロング4枚刃エンドミル *Long Flute End Mill* |  |
| | EXLSE4 | 超ロングシャンク4枚刃エンドミル *Long Shank End Mill* |  |
| | TE-2 | テーパーエンドミル 2枚刃 *Taper End Mill Flute:2* |  |
| | TE-4 | テーパーエンドミル 4枚刃 *Taper End Mill Flute:4* |  |
| | TEL | ロングテーパーエンドミル *Long Taper End Mill* |  |
| | RM2 | ランナーミル（台形ランナー用） *Taper End Mill For Runner* |  |

エンドミル　切削条件参考表 *End Mill Cutting Condition Table* — P346 — 参考資料 *Reference Data*

| | 頁 Page | 切削条件表 Cutting Condition Table Page | 被削材別適合表 Work Material | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 非鉄金属 Nonferrous Metal | 炭素鋼 Carbon Steel | 合金鋼 Alloy Steel | 鋳鉄 Cast Iron | ダイス鋼 die Steel | 調質鋼 Prehadened Steel | 耐熱合金 Heat Resisting Alloy Steel | ステンレス Stainless Steel | チタン合金 Titanium Alloy | グラファイト Graphite |
| | | | Al・Cu | S45C・S55C | SCM435 | FC20 | SKD11 | NAK80 | INCONEL | SUS304 | Ti-6Al-4V | |
| | P317 | P357 | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | | ○ |
| | P320 | P358 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | △ | ○ |
| | P321 | P359 | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | △ | ○ |
| | P322 | P360 | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | △ | ○ |
| | P324 | P361 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | | |
| | P324 | P361 | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | | |
| | P325 | P362 | ○ | ○ | ○ | ○ | ○ | △ | △ | △ | | |
| | P328 | P362 | ○ | ○ | ○ | ○ | ○ | △ | △ | △ | | |
| | P329 | P362 | ○ | ○ | ○ | ○ | ○ | △ | △ | △ | | |
| | P330 | P362 | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | | |
| | P332 | P363 | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | | |
| | P334 | P363 | ○ | ○ | ○ | ○ | ○ | ○ | △ | △ | | |
| | P335 | P364 | △ | ○ | ○ | △ | △ | | | | | |
| | P336 | P364 | △ | ○ | ○ | △ | △ | | | | | |
| | P337 | P364 | ○ | ○ | ○ | △ | △ | △ | | | | |
| | P338 | P365 | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | | |
| | P339 | P365 | ○ | ○ | ○ | ○ | ○ | △ | △ | △ | | |
| | P340 | P365 | ○ | ○ | ○ | ○ | ○ | △ | △ | △ | | |
| | P341 | P366 | ○ | ○ | ○ | ○ | ○ | △ | △ | △ | | |
| | P342 | P367 | ○ | ○ | ○ | ○ | ○ | △ | △ | △ | | |
| | P344 | P366 | ○ | ○ | ○ | ○ | △ | △ | △ | △ | | |
| | P345 | P368 | ○ | ○ | ○ | ○ | ○ | △ | △ | △ | | |
| | P370 | | | | | | | | | | | |

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| | 用途別 By Purpose | 型式 Product Code | 製品名称 Product Name | 頁 Page | 切削条件表 Cutting Condition Table Page |
|---|---|---|---|---|---|
| 超硬リーマ Carbide Reamer | 高硬度・難削材 For Hard Materials | CSUSR-A | 超硬ステンレス用リーマ<br>Solid Carbide Reamer For Stainless Steel-A Coated | P1 | P133 |
| | | CSRH-P | ソリッド高硬度用リーマ（～HRC62）<br>Solid Carbide Reamer For Hard Steel (~HRC62) | P13 | P133 |
| | 止り穴加工 For Blind Hole | CSER-C | 超硬エンド刃付リーマ<br>Solid Carbide End Mill Reamer For Blind Hole | P15 | P134 |
| | | CSOER | 超硬オイルホール付止穴用リーマ<br>Solid Carbide Oil Hole Reamer For Blind Hole | P17 | P134 |
| | | CSCER | 超硬エンド刃付クーラントリーマ（止まり穴用）<br>Solid Carbide Coolant Reamer for Blind Hole | P21 | P135 |
| | 貫通穴加工（ストレート刃） For Through Hole (Straight Flutes) | CSR-C | コーティング ソリッドリーマ<br>TiCN2 Coated Solid Carbide Reamer | P6 | P133 |
| | | CSR-DLC | 超硬ソリッドアルミ用リーマ<br>Solid Carbide Reamer DLC Coated For Aluminum | P11 | P133 |
| | | CSRR-3 | 超硬ルーマー型リーマ<br>Solid Carbide Roumer Type Reamer | P22 | P135 |
| | | CSR | ソリッドリーマ<br>Solid Carbide Reamer | P27 | P135 |
| | | CSRM | ソリッドミディアムリーマ<br>Solid Carbide Medium Reamer | P31 | P135 |
| | | CSLHR | ソリッドロングハンドリーマ<br>Solid Carbide Long Hand Reamer | P33 | P135 |
| | | CSCRS | 超硬チャッキングリーマ<br>Carbide Straight Shank Chucking Reamer | P36 | P136 |
| | | CSCRL | 超硬ロングシャンクチャッキングリーマ<br>Carbide Long Shank Chucking Reamer | P40 | P136 |
| | | CSGR-A | 超硬ソリッドリーマ シャンクスルークーラント<br>Solid Carbide Reamer Shank Through Coolant | P19 | P134 |
| | | CSGR-DLC | 超硬ソリッドリーマ シャンクスルークーラント アルミ用<br>Solid Carbide Reamer Shank Through Coolant For Aluminum | P20 | P135 |
| | | CSR-ECO | 超硬高精度用リーマ<br>Solid Carbide High Precision Reamer | P25 | P135 |
| | | CSR-MC | 超硬ミクロンリーマ<br>Solid Carbide Micron Reamer | P23 | P135 |
| | 貫通穴加工（スパイラル刃） For Through Hole (Spiral Flutes) | CSPR-C | コーティング ソリッドスパイラルリーマ<br>TiCN2 Coated Solid Carbide Spiral Reamer | P9 | P133 |
| | | CSSPSCR | ソリッドスパイラルチャッキングリーマ<br>Solid Carbide Spiral Chucking Reamer | P39 | P135 |
| | | CSHR | ソリッドヘリカルリーマ<br>Solid Carbide Helical Reamer | P42 | P136 |
| | | CHHR | 超硬ハイヘリカルリーマ<br>Carbide High Helical Reamer | P43 | P137 |
| | | CHHRT | 超硬ハイヘリカルリーマ（テーパーシャンク）<br>Solid Carbide Head High Helical Reamer with Taper Shank | P45 | P137 |
| | | CNCR-C | 超硬自動旋盤用リーマ<br>Solid Carbide Reamer For NC Lathe Machine | P4 | P133 |
| | テーパー穴加工 For Taper Hole | CSTPR | ソリッドテーパーピンリーマ<br>Solid Carbide Taper Pin Reamer | P46 | P137 |
| | | CSPGR | ソリッドピンゲートリーマ<br>Solid Carbide Pin Gate Reamer | P47 | P137 |
| | | CSPOTR | 超硬オイルホールスパイラルテーパーリーマ<br>Solid Carbide Head Oil Hole Spiral Taper Reamer | P48 | P138 |
| ハイスリーマ High Speed Steel Reamer | 貫通穴加工（ストレート刃） For Through Hole (Straight Flutes) | HR | ハンドリーマ<br>Hand Reamer | P61 | P140 |
| | | LHR | ロングハンドリーマ<br>Long Hand Reamer | P71 | P140 |
| | | SCR | ストレートシャンクチャッキングリーマ<br>Straight Shank Chucking Reamer | P76 | P141 |
| | | SCRL | ロングシャンクチャッキングリーマ<br>Long Shank Chucking Reamer | P83 | P141 |

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| | 用途別 By Purpose | 型式 Product Code | 製品名称 Product Name | 頁 Page | 切削条件表 Cutting Condition Table Page |
|---|---|---|---|---|---|
| ハイスリーマ High Speed Steel Reamer | 貫通穴加工（ストレート刃） For Through Hole (Straight Flutes) | TCR | テーパーシャンクチャッキングリーマ Taper Shank Chucking Reamer | P85 | P141 |
| | | MR | マシンリーマ Machine Reamer | P87 | P141 |
| | | LMR | ロングマシンリーマ Long Machine Reamer | P95 | P141 |
| | | TiN-SR | TiNストレートリーマ TiN Straight Reamer | P55 | P139 |
| | 貫通穴加工（スパイラル刃） For Through Hole (Spiral Flutes) | SPHR | スパイラルハンドリーマ Spiral Hand Reamer | P68 | P140 |
| | | SPLHR | スパイラルロングハンドリーマ Spiral Long Hand Reamer | P75 | P140 |
| | | SPSCR | ストレートシャンクスパイラルチャッキングリーマ Straight Shank Spiral Chucking Reamer | P80 | P141 |
| | | MCR-TiN | マシンチャッキングリーマ Machine Chucking Reamer | P53 | P139 |
| | | SPMR | スパイラルマシンリーマ Spiral Machine Reamer | P91 | P141 |
| | | SPLMR | スパイラルロングマシンリーマ Spiral Long Machine Reamer | P98 | P141 |
| | | HHHR | ハイヘリカルリーマ High Helical Reamer | P99 | P140 |
| | | HHHRL | ロングハイヘリカルリーマ Long High Helical Reamer | P104 | P140 |
| | | HHHRT | ハイヘリカルリーマ（テーパーシャンク） High Helical Reamer with Taper Shank | P102 | P140 |
| | | HHHRTL | ロングハイヘリカルリーマ（テーパーシャンク） Long High Helical Reamer with Taper Shank | P104 | P140 |
| | | TiN-SPR | TiNスパイラルリーマ TiN Spiral Reamer | P58 | P139 |
| | | NCR-C | 自動旋盤用リーマ Reamer For NC Lathe Machine | P51 | P139 |
| | テーパー穴加工 For Taper Hole | TPR | テーパーピンリーマ Taper Pin Reamer | P107,P110 | P142 |
| | | SPTPR | スパイラルテーパーピンリーマ Spiral Taper Pin Reamer | P108,P110 | P142 |
| | | HTPR | ヘリカルテーパーピンリーマ Helical Taper Pin Reamer | P109,P110 | P142 |
| | | HTPRT | マシン用ヘリカルテーパーピンリーマ Helical Taper Pin Reamer With Taper Shank | P112 | P142 |
| | | TPRT | マシン用テーパーピンリーマ Taper Pin Reamer With Taper Shank | P111 | P142 |
| | | MTR-F | モールステーパーリーマ（ハンド用）仕上用 Morse Taper Reamer (Hand) For Finish | P126 | P144 |
| | | MTR-RF | モールステーパーリーマ（ハンド用）荒仕上用 Morse Taper Reamer (Hand) For Rough Finish | P126 | P144 |
| | | MTRT-F | モールステーパーリーマ（マシン用）仕上用 Morse Taper Reamer (Machine) For Finish | P127 | P144 |
| | | MTRT-RF | モールステーパーリーマ（マシン用）荒仕上用 Morse Taper Reamer (Machine) For Rough Finish | P127 | P144 |
| | | SPTR-F | 1/10テーパー,スパイラルテーパーリーマ 仕上用 Spiral Taper Reamer 1/10T For Finish | P128 | P144 |
| | | SPTR-RF | 1/10テーパー,スパイラルテーパーリーマ 荒仕上用 Spiral Taper Reamer 1/10T For Rough Finish | P128 | P144 |
| | | SUR | スプールリーマ Sprue Reamer | P113 | P143 |
| | | SURH | 半月スプールリーマ Half Sprue Reamer | P118 | P143 |
| | | SURN | ニック付スプールリーマ Sprue Reamer With Nick | P116 | P143 |

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|---|---|---|---|---|---|
| ハイスリーマ High Speed Steel Reamer | テーパー穴加工 For Taper Hole | SUR2-R | R付スプールリーマ 2枚刃<br>Sprue Reamer With R Flute:2 | P121 | P143 |
| | | SP-SUR2-R | R付スプールリーマ 2枚刃スパイラル<br>Spiral Sprue Reamer With R Flute:2 | P122 | P143 |
| | | SUR3-R | R付スプールリーマ 3枚刃<br>Sprue Reamer With R Flute:3 | P123 | P143 |
| | | SP-SUR3-R | R付スプールリーマ 3枚刃スパイラル<br>Spiral Sprue Reamer With R Flute:3 | P124 | P143 |
| | | PGR | ピンゲートリーマ<br>Pin Gate Reamer | P125 | P143 |
| | | PR | パイプリーマ<br>Pipe Reamer | P129 | P144 |
| | | HSPTR | 粉末ハイス スパイラルテーパーリーマ<br>Powder Metallurgy Spiral Taper Reamer | P130 | P142 |
| | 止り穴加工 For Blind Hole | ERR-TiN | エンド刃付止穴用リーマ<br>End Mill Reamer For Blind Hole | P49 | P139 |
| | ドリル・リーマー体型 Drill / Reamer Integrated | DR | ドリルリーマ<br>Drill Reamer | P105 | P141 |
| | | DRT | ドリルリーマ（テーパーシャンク）<br>Drill Reamer With Taper Shank | P106 | P141 |

## カッター シリーズ

| | 用途別 By Purpose | 型式 Product Code | 製品名称 Product Name | 頁 Page | 切削条件表 Cutting Condition Table Page |
|---|---|---|---|---|---|
| 超硬カッター Carbide Cutter | R加工 For R Cut | CSQCS2-A | 超硬ソリッド球面カッター 2枚刃<br>Solid Carbide Spherical Cutter Flute:2 | P147 | P239 |
| | | CSQCL2-A | 超硬ソリッド球面カッター 2枚刃 ロングタイプ<br>Solid Carbide Spherical Cutter Flute:2 Long | P147 | P239 |
| | | CSQCS4-A | 超硬ソリッド球面カッター 4枚刃<br>Solid Carbide Spherical Cutter Flute:4 | P147 | P239 |
| | | CSQCL4-A | 超硬ソリッド球面カッター 4枚刃 ロングタイプ<br>Solid Carbide Spherical Cutter Flute:4 Long | P147 | P239 |
| | | CSWRC-A | 超硬ミニWR面取カッター<br>Solid Carbide Mini Double R Cutter | P170 | P249 |
| | | CSWRCL-A | 超硬ミニWR面取カッターロング<br>Solid Carbide Mini Double R Cutter With Long Straight Shank | P170 | P249 |
| | | CMCRC | 超硬ミニコーナーRカッター<br>Carbide Mini Corner R Cutter | P186 | P254 |
| | | CCRC | 超硬コーナーRカッター<br>Carbide Tipped Corner R Cutter | P187 | P254 |
| | | CSMU-S | 超硬スーパーミニコンベックス スリムシャンク<br>Solid Carbide Super Mini Convex Cutter Slim Shank | P158 | P243 |
| | | CSMU | 超硬スーパーミニコンベックス<br>Solid Carbide Super Mini Convex Cutter | P167 | P247 |
| | | CSMUL-A | 超硬スーパーミニコンベックスロング<br>Solid Carbide Super Mini Convex Cutter Long | P168 | P248 |
| | | CSMV | 超硬スーパーミニコンケーブ<br>Solid Carbide Super Mini Concave Cutter | P169 | P248 |
| | スクエア溝加工（キーシードカッター） For Square Groove Cut (Keyseat Cutter) | CSMK-S | 超硬スーパーミニキーシードカッター スリムシャンク<br>Solid Carbide Super Mini Keyseat Cutter Slim Shank | P159 | P243 |
| | | CSMK-Re | 超硬スーパーミニキーシードカッター 樹脂用<br>Solid Carbide Super Mini Keyseat Cutter For Resin | P154 | P241 |
| | | CSMK-Al | 超硬スーパーミニキーシードカッター アルミ用<br>Solid Carbide Super Mini Keyseat Cutter For Aluminum | P155 | P241 |
| | | CSMK | 超硬スーパーミニキーシードカッター<br>Solid Carbide Super Mini Keyseat Cutter | P171 | P249 |

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| 超硬カッター Carbide Cutter | スクエア溝加工 (キーシードカッター) For Square Groove Cut (Keyseat Cutter) | CSMTKC | 超硬スーパーミニ千鳥刃キーシードカッター Solid Carbide Super Mini Staggered Tooth Keyseat Cutter | P173 | P250 |
| | | CSKC | 超硬ソリッドキーシードカッター Solid Carbide Keyseat Cutter | P178 | P251 |
| | | CKC | 超硬キーシードカッター Solid Carbide Head Keyseat Cutter | P180 | P251 |
| | | CKC-AS | 超硬キーシードカッター ASタイプ Solid Carbide Head Keyseat Cutter AS-Type | P182 | P251 |
| | スクエア溝加工 (Tスロットカッター) For Square Groove Cut (T Slot Cutter) | CSMT-S | 超硬スーパーミニスロット スリムシャンク Solid Carbide Super Mini Slot Cutter Slim Shank | P156 | P242 |
| | | CSMT-H | 超硬スーパーミニスロット 高硬度用 Solid Carbide Super Mini Slot Cutter For Hard Steel | P148 | P239 |
| | | CSMT-Re | 超硬スーパーミニスロット 樹脂用 Solid Carbide Super Mini Slot Cutter For Resin | P149 | P239 |
| | | CSMT-Al | 超硬スーパーミニスロット アルミ用 Solid Carbide Super Mini Slot Cutter For Aluminum | P150 | P240 |
| | | CSMT | 超硬スーパーミニスロット Solid Carbide Super Mini Slot Cutter | P160 | P244 |
| | | CSMTL-A | 超硬スーパーミニスロットロング Solid Carbide Super Mini Slot Cutter Long | P161 | P244 |
| | | CSTC | 超硬ソリッドTスロットカッター Solid Carbide T-Slot Cutter | P176 | P244 |
| | | CSTTC | 超硬ソリッド千鳥刃Tスロットカッター Solid Carbide Staggered Tooth T-Slot Cutter | P177 | P250 |
| | | CSTTCL | 超硬ソリッド千鳥刃Tスロットカッターロング Solid Carbide Staggered Tooth T-Slot Cutter With Long Straight Shank | P177 | P250 |
| | アリ溝・角度付溝・面取り加工 For Dovetail Groove Cut/ Angled Groove Cut/ Chamfering | CSMS-S | 超硬スーパーミニアンギュラ スリムシャンク Solid Carbide Super Mini Angular Cutter Slim Shank | P157 | P242 |
| | | CSMS-H | 超硬スーパーミニアンギュラ 高硬度用 Solid Carbide Super Mini Angular Cutter For Hard Steel | P151 | P240 |
| | | CSMS-Re | 超硬スーパーミニアンギュラ 樹脂用 Solid Carbide Super Mini Angular Cutter For Resin | P151 | P240 |
| | | CSMS-Al | 超硬スーパーミニアンギュラ アルミ用 Solid Carbide Super Mini Angular Cutter For Aluminum | P152 | P240 |
| | | CSMS | 超硬スーパーミニアンギュラ Solid Carbide Super Mini Angular Cutter | P162 | P244 |
| | | CSMSL-A | 超硬スーパーミニアンギュラロング Solid Carbide Super Mini Angular Cutter Long | P162 | P245 |
| | | CSMW-S | 超硬スーパーミニWアンギュラ スリムシャンク Solid Carbide Super Mini W-Angular Cutter Slim Shank | P157 | P243 |
| | | CSMW-H | 超硬スーパーミニWアンギュラ 高硬度用 Solid Carbide Super Mini W-Angular Cutter For Hard Steel | P152 | P240 |
| | | CSMW-Re | 超硬スーパーミニWアンギュラ 樹脂用 Solid Carbide Super Mini W-Angular Cutter For Resin | P153 | P240 |
| | | CSMW-Al | 超硬スーパーミニWアンギュラ アルミ用 Solid Carbide Super Mini W-Angular Cutter For Aluminum | P153 | P241 |
| | | CSMW | 超硬スーパーミニWアンギュラ Solid Carbide Super Mini W-Angular Cutter | P163 | P245 |
| | | CSMWL-A | 超硬スーパーミニWアンギュラロング Solid Carbide Super Mini W-Angular Cutter Long | P163 | P246 |
| | | CSMST2-P | 超硬ソリッドミニストロングアンギュラ 2枚刃 Solid Carbide Mini Strong Angular Cutter Flute:2 | P164 | P246 |
| | | CSMST4-P | 超硬ソリッドミニストロングアンギュラ 4枚刃 Solid Carbide Mini Strong Angular Cutter Flute:4 | P165 | P247 |
| | | CSACS | 超硬ソリッドアンギュラカッター Solid Carbide Angular Cutter With Straight Shank | P175 | P250 |
| | | CSACLS | 超硬ソリッドアンギュラカッターロング Solid Carbide Angular Cutter With Long Straight Shank | P175 | P250 |

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| 超硬カッター Carbide Cutter | Oリングアリ溝加工 For O Ring Dovetail Groove Cut | OAC4 | 超硬Oリング用アリ溝カッター 4枚刃 ステン用仕上げ Solid Carbide Angular Cutter For O Ring 4Flutes For Finishing Stainless | P188 | P254 |
| | | OAC4-R | 超硬Oリング用アリ溝カッター 4枚刃 ステン用荒 Solid Carbide Angular Cutter For O Ring 4Flutes For Roughing Stainless | P189 | P255 |
| | | OAC2 | 超硬Oリング用アリ溝カッター 2枚刃 アルミ用 Solid Carbide Angular Cutter For O Ring 2Flutes For Aluminum | P190 | P255 |
| | | OACR2 | 超硬R面取付Oリング用アリ溝カッター Solid Carbide Angular Cutter With Chamfering R For O Ring | P191 | P255 |
| | ザグリ加工 For Counterboring | CZCS | 超硬パイロット付ザグリカッター ストレートシャンク Carbide Tipped Counterbore With Straight Shank | P184 | P252 |
| | | CZCT | 超硬パイロット付ザグリカッター テーパーシャンク Carbide Tipped Counterbore With Taper Shank | P184 | P252 |
| | | CSSC | 超硬シート面カッター（PF規格／UNF規格） Carbide Tipped Seat Surface Cutter (PF Standard / UNF Standard) | P185 | P253 |
| | | CSSZC | 超硬シート面ザグリカッター（PF規格／UNF規格） Carbide Counterbore With Seat Surface (PF Standard / UNF Standard) | P185 | P253 |
| | | CCB | 超硬沈めフライス Carbide Tipped Counterbore | P186 | P253 |
| | | CUKC-K10 | 超硬裏ザグリカッターK10 Carbide Tipped Back Counterboring Cutter | P192 | P256 |
| | | CUKC-P20 | 超硬裏ザグリカッターP20 Carbide Tipped Back Counterboring Cutter | P192 | P256 |
| ハイスカッター High Speed Steel Cutter | R加工 For R Cut | RC | R面取カッター（スプールブッシュ用） R Cutter (For Sprue Bushes) | P221 | P263 |
| | | MCRC | ミニコーナーRカッター（ハーフ） Mini Corner R Cutter | P223 | P265 |
| | | CRC | コーナーRカッター Corner R Cutter | P223 | P265 |
| | スクエア溝加工（キーシードカッター） For Square Groove Cut (Keyseat Cutter) | KC | キーシードカッター Keyseat Cutter | P200 | P258 |
| | | KCS | 側刃付キーシードカッター Keyseat Cutter With Side Cutting Edge | P208 | P258 |
| | | KCLS | ロングシャンクキーシードカッター Long Shank Keyseat Cutter | P209 | P259 |
| | | TKCLS | ロングシャンク千鳥刃キーシードカッター Long Shank Staggered Tooth Keyseat Cutter | P211 | P259 |
| | | MSS-TiN | 柄付メタルソー Metal Saw With Straight Shank (TiN Coated) | P212 | P259 |
| | | KCNC-C | 自動旋盤用カッター TiCNコーティング Cutter For NC Lathe Machine TiCN Coated | P198 | P258 |
| | | KCNC | 自動旋盤用カッター Cutter For NC Lathe Machine | P199 | P258 |
| | Oリングアリ溝加工 For O Ring Dovetail Groove Cut | HOAC2-A | Oリング用アリ溝カッター 2枚刃 Angular Cutter For O Ring 2Flutes | P193 | P256 |
| | | HOAC4-A | Oリング用アリ溝カッター 4枚刃 Angular Cutter For O Ring 4Flutes | P193 | P256 |
| | | HOACR2-A | R面取付Oリング用アリ溝カッター 2枚刃 Angular Cutter With Chamfering R For O Ring 2Flutes | P194 | P256 |
| | アリ溝・角度付溝・面取り加工 For Dovetail Groove Cut/ Angled Groove Cut/ Chamfering | ACS | 柄付アンギュラカッター Angular Cutter With Straight Shank | P214 | P260 |
| | | ACSW | 柄付Wアンギュラカッター W Angular Cutter With Straight Shank | P216 | P261 |
| | | ACST | 強力型柄付アンギュラカッター Long Shank Strong Angular Cutter With Straight Shank | P217 | P262 |
| | | PCS | 柄付傘型カッター Parasol Cutter With Straight Shank | P218 | P263 |
| | | CF | センターフライス Countersink With Straight Shank | P219 | P263 |
| | | CFT | センターフライス（テーパーシャンク） Countersink With Taper Shank | P220 | P263 |

# ■カッター シリーズ

| | 用途別 By Purpose | 型式 Product Code | 製品名称 Product Name | 頁 Page | 切削条件表 Cutting Condition Table Page |
|---|---|---|---|---|---|
| ハイスカッター High Speed Steel Cutter | | CC | センター面取カッター Center Chamfering Cutter | P222 | P264 |
| | ザグリ加工 For Counterboring | ZCS | パイロット付ザグリカッター ストレートシャンク Counterbore With Straight Shank | P224 | P266 |
| | | ZCT | パイロット付ザグリカッター テーパーシャンク Counterbore With Taper Shank | P225 | P266 |
| | | ZCP | ザグリカッター用パイロット Guide For Counterbore | P226 | |
| | | CB | 六角穴付ボルト用沈めフライス ストレートシャンク Counterbore With Straight Shank | P227 | P267 |
| | | CBT | 六角穴付ボルト用沈めフライス テーパーシャンク Counterbore With Taper Shank | P227 | P267 |
| | | CBLS | 六角穴付ボルト用ロングシャンク沈めフライス Long Shank Counterbore | P228 | P267 |
| | | CBS | 皿小ネジ用沈めフライス Screw Countersink | P229 | P267 |
| | | CBH | 平小ネジ用沈めフライス Screw Counterbore | P228 | P267 |
| | | CBO | 押出ピン用沈めフライス Push Pin Counterbore | P229 | P268 |
| | | CB-JM | JIS沈めフライス Counterbore With JIS | P230 | P268 |
| | | CB-TSM | TSM沈めフライス Counterbore With TSM | P230 | P268 |
| | | DCB | 六角穴付ボルト用ドリル付沈めフライス Counterbore With Drill | P231 | P269 |
| | | DCBS | 皿小ネジ用ドリル付沈めフライス Screw Countersink With Drill | P232 | P269 |
| | | DCBTA | TAS六角穴付ボルト用ドリル付沈めフライス TAS Counterbore With Drill | P232 | P269 |
| | | DCBSTA | TAS皿小ネジ用ドリル付沈めフライス TAS Screw Countersink With Drill | P233 | P270 |
| | | DCB-TRM | 六角ボルト沈め用段付ドリル R型 Counterbore With Drill (Taper Shank) R-Type | P234 | P270 |
| | | DCB-TZM | 六角ボルト沈め用段付ドリル Z型 Counterbore With Drill (Taper Shank) Z-Type | P234 | P270 |
| | | DCB-SRM | 六角ボルト沈め用段付ドリル（ストレートシャンク）R型 Counterbore With Drill (Straight Shank) R-Type | P235 | P269 |
| | | DCB-SHM | 平小ネジ沈め用段付ドリル（ストレートシャンク）H型 Screw Counterbore With Drill (Straight Shank) H-Type | P235 | P269 |
| | | DCB-SSM | 皿小ネジ沈め用段付ドリル（ストレートシャンク）S型 Screw Counterbore With Drill (Straight Shank) S-Type | P236 | P270 |
| | | SSC-TiN | シート面カッター（PF規格／UNF規格） Seat Surface Cutter (PF Standard / UNF Standard) | P237 | P271 |
| | | SSZC-TiN | シート面ザグリカッター（PF規格／UNF規格） Counterbore With Seat Surface (PF Standard / UNF Standard) | P237 | P271 |
| | | UKC | 裏ザグリカッター Back Counterboring Cutter | P197 | P257 |
| | | UKCC | 裏ザグリカッター TiNコーティング Back Counterboring Cutter (TiN Coated) | P197 | P257 |
| | | BZC | スタンダード裏ザグリカッター Standard Back Counterboring Cutter | P195 | P257 |
| | | BDC | 深穴用裏ザグリカッター Back Counterboring Cutter For Deep Hole | P195 | P257 |
| | | BMC | 裏面取カッター Back Countersink | P195 | P257 |
| | | BZH | ガイドホルダー Guide Holder | P195 | |

## ドリル シリーズ

| | 用途別 By Purpose | 型式 Product Code | 製品名称 Product Name | 頁 Page | 切削条件表 Cutting Condition Table Page |
|---|---|---|---|---|---|
| 超硬ドリル Carbide Drill | 非鉄・樹脂加工 Nonfrrous Metal・Resin | CSHD | 超硬半月ドリル Solid Carbide Half Drill | P275 | P287 |
| | ドリル・ザグリ加工 Drilling / Counterboring | CNCZ-C | 超硬フラットザグリドリル（自動旋盤用） Solid Carbide Flat Drill For Counterboring | P273 | P287 |
| | 折損タップ除去専用 For Broken Tap Removal | TR-P | タップ リムーバーPlus（レギュラーサイズ） Tap Remover Plus Regular Size | P274 | P274 |
| | | TRL-P | タップ リムーバーPlus（ロングサイズ） Tap Remover Plus Long Size | P274 | P274 |
| | 位置決め・面取り加工 For Positioning and Chamfering | CCTS | 超硬センタリングツール ショートタイプ Solid Carbide Head Centering Tool Short Type | P276 | P287 |
| | | CCTL | 超硬センタリングツール ロングタイプ Solid Carbide Head Centering Tool Long Type | P276 | P287 |
| | | CCTST | 超硬センタリングツール ショートタイプ(テーパーシャンク) Solid Carbide Head Centering Tool with Taper Shank Short Type | P277 | P287 |
| | | CCTLT | 超硬センタリングツール ロングタイプ(テーパーシャンク) Solid Carbide Head Centering Tool with Taper Shank Long Type | P277 | P287 |
| ハイスドリル High Speed Steel Drill | ドリル・ザグリ加工 Drilling / Counterboring | FZD-A | フラットザグリドリル Flat Drill For Counterboring | P278 | P288 |
| | 位置決め・面取り加工 For Positioning and Chamfering | GSS | スターティングドリル Starting Drill | P280 | P288 |
| | | CT | センタリングツール Centering Tool Point 90° • 118° | P284 | P290 |
| | | CTT | センタリングツール（テーパーシャンク） Centering Tool With Taper Shank Point 90° • 118° | P284 | P290 |
| | テーパー穴加工 For Taper Hole | TPD | テーパーピンドリル（ストレートシャンク） Taper Pin Drill With Straight Shank | P281 | P289 |
| | | TPDT | テーパーピンドリル（テーパーシャンク） Taper Pin Drill With Taper Shank | P281 | P289 |
| | | SPTDN | ニック付スパイラルテーパーコアドリル Spiral Taper Core Drill With Nick | P282 | P289 |
| | 管用ドリル For Pipe | PTDS | 管用ドリル（ストレートシャンク） Drill With Straight Shank For Pipe | P283 | P290 |
| | | PTDT | 管用ドリル（テーパーシャンク） Drill With Taper Shank For Pipe | P283 | P290 |

## エンドミル シリーズ

| | 形状別 By Geometry | 型式 Product Code | 製品名称 Product Name | 頁 Page | 切削条件表 Cutting Condition Table Page |
|---|---|---|---|---|---|
| 超硬エンドミル Carbide End Mill | カーボンファイバー専用 For Carbon Fibre | CSFRPE-P | 超硬ソリッドファイバー用カッター底刃付タイプ コーティング付 P coated Solid Carbide Cutter For Fiber End Mill Type | P293 | P347 |
| | | CSFRPE | 超硬ソリッドファイバー用カッター底刃付タイプ Solid Carbide Cutter For Fiber End Mill Type | P293 | P347 |
| | | CSFRP-P | 超硬ソリッドファイバー用カッター コーティング付 P coated Solid Carbide Cutter For Fiber | P293 | P347 |
| | | CSFRP | 超硬ソリッドファイバー用カッター Solid Carbide Cutter For Fiber | P293 | P347 |
| | スクエア形状 Square shape | GES2 | 超硬グラファイト ソリッドエンドミル 2枚刃 スタンダードタイプ Solid Carbide Graphite Standard End Mill Flute:2 | P294 | P347 |
| | | GEL2 | 超硬グラファイト ソリッドエンドミル 2枚刃 ロングタイプ Solid Carbide Graphite Long End Mill Flute:2 | P294 | P347 |
| | | GES4 | 超硬グラファイト ソリッドエンドミル 4枚刃 スタンダードタイプ Solid Carbide Graphite Standard End Mill Flute:4 | P295 | P348 |
| | | GEL4 | 超硬グラファイト ソリッドエンドミル 4枚刃 ロングタイプ Solid Carbide Graphite Long End Mill Flute:4 | P295 | P348 |
| | | AHES2 | 超硬エアーホールエンドミル 2枚刃 スタンダードタイプ Carbide Airhole Standard End Mill Flute:2 | P302 | P351 |
| | | AHEL2 | 超硬エアーホールエンドミル 2枚刃 ロングタイプ Carbide Airhole Long End Mill Flute:2 | P302 | P351 |

# ■エンドミル シリーズ

| | 形状別 By Geometry | 型式 Product Code | 製品名称 Product Name | 頁 Page | 切削条件表 Cutting Condition Table Page |
|---|---|---|---|---|---|
| 超硬エンドミル Carbide End Mill | スクエア形状 Square shape | AHES4 | 超硬エアーホールエンドミル 4枚刃 スタンダードタイプ Carbide Airhole Standard End Mill Flute:4 | P302 | P352 |
| | | AHEL4 | 超硬エアーホールエンドミル 4枚刃 ロングタイプ Carbide Airhole Long End Mill Flute:4 | P302 | P352 |
| | | CSME2 | 超硬スーパーミニエンドミル 2枚刃 Solid Carbide Super Mini End Mill Flute:2 | P324 | P361 |
| | | CSME4 | 超硬スーパーミニエンドミル 4枚刃 Solid Carbide Super Mini End Mill Flute:4 | P324 | P361 |
| | テーパー形状 Taper shape | GTE | 超硬グラファイト ソリッドテーパーエンドミル Solid Carbide Graphite Taper End Mill | P300 | P350 |
| | | AHTE | 超硬エアホールソリッドテーパーエンドミル Solid Carbide Airhole Taper End Mill | P305 | P353 |
| | | CSTE | 超硬ソリッドテーパーエンドミル Solid Carbide Taper End Mill | P310 | P356 |
| | | CSTEM | 超硬ソリッドテーパーエンドミル（ミディアム） Solid Carbide Taper End Mill (Medium) | P312 | P356 |
| | | CSTEL | 超硬ソリッドテーパーエンドミル（ロング） Solid Carbide Taper End Mill (Long) | P314 | P356 |
| | | CRM-2 | 超硬ソリッド台形ランナーエンドミル Solid Carbide Taper End Mill For Runner | P320 | P358 |
| | | CRM-P | 超硬ソリッド台形ランナーエンドミル（Pコーティング） P-Coated Solid Carbide Taper End Mill For Runner | P321 | P359 |
| | | CSRT-A | 超硬リバースカッター（超硬ソリッド逆テーパーエンドミル） Solid Carbide Reverse Cutter | P322 | P360 |
| | ボール形状 Ball shape | GBES2 | 超硬グラファイト ソリッドボールエンドミル 2枚刃 スタンダードタイプ Solid Carbide Graphite Standard Ball End Mill Flute:2 | P296 | P349 |
| | | GBEL2 | 超硬グラファイト ソリッドボールエンドミル 2枚刃 ロングタイプ Solid Carbide Graphite Long Ball End Mill Flute:2 | P297 | P349 |
| | | GBES4 | 超硬グラファイト ソリッドボールエンドミル 4枚刃 スタンダードタイプ Solid Carbide Graphite Standard Ball End Mill Flute:4 | P298 | P350 |
| | | GBEL4 | 超硬グラファイト ソリッドボールエンドミル 4枚刃 ロングタイプ Solid Carbide Graphite Long Ball End Mill Flute:4 | P299 | P350 |
| | | AHBES2 | 超硬エアホールボールエンドミル 2枚刃 スタンダードタイプ Carbide Airhole Standard Ball End Mill Flute:2 | P303 | P352 |
| | | AHBEL2 | 超硬エアホールボールエンドミル 2枚刃 ロングタイプ Carbide Airhole Long Ball End Mill Flute:2 | P303 | P352 |
| | | AHBES4 | 超硬エアホールボールエンドミル 4枚刃 スタンダードタイプ Carbide Airhole Standard Ball End Mill Flute:4 | P304 | P353 |
| | | AHBEL4 | 超硬エアホールボールエンドミル 4枚刃 ロングタイプ Carbide Airhole Long Ball End Mill Flute:4 | P304 | P353 |
| | | CSBE | 超硬ソリッドボールエンドミル Solid Carbide Ball End Mill | P307 | P354 |
| | | CMBE | 超硬先ムクボールエンドミル Solid Carbide Head Ball End Mill | P309 | P355 |
| | テーパーボール形状 Taper Ball shape | GTBE | 超硬グラファイト ソリッドテーパーボールエンドミル Solid Carbide Graphite Taper Ball End Mill | P301 | P351 |
| | | AHTBE | 超硬エアホールソリッドテーパーボールエンドミル Solid Carbide Airhole Taper Ball End Mill | P306 | P354 |
| | | CSTBE | 超硬ソリッドテーパーボールエンドミル Solid Carbide Taper Ball End Mill | P315 | P357 |
| | | CSTBEL | 超硬ソリッドロングテーパーボールエンドミル Solid Carbide Long Taper Ball End Mill | P317 | P357 |
| ハイスエンドミル High Speed Steel End mill | スクエア形状 Square shape | SLEM | スロッチングエンドミル Slotting End Mill | P335 | P364 |
| | | SLEML | ロングスロッチングエンドミル Long Slotting End Mill | P336 | P364 |
| | | SLEMLS | ロングシャンクスロッチングエンドミル Long Shank Slotting End Mill | P337 | P364 |
| | | HPSLEM | HPMスロッチングエンドミル HPM Slotting End Mill | P338 | P365 |

## ■エンドミル シリーズ

| | 形状別<br>*By Geometry* | 型式<br>*Product Code* | 製品名称<br>*Product Name* | 頁<br>*Page* | 切削条件表<br>*Cutting Condition Table Page* |
|---|---|---|---|---|---|
| ハイスエンドミル<br>*High Speed Steel End mill* | スクエア形状<br>*Square shape* | EXLE4 | 超ロング4枚刃エンドミル<br>*Long Flute End Mill* | P339 | P365 |
| | | EXLSE4 | 超ロングシャンク4枚刃エンドミル<br>*Long Shank End Mill* | P340 | P365 |
| | テーパー形状<br>*Taper shape* | TE-2 | テーパーエンドミル 2枚刃<br>*Taper End Mill Flute:2* | P341 | P366 |
| | | TE-4 | テーパーエンドミル 4枚刃<br>*Taper End Mill Flute:4* | P342 | P367 |
| | | TEL | ロングテーパーエンドミル<br>*Long Taper End Mill* | P344 | P366 |
| | | RM2 | ランナーミル（台形ランナー用）<br>*Taper End Mill For Runner* | P345 | P368 |
| | ボール形状<br>*Ball shape* | BE | ボールエンドミル<br>*Ball End Mill* | P325 | P362 |
| | | BEL | ロングボールエンドミル<br>*Long Ball End Mill* | P328 | P362 |
| | | BELS | ロングシャンクボールエンドミル<br>*Long Shank Ball End Mill* | P329 | P362 |
| | | HPBE | HPMボールエンドミル<br>*HPM Ball End Mill* | P330 | P362 |
| | テーパーボール形状<br>*Taper Ball shape* | HPTBE | テーパーボールエンドミル<br>*Taper Ball End Mill* | P332 | P363 |
| | C面付形状<br>*Shape with Corner C* | CEM | C面付エンドミル<br>*Corner C End Mill* | P334 | P363 |

# REAMER SERIES

超硬

# CSUSR-A

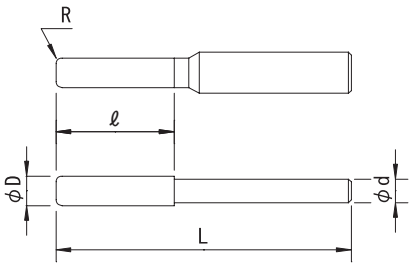
## 超硬ステンレス用リーマ　*Solid Carbide Reamer For Stainless Steel-A Coated*

切削条件表 P133　高硬度・難削材　右ネジレ30°　TiAlN　食付R　K03



D≦Φ2.995センターナシ






| 公差 (Tolerance) | D | | | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.01トビ Increment 0.01 | +0.005 0 | 0.005トビ Increment 0.005 | +0.005 0 | 0.5～3 | +0.007 +0.002 | 3.1～6 | +0.009 +0.004 | 6.1～10 | +0.012 +0.006 | 10.1～12 | +0.015 +0.007 | 0 −0.009 |

右刃右ネジレ30°　TiAlNコーティング　食付R K03
Helix Angle-Right30°　TiAlN Coating　Shape of Chamfer-R　Micro Grain Carbide

| 直径 (ΦD) *Dia.* | 食付R (R) *Chamfer R* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **0.5** | 0.1 | 6 | 50 | 3 | 4 | – |
| **0.6** | 0.1 | 8 | 50 | 3 | 4 | – |
| **0.7** | 0.1 | 8 | 50 | 3 | 4 | – |
| **0.8** | 0.1 | 12 | 50 | 3 | 4 | – |
| **0.9** | 0.2 | 12 | 50 | 3 | 4 | – |
| **1** | 0.2 | 12 | 50 | 3 | 4 | – |
| **1.1** | 0.2 | 15 | 50 | 3 | 4 | – |
| **1.2** | 0.2 | 15 | 50 | 3 | 4 | – |
| **1.3** | 0.2 | 15 | 50 | 3 | 4 | – |
| **1.4** | 0.2 | 16 | 50 | 3 | 4 | – |
| **1.5** | 0.2 | 16 | 50 | 3 | 4 | – |
| **1.6** | 0.2 | 18 | 50 | 3 | 4 | – |
| **1.7** | 0.2 | 18 | 50 | 3 | 4 | – |
| **1.8** | 0.2 | 18 | 50 | 3 | 4 | – |
| **1.9** | 0.2 | 18 | 50 | 3 | 4 | – |
| **2** | 0.2 | 18 | 50 | 3 | 4 | – |
| **2.1** | 0.3 | 20 | 50 | 3 | 4 | – |
| **2.2** | 0.3 | 20 | 50 | 3 | 4 | – |
| **2.3** | 0.3 | 20 | 50 | 3 | 4 | – |
| **2.4** | 0.3 | 20 | 50 | 3 | 4 | – |
| **2.5** | 0.3 | 20 | 50 | 3 | 4 | – |
| **2.6** | 0.3 | 20 | 50 | 3 | 4 | – |
| **2.7** | 0.3 | 20 | 50 | 3 | 4 | – |
| **2.8** | 0.3 | 20 | 50 | 3 | 4 | – |
| **2.9** | 0.3 | 20 | 50 | 3 | 4 | – |
| **3** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.1** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.2** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.3** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.4** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.5** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.6** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.7** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.8** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.9** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **4** | 0.4 | 27 | 60 | 3 | 4 | 60°凹 |
| **4.1** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.2** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.3** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.4** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.5** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.6** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.7** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.8** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.9** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **5** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付R (R) *Chamfer R* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **5.1** | 0.5 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.2** | 0.5 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.3** | 0.5 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.4** | 0.5 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.5** | 0.5 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.6** | 0.5 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.7** | 0.5 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.8** | 0.5 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.9** | 0.5 | 30 | 80 | 6 | 6 | 60°凹 |
| **6** | 0.5 | 30 | 80 | 6 | 6 | 60°凹 |
| **6.1** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.2** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.3** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.4** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.5** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.6** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.7** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.8** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.9** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **7** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.1** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.2** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.3** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.4** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.5** | 0.5 | 35 | 90 | 8 | 6 | 60°凹 |
| **7.6** | 0.5 | 35 | 90 | 8 | 6 | 60°凹 |
| **7.7** | 0.5 | 35 | 90 | 8 | 6 | 60°凹 |
| **7.8** | 0.5 | 35 | 90 | 8 | 6 | 60°凹 |
| **7.9** | 0.5 | 35 | 90 | 8 | 6 | 60°凹 |
| **8** | 0.5 | 35 | 90 | 8 | 6 | 60°凹 |
| **8.1** | 0.5 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.2** | 0.5 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.3** | 0.5 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.4** | 0.5 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.5** | 0.5 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.6** | 0.5 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.7** | 0.5 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.8** | 0.5 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.9** | 0.5 | 40 | 90 | 8 | 6 | 60°凹 |
| **9** | 0.5 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.1** | 0.5 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.2** | 0.5 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.3** | 0.5 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.4** | 0.5 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.5** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **9.6** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |

# CSUSR-A 超硬ステンレス用リーマ

| 直径 (ΦD) Dia. | 食付R (R) Chamfer R | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **9.7** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **9.8** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **9.9** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **10** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **10.1** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **10.2** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **10.3** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **10.4** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **10.5** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **10.6** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **10.7** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **10.8** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付R (R) Chamfer R | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **10.9** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **11** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **11.1** | 0.5 | 45 | 100 | 10 | 6 | 60°凹 |
| **11.2** | 0.5 | 45 | 100 | 10 | 6 | 60°凹 |
| **11.3** | 0.5 | 45 | 100 | 10 | 6 | 60°凹 |
| **11.4** | 0.5 | 45 | 100 | 10 | 6 | 60°凹 |
| **11.5** | 0.5 | 45 | 100 | 12 | 6 | 60°凹 |
| **11.6** | 0.5 | 45 | 100 | 12 | 6 | 60°凹 |
| **11.7** | 0.5 | 45 | 100 | 12 | 6 | 60°凹 |
| **11.8** | 0.5 | 45 | 100 | 12 | 6 | 60°凹 |
| **11.9** | 0.5 | 45 | 100 | 12 | 6 | 60°凹 |
| **12** | 0.5 | 45 | 100 | 12 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付R (R) Chamfer R | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **0.51 ～ 0.59** | 0.1 | 8 | 50 | 3 | 4 | – |
| **0.61 ～ 0.69** | 0.1 | 8 | 50 | 3 | 4 | – |
| **0.71 ～ 0.79** | 0.1 | 12 | 50 | 3 | 4 | – |
| **0.81 ～ 0.89** | 0.2 | 12 | 50 | 3 | 4 | – |
| **0.91 ～ 0.99** | 0.2 | 12 | 50 | 3 | 4 | – |
| **1.01 ～ 1.09** | 0.2 | 15 | 50 | 3 | 4 | – |
| **1.11 ～ 1.19** | 0.2 | 15 | 50 | 3 | 4 | – |
| **1.21 ～ 1.29** | 0.2 | 15 | 50 | 3 | 4 | – |
| **1.31 ～ 1.39** | 0.2 | 16 | 50 | 3 | 4 | – |
| **1.41 ～ 1.49** | 0.2 | 16 | 50 | 3 | 4 | – |
| **1.51 ～ 1.59** | 0.2 | 18 | 50 | 3 | 4 | – |
| **1.61 ～ 1.69** | 0.2 | 18 | 50 | 3 | 4 | – |
| **1.71 ～ 1.79** | 0.2 | 18 | 50 | 3 | 4 | – |
| **1.81 ～ 1.89** | 0.2 | 18 | 50 | 3 | 4 | – |
| **1.91 ～ 1.99** | 0.2 | 18 | 50 | 3 | 4 | – |
| **2.01 ～ 2.09** | 0.2 | 20 | 50 | 3 | 4 | – |
| **2.11 ～ 2.19** | 0.3 | 20 | 50 | 3 | 4 | – |
| **2.21 ～ 2.29** | 0.3 | 20 | 50 | 3 | 4 | – |
| **2.31 ～ 2.39** | 0.3 | 20 | 50 | 3 | 4 | – |
| **2.41 ～ 2.49** | 0.3 | 20 | 50 | 3 | 4 | – |
| **2.51 ～ 2.59** | 0.3 | 20 | 50 | 3 | 4 | – |
| **2.61 ～ 2.69** | 0.3 | 20 | 50 | 3 | 4 | – |
| **2.71 ～ 2.79** | 0.3 | 20 | 50 | 3 | 4 | – |
| **2.81 ～ 2.89** | 0.3 | 20 | 50 | 3 | 4 | – |
| **2.91 ～ 2.99** | 0.3 | 27 | 60 | 3 | 4 | – |
| **3.01 ～ 3.09** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.11 ～ 3.19** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.21 ～ 3.29** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.31 ～ 3.39** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.41 ～ 3.49** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.51 ～ 3.59** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.61 ～ 3.69** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.71 ～ 3.79** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.81 ～ 3.89** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |

| 直径 (ΦD) Dia. | 食付R (R) Chamfer R | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **3.91 ～ 3.99** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **4.01 ～ 4.09** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.11 ～ 4.19** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.21 ～ 4.29** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.31 ～ 4.39** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.41 ～ 4.49** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.51 ～ 4.59** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.61 ～ 4.69** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.71 ～ 4.79** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.81 ～ 4.89** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.91 ～ 4.99** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **5.01 ～ 5.09** | 0.5 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.11 ～ 5.19** | 0.5 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.21 ～ 5.29** | 0.5 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.31 ～ 5.39** | 0.5 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.41 ～ 5.49** | 0.5 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.51 ～ 5.59** | 0.5 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.61 ～ 5.69** | 0.5 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.71 ～ 5.79** | 0.5 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.81 ～ 5.89** | 0.5 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.91 ～ 5.99** | 0.5 | 30 | 80 | 6 | 6 | 60°凹 |
| **6.01 ～ 6.09** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.95 ～ 6.99** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.01 ～ 7.05** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.95 ～ 7.99** | 0.5 | 35 | 90 | 8 | 6 | 60°凹 |
| **8.01 ～ 8.05** | 0.5 | 35 | 90 | 8 | 6 | 60°凹 |
| **8.95 ～ 8.99** | 0.5 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.01 ～ 9.05** | 0.5 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.95 ～ 9.99** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **10.01 ～ 10.05** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **10.95 ～ 10.99** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **11.01 ～ 11.05** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **11.95 ～ 11.99** | 0.5 | 45 | 100 | 12 | 6 | 60°凹 |
| **12.01 ～ 12.05** | 0.5 | 45 | 100 | 12 | 6 | 60°凹 |

# CSUSR-A 超硬ステンレス用リーマ

| 直径 (ΦD) Dia. | 食付R (R) Chamfer R | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **0.955 ～ 0.995** | 0.2 | 12 | 50 | 3 | 4 | – |
| **1.005 ～ 1.045** | 0.2 | 15 | 50 | 3 | 4 | – |
| **1.955 ～ 1.995** | 0.2 | 18 | 50 | 3 | 4 | – |
| **2.005 ～ 2.045** | 0.2 | 20 | 50 | 3 | 4 | – |
| **2.955 ～ 2.995** | 0.3 | 27 | 60 | 3 | 4 | – |
| **3.005 ～ 3.045** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.955 ～ 3.995** | 0.3 | 27 | 60 | 3 | 4 | 60°凹 |
| **4.005 ～ 4.045** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.955 ～ 4.995** | 0.4 | 30 | 70 | 4 | 6 | 60°凹 |
| **5.005 ～ 5.045** | 0.5 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.955 ～ 5.995** | 0.5 | 30 | 80 | 6 | 6 | 60°凹 |
| **6.005 ～ 6.045** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付R (R) Chamfer R | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **6.955 ～ 6.995** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.005 ～ 7.045** | 0.5 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.955 ～ 7.995** | 0.5 | 35 | 90 | 8 | 6 | 60°凹 |
| **8.005 ～ 8.045** | 0.5 | 35 | 90 | 8 | 6 | 60°凹 |
| **8.955 ～ 8.995** | 0.5 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.005 ～ 9.045** | 0.5 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.955 ～ 9.995** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **10.005 ～ 10.045** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **10.955 ～ 10.995** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **11.005 ～ 11.045** | 0.5 | 40 | 100 | 10 | 6 | 60°凹 |
| **11.955 ～ 11.995** | 0.5 | 45 | 100 | 12 | 6 | 60°凹 |
| **12.005 ～ 12.045** | 0.5 | 45 | 100 | 12 | 6 | 60°凹 |

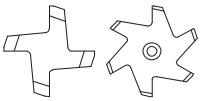
超硬

# CNCR-C

## 超硬自動旋盤用リーマ　*Solid Carbide Reamer For NC Lathe Machine*

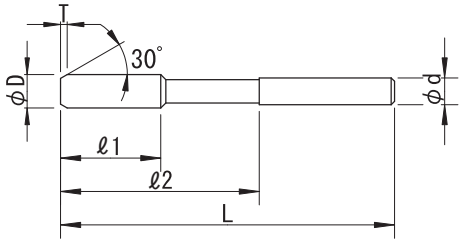
切削条件表 P133

貫通穴加工(スパイラル刃)　左ネジレ7°　TiCN　食付30°　K10



D≦Φ2.9　60°凸






| 公差(Tolerance) | D：$^{+0.005}_{0}$ | d：h7 |
|---|---|---|

右刃左ネジレ7°　TiCNコーティング　食付角度30°　K10
Helix Angle-Left7°　TiCN Coating　Chamfer Angle30°　Micro Grain Carbide (K10)

| 直径(ΦD) *Dia.* | 食付長(T) *Chamfer Length* | 刃長(ℓ1) *Length of Flutes* | 首下長(ℓ2) *Neck Length* | 全長(L) *Overall Length* | シャンク径(Φd) *Shank Dia.* | 刃数(N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| 1 | 0.4 | 12 | 30 | 50 | 3 | 4 | 60°凸 |
| 1.1 | 0.4 | 12 | 30 | 50 | 3 | 4 | 60°凸 |
| 1.2 | 0.4 | 12 | 30 | 50 | 3 | 4 | 60°凸 |
| 1.3 | 0.4 | 12 | 30 | 50 | 3 | 4 | 60°凸 |
| 1.4 | 0.4 | 15 | 30 | 50 | 3 | 4 | 60°凸 |
| 1.5 | 0.4 | 15 | 30 | 50 | 3 | 4 | 60°凸 |
| 1.6 | 0.4 | 15 | 30 | 50 | 3 | 4 | 60°凸 |
| 1.7 | 0.5 | 15 | 30 | 50 | 3 | 4 | 60°凸 |
| 1.8 | 0.5 | 15 | 30 | 50 | 3 | 4 | 60°凸 |
| 1.9 | 0.5 | 15 | 30 | 50 | 3 | 4 | 60°凸 |
| 2 | 0.5 | 16 | 30 | 50 | 3 | 4 | 60°凸 |
| 2.1 | 0.5 | 18 | 30 | 50 | 3 | 4 | 60°凸 |
| 2.2 | 0.5 | 18 | 30 | 50 | 3 | 4 | 60°凸 |
| 2.3 | 0.5 | 18 | 30 | 50 | 3 | 4 | 60°凸 |
| 2.4 | 0.5 | 18 | 30 | 50 | 3 | 4 | 60°凸 |
| 2.5 | 0.5 | 18 | 30 | 50 | 3 | 4 | 60°凸 |
| 2.6 | 0.5 | 18 | 30 | 50 | 3 | 4 | 60°凸 |
| 2.7 | 0.5 | 18 | 30 | 50 | 3 | 4 | 60°凸 |
| 2.8 | 0.5 | 18 | 30 | 50 | 3 | 4 | 60°凸 |
| 2.9 | 0.5 | 18 | 30 | 50 | 3 | 4 | 60°凸 |
| 3 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 3.1 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 3.2 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 3.3 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 3.4 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 3.5 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 3.6 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 3.7 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 3.8 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 3.9 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 4 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 4.1 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 4.2 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 4.3 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 4.4 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 4.5 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 4.6 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 4.7 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 4.8 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 4.9 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 5 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 5.1 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |
| 5.2 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |
| 5.3 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |
| 5.4 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |

| 直径(ΦD) *Dia.* | 食付長(T) *Chamfer Length* | 刃長(ℓ1) *Length of Flutes* | 首下長(ℓ2) *Neck Length* | 全長(L) *Overall Length* | シャンク径(Φd) *Shank Dia.* | 刃数(N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| 5.5 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |
| 5.6 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |
| 5.7 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |
| 5.8 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |
| 5.9 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |
| 6 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |
| 6.1 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 6.2 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 6.3 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 6.4 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 6.5 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 6.6 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 6.7 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 6.8 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 6.9 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7.1 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7.2 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7.3 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7.4 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7.5 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7.6 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7.7 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7.8 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7.9 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 8 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 8.1 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 8.2 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 8.3 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 8.4 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 8.5 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 8.6 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 8.7 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 8.8 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 8.9 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9.1 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9.2 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9.3 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9.4 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9.5 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9.6 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9.7 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9.8 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9.9 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |

# CNCR-C 超硬自動旋盤用リーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首下長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **10** | 1 | 25 | 40 | 65 | 8 | 6 | 60° 凹 |
| **10.1** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **10.2** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **10.3** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **10.4** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **10.5** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **10.6** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **10.7** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **10.8** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **10.9** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首下長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **11.1** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.2** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.3** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.4** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.5** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.6** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.7** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.8** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.9** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **12** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首下長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **0.97 ～ 1.05** | 0.4 | 12 | 30 | 50 | 3 | 4 | 60° 凸 |
| **1.97 ～ 2.05** | 0.5 | 16 | 30 | 50 | 3 | 4 | 60° 凸 |
| **2.97 ～ 3.05** | 0.5 | 20 | 35 | 60 | 3 | 6 | 60° 凹 |
| **3.97 ～ 4.05** | 0.5 | 20 | 35 | 60 | 3 | 6 | 60° 凹 |
| **4.97 ～ 5.05** | 0.5 | 25 | 40 | 65 | 4 | 6 | 60° 凹 |
| **5.97 ～ 6.05** | 0.5 | 25 | 40 | 65 | 5 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首下長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **6.97 ～ 7.05** | 0.5 | 25 | 40 | 65 | 6 | 6 | 60° 凹 |
| **7.97 ～ 8.05** | 0.5 | 25 | 40 | 65 | 6 | 6 | 60° 凹 |
| **8.97 ～ 9.05** | 1 | 25 | 40 | 65 | 8 | 6 | 60° 凹 |
| **9.97 ～ 10.05** | 1 | 25 | 40 | 65 | 8 | 6 | 60° 凹 |
| **10.97 ～ 11.05** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.97 ～ 12.05** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首下長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **0.975 ～ 1.045** | 0.4 | 12 | 30 | 50 | 3 | 4 | 60° 凸 |
| **1.975 ～ 2.045** | 0.5 | 16 | 30 | 50 | 3 | 4 | 60° 凸 |
| **2.975 ～ 3.045** | 0.5 | 20 | 35 | 60 | 3 | 6 | 60° 凹 |
| **3.975 ～ 4.045** | 0.5 | 20 | 35 | 60 | 3 | 6 | 60° 凹 |
| **4.975 ～ 5.045** | 0.5 | 25 | 40 | 65 | 4 | 6 | 60° 凹 |
| **5.975 ～ 6.045** | 0.5 | 25 | 40 | 65 | 5 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首下長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **6.975 ～ 7.045** | 0.5 | 25 | 40 | 65 | 6 | 6 | 60° 凹 |
| **7.975 ～ 8.045** | 0.5 | 25 | 40 | 65 | 6 | 6 | 60° 凹 |
| **8.975 ～ 9.045** | 1 | 25 | 40 | 65 | 8 | 6 | 60° 凹 |
| **9.975 ～ 10.045** | 1 | 25 | 40 | 65 | 8 | 6 | 60° 凹 |
| **10.975 ～ 11.045** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.975 ～ 12.045** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |

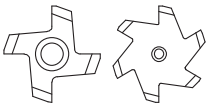
超硬

# CSR-C

## コーティング ソリッドリーマ *TiCN2 Coated Solid Carbide Reamer*

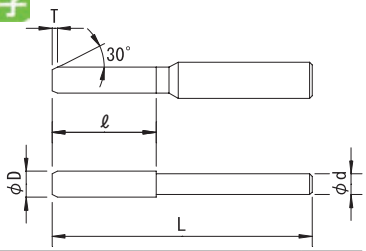
切削条件表 P133

**貫通穴加工（ストレート刃）** 右直刃 TiCN 食付30° 超微粒子



D≦Φ2.995センターナシ






| 公差 (Tolerance) | D | | | | | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.01トビ Increment 0.01 | +0.005 0 | 0.005トビ Increment 0.005 | +0.005 0 | 0.8～3 | +0.007 +0.002 | 3.1～6 | +0.009 +0.004 | 6.1～10 | +0.012 +0.006 | 10.1～12 | +0.015 +0.007 | 0 −0.009 |

右刃ストレート　TiCN2コーティング　食付角度30°　超微粒子
Straight Flute　TiCN2 Coating　Chamfer Angle30°　Ultra Micro Grain Carbide

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **0.8** | 0.3 | 12 | 50 | 3 | 4 | – |
| **0.9** | 0.3 | 12 | 50 | 3 | 4 | – |
| **1** | 0.3 | 12 | 50 | 3 | 4 | – |
| **1.1** | 0.3 | 15 | 50 | 3 | 4 | – |
| **1.2** | 0.3 | 15 | 50 | 3 | 4 | – |
| **1.3** | 0.3 | 15 | 50 | 3 | 4 | – |
| **1.4** | 0.3 | 16 | 50 | 3 | 4 | – |
| **1.5** | 0.3 | 16 | 50 | 3 | 4 | – |
| **1.6** | 0.4 | 18 | 50 | 3 | 4 | – |
| **1.7** | 0.4 | 18 | 50 | 3 | 4 | – |
| **1.8** | 0.4 | 18 | 50 | 3 | 4 | – |
| **1.9** | 0.4 | 18 | 50 | 3 | 4 | – |
| **2** | 0.5 | 18 | 50 | 3 | 4 | – |
| **2.1** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.2** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.3** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.4** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.5** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.6** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.7** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.8** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.9** | 0.5 | 20 | 50 | 3 | 4 | – |
| **3** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.1** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.2** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.3** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.4** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.5** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.6** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.7** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.8** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.9** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **4** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **4.1** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.2** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.3** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.4** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.5** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.6** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.7** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.8** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.9** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **5** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **5.1** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.2** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.3** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **5.4** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.5** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.6** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.7** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.8** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.9** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **6** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **6.1** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.2** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.3** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.4** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.5** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.6** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.7** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.8** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.9** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **7** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.1** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.2** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.3** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.4** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.5** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.6** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.7** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.8** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.9** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **8** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **8.1** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.2** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.3** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.4** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.5** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.6** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.7** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.8** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.9** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **9** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.1** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.2** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.3** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.4** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.5** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **9.6** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **9.7** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **9.8** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **9.9** | 1 | 40 | 90 | 10 | 6 | 60°凹 |

# CSR-C コーティング ソリッドリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **10** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.1** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.2** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.3** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.4** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.5** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.6** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.7** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.8** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.9** | 1 | 40 | 90 | 10 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **11** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **11.1** | 1 | 45 | 90 | 10 | 6 | 60°凹 |
| **11.2** | 1 | 45 | 90 | 10 | 6 | 60°凹 |
| **11.3** | 1 | 45 | 90 | 10 | 6 | 60°凹 |
| **11.4** | 1 | 45 | 90 | 10 | 6 | 60°凹 |
| **11.5** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.6** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.7** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.8** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.9** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **12** | 1 | 45 | 90 | 12 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **0.81 ～ 0.89** | 0.3 | 12 | 50 | 3 | 4 | – |
| **0.91 ～ 0.99** | 0.3 | 12 | 50 | 3 | 4 | – |
| **1.01 ～ 1.09** | 0.3 | 12 | 50 | 3 | 4 | – |
| **1.11 ～ 1.19** | 0.3 | 15 | 50 | 3 | 4 | – |
| **1.21 ～ 1.29** | 0.3 | 15 | 50 | 3 | 4 | – |
| **1.31 ～ 1.39** | 0.3 | 16 | 50 | 3 | 4 | – |
| **1.41 ～ 1.49** | 0.3 | 16 | 50 | 3 | 4 | – |
| **1.51 ～ 1.59** | 0.4 | 18 | 50 | 3 | 4 | – |
| **1.61 ～ 1.69** | 0.4 | 18 | 50 | 3 | 4 | – |
| **1.71 ～ 1.79** | 0.4 | 18 | 50 | 3 | 4 | – |
| **1.81 ～ 1.89** | 0.4 | 18 | 50 | 3 | 4 | – |
| **1.91 ～ 1.99** | 0.5 | 18 | 50 | 3 | 4 | – |
| **2.01 ～ 2.09** | 0.5 | 18 | 50 | 3 | 4 | – |
| **2.11 ～ 2.19** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.21 ～ 2.29** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.31 ～ 2.39** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.41 ～ 2.49** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.51 ～ 2.59** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.61 ～ 2.69** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.71 ～ 2.79** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.81 ～ 2.89** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.91 ～ 2.99** | 0.5 | 27 | 60 | 3 | 4 | – |
| **3.01 ～ 3.09** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.11 ～ 3.19** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.21 ～ 3.29** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.31 ～ 3.39** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.41 ～ 3.49** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.51 ～ 3.59** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.61 ～ 3.69** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.71 ～ 3.79** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.81 ～ 3.89** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.91 ～ 3.99** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **4.01 ～ 4.09** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **4.11 ～ 4.19** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.21 ～ 4.29** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.31 ～ 4.39** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.41 ～ 4.49** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.51 ～ 4.59** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.61 ～ 4.69** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.71 ～ 4.79** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.81 ～ 4.89** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.91 ～ 4.99** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **5.01 ～ 5.09** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **5.11 ～ 5.19** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.21 ～ 5.29** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.31 ～ 5.39** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.41 ～ 5.49** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.51 ～ 5.59** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.61 ～ 5.69** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.71 ～ 5.79** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.81 ～ 5.89** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.91 ～ 5.99** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **6.01 ～ 6.05** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **6.95 ～ 6.99** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.01 ～ 7.05** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.95 ～ 7.99** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **8.01 ～ 8.05** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **8.95 ～ 8.99** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.01 ～ 9.05** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.95 ～ 9.99** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.01 ～ 10.05** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.95 ～ 10.99** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **11.01 ～ 11.05** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **11.95 ～ 11.99** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **12.01 ～ 12.05** | 1 | 45 | 90 | 12 | 6 | 60°凹 |

# CSR-C コーティング ソリッドリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **0.955 ～ 0.995** | 0.3 | 12 | 50 | 3 | 4 | – |
| **1.005 ～ 1.045** | 0.3 | 12 | 50 | 3 | 4 | – |
| **1.105** | 0.3 | 15 | 50 | 3 | 4 | – |
| **1.205** | 0.3 | 15 | 50 | 3 | 4 | – |
| **1.305** | 0.3 | 16 | 50 | 3 | 4 | – |
| **1.405** | 0.3 | 16 | 50 | 3 | 4 | – |
| **1.505** | 0.4 | 18 | 50 | 3 | 4 | – |
| **1.605** | 0.4 | 18 | 50 | 3 | 4 | – |
| **1.705** | 0.4 | 18 | 50 | 3 | 4 | – |
| **1.805** | 0.4 | 18 | 50 | 3 | 4 | – |
| **1.905** | 0.5 | 18 | 50 | 3 | 4 | – |
| **1.955 ～ 1.995** | 0.5 | 18 | 50 | 3 | 4 | – |
| **2.005 ～ 2.045** | 0.5 | 18 | 50 | 3 | 4 | – |
| **2.105** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.205** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.305** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.405** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.505** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.605** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.705** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.805** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.905** | 0.5 | 27 | 60 | 3 | 4 | – |
| **2.955 ～ 2.995** | 0.5 | 27 | 60 | 3 | 4 | – |
| **3.005 ～ 3.045** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.105** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.205** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.305** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.405** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.505** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.605** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.705** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.805** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.905** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.955 ～ 3.995** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **4.005 ～ 4.045** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **4.105** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.205** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.305** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.405** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.505** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.605** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.705** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.805** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.905** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.955 ～ 4.995** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **5.005 ～ 5.045** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **5.105** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.205** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.305** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.405** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.505** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.605** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.705** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.805** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.905** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.955 ～ 5.995** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **6.005 ～ 6.045** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **6.955 ～ 6.995** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.005 ～ 7.045** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.955 ～ 7.995** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **8.005 ～ 8.045** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **8.955 ～ 8.995** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.005 ～ 9.045** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.955 ～ 9.995** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.005 ～ 10.045** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.955 ～ 10.995** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **11.005 ～ 11.045** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **11.955 ～ 11.995** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **12.005 ～ 12.045** | 1 | 45 | 90 | 12 | 6 | 60°凹 |

超硬

# CSPR-C

## コーティング ソリッドスパイラルリーマ *TiCN2 Coated Solid Carbide Spiral Reamer*

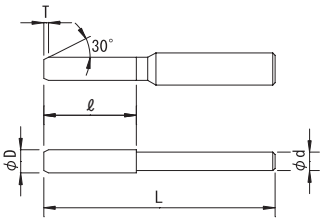
切削条件表 P133

貫通穴加工（スパイラル刃）

左ネジレ30° TiCN 食付30° 超微粒子






| 公差 (Tolerance) | D | | | | | | d | |
|---|---|---|---|---|---|---|---|---|
| | 0.01トビ Increment 0.01 | +0.005 0 | 0.8～3 | +0.007 +0.002 | 3.1～6 | +0.009 +0.004 | 0.8～3.5 | 0 -0.006 | 3.51～12.09 | 0 -0.009 |
| | 6.1～10 | +0.012 +0.006 | 10.1～12 | +0.015 +0.007 | | | | | | |

右刃左ネジレ30° TiCN2コーティング 食付角度30° 超微粒子
Helix Angle-Left30° TiCN2 Coating Chamfer Angle30° Ultra Micro Grain Carbide

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **0.8** | 0.2 | 15 | 50 | 3 | 3 | – |
| **0.9** | 0.2 | 15 | 50 | 3 | 3 | – |
| **1** | 0.2 | 15 | 50 | 3 | 3 | – |
| **1.1** | 0.3 | 15 | 50 | 3 | 3 | – |
| **1.2** | 0.3 | 15 | 50 | 3 | 3 | – |
| **1.3** | 0.3 | 15 | 50 | 3 | 3 | – |
| **1.4** | 0.3 | 16 | 50 | 3 | 3 | – |
| **1.5** | 0.5 | 16 | 50 | 3 | 3 | – |
| **1.6** | 0.5 | 18 | 50 | 3 | 3 | – |
| **1.7** | 0.5 | 18 | 50 | 3 | 3 | – |
| **1.8** | 0.5 | 18 | 50 | 3 | 3 | – |
| **1.9** | 0.5 | 18 | 50 | 3 | 3 | – |
| **2** | 0.5 | 18 | 50 | 3 | 4 | – |
| **2.1** | 0.5 | 20 | 60 | 3 | 4 | – |
| **2.2** | 0.5 | 20 | 60 | 3 | 4 | – |
| **2.3** | 0.5 | 20 | 60 | 3 | 4 | – |
| **2.4** | 0.5 | 20 | 60 | 3 | 4 | – |
| **2.5** | 0.5 | 20 | 60 | 3 | 4 | – |
| **2.6** | 0.5 | 20 | 60 | 3 | 4 | – |
| **2.7** | 0.5 | 20 | 60 | 3 | 4 | – |
| **2.8** | 0.5 | 20 | 60 | 3 | 4 | – |
| **2.9** | 0.5 | 20 | 60 | 3 | 4 | – |
| **3** | 0.5 | 30 | 70 | 3 | 4 | 60°凹 |
| **3.1** | 0.5 | 30 | 70 | 3 | 4 | 60°凹 |
| **3.2** | 0.5 | 30 | 70 | 3 | 4 | 60°凹 |
| **3.3** | 0.5 | 30 | 70 | 3 | 4 | 60°凹 |
| **3.4** | 0.5 | 30 | 70 | 3 | 4 | 60°凹 |
| **3.5** | 0.5 | 30 | 70 | 3 | 4 | 60°凹 |
| **3.6** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **3.7** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **3.8** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **3.9** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **4** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **4.1** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **4.2** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **4.3** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **4.4** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **4.5** | 0.5 | 35 | 80 | 4 | 4 | 60°凹 |
| **4.6** | 0.5 | 35 | 80 | 4 | 4 | 60°凹 |
| **4.7** | 0.5 | 35 | 80 | 4 | 4 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **4.8** | 0.5 | 35 | 80 | 4 | 4 | 60°凹 |
| **4.9** | 0.5 | 35 | 80 | 4 | 4 | 60°凹 |
| **5** | 0.5 | 35 | 80 | 4 | 4 | 60°凹 |
| **5.1** | 0.8 | 35 | 90 | 4 | 4 | 60°凹 |
| **5.2** | 0.8 | 35 | 90 | 4 | 4 | 60°凹 |
| **5.3** | 0.8 | 35 | 90 | 4 | 4 | 60°凹 |
| **5.4** | 0.8 | 35 | 90 | 4 | 4 | 60°凹 |
| **5.5** | 0.8 | 35 | 90 | 4 | 4 | 60°凹 |
| **5.6** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **5.7** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **5.8** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **5.9** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **6** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **6.1** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **6.2** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **6.3** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **6.4** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **6.5** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **6.6** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **6.7** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **6.8** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **6.9** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **7** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **7.1** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **7.2** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **7.3** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **7.4** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **7.5** | 1 | 35 | 100 | 8 | 4 | 60°凹 |
| **7.6** | 1 | 35 | 100 | 8 | 4 | 60°凹 |
| **7.7** | 1 | 35 | 100 | 8 | 4 | 60°凹 |
| **7.8** | 1 | 35 | 100 | 8 | 4 | 60°凹 |
| **7.9** | 1 | 35 | 100 | 8 | 4 | 60°凹 |
| **8** | 1 | 35 | 100 | 8 | 4 | 60°凹 |
| **8.1** | 1 | 40 | 110 | 8 | 4 | 60°凹 |
| **8.2** | 1 | 40 | 110 | 8 | 4 | 60°凹 |
| **8.3** | 1 | 40 | 110 | 8 | 4 | 60°凹 |
| **8.4** | 1 | 40 | 110 | 8 | 4 | 60°凹 |
| **8.5** | 1 | 40 | 110 | 8 | 4 | 60°凹 |
| **8.6** | 1 | 40 | 110 | 8 | 4 | 60°凹 |
| **8.7** | 1 | 40 | 110 | 8 | 4 | 60°凹 |

# CSPR-C コーティング ソリッドスパイラルリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **8.8** | 1 | 40 | 110 | 8 | 4 | 60°凹 |
| **8.9** | 1 | 40 | 110 | 8 | 4 | 60°凹 |
| **9** | 1 | 40 | 110 | 8 | 4 | 60°凹 |
| **9.1** | 1 | 40 | 110 | 8 | 4 | 60°凹 |
| **9.2** | 1 | 40 | 110 | 8 | 4 | 60°凹 |
| **9.3** | 1 | 40 | 110 | 8 | 4 | 60°凹 |
| **9.4** | 1 | 40 | 110 | 8 | 4 | 60°凹 |
| **9.5** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **9.6** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **9.7** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **9.8** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **9.9** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **10** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **10.1** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **10.2** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **10.3** | 1 | 40 | 120 | 10 | 4 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **10.4** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **10.5** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **10.6** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **10.7** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **10.8** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **10.9** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **11** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **11.1** | 1 | 45 | 120 | 10 | 4 | 60°凹 |
| **11.2** | 1 | 45 | 120 | 10 | 4 | 60°凹 |
| **11.3** | 1 | 45 | 120 | 10 | 4 | 60°凹 |
| **11.4** | 1 | 45 | 120 | 10 | 4 | 60°凹 |
| **11.5** | 1 | 45 | 120 | 12 | 4 | 60°凹 |
| **11.6** | 1 | 45 | 120 | 12 | 4 | 60°凹 |
| **11.7** | 1 | 45 | 120 | 12 | 4 | 60°凹 |
| **11.8** | 1 | 45 | 120 | 12 | 4 | 60°凹 |
| **11.9** | 1 | 45 | 120 | 12 | 4 | 60°凹 |
| **12** | 1 | 45 | 120 | 12 | 4 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **0.81 ～ 0.89** | 0.2 | 15 | 50 | 3 | 3 | – |
| **0.91 ～ 0.99** | 0.2 | 15 | 50 | 3 | 3 | – |
| **1.01 ～ 1.09** | 0.2 | 15 | 50 | 3 | 3 | – |
| **1.11 ～ 1.19** | 0.3 | 15 | 50 | 3 | 3 | – |
| **1.21 ～ 1.29** | 0.3 | 15 | 50 | 3 | 3 | – |
| **1.31 ～ 1.39** | 0.3 | 16 | 50 | 3 | 3 | – |
| **1.41 ～ 1.49** | 0.3 | 16 | 50 | 3 | 3 | – |
| **1.51 ～ 1.59** | 0.5 | 18 | 50 | 3 | 3 | – |
| **1.61 ～ 1.69** | 0.5 | 18 | 50 | 3 | 3 | – |
| **1.71 ～ 1.79** | 0.5 | 18 | 50 | 3 | 3 | – |
| **1.81 ～ 1.89** | 0.5 | 18 | 50 | 3 | 3 | – |
| **1.91 ～ 1.99** | 0.5 | 18 | 50 | 3 | 3 | – |
| **2.01 ～ 2.09** | 0.5 | 18 | 50 | 3 | 4 | – |
| **2.11 ～ 2.19** | 0.5 | 20 | 60 | 3 | 4 | – |
| **2.21 ～ 2.29** | 0.5 | 20 | 60 | 3 | 4 | – |
| **2.31 ～ 2.39** | 0.5 | 20 | 60 | 3 | 4 | – |
| **2.41 ～ 2.49** | 0.5 | 20 | 60 | 3 | 4 | – |
| **2.51 ～ 2.59** | 0.5 | 20 | 60 | 3 | 4 | – |
| **2.61 ～ 2.69** | 0.5 | 20 | 60 | 3 | 4 | – |
| **2.71 ～ 2.79** | 0.5 | 20 | 60 | 3 | 4 | – |
| **2.81 ～ 2.89** | 0.5 | 20 | 60 | 3 | 4 | – |
| **2.91 ～ 2.94** | 0.5 | 30 | 70 | 3 | 4 | – |
| **2.95 ～ 2.99** | 0.5 | 30 | 70 | 3 | 4 | 60°凹 |
| **3.01 ～ 3.09** | 0.5 | 30 | 70 | 3 | 4 | 60°凹 |
| **3.11 ～ 3.19** | 0.5 | 30 | 70 | 3 | 4 | 60°凹 |
| **3.21 ～ 3.29** | 0.5 | 30 | 70 | 3 | 4 | 60°凹 |
| **3.31 ～ 3.39** | 0.5 | 30 | 70 | 3 | 4 | 60°凹 |
| **3.41 ～ 3.49** | 0.5 | 30 | 70 | 3 | 4 | 60°凹 |
| **3.51 ～ 3.59** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **3.61 ～ 3.69** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **3.71 ～ 3.79** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **3.81 ～ 3.89** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **3.91 ～ 3.99** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **4.01 ～ 4.09** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **4.11 ～ 4.19** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **4.21 ～ 4.29** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **4.31 ～ 4.39** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **4.41 ～ 4.49** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **4.51 ～ 4.59** | 0.5 | 35 | 80 | 4 | 4 | 60°凹 |
| **4.61 ～ 4.69** | 0.5 | 35 | 80 | 4 | 4 | 60°凹 |
| **4.71 ～ 4.79** | 0.5 | 35 | 80 | 4 | 4 | 60°凹 |
| **4.81 ～ 4.89** | 0.5 | 35 | 80 | 4 | 4 | 60°凹 |
| **4.91 ～ 4.99** | 0.5 | 35 | 80 | 4 | 4 | 60°凹 |
| **5.01 ～ 5.09** | 0.5 | 35 | 80 | 4 | 4 | 60°凹 |
| **5.11 ～ 5.19** | 0.8 | 35 | 90 | 4 | 4 | 60°凹 |
| **5.21 ～ 5.29** | 0.8 | 35 | 90 | 4 | 4 | 60°凹 |
| **5.31 ～ 5.39** | 0.8 | 35 | 90 | 4 | 4 | 60°凹 |
| **5.41 ～ 5.49** | 0.8 | 35 | 90 | 4 | 4 | 60°凹 |
| **5.51 ～ 5.59** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **5.61 ～ 5.69** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **5.71 ～ 5.79** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **5.81 ～ 5.89** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **5.91 ～ 5.99** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **6.01 ～ 6.09** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **6.95 ～ 6.99** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **7.01 ～ 7.05** | 0.8 | 35 | 100 | 6 | 4 | 60°凹 |
| **7.95 ～ 7.99** | 1 | 35 | 100 | 8 | 4 | 60°凹 |
| **8.01 ～ 8.05** | 1 | 35 | 100 | 8 | 4 | 60°凹 |
| **8.95 ～ 8.99** | 1 | 40 | 110 | 8 | 4 | 60°凹 |
| **9.01 ～ 9.05** | 1 | 40 | 110 | 8 | 4 | 60°凹 |
| **9.95 ～ 9.99** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **10.01 ～ 10.05** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **10.95 ～ 10.99** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **11.01 ～ 11.05** | 1 | 40 | 120 | 10 | 4 | 60°凹 |
| **11.95 ～ 11.99** | 1 | 45 | 120 | 12 | 4 | 60°凹 |
| **12.01 ～ 12.05** | 1 | 45 | 120 | 12 | 4 | 60°凹 |

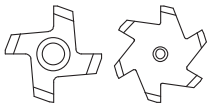
超硬

# CSR-DLC

## 超硬ソリッドアルミ用リーマ　*Solid Carbide Reamer DLC Coated For Aluminum*

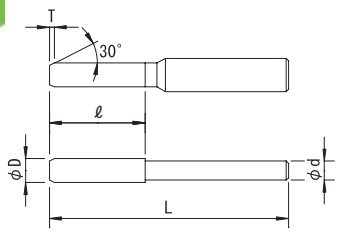
切削条件表 P133

**貫通穴加工（ストレート刃）**　右直刃　DLC　食付30°　K10



D≦Φ2.99センターナシ






| 公差 (Tolerance) | D | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|
| 0.01トビ Increment 0.01 | +0.005 0 | 0.5～3 | +0.007 +0.002 | 3.1～6 | +0.009 +0.004 | 6.1～10 | +0.012 +0.006 | 10.1～12 | +0.015 +0.007 | h6 |

右刃ストレート　DLCコーティング　食付角度30°　K10
Straight Flute　DLC Coating　Chamfer Angle30°　Micro Grain Carbide(K10)

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **0.5** | 0.2 | 6 | 50 | 3 | 4 | – |
| **0.6** | 0.2 | 8 | 50 | 3 | 4 | – |
| **0.7** | 0.2 | 8 | 50 | 3 | 4 | – |
| **0.8** | 0.3 | 12 | 50 | 3 | 4 | – |
| **0.9** | 0.3 | 12 | 50 | 3 | 4 | – |
| **1** | 0.3 | 12 | 50 | 3 | 4 | – |
| **1.1** | 0.3 | 15 | 50 | 3 | 4 | – |
| **1.2** | 0.3 | 15 | 50 | 3 | 4 | – |
| **1.3** | 0.3 | 15 | 50 | 3 | 4 | – |
| **1.4** | 0.3 | 16 | 50 | 3 | 4 | – |
| **1.5** | 0.4 | 16 | 50 | 3 | 4 | – |
| **1.6** | 0.4 | 18 | 50 | 3 | 4 | – |
| **1.7** | 0.4 | 18 | 50 | 3 | 4 | – |
| **1.8** | 0.4 | 18 | 50 | 3 | 4 | – |
| **1.9** | 0.4 | 18 | 50 | 3 | 4 | – |
| **2** | 0.5 | 18 | 50 | 3 | 4 | – |
| **2.1** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.2** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.3** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.4** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.5** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.6** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.7** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.8** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.9** | 0.5 | 20 | 50 | 3 | 4 | – |
| **3** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.1** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.2** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.3** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.4** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.5** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.6** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.7** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.8** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.9** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **4** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **4.1** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.2** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.3** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.4** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.5** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.6** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.7** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.8** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.9** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **5** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **5.1** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.2** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.3** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.4** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.5** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.6** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.7** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.8** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.9** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **6** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **6.1** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.2** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.3** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.4** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.5** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.6** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.7** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.8** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **6.9** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **7** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.1** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.2** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.3** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.4** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.5** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.6** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.7** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.8** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.9** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **8** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **8.1** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.2** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.3** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.4** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.5** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.6** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.7** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.8** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **8.9** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **9** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.1** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.2** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.3** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.4** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.5** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **9.6** | 1 | 40 | 90 | 10 | 6 | 60°凹 |

# CSR-DLC 超硬ソリッドアルミ用リーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **9.7** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **9.8** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **9.9** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.1** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.2** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.3** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.4** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.5** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.6** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.7** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.8** | 1 | 40 | 90 | 10 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **10.9** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **11** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **11.1** | 1 | 45 | 90 | 10 | 6 | 60°凹 |
| **11.2** | 1 | 45 | 90 | 10 | 6 | 60°凹 |
| **11.3** | 1 | 45 | 90 | 10 | 6 | 60°凹 |
| **11.4** | 1 | 45 | 90 | 10 | 6 | 60°凹 |
| **11.5** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.6** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.7** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.8** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.9** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **12** | 1 | 45 | 90 | 12 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **0.51～ 0.59** | 0.2 | 6 | 50 | 3 | 4 | – |
| **0.61～ 0.69** | 0.2 | 8 | 50 | 3 | 4 | – |
| **0.71～ 0.79** | 0.2 | 8 | 50 | 3 | 4 | – |
| **0.81～ 0.89** | 0.3 | 12 | 50 | 3 | 4 | – |
| **0.91～ 0.99** | 0.3 | 12 | 50 | 3 | 4 | – |
| **1.01～ 1.09** | 0.3 | 12 | 50 | 3 | 4 | – |
| **1.11～ 1.19** | 0.3 | 15 | 50 | 3 | 4 | – |
| **1.21～ 1.29** | 0.3 | 15 | 50 | 3 | 4 | – |
| **1.31～ 1.39** | 0.3 | 16 | 50 | 3 | 4 | – |
| **1.41～ 1.49** | 0.3 | 16 | 50 | 3 | 4 | – |
| **1.51～ 1.59** | 0.4 | 18 | 50 | 3 | 4 | – |
| **1.61～ 1.69** | 0.4 | 18 | 50 | 3 | 4 | – |
| **1.71～ 1.79** | 0.4 | 18 | 50 | 3 | 4 | – |
| **1.81～ 1.89** | 0.4 | 18 | 50 | 3 | 4 | – |
| **1.91～ 1.99** | 0.5 | 18 | 50 | 3 | 4 | – |
| **2.01～ 2.09** | 0.5 | 18 | 50 | 3 | 4 | – |
| **2.11～ 2.19** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.21～ 2.29** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.31～ 2.39** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.41～ 2.49** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.51～ 2.59** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.61～ 2.69** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.71～ 2.79** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.81～ 2.89** | 0.5 | 20 | 50 | 3 | 4 | – |
| **2.91～ 2.99** | 0.5 | 27 | 60 | 3 | 4 | – |
| **3.01～ 3.09** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.11～ 3.19** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.21～ 3.29** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.31～ 3.39** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.41～ 3.49** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.51～ 3.59** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.61～ 3.69** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.71～ 3.79** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.81～ 3.89** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |

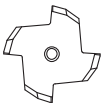
| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **3.91～ 3.99** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **4.01～ 4.09** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **4.11～ 4.19** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.21～ 4.29** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.31～ 4.39** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.41～ 4.49** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.51～ 4.59** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.61～ 4.69** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.71～ 4.79** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.81～ 4.89** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **4.91～ 4.99** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **5.01～ 5.09** | 0.5 | 30 | 70 | 4 | 6 | 60°凹 |
| **5.11～ 5.19** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.21～ 5.29** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.31～ 5.39** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.41～ 5.49** | 0.8 | 30 | 80 | 4 | 6 | 60°凹 |
| **5.51～ 5.59** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.61～ 5.69** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.71～ 5.79** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.81～ 5.89** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.91～ 5.99** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **6.01～ 6.05** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **6.95～ 6.99** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.01～ 7.05** | 0.8 | 35 | 80 | 6 | 6 | 60°凹 |
| **7.95～ 7.99** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **8.01～ 8.05** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **8.95～ 8.99** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.01～ 9.05** | 1 | 40 | 90 | 8 | 6 | 60°凹 |
| **9.95～ 9.99** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.01～10.05** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.95～10.99** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **11.01～11.05** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **11.95～11.99** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **12.01～12.05** | 1 | 45 | 90 | 12 | 6 | 60°凹 |

超硬

# CSRH-P

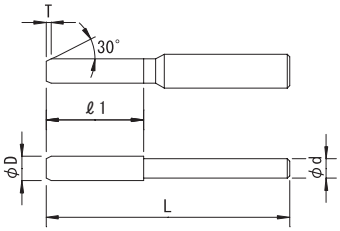
## ソリッド高硬度用リーマ（～HRC62）　*Solid Carbide Reamer For Hard Steel (～HRC62)*

切削条件表 P133　高硬度・難削材　右ネジレ 8°　P Coating　食付 30°　超微粒子



D≦Φ3.05センターナシ





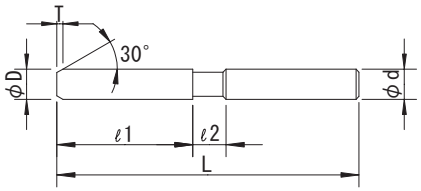

| 公差 (Tolerance) | D | | | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.01トビ Increment 0.01 | +0.005 0 | 3 | +0.006 +0.002 | 3.1～6 | +0.009 +0.004 | 6.1～10 | +0.012 +0.006 | 10.1～18 | +0.015 +0.007 | 18.1～20 | +0.017 +0.008 | h6 |

右刃右ネジレ8°　Pコーティング　食付角度30°　超微粒子
Helix Angle-Right8°　P Coating　Chamfer Angle30°　Ultra Micro Grain Carbide

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **3** | 0.5 | 40 | 80 | 3.0 | 4 | – |
| **3.1** | 0.5 | 40 | 80 | 4.0 | 4 | 60°凹 |
| **3.2** | 0.5 | 40 | 80 | 4.0 | 4 | 60°凹 |
| **3.3** | 0.5 | 40 | 80 | 4.0 | 4 | 60°凹 |
| **3.4** | 0.5 | 40 | 80 | 4.0 | 4 | 60°凹 |
| **3.5** | 0.5 | 40 | 80 | 4.0 | 4 | 60°凹 |
| **3.6** | 0.5 | 40 | 80 | 4.0 | 4 | 60°凹 |
| **3.7** | 0.5 | 40 | 80 | 4.0 | 4 | 60°凹 |
| **3.8** | 0.5 | 40 | 80 | 4.0 | 4 | 60°凹 |
| **3.9** | 0.5 | 40 | 80 | 4.0 | 4 | 60°凹 |
| **4** | 0.5 | 40 | 80 | 4.0 | 4 | 60°凹 |
| **4.1** | 0.5 | 40 | 80 | 6.0 | 4 | 60°凹 |
| **4.2** | 0.5 | 40 | 80 | 6.0 | 4 | 60°凹 |
| **4.3** | 0.5 | 40 | 80 | 6.0 | 4 | 60°凹 |
| **4.4** | 0.5 | 40 | 80 | 6.0 | 4 | 60°凹 |
| **4.5** | 0.5 | 40 | 80 | 6.0 | 4 | 60°凹 |
| **4.6** | 0.5 | 40 | 80 | 6.0 | 4 | 60°凹 |
| **4.7** | 0.5 | 40 | 80 | 6.0 | 4 | 60°凹 |
| **4.8** | 0.5 | 40 | 80 | 6.0 | 4 | 60°凹 |
| **4.9** | 0.5 | 40 | 80 | 6.0 | 4 | 60°凹 |
| **5** | 0.5 | 40 | 80 | 6.0 | 4 | 60°凹 |
| **5.1** | 0.8 | 50 | 100 | 6.0 | 4 | 60°凹 |
| **5.2** | 0.8 | 50 | 100 | 6.0 | 4 | 60°凹 |
| **5.3** | 0.8 | 50 | 100 | 6.0 | 4 | 60°凹 |
| **5.4** | 0.8 | 50 | 100 | 6.0 | 4 | 60°凹 |
| **5.5** | 0.8 | 50 | 100 | 6.0 | 4 | 60°凹 |
| **5.6** | 0.8 | 50 | 100 | 6.0 | 4 | 60°凹 |
| **5.7** | 0.8 | 50 | 100 | 6.0 | 4 | 60°凹 |
| **5.8** | 0.8 | 50 | 100 | 6.0 | 4 | 60°凹 |
| **5.9** | 0.8 | 50 | 100 | 6.0 | 4 | 60°凹 |
| **6** | 0.8 | 50 | 100 | 6.0 | 4 | 60°凹 |
| **6.1** | 0.8 | 50 | 100 | 8.0 | 4 | 60°凹 |
| **6.2** | 0.8 | 50 | 100 | 8.0 | 4 | 60°凹 |
| **6.3** | 0.8 | 50 | 100 | 8.0 | 4 | 60°凹 |
| **6.4** | 0.8 | 50 | 100 | 8.0 | 4 | 60°凹 |
| **6.5** | 0.8 | 50 | 100 | 8.0 | 4 | 60°凹 |
| **6.6** | 0.8 | 50 | 100 | 8.0 | 4 | 60°凹 |
| **6.7** | 0.8 | 50 | 100 | 8.0 | 4 | 60°凹 |
| **6.8** | 0.8 | 50 | 100 | 8.0 | 4 | 60°凹 |
| **6.9** | 0.8 | 50 | 100 | 8.0 | 4 | 60°凹 |
| **7** | 0.8 | 50 | 100 | 8.0 | 4 | 60°凹 |
| **7.1** | 0.8 | 50 | 100 | 8.0 | 4 | 60°凹 |
| **7.2** | 0.8 | 50 | 100 | 8.0 | 4 | 60°凹 |
| **7.3** | 0.8 | 50 | 100 | 8.0 | 4 | 60°凹 |
| **7.4** | 0.8 | 50 | 100 | 8.0 | 4 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **7.5** | 0.8 | 50 | 100 | 8 | 4 | 60°凹 |
| **7.6** | 0.8 | 50 | 100 | 8 | 4 | 60°凹 |
| **7.7** | 0.8 | 50 | 100 | 8 | 4 | 60°凹 |
| **7.8** | 0.8 | 50 | 100 | 8 | 4 | 60°凹 |
| **7.9** | 0.8 | 50 | 100 | 8 | 4 | 60°凹 |
| **8** | 0.8 | 50 | 100 | 8 | 4 | 60°凹 |
| **8.1** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **8.2** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **8.3** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **8.4** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **8.5** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **8.6** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **8.7** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **8.8** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **8.9** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **9** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **9.1** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **9.2** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **9.3** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **9.4** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **9.5** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **9.6** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **9.7** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **9.8** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **9.9** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **10** | 0.8 | 60 | 120 | 10 | 4 | 60°凹 |
| **10.1** | 0.8 | 65 | 120 | 12 | 4 | 60°凹 |
| **10.2** | 0.8 | 65 | 120 | 12 | 4 | 60°凹 |
| **10.3** | 0.8 | 65 | 120 | 12 | 4 | 60°凹 |
| **10.4** | 0.8 | 65 | 120 | 12 | 4 | 60°凹 |
| **10.5** | 0.8 | 65 | 120 | 12 | 4 | 60°凹 |
| **10.6** | 0.8 | 65 | 120 | 12 | 4 | 60°凹 |
| **10.7** | 0.8 | 65 | 120 | 12 | 4 | 60°凹 |
| **10.8** | 0.8 | 65 | 120 | 12 | 4 | 60°凹 |
| **10.9** | 0.8 | 65 | 120 | 12 | 4 | 60°凹 |
| **11** | 0.8 | 65 | 120 | 12 | 4 | 60°凹 |
| **11.1** | 0.8 | 65 | 130 | 12 | 4 | 60°凹 |
| **11.2** | 0.8 | 65 | 130 | 12 | 4 | 60°凹 |
| **11.3** | 0.8 | 65 | 130 | 12 | 4 | 60°凹 |
| **11.4** | 0.8 | 65 | 130 | 12 | 4 | 60°凹 |
| **11.5** | 0.8 | 65 | 130 | 12 | 4 | 60°凹 |
| **11.6** | 0.8 | 65 | 130 | 12 | 4 | 60°凹 |
| **11.7** | 0.8 | 65 | 130 | 12 | 4 | 60°凹 |
| **11.8** | 0.8 | 65 | 130 | 12 | 4 | 60°凹 |
| **11.9** | 0.8 | 65 | 130 | 12 | 4 | 60°凹 |
| **12** | 0.8 | 65 | 130 | 12 | 4 | 60°凹 |

# CSRH-P ソリッド高硬度用リーマ




ΦD≧12.5

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **12.5** | 0.8 | 65 | 10 | 130 | 12 | 4 | 60° 凹 |
| **13** | 0.8 | 65 | 10 | 130 | 12 | 6 | 60° 凹 |
| **13.5** | 0.8 | 65 | 10 | 130 | 12 | 6 | 60° 凹 |
| **14** | 0.8 | 65 | 10 | 130 | 12 | 6 | 60° 凹 |
| **14.5** | 1 | 65 | 10 | 130 | 16 | 6 | 60° 凹 |
| **15** | 1 | 65 | 10 | 130 | 16 | 6 | 60° 凹 |
| **15.5** | 1 | 65 | 10 | 130 | 16 | 6 | 60° 凹 |
| **16** | 1 | 65 | 10 | 130 | 16 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **16.5** | 1 | 70 | 10 | 150 | 16 | 6 | 60° 凹 |
| **17** | 1 | 70 | 10 | 150 | 16 | 6 | 60° 凹 |
| **17.5** | 1 | 70 | 10 | 150 | 16 | 6 | 60° 凹 |
| **18** | 1 | 70 | 10 | 150 | 16 | 6 | 60° 凹 |
| **18.5** | 1 | 80 | 10 | 170 | 20 | 6 | 60° 凹 |
| **19** | 1 | 80 | 10 | 170 | 20 | 6 | 60° 凹 |
| **19.5** | 1 | 80 | 10 | 170 | 20 | 6 | 60° 凹 |
| **20** | 1 | 80 | 10 | 170 | 20 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **2.95 ～ 2.99** | 0.5 | 40 | 80 | 3 | 4 | – |
| **3.01 ～ 3.05** | 0.5 | 40 | 80 | 3 | 4 | – |
| **3.95 ～ 3.99** | 0.5 | 40 | 80 | 4 | 4 | 60° 凹 |
| **4.01 ～ 4.05** | 0.5 | 40 | 80 | 4 | 4 | 60° 凹 |
| **4.95 ～ 4.99** | 0.5 | 40 | 80 | 6 | 4 | 60° 凹 |
| **5.01 ～ 5.05** | 0.5 | 40 | 80 | 6 | 4 | 60° 凹 |
| **5.95 ～ 5.99** | 0.8 | 50 | 100 | 6 | 4 | 60° 凹 |
| **6.01 ～ 6.05** | 0.8 | 50 | 100 | 6 | 4 | 60° 凹 |
| **6.95 ～ 6.99** | 0.8 | 50 | 100 | 8 | 4 | 60° 凹 |
| **7.01 ～ 7.05** | 0.8 | 50 | 100 | 8 | 4 | 60° 凹 |
| **7.95 ～ 7.99** | 0.8 | 50 | 100 | 8 | 4 | 60° 凹 |
| **8.01 ～ 8.05** | 0.8 | 50 | 100 | 8 | 4 | 60° 凹 |
| **8.95 ～ 8.99** | 0.8 | 60 | 120 | 10 | 4 | 60° 凹 |
| **9.01 ～ 9.05** | 0.8 | 60 | 120 | 10 | 4 | 60° 凹 |
| **9.95 ～ 9.99** | 0.8 | 60 | 120 | 10 | 4 | 60° 凹 |
| **10.01 ～ 10.05** | 0.8 | 60 | 120 | 10 | 4 | 60° 凹 |
| **10.95 ～ 10.99** | 0.8 | 65 | 120 | 12 | 4 | 60° 凹 |
| **11.01 ～ 11.05** | 0.8 | 65 | 120 | 12 | 4 | 60° 凹 |
| **11.95 ～ 11.99** | 0.8 | 65 | 130 | 12 | 4 | 60° 凹 |
| **12.01 ～ 12.05** | 0.8 | 65 | 130 | 12 | 4 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **12.95 ～ 12.99** | 0.8 | 65 | 10 | 130 | 12 | 6 | 60° 凹 |
| **13.01 ～ 13.05** | 0.8 | 65 | 10 | 130 | 12 | 6 | 60° 凹 |
| **13.95 ～ 13.99** | 0.8 | 65 | 10 | 130 | 12 | 6 | 60° 凹 |
| **14.01 ～ 14.05** | 0.8 | 65 | 10 | 130 | 12 | 6 | 60° 凹 |
| **14.95 ～ 14.99** | 1 | 65 | 10 | 130 | 16 | 6 | 60° 凹 |
| **15.01 ～ 15.05** | 1 | 65 | 10 | 130 | 16 | 6 | 60° 凹 |
| **15.95 ～ 15.99** | 1 | 65 | 10 | 130 | 16 | 6 | 60° 凹 |
| **16.01 ～ 16.05** | 1 | 65 | 10 | 130 | 16 | 6 | 60° 凹 |
| **16.95 ～ 16.99** | 1 | 70 | 10 | 150 | 16 | 6 | 60° 凹 |
| **17.01 ～ 17.05** | 1 | 70 | 10 | 150 | 16 | 6 | 60° 凹 |
| **17.95 ～ 17.99** | 1 | 70 | 10 | 150 | 16 | 6 | 60° 凹 |
| **18.01 ～ 18.05** | 1 | 70 | 10 | 150 | 16 | 6 | 60° 凹 |
| **18.95 ～ 18.99** | 1 | 80 | 10 | 170 | 20 | 6 | 60° 凹 |
| **19.01 ～ 19.05** | 1 | 80 | 10 | 170 | 20 | 6 | 60° 凹 |
| **19.95 ～ 19.99** | 1 | 80 | 10 | 170 | 20 | 6 | 60° 凹 |
| **20.01 ～ 20.05** | 1 | 80 | 10 | 170 | 20 | 6 | 60° 凹 |

超硬

# CSER-C

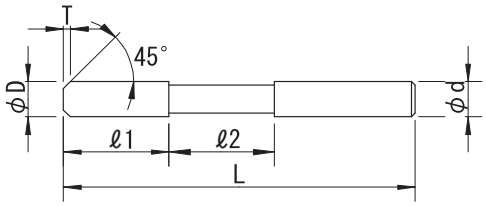
## 超硬エンド刃付リーマ　*Solid Carbide End Mill Reamer For Blind Hole*

切削条件表 P134　止り穴加工　右ネジレ30°　TiCN　食付45°　K10



センターカット






| 公差(Tolerance) | D：$^{+0.005}_{0}$ | d：h6 |
|---|---|---|

右刃右ネジレ30°　TiCN2コーティング　食付角度45°　K10
Helix Angle-Right30°　TiCN2 Coating　Chamfer Angle45°　Micro Grain Carbide(K10)

| 直径（ΦD） *Dia.* | 食付長（T） *Chamfer Length* | 刃長（ℓ1） *Length of Flutes* | 首長（ℓ2） *Neck Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 刃数（N） *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| 1 | 0.1 | 5 | 10 | 50 | 3 | 4 | – |
| 1.1 | 0.1 | 6 | 10 | 50 | 3 | 4 | – |
| 1.2 | 0.1 | 6 | 10 | 50 | 3 | 4 | – |
| 1.3 | 0.1 | 6 | 10 | 50 | 3 | 4 | – |
| 1.4 | 0.1 | 6 | 10 | 50 | 3 | 4 | – |
| 1.5 | 0.1 | 6 | 10 | 50 | 3 | 4 | – |
| 1.6 | 0.1 | 8 | 10 | 50 | 3 | 4 | – |
| 1.7 | 0.1 | 8 | 10 | 50 | 3 | 4 | – |
| 1.8 | 0.1 | 8 | 10 | 50 | 3 | 4 | – |
| 1.9 | 0.1 | 8 | 10 | 50 | 3 | 4 | – |
| 2 | 0.15 | 10 | 10 | 60 | 3 | 4 | – |
| 2.1 | 0.15 | 10 | 10 | 60 | 3 | 4 | – |
| 2.2 | 0.15 | 10 | 10 | 60 | 3 | 4 | – |
| 2.3 | 0.15 | 10 | 10 | 60 | 3 | 4 | – |
| 2.4 | 0.15 | 10 | 10 | 60 | 3 | 4 | – |
| 2.5 | 0.15 | 10 | 10 | 60 | 3 | 4 | – |
| 2.6 | 0.15 | 10 | 10 | 60 | 3 | 4 | – |
| 2.7 | 0.15 | 10 | 10 | 60 | 3 | 4 | – |
| 2.8 | 0.15 | 10 | 10 | 60 | 3 | 4 | – |
| 2.9 | 0.15 | 10 | 10 | 60 | 3 | 4 | – |
| 3 | 0.15 | 20 | 20 | 65 | 3 | 4 | – |
| 3.1 | 0.2 | 20 | 20 | 70 | 4 | 4 | – |
| 3.2 | 0.2 | 20 | 20 | 70 | 4 | 4 | – |
| 3.3 | 0.2 | 20 | 20 | 70 | 4 | 4 | – |
| 3.4 | 0.2 | 20 | 20 | 70 | 4 | 4 | – |
| 3.5 | 0.2 | 20 | 20 | 70 | 4 | 4 | – |
| 3.6 | 0.2 | 20 | 20 | 70 | 4 | 4 | – |
| 3.7 | 0.2 | 20 | 20 | 70 | 4 | 4 | – |
| 3.8 | 0.2 | 20 | 20 | 70 | 4 | 4 | – |
| 3.9 | 0.2 | 20 | 20 | 70 | 4 | 4 | – |
| 4 | 0.2 | 20 | 20 | 70 | 4 | 4 | – |
| 4.1 | 0.2 | 25 | 20 | 75 | 5 | 4 | – |
| 4.2 | 0.2 | 25 | 20 | 75 | 5 | 4 | – |
| 4.3 | 0.2 | 25 | 20 | 75 | 5 | 4 | – |
| 4.4 | 0.2 | 25 | 20 | 75 | 5 | 4 | – |
| 4.5 | 0.2 | 25 | 20 | 75 | 5 | 4 | – |
| 4.6 | 0.2 | 25 | 20 | 75 | 5 | 4 | – |
| 4.7 | 0.2 | 25 | 20 | 75 | 5 | 4 | – |
| 4.8 | 0.2 | 25 | 20 | 75 | 5 | 4 | – |
| 4.9 | 0.2 | 25 | 20 | 75 | 5 | 4 | – |
| 5 | 0.2 | 25 | 20 | 75 | 5 | 4 | – |
| 5.1 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 5.2 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 5.3 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 5.4 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |

| 直径（ΦD） *Dia.* | 食付長（T） *Chamfer Length* | 刃長（ℓ1） *Length of Flutes* | 首長（ℓ2） *Neck Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 刃数（N） *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| 5.5 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 5.6 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 5.7 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 5.8 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 5.9 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 6 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 6.1 | 0.3 | 25 | 45 | 110 | 8 | 4 | – |
| 6.2 | 0.3 | 25 | 45 | 110 | 8 | 4 | – |
| 6.3 | 0.3 | 25 | 45 | 110 | 8 | 4 | – |
| 6.4 | 0.3 | 25 | 45 | 110 | 8 | 4 | – |
| 6.5 | 0.3 | 25 | 45 | 110 | 8 | 4 | – |
| 6.6 | 0.3 | 25 | 45 | 110 | 8 | 4 | – |
| 6.7 | 0.3 | 25 | 45 | 110 | 8 | 4 | – |
| 6.8 | 0.3 | 25 | 45 | 110 | 8 | 4 | – |
| 6.9 | 0.3 | 25 | 45 | 110 | 8 | 4 | – |
| 7 | 0.3 | 25 | 45 | 110 | 8 | 4 | – |
| 7.1 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 7.2 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 7.3 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 7.4 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 7.5 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 7.6 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 7.7 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 7.8 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 7.9 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 8 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 8.1 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 8.2 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 8.3 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 8.4 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 8.5 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 8.6 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 8.7 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 8.8 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 8.9 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 9 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 9.1 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| 9.2 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| 9.3 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| 9.4 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| 9.5 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| 9.6 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| 9.7 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| 9.8 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| 9.9 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |

# CSER-C 超硬エンド刃付リーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **10** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **10.1** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **10.2** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **10.3** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **10.4** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **10.5** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **10.6** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **10.7** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **10.8** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **10.9** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **11** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **11.1** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **11.2** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **11.3** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **11.4** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **11.5** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **11.6** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **11.7** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **11.8** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **11.9** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **12** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **1.01 ～ 1.05** | 0.1 | 5 | 10 | 50 | 3 | 4 | – |
| **1.95 ～ 1.99** | 0.1 | 8 | 10 | 60 | 3 | 4 | – |
| **2.01 ～ 2.05** | 0.15 | 10 | 10 | 60 | 3 | 4 | – |
| **2.95 ～ 2.99** | 0.15 | 20 | 20 | 65 | 3 | 4 | – |
| **3.01 ～ 3.05** | 0.15 | 20 | 20 | 65 | 3 | 4 | – |
| **3.95 ～ 3.99** | 0.2 | 20 | 20 | 70 | 4 | 4 | – |
| **4.01 ～ 4.05** | 0.2 | 20 | 20 | 70 | 4 | 4 | – |
| **4.95 ～ 4.99** | 0.2 | 25 | 20 | 75 | 5 | 4 | – |
| **5.01 ～ 5.05** | 0.2 | 25 | 20 | 75 | 5 | 4 | – |
| **5.95 ～ 5.99** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **6.01 ～ 6.05** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **6.95 ～ 6.99** | 0.3 | 25 | 45 | 110 | 8 | 4 | – |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **7.01 ～ 7.05** | 0.3 | 25 | 45 | 110 | 8 | 4 | – |
| **7.95 ～ 7.99** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| **8.01 ～ 8.05** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| **8.95 ～ 8.99** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **9.01 ～ 9.05** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **9.95 ～ 9.99** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **10.01 ～ 10.05** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **10.95 ～ 10.99** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **11.01 ～ 11.05** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **11.95 ～ 11.99** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **12.01 ～ 12.05** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **1.005 ～ 1.055** | 0.1 | 5 | 10 | 50 | 3 | 4 | – |
| **1.955 ～ 1.995** | 0.1 | 8 | 10 | 60 | 3 | 4 | – |
| **2.005 ～ 2.055** | 0.15 | 10 | 10 | 60 | 3 | 4 | – |
| **2.955 ～ 2.995** | 0.15 | 20 | 20 | 65 | 3 | 4 | – |
| **3.005 ～ 3.055** | 0.15 | 20 | 20 | 65 | 3 | 4 | – |
| **3.955 ～ 3.995** | 0.2 | 20 | 20 | 70 | 4 | 4 | – |
| **4.005 ～ 4.055** | 0.2 | 20 | 20 | 70 | 4 | 4 | – |
| **4.955 ～ 4.995** | 0.2 | 25 | 20 | 75 | 5 | 4 | – |
| **5.005 ～ 5.055** | 0.2 | 25 | 20 | 75 | 5 | 4 | – |
| **5.955 ～ 5.995** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **6.005 ～ 6.055** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **6.955 ～ 6.995** | 0.3 | 25 | 45 | 110 | 8 | 4 | – |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **7.005 ～ 7.055** | 0.3 | 25 | 45 | 110 | 8 | 4 | – |
| **7.955 ～ 7.995** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| **8.005 ～ 8.055** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| **8.955 ～ 8.995** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **9.005 ～ 9.055** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **9.955 ～ 9.995** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **10.005 ～ 10.055** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **10.955 ～ 10.995** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **11.005 ～ 11.055** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **11.955 ～ 11.995** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **12.005 ～ 12.055** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |

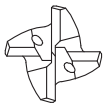
超硬

# CSOER

## 超硬オイルホール付止穴用リーマ　*Solid Carbide Oil Hole Reamer For Blind Hole*

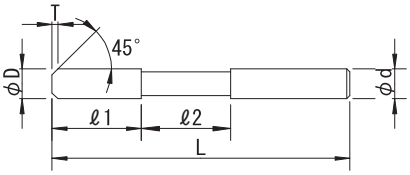
切削条件表 P134

止り穴加工　右ネジレ24～30°　OiL Hole　食付45°　超微粒子



センターカット






| 公差 (Tolerance) | D | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|
| 0.01トビ Increment 0.01 | +0.005 0 | 3 | +0.006 +0.002 | 3.1～6 | +0.009 +0.004 | 6.1～10 | +0.012 +0.006 | 10.1～16 | +0.015 +0.007 | h6 |

右刃右ネジレ24～30°　オイルホール付　食付角度45°　超微粒子
Helix Angle-Right24° ～ 30°　With Oil Hole　Chamfer Angle45°　Ultra Micro Grain Carbide

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **3** | 0.2 | 16 | 19 | 60 | 3 | 4 | – |
| **3.1** | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| **3.2** | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| **3.3** | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| **3.4** | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| **3.5** | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| **3.6** | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| **3.7** | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| **3.8** | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| **3.9** | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| **4** | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| **4.1** | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| **4.2** | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| **4.3** | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| **4.4** | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| **4.5** | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| **4.6** | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| **4.7** | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| **4.8** | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| **4.9** | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| **5** | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| **5.1** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **5.2** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **5.3** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **5.4** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **5.5** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **5.6** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **5.7** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **5.8** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **5.9** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **6** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **6.1** | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| **6.2** | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| **6.3** | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| **6.4** | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| **6.5** | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| **6.6** | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| **6.7** | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| **6.8** | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| **6.9** | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| **7** | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| **7.1** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| **7.2** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| **7.3** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| **7.4** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **7.5** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| **7.6** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| **7.7** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| **7.8** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| **7.9** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| **8** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| **8.1** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **8.2** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **8.3** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **8.4** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **8.5** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **8.6** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **8.7** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **8.8** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **8.9** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **9** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **9.1** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **9.2** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **9.3** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **9.4** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **9.5** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **9.6** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **9.7** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **9.8** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **9.9** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **10** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **10.1** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **10.2** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **10.3** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **10.4** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **10.5** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **10.6** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **10.7** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **10.8** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **10.9** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **11** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **11.1** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **11.2** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **11.3** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **11.4** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **11.5** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **11.6** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **11.7** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **11.8** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **11.9** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |

# CSOER 超硬オイルホール付止穴用リーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **12** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **13** | 0.3 | 30 | 80 | 165 | 12 | 4 | – |
| **14** | 0.3 | 30 | 85 | 170 | 16 | 4 | – |
| **15** | 0.3 | 30 | 90 | 180 | 16 | 4 | – |
| **16** | 0.3 | 30 | 95 | 185 | 16 | 4 | – |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **2.95 ～ 2.99** | 0.2 | 16 | 19 | 60 | 3 | 4 | – |
| **3.01 ～ 3.05** | 0.2 | 16 | 19 | 60 | 3 | 4 | – |
| **3.95 ～ 3.99** | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| **4.01 ～ 4.05** | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| **4.95 ～ 4.99** | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| **5.01 ～ 5.05** | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| **5.95 ～ 5.99** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **6.01 ～ 6.05** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **6.95 ～ 6.99** | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| **7.01 ～ 7.05** | 0.3 | 25 | 45 | 110 | 6 | 4 | – |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **7.95 ～ 7.99** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| **8.01 ～ 8.05** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| **8.95 ～ 8.99** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **9.01 ～ 9.05** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **9.95 ～ 9.99** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **10.01 ～ 10.05** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **10.95 ～ 10.99** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **11.01 ～ 11.05** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **11.95 ～ 11.99** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **12.01 ～ 12.05** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |

超硬

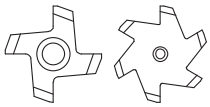
# CSGR-A

## 超硬ソリッドリーマ シャンクスルークーラント *Solid Carbide Reamer Shank Through Coolant*

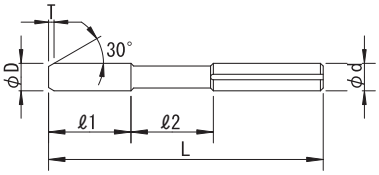
切削条件表 P134

貫通穴加工（ストレート刃）

右直刃 | TiAlN | Shank Through | 食付30° | K10








| 公差 (Tolerance) | D | | | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.01トビ Increment 0.01 | +0.005 0 | 3 | +0.006 +0.002 | 3.5～6 | +0.009 +0.004 | 6.35～10 | +0.012 +0.006 | 10.3～18 | +0.015 +0.007 | 18.1～20 | +0.017 +0.008 | h6 |

右刃ストレート　TiAlNコーティング　貫通穴用　食付角度30°　K10

Straight Flute　TiAlN Coating　For through hole　Chamfer Angle30°　Micro Grain Carbide(K10)

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **3** | 0.5 | 12 | 60 | 100 | 4 | 4 | 60° 凹 |
| **3.5** | 0.5 | 12 | 60 | 100 | 4 | 4 | 60° 凹 |
| **4** | 0.5 | 12 | 60 | 100 | 4 | 4 | 60° 凹 |
| **4.5** | 0.5 | 12 | 72 | 120 | 6 | 6 | 60° 凹 |
| **5** | 0.5 | 12 | 72 | 120 | 6 | 6 | 60° 凹 |
| **5.5** | 0.8 | 12 | 72 | 120 | 6 | 6 | 60° 凹 |
| **5.7** | 0.8 | 12 | 72 | 120 | 6 | 6 | 60° 凹 |
| **6** | 0.8 | 12 | 72 | 120 | 6 | 6 | 60° 凹 |
| **6.5** | 0.8 | 16 | 78 | 130 | 8 | 6 | 60° 凹 |
| **7** | 0.8 | 16 | 78 | 130 | 8 | 6 | 60° 凹 |
| **7.5** | 0.8 | 16 | 78 | 130 | 8 | 6 | 60° 凹 |
| **7.6** | 0.8 | 16 | 78 | 130 | 8 | 6 | 60° 凹 |
| **7.8** | 0.8 | 16 | 78 | 130 | 8 | 6 | 60° 凹 |
| **7.9** | 0.8 | 16 | 78 | 130 | 8 | 6 | 60° 凹 |
| **8** | 0.8 | 16 | 78 | 130 | 8 | 6 | 60° 凹 |
| **8.5** | 1 | 19 | 71 | 130 | 10 | 6 | 60° 凹 |
| **9** | 1 | 19 | 71 | 130 | 10 | 6 | 60° 凹 |
| **9.5** | 1 | 19 | 71 | 130 | 10 | 6 | 60° 凹 |
| **10** | 1 | 19 | 71 | 130 | 10 | 6 | 60° 凹 |
| **10.3** | 1 | 19 | 86 | 150 | 12 | 6 | 60° 凹 |
| **10.5** | 1 | 19 | 86 | 150 | 12 | 6 | 60° 凹 |
| **11** | 1 | 19 | 86 | 150 | 12 | 6 | 60° 凹 |
| **11.5** | 1 | 19 | 86 | 150 | 12 | 6 | 60° 凹 |
| **12** | 1 | 19 | 86 | 150 | 12 | 6 | 60° 凹 |
| **12.5** | 1 | 22 | 83 | 150 | 14 | 8 | 60° 凹 |
| **13** | 1 | 22 | 83 | 150 | 14 | 8 | 60° 凹 |
| **14** | 1 | 22 | 83 | 150 | 14 | 8 | 60° 凹 |
| **14.1** | 1 | 22 | 83 | 150 | 14 | 8 | 60° 凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **14.2** | 1.5 | 22 | 110 | 180 | 16 | 8 | 60° 凹 |
| **14.3** | 1.5 | 22 | 110 | 180 | 16 | 8 | 60° 凹 |
| **14.5** | 1.5 | 22 | 110 | 180 | 16 | 8 | 60° 凹 |
| **15** | 1.5 | 22 | 110 | 180 | 16 | 8 | 60° 凹 |
| **15.5** | 1.5 | 22 | 110 | 180 | 16 | 8 | 60° 凹 |
| **16** | 1.5 | 22 | 110 | 180 | 16 | 8 | 60° 凹 |
| **16.1** | 1.5 | 22 | 110 | 180 | 16 | 8 | 60° 凹 |
| **16.2** | 1.5 | 25 | 107 | 180 | 18 | 8 | 60° 凹 |
| **16.5** | 1.5 | 25 | 107 | 180 | 18 | 8 | 60° 凹 |
| **17** | 1.5 | 25 | 107 | 180 | 18 | 8 | 60° 凹 |
| **18** | 1.5 | 25 | 107 | 180 | 18 | 8 | 60° 凹 |
| **18.1** | 1.5 | 25 | 107 | 180 | 18 | 8 | 60° 凹 |
| **18.2** | 1.5 | 25 | 125 | 200 | 20 | 8 | 60° 凹 |
| **18.5** | 1.5 | 25 | 125 | 200 | 20 | 8 | 60° 凹 |
| **19** | 1.5 | 25 | 125 | 200 | 20 | 8 | 60° 凹 |
| **19.1** | 1.5 | 25 | 125 | 200 | 20 | 8 | 60° 凹 |
| **19.2** | 1.5 | 25 | 125 | 200 | 20 | 8 | 60° 凹 |
| **19.3** | 1.5 | 25 | 125 | 200 | 20 | 8 | 60° 凹 |
| **19.5** | 1.5 | 25 | 125 | 200 | 20 | 8 | 60° 凹 |
| **20** | 1.5 | 25 | 125 | 200 | 20 | 8 | 60° 凹 |
| | | | | | | | |
| **1/8** | 0.5 | 12 | 60 | 100 | 4 | 4 | 60° 凹 |
| **1/4** | 0.8 | 16 | 78 | 130 | 8 | 6 | 60° 凹 |
| **5/16** | 0.8 | 16 | 78 | 130 | 8 | 6 | 60° 凹 |
| **11/32** | 1 | 19 | 71 | 130 | 10 | 6 | 60° 凹 |
| **3/8** | 1 | 19 | 71 | 130 | 10 | 6 | 60° 凹 |
| **1/2** | 1 | 22 | 83 | 150 | 14 | 8 | 60° 凹 |
| **5/8** | 1.5 | 22 | 110 | 180 | 16 | 8 | 60° 凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **2.97～2.99** | 0.5 | 12 | 60 | 100 | 4 | 4 | 60° 凹 |
| **3.01～3.03** | 0.5 | 12 | 60 | 100 | 4 | 4 | 60° 凹 |
| **3.97～3.99** | 0.5 | 12 | 60 | 100 | 4 | 4 | 60° 凹 |
| **4.01～4.03** | 0.5 | 12 | 60 | 100 | 4 | 4 | 60° 凹 |
| **4.97～4.99** | 0.5 | 12 | 72 | 120 | 6 | 6 | 60° 凹 |
| **5.01～5.03** | 0.5 | 12 | 72 | 120 | 6 | 6 | 60° 凹 |
| **5.97～5.99** | 0.8 | 12 | 72 | 120 | 6 | 6 | 60° 凹 |
| **6.01～6.03** | 0.8 | 12 | 72 | 120 | 6 | 6 | 60° 凹 |
| **6.97～6.99** | 0.8 | 16 | 78 | 130 | 8 | 6 | 60° 凹 |
| **7.01～7.03** | 0.8 | 16 | 78 | 130 | 8 | 6 | 60° 凹 |
| **7.97～7.99** | 0.8 | 16 | 78 | 130 | 8 | 6 | 60° 凹 |
| **8.01～8.03** | 0.8 | 16 | 78 | 130 | 8 | 6 | 60° 凹 |
| **8.97～8.99** | 1 | 19 | 71 | 130 | 10 | 6 | 60° 凹 |
| **9.01～9.03** | 1 | 19 | 71 | 130 | 10 | 6 | 60° 凹 |
| **9.97～9.99** | 1 | 19 | 71 | 130 | 10 | 6 | 60° 凹 |
| **10.01～10.03** | 1 | 19 | 71 | 130 | 10 | 6 | 60° 凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **10.97～10.99** | 1 | 19 | 86 | 150 | 12 | 6 | 60° 凹 |
| **11.01～11.03** | 1 | 19 | 86 | 150 | 12 | 6 | 60° 凹 |
| **11.97～11.99** | 1 | 19 | 86 | 150 | 12 | 6 | 60° 凹 |
| **12.01～12.03** | 1 | 19 | 86 | 150 | 12 | 6 | 60° 凹 |
| **12.97～12.99** | 1 | 22 | 83 | 150 | 14 | 8 | 60° 凹 |
| **13.01～13.03** | 1 | 22 | 83 | 150 | 14 | 8 | 60° 凹 |
| **13.97～13.99** | 1 | 22 | 83 | 150 | 14 | 8 | 60° 凹 |
| **14.01～14.03** | 1 | 22 | 83 | 150 | 14 | 8 | 60° 凹 |
| **14.99** | 1.5 | 22 | 110 | 180 | 16 | 8 | 60° 凹 |
| **15.01～15.03** | 1.5 | 22 | 110 | 180 | 16 | 8 | 60° 凹 |
| **15.98～15.99** | 1.5 | 22 | 110 | 180 | 16 | 8 | 60° 凹 |
| **16.01～16.02** | 1.5 | 22 | 110 | 180 | 16 | 8 | 60° 凹 |
| **17.01～17.02** | 1.5 | 25 | 107 | 180 | 18 | 8 | 60° 凹 |
| **18.01～18.03** | 1.5 | 25 | 107 | 180 | 18 | 8 | 60° 凹 |
| **20.01～20.03** | 1.5 | 25 | 125 | 200 | 20 | 8 | 60° 凹 |

超硬

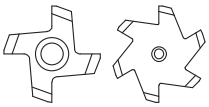
# CSGR-DLC

## 超硬ソリッドリーマ シャンクスルークーラント アルミ用 *Solid Carbide Reamer Shank Through Coolant For Aluminum*

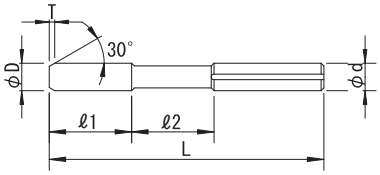
切削条件表 P135

**貫通穴加工（ストレート刃）**

右直刃 | HF DLC | Shank Through | 食付30° | K10








| 公差 (Tolerance) | D | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|
| | 4～6 | +0.009 +0.004 | 7～10 | +0.012 +0.006 | 12～18 | +0.015 +0.007 | 20 | +0.017 +0.008 | h6 |

右刃ストレート　水素フリー　DLCコーティング　貫通穴用　食付角度30°　K10
Straight Flute　Hydrogen Free　DLC Coating　For through hole　Chamfer Angle30°　Micro Grain Carbide(K10)

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **4** | 0.5 | 12 | 60 | 100 | 4 | 4 | 60°凹 |
| **5** | 0.5 | 12 | 72 | 120 | 6 | 6 | 60°凹 |
| **6** | 0.8 | 12 | 72 | 120 | 6 | 6 | 60°凹 |
| **7** | 0.8 | 16 | 78 | 130 | 8 | 6 | 60°凹 |
| **8** | 0.8 | 16 | 78 | 130 | 8 | 6 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **10** | 1 | 19 | 71 | 130 | 10 | 6 | 60°凹 |
| **12** | 1 | 19 | 86 | 150 | 12 | 6 | 60°凹 |
| **14** | 1 | 22 | 83 | 150 | 14 | 8 | 60°凹 |
| **16** | 1.5 | 22 | 110 | 180 | 16 | 8 | 60°凹 |
| **18** | 1.5 | 25 | 107 | 180 | 18 | 8 | 60°凹 |
| **20** | 1.5 | 25 | 125 | 200 | 20 | 8 | 60°凹 |

超硬

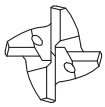
# CSCER

## 超硬エンド刃付クーラントリーマ（止まり穴用） *Solid Carbide Coolant Reamer For Blind Hole*

切削条件表 P135

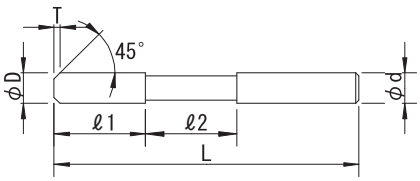
止り穴加工

右ネジレ15° / OiL Hole / 食付45° / 超微粒子



センターカット






| 公差 (Tolerance) | D | | | | | | d |
|---|---|---|---|---|---|---|---|
| | 5～6 | +0.009 +0.004 | 6.5～10 | +0.012 +0.006 | 10.5～12 | +0.015 +0.007 | h6 |

右刃右ネジレ15° オイルホール付 食付角度45° 超微粒子
Helix Angle-Right15° With Oil Hole Chamfer Angle45° Ultra Micro Grain Carbide

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **5** | 0.4 | 24 | 36 | 90 | 5 | 4 | – |
| **5.5** | 0.4 | 25 | 35 | 100 | 5.5 | 4 | – |
| **6** | 0.4 | 25 | 35 | 100 | 6 | 4 | – |
| **6.5** | 0.4 | 25 | 45 | 110 | 6.5 | 4 | – |
| **7** | 0.4 | 25 | 45 | 110 | 7 | 4 | – |
| **7.5** | 0.4 | 25 | 45 | 110 | 7.5 | 4 | – |
| **8** | 0.4 | 25 | 60 | 125 | 8 | 4 | – |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **8.5** | 0.4 | 30 | 60 | 135 | 8.5 | 4 | – |
| **9** | 0.4 | 30 | 60 | 135 | 9 | 4 | – |
| **9.5** | 0.4 | 30 | 65 | 145 | 9.5 | 4 | – |
| **10** | 0.4 | 30 | 65 | 145 | 10 | 4 | – |
| **10.5** | 0.4 | 30 | 65 | 145 | 10.5 | 4 | – |
| **11** | 0.4 | 30 | 65 | 145 | 11 | 4 | – |
| **11.5** | 0.4 | 30 | 65 | 145 | 11.5 | 4 | – |
| **12** | 0.4 | 30 | 65 | 145 | 12 | 4 | – |

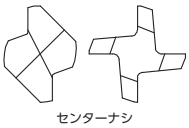
超硬

# CSRR-3

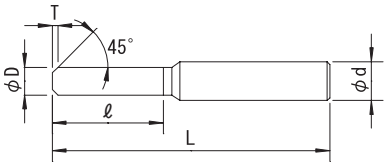
## 超硬ルーマー型リーマ *Solid Carbide Roumer Type Reamer*

切削条件表 P135

貫通穴加工（ストレート刃） 右直刃 食付45° 超微粒子






| 公差 (Tolerance) | D | | d |
|---|---|---|---|
| | 0.2～3 | +0.005 0 | 0 −0.009 |

右刃ストレート　食付角度45°　超微粒子
Straight Flute　Chamfer Angle45°　Ultra Micro Grain Carbide

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **0.2** | 0.05 | 3 | 45 | 3 | 2 | – |
| **0.3** | 0.1 | 5 | 45 | 3 | 4 | – |
| **0.4** | 0.1 | 6 | 45 | 3 | 4 | – |
| **0.5** | 0.15 | 6 | 45 | 3 | 4 | – |
| **0.6** | 0.15 | 8 | 45 | 3 | 4 | – |
| **0.7** | 0.2 | 8 | 45 | 3 | 4 | – |
| **0.8** | 0.2 | 8 | 45 | 3 | 4 | – |
| **0.9** | 0.3 | 8 | 45 | 3 | 4 | – |
| **1** | 0.3 | 10 | 45 | 3 | 4 | – |
| **1.1** | 0.3 | 10 | 45 | 3 | 4 | – |
| **1.2** | 0.3 | 10 | 45 | 3 | 4 | – |
| **1.3** | 0.3 | 10 | 45 | 3 | 4 | – |
| **1.4** | 0.3 | 10 | 45 | 3 | 4 | – |
| **1.5** | 0.3 | 10 | 45 | 3 | 4 | – |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **1.6** | 0.5 | 22 | 45 | 3 | 4 | – |
| **1.7** | 0.5 | 22 | 45 | 3 | 4 | – |
| **1.8** | 0.5 | 22 | 45 | 3 | 4 | – |
| **1.9** | 0.5 | 22 | 45 | 3 | 4 | – |
| **2** | 0.5 | 22 | 45 | 3 | 4 | – |
| **2.1** | 0.5 | 22 | 45 | 3 | 4 | – |
| **2.2** | 0.5 | 22 | 45 | 3 | 4 | – |
| **2.3** | 0.5 | 22 | 45 | 3 | 4 | – |
| **2.4** | 0.5 | 22 | 45 | 3 | 4 | – |
| **2.5** | 0.5 | 22 | 45 | 3 | 4 | – |
| **2.6** | 0.5 | 22 | 45 | 3 | 4 | – |
| **2.7** | 0.5 | 25 | 50 | 3 | 4 | – |
| **2.8** | 0.5 | 25 | 50 | 3 | 4 | – |
| **2.9** | 0.5 | 25 | 50 | 3 | 4 | – |
| **3** | 0.5 | 25 | 50 | 3 | 4 | – |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **0.21～0.29** | 0.05 | 3 | 45 | 3 | 2 | – |
| **0.31～0.39** | 0.1 | 5 | 45 | 3 | 4 | – |
| **0.41～0.49** | 0.1 | 6 | 45 | 3 | 4 | – |
| **0.51～0.59** | 0.15 | 6 | 45 | 3 | 4 | – |
| **0.61～0.69** | 0.15 | 8 | 45 | 3 | 4 | – |
| **0.71～0.79** | 0.2 | 8 | 45 | 3 | 4 | – |
| **0.81～0.89** | 0.2 | 8 | 45 | 3 | 4 | – |
| **0.91～0.99** | 0.3 | 8 | 45 | 3 | 4 | – |
| **1.01～1.09** | 0.3 | 10 | 45 | 3 | 4 | – |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **1.11～1.19** | 0.3 | 10 | 45 | 3 | 4 | – |
| **1.21～1.29** | 0.3 | 10 | 45 | 3 | 4 | – |
| **1.31～1.39** | 0.3 | 10 | 45 | 3 | 4 | – |
| **1.41～1.49** | 0.3 | 10 | 45 | 3 | 4 | – |
| **1.51～1.59** | 0.3 | 10 | 45 | 3 | 4 | – |
| **1.61～1.69** | 0.5 | 22 | 45 | 3 | 4 | – |
| **1.71～1.79** | 0.5 | 22 | 45 | 3 | 4 | – |
| **1.81～1.89** | 0.5 | 22 | 45 | 3 | 4 | – |
| **1.91～1.99** | 0.5 | 22 | 45 | 3 | 4 | – |

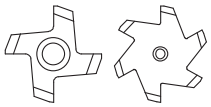
超硬

# CSR-MC

## 超硬ミクロンリーマ　*Solid Carbide Micron Reamer*

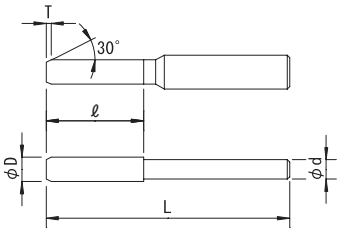
切削条件表 P135

**貫通穴用（ストレート刃）** 右直刃 食付30° K10



D≦Φ2.909　60°凸






| 公差(Tolerance) | D | d |
|---|---|---|
| | +0.001 未満 0 | h6 |

右刃ストレート　食付角度30°　K10
Straight Flute　Chamfer Angle30°　Micro Grain Carbide(K10)

| 直径（ΦD） Dia. | 食付長（T） Chamfer Length | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. | 刃数（N） Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 0.5 ～ 0.509 | 0.1 | 5 | 50 | 1 | 4 | 60°凸 |
| 0.51 ～ 0.599 | 0.1 | 6 | 50 | 1 | 4 | 60°凸 |
| 0.6 ～ 0.609 | 0.1 | 6 | 50 | 1 | 4 | 60°凸 |
| 0.61 ～ 0.699 | 0.1 | 10 | 50 | 1 | 4 | 60°凸 |
| 0.7 ～ 0.709 | 0.1 | 10 | 50 | 1 | 4 | 60°凸 |
| 0.71 ～ 0.799 | 0.2 | 12 | 50 | 1 | 4 | 60°凸 |
| 0.8 ～ 0.899 | 0.2 | 12 | 50 | 1 | 4 | 60°凸 |
| 0.9 ～ 0.999 | 0.2 | 12 | 50 | 1 | 4 | 60°凸 |
| 1 ～ 1.009 | 0.2 | 12 | 50 | 1 | 4 | 60°凸 |
| 1.01 ～ 1.099 | 0.2 | 15 | 50 | 1.5 | 4 | 60°凸 |
| 1.1 ～ 1.199 | 0.2 | 15 | 50 | 1.5 | 4 | 60°凸 |
| 1.2 ～ 1.299 | 0.2 | 15 | 50 | 1.5 | 4 | 60°凸 |
| 1.3 ～ 1.309 | 0.2 | 15 | 50 | 1.5 | 4 | 60°凸 |
| 1.31 ～ 1.399 | 0.3 | 16 | 50 | 1.5 | 4 | 60°凸 |
| 1.4 ～ 1.499 | 0.3 | 16 | 50 | 1.5 | 4 | 60°凸 |
| 1.5 ～ 1.509 | 0.3 | 16 | 50 | 1.5 | 4 | 60°凸 |
| 1.51 ～ 1.599 | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| 1.6 ～ 1.699 | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| 1.7 ～ 1.799 | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| 1.8 ～ 1.899 | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| 1.9 ～ 1.999 | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| 2 ～ 2.009 | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| 2.01 ～ 2.099 | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| 2.1 ～ 2.199 | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| 2.2 ～ 2.299 | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| 2.3 ～ 2.399 | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| 2.4 ～ 2.499 | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| 2.5 ～ 2.509 | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| 2.51 ～ 2.599 | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| 2.6 ～ 2.699 | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| 2.7 ～ 2.799 | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| 2.8 ～ 2.899 | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| 2.9 ～ 2.909 | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| 2.91 ～ 2.999 | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| 3 ～ 3.009 | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| 3.01 ～ 3.099 | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |

| 直径（ΦD） Dia. | 食付長（T） Chamfer Length | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. | 刃数（N） Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 3.1 ～ 3.199 | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| 3.2 ～ 3.299 | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| 3.3 ～ 3.399 | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| 3.4 ～ 3.499 | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| 3.5 ～ 3.509 | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| 3.51 ～ 3.599 | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| 3.6 ～ 3.699 | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| 3.7 ～ 3.799 | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| 3.8 ～ 3.899 | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| 3.9 ～ 3.999 | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| 4 ～ 4.009 | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| 4.01 ～ 4.099 | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| 4.1 ～ 4.199 | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| 4.2 ～ 4.299 | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| 4.3 ～ 4.399 | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| 4.4 ～ 4.499 | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| 4.5 ～ 4.509 | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| 4.51 ～ 4.599 | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| 4.6 ～ 4.699 | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| 4.7 ～ 4.799 | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| 4.8 ～ 4.899 | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| 4.9 ～ 4.999 | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| 5 ～ 5.009 | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| 5.01 ～ 5.099 | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |
| 5.1 ～ 5.199 | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |
| 5.2 ～ 5.299 | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |
| 5.3 ～ 5.399 | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |
| 5.4 ～ 5.499 | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |
| 5.5 ～ 5.509 | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |
| 5.51 ～ 5.599 | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| 5.6 ～ 5.699 | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| 5.7 ～ 5.799 | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| 5.8 ～ 5.899 | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| 5.9 ～ 5.999 | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| 6 ～ 6.009 | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| 6.01 ～ 6.05 | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |

# CSR-MC 超硬ミクロンリーマ

Φ6.051～Φ12.1までは受注生産品となります。

| 直径（ΦD） Dia. | 食付長（T） Chamfer Length | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. | 刃数（N） Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 6.051 ～ 6.099 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.1 ～ 6.199 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.2 ～ 6.299 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.3 ～ 6.399 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.4 ～ 6.499 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.5 ～ 6.599 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.6 ～ 6.699 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.7 ～ 6.799 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.8 ～ 6.899 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.9 ～ 6.999 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 7 ～ 7.009 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 7.01 ～ 7.099 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.1 ～ 7.199 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.2 ～ 7.299 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.3 ～ 7.399 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.4 ～ 7.499 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.5 ～ 7.599 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.6 ～ 7.699 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.7 ～ 7.799 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.8 ～ 7.899 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.9 ～ 7.999 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 8 ～ 8.009 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 8.01 ～ 8.099 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.1 ～ 8.199 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.2 ～ 8.299 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.3 ～ 8.399 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.4 ～ 8.499 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.5 ～ 8.599 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.6 ～ 8.699 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.7 ～ 8.799 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.8 ～ 8.899 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.9 ～ 8.999 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 9 ～ 9.009 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |

| 直径（ΦD） Dia. | 食付長（T） Chamfer Length | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. | 刃数（N） Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 9.01 ～ 9.099 | 1 | 40 | 90 | 10 | 6 | 60° 凹 |
| 9.1 ～ 9.199 | 1 | 40 | 90 | 10 | 6 | 60° 凹 |
| 9.2 ～ 9.299 | 1 | 40 | 90 | 10 | 6 | 60° 凹 |
| 9.3 ～ 9.399 | 1 | 40 | 90 | 10 | 6 | 60° 凹 |
| 9.4 ～ 9.499 | 1 | 40 | 90 | 10 | 6 | 60° 凹 |
| 9.5 ～ 9.599 | 1 | 40 | 90 | 10 | 6 | 60° 凹 |
| 9.6 ～ 9.699 | 1 | 40 | 90 | 10 | 6 | 60° 凹 |
| 9.7 ～ 9.799 | 1 | 40 | 90 | 10 | 6 | 60° 凹 |
| 9.8 ～ 9.899 | 1 | 40 | 90 | 10 | 6 | 60° 凹 |
| 9.9 ～ 9.999 | 1 | 40 | 90 | 10 | 6 | 60° 凹 |
| 10 ～ 10.009 | 1 | 40 | 90 | 10 | 6 | 60° 凹 |
| 10.01 ～ 10.099 | 1 | 40 | 90 | 11 | 6 | 60° 凹 |
| 10.1 ～ 10.199 | 1 | 40 | 90 | 11 | 6 | 60° 凹 |
| 10.2 ～ 10.299 | 1 | 40 | 90 | 11 | 6 | 60° 凹 |
| 10.3 ～ 10.399 | 1 | 40 | 90 | 11 | 6 | 60° 凹 |
| 10.4 ～ 10.499 | 1 | 40 | 90 | 11 | 6 | 60° 凹 |
| 10.5 ～ 10.599 | 1 | 40 | 90 | 11 | 6 | 60° 凹 |
| 10.6 ～ 10.699 | 1 | 40 | 90 | 11 | 6 | 60° 凹 |
| 10.7 ～ 10.799 | 1 | 40 | 90 | 11 | 6 | 60° 凹 |
| 10.8 ～ 10.899 | 1 | 40 | 90 | 11 | 6 | 60° 凹 |
| 10.9 ～ 10.999 | 1 | 40 | 90 | 11 | 6 | 60° 凹 |
| 11 ～ 11.009 | 1 | 40 | 90 | 11 | 6 | 60° 凹 |
| 11.01 ～ 11.099 | 1 | 45 | 90 | 12 | 6 | 60° 凹 |
| 11.1 ～ 11.199 | 1 | 45 | 90 | 12 | 6 | 60° 凹 |
| 11.2 ～ 11.299 | 1 | 45 | 90 | 12 | 6 | 60° 凹 |
| 11.3 ～ 11.399 | 1 | 45 | 90 | 12 | 6 | 60° 凹 |
| 11.4 ～ 11.499 | 1 | 45 | 90 | 12 | 6 | 60° 凹 |
| 11.5 ～ 11.599 | 1 | 45 | 90 | 12 | 6 | 60° 凹 |
| 11.6 ～ 11.699 | 1 | 45 | 90 | 12 | 6 | 60° 凹 |
| 11.7 ～ 11.799 | 1 | 45 | 90 | 12 | 6 | 60° 凹 |
| 11.8 ～ 11.899 | 1 | 45 | 90 | 12 | 6 | 60° 凹 |
| 11.9 ～ 11.999 | 1 | 45 | 90 | 12 | 6 | 60° 凹 |
| 12 ～ 12.099 | 1 | 45 | 90 | 12 | 6 | 60° 凹 |
| 12.1 | 1 | 45 | 90 | 12 | 6 | 60° 凹 |

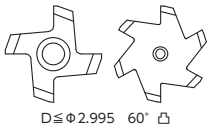
超硬

# CSR-ECO

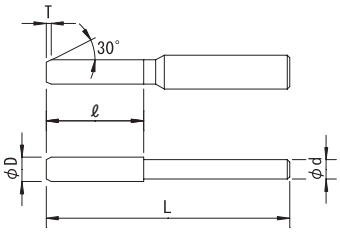
## 超硬高精度用リーマ　*Solid Carbide High Precision Reamer*

切削条件表 P135

**貫通穴用（ストレート刃）** 右直刃 食付30° K10






| 公差(Tolerance) | D | | | d |
|---|---|---|---|---|
| | 0.1トビ Increment 0.1 +0.005 0 | 0.01トビ Increment 0.01 +0.005 0 | 0.005トビ Increment 0.005 +0.003 0 | h6 |

右刃ストレート　食付角度30°　K10
Straight Flute　Chamfer Angle30°　Micro Grain Carbide(K10)

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **0.5** | 0.1 | 5 | 50 | 1 | 4 | 60°凸 |
| **0.6** | 0.1 | 6 | 50 | 1 | 4 | 60°凸 |
| **0.7** | 0.1 | 10 | 50 | 1 | 4 | 60°凸 |
| **0.8 ～ 0.9** | 0.2 | 12 | 50 | 1 | 4 | 60°凸 |
| **1** | 0.2 | 12 | 50 | 1 | 4 | 60°凸 |
| **1.1 ～ 1.3** | 0.2 | 15 | 50 | 1.5 | 4 | 60°凸 |
| **1.4 ～ 1.5** | 0.3 | 16 | 50 | 1.5 | 4 | 60°凸 |
| **1.6 ～ 1.9** | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| **2** | 0.5 | 18 | 50 | 2 | 4 | 60°凸 |
| **2.1 ～ 2.5** | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| **2.6 ～ 2.9** | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| **3** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.1 ～ 3.5** | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| **3.6 ～ 3.9** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **4** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **4.1 ～ 4.5** | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| **4.6 ～ 4.9** | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| **5** | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| **5.1 ～ 5.5** | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **5.6 ～ 5.9** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **6** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **6.1 ～ 6.5** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.6 ～ 6.9** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **7** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **7.1 ～ 7.5** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.6 ～ 7.9** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **8** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **8.1 ～ 8.5** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.6 ～ 8.9** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **9** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **9.1 ～ 9.5** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **9.6 ～ 9.9** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.1 ～ 10.5** | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| **10.6 ～ 10.9** | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| **11** | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| **11.1 ～ 11.5** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.6 ～ 11.9** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **12** | 1 | 45 | 90 | 12 | 6 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **0.51 ～ 0.59** | 0.1 | 6 | 50 | 1 | 4 | 60°凸 |
| **0.61 ～ 0.69** | 0.1 | 10 | 50 | 1 | 4 | 60°凸 |
| **0.71 ～ 0.99** | 0.2 | 12 | 50 | 1 | 4 | 60°凸 |
| **1.01 ～ 1.29** | 0.2 | 15 | 50 | 1.5 | 4 | 60°凸 |
| **1.31 ～ 1.49** | 0.3 | 16 | 50 | 1.5 | 4 | 60°凸 |
| **1.51 ～ 1.89** | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| **1.91 ～ 1.99** | 0.5 | 18 | 50 | 2 | 4 | 60°凸 |
| **2.01 ～ 2.49** | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| **2.51 ～ 2.99** | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| **3.01 ～ 3.49** | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| **3.51 ～ 3.99** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **4.01 ～ 4.49** | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| **4.51 ～ 4.99** | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| **5.01 ～ 5.09** | 0.5 | 30 | 80 | 5.5 | 6 | 60°凹 |
| **5.11 ～ 5.49** | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **5.51 ～ 5.99** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **6.01 ～ 6.49** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.51 ～ 6.99** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **7.01 ～ 7.49** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.51 ～ 7.99** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **8.01 ～ 8.09** | 0.8 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.11 ～ 8.49** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.51 ～ 8.99** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **9.01 ～ 9.49** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **9.51 ～ 9.99** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.01 ～ 10.49** | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| **10.51 ～ 10.99** | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| **11.01 ～ 11.49** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.51 ～ 11.99** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **12.01 ～ 12.05** | 1 | 45 | 90 | 12 | 6 | 60°凹 |

# CSR-ECO 超硬高精度用リーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 0.955 ～ 0.995 | 0.2 | 12 | 50 | 1 | 4 | 60° 凸 |
| 1.005 ～ 1.045 | 0.2 | 15 | 50 | 1.5 | 4 | 60° 凸 |
| 1.105 | 0.2 | 15 | 50 | 1.5 | 4 | 60° 凸 |
| 1.205 | 0.2 | 15 | 50 | 1.5 | 4 | 60° 凸 |
| 1.305 | 0.2 | 16 | 50 | 1.5 | 4 | 60° 凸 |
| 1.405 | 0.3 | 16 | 50 | 1.5 | 4 | 60° 凸 |
| 1.505 | 0.4 | 18 | 50 | 2 | 4 | 60° 凸 |
| 1.605 | 0.4 | 18 | 50 | 2 | 4 | 60° 凸 |
| 1.705 | 0.4 | 18 | 50 | 2 | 4 | 60° 凸 |
| 1.805 | 0.4 | 18 | 50 | 2 | 4 | 60° 凸 |
| 1.905 | 0.5 | 18 | 50 | 2 | 4 | 60° 凸 |
| 1.955 ～ 1.995 | 0.5 | 18 | 50 | 2 | 4 | 60° 凸 |
| 2.005 ～ 2.045 | 0.5 | 20 | 50 | 2.5 | 4 | 60° 凸 |
| 2.105 | 0.5 | 20 | 50 | 2.5 | 4 | 60° 凸 |
| 2.205 | 0.5 | 20 | 50 | 2.5 | 4 | 60° 凸 |
| 2.305 | 0.5 | 20 | 50 | 2.5 | 4 | 60° 凸 |
| 2.405 | 0.5 | 20 | 50 | 2.5 | 4 | 60° 凸 |
| 2.505 | 0.5 | 20 | 50 | 3 | 4 | 60° 凸 |
| 2.605 | 0.5 | 20 | 50 | 3 | 4 | 60° 凸 |
| 2.705 | 0.5 | 20 | 50 | 3 | 4 | 60° 凸 |
| 2.805 | 0.5 | 20 | 50 | 3 | 4 | 60° 凸 |
| 2.905 | 0.5 | 20 | 50 | 3 | 4 | 60° 凸 |
| 2.955 ～ 2.995 | 0.5 | 20 | 50 | 3 | 4 | 60° 凸 |
| 3.005 ～ 3.045 | 0.5 | 27 | 60 | 3.5 | 4 | 60° 凹 |
| 3.105 | 0.5 | 27 | 60 | 3.5 | 4 | 60° 凹 |
| 3.205 | 0.5 | 27 | 60 | 3.5 | 4 | 60° 凹 |
| 3.305 | 0.5 | 27 | 60 | 3.5 | 4 | 60° 凹 |
| 3.405 | 0.5 | 27 | 60 | 3.5 | 4 | 60° 凹 |
| 3.505 | 0.5 | 27 | 60 | 4 | 4 | 60° 凹 |
| 3.605 | 0.5 | 27 | 60 | 4 | 4 | 60° 凹 |
| 3.705 | 0.5 | 27 | 60 | 4 | 4 | 60° 凹 |
| 3.805 | 0.5 | 27 | 60 | 4 | 4 | 60° 凹 |
| 3.905 | 0.5 | 27 | 60 | 4 | 4 | 60° 凹 |
| 3.955 ～ 3.995 | 0.5 | 27 | 60 | 4 | 4 | 60° 凹 |
| 4.005 ～ 4.045 | 0.5 | 30 | 70 | 4.5 | 6 | 60° 凹 |
| 4.105 | 0.5 | 30 | 70 | 4.5 | 6 | 60° 凹 |
| 4.205 | 0.5 | 30 | 70 | 4.5 | 6 | 60° 凹 |
| 4.305 | 0.5 | 30 | 70 | 4.5 | 6 | 60° 凹 |
| 4.405 | 0.5 | 30 | 70 | 4.5 | 6 | 60° 凹 |
| 4.505 | 0.5 | 30 | 70 | 5 | 6 | 60° 凹 |
| 4.605 | 0.5 | 30 | 70 | 5 | 6 | 60° 凹 |
| 4.705 | 0.5 | 30 | 70 | 5 | 6 | 60° 凹 |
| 4.805 | 0.5 | 30 | 70 | 5 | 6 | 60° 凹 |
| 4.905 | 0.5 | 30 | 70 | 5 | 6 | 60° 凹 |
| 4.955 ～ 4.995 | 0.5 | 30 | 70 | 5 | 6 | 60° 凹 |
| 5.005 ～ 5.045 | 0.5 | 30 | 80 | 5.5 | 6 | 60° 凹 |
| 5.105 | 0.8 | 30 | 80 | 5.5 | 6 | 60° 凹 |
| 5.205 | 0.8 | 30 | 80 | 5.5 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 5.305 | 0.8 | 30 | 80 | 5.5 | 6 | 60° 凹 |
| 5.405 | 0.8 | 30 | 80 | 5.5 | 6 | 60° 凹 |
| 5.505 | 0.8 | 30 | 80 | 6 | 6 | 60° 凹 |
| 5.605 | 0.8 | 30 | 80 | 6 | 6 | 60° 凹 |
| 5.705 | 0.8 | 30 | 80 | 6 | 6 | 60° 凹 |
| 5.805 | 0.8 | 30 | 80 | 6 | 6 | 60° 凹 |
| 5.905 | 0.8 | 30 | 80 | 6 | 6 | 60° 凹 |
| 5.955 ～ 5.995 | 0.8 | 30 | 80 | 6 | 6 | 60° 凹 |
| 6.005 ～ 6.045 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.105 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.205 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.305 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.405 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.505 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.605 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.705 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.805 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.905 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 6.955 ～ 6.995 | 0.8 | 35 | 80 | 7 | 6 | 60° 凹 |
| 7.005 ～ 7.045 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.105 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.205 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.305 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.405 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.505 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.605 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.705 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.805 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.905 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 7.955 ～ 7.995 | 0.8 | 35 | 80 | 8 | 6 | 60° 凹 |
| 8.005 ～ 8.045 | 0.8 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.105 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.205 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.305 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.405 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.505 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.605 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.705 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.805 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.905 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 8.955 ～ 8.995 | 1 | 40 | 90 | 9 | 6 | 60° 凹 |
| 9.005 ～ 9.045 | 1 | 40 | 90 | 10 | 6 | 60° 凹 |
| 9.955 ～ 9.995 | 1 | 40 | 90 | 10 | 6 | 60° 凹 |
| 10.005 ～ 10.045 | 1 | 40 | 90 | 11 | 6 | 60° 凹 |
| 10.955 ～ 10.995 | 1 | 40 | 90 | 11 | 6 | 60° 凹 |
| 11.005 ～ 11.045 | 1 | 45 | 90 | 12 | 6 | 60° 凹 |
| 11.955 ～ 11.995 | 1 | 45 | 90 | 12 | 6 | 60° 凹 |
| 12.005 ～ 12.045 | 1 | 45 | 90 | 12 | 6 | 60° 凹 |

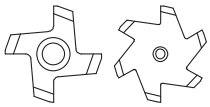
超硬

# CSR

## ソリッドリーマ *Solid Carbide Reamer*

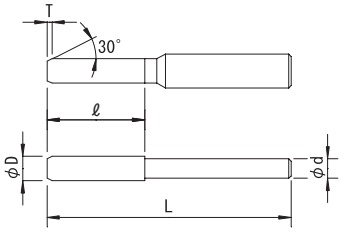
切削条件表 P135

貫通穴加工（ストレート刃） 右直刃 食付30° K10



D≦Φ2.995 60° 凸






| 公差 (Tolerance) | D | | | | | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.01トビ Increment 0.01 | +0.005 0 | 0.005トビ Increment 0.005 | +0.003 0 | 0.4～3 | +0.007 +0.002 | 3.1～6 | +0.009 +0.004 | 6.1～10 | +0.012 +0.006 | 10.1～18 | +0.015 +0.007 | 18.1～20 | +0.017 +0.008 | h7 |

右刃ストレート　食付角度30°　K10
Straight Flute　Chamfer Angle30°　Micro Grain Carbide(K10)

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **0.4** | 0.2 | 4 | 50 | 1 | 4 | 60°凸 |
| **0.5** | 0.2 | 5 | 50 | 1 | 4 | 60°凸 |
| **0.6** | 0.2 | 6 | 50 | 1 | 4 | 60°凸 |
| **0.7** | 0.2 | 10 | 50 | 1 | 4 | 60°凸 |
| **0.8** | 0.3 | 12 | 50 | 1 | 4 | 60°凸 |
| **0.9** | 0.3 | 12 | 50 | 1 | 4 | 60°凸 |
| **1** | 0.3 | 12 | 50 | 1 | 4 | 60°凸 |
| **1.1** | 0.3 | 15 | 50 | 1.5 | 4 | 60°凸 |
| **1.2** | 0.3 | 15 | 50 | 1.5 | 4 | 60°凸 |
| **1.3** | 0.3 | 15 | 50 | 1.5 | 4 | 60°凸 |
| **1.4** | 0.3 | 16 | 50 | 1.5 | 4 | 60°凸 |
| **1.5** | 0.3 | 16 | 50 | 1.5 | 4 | 60°凸 |
| **1.6** | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| **1.7** | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| **1.8** | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| **1.9** | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| **2** | 0.5 | 18 | 50 | 2 | 4 | 60°凸 |
| **2.1** | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| **2.2** | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| **2.3** | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| **2.4** | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| **2.5** | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| **2.6** | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| **2.7** | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| **2.8** | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| **2.9** | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| **3** | 0.5 | 27 | 60 | 3 | 4 | 60°凹 |
| **3.1** | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| **3.2** | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| **3.3** | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| **3.4** | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| **3.5** | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| **3.6** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.7** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.8** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.9** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **4** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **4.1** | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| **4.2** | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| **4.3** | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| **4.4** | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| **4.5** | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| **4.6** | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| **4.7** | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| **4.8** | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| **4.9** | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **5** | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| **5.1** | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |
| **5.2** | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |
| **5.3** | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |
| **5.4** | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |
| **5.5** | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |
| **5.6** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.7** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.8** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.9** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **6** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **6.1** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.2** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.3** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.4** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.5** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.6** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.7** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.8** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.9** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **7** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **7.1** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.2** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.3** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.4** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.5** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.6** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.7** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.8** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.9** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **8** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **8.1** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.2** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.3** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.4** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.5** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.6** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.7** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.8** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.9** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **9** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **9.1** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **9.2** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **9.3** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **9.4** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **9.5** | 1 | 40 | 90 | 10 | 6 | 60°凹 |

# CSR ソリッドリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **9.6** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **9.7** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **9.8** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **9.9** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.1** | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| **10.2** | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| **10.3** | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| **10.4** | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| **10.5** | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| **10.6** | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| **10.7** | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| **10.8** | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| **10.9** | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| **11** | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| **11.1** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.2** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.3** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.4** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.5** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.6** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.7** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.8** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.9** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **12** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **12.1** | 1 | 50 | 120 | 12 | 6 | 60°凹 |
| **12.2** | 1 | 50 | 120 | 12 | 6 | 60°凹 |
| **12.3** | 1 | 50 | 120 | 12 | 6 | 60°凹 |
| **12.4** | 1 | 50 | 120 | 12 | 6 | 60°凹 |
| **12.5** | 1 | 50 | 120 | 12 | 6 | 60°凹 |
| **12.6** | 1 | 50 | 120 | 12 | 6 | 60°凹 |
| **12.7** | 1 | 50 | 120 | 12 | 8 | 60°凹 |
| **12.8** | 1 | 50 | 120 | 12 | 8 | 60°凹 |
| **12.9** | 1 | 50 | 120 | 12 | 8 | 60°凹 |
| **13** | 1 | 50 | 120 | 12 | 8 | 60°凹 |
| **13.1** | 1 | 60 | 120 | 12 | 8 | 60°凹 |
| **13.2** | 1 | 60 | 120 | 12 | 8 | 60°凹 |
| **13.3** | 1 | 60 | 120 | 12 | 8 | 60°凹 |
| **13.4** | 1 | 60 | 120 | 12 | 8 | 60°凹 |
| **13.5** | 1 | 60 | 120 | 12 | 8 | 60°凹 |
| **13.6** | 1 | 60 | 120 | 12 | 8 | 60°凹 |
| **13.7** | 1 | 60 | 120 | 12 | 8 | 60°凹 |
| **13.8** | 1 | 60 | 120 | 12 | 8 | 60°凹 |
| **13.9** | 1 | 60 | 120 | 12 | 8 | 60°凹 |
| **14** | 1 | 60 | 120 | 12 | 8 | 60°凹 |
| **14.1** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **14.2** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **14.3** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **14.4** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **14.5** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **14.6** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **14.7** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **14.8** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **14.9** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **15** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **15.1** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **15.2** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **15.3** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **15.4** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **15.5** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **15.6** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **15.7** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **15.8** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **15.9** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **16** | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| **16.1** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **16.2** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **16.3** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **16.4** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **16.5** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **16.6** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **16.7** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **16.8** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **16.9** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **17** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **17.1** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **17.2** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **17.3** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **17.4** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **17.5** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **17.6** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **17.7** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **17.8** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **17.9** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **18** | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| **18.1** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **18.2** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **18.3** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **18.4** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **18.5** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **18.6** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **18.7** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **18.8** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **18.9** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **19** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **19.1** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **19.2** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **19.3** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **19.4** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **19.5** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **19.6** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **19.7** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **19.8** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **19.9** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| **20** | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |

# CSR ソリッドリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 0.81 ～ 0.89 | 0.3 | 12 | 50 | 1 | 4 | 60°凸 |
| 0.91 ～ 0.99 | 0.3 | 12 | 50 | 1 | 4 | 60°凸 |
| 1.01 ～ 1.09 | 0.3 | 15 | 50 | 1.5 | 4 | 60°凸 |
| 1.11 ～ 1.19 | 0.3 | 15 | 50 | 1.5 | 4 | 60°凸 |
| 1.21 ～ 1.29 | 0.3 | 15 | 50 | 1.5 | 4 | 60°凸 |
| 1.31 ～ 1.39 | 0.3 | 16 | 50 | 1.5 | 4 | 60°凸 |
| 1.41 ～ 1.49 | 0.3 | 16 | 50 | 1.5 | 4 | 60°凸 |
| 1.51 ～ 1.59 | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| 1.61 ～ 1.69 | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| 1.71 ～ 1.79 | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| 1.81 ～ 1.89 | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| 1.91 ～ 1.99 | 0.5 | 18 | 50 | 2 | 4 | 60°凸 |
| 2.01 ～ 2.09 | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| 2.11 ～ 2.19 | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| 2.21 ～ 2.29 | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| 2.31 ～ 2.39 | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| 2.41 ～ 2.49 | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| 2.51 ～ 2.59 | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| 2.61 ～ 2.69 | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| 2.71 ～ 2.79 | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| 2.81 ～ 2.89 | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| 2.91 ～ 2.99 | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| 3.01 ～ 3.09 | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| 3.11 ～ 3.19 | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| 3.21 ～ 3.29 | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| 3.31 ～ 3.39 | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| 3.41 ～ 3.49 | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| 3.51 ～ 3.59 | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| 3.61 ～ 3.69 | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| 3.71 ～ 3.79 | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| 3.81 ～ 3.89 | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| 3.91 ～ 3.99 | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| 4.01 ～ 4.09 | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| 4.11 ～ 4.19 | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| 4.21 ～ 4.29 | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| 4.31 ～ 4.39 | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| 4.41 ～ 4.49 | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| 4.51 ～ 4.59 | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| 4.61 ～ 4.69 | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| 4.71 ～ 4.79 | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| 4.81 ～ 4.89 | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| 4.91 ～ 4.99 | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| 5.01 ～ 5.09 | 0.5 | 30 | 80 | 5.5 | 6 | 60°凹 |
| 5.11 ～ 5.19 | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |
| 5.21 ～ 5.29 | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |
| 5.31 ～ 5.39 | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |
| 5.41 ～ 5.49 | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |
| 5.51 ～ 5.59 | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| 5.61 ～ 5.69 | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| 5.71 ～ 5.79 | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| 5.81 ～ 5.89 | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| 5.91 ～ 5.99 | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| 6.01 ～ 6.09 | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| 6.11 ～ 6.19 | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| 6.21 ～ 6.29 | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| 6.31 ～ 6.39 | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| 6.41 ～ 6.49 | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| 6.51 ～ 6.59 | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| 6.61 ～ 6.69 | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| 6.71 ～ 6.79 | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| 6.81 ～ 6.89 | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| 6.91 ～ 6.99 | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| 7.01 ～ 7.09 | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| 7.11 ～ 7.19 | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 7.21 ～ 7.29 | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| 7.31 ～ 7.39 | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| 7.41 ～ 7.49 | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| 7.51 ～ 7.59 | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| 7.61 ～ 7.69 | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| 7.71 ～ 7.79 | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| 7.81 ～ 7.89 | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| 7.91 ～ 7.99 | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| 8.01 ～ 8.09 | 0.8 | 40 | 90 | 9 | 6 | 60°凹 |
| 8.11 ～ 8.19 | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| 8.21 ～ 8.29 | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| 8.31 ～ 8.39 | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| 8.41 ～ 8.49 | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| 8.51 ～ 8.59 | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| 8.61 ～ 8.69 | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| 8.71 ～ 8.79 | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| 8.81 ～ 8.89 | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| 8.91 ～ 8.99 | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| 9.01 ～ 9.09 | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| 9.11 ～ 9.19 | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| 9.21 ～ 9.29 | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| 9.31 ～ 9.39 | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| 9.41 ～ 9.49 | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| 9.51 ～ 9.59 | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| 9.61 ～ 9.69 | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| 9.71 ～ 9.79 | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| 9.81 ～ 9.89 | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| 9.91 ～ 9.99 | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| 10.01 ～ 10.09 | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| 10.11 ～ 10.19 | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| 10.21 ～ 10.29 | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| 10.31 ～ 10.39 | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| 10.41 ～ 10.49 | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| 10.51 ～ 10.59 | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| 10.61 ～ 10.69 | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| 10.71 ～ 10.79 | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| 10.81 ～ 10.89 | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| 10.91 ～ 10.99 | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| 11.01 ～ 11.09 | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| 11.11 ～ 11.19 | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| 11.21 ～ 11.29 | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| 11.31 ～ 11.39 | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| 11.41 ～ 11.49 | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| 11.51 ～ 11.59 | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| 11.61 ～ 11.69 | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| 11.71 ～ 11.79 | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| 11.81 ～ 11.89 | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| 11.91 ～ 11.99 | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| 12.01 ～ 12.05 | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| 12.95 ～ 12.99 | 1 | 50 | 120 | 12 | 8 | 60°凹 |
| 13.01 ～ 13.05 | 1 | 50 | 120 | 12 | 8 | 60°凹 |
| 13.95 ～ 13.99 | 1 | 60 | 120 | 12 | 8 | 60°凹 |
| 14.01 ～ 14.05 | 1 | 60 | 120 | 12 | 8 | 60°凹 |
| 14.95 ～ 14.99 | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| 15.01 ～ 15.05 | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| 15.95 ～ 15.99 | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| 16.01 ～ 16.05 | 1.5 | 60 | 130 | 16 | 8 | 60°凹 |
| 16.95 ～ 16.99 | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| 17.01 ～ 17.05 | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| 17.95 ～ 17.99 | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| 18.01 ～ 18.05 | 1.5 | 70 | 150 | 16 | 8 | 60°凹 |
| 18.95 ～ 18.99 | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| 19.01 ～ 19.05 | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| 19.95 ～ 19.99 | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |
| 20.01 ～ 20.05 | 1.5 | 80 | 170 | 20 | 8 | 60°凹 |

# CSR ソリッドリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **0.955 ～ 0.995** | 0.3 | 12 | 50 | 1 | 4 | 60°凸 |
| **1.005 ～ 1.045** | 0.3 | 15 | 50 | 1.5 | 4 | 60°凸 |
| **1.105** | 0.3 | 15 | 50 | 1.5 | 4 | 60°凸 |
| **1.205** | 0.3 | 15 | 50 | 1.5 | 4 | 60°凸 |
| **1.305** | 0.3 | 16 | 50 | 1.5 | 4 | 60°凸 |
| **1.405** | 0.3 | 16 | 50 | 1.5 | 4 | 60°凸 |
| **1.505** | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| **1.605** | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| **1.705** | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| **1.805** | 0.4 | 18 | 50 | 2 | 4 | 60°凸 |
| **1.905** | 0.5 | 18 | 50 | 2 | 4 | 60°凸 |
| **1.955 ～ 1.995** | 0.5 | 18 | 50 | 2 | 4 | 60°凸 |
| **2.005 ～ 2.045** | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| **2.105** | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| **2.205** | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| **2.305** | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| **2.405** | 0.5 | 20 | 50 | 2.5 | 4 | 60°凸 |
| **2.505** | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| **2.605** | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| **2.705** | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| **2.805** | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| **2.905** | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| **2.955 ～ 2.995** | 0.5 | 20 | 50 | 3 | 4 | 60°凸 |
| **3.005 ～ 3.045** | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| **3.105** | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| **3.205** | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| **3.305** | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| **3.405** | 0.5 | 27 | 60 | 3.5 | 4 | 60°凹 |
| **3.505** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.605** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.705** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.805** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.905** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **3.955 ～ 3.995** | 0.5 | 27 | 60 | 4 | 4 | 60°凹 |
| **4.005 ～ 4.045** | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| **4.105** | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| **4.205** | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| **4.305** | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| **4.405** | 0.5 | 30 | 70 | 4.5 | 6 | 60°凹 |
| **4.505** | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| **4.605** | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| **4.705** | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| **4.805** | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| **4.905** | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| **4.955 ～ 4.995** | 0.5 | 30 | 70 | 5 | 6 | 60°凹 |
| **5.005 ～ 5.045** | 0.5 | 30 | 80 | 5.5 | 6 | 60°凹 |
| **5.105** | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |
| **5.205** | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **5.305** | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |
| **5.405** | 0.8 | 30 | 80 | 5.5 | 6 | 60°凹 |
| **5.505** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.605** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.705** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.805** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.905** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **5.955 ～ 5.995** | 0.8 | 30 | 80 | 6 | 6 | 60°凹 |
| **6.005 ～ 6.045** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.105** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.205** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.305** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.405** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.505** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.605** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.705** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.805** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.905** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **6.955 ～ 6.995** | 0.8 | 35 | 80 | 7 | 6 | 60°凹 |
| **7.005 ～ 7.045** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.105** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.205** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.305** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.405** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.505** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.605** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.705** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.805** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.905** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **7.955 ～ 7.995** | 0.8 | 35 | 80 | 8 | 6 | 60°凹 |
| **8.005 ～ 8.045** | 0.8 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.105** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.205** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.305** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.405** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.505** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.605** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.705** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.805** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.905** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **8.955 ～ 8.995** | 1 | 40 | 90 | 9 | 6 | 60°凹 |
| **9.005 ～ 9.045** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **9.955 ～ 9.995** | 1 | 40 | 90 | 10 | 6 | 60°凹 |
| **10.005 ～ 10.045** | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| **10.955 ～ 10.995** | 1 | 40 | 90 | 11 | 6 | 60°凹 |
| **11.005 ～ 11.045** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **11.955 ～ 11.995** | 1 | 45 | 90 | 12 | 6 | 60°凹 |
| **12.005 ～ 12.045** | 1 | 45 | 90 | 12 | 6 | 60°凹 |

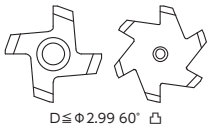
超硬

# CSRM

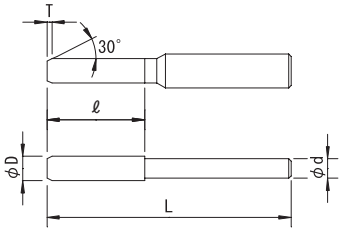
## ソリッドミディアムリーマ　*Solid Carbide Medium Reamer*

切削条件表 P135

**貫通穴加工（ストレート刃）**　右直刃　食付30°　K10






| 公差 (Tolerance) | D | | | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.01トビ Increment 0.01 | +0.005 0 | 0.8～3 | +0.007 +0.002 | 3.1～6 | +0.009 +0.004 | 6.1～10 | +0.012 +0.006 | 10.1～12 | +0.015 +0.007 | h7 |

右刃ストレート　食付角度30°　K10
Straight Flute　Chamfer Angle30°　Micro Grain Carbide(K10)

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **0.8** | 0.3 | 15 | 50 | 1 | 4 | 60°凸 |
| **0.9** | 0.3 | 15 | 50 | 1 | 4 | 60°凸 |
| **1** | 0.3 | 30 | 70 | 1 | 4 | 60°凸 |
| **1.1** | 0.3 | 30 | 70 | 1.5 | 4 | 60°凸 |
| **1.2** | 0.3 | 30 | 70 | 1.5 | 4 | 60°凸 |
| **1.3** | 0.3 | 30 | 70 | 1.5 | 4 | 60°凸 |
| **1.4** | 0.3 | 30 | 70 | 1.5 | 4 | 60°凸 |
| **1.5** | 0.3 | 30 | 70 | 1.5 | 4 | 60°凸 |
| **1.6** | 0.4 | 35 | 70 | 2 | 4 | 60°凸 |
| **1.7** | 0.4 | 35 | 70 | 2 | 4 | 60°凸 |
| **1.8** | 0.4 | 35 | 70 | 2 | 4 | 60°凸 |
| **1.9** | 0.4 | 35 | 70 | 2 | 4 | 60°凸 |
| **2** | 0.5 | 35 | 70 | 2 | 4 | 60°凸 |
| **2.1** | 0.5 | 45 | 80 | 2.5 | 4 | 60°凸 |
| **2.2** | 0.5 | 45 | 80 | 2.5 | 4 | 60°凸 |
| **2.3** | 0.5 | 45 | 80 | 2.5 | 4 | 60°凸 |
| **2.4** | 0.5 | 45 | 80 | 2.5 | 4 | 60°凸 |
| **2.5** | 0.5 | 45 | 80 | 2.5 | 4 | 60°凸 |
| **2.6** | 0.5 | 45 | 80 | 3 | 4 | 60°凸 |
| **2.7** | 0.5 | 45 | 80 | 3 | 4 | 60°凸 |
| **2.8** | 0.5 | 45 | 80 | 3 | 4 | 60°凸 |
| **2.9** | 0.5 | 45 | 80 | 3 | 4 | 60°凸 |
| **3** | 0.5 | 45 | 80 | 3 | 4 | 60°凹 |
| **3.1** | 0.5 | 45 | 90 | 3.5 | 4 | 60°凹 |
| **3.2** | 0.5 | 45 | 90 | 3.5 | 4 | 60°凹 |
| **3.3** | 0.5 | 45 | 90 | 3.5 | 4 | 60°凹 |
| **3.4** | 0.5 | 45 | 90 | 3.5 | 4 | 60°凹 |
| **3.5** | 0.5 | 45 | 90 | 3.5 | 4 | 60°凹 |
| **3.6** | 0.5 | 50 | 90 | 4 | 4 | 60°凹 |
| **3.7** | 0.5 | 50 | 90 | 4 | 4 | 60°凹 |
| **3.8** | 0.5 | 50 | 90 | 4 | 4 | 60°凹 |
| **3.9** | 0.5 | 50 | 90 | 4 | 4 | 60°凹 |
| **4** | 0.5 | 50 | 90 | 4 | 4 | 60°凹 |
| **4.1** | 0.5 | 50 | 90 | 4.5 | 6 | 60°凹 |
| **4.2** | 0.5 | 50 | 90 | 4.5 | 6 | 60°凹 |
| **4.3** | 0.5 | 50 | 90 | 4.5 | 6 | 60°凹 |
| **4.4** | 0.5 | 50 | 90 | 4.5 | 6 | 60°凹 |
| **4.5** | 0.5 | 50 | 90 | 4.5 | 6 | 60°凹 |
| **4.6** | 0.5 | 50 | 90 | 5 | 6 | 60°凹 |
| **4.7** | 0.5 | 50 | 90 | 5 | 6 | 60°凹 |
| **4.8** | 0.5 | 50 | 90 | 5 | 6 | 60°凹 |
| **4.9** | 0.5 | 50 | 90 | 5 | 6 | 60°凹 |
| **5** | 0.5 | 50 | 90 | 5 | 6 | 60°凹 |
| **5.1** | 0.8 | 60 | 100 | 5.5 | 6 | 60°凹 |
| **5.2** | 0.8 | 60 | 100 | 5.5 | 6 | 60°凹 |
| **5.3** | 0.8 | 60 | 100 | 5.5 | 6 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **5.4** | 0.8 | 60 | 100 | 5.5 | 6 | 60°凹 |
| **5.5** | 0.8 | 60 | 100 | 5.5 | 6 | 60°凹 |
| **5.6** | 0.8 | 60 | 100 | 6 | 6 | 60°凹 |
| **5.7** | 0.8 | 60 | 100 | 6 | 6 | 60°凹 |
| **5.8** | 0.8 | 60 | 100 | 6 | 6 | 60°凹 |
| **5.9** | 0.8 | 60 | 100 | 6 | 6 | 60°凹 |
| **6** | 0.8 | 60 | 100 | 6 | 6 | 60°凹 |
| **6.1** | 0.8 | 60 | 100 | 7 | 6 | 60°凹 |
| **6.2** | 0.8 | 60 | 100 | 7 | 6 | 60°凹 |
| **6.3** | 0.8 | 60 | 100 | 7 | 6 | 60°凹 |
| **6.4** | 0.8 | 60 | 100 | 7 | 6 | 60°凹 |
| **6.5** | 0.8 | 60 | 100 | 7 | 6 | 60°凹 |
| **6.6** | 0.8 | 60 | 100 | 7 | 6 | 60°凹 |
| **6.7** | 0.8 | 60 | 100 | 7 | 6 | 60°凹 |
| **6.8** | 0.8 | 60 | 100 | 7 | 6 | 60°凹 |
| **6.9** | 0.8 | 60 | 100 | 7 | 6 | 60°凹 |
| **7** | 0.8 | 60 | 100 | 7 | 6 | 60°凹 |
| **7.1** | 0.8 | 60 | 100 | 8 | 6 | 60°凹 |
| **7.2** | 0.8 | 60 | 100 | 8 | 6 | 60°凹 |
| **7.3** | 0.8 | 60 | 100 | 8 | 6 | 60°凹 |
| **7.4** | 0.8 | 60 | 100 | 8 | 6 | 60°凹 |
| **7.5** | 0.8 | 60 | 100 | 8 | 6 | 60°凹 |
| **7.6** | 0.8 | 60 | 100 | 8 | 6 | 60°凹 |
| **7.7** | 0.8 | 60 | 100 | 8 | 6 | 60°凹 |
| **7.8** | 0.8 | 60 | 100 | 8 | 6 | 60°凹 |
| **7.9** | 0.8 | 60 | 100 | 8 | 6 | 60°凹 |
| **8** | 0.8 | 60 | 100 | 8 | 6 | 60°凹 |
| **8.1** | 1 | 70 | 120 | 9 | 6 | 60°凹 |
| **8.2** | 1 | 70 | 120 | 9 | 6 | 60°凹 |
| **8.3** | 1 | 70 | 120 | 9 | 6 | 60°凹 |
| **8.4** | 1 | 70 | 120 | 9 | 6 | 60°凹 |
| **8.5** | 1 | 70 | 120 | 9 | 6 | 60°凹 |
| **8.6** | 1 | 70 | 120 | 9 | 6 | 60°凹 |
| **8.7** | 1 | 70 | 120 | 9 | 6 | 60°凹 |
| **8.8** | 1 | 70 | 120 | 9 | 6 | 60°凹 |
| **8.9** | 1 | 70 | 120 | 9 | 6 | 60°凹 |
| **9** | 1 | 70 | 120 | 9 | 6 | 60°凹 |
| **9.1** | 1 | 70 | 120 | 10 | 6 | 60°凹 |
| **9.2** | 1 | 70 | 120 | 10 | 6 | 60°凹 |
| **9.3** | 1 | 70 | 120 | 10 | 6 | 60°凹 |
| **9.4** | 1 | 70 | 120 | 10 | 6 | 60°凹 |
| **9.5** | 1 | 70 | 120 | 10 | 6 | 60°凹 |
| **9.6** | 1 | 70 | 120 | 10 | 6 | 60°凹 |
| **9.7** | 1 | 70 | 120 | 10 | 6 | 60°凹 |
| **9.8** | 1 | 70 | 120 | 10 | 6 | 60°凹 |
| **9.9** | 1 | 70 | 120 | 10 | 6 | 60°凹 |

# CSRM ソリッドミディアムリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **10** | 1 | 70 | 120 | 10 | 6 | 60°凹 |
| **10.1** | 1 | 75 | 125 | 11 | 6 | 60°凹 |
| **10.2** | 1 | 75 | 125 | 11 | 6 | 60°凹 |
| **10.3** | 1 | 75 | 125 | 11 | 6 | 60°凹 |
| **10.4** | 1 | 75 | 125 | 11 | 6 | 60°凹 |
| **10.5** | 1 | 75 | 125 | 11 | 6 | 60°凹 |
| **10.6** | 1 | 75 | 125 | 11 | 6 | 60°凹 |
| **10.7** | 1 | 75 | 125 | 11 | 6 | 60°凹 |
| **10.8** | 1 | 75 | 125 | 11 | 6 | 60°凹 |
| **10.9** | 1 | 75 | 125 | 11 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **11** | 1 | 75 | 125 | 11 | 6 | 60°凹 |
| **11.1** | 1 | 80 | 130 | 12 | 6 | 60°凹 |
| **11.2** | 1 | 80 | 130 | 12 | 6 | 60°凹 |
| **11.3** | 1 | 80 | 130 | 12 | 6 | 60°凹 |
| **11.4** | 1 | 80 | 130 | 12 | 6 | 60°凹 |
| **11.5** | 1 | 80 | 130 | 12 | 6 | 60°凹 |
| **11.6** | 1 | 80 | 130 | 12 | 6 | 60°凹 |
| **11.7** | 1 | 80 | 130 | 12 | 6 | 60°凹 |
| **11.8** | 1 | 80 | 130 | 12 | 6 | 60°凹 |
| **11.9** | 1 | 80 | 130 | 12 | 6 | 60°凹 |
| **12** | 1 | 80 | 130 | 12 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **0.95 ～ 0.99** | 0.3 | 15 | 50 | 1 | 4 | 60°凸 |
| **1.01 ～ 1.05** | 0.3 | 30 | 70 | 1.5 | 4 | 60°凸 |
| **1.95 ～ 1.99** | 0.4 | 35 | 70 | 2 | 4 | 60°凸 |
| **2.01 ～ 2.05** | 0.5 | 45 | 80 | 2.5 | 4 | 60°凸 |
| **2.95 ～ 2.99** | 0.5 | 45 | 80 | 3 | 4 | 60°凸 |
| **3.01 ～ 3.05** | 0.5 | 45 | 90 | 3.5 | 4 | 60°凹 |
| **3.95 ～ 3.99** | 0.5 | 50 | 90 | 4 | 4 | 60°凹 |
| **4.01 ～ 4.05** | 0.5 | 50 | 90 | 4.5 | 6 | 60°凹 |
| **4.95 ～ 4.99** | 0.5 | 50 | 90 | 5 | 6 | 60°凹 |
| **5.01 ～ 5.05** | 0.8 | 60 | 100 | 5.5 | 6 | 60°凹 |
| **5.95 ～ 5.99** | 0.8 | 60 | 100 | 6 | 6 | 60°凹 |
| **6.01 ～ 6.05** | 0.8 | 60 | 100 | 7 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **6.95 ～ 6.99** | 0.8 | 60 | 100 | 7 | 6 | 60°凹 |
| **7.01 ～ 7.05** | 0.8 | 60 | 100 | 8 | 6 | 60°凹 |
| **7.95 ～ 7.99** | 0.8 | 60 | 100 | 8 | 6 | 60°凹 |
| **8.01 ～ 8.05** | 1 | 70 | 120 | 9 | 6 | 60°凹 |
| **8.95 ～ 8.99** | 1 | 70 | 120 | 9 | 6 | 60°凹 |
| **9.01 ～ 9.05** | 1 | 70 | 120 | 10 | 6 | 60°凹 |
| **9.95 ～ 9.99** | 1 | 70 | 120 | 10 | 6 | 60°凹 |
| **10.01 ～ 10.05** | 1 | 75 | 125 | 11 | 6 | 60°凹 |
| **10.95 ～ 10.99** | 1 | 75 | 125 | 11 | 6 | 60°凹 |
| **11.01 ～ 11.05** | 1 | 80 | 130 | 12 | 6 | 60°凹 |
| **11.95 ～ 11.99** | 1 | 80 | 130 | 12 | 6 | 60°凹 |
| **12.01 ～ 12.05** | 1 | 80 | 130 | 12 | 6 | 60°凹 |

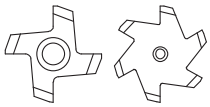
超硬

# CSLHR

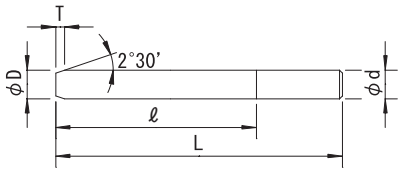
## ソリッドロングハンドリーマ　*Solid Carbide Long Hand Reamer*

切削条件表 P135

**貫通穴加工（ストレート刃）**　右直刃　食付 2°30'　K10






| 公差 (Tolerance) | D | | | | | | | | d | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.01トビ Increment 0.01 | +0.005 0 | 0.4～3 | +0.007 +0.002 | 3.1～6 | +0.009 +0.004 | 6.1～10 | +0.012 +0.006 | 0.4～1 | +0.007 +0.002 | 1.1～ | 0 −0.02 |

右刃ストレート K10　食付角度2° 30'　※サイズによりシャンク径が2種類あります。
Straight Flute　Chamfer Angle2°30'　Micro Grain Carbide(K10)　※Two types of shank diameter are available by size of Diameter.

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **0.4** | 1.5 | 20 | 60 | 0.4 | 4 | 60°凸 |
| **0.5** | 1.5 | 20 | 60 | 0.5 | 4 | 60°凸 |
| **0.6** | 1.5 | 25 | 60 | 0.6 | 4 | 60°凸 |
| **0.7** | 2 | 25 | 60 | 0.7 | 4 | 60°凸 |
| **0.8** | 2.5 | 30 | 60 | 0.8 | 4 | 60°凸 |
| **0.9** | 2.5 | 30 | 60 | 0.9 | 4 | 60°凸 |
| **1** | 3 | 40 | 80 | 1 | 4 | 60°凸 |
| **1.1** | 3 | 40 | 80 | 1.1 | 4 | 60°凸 |
| **1.2** | 3 | 40 | 80 | 1.2 | 4 | 60°凸 |
| **1.3** | 3 | 45 | 80 | 1.3 | 4 | 60°凸 |
| **1.4** | 3.5 | 45 | 80 | 1.4 | 4 | 60°凸 |
| **1.5** | 3.5 | 50 | 100 | 1.5 | 4 | 60°凸 |
| **1.6** | 3.5 | 50 | 100 | 1.6 | 4 | 60°凸 |
| **1.7** | 4 | 55 | 100 | 1.7 | 4 | 60°凸 |
| **1.8** | 4 | 55 | 100 | 1.8 | 4 | 60°凸 |
| **1.9** | 4 | 55 | 100 | 1.9 | 4 | 60°凸 |
| **2** | 4.5 | 60 | 100 | 2 | 4 | 60°凸 |
| **2.1** | 4.5 | 60 | 100 | 2.1 | 4 | 60°凸 |
| **2.2** | 4.5 | 60 | 100 | 2.2 | 4 | 60°凸 |
| **2.3** | 4.5 | 60 | 100 | 2.3 | 4 | 60°凸 |
| **2.4** | 4.5 | 60 | 100 | 2.4 | 4 | 60°凸 |
| **2.5** | 4.5 | 60 | 100 | 2.5 | 4 | 60°凸 |
| **2.6** | 4.5 | 60 | 100 | 2.6 | 4 | 60°凸 |
| **2.7** | 4.5 | 65 | 100 | 2.7 | 4 | 60°凸 |
| **2.8** | 4.5 | 65 | 100 | 2.8 | 4 | 60°凸 |
| **2.9** | 4.5 | 65 | 100 | 2.9 | 4 | 60°凸 |
| **3** | 4.5 | 65 | 100 | 3 | 4 | 60°凸 |
| **3.1** | 4.5 | 100 | 130 | 3.1 | 4 | 60°凹 |
| **3.2** | 4.5 | 100 | 130 | 3.2 | 4 | 60°凹 |
| **3.3** | 4.5 | 100 | 130 | 3.3 | 4 | 60°凹 |
| **3.4** | 4.5 | 100 | 130 | 3.4 | 4 | 60°凹 |
| **3.5** | 4.5 | 100 | 130 | 3.5 | 4 | 60°凹 |
| **3.6** | 4.5 | 100 | 130 | 3.6 | 4 | 60°凹 |
| **3.7** | 4.5 | 100 | 130 | 3.7 | 4 | 60°凹 |
| **3.8** | 4.5 | 100 | 130 | 3.8 | 4 | 60°凹 |
| **3.9** | 4.5 | 100 | 130 | 3.9 | 4 | 60°凹 |
| **4** | 4.5 | 120 | 170 | 4 | 4 | 60°凹 |
| **4.1** | 4.5 | 120 | 170 | 4.1 | 4 | 60°凹 |
| **4.2** | 4.5 | 120 | 170 | 4.2 | 4 | 60°凹 |
| **4.3** | 4.5 | 120 | 170 | 4.3 | 4 | 60°凹 |
| **4.4** | 4.5 | 120 | 170 | 4.4 | 4 | 60°凹 |
| **4.5** | 5 | 120 | 170 | 4.5 | 4 | 60°凹 |
| **4.6** | 5 | 120 | 170 | 4.6 | 4 | 60°凹 |
| **4.7** | 5 | 120 | 170 | 4.7 | 4 | 60°凹 |
| **4.8** | 5 | 120 | 170 | 4.8 | 4 | 60°凹 |
| **4.9** | 5 | 120 | 170 | 4.9 | 4 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **5** | 5 | 150 | 200 | 5 | 6 | 60°凹 |
| **5.1** | 5 | 150 | 200 | 5.1 | 6 | 60°凹 |
| **5.2** | 5 | 150 | 200 | 5.2 | 6 | 60°凹 |
| **5.3** | 5 | 150 | 200 | 5.3 | 6 | 60°凹 |
| **5.4** | 5 | 150 | 200 | 5.4 | 6 | 60°凹 |
| **5.5** | 5 | 150 | 200 | 5.5 | 6 | 60°凹 |
| **5.6** | 5 | 150 | 200 | 5.6 | 6 | 60°凹 |
| **5.7** | 5 | 150 | 200 | 5.7 | 6 | 60°凹 |
| **5.8** | 5 | 150 | 200 | 5.8 | 6 | 60°凹 |
| **5.9** | 5 | 150 | 200 | 5.9 | 6 | 60°凹 |
| **6** | 5 | 150 | 200 | 6 | 6 | 60°凹 |
| **6.1** | 5 | 150 | 200 | 6.1 | 6 | 60°凹 |
| **6.2** | 5 | 150 | 200 | 6.2 | 6 | 60°凹 |
| **6.3** | 5 | 150 | 200 | 6.3 | 6 | 60°凹 |
| **6.4** | 5 | 150 | 200 | 6.4 | 6 | 60°凹 |
| **6.5** | 7 | 150 | 200 | 6.5 | 6 | 60°凹 |
| **6.6** | 7 | 150 | 200 | 6.6 | 6 | 60°凹 |
| **6.7** | 7 | 150 | 200 | 6.7 | 6 | 60°凹 |
| **6.8** | 7 | 150 | 200 | 6.8 | 6 | 60°凹 |
| **6.9** | 7 | 150 | 200 | 6.9 | 6 | 60°凹 |
| **7** | 7 | 150 | 200 | 7 | 6 | 60°凹 |
| **7.1** | 7 | 150 | 200 | 7.1 | 6 | 60°凹 |
| **7.2** | 7 | 150 | 200 | 7.2 | 6 | 60°凹 |
| **7.3** | 7 | 150 | 200 | 7.3 | 6 | 60°凹 |
| **7.4** | 7 | 150 | 200 | 7.4 | 6 | 60°凹 |
| **7.5** | 7 | 150 | 200 | 7.5 | 6 | 60°凹 |
| **7.6** | 7 | 150 | 200 | 7.6 | 6 | 60°凹 |
| **7.7** | 7 | 150 | 200 | 7.7 | 6 | 60°凹 |
| **7.8** | 7 | 150 | 200 | 7.8 | 6 | 60°凹 |
| **7.9** | 7 | 150 | 200 | 7.9 | 6 | 60°凹 |
| **8** | 7 | 150 | 200 | 8 | 6 | 60°凹 |
| **8.1** | 7 | 150 | 200 | 8.1 | 6 | 60°凹 |
| **8.2** | 7 | 150 | 200 | 8.2 | 6 | 60°凹 |
| **8.3** | 7 | 150 | 200 | 8.3 | 6 | 60°凹 |
| **8.4** | 7 | 150 | 200 | 8.4 | 6 | 60°凹 |
| **8.5** | 7 | 150 | 200 | 8.5 | 6 | 60°凹 |
| **8.6** | 7 | 150 | 200 | 8.6 | 6 | 60°凹 |
| **8.7** | 7 | 150 | 200 | 8.7 | 6 | 60°凹 |
| **8.8** | 7 | 150 | 200 | 8.8 | 6 | 60°凹 |
| **8.9** | 7 | 150 | 200 | 8.9 | 6 | 60°凹 |
| **9** | 7 | 150 | 200 | 9 | 6 | 60°凹 |
| **9.1** | 7 | 150 | 200 | 9.1 | 6 | 60°凹 |
| **9.2** | 7 | 150 | 200 | 9.2 | 6 | 60°凹 |
| **9.3** | 7 | 150 | 200 | 9.3 | 6 | 60°凹 |
| **9.4** | 7 | 150 | 200 | 9.4 | 6 | 60°凹 |
| **9.5** | 7 | 150 | 200 | 9.5 | 6 | 60°凹 |

# CSLHR ソリッドロングハンドリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **9.6** | 7 | 150 | 200 | 9.6 | 6 | 60°凹 |
| **9.7** | 7 | 150 | 200 | 9.7 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **9.8** | 7 | 150 | 200 | 9.8 | 6 | 60°凹 |
| **9.9** | 7 | 150 | 200 | 9.9 | 6 | 60°凹 |
| **10** | 7 | 150 | 200 | 10 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **1.95** | 4.5 | 60 | 100 | 1.95 | 4 | 60°凸 |
| **1.96** | 4.5 | 60 | 100 | 1.96 | 4 | 60°凸 |
| **1.97** | 4.5 | 60 | 100 | 1.97 | 4 | 60°凸 |
| | | | | 2 | | 60°凸 |
| **1.98** | 4.5 | 60 | 100 | 1.98 | 4 | 60°凸 |
| | | | | 2 | | 60°凸 |
| **1.99** | 4.5 | 60 | 100 | 1.99 | 4 | 60°凸 |
| | | | | 2 | | 60°凸 |
| **2.01** | 4.5 | 60 | 100 | 2.01 | 4 | 60°凸 |
| | | | | 2 | | 60°凸 |
| **2.02** | 4.5 | 60 | 100 | 2.02 | 4 | 60°凸 |
| | | | | 2 | | 60°凸 |
| **2.03** | 4.5 | 60 | 100 | 2.03 | 4 | 60°凸 |
| | | | | 2 | | 60°凸 |
| **2.04** | 4.5 | 60 | 100 | 2.04 | 4 | 60°凸 |
| | | | | 2 | | 60°凸 |
| **2.05** | 4.5 | 60 | 100 | 2.05 | 4 | 60°凸 |
| | | | | 2 | | 60°凸 |
| **2.95** | 4.5 | 65 | 100 | 2.95 | 4 | 60°凸 |
| **2.96** | 4.5 | 65 | 100 | 2.96 | 4 | 60°凸 |
| **2.97** | 4.5 | 65 | 100 | 2.97 | 4 | 60°凸 |
| | | | | 3 | | 60°凸 |
| **2.98** | 4.5 | 65 | 100 | 2.98 | 4 | 60°凸 |
| | | | | 3 | | 60°凸 |
| **2.99** | 4.5 | 65 | 100 | 2.99 | 4 | 60°凸 |
| | | | | 3 | | 60°凸 |
| **3.01** | 4.5 | 65 | 100 | 3.01 | 4 | 60°凸 |
| | | | | 3 | | 60°凸 |
| **3.02** | 4.5 | 65 | 100 | 3.02 | 4 | 60°凸 |
| | | | | 3 | | 60°凸 |
| **3.03** | 4.5 | 65 | 100 | 3.03 | 4 | 60°凸 |
| | | | | 3 | | 60°凸 |
| **3.04** | 4.5 | 65 | 100 | 3.04 | 4 | 60°凸 |
| | | | | 3 | | 60°凸 |
| **3.05** | 4.5 | 65 | 100 | 3.05 | 4 | 60°凸 |
| | | | | 3 | | 60°凸 |
| **3.95** | 4.5 | 100 | 130 | 3.95 | 4 | 60°凹 |
| **3.96** | 4.5 | 100 | 130 | 3.96 | 4 | 60°凹 |
| **3.97** | 4.5 | 100 | 130 | 3.97 | 4 | 60°凹 |
| | 4.5 | 120 | 170 | 4 | 4 | 60°凹 |
| **3.98** | 4.5 | 100 | 130 | 3.98 | 4 | 60°凹 |
| | 4.5 | 120 | 170 | 4 | 4 | 60°凹 |
| **3.99** | 4.5 | 100 | 130 | 3.99 | 4 | 60°凹 |
| | 4.5 | 120 | 170 | 4 | 4 | 60°凹 |
| **4.01** | 4.5 | 120 | 170 | 4.01 | 4 | 60°凹 |
| | | | | 4 | | 60°凹 |
| **4.02** | 4.5 | 120 | 170 | 4.02 | 4 | 60°凹 |
| | | | | 4 | | 60°凹 |
| **4.03** | 4.5 | 120 | 170 | 4.03 | 4 | 60°凹 |
| | | | | 4 | | 60°凹 |
| **4.04** | 4.5 | 120 | 170 | 4.04 | 4 | 60°凹 |
| | | | | 4 | | 60°凹 |
| **4.05** | 4.5 | 120 | 170 | 4.05 | 4 | 60°凹 |
| | | | | 4 | | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **4.95** | 5 | 150 | 200 | 4.95 | 6 | 60°凹 |
| **4.96** | 5 | 150 | 200 | 4.96 | 6 | 60°凹 |
| **4.97** | 5 | 150 | 200 | 4.97 | 6 | 60°凹 |
| | | | | 5 | | 60°凹 |
| **4.98** | 5 | 150 | 200 | 4.98 | 6 | 60°凹 |
| | | | | 5 | | 60°凹 |
| **4.99** | 5 | 150 | 200 | 4.99 | 6 | 60°凹 |
| | | | | 5 | | 60°凹 |
| **5.01** | 5 | 150 | 200 | 5.01 | 6 | 60°凹 |
| | | | | 5 | | 60°凹 |
| **5.02** | 5 | 150 | 200 | 5.02 | 6 | 60°凹 |
| | | | | 5 | | 60°凹 |
| **5.03** | 5 | 150 | 200 | 5.03 | 6 | 60°凹 |
| | | | | 5 | | 60°凹 |
| **5.04** | 5 | 150 | 200 | 5.04 | 6 | 60°凹 |
| | | | | 5 | | 60°凹 |
| **5.05** | 5 | 150 | 200 | 5.05 | 6 | 60°凹 |
| | | | | 5 | | 60°凹 |
| **5.95** | 5 | 150 | 200 | 5.95 | 6 | 60°凹 |
| **5.96** | 5 | 150 | 200 | 5.96 | 6 | 60°凹 |
| **5.97** | 5 | 150 | 200 | 5.97 | 6 | 60°凹 |
| | | | | 6 | | 60°凹 |
| **5.98** | 5 | 150 | 200 | 5.98 | 6 | 60°凹 |
| | | | | 6 | | 60°凹 |
| **5.99** | 5 | 150 | 200 | 5.99 | 6 | 60°凹 |
| | | | | 6 | | 60°凹 |
| **6.01** | 5 | 150 | 200 | 6.01 | 6 | 60°凹 |
| | | | | 6 | | 60°凹 |
| **6.02** | 5 | 150 | 200 | 6.02 | 6 | 60°凹 |
| | | | | 6 | | 60°凹 |
| **6.03** | 5 | 150 | 200 | 6.03 | 6 | 60°凹 |
| | | | | 6 | | 60°凹 |
| **6.04** | 5 | 150 | 200 | 6.04 | 6 | 60°凹 |
| | | | | 6 | | 60°凹 |
| **6.05** | 5 | 150 | 200 | 6.05 | 6 | 60°凹 |
| | | | | 6 | | 60°凹 |
| **6.95** | 7 | 150 | 200 | 6.95 | 6 | 60°凹 |
| **6.96** | 7 | 150 | 200 | 6.96 | 6 | 60°凹 |
| **6.97** | 7 | 150 | 200 | 6.97 | 6 | 60°凹 |
| | | | | 7 | | 60°凹 |
| **6.98** | 7 | 150 | 200 | 6.98 | 6 | 60°凹 |
| | | | | 7 | | 60°凹 |
| **6.99** | 7 | 150 | 200 | 6.99 | 6 | 60°凹 |
| | | | | 7 | | 60°凹 |
| **7.01** | 7 | 150 | 200 | 7.01 | 6 | 60°凹 |
| | | | | 7 | | 60°凹 |
| **7.02** | 7 | 150 | 200 | 7.02 | 6 | 60°凹 |
| | | | | 7 | | 60°凹 |
| **7.03** | 7 | 150 | 200 | 7.03 | 6 | 60°凹 |
| | | | | 7 | | 60°凹 |
| **7.04** | 7 | 150 | 200 | 7.04 | 6 | 60°凹 |
| | | | | 7 | | 60°凹 |
| **7.05** | 7 | 150 | 200 | 7.05 | 6 | 60°凹 |
| | | | | 7 | | 60°凹 |

# CSLHR ソリッドロングハンドリーマ

| 直径（ΦD） Dia. | 食付長（T） Chamfer Length | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. | 刃数（N） Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **7.95** | 7 | 150 | 200 | 7.95 | 6 | 60°凹 |
| **7.96** | 7 | 150 | 200 | 7.96 | 6 | 60°凹 |
| **7.97** | 7 | 150 | 200 | 7.97 | 6 | 60°凹 |
| | | | | 8 | | 60°凹 |
| **7.98** | 7 | 150 | 200 | 7.98 | 6 | 60°凹 |
| | | | | 8 | | 60°凹 |
| **7.99** | 7 | 150 | 200 | 7.99 | 6 | 60°凹 |
| | | | | 8 | | 60°凹 |
| **8.01** | 7 | 150 | 200 | 8.01 | 6 | 60°凹 |
| | | | | 8 | | 60°凹 |
| **8.02** | 7 | 150 | 200 | 8.02 | 6 | 60°凹 |
| | | | | 8 | | 60°凹 |
| **8.03** | 7 | 150 | 200 | 8.03 | 6 | 60°凹 |
| | | | | 8 | | 60°凹 |
| **8.04** | 7 | 150 | 200 | 8.04 | 6 | 60°凹 |
| | | | | 8 | | 60°凹 |
| **8.05** | 7 | 150 | 200 | 8.05 | 6 | 60°凹 |
| | | | | 8 | | 60°凹 |
| **8.95** | 7 | 150 | 200 | 8.95 | 6 | 60°凹 |
| **8.96** | 7 | 150 | 200 | 8.96 | 6 | 60°凹 |
| **8.97** | 7 | 150 | 200 | 8.97 | 6 | 60°凹 |
| | | | | 9 | | 60°凹 |
| **8.98** | 7 | 150 | 200 | 8.98 | 6 | 60°凹 |
| | | | | 9 | | 60°凹 |
| **8.99** | 7 | 150 | 200 | 8.99 | 6 | 60°凹 |
| | | | | 9 | | 60°凹 |

| 直径（ΦD） Dia. | 食付長（T） Chamfer Length | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. | 刃数（N） Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **9.01** | 7 | 150 | 200 | 9.01 | 6 | 60°凹 |
| | | | | 9 | | 60°凹 |
| **9.02** | 7 | 150 | 200 | 9.02 | 6 | 60°凹 |
| | | | | 9 | | 60°凹 |
| **9.03** | 7 | 150 | 200 | 9.03 | 6 | 60°凹 |
| | | | | 9 | | 60°凹 |
| **9.04** | 7 | 150 | 200 | 9.04 | 6 | 60°凹 |
| | | | | 9 | | 60°凹 |
| **9.05** | 7 | 150 | 200 | 9.05 | 6 | 60°凹 |
| | | | | 9 | | 60°凹 |
| **9.95** | 7 | 150 | 200 | 9.95 | 6 | 60°凹 |
| **9.96** | 7 | 150 | 200 | 9.96 | 6 | 60°凹 |
| **9.97** | 7 | 150 | 200 | 9.97 | 6 | 60°凹 |
| | | | | 10 | | 60°凹 |
| **9.98** | 7 | 150 | 200 | 9.98 | 6 | 60°凹 |
| | | | | 10 | | 60°凹 |
| **9.99** | 7 | 150 | 200 | 9.99 | 6 | 60°凹 |
| | | | | 10 | | 60°凹 |
| **10.01** | 7 | 150 | 200 | 10.01 | 6 | 60°凹 |
| | | | | 10 | | 60°凹 |
| **10.02** | 7 | 150 | 200 | 10.02 | 6 | 60°凹 |
| | | | | 10 | | 60°凹 |
| **10.03** | 7 | 150 | 200 | 10.03 | 6 | 60°凹 |
| | | | | 10 | | 60°凹 |
| **10.04** | 7 | 150 | 200 | 10.04 | 6 | 60°凹 |
| | | | | 10 | | 60°凹 |
| **10.05** | 7 | 150 | 200 | 10.05 | 6 | 60°凹 |
| | | | | 10 | | 60°凹 |

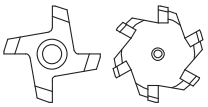
超硬

# CSCRS

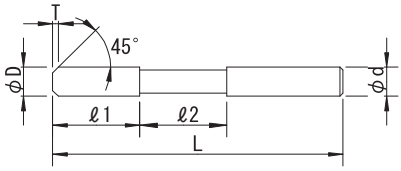
## 超硬チャッキングリーマ *Carbide Straight Shank Chucking Reamer*

切削条件表 P136

貫通穴加工（ストレート刃） 右直刃 食付45° K10






| 公差 (Tolerance) | D | | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.01トビ Increment 0.01 +0.005 0 | 0.005トビ Increment 0.005 +0.003 0 | 1～3 +0.006 +0.002 | 3.1～6 +0.009 +0.004 | 6.1～10 +0.012 +0.006 | 10.1～18 +0.015 +0.007 | 18.5～ +0.017 +0.008 | h7 |

右刃ストレート　食付角度45°　K10　φ6.09までソリッド
Straight Flute　Chamfer Angle45°　Micro Grain Carbide(K10)　※Solid Carbide for up to φ6.09

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **1** | 0.2 | 15 | – | 60 | 1 | 4 | 60° 凸 |
| **1.1** | 0.2 | 15 | – | 60 | 1 | 4 | 60° 凸 |
| **1.2** | 0.2 | 15 | – | 60 | 1.1 | 4 | 60° 凸 |
| **1.3** | 0.2 | 15 | – | 60 | 1.2 | 4 | 60° 凸 |
| **1.4** | 0.2 | 15 | – | 60 | 1.4 | 4 | 60° 凸 |
| **1.5** | 0.3 | 18 | – | 70 | 1.4 | 4 | 60° 凸 |
| **1.6** | 0.3 | 18 | – | 70 | 1.4 | 4 | 60° 凸 |
| **1.7** | 0.3 | 20 | – | 80 | 1.5 | 4 | 60° 凸 |
| **1.8** | 0.3 | 20 | – | 80 | 1.6 | 4 | 60° 凸 |
| **1.9** | 0.3 | 20 | – | 80 | 1.6 | 4 | 60° 凸 |
| **2** | 0.5 | 20 | – | 80 | 2 | 4 | 60° 凸 |
| **2.1** | 0.5 | 25 | – | 90 | 2 | 4 | 60° 凸 |
| **2.2** | 0.5 | 25 | – | 90 | 2 | 4 | 60° 凸 |
| **2.3** | 0.5 | 25 | – | 90 | 2 | 4 | 60° 凸 |
| **2.4** | 0.5 | 25 | – | 90 | 2 | 4 | 60° 凸 |
| **2.5** | 0.5 | 25 | – | 90 | 2.2 | 4 | 60° 凸 |
| **2.6** | 0.5 | 30 | – | 110 | 2.5 | 4 | 60° 凸 |
| **2.7** | 0.5 | 30 | – | 110 | 2.5 | 4 | 60° 凸 |
| **2.8** | 0.5 | 30 | – | 110 | 2.5 | 4 | 60° 凸 |
| **2.9** | 0.5 | 30 | – | 110 | 2.5 | 4 | 60° 凸 |
| **3** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **3.1** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **3.2** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **3.3** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **3.4** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **3.5** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **3.6** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **3.7** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **3.8** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **3.9** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **4** | 0.5 | 30 | – | 110 | 4 | 4 | 60° 凹 |
| **4.1** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **4.2** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **4.3** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **4.4** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **4.5** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **4.6** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **4.7** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **4.8** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **4.9** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **5** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **5.1** | 0.8 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **5.2** | 0.8 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **5.3** | 0.8 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **5.4** | 0.8 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **5.5** | 0.8 | 30 | – | 120 | 4 | 4 | 60° 凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **5.6** | 0.8 | 30 | – | 130 | 5 | 4 | 60° 凹 |
| **5.7** | 0.8 | 30 | – | 130 | 5 | 4 | 60° 凹 |
| **5.8** | 0.8 | 30 | – | 130 | 5 | 4 | 60° 凹 |
| **5.9** | 0.8 | 30 | – | 130 | 5 | 4 | 60° 凹 |
| **6** | 0.8 | 30 | – | 130 | 6 | 4 | 60° 凹 |
| **6.1** | 0.8 | 35 | 10 | 130 | 6 | 4 | 60° 凹 |
| **6.2** | 0.8 | 35 | 10 | 130 | 6 | 4 | 60° 凹 |
| **6.3** | 0.8 | 35 | 10 | 130 | 6 | 4 | 60° 凹 |
| **6.4** | 0.8 | 35 | 10 | 130 | 6 | 4 | 60° 凹 |
| **6.5** | 0.8 | 35 | 10 | 130 | 6 | 4 | 60° 凹 |
| **6.6** | 0.8 | 35 | 10 | 140 | 6 | 4 | 60° 凹 |
| **6.7** | 0.8 | 35 | 10 | 140 | 6 | 4 | 60° 凹 |
| **6.8** | 0.8 | 35 | 10 | 140 | 6 | 4 | 60° 凹 |
| **6.9** | 0.8 | 35 | 10 | 140 | 6 | 4 | 60° 凹 |
| **7** | 0.8 | 35 | 10 | 140 | 6 | 4 | 60° 凹 |
| **7.1** | 0.8 | 35 | 10 | 140 | 6 | 4 | 60° 凹 |
| **7.2** | 0.8 | 35 | 10 | 140 | 6 | 4 | 60° 凹 |
| **7.3** | 0.8 | 35 | 10 | 140 | 6 | 4 | 60° 凹 |
| **7.4** | 0.8 | 35 | 10 | 140 | 6 | 4 | 60° 凹 |
| **7.5** | 0.8 | 35 | 10 | 140 | 6 | 4 | 60° 凹 |
| **7.6** | 0.8 | 40 | 10 | 150 | 6 | 4 | 60° 凹 |
| **7.7** | 0.8 | 40 | 10 | 150 | 6 | 4 | 60° 凹 |
| **7.8** | 0.8 | 40 | 10 | 150 | 6 | 4 | 60° 凹 |
| **7.9** | 0.8 | 40 | 10 | 150 | 6 | 4 | 60° 凹 |
| **8** | 0.8 | 40 | 10 | 150 | 8 | 4 | 60° 凹 |
| **8.1** | 0.8 | 40 | 10 | 150 | 8 | 4 | 60° 凹 |
| **8.2** | 0.8 | 40 | 10 | 150 | 8 | 4 | 60° 凹 |
| **8.3** | 0.8 | 40 | 10 | 150 | 8 | 4 | 60° 凹 |
| **8.4** | 0.8 | 40 | 10 | 150 | 8 | 4 | 60° 凹 |
| **8.5** | 0.8 | 40 | 10 | 150 | 8 | 4 | 60° 凹 |
| **8.6** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **8.7** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **8.8** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **8.9** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **9** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **9.1** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **9.2** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **9.3** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **9.4** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **9.5** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **9.6** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **9.7** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **9.8** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **9.9** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **10** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **10.1** | 1 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |

# CSCRS 超硬チャッキングリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **10.2** | 1 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **10.3** | 1 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **10.4** | 1 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **10.5** | 1 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **10.6** | 1 | 45 | 10 | 170 | 8 | 4 | 60° 凹 |
| **10.7** | 1 | 45 | 10 | 170 | 8 | 4 | 60° 凹 |
| **10.8** | 1 | 45 | 10 | 170 | 8 | 4 | 60° 凹 |
| **10.9** | 1 | 45 | 10 | 170 | 8 | 4 | 60° 凹 |
| **11** | 1 | 45 | 10 | 170 | 8 | 4 | 60° 凹 |
| **11.1** | 1 | 45 | 12 | 170 | 10 | 4 | 60° 凹 |
| **11.2** | 1 | 45 | 12 | 170 | 10 | 4 | 60° 凹 |
| **11.3** | 1 | 45 | 12 | 170 | 10 | 4 | 60° 凹 |
| **11.4** | 1 | 45 | 12 | 170 | 10 | 4 | 60° 凹 |
| **11.5** | 1 | 45 | 12 | 170 | 10 | 4 | 60° 凹 |
| **11.6** | 1 | 45 | 12 | 170 | 10 | 4 | 60° 凹 |
| **11.7** | 1 | 45 | 12 | 170 | 10 | 4 | 60° 凹 |
| **11.8** | 1 | 45 | 12 | 170 | 10 | 4 | 60° 凹 |
| **11.9** | 1 | 45 | 12 | 170 | 10 | 4 | 60° 凹 |
| **12** | 1 | 45 | 12 | 170 | 10 | 4 | 60° 凹 |
| **12.1** | 1 | 45 | 12 | 180 | 10 | 6 | 60° 凹 |
| **12.2** | 1 | 45 | 12 | 180 | 10 | 6 | 60° 凹 |
| **12.3** | 1 | 45 | 12 | 180 | 10 | 6 | 60° 凹 |
| **12.4** | 1 | 45 | 12 | 180 | 10 | 6 | 60° 凹 |
| **12.5** | 1 | 45 | 12 | 180 | 10 | 6 | 60° 凹 |
| **12.6** | 1 | 45 | 12 | 180 | 10 | 6 | 60° 凹 |
| **12.7** | 1 | 45 | 12 | 180 | 10 | 6 | 60° 凹 |
| **12.8** | 1 | 45 | 12 | 180 | 10 | 6 | 60° 凹 |
| **12.9** | 1 | 45 | 12 | 180 | 10 | 6 | 60° 凹 |
| **13** | 1 | 45 | 12 | 180 | 10 | 6 | 60° 凹 |
| **13.1** | 1 | 50 | 12 | 190 | 10 | 6 | 60° 凹 |
| **13.2** | 1 | 50 | 12 | 190 | 10 | 6 | 60° 凹 |
| **13.3** | 1 | 50 | 12 | 190 | 10 | 6 | 60° 凹 |
| **13.4** | 1 | 50 | 12 | 190 | 10 | 6 | 60° 凹 |
| **13.5** | 1 | 50 | 12 | 190 | 10 | 6 | 60° 凹 |
| **13.6** | 1 | 50 | 12 | 190 | 10 | 6 | 60° 凹 |
| **13.7** | 1 | 50 | 12 | 190 | 10 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **13.8** | 1 | 50 | 12 | 190 | 10 | 6 | 60° 凹 |
| **13.9** | 1 | 50 | 12 | 190 | 10 | 6 | 60° 凹 |
| **14** | 1 | 50 | 12 | 190 | 10 | 6 | 60° 凹 |
| **14.5** | 1.5 | 50 | 12 | 200 | 12 | 6 | 60° 凹 |
| **15** | 1.5 | 50 | 12 | 200 | 12 | 6 | 60° 凹 |
| **15.5** | 1.5 | 50 | 12 | 200 | 12 | 6 | 60° 凹 |
| **16** | 1.5 | 50 | 12 | 200 | 12 | 6 | 60° 凹 |
| **16.5** | 1.5 | 55 | 15 | 200 | 16* | 6 | 60° 凹 |
| **17** | 1.5 | 55 | 15 | 200 | 16* | 6 | 60° 凹 |
| **17.5** | 1.5 | 55 | 15 | 220 | 16* | 6 | 60° 凹 |
| **18** | 1.5 | 55 | 15 | 220 | 16* | 6 | 60° 凹 |
| **18.5** | 1.5 | 55 | 15 | 220 | 16* | 6 | 60° 凹 |
| **19** | 1.5 | 55 | 15 | 220 | 16* | 6 | 60° 凹 |
| **19.5** | 1.5 | 60 | 15 | 230 | 16* | 6 | 60° 凹 |
| **20** | 1.5 | 60 | 15 | 230 | 16* | 6 | 60° 凹 |
| **20.5** | 1.5 | 60 | 15 | 240 | 16* | 6 | 60° 凹 |
| **21** | 1.5 | 60 | 15 | 240 | 16* | 6 | 60° 凹 |
| **21.5** | 1.5 | 65 | 15 | 240 | 16* | 6 | 60° 凹 |
| **22** | 1.5 | 65 | 15 | 240 | 16* | 6 | 60° 凹 |
| **22.5** | 1.5 | 65 | 15 | 250 | 16* | 6 | 60° 凹 |
| **23** | 1.5 | 65 | 15 | 250 | 16* | 6 | 60° 凹 |
| **23.5** | 1.5 | 65 | 15 | 265 | 20* | 6 | 60° 凹 |
| **24** | 1.5 | 65 | 15 | 265 | 20* | 6 | 60° 凹 |
| **24.5** | 1.5 | 65 | 15 | 265 | 20* | 6 | 60° 凹 |
| **25** | 1.5 | 65 | 15 | 265 | 20* | 6 | 60° 凹 |
| **25.5** | 1.5 | 70 | 15 | 270 | 20* | 6 | 60° 凹 |
| **26** | 1.5 | 70 | 15 | 270 | 20* | 6 | 60° 凹 |
| **26.5** | 1.5 | 70 | 15 | 270 | 20* | 6 | 60° 凹 |
| **27** | 1.5 | 70 | 15 | 270 | 20* | 6 | 60° 凹 |
| **27.5** | 1.5 | 70 | 15 | 270 | 20* | 6 | 60° 凹 |
| **28** | 1.5 | 70 | 15 | 270 | 20* | 8 | 60° 凹 |
| **28.5** | 1.5 | 75 | 15 | 280 | 20* | 8 | 60° 凹 |
| **29** | 1.5 | 75 | 15 | 280 | 20* | 8 | 60° 凹 |
| **29.5** | 1.5 | 75 | 15 | 280 | 20* | 8 | 60° 凹 |
| **30** | 1.5 | 75 | 15 | 280 | 20* | 8 | 60° 凹 |

*シャンク径φ16以上はフラット付ストレートシャンク(Type Ⅰ)P373参照

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **1.01 ～ 1.05** | 0.2 | 15 | – | 60 | 1 | 4 | 60° 凸 |
| **1.95 ～ 1.99** | 0.3 | 20 | – | 80 | 1.6 | 4 | 60° 凸 |
| **2.01 ～ 2.09** | 0.5 | 20 | – | 80 | 2 | 4 | 60° 凸 |
| **2.11 ～ 2.19** | 0.5 | 25 | – | 90 | 2 | 4 | 60° 凸 |
| **2.21 ～ 2.29** | 0.5 | 25 | – | 90 | 2 | 4 | 60° 凸 |
| **2.31 ～ 2.39** | 0.5 | 25 | – | 90 | 2 | 4 | 60° 凸 |
| **2.41 ～ 2.49** | 0.5 | 25 | – | 90 | 2 | 4 | 60° 凸 |
| **2.51 ～ 2.59** | 0.5 | 25 | – | 90 | 2.2 | 4 | 60° 凸 |
| **2.61 ～ 2.69** | 0.5 | 30 | – | 110 | 2.5 | 4 | 60° 凸 |
| **2.71 ～ 2.79** | 0.5 | 30 | – | 110 | 2.5 | 4 | 60° 凸 |
| **2.81 ～ 2.89** | 0.5 | 30 | – | 110 | 2.5 | 4 | 60° 凸 |
| **2.91 ～ 2.99** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凸 |
| **3.01 ～ 3.09** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **3.11 ～ 3.19** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **3.21 ～ 3.29** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **3.31 ～ 3.39** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **3.41 ～ 3.49** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **3.51 ～ 3.59** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **3.61 ～ 3.69** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **3.71 ～ 3.79** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **3.81 ～ 3.89** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **3.91 ～ 3.99** | 0.5 | 30 | – | 110 | 3 | 4 | 60° 凹 |
| **4.01 ～ 4.09** | 0.5 | 30 | – | 110 | 4 | 4 | 60° 凹 |
| **4.11 ～ 4.19** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **4.21 ～ 4.29** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **4.31 ～ 4.39** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **4.41 ～ 4.49** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **4.51 ～ 4.59** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **4.61 ～ 4.69** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **4.71 ～ 4.79** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **4.81 ～ 4.89** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **4.91 ～ 4.99** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **5.01 ～ 5.09** | 0.5 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **5.11 ～ 5.19** | 0.8 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **5.21 ～ 5.29** | 0.8 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **5.31 ～ 5.39** | 0.8 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **5.41 ～ 5.49** | 0.8 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **5.51 ～ 5.59** | 0.8 | 30 | – | 120 | 4 | 4 | 60° 凹 |
| **5.61 ～ 5.69** | 0.8 | 30 | – | 130 | 5 | 4 | 60° 凹 |
| **5.71 ～ 5.79** | 0.8 | 30 | – | 130 | 5 | 4 | 60° 凹 |
| **5.81 ～ 5.89** | 0.8 | 30 | – | 130 | 5 | 4 | 60° 凹 |
| **5.91 ～ 5.99** | 0.8 | 30 | – | 130 | 5 | 4 | 60° 凹 |
| **6.01 ～ 6.09** | 0.8 | 30 | – | 130 | 6 | 4 | 60° 凹 |
| **6.95 ～ 6.99** | 0.8 | 35 | 10 | 140 | 6 | 4 | 60° 凹 |
| **7.01 ～ 7.05** | 0.8 | 35 | 10 | 140 | 6 | 4 | 60° 凹 |
| **7.95 ～ 7.99** | 0.8 | 40 | 10 | 150 | 6 | 4 | 60° 凹 |
| **8.01 ～ 8.05** | 0.8 | 40 | 10 | 150 | 8 | 4 | 60° 凹 |
| **8.95 ～ 8.99** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **9.01 ～ 9.05** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |
| **9.95 ～ 9.99** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60° 凹 |

# CSCRS 超硬チャッキングリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **10.01 ～ 10.05** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60°凹 |
| **10.95 ～ 10.99** | 1 | 45 | 10 | 170 | 8 | 4 | 60°凹 |
| **11.01 ～ 11.05** | 1 | 45 | 10 | 170 | 8 | 4 | 60°凹 |
| **11.95 ～ 11.99** | 1 | 45 | 12 | 170 | 10 | 4 | 60°凹 |
| **12.01 ～ 12.05** | 1 | 45 | 12 | 170 | 10 | 4 | 60°凹 |
| **12.95 ～ 12.99** | 1 | 45 | 12 | 180 | 10 | 6 | 60°凹 |
| **13.01 ～ 13.05** | 1 | 45 | 12 | 180 | 10 | 6 | 60°凹 |
| **13.95 ～ 13.99** | 1 | 50 | 12 | 190 | 10 | 6 | 60°凹 |
| **14.01 ～ 14.05** | 1 | 50 | 12 | 190 | 10 | 6 | 60°凹 |
| **14.95 ～ 14.99** | 1.5 | 50 | 12 | 200 | 12 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **15.01 ～ 15.05** | 1.5 | 50 | 12 | 200 | 12 | 6 | 60°凹 |
| **15.95 ～ 15.99** | 1.5 | 50 | 12 | 200 | 12 | 6 | 60°凹 |
| **16.01 ～ 16.05** | 1.5 | 50 | 12 | 200 | 12 | 6 | 60°凹 |
| **16.95 ～ 16.99** | 1.5 | 55 | 15 | 200 | 16* | 6 | 60°凹 |
| **17.01 ～ 17.05** | 1.5 | 55 | 15 | 200 | 16* | 6 | 60°凹 |
| **17.95 ～ 17.99** | 1.5 | 55 | 15 | 220 | 16* | 6 | 60°凹 |
| **18.01 ～ 18.05** | 1.5 | 55 | 15 | 220 | 16* | 6 | 60°凹 |
| **18.95 ～ 18.99** | 1.5 | 55 | 15 | 220 | 16* | 6 | 60°凹 |
| **19.01 ～ 19.05** | 1.5 | 55 | 15 | 220 | 16* | 6 | 60°凹 |
| **19.95 ～ 19.99** | 1.5 | 60 | 15 | 230 | 16* | 6 | 60°凹 |
| **20.01 ～ 20.05** | 1.5 | 60 | 15 | 230 | 16* | 6 | 60°凹 |

*シャンク径φ16以上はフラット付ストレートシャンク(Type Ⅰ)P373参照

| 直径 (ΦD) Dia. | 食付長 (R) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **1.005 ～ 1.045** | 0.2 | 15 | – | 60 | 1 | 4 | 60°凸 |
| **1.105** | 0.2 | 15 | – | 60 | 1 | 4 | 60°凸 |
| **1.205** | 0.2 | 15 | – | 60 | 1.1 | 4 | 60°凸 |
| **1.305** | 0.2 | 15 | – | 60 | 1.2 | 4 | 60°凸 |
| **1.405** | 0.2 | 15 | – | 60 | 1.4 | 4 | 60°凸 |
| **1.505** | 0.3 | 18 | – | 70 | 1.4 | 4 | 60°凸 |
| **1.605** | 0.3 | 18 | – | 70 | 1.4 | 4 | 60°凸 |
| **1.705** | 0.3 | 20 | – | 80 | 1.5 | 4 | 60°凸 |
| **1.805** | 0.3 | 20 | – | 80 | 1.6 | 4 | 60°凸 |
| **1.905** | 0.3 | 20 | – | 80 | 1.6 | 4 | 60°凸 |
| **1.955 ～ 1.995** | 0.3 | 20 | – | 80 | 1.6 | 4 | 60°凸 |
| **2.005 ～ 2.045** | 0.5 | 20 | – | 80 | 2 | 4 | 60°凸 |
| **2.105** | 0.5 | 25 | – | 90 | 2 | 4 | 60°凸 |
| **2.205** | 0.5 | 25 | – | 90 | 2 | 4 | 60°凸 |
| **2.305** | 0.5 | 25 | – | 90 | 2 | 4 | 60°凸 |
| **2.405** | 0.5 | 25 | – | 90 | 2 | 4 | 60°凸 |
| **2.505** | 0.5 | 25 | – | 90 | 2.2 | 4 | 60°凸 |
| **2.605** | 0.5 | 30 | – | 110 | 2.5 | 4 | 60°凸 |
| **2.705** | 0.5 | 30 | – | 110 | 2.5 | 4 | 60°凸 |
| **2.805** | 0.5 | 30 | – | 110 | 2.5 | 4 | 60°凸 |
| **2.905** | 0.5 | 30 | – | 110 | 2.5 | 4 | 60°凸 |
| **2.955 ～ 2.995** | 0.5 | 30 | – | 110 | 3 | 4 | 60°凸 |
| **3.005 ～ 3.045** | 0.5 | 30 | – | 110 | 3 | 4 | 60°凹 |
| **3.105** | 0.5 | 30 | – | 110 | 3 | 4 | 60°凹 |
| **3.205** | 0.5 | 30 | – | 110 | 3 | 4 | 60°凹 |
| **3.305** | 0.5 | 30 | – | 110 | 3 | 4 | 60°凹 |
| **3.405** | 0.5 | 30 | – | 110 | 3 | 4 | 60°凹 |
| **3.505** | 0.5 | 30 | – | 110 | 3 | 4 | 60°凹 |
| **3.605** | 0.5 | 30 | – | 110 | 3 | 4 | 60°凹 |
| **3.705** | 0.5 | 30 | – | 110 | 3 | 4 | 60°凹 |
| **3.805** | 0.5 | 30 | – | 110 | 3 | 4 | 60°凹 |
| **3.905** | 0.5 | 30 | – | 110 | 3 | 4 | 60°凹 |
| **3.955 ～ 3.995** | 0.5 | 30 | – | 110 | 3 | 4 | 60°凹 |
| **4.005 ～ 4.045** | 0.5 | 30 | – | 110 | 4 | 4 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (R) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **4.105** | 0.5 | 30 | – | 120 | 4 | 4 | 60°凹 |
| **4.205** | 0.5 | 30 | – | 120 | 4 | 4 | 60°凹 |
| **4.305** | 0.5 | 30 | – | 120 | 4 | 4 | 60°凹 |
| **4.405** | 0.5 | 30 | – | 120 | 4 | 4 | 60°凹 |
| **4.505** | 0.5 | 30 | – | 120 | 4 | 4 | 60°凹 |
| **4.605** | 0.5 | 30 | – | 120 | 4 | 4 | 60°凹 |
| **4.705** | 0.5 | 30 | – | 120 | 4 | 4 | 60°凹 |
| **4.805** | 0.5 | 30 | – | 120 | 4 | 4 | 60°凹 |
| **4.905** | 0.5 | 30 | – | 120 | 4 | 4 | 60°凹 |
| **4.955 ～ 4.995** | 0.5 | 30 | – | 120 | 4 | 4 | 60°凹 |
| **5.005 ～ 5.045** | 0.5 | 30 | – | 120 | 4 | 4 | 60°凹 |
| **5.105** | 0.8 | 30 | – | 120 | 4 | 4 | 60°凹 |
| **5.205** | 0.8 | 30 | – | 120 | 4 | 4 | 60°凹 |
| **5.305** | 0.8 | 30 | – | 120 | 4 | 4 | 60°凹 |
| **5.405** | 0.8 | 30 | – | 120 | 4 | 4 | 60°凹 |
| **5.505** | 0.8 | 30 | – | 120 | 4 | 4 | 60°凹 |
| **5.605** | 0.8 | 30 | – | 130 | 5 | 4 | 60°凹 |
| **5.705** | 0.8 | 30 | – | 130 | 5 | 4 | 60°凹 |
| **5.805** | 0.8 | 30 | – | 130 | 5 | 4 | 60°凹 |
| **5.905** | 0.8 | 30 | – | 130 | 5 | 4 | 60°凹 |
| **5.955 ～ 5.995** | 0.8 | 30 | – | 130 | 5 | 4 | 60°凹 |
| **6.005 ～ 6.045** | 0.8 | 30 | – | 130 | 6 | 4 | 60°凹 |
| **6.955 ～ 6.995** | 0.8 | 35 | 10 | 140 | 6 | 4 | 60°凹 |
| **7.005 ～ 7.045** | 0.8 | 35 | 10 | 140 | 6 | 4 | 60°凹 |
| **7.955 ～ 7.995** | 0.8 | 40 | 10 | 150 | 6 | 4 | 60°凹 |
| **8.005 ～ 8.045** | 0.8 | 40 | 10 | 150 | 8 | 4 | 60°凹 |
| **8.955 ～ 8.995** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60°凹 |
| **9.005 ～ 9.045** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60°凹 |
| **9.955 ～ 9.995** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60°凹 |
| **10.005 ～ 10.045** | 0.8 | 40 | 10 | 160 | 8 | 4 | 60°凹 |
| **10.955 ～ 10.995** | 1 | 45 | 10 | 170 | 8 | 4 | 60°凹 |
| **11.005 ～ 11.045** | 1 | 45 | 10 | 170 | 8 | 4 | 60°凹 |
| **11.955 ～ 11.995** | 1 | 45 | 12 | 170 | 10 | 4 | 60°凹 |
| **12.005 ～ 12.045** | 1 | 45 | 12 | 170 | 10 | 4 | 60°凹 |

超硬

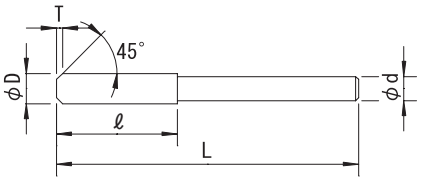
# CSSPSCR

## ソリッドスパイラルチャッキングリーマ *Solid Carbide Spiral Chucking Reamer*

切削条件表 P135 | 貫通穴加工（スパイラル刃） | 左ネジレ 12° | 食付 45° | K10








| 公差 (Tolerance) | D | | | | | | d |
|---|---|---|---|---|---|---|---|
| | 3 | +0.006 +0.002 | 3.5～6 | +0.009 +0.004 | 6.5～10 | +0.012 +0.006 | h7 |

右刃左ネジレ12° 食付角度45° K10
Helix Angle-Left12° Chamfer Angle45° Micro Grain Carbide(K10)

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **3** | 0.5 | 30 | 80 | 3 | 4 | 60°凹 |
| **3.5** | 0.5 | 30 | 80 | 3 | 4 | 60°凹 |
| **4** | 0.5 | 30 | 80 | 4 | 4 | 60°凹 |
| **4.5** | 0.5 | 30 | 100 | 4 | 4 | 60°凹 |
| **5** | 0.5 | 30 | 100 | 4 | 4 | 60°凹 |
| **5.5** | 0.8 | 30 | 100 | 4 | 4 | 60°凹 |
| **6** | 0.8 | 30 | 110 | 6 | 4 | 60°凹 |
| **6.5** | 0.8 | 30 | 110 | 6 | 4 | 60°凹 |
| **7** | 0.8 | 35 | 120 | 6 | 4 | 60°凹 |
| **7.5** | 0.8 | 35 | 120 | 6 | 4 | 60°凹 |
| **8** | 0.8 | 35 | 120 | 8 | 4 | 60°凹 |
| **8.5** | 0.8 | 35 | 130 | 8 | 4 | 60°凹 |
| **9** | 0.8 | 35 | 130 | 8 | 4 | 60°凹 |
| **9.5** | 0.8 | 35 | 140 | 8 | 4 | 60°凹 |
| **10** | 0.8 | 35 | 140 | 8 | 4 | 60°凹 |

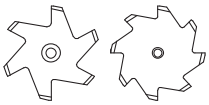
超硬

# CSCRL

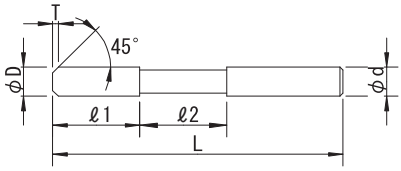
## 超硬ロングシャンクチャッキングリーマ *Carbide Long Shank Chucking Reamer*

切削条件表 P136

貫通穴加工（ストレート刃） 右直刃 食付45° K10






| 公差 (Tolerance) | D | | | | | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | +0.006 +0.002 | 3.1～6 | +0.009 +0.004 | 6.1～10 | +0.012 +0.006 | 10.1～18 | +0.015 +0.007 | 18.5～ | +0.017 +0.008 | | | h7 |

右刃ストレート　食付角度45°　K10　φ3～7.9までソリッド　φ8～先ムク
Straight Flute　Chamfer Angle45°　Micro Grain Carbide(K10)　Solid Carbide for φ3 to 7.9 Solid. Head Carbide for φ8 and Over

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **3** | 0.5 | 35 | 55 | 165 | 3 | 6 | 60°凸 |
| **3.1** | 0.5 | 35 | 55 | 165 | 3 | 6 | 60°凸 |
| **3.2** | 0.5 | 35 | 55 | 165 | 3 | 6 | 60°凸 |
| **3.3** | 0.5 | 35 | 55 | 165 | 3 | 6 | 60°凸 |
| **3.4** | 0.5 | 35 | 55 | 165 | 3 | 6 | 60°凸 |
| **3.5** | 0.5 | 35 | 55 | 165 | 3.5 | 6 | 60°凸 |
| **3.6** | 0.5 | 35 | 55 | 165 | 3.5 | 6 | 60°凸 |
| **3.7** | 0.5 | 35 | 55 | 165 | 3.5 | 6 | 60°凸 |
| **3.8** | 0.5 | 35 | 55 | 165 | 3.5 | 6 | 60°凸 |
| **3.9** | 0.5 | 35 | 55 | 165 | 3.5 | 6 | 60°凸 |
| **4** | 0.5 | 35 | 55 | 165 | 4 | 6 | 60°凹 |
| **4.1** | 0.5 | 35 | 55 | 165 | 4 | 6 | 60°凹 |
| **4.2** | 0.5 | 35 | 55 | 165 | 4 | 6 | 60°凹 |
| **4.3** | 0.5 | 35 | 55 | 165 | 4 | 6 | 60°凹 |
| **4.4** | 0.5 | 35 | 55 | 165 | 4 | 6 | 60°凹 |
| **4.5** | 0.5 | 35 | 55 | 165 | 4.5 | 6 | 60°凹 |
| **4.6** | 0.5 | 35 | 55 | 165 | 4.5 | 6 | 60°凹 |
| **4.7** | 0.5 | 35 | 55 | 165 | 4.5 | 6 | 60°凹 |
| **4.8** | 0.5 | 35 | 55 | 165 | 4.5 | 6 | 60°凹 |
| **4.9** | 0.5 | 35 | 55 | 165 | 4.5 | 6 | 60°凹 |
| **5** | 0.5 | 35 | 55 | 180 | 5 | 6 | 60°凹 |
| **5.1** | 0.8 | 35 | 55 | 180 | 5 | 6 | 60°凹 |
| **5.2** | 0.8 | 35 | 55 | 180 | 5 | 6 | 60°凹 |
| **5.3** | 0.8 | 35 | 55 | 180 | 5 | 6 | 60°凹 |
| **5.4** | 0.8 | 35 | 55 | 180 | 5 | 6 | 60°凹 |
| **5.5** | 0.8 | 35 | 55 | 180 | 5.5 | 6 | 60°凹 |
| **5.6** | 0.8 | 35 | 55 | 180 | 5.5 | 6 | 60°凹 |
| **5.7** | 0.8 | 35 | 55 | 180 | 5.5 | 6 | 60°凹 |
| **5.8** | 0.8 | 35 | 55 | 180 | 5.5 | 6 | 60°凹 |
| **5.9** | 0.8 | 35 | 55 | 180 | 5.5 | 6 | 60°凹 |
| **6** | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| **6.1** | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| **6.2** | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| **6.3** | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| **6.4** | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| **6.5** | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| **6.6** | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| **6.7** | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| **6.8** | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| **6.9** | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| **7** | 0.8 | 35 | 65 | 205 | 7 | 6 | 60°凹 |
| **7.1** | 0.8 | 35 | 65 | 205 | 7 | 6 | 60°凹 |
| **7.2** | 0.8 | 35 | 65 | 205 | 7 | 6 | 60°凹 |
| **7.3** | 0.8 | 35 | 65 | 205 | 7 | 6 | 60°凹 |
| **7.4** | 0.8 | 35 | 65 | 205 | 7 | 6 | 60°凹 |
| **7.5** | 0.8 | 35 | 65 | 205 | 7 | 6 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **7.6** | 0.8 | 35 | 65 | 205 | 7 | 6 | 60°凹 |
| **7.7** | 0.8 | 35 | 65 | 205 | 7 | 6 | 60°凹 |
| **7.8** | 0.8 | 35 | 65 | 205 | 7 | 6 | 60°凹 |
| **7.9** | 0.8 | 35 | 65 | 205 | 7 | 6 | 60°凹 |
| **8** | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| **8.1** | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| **8.2** | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| **8.3** | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| **8.4** | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| **8.5** | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| **8.6** | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| **8.7** | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| **8.8** | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| **8.9** | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| **9** | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| **9.1** | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| **9.2** | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| **9.3** | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| **9.4** | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| **9.5** | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| **9.6** | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| **9.7** | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| **9.8** | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| **9.9** | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| **10** | 0.8 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| **10.1** | 1 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| **10.2** | 1 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| **10.3** | 1 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| **10.4** | 1 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| **10.5** | 1 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| **10.6** | 1 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| **10.7** | 1 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| **10.8** | 1 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| **10.9** | 1 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| **11** | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| **11.1** | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| **11.2** | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| **11.3** | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| **11.4** | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| **11.5** | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| **11.6** | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| **11.7** | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| **11.8** | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| **11.9** | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| **12** | 1 | 45 | 105 | 255 | 12 | 6 | 60°凹 |
| **12.1** | 1 | 45 | 90 | 255 | 12 | 6 | 60°凹 |

# CSCRL 超硬ロングシャンクチャッキングリーマ

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **12.2** | 1 | 45 | 90 | 255 | 12 | 6 | 60˚凹 |
| **12.3** | 1 | 45 | 90 | 255 | 12 | 6 | 60˚凹 |
| **12.4** | 1 | 45 | 90 | 255 | 12 | 6 | 60˚凹 |
| **12.5** | 1 | 45 | 90 | 255 | 12 | 6 | 60˚凹 |
| **12.6** | 1 | 45 | 90 | 255 | 12 | 6 | 60˚凹 |
| **12.7** | 1 | 45 | 90 | 255 | 12 | 6 | 60˚凹 |
| **12.8** | 1 | 45 | 90 | 255 | 12 | 6 | 60˚凹 |
| **12.9** | 1 | 45 | 90 | 255 | 12 | 6 | 60˚凹 |
| **13** | 1 | 45 | 100 | 265 | 13 | 8 | 60˚凹 |
| **13.5** | 1 | 45 | 100 | 265 | 13 | 8 | 60˚凹 |
| **14** | 1 | 50 | 115 | 285 | 14 | 8 | 60˚凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **14.5** | 1.5 | 50 | 115 | 285 | 14 | 8 | 60˚凹 |
| **15** | 1.5 | 50 | 115 | 285 | 15 | 8 | 60˚凹 |
| **15.5** | 1.5 | 50 | 115 | 285 | 15 | 8 | 60˚凹 |
| **16** | 1.5 | 50 | 115 | 300 | 16 | 8 | 60˚凹 |
| **16.5** | 1.5 | 50 | 115 | 300 | 16 | 8 | 60˚凹 |
| **17** | 1.5 | 55 | 110 | 300 | 16 | 8 | 60˚凹 |
| **17.5** | 1.5 | 55 | 110 | 300 | 16 | 8 | 60˚凹 |
| **18** | 1.5 | 55 | 125 | 320 | 18 | 8 | 60˚凹 |
| **18.5** | 1.5 | 55 | 125 | 320 | 18 | 8 | 60˚凹 |
| **19** | 1.5 | 55 | 125 | 320 | 18 | 8 | 60˚凹 |
| **19.5** | 1.5 | 55 | 125 | 320 | 18 | 8 | 60˚凹 |
| **20** | 1.5 | 60 | 135 | 345 | 20 | 8 | 60˚凹 |

超硬

# CSHR

## ソリッドヘリカルリーマ *Solid Carbide Helical Reamer*

切削条件表 P136

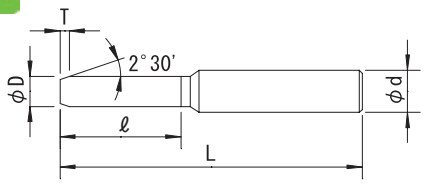
貫通穴加工（スパイラル刃）

左ネジレ 30°　食付 2°30'　K10



D≦Φ3.5 60° 凸






| 公差 (Tolerance) | D | | | | | | d |
|---|---|---|---|---|---|---|---|
| | 1～2.5 | +0.005 +0.001 | 2.6～6 | +0.006 +0.002 | 6.1～10 | +0.007 +0.003 | h7 |

右刃左ネジレ30°　食付角度2°30′　K10
Helix Angle-Left30°　Chamfer Angle2°30'　Micro Grain Carbide(K10)

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **1** | 3 | 20 | 45 | 1 | 3 | 60°凸 |
| **1.1** | 3.5 | 20 | 45 | 1.5 | 3 | 60°凸 |
| **1.2** | 3.5 | 20 | 45 | 1.5 | 3 | 60°凸 |
| **1.3** | 3.5 | 20 | 45 | 1.5 | 3 | 60°凸 |
| **1.4** | 3.5 | 20 | 45 | 1.5 | 3 | 60°凸 |
| **1.5** | 3.5 | 20 | 45 | 1.5 | 3 | 60°凸 |
| **1.6** | 4 | 20 | 50 | 2 | 3 | 60°凸 |
| **1.7** | 4 | 20 | 50 | 2 | 3 | 60°凸 |
| **1.8** | 4 | 20 | 50 | 2 | 3 | 60°凸 |
| **1.9** | 4 | 20 | 50 | 2 | 3 | 60°凸 |
| **2** | 4 | 20 | 50 | 2 | 3 | 60°凸 |
| **2.1** | 4.5 | 20 | 50 | 2.5 | 3 | 60°凸 |
| **2.2** | 4.5 | 20 | 50 | 2.5 | 3 | 60°凸 |
| **2.3** | 4.5 | 20 | 50 | 2.5 | 3 | 60°凸 |
| **2.4** | 4.5 | 20 | 50 | 2.5 | 3 | 60°凸 |
| **2.5** | 4.5 | 20 | 50 | 2.5 | 3 | 60°凸 |
| **2.6** | 4.5 | 25 | 60 | 3 | 3 | 60°凸 |
| **2.7** | 4.5 | 25 | 60 | 3 | 3 | 60°凸 |
| **2.8** | 4.5 | 25 | 60 | 3 | 3 | 60°凸 |
| **2.9** | 4.5 | 25 | 60 | 3 | 3 | 60°凸 |
| **3** | 4.5 | 25 | 60 | 3 | 3 | 60°凸 |
| **3.1** | 4.5 | 25 | 60 | 3.5 | 3 | 60°凸 |
| **3.2** | 4.5 | 25 | 60 | 3.5 | 3 | 60°凸 |
| **3.3** | 4.5 | 25 | 60 | 3.5 | 3 | 60°凸 |
| **3.4** | 4.5 | 25 | 60 | 3.5 | 3 | 60°凸 |
| **3.5** | 4.5 | 25 | 60 | 3.5 | 3 | 60°凸 |
| **3.6** | 4.5 | 30 | 70 | 4 | 3 | 60°凹 |
| **3.7** | 4.5 | 30 | 70 | 4 | 3 | 60°凹 |
| **3.8** | 4.5 | 30 | 70 | 4 | 3 | 60°凹 |
| **3.9** | 4.5 | 30 | 70 | 4 | 3 | 60°凹 |
| **4** | 4.5 | 30 | 70 | 4 | 3 | 60°凹 |
| **4.1** | 4.5 | 30 | 70 | 4.5 | 3 | 60°凹 |
| **4.2** | 4.5 | 30 | 70 | 4.5 | 3 | 60°凹 |
| **4.3** | 4.5 | 30 | 70 | 4.5 | 3 | 60°凹 |
| **4.4** | 4.5 | 30 | 70 | 4.5 | 3 | 60°凹 |
| **4.5** | 4.5 | 30 | 70 | 4.5 | 3 | 60°凹 |
| **4.6** | 5 | 30 | 70 | 5 | 3 | 60°凹 |
| **4.7** | 5 | 30 | 70 | 5 | 3 | 60°凹 |
| **4.8** | 5 | 30 | 70 | 5 | 3 | 60°凹 |
| **4.9** | 5 | 30 | 70 | 5 | 3 | 60°凹 |
| **5** | 5 | 30 | 70 | 5 | 3 | 60°凹 |
| **5.1** | 5 | 30 | 80 | 5.5 | 3 | 60°凹 |
| **5.2** | 5 | 30 | 80 | 5.5 | 3 | 60°凹 |
| **5.3** | 5 | 30 | 80 | 5.5 | 3 | 60°凹 |
| **5.4** | 5 | 30 | 80 | 5.5 | 3 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| **5.5** | 5 | 30 | 80 | 5.5 | 3 | 60°凹 |
| **5.6** | 5 | 35 | 80 | 6 | 3 | 60°凹 |
| **5.7** | 5 | 35 | 80 | 6 | 3 | 60°凹 |
| **5.8** | 5 | 35 | 80 | 6 | 3 | 60°凹 |
| **5.9** | 5 | 35 | 80 | 6 | 3 | 60°凹 |
| **6** | 5 | 35 | 80 | 6 | 3 | 60°凹 |
| **6.1** | 7 | 35 | 80 | 6.5 | 3 | 60°凹 |
| **6.2** | 7 | 35 | 80 | 6.5 | 3 | 60°凹 |
| **6.3** | 7 | 35 | 80 | 6.5 | 3 | 60°凹 |
| **6.4** | 7 | 35 | 80 | 6.5 | 3 | 60°凹 |
| **6.5** | 7 | 35 | 80 | 6.5 | 3 | 60°凹 |
| **6.6** | 7 | 35 | 80 | 7 | 3 | 60°凹 |
| **6.7** | 7 | 35 | 80 | 7 | 3 | 60°凹 |
| **6.8** | 7 | 35 | 80 | 7 | 3 | 60°凹 |
| **6.9** | 7 | 35 | 80 | 7 | 3 | 60°凹 |
| **7** | 7 | 35 | 80 | 7 | 3 | 60°凹 |
| **7.1** | 7 | 35 | 80 | 7.5 | 3 | 60°凹 |
| **7.2** | 7 | 35 | 80 | 7.5 | 3 | 60°凹 |
| **7.3** | 7 | 35 | 80 | 7.5 | 3 | 60°凹 |
| **7.4** | 7 | 35 | 80 | 7.5 | 3 | 60°凹 |
| **7.5** | 7 | 35 | 80 | 7.5 | 3 | 60°凹 |
| **7.6** | 7 | 35 | 80 | 8 | 3 | 60°凹 |
| **7.7** | 7 | 35 | 80 | 8 | 3 | 60°凹 |
| **7.8** | 7 | 35 | 80 | 8 | 3 | 60°凹 |
| **7.9** | 7 | 35 | 80 | 8 | 3 | 60°凹 |
| **8** | 7 | 35 | 80 | 8 | 3 | 60°凹 |
| **8.1** | 7 | 40 | 90 | 8.5 | 3 | 60°凹 |
| **8.2** | 7 | 40 | 90 | 8.5 | 3 | 60°凹 |
| **8.3** | 7 | 40 | 90 | 8.5 | 3 | 60°凹 |
| **8.4** | 7 | 40 | 90 | 8.5 | 3 | 60°凹 |
| **8.5** | 7 | 40 | 90 | 8.5 | 3 | 60°凹 |
| **8.6** | 7 | 40 | 90 | 9 | 3 | 60°凹 |
| **8.7** | 7 | 40 | 90 | 9 | 3 | 60°凹 |
| **8.8** | 7 | 40 | 90 | 9 | 3 | 60°凹 |
| **8.9** | 7 | 40 | 90 | 9 | 3 | 60°凹 |
| **9** | 7 | 40 | 90 | 9 | 3 | 60°凹 |
| **9.1** | 7 | 40 | 90 | 9.5 | 3 | 60°凹 |
| **9.2** | 7 | 40 | 90 | 9.5 | 3 | 60°凹 |
| **9.3** | 7 | 40 | 90 | 9.5 | 3 | 60°凹 |
| **9.4** | 7 | 40 | 90 | 9.5 | 3 | 60°凹 |
| **9.5** | 7 | 40 | 90 | 9.5 | 3 | 60°凹 |
| **9.6** | 7 | 40 | 90 | 10 | 3 | 60°凹 |
| **9.7** | 7 | 40 | 90 | 10 | 3 | 60°凹 |
| **9.8** | 7 | 40 | 90 | 10 | 3 | 60°凹 |
| **9.9** | 7 | 40 | 90 | 10 | 3 | 60°凹 |
| **10** | 7 | 40 | 90 | 10 | 3 | 60°凹 |

超硬

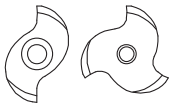
# CHHR

## 超硬ハイヘリカルリーマ *Carbide High Helical Reamer*

切削条件表 P137

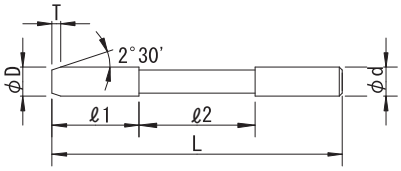
**貫通穴加工（スパイラル刃）**

左ネジレ 60°　食付 2°30'　超微粒子



D≦Φ2.6 60° 凸






| 公差 (Tolerance) | D | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|
| 0.01トビ Increment 0.01 | +0.005 0 | 2～2.5 | +0.005 +0.001 | 2.6～6 | +0.006 +0.002 | 6.1～10.5 | +0.008 +0.003 | 10.6～14 | +0.009 +0.004 | h7 |

右刃左ネジレ60°　ストレートシャンク　食付角度2°30'　超微粒子　φ5.09までソリッド

Helix Angle-Left60°　Straight Shank　Chamfer Angle2°30'　Ultra Micro Grain Carbide　※Solid Carbide for up to φ5.09

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **2** | 4.6 | 10 | 25 | 55 | 2 | 2 | 60° 凸 |
| **2.1** | 4.6 | 10 | 25 | 55 | 2 | 2 | 60° 凸 |
| **2.2** | 4.6 | 12 | 23 | 60 | 2.5 | 2 | 60° 凸 |
| **2.3** | 4.6 | 12 | 23 | 60 | 2.5 | 2 | 60° 凸 |
| **2.4** | 4.6 | 12 | 23 | 60 | 2.5 | 2 | 60° 凸 |
| **2.5** | 4.6 | 12 | 23 | 60 | 2.5 | 2 | 60° 凸 |
| **2.6** | 4.6 | 12 | 23 | 60 | 3 | 2 | 60° 凸 |
| **2.7** | 4.6 | 12 | 23 | 60 | 3 | 2 | 60° 凹 |
| **2.8** | 4.6 | 12 | 23 | 60 | 3 | 2 | 60° 凹 |
| **2.9** | 4.6 | 12 | 23 | 60 | 3 | 2 | 60° 凹 |
| **3** | 4.6 | 12 | 23 | 60 | 3 | 2 | 60° 凹 |
| **3.1** | 4.6 | 12 | 23 | 60 | 3 | 2 | 60° 凹 |
| **3.2** | 4.6 | 18 | 17 | 60 | 3.5 | 2 | 60° 凹 |
| **3.3** | 4.6 | 18 | 17 | 60 | 3.5 | 2 | 60° 凹 |
| **3.4** | 4.6 | 18 | 17 | 60 | 3.5 | 2 | 60° 凹 |
| **3.5** | 4.6 | 18 | 17 | 60 | 3.5 | 2 | 60° 凹 |
| **3.6** | 4.6 | 18 | 17 | 60 | 4 | 3 | 60° 凹 |
| **3.7** | 4.6 | 18 | 17 | 60 | 4 | 3 | 60° 凹 |
| **3.8** | 4.6 | 18 | 17 | 60 | 4 | 3 | 60° 凹 |
| **3.9** | 4.6 | 18 | 17 | 60 | 4 | 3 | 60° 凹 |
| **4** | 4.6 | 18 | 17 | 60 | 4 | 3 | 60° 凹 |
| **4.1** | 4.6 | 18 | 17 | 60 | 4 | 3 | 60° 凹 |
| **4.2** | 5 | 22 | 23 | 75 | 4.5 | 3 | 60° 凹 |
| **4.3** | 5 | 22 | 23 | 75 | 4.5 | 3 | 60° 凹 |
| **4.4** | 5 | 22 | 23 | 75 | 4.5 | 3 | 60° 凹 |
| **4.5** | 5 | 22 | 23 | 75 | 4.5 | 3 | 60° 凹 |
| **4.6** | 5 | 22 | 23 | 75 | 5 | 3 | 60° 凹 |
| **4.7** | 5 | 22 | 23 | 75 | 5 | 3 | 60° 凹 |
| **4.8** | 5 | 22 | 23 | 75 | 5 | 3 | 60° 凹 |
| **4.9** | 5 | 22 | 23 | 75 | 5 | 3 | 60° 凹 |
| **5** | 5 | 22 | 23 | 75 | 5 | 3 | 60° 凹 |
| **5.1** | 5 | 22 | 23 | 75 | 5 | 3 | 60° 凹 |
| **5.2** | 5 | 25 | 40 | 100 | 6 | 3 | 60° 凹 |
| **5.3** | 5 | 25 | 40 | 100 | 6 | 3 | 60° 凹 |
| **5.4** | 5 | 25 | 40 | 100 | 6 | 3 | 60° 凹 |
| **5.5** | 5 | 25 | 40 | 100 | 6 | 3 | 60° 凹 |
| **5.6** | 5 | 25 | 40 | 100 | 6 | 3 | 60° 凹 |
| **5.7** | 5 | 25 | 40 | 100 | 6 | 3 | 60° 凹 |
| **5.8** | 5 | 25 | 40 | 100 | 6 | 3 | 60° 凹 |
| **5.9** | 5 | 25 | 40 | 100 | 6 | 3 | 60° 凹 |
| **6** | 5 | 25 | 40 | 100 | 6 | 3 | 60° 凹 |
| **6.1** | 5 | 25 | 40 | 100 | 6 | 3 | 60° 凹 |
| **6.2** | 7 | 25 | 45 | 110 | 8 | 3 | 60° 凹 |
| **6.3** | 7 | 25 | 45 | 110 | 8 | 3 | 60° 凹 |
| **6.4** | 7 | 25 | 45 | 110 | 8 | 3 | 60° 凹 |
| **6.5** | 7 | 25 | 45 | 110 | 8 | 3 | 60° 凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **6.6** | 7 | 25 | 45 | 110 | 8 | 3 | 60° 凹 |
| **6.7** | 7 | 25 | 45 | 110 | 8 | 3 | 60° 凹 |
| **6.8** | 7 | 25 | 45 | 110 | 8 | 3 | 60° 凹 |
| **6.9** | 7 | 25 | 45 | 110 | 8 | 3 | 60° 凹 |
| **7** | 7 | 25 | 45 | 110 | 8 | 3 | 60° 凹 |
| **7.1** | 7 | 25 | 45 | 110 | 8 | 3 | 60° 凹 |
| **7.2** | 7 | 25 | 60 | 125 | 8 | 3 | 60° 凹 |
| **7.3** | 7 | 25 | 60 | 125 | 8 | 3 | 60° 凹 |
| **7.4** | 7 | 25 | 60 | 125 | 8 | 3 | 60° 凹 |
| **7.5** | 7 | 25 | 60 | 125 | 8 | 3 | 60° 凹 |
| **7.6** | 7 | 25 | 60 | 125 | 8 | 3 | 60° 凹 |
| **7.7** | 7 | 25 | 60 | 125 | 8 | 3 | 60° 凹 |
| **7.8** | 7 | 25 | 60 | 125 | 8 | 3 | 60° 凹 |
| **7.9** | 7 | 25 | 60 | 125 | 8 | 3 | 60° 凹 |
| **8** | 7 | 25 | 60 | 125 | 8 | 3 | 60° 凹 |
| **8.1** | 7 | 25 | 60 | 125 | 8 | 3 | 60° 凹 |
| **8.2** | 7 | 25 | 65 | 135 | 10 | 3 | 60° 凹 |
| **8.3** | 7 | 25 | 65 | 135 | 10 | 3 | 60° 凹 |
| **8.4** | 7 | 25 | 65 | 135 | 10 | 3 | 60° 凹 |
| **8.5** | 7 | 25 | 65 | 135 | 10 | 3 | 60° 凹 |
| **8.6** | 7 | 25 | 65 | 135 | 10 | 3 | 60° 凹 |
| **8.7** | 7 | 25 | 65 | 135 | 10 | 3 | 60° 凹 |
| **8.8** | 7 | 25 | 65 | 135 | 10 | 3 | 60° 凹 |
| **8.9** | 7 | 25 | 65 | 135 | 10 | 3 | 60° 凹 |
| **9** | 7 | 25 | 65 | 135 | 10 | 3 | 60° 凹 |
| **9.1** | 7 | 25 | 65 | 135 | 10 | 3 | 60° 凹 |
| **9.2** | 7 | 29 | 71 | 150 | 10 | 3 | 60° 凹 |
| **9.3** | 7 | 29 | 71 | 150 | 10 | 3 | 60° 凹 |
| **9.4** | 7 | 29 | 71 | 150 | 10 | 3 | 60° 凹 |
| **9.5** | 7 | 29 | 71 | 150 | 10 | 3 | 60° 凹 |
| **9.6** | 7 | 29 | 71 | 150 | 10 | 3 | 60° 凹 |
| **9.7** | 7 | 29 | 71 | 150 | 10 | 3 | 60° 凹 |
| **9.8** | 7 | 29 | 71 | 150 | 10 | 3 | 60° 凹 |
| **9.9** | 7 | 29 | 71 | 150 | 10 | 3 | 60° 凹 |
| **10** | 7 | 29 | 71 | 150 | 10 | 3 | 60° 凹 |
| **10.1** | 7 | 29 | 71 | 150 | 10 | 3 | 60° 凹 |
| **10.2** | 7 | 29 | 76 | 155 | 12 | 3 | 60° 凹 |
| **10.3** | 7 | 29 | 76 | 155 | 12 | 3 | 60° 凹 |
| **10.4** | 7 | 29 | 76 | 155 | 12 | 3 | 60° 凹 |
| **10.5** | 7 | 29 | 76 | 155 | 12 | 3 | 60° 凹 |
| **10.6** | 7 | 29 | 76 | 155 | 12 | 3 | 60° 凹 |
| **10.7** | 7 | 29 | 76 | 155 | 12 | 3 | 60° 凹 |
| **10.8** | 7 | 29 | 76 | 155 | 12 | 3 | 60° 凹 |
| **10.9** | 7 | 29 | 76 | 155 | 12 | 3 | 60° 凹 |
| **11** | 7 | 29 | 76 | 155 | 12 | 3 | 60° 凹 |
| **11.1** | 7 | 29 | 76 | 155 | 12 | 3 | 60° 凹 |

# CHHR 超硬ハイヘリカルリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **11.2** | 7 | 29 | 76 | 160 | 12 | 3 | 60° 凹 |
| **11.3** | 7 | 29 | 76 | 160 | 12 | 3 | 60° 凹 |
| **11.4** | 7 | 29 | 76 | 160 | 12 | 3 | 60° 凹 |
| **11.5** | 7 | 29 | 76 | 160 | 12 | 3 | 60° 凹 |
| **11.6** | 7 | 29 | 76 | 160 | 12 | 3 | 60° 凹 |
| **11.7** | 7 | 29 | 76 | 160 | 12 | 3 | 60° 凹 |
| **11.8** | 7 | 29 | 76 | 160 | 12 | 3 | 60° 凹 |
| **11.9** | 7 | 29 | 76 | 160 | 12 | 3 | 60° 凹 |
| **12** | 7 | 29 | 76 | 160 | 12 | 3 | 60° 凹 |
| **12.1** | 7 | 29 | 76 | 160 | 12 | 3 | 60° 凹 |
| **12.2** | 7 | 29 | 81 | 165 | 12 | 3 | 60° 凹 |
| **12.3** | 7 | 29 | 81 | 165 | 12 | 3 | 60° 凹 |
| **12.4** | 7 | 29 | 81 | 165 | 12 | 3 | 60° 凹 |
| **12.5** | 7 | 29 | 81 | 165 | 12 | 3 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **12.6** | 7 | 29 | 81 | 165 | 12 | 3 | 60° 凹 |
| **12.7** | 7 | 29 | 81 | 165 | 12 | 3 | 60° 凹 |
| **12.8** | 7 | 29 | 81 | 165 | 12 | 3 | 60° 凹 |
| **12.9** | 7 | 29 | 81 | 165 | 12 | 3 | 60° 凹 |
| **13** | 7 | 29 | 81 | 165 | 12 | 3 | 60° 凹 |
| **13.1** | 7 | 29 | 81 | 165 | 12 | 3 | 60° 凹 |
| **13.2** | 7 | 29 | 86 | 170 | 16 | 3 | 60° 凹 |
| **13.3** | 7 | 29 | 86 | 170 | 16 | 3 | 60° 凹 |
| **13.4** | 7 | 29 | 86 | 170 | 16 | 3 | 60° 凹 |
| **13.5** | 7 | 29 | 86 | 170 | 16 | 3 | 60° 凹 |
| **13.6** | 7 | 29 | 86 | 170 | 16 | 3 | 60° 凹 |
| **13.7** | 7 | 29 | 86 | 170 | 16 | 3 | 60° 凹 |
| **13.8** | 7 | 29 | 86 | 170 | 16 | 3 | 60° 凹 |
| **13.9** | 7 | 29 | 86 | 170 | 16 | 3 | 60° 凹 |
| **14** | 7 | 29 | 86 | 170 | 16 | 3 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **2.01 ～ 2.09** | 4.6 | 10 | 25 | 55 | 2 | 2 | 60° 凸 |
| **3.01 ～ 3.09** | 4.6 | 12 | 25 | 60 | 3 | 2 | 60° 凹 |
| **4.01 ～ 4.09** | 4.6 | 18 | 17 | 60 | 4 | 3 | 60° 凹 |
| **5.01 ～ 5.09** | 5 | 22 | 23 | 75 | 5 | 3 | 60° 凹 |
| **6.01 ～ 6.09** | 5 | 25 | 40 | 100 | 6 | 3 | 60° 凹 |
| **7.01 ～ 7.09** | 7 | 25 | 45 | 110 | 8 | 3 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **8.01 ～ 8.09** | 7 | 25 | 60 | 125 | 8 | 3 | 60° 凹 |
| **9.01 ～ 9.09** | 7 | 25 | 65 | 135 | 10 | 3 | 60° 凹 |
| **10.01 ～ 10.09** | 7 | 29 | 71 | 150 | 10 | 3 | 60° 凹 |
| **11.01 ～ 11.09** | 7 | 29 | 76 | 155 | 12 | 3 | 60° 凹 |
| **12.01 ～ 12.09** | 7 | 29 | 76 | 160 | 12 | 3 | 60° 凹 |
| **13.01 ～ 13.09** | 7 | 29 | 81 | 165 | 12 | 3 | 60° 凹 |
| **14.01 ～ 14.09** | 7 | 29 | 86 | 170 | 16 | 3 | 60° 凹 |

超硬

# CHHRT

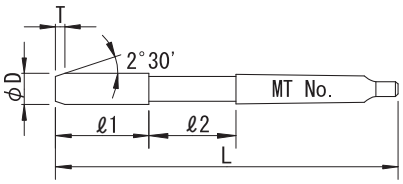
## 超硬ハイヘリカルリーマ（テーパーシャンク） *Solid Carbide Head High Helical Reamer with Taper Shank*

切削条件表 P137

貫通穴加工（スパイラル刃）

左ネジレ 60°　食付 2°30'　超微粒子






| 公差 (Tolerance) | D | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 6 | +0.006 +0.002 | 6.5～10.5 | +0.008 +0.003 | 11～18 | +0.009 +0.004 | 18.5～30 | +0.01 +0.005 |

右刃左ネジレ60°　テーパーシャンク　食付角度2°30'　超微粒子
Helix Angle-Left60°　Taper Shank　Chamfer Angle2°30'　Ultra Micro Grain Carbide

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | MTNo. *Shank MTNo.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **6** | 5 | 25 | 39.5 | 130 | 1 | 3 | 60°凹 |
| **6.5** | 7 | 25 | 49.5 | 140 | 1 | 3 | 60°凹 |
| **7** | 7 | 25 | 49.5 | 140 | 1 | 3 | 60°凹 |
| **7.5** | 7 | 25 | 59.5 | 150 | 1 | 3 | 60°凹 |
| **8** | 7 | 25 | 59.5 | 150 | 1 | 3 | 60°凹 |
| **8.5** | 7 | 25 | 74.5 | 165 | 1 | 3 | 60°凹 |
| **9** | 7 | 25 | 74.5 | 165 | 1 | 3 | 60°凹 |
| **9.5** | 7 | 29 | 70.5 | 165 | 1 | 3 | 60°凹 |
| **10** | 7 | 29 | 70.5 | 165 | 1 | 3 | 60°凹 |
| **10.5** | 7 | 29 | 75.5 | 170 | 1 | 3 | 60°凹 |
| **11** | 7 | 29 | 75.5 | 170 | 1 | 3 | 60°凹 |
| **11.5** | 7 | 29 | 80.5 | 175 | 1 | 3 | 60°凹 |
| **12** | 7 | 29 | 80.5 | 175 | 1 | 3 | 60°凹 |
| **12.5** | 7 | 29 | 85.5 | 180 | 1 | 3 | 60°凹 |
| **13** | 7 | 29 | 85.5 | 180 | 1 | 3 | 60°凹 |
| **13.5** | 7 | 29 | 85.5 | 180 | 1 | 3 | 60°凹 |
| **14** | 7 | 29 | 85.5 | 180 | 1 | 3 | 60°凹 |
| **14.5** | 7 | 29 | 91 | 200 | 2 | 3 | 60°凹 |
| **15** | 7 | 29 | 91 | 200 | 2 | 3 | 60°凹 |
| **15.5** | 7 | 30 | 95 | 205 | 2 | 4 | 60°凹 |
| **16** | 7 | 30 | 95 | 205 | 2 | 4 | 60°凹 |
| **16.5** | 7 | 30 | 95 | 205 | 2 | 4 | 60°凹 |
| **17** | 7 | 30 | 95 | 205 | 2 | 4 | 60°凹 |
| **17.5** | 7 | 30 | 100 | 210 | 2 | 4 | 60°凹 |

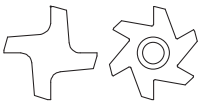
| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | MTNo. *Shank MTNo.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **18** | 7 | 30 | 100 | 210 | 2 | 4 | 60°凹 |
| **18.5** | 7 | 30 | 100 | 210 | 2 | 4 | 60°凹 |
| **19** | 7 | 30 | 100 | 210 | 2 | 4 | 60°凹 |
| **19.5** | 7 | 30 | 110 | 220 | 2 | 4 | 60°凹 |
| **20** | 7 | 30 | 110 | 220 | 2 | 4 | 60°凹 |
| **20.5** | 8 | 33.5 | 116.5 | 230 | 2 | 4 | 60°凹 |
| **21** | 8 | 33.5 | 116.5 | 230 | 2 | 4 | 60°凹 |
| **21.5** | 8 | 33.5 | 116.5 | 230 | 2 | 4 | 60°凹 |
| **22** | 8 | 33.5 | 116.5 | 230 | 2 | 4 | 60°凹 |
| **22.5** | 8 | 33.5 | 126.5 | 240 | 2 | 4 | 60°凹 |
| **23** | 8 | 33.5 | 126.5 | 240 | 2 | 4 | 60°凹 |
| **23.5** | 8 | 33.5 | 117.5 | 250 | 3 | 4 | 60°凹 |
| **24** | 8 | 33.5 | 117.5 | 250 | 3 | 4 | 60°凹 |
| **24.5** | 8 | 33.5 | 122.5 | 255 | 3 | 4 | 60°凹 |
| **25** | 8 | 33.5 | 122.5 | 255 | 3 | 4 | 60°凹 |
| **25.5** | 8 | 33.5 | 122.5 | 255 | 3 | 4 | 60°凹 |
| **26** | 8 | 33.5 | 122.5 | 255 | 3 | 4 | 60°凹 |
| **26.5** | 8 | 33.5 | 122.5 | 255 | 3 | 4 | 60°凹 |
| **27** | 8 | 33.5 | 122.5 | 255 | 3 | 4 | 60°凹 |
| **27.5** | 8 | 39 | 122 | 260 | 3 | 6 | 60°凹 |
| **28** | 8 | 39 | 122 | 260 | 3 | 6 | 60°凹 |
| **28.5** | 8 | 39 | 122 | 260 | 3 | 6 | 60°凹 |
| **29** | 8 | 39 | 122 | 260 | 3 | 6 | 60°凹 |
| **29.5** | 8 | 39 | 122 | 260 | 3 | 6 | 60°凹 |
| **30** | 8 | 39 | 122 | 260 | 3 | 6 | 60°凹 |

超硬

# CSTPR

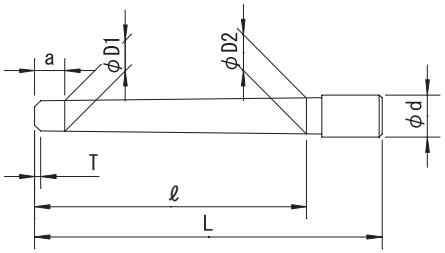
## ソリッドテーパーピンリーマ　*Solid Carbide Taper Pin Reamer*

切削条件表 P137　テーパー穴加工　右直刃　食付45°　K10



D≦Φ2.5　60°






| 公差(Tolerance) | D1：±0.05 | d：h6 |
|---|---|---|

**1/50テーパー** 右刃ストレート　食付角度45°　K10
1/50 Taper Straight Flute　Chamfer Angle45°　Micro Grain Carbide(K10)

| 小径（φD1）*First Diameter* | 食付長（T）*Chamfer Length* | 刃長（ℓ）*Length of Flutes* | 大径（φD2）*Diameter at Large End* | 全長（L）*Overall Length* | シャンク径（φd）*Shank Dia.* | a | 刃数（N）*Number of Flutes* |
|---|---|---|---|---|---|---|---|
| **1** | – | 28 | 1.46 | 45 | 2 | 5 | 4 |
| **1.2** | – | 32 | 1.74 | 50 | 2.5 | 5 | 4 |
| **1.5** | – | 37 | 2.14 | 58 | 2.5 | 5 | 4 |
| **1.6** | – | 37 | 2.24 | 58 | 2.5 | 5 | 4 |
| **1.8** | – | 48 | 2.66 | 70 | 3 | 5 | 4 |
| **2** | – | 48 | 2.86 | 70 | 3 | 5 | 4 |
| **2.5** | – | 53 | 3.46 | 75 | 3 | 5 | 4 |
| **3** | – | 63 | 4.16 | 88 | 4 | 5 | 6 |
| **4** | 0.5 | 75 | 5.4 | 102 | 5 | 5 | 6 |
| **5** | 1 | 87 | 6.64 | 115 | 6 | 5 | 6 |
| **6** | 1 | 99 | 7.88 | 130 | 8 | 5 | 6 |
| **7** | 1 | 119 | 9.28 | 152 | 8 | 5 | 6 |
| **8** | 1 | 141 | 10.72 | 178 | 10 | 5 | 6 |
| **10** | 1 | 163 | 13.16 | 205 | 12 | 5 | 8 |
| **12** | 1 | 194 | 15.74 | 240 | 14 | 7 | 8 |
| **13** | 1 | 194 | 16.74 | 240 | 14 | 7 | 8 |

超硬

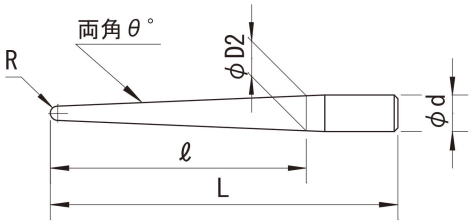
# CSPGR

## ソリッドピンゲートリーマ　*Solid Carbide Pin Gate Reamer*

切削条件表 P137　テーパー穴加工　右ネジレ8°　超微粒子








| 公差(Tolerance) | R：$^{0}_{-0.05}$ | θ：±5' | d：h7 |
|---|---|---|---|

右刃右ネジレ8°　超微粒子
Helix Angle-Right8°　Ultra Micro Grain Carbide

| R | 両角（θ）*Taper Angle* | 刃長（ℓ）*Length of Flutes* | 大径（φD2）*Diameter at Large End* | 全長（L）*Overall Length* | シャンク径（φd）*Shank Dia.* | 刃数（N）*Number of Flutes* |
|---|---|---|---|---|---|---|
| 0.5 | 1° | 25 | 1.42 | 70 | 3 | 4 |
| | 2° | 25 | 1.85 | 70 | 3 | 4 |
| | 3° | 25 | 2.28 | 70 | 3 | 4 |
| | 4° | 25 | 2.71 | 70 | 3 | 4 |
| | 5° | 25 | 3.14 | 70 | 4 | 4 |
| 0.75 | 1° | 30 | 2.01 | 80 | 3 | 4 |
| | 2° | 30 | 2.52 | 80 | 3 | 4 |
| | 3° | 30 | 3.03 | 80 | 4 | 4 |
| | 4° | 30 | 3.54 | 80 | 4 | 4 |
| | 5° | 30 | 4.05 | 80 | 4 | 4 |
| 1 | 1° | 40 | 2.68 | 90 | 3 | 4 |
| | 2° | 40 | 3.36 | 90 | 4 | 4 |
| | 3° | 40 | 4.04 | 90 | 4 | 4 |
| | 4° | 40 | 4.72 | 90 | 6 | 4 |
| | 5° | 40 | 5.4 | 90 | 6 | 4 |
| 1.25 | 1° | 45 | 3.26 | 95 | 4 | 4 |
| | 2° | 45 | 4.02 | 95 | 4 | 4 |
| | 3° | 45 | 4.79 | 95 | 6 | 4 |
| | 4° | 45 | 5.55 | 95 | 6 | 4 |
| | 5° | 45 | 6.32 | 95 | 8 | 4 |
| 1.5 | 1° | 45 | 3.75 | 95 | 4 | 4 |
| | 2° | 45 | 4.51 | 95 | 6 | 4 |
| | 3° | 45 | 5.27 | 95 | 6 | 4 |
| | 4° | 45 | 6.03 | 95 | 6 | 4 |
| | 5° | 45 | 6.8 | 95 | 8 | 4 |
| 2 | 1° | 50 | 4.83 | 100 | 6 | 4 |
| | 2° | 50 | 5.67 | 100 | 6 | 4 |
| | 3° | 50 | 6.51 | 100 | 8 | 4 |
| | 4° | 50 | 7.35 | 100 | 8 | 4 |
| | 5° | 50 | 8.19 | 100 | 10 | 4 |
| 2.5 | 1° | 60 | 6 | 110 | 6 | 4 |
| | 2° | 60 | 7 | 110 | 8 | 4 |
| | 3° | 60 | 8.01 | 110 | 8 | 4 |
| | 4° | 60 | 9.01 | 110 | 10 | 4 |

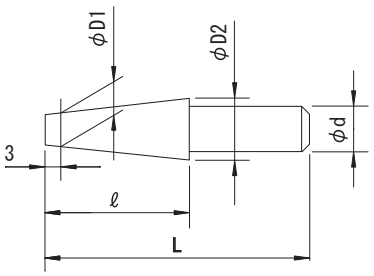
超硬

# CSPOTR

## 超硬オイルホールスパイラルテーパーリーマ　*Solid Carbide Head Oil Hole Spiral Taper Reamer*

切削条件表 P138　テーパー穴加工　左ネジレ20°　左ネジレ30°　OiL Hole　K10






| 公差(Tolerance) | D1：±0.05 | d：h7 |
|---|---|---|

1/5, 1/6テーパー右刃左ネジレ20°　1/8, 1/10テーパー右刃左ネジレ30°　K10

1/5, 1/6 Taper Herix Angle-left20°　1/8, 1/10 Taper helix Angle-left30°　Micro Grain Carbide(K10)

| 呼び寸法 Size | 基準径（φD1） Std. Dia. | 刃長（ℓ） Length of Flutes | 大径（φD2） Dia at Large End | 全長（L） Overall Length | シャンク径（φd） Shank Dia. | 刃数（N） Number of Flutes |
|---|---|---|---|---|---|---|
| **8-1/ 5** | 8 | 40 | 15.4 | 95 | 16 | 4 |
| **10-1/ 5** | 10 | 40 | 17.4 | 95 | 16 | 4 |
| **12-1/ 5** | 12 | 40 | 19.4 | 95 | 20 | 4 |
| **15-1/ 5** | 15 | 45 | 23.4 | 100 | 20 | 6 |
| **16-1/ 5** | 16 | 45 | 24.4 | 100 | 20 | 6 |
| **18-1/ 5** | 18 | 45 | 26.4 | 100 | 25 | 6 |
| **20-1/ 5** | 20 | 45 | 28.4 | 100 | 25 | 6 |
| **8-1/ 6** | 8 | 40 | 14.16 | 95 | 16 | 4 |
| **10-1/ 6** | 10 | 40 | 16.16 | 95 | 16 | 4 |
| **12-1/ 6** | 12 | 40 | 18.16 | 95 | 16 | 4 |
| **15-1/ 6** | 15 | 45 | 22 | 100 | 20 | 6 |
| **16-1/ 6** | 16 | 45 | 23 | 100 | 20 | 6 |
| **18-1/ 6** | 18 | 45 | 25 | 100 | 25 | 6 |
| **20-1/ 6** | 20 | 45 | 27 | 100 | 25 | 6 |

| 呼び寸法 Size | 基準径（φD1） Std. Dia. | 刃長（ℓ） Length of Flutes | 大径（φD2） Dia at Large End | 全長（L） Overall Length | シャンク径（φd） Shank Dia. | 刃数（N） Number of Flutes |
|---|---|---|---|---|---|---|
| **8-1/ 8** | 8 | 45 | 13.25 | 100 | 12 | 4 |
| **10-1/ 8** | 10 | 45 | 15.25 | 100 | 16 | 4 |
| **12-1/ 8** | 12 | 45 | 17.25 | 100 | 16 | 4 |
| **15-1/ 8** | 15 | 50 | 20.88 | 105 | 20 | 6 |
| **16-1/ 8** | 16 | 50 | 21.88 | 105 | 20 | 6 |
| **18-1/ 8** | 18 | 50 | 23.88 | 105 | 20 | 6 |
| **20-1/ 8** | 20 | 50 | 25.88 | 105 | 25 | 6 |
| **8-1/10** | 8 | 45 | 12.2 | 100 | 12 | 4 |
| **10-1/10** | 10 | 45 | 14.2 | 100 | 12 | 4 |
| **12-1/10** | 12 | 45 | 16.2 | 100 | 16 | 4 |
| **15-1/10** | 15 | 50 | 19.7 | 105 | 20 | 6 |
| **16-1/10** | 16 | 50 | 20.7 | 105 | 20 | 6 |
| **18-1/10** | 18 | 50 | 22.7 | 105 | 20 | 6 |
| **20-1/10** | 20 | 50 | 24.7 | 105 | 25 | 6 |
| **22-1/10** | 22 | 55 | 27.2 | 115 | 25 | 6 |
| **25-1/10** | 25 | 55 | 30.2 | 115 | 25 | 6 |

# ERR-TiN

## エンド刃付止穴用リーマ　*End Mill Reamer For Blind Hole*

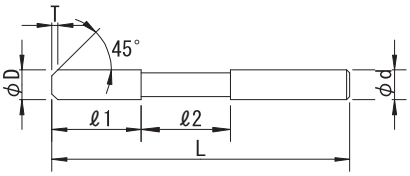
切削条件表 P139

止り穴加工　右ネジレ30°　TiN　食付45°　粉末ハイス



センターカット






| 公差 (Tolerance) | D | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|
| | 0.01トビ Increment 0.01 | +0.005 0 | 0.005トビ Increment 0.005 | +0.005 0 | 3 | +0.006 +0.002 | 3.1～ 6 | +0.009 +0.004 | 6.1～10 | +0.012 +0.006 | h6 |
| | 10.1～18 | +0.015 +0.007 | 19～30 | +0.017 +0.008 | 35 ～50 | +0.02 +0.009 | | | | | |

右刃右ネジレ30°　TiNコーティング　食付角度45°　粉末ハイス
Helix Angle-Right30°　TiN Coating　Chamfer Angle45°　Powder Metallurgy

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| 3 | 0.2 | 16 | 19 | 60 | 3 | 4 | – |
| 3.1 | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| 3.2 | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| 3.3 | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| 3.4 | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| 3.5 | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| 3.6 | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| 3.7 | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| 3.8 | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| 3.9 | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| 4 | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| 4.1 | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| 4.2 | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| 4.3 | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| 4.4 | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| 4.5 | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| 4.6 | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| 4.7 | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| 4.8 | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| 4.9 | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| 5 | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| 5.1 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 5.2 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 5.3 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 5.4 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 5.5 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 5.6 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 5.7 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 5.8 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 5.9 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 6 | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| 6.1 | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| 6.2 | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| 6.3 | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| 6.4 | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| 6.5 | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| 6.6 | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| 6.7 | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| 6.8 | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| 6.9 | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| 7 | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| 7.1 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 7.2 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 7.3 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 7.4 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| 7.5 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 7.6 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 7.7 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 7.8 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 7.9 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 8 | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| 8.1 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 8.2 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 8.3 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 8.4 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 8.5 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 8.6 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 8.7 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 8.8 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 8.9 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 9 | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| 9.1 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| 9.2 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| 9.3 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| 9.4 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| 9.5 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| 9.6 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| 9.7 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| 9.8 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| 9.9 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| 10 | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| 10.1 | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| 10.2 | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| 10.3 | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| 10.4 | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| 10.5 | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| 10.6 | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| 10.7 | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| 10.8 | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| 10.9 | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| 11 | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| 11.1 | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| 11.2 | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| 11.3 | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| 11.4 | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| 11.5 | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| 11.6 | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| 11.7 | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| 11.8 | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| 11.9 | 0.3 | 30 | 75 | 160 | 12 | 4 | – |

# ERR-TiN エンド刃付止穴用リーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **12** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **13** | 0.3 | 30 | 80 | 165 | 12 | 4 | – |
| **14** | 0.3 | 30 | 85 | 170 | 16 | 4 | – |
| **15** | 0.3 | 30 | 90 | 180 | 16 | 4 | – |
| **16** | 0.3 | 30 | 95 | 185 | 16 | 4 | – |
| **17** | 0.3 | 30 | 95 | 185 | 16 | 4 | – |
| **18** | 0.3 | 30 | 95 | 185 | 16 | 4 | – |
| **19** | 0.3 | 30 | 95 | 185 | 20 | 4 | – |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **20** | 0.3 | 30 | 95 | 185 | 20 | 4 | – |
| **22** | 0.3 | 30 | 95 | 185 | 20 | 4 | – |
| **25** | 0.3 | 30 | 95 | 185 | 25 | 4 | – |
| **30** | 0.3 | 30 | 95 | 185 | 25 | 4 | – |
| **35** | 0.3 | 30 | 95 | 185 | 32 | 4 | – |
| **40** | 0.3 | 30 | 95 | 185 | 32 | 4 | – |
| **50** | 0.3 | 30 | 95 | 185 | 32 | 4 | – |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **2.95 ～ 2.99** | 0.2 | 16 | 19 | 60 | 3 | 4 | – |
| **3.01 ～ 3.05** | 0.2 | 16 | 19 | 60 | 3 | 4 | – |
| **3.95 ～ 3.99** | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| **4.01 ～ 4.05** | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| **4.95 ～ 4.99** | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| **5.01 ～ 5.05** | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| **5.95 ～ 5.99** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **6.01 ～ 6.05** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **6.95 ～ 6.99** | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| **7.01 ～ 7.05** | 0.3 | 25 | 45 | 110 | 6 | 4 | – |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **7.95 ～ 7.99** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| **8.01 ～ 8.05** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| **8.95 ～ 8.99** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **9.01 ～ 9.05** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **9.95 ～ 9.99** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **10.01 ～ 10.05** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **10.95 ～ 10.99** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **11.01 ～ 11.05** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **11.95 ～ 11.99** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **12.01 ～ 12.05** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **2.955 ～ 2.995** | 0.2 | 16 | 19 | 60 | 3 | 4 | – |
| **3.005 ～ 3.045** | 0.2 | 16 | 19 | 60 | 3 | 4 | – |
| **3.955 ～ 3.995** | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| **4.005 ～ 4.045** | 0.2 | 18 | 17 | 60 | 4 | 4 | – |
| **4.955 ～ 4.995** | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| **5.005 ～ 5.045** | 0.2 | 22 | 23 | 75 | 5 | 4 | – |
| **5.955 ～ 5.995** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **6.005 ～ 6.045** | 0.2 | 25 | 40 | 100 | 6 | 4 | – |
| **6.955 ～ 6.995** | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| **7.005 ～ 7.045** | 0.3 | 25 | 45 | 110 | 6 | 4 | – |
| **7.955 ～ 7.995** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **8.005 ～ 8.045** | 0.3 | 25 | 60 | 125 | 8 | 4 | – |
| **8.955 ～ 8.995** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **9.005 ～ 9.045** | 0.3 | 25 | 65 | 135 | 8 | 4 | – |
| **9.955 ～ 9.995** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **10.005 ～ 10.045** | 0.3 | 30 | 70 | 150 | 10 | 4 | – |
| **10.955 ～ 10.995** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **11.005 ～ 11.045** | 0.3 | 30 | 75 | 155 | 10 | 4 | – |
| **11.955 ～ 11.995** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |
| **12.005 ～ 12.045** | 0.3 | 30 | 75 | 160 | 12 | 4 | – |

ハイス

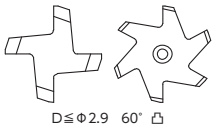
# NCR-C

## 自動旋盤用リーマ　*Reamer For NC Lathe Machine*

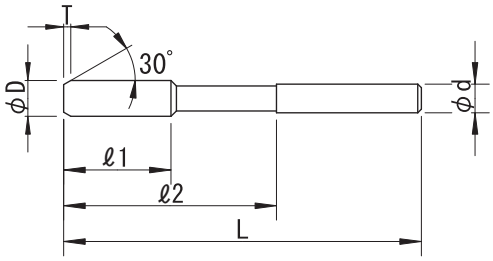
切削条件表 P139

貫通穴加工（スパイラル刃）

左ネジレ 7°　TiCN　食付 30°　HSS Co






| 公差(Tolerance) | D：$^{+0.005}_{0}$ | d：h7 |
|---|---|---|

右刃左ネジレ7°　TiCNコーティング　食付角度30°　SKH56
Helix Angle-Left7°　TiCN Coating　Chamfer Angle30°　HSS-Co.

| 直径（ΦD） *Dia.* | 食付長（T） *Chamfer Length* | 刃長（ℓ1） *Length of Flutes* | 首下長（ℓ2） *Neck Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 刃数（N） *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| 1 | 0.4 | 12 | 30 | 50 | 3 | 4 | 60°凸 |
| 1.1 | 0.4 | 12 | 30 | 50 | 3 | 4 | 60°凸 |
| 1.2 | 0.4 | 12 | 30 | 50 | 3 | 4 | 60°凸 |
| 1.3 | 0.4 | 12 | 30 | 50 | 3 | 4 | 60°凸 |
| 1.4 | 0.4 | 15 | 30 | 50 | 3 | 4 | 60°凸 |
| 1.5 | 0.4 | 15 | 30 | 50 | 3 | 4 | 60°凸 |
| 1.6 | 0.4 | 15 | 30 | 50 | 3 | 4 | 60°凸 |
| 1.7 | 0.5 | 15 | 30 | 50 | 3 | 4 | 60°凸 |
| 1.8 | 0.5 | 15 | 30 | 50 | 3 | 4 | 60°凸 |
| 1.9 | 0.5 | 15 | 30 | 50 | 3 | 4 | 60°凸 |
| 2 | 0.5 | 16 | 30 | 50 | 3 | 4 | 60°凸 |
| 2.1 | 0.5 | 18 | 30 | 50 | 3 | 4 | 60°凸 |
| 2.2 | 0.5 | 18 | 30 | 50 | 3 | 4 | 60°凸 |
| 2.3 | 0.5 | 18 | 30 | 50 | 3 | 4 | 60°凸 |
| 2.4 | 0.5 | 18 | 30 | 50 | 3 | 4 | 60°凸 |
| 2.5 | 0.5 | 18 | 30 | 50 | 3 | 4 | 60°凸 |
| 2.6 | 0.5 | 18 | 30 | 50 | 3 | 4 | 60°凸 |
| 2.7 | 0.5 | 18 | 30 | 50 | 3 | 4 | 60°凸 |
| 2.8 | 0.5 | 18 | 30 | 50 | 3 | 4 | 60°凸 |
| 2.9 | 0.5 | 18 | 30 | 50 | 3 | 4 | 60°凸 |
| 3 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 3.1 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 3.2 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 3.3 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 3.4 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 3.5 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 3.6 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 3.7 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 3.8 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 3.9 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 4 | 0.5 | 20 | 35 | 60 | 3 | 6 | 60°凹 |
| 4.1 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 4.2 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 4.3 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 4.4 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 4.5 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 4.6 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 4.7 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 4.8 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 4.9 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 5 | 0.5 | 25 | 40 | 65 | 4 | 6 | 60°凹 |
| 5.1 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |
| 5.2 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |
| 5.3 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |
| 5.4 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |

| 直径（ΦD） *Dia.* | 食付長（T） *Chamfer Length* | 刃長（ℓ1） *Length of Flutes* | 首下長（ℓ2） *Neck Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 刃数（N） *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| 5.5 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |
| 5.6 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |
| 5.7 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |
| 5.8 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |
| 5.9 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |
| 6 | 0.5 | 25 | 40 | 65 | 5 | 6 | 60°凹 |
| 6.1 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 6.2 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 6.3 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 6.4 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 6.5 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 6.6 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 6.7 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 6.8 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 6.9 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7.1 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7.2 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7.3 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7.4 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7.5 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7.6 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7.7 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7.8 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 7.9 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 8 | 0.5 | 25 | 40 | 65 | 6 | 6 | 60°凹 |
| 8.1 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 8.2 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 8.3 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 8.4 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 8.5 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 8.6 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 8.7 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 8.8 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 8.9 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9.1 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9.2 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9.3 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9.4 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9.5 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9.6 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9.7 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9.8 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |
| 9.9 | 1 | 25 | 40 | 65 | 8 | 6 | 60°凹 |

# NCR-C 自動旋盤用リーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首下長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **10** | 1 | 25 | 40 | 65 | 8 | 6 | 60° 凹 |
| **10.1** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **10.2** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **10.3** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **10.4** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **10.5** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **10.6** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **10.7** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **10.8** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **10.9** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首下長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **11.1** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.2** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.3** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.4** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.5** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.6** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.7** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.8** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.9** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **12** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首下長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **0.97 ～ 1.05** | 0.4 | 12 | 30 | 50 | 3 | 4 | 60° 凸 |
| **1.97 ～ 2.05** | 0.5 | 16 | 30 | 50 | 3 | 4 | 60° 凸 |
| **2.97 ～ 3.05** | 0.5 | 20 | 35 | 60 | 3 | 6 | 60° 凹 |
| **3.97 ～ 4.05** | 0.5 | 20 | 35 | 60 | 3 | 6 | 60° 凹 |
| **4.97 ～ 5.05** | 0.5 | 25 | 40 | 65 | 4 | 6 | 60° 凹 |
| **5.97 ～ 6.05** | 0.5 | 25 | 40 | 65 | 5 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首下長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **6.97 ～ 7.05** | 0.5 | 25 | 40 | 65 | 6 | 6 | 60° 凹 |
| **7.97 ～ 8.05** | 0.5 | 25 | 40 | 65 | 6 | 6 | 60° 凹 |
| **8.97 ～ 9.05** | 1 | 25 | 40 | 65 | 8 | 6 | 60° 凹 |
| **9.97 ～ 10.05** | 1 | 25 | 40 | 65 | 8 | 6 | 60° 凹 |
| **10.97 ～ 11.05** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.97 ～ 12.05** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首下長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **0.975 ～ 1.045** | 0.4 | 12 | 30 | 50 | 3 | 4 | 60° 凸 |
| **1.975 ～ 2.045** | 0.5 | 16 | 30 | 50 | 3 | 4 | 60° 凸 |
| **2.975 ～ 3.045** | 0.5 | 20 | 35 | 60 | 3 | 6 | 60° 凹 |
| **3.975 ～ 4.045** | 0.5 | 20 | 35 | 60 | 3 | 6 | 60° 凹 |
| **4.975 ～ 5.045** | 0.5 | 25 | 40 | 65 | 4 | 6 | 60° 凹 |
| **5.975 ～ 6.045** | 0.5 | 25 | 40 | 65 | 5 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首下長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **6.975 ～ 7.045** | 0.5 | 25 | 40 | 65 | 6 | 6 | 60° 凹 |
| **7.975 ～ 8.045** | 0.5 | 25 | 40 | 65 | 6 | 6 | 60° 凹 |
| **8.975 ～ 9.045** | 1 | 25 | 40 | 65 | 8 | 6 | 60° 凹 |
| **9.975 ～ 10.045** | 1 | 25 | 40 | 65 | 8 | 6 | 60° 凹 |
| **10.975 ～ 11.045** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |
| **11.975 ～ 12.045** | 1 | 30 | 40 | 70 | 10 | 6 | 60° 凹 |

ハイス

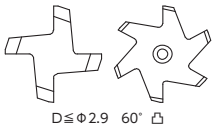
# MCR-TiN

## マシンチャッキングリーマ　*Machine Chucking Reamer*

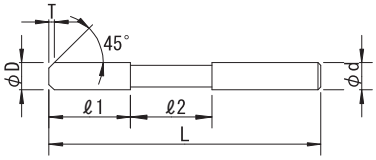
切削条件表 P139

**貫通穴加工（スパイラル刃）**

左ネジレ 7°　TiN　食付 45°　HSS Co






| 公差 (Tolerance) | D | | | | | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.01トビ Increment 0.01 | +0.005 0 | 2～3 | +0.006 +0.002 | 3.1～6 | +0.009 +0.004 | 6.1～10 | +0.012 +0.006 | 11～18 | +0.015 +0.007 | 19～ | +0.017 +0.008 | h7 |

右刃左ネジレ7°　TiNコーティング　食付角度45°　HSS-Co.
Helix Angle-Left7°　TiN Coating　Chamfer Angle45°　HSS-Co.

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **2** | 0.3 | 11 | 10 | 50 | 2 | 4 | 60°凸 |
| **2.1** | 0.3 | 11 | 10 | 50 | 2 | 4 | 60°凸 |
| **2.2** | 0.3 | 15 | 15 | 60 | 3 | 4 | 60°凸 |
| **2.3** | 0.3 | 15 | 15 | 60 | 3 | 4 | 60°凸 |
| **2.4** | 0.3 | 15 | 15 | 60 | 3 | 4 | 60°凸 |
| **2.5** | 0.3 | 15 | 15 | 60 | 3 | 4 | 60°凸 |
| **2.6** | 0.3 | 15 | 15 | 60 | 3 | 4 | 60°凸 |
| **2.7** | 0.3 | 15 | 15 | 60 | 3 | 4 | 60°凸 |
| **2.8** | 0.3 | 15 | 15 | 60 | 3 | 4 | 60°凸 |
| **2.9** | 0.3 | 15 | 15 | 60 | 3 | 4 | 60°凸 |
| **3** | 0.3 | 15 | 15 | 60 | 3 | 4 | 60°凹 |
| **3.1** | 0.3 | 18 | 20 | 70 | 4 | 6 | 60°凹 |
| **3.2** | 0.3 | 18 | 20 | 70 | 4 | 6 | 60°凹 |
| **3.3** | 0.3 | 18 | 20 | 70 | 4 | 6 | 60°凹 |
| **3.4** | 0.3 | 18 | 20 | 70 | 4 | 6 | 60°凹 |
| **3.5** | 0.3 | 18 | 20 | 70 | 4 | 6 | 60°凹 |
| **3.6** | 0.3 | 18 | 20 | 70 | 4 | 6 | 60°凹 |
| **3.7** | 0.3 | 18 | 20 | 70 | 4 | 6 | 60°凹 |
| **3.8** | 0.3 | 18 | 20 | 70 | 4 | 6 | 60°凹 |
| **3.9** | 0.3 | 18 | 20 | 70 | 4 | 6 | 60°凹 |
| **4** | 0.5 | 18 | 20 | 70 | 4 | 6 | 60°凹 |
| **4.1** | 0.5 | 18 | 20 | 70 | 4 | 6 | 60°凹 |
| **4.2** | 0.5 | 18 | 20 | 70 | 4 | 6 | 60°凹 |
| **4.3** | 0.5 | 18 | 20 | 70 | 4 | 6 | 60°凹 |
| **4.4** | 0.5 | 18 | 20 | 70 | 4 | 6 | 60°凹 |
| **4.5** | 0.5 | 23 | 23 | 80 | 5 | 6 | 60°凹 |
| **4.6** | 0.5 | 23 | 23 | 80 | 5 | 6 | 60°凹 |
| **4.7** | 0.5 | 23 | 23 | 80 | 5 | 6 | 60°凹 |
| **4.8** | 0.5 | 23 | 23 | 80 | 5 | 6 | 60°凹 |
| **4.9** | 0.5 | 23 | 23 | 80 | 5 | 6 | 60°凹 |
| **5** | 0.5 | 23 | 23 | 80 | 5 | 6 | 60°凹 |
| **5.1** | 0.5 | 23 | 23 | 80 | 5 | 6 | 60°凹 |
| **5.2** | 0.5 | 23 | 23 | 80 | 5 | 6 | 60°凹 |
| **5.3** | 0.5 | 23 | 23 | 80 | 5 | 6 | 60°凹 |
| **5.4** | 0.5 | 26 | 28 | 90 | 6 | 6 | 60°凹 |
| **5.5** | 0.5 | 26 | 28 | 90 | 6 | 6 | 60°凹 |
| **5.6** | 0.5 | 26 | 28 | 90 | 6 | 6 | 60°凹 |
| **5.7** | 0.5 | 26 | 28 | 90 | 6 | 6 | 60°凹 |
| **5.8** | 0.5 | 26 | 28 | 90 | 6 | 6 | 60°凹 |
| **5.9** | 0.5 | 26 | 28 | 90 | 6 | 6 | 60°凹 |
| **6** | 0.5 | 26 | 28 | 90 | 6 | 6 | 60°凹 |
| **6.1** | 0.5 | 26 | 28 | 90 | 6 | 6 | 60°凹 |
| **6.2** | 0.5 | 26 | 28 | 90 | 6 | 6 | 60°凹 |
| **6.3** | 0.5 | 26 | 28 | 90 | 6 | 6 | 60°凹 |
| **6.4** | 0.5 | 26 | 28 | 90 | 6 | 6 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **6.5** | 0.5 | 26 | 28 | 90 | 6 | 6 | 60°凹 |
| **6.6** | 0.5 | 26 | 28 | 90 | 6 | 6 | 60°凹 |
| **6.7** | 0.5 | 26 | 28 | 90 | 6 | 6 | 60°凹 |
| **6.8** | 0.7 | 31 | 31 | 100 | 8 | 6 | 60°凹 |
| **6.9** | 0.7 | 31 | 31 | 100 | 8 | 6 | 60°凹 |
| **7** | 0.7 | 31 | 31 | 100 | 8 | 6 | 60°凹 |
| **7.1** | 0.7 | 31 | 31 | 100 | 8 | 6 | 60°凹 |
| **7.2** | 0.7 | 31 | 31 | 100 | 8 | 6 | 60°凹 |
| **7.3** | 0.7 | 31 | 31 | 100 | 8 | 6 | 60°凹 |
| **7.4** | 0.7 | 31 | 31 | 100 | 8 | 6 | 60°凹 |
| **7.5** | 0.7 | 31 | 31 | 100 | 8 | 6 | 60°凹 |
| **7.6** | 0.7 | 33 | 29 | 100 | 8 | 6 | 60°凹 |
| **7.7** | 0.7 | 33 | 29 | 100 | 8 | 6 | 60°凹 |
| **7.8** | 0.7 | 33 | 29 | 100 | 8 | 6 | 60°凹 |
| **7.9** | 0.7 | 33 | 29 | 100 | 8 | 6 | 60°凹 |
| **8** | 0.7 | 33 | 29 | 100 | 8 | 6 | 60°凹 |
| **8.1** | 0.7 | 33 | 29 | 100 | 8 | 6 | 60°凹 |
| **8.2** | 0.7 | 33 | 29 | 100 | 8 | 6 | 60°凹 |
| **8.3** | 0.7 | 33 | 29 | 100 | 8 | 6 | 60°凹 |
| **8.4** | 0.7 | 33 | 29 | 100 | 8 | 6 | 60°凹 |
| **8.5** | 0.7 | 33 | 29 | 100 | 8 | 6 | 60°凹 |
| **8.6** | 0.7 | 36 | 34 | 110 | 10 | 6 | 60°凹 |
| **8.7** | 0.7 | 36 | 34 | 110 | 10 | 6 | 60°凹 |
| **8.8** | 0.7 | 36 | 34 | 110 | 10 | 6 | 60°凹 |
| **8.9** | 0.7 | 36 | 34 | 110 | 10 | 6 | 60°凹 |
| **9** | 0.7 | 36 | 34 | 110 | 10 | 6 | 60°凹 |
| **9.1** | 0.7 | 36 | 34 | 110 | 10 | 6 | 60°凹 |
| **9.2** | 0.7 | 36 | 34 | 110 | 10 | 6 | 60°凹 |
| **9.3** | 0.7 | 36 | 34 | 110 | 10 | 6 | 60°凹 |
| **9.4** | 0.7 | 36 | 34 | 110 | 10 | 6 | 60°凹 |
| **9.5** | 0.7 | 36 | 34 | 110 | 10 | 6 | 60°凹 |
| **9.6** | 0.7 | 38 | 40 | 120 | 10 | 6 | 60°凹 |
| **9.7** | 0.7 | 38 | 40 | 120 | 10 | 6 | 60°凹 |
| **9.8** | 0.7 | 38 | 40 | 120 | 10 | 6 | 60°凹 |
| **9.9** | 0.7 | 38 | 40 | 120 | 10 | 6 | 60°凹 |
| **10** | 0.7 | 38 | 40 | 120 | 10 | 6 | 60°凹 |
| **11** | 0.7 | 41 | 47 | 130 | 10 | 6 | 60°凹 |
| **12** | 0.7 | 44 | 44 | 130 | 10 | 6 | 60°凹 |
| **13** | 0.7 | 44 | 38 | 130 | 12 | 8 | 60°凹 |
| **14** | 0.7 | 47 | 35 | 130 | 12 | 8 | 60°凹 |
| **15** | 0.7 | 50 | 32 | 130 | 12 | 8 | 60°凹 |
| **16** | 0.7 | 52 | 30 | 130 | 12 | 8 | 60°凹 |
| **17** | 0.7 | 54 | 28 | 130 | 16 | 8 | 60°凹 |
| **18** | 0.7 | 56 | 34 | 140 | 16 | 8 | 60°凹 |
| **19** | 0.7 | 58 | 32 | 140 | 16 | 8 | 60°凹 |
| **20** | 0.7 | 60 | 40 | 150 | 16 | 8 | 60°凹 |

# MCR-TiN マシンチャッキングリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **1.95 ～ 1.99** | 0.3 | 11 | 10 | 50 | 2 | 4 | 60°凸 |
| **2.01 ～ 2.05** | 0.3 | 11 | 10 | 50 | 2 | 4 | 60°凸 |
| **2.95 ～ 2.99** | 0.3 | 15 | 15 | 60 | 3 | 4 | 60°凹 |
| **3.01 ～ 3.05** | 0.3 | 15 | 15 | 60 | 3 | 4 | 60°凹 |
| **3.95 ～ 3.99** | 0.5 | 18 | 20 | 70 | 4 | 6 | 60°凹 |
| **4.01 ～ 4.05** | 0.5 | 18 | 20 | 70 | 4 | 6 | 60°凹 |
| **4.95 ～ 4.99** | 0.5 | 23 | 23 | 80 | 5 | 6 | 60°凹 |
| **5.01 ～ 5.05** | 0.5 | 23 | 23 | 80 | 5 | 6 | 60°凹 |
| **5.95 ～ 5.99** | 0.5 | 26 | 28 | 90 | 6 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **6.01 ～ 6.05** | 0.5 | 26 | 28 | 90 | 6 | 6 | 60°凹 |
| **6.95 ～ 6.99** | 0.7 | 31 | 31 | 100 | 8 | 6 | 60°凹 |
| **7.01 ～ 7.05** | 0.7 | 31 | 31 | 100 | 8 | 6 | 60°凹 |
| **7.95 ～ 7.99** | 0.7 | 33 | 29 | 100 | 8 | 6 | 60°凹 |
| **8.01 ～ 8.05** | 0.7 | 33 | 29 | 100 | 8 | 6 | 60°凹 |
| **8.95 ～ 8.99** | 0.7 | 36 | 34 | 110 | 10 | 6 | 60°凹 |
| **9.01 ～ 9.05** | 0.7 | 36 | 34 | 110 | 10 | 6 | 60°凹 |
| **9.95 ～ 9.99** | 0.7 | 38 | 40 | 120 | 10 | 6 | 60°凹 |
| **10.01 ～ 10.05** | 0.7 | 38 | 40 | 120 | 10 | 6 | 60°凹 |

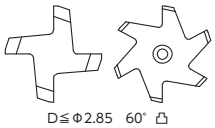
ハイス

# TiN-SR

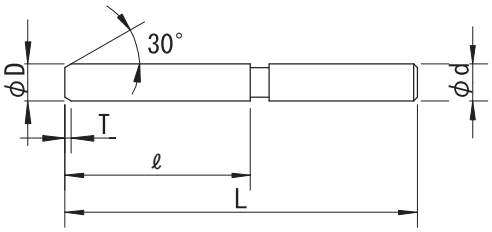
## TiNストレートリーマ　*TiN Straight Reamer*

切削条件表 P139

貫通穴加工（ストレート刃）　右直刃　TiN　食付30°　HSS






| 公差(Tolerance) | D：$^{+0.005}_{0}$ | d：h6 |
|---|---|---|

右刃ストレート　TiNコーティング　食付角度30°　SKH51
Straight Flute　TiN Coating　Chamfer Angle30°　HSS

| 直径（ΦD） *Dia.* | 食付長（T） *Chamfer Length* | 刃長（ℓ） *Length of Flutes* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 刃数（N） *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| 1 | 0.4 | 20 | 40 | 2 | 4 | 60°凸 |
| 1.1 | 0.4 | 25 | 45 | 2 | 4 | 60°凸 |
| 1.2 | 0.4 | 25 | 45 | 2 | 4 | 60°凸 |
| 1.3 | 0.4 | 25 | 50 | 3 | 4 | 60°凸 |
| 1.4 | 0.4 | 25 | 50 | 3 | 4 | 60°凸 |
| 1.5 | 0.4 | 25 | 50 | 3 | 4 | 60°凸 |
| 1.6 | 0.5 | 30 | 55 | 3 | 4 | 60°凸 |
| 1.7 | 0.5 | 30 | 55 | 3 | 4 | 60°凸 |
| 1.8 | 0.5 | 30 | 55 | 3 | 4 | 60°凸 |
| 1.9 | 0.5 | 30 | 60 | 3 | 4 | 60°凸 |
| 2 | 0.5 | 30 | 60 | 3 | 4 | 60°凸 |
| 2.1 | 0.5 | 30 | 60 | 3 | 4 | 60°凸 |
| 2.2 | 0.5 | 30 | 60 | 3 | 4 | 60°凸 |
| 2.3 | 0.5 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.4 | 0.5 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.5 | 0.5 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.6 | 0.5 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.7 | 0.5 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.8 | 0.5 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.9 | 0.5 | 40 | 72 | 3 | 6 | 60°凹 |
| 3 | 0.5 | 40 | 72 | 3 | 6 | 60°凹 |
| 3.1 | 0.5 | 40 | 72 | 3 | 6 | 60°凹 |
| 3.2 | 0.5 | 40 | 75 | 3 | 6 | 60°凹 |
| 3.3 | 0.5 | 40 | 75 | 3 | 6 | 60°凹 |
| 3.4 | 0.5 | 40 | 75 | 3 | 6 | 60°凹 |
| 3.5 | 0.5 | 40 | 75 | 3 | 6 | 60°凹 |
| 3.6 | 0.5 | 40 | 75 | 3 | 6 | 60°凹 |
| 3.7 | 0.5 | 40 | 80 | 4 | 6 | 60°凹 |
| 3.8 | 0.5 | 40 | 80 | 4 | 6 | 60°凹 |
| 3.9 | 0.5 | 40 | 80 | 4 | 6 | 60°凹 |
| 4 | 0.5 | 40 | 80 | 4 | 6 | 60°凹 |
| 4.1 | 0.5 | 40 | 80 | 4 | 6 | 60°凹 |
| 4.2 | 0.5 | 45 | 85 | 4 | 6 | 60°凹 |
| 4.3 | 0.5 | 45 | 85 | 4 | 6 | 60°凹 |
| 4.4 | 0.5 | 45 | 85 | 4 | 6 | 60°凹 |
| 4.5 | 0.5 | 45 | 85 | 4 | 6 | 60°凹 |
| 4.6 | 0.5 | 45 | 85 | 4 | 6 | 60°凹 |
| 4.7 | 0.5 | 45 | 90 | 4 | 6 | 60°凹 |
| 4.8 | 0.5 | 45 | 90 | 4 | 6 | 60°凹 |
| 4.9 | 0.5 | 45 | 90 | 4 | 6 | 60°凹 |
| 5 | 0.5 | 45 | 90 | 4 | 6 | 60°凹 |
| 5.1 | 0.5 | 45 | 90 | 4 | 6 | 60°凹 |
| 5.2 | 0.5 | 45 | 95 | 4 | 6 | 60°凹 |

| 直径（ΦD） *Dia.* | 食付長（T） *Chamfer Length* | 刃長（ℓ） *Length of Flutes* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 刃数（N） *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| 5.3 | 0.5 | 45 | 95 | 4 | 6 | 60°凹 |
| 5.4 | 0.5 | 45 | 95 | 4 | 6 | 60°凹 |
| 5.5 | 0.5 | 45 | 95 | 4 | 6 | 60°凹 |
| 5.6 | 0.5 | 45 | 95 | 4 | 6 | 60°凹 |
| 5.7 | 0.5 | 50 | 100 | 6 | 6 | 60°凹 |
| 5.8 | 0.5 | 50 | 100 | 6 | 6 | 60°凹 |
| 5.9 | 0.5 | 50 | 100 | 6 | 6 | 60°凹 |
| 6 | 0.5 | 50 | 100 | 6 | 6 | 60°凹 |
| 6.1 | 0.5 | 50 | 100 | 6 | 6 | 60°凹 |
| 6.2 | 0.5 | 50 | 100 | 6 | 6 | 60°凹 |
| 6.3 | 0.5 | 50 | 100 | 6 | 6 | 60°凹 |
| 6.4 | 0.5 | 50 | 100 | 6 | 6 | 60°凹 |
| 6.5 | 0.5 | 50 | 100 | 6 | 6 | 60°凹 |
| 6.6 | 0.5 | 50 | 100 | 6 | 6 | 60°凹 |
| 6.7 | 0.5 | 55 | 105 | 6 | 6 | 60°凹 |
| 6.8 | 0.5 | 55 | 105 | 6 | 6 | 60°凹 |
| 6.9 | 0.5 | 55 | 105 | 6 | 6 | 60°凹 |
| 7 | 0.5 | 55 | 105 | 6 | 6 | 60°凹 |
| 7.1 | 0.5 | 55 | 105 | 6 | 6 | 60°凹 |
| 7.2 | 0.5 | 55 | 110 | 6 | 6 | 60°凹 |
| 7.3 | 0.5 | 55 | 110 | 6 | 6 | 60°凹 |
| 7.4 | 0.5 | 55 | 110 | 6 | 6 | 60°凹 |
| 7.5 | 0.5 | 55 | 110 | 6 | 6 | 60°凹 |
| 7.6 | 0.5 | 55 | 110 | 6 | 6 | 60°凹 |
| 7.7 | 0.5 | 60 | 115 | 8 | 6 | 60°凹 |
| 7.8 | 0.5 | 60 | 115 | 8 | 6 | 60°凹 |
| 7.9 | 0.5 | 60 | 115 | 8 | 6 | 60°凹 |
| 8 | 0.5 | 60 | 115 | 8 | 6 | 60°凹 |
| 8.1 | 0.5 | 60 | 115 | 8 | 6 | 60°凹 |
| 8.2 | 1 | 60 | 120 | 8 | 6 | 60°凹 |
| 8.3 | 1 | 60 | 120 | 8 | 6 | 60°凹 |
| 8.4 | 1 | 60 | 120 | 8 | 6 | 60°凹 |
| 8.5 | 1 | 60 | 120 | 8 | 6 | 60°凹 |
| 8.6 | 1 | 60 | 120 | 8 | 6 | 60°凹 |
| 8.7 | 1 | 65 | 125 | 8 | 6 | 60°凹 |
| 8.8 | 1 | 65 | 125 | 8 | 6 | 60°凹 |
| 8.9 | 1 | 65 | 125 | 8 | 6 | 60°凹 |
| 9 | 1 | 65 | 125 | 8 | 6 | 60°凹 |
| 9.1 | 1 | 65 | 125 | 8 | 6 | 60°凹 |
| 9.2 | 1 | 65 | 125 | 8 | 6 | 60°凹 |
| 9.3 | 1 | 65 | 125 | 8 | 6 | 60°凹 |
| 9.4 | 1 | 65 | 125 | 8 | 6 | 60°凹 |
| 9.5 | 1 | 65 | 125 | 8 | 6 | 60°凹 |

# TiN-SR TiNストレートリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 9.6 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.7 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 9.8 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 9.9 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 10 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 10.1 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 10.2 | 1 | 70 | 135 | 10 | 6 | 60° 凹 |
| 10.3 | 1 | 70 | 135 | 10 | 6 | 60° 凹 |
| 10.4 | 1 | 70 | 135 | 10 | 6 | 60° 凹 |
| 10.5 | 1 | 70 | 135 | 10 | 6 | 60° 凹 |
| 10.6 | 1 | 70 | 135 | 10 | 6 | 60° 凹 |
| 10.7 | 1 | 75 | 140 | 10 | 6 | 60° 凹 |
| 10.8 | 1 | 75 | 140 | 10 | 6 | 60° 凹 |
| 10.9 | 1 | 75 | 140 | 10 | 6 | 60° 凹 |
| 11 | 1 | 75 | 140 | 10 | 6 | 60° 凹 |
| 11.1 | 1 | 75 | 140 | 10 | 6 | 60° 凹 |
| 11.2 | 1 | 75 | 145 | 10 | 6 | 60° 凹 |
| 11.3 | 1 | 75 | 145 | 10 | 6 | 60° 凹 |
| 11.4 | 1 | 75 | 145 | 10 | 6 | 60° 凹 |
| 11.5 | 1 | 75 | 145 | 10 | 6 | 60° 凹 |
| 11.6 | 1 | 75 | 145 | 10 | 6 | 60° 凹 |
| 11.7 | 1 | 75 | 150 | 12 | 6 | 60° 凹 |
| 11.8 | 1 | 75 | 150 | 12 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 11.9 | 1 | 75 | 150 | 12 | 6 | 60° 凹 |
| 12 | 1 | 75 | 150 | 12 | 6 | 60° 凹 |
| 12.1 | 1 | 75 | 150 | 12 | 6 | 60° 凹 |
| 12.2 | 1 | 80 | 155 | 12 | 6 | 60° 凹 |
| 12.3 | 1 | 80 | 155 | 12 | 6 | 60° 凹 |
| 12.4 | 1 | 80 | 155 | 12 | 6 | 60° 凹 |
| 12.5 | 1 | 80 | 155 | 12 | 6 | 60° 凹 |
| 12.6 | 1 | 80 | 155 | 12 | 6 | 60° 凹 |
| 12.7 | 1 | 80 | 160 | 12 | 8 | 60° 凹 |
| 12.8 | 1 | 80 | 160 | 12 | 8 | 60° 凹 |
| 12.9 | 1 | 80 | 160 | 12 | 8 | 60° 凹 |
| 13 | 1 | 80 | 160 | 12 | 8 | 60° 凹 |
| 13.1 | 1 | 80 | 160 | 12 | 8 | 60° 凹 |
| 13.2 | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| 13.3 | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| 13.4 | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| 13.5 | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| 13.6 | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| 13.7 | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| 13.8 | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| 13.9 | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| 14 | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| 14.1 | 1 | 85 | 165 | 12 | 8 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 1.01 ～ 1.05 | 0.4 | 20 | 40 | 2 | 4 | 60° 凸 |
| 1.06 ～ 1.09 | 0.4 | 25 | 45 | 2 | 4 | 60° 凸 |
| 1.11 ～ 1.19 | 0.4 | 25 | 45 | 2 | 4 | 60° 凸 |
| 1.21 ～ 1.25 | 0.4 | 25 | 45 | 2 | 4 | 60° 凸 |
| 1.26 ～ 1.29 | 0.4 | 25 | 50 | 3 | 4 | 60° 凸 |
| 1.31 ～ 1.39 | 0.4 | 25 | 50 | 3 | 4 | 60° 凸 |
| 1.41 ～ 1.49 | 0.4 | 25 | 50 | 3 | 4 | 60° 凸 |
| 1.51 ～ 1.55 | 0.4 | 25 | 50 | 3 | 4 | 60° 凸 |
| 1.56 ～ 1.59 | 0.5 | 30 | 55 | 3 | 4 | 60° 凸 |
| 1.61 ～ 1.69 | 0.5 | 30 | 55 | 3 | 4 | 60° 凸 |
| 1.71 ～ 1.79 | 0.5 | 30 | 55 | 3 | 4 | 60° 凸 |
| 1.81 ～ 1.85 | 0.5 | 30 | 55 | 3 | 4 | 60° 凸 |
| 1.86 ～ 1.89 | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| 1.91 ～ 1.99 | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| 2.01 ～ 2.09 | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| 2.11 ～ 2.19 | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| 2.21 ～ 2.25 | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| 2.26 ～ 2.29 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.31 ～ 2.39 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.41 ～ 2.49 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.51 ～ 2.59 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.61 ～ 2.69 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.71 ～ 2.79 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.81 ～ 2.85 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.86 ～ 2.89 | 0.5 | 40 | 72 | 3 | 6 | 60° 凹 |
| 2.91 ～ 2.99 | 0.5 | 40 | 72 | 3 | 6 | 60° 凹 |
| 3.01 ～ 3.09 | 0.5 | 40 | 72 | 3 | 6 | 60° 凹 |
| 3.11 ～ 3.19 | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| 3.21 ～ 3.29 | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| 3.31 ～ 3.39 | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| 3.41 ～ 3.49 | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| 3.51 ～ 3.59 | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| 3.61 ～ 3.69 | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| 3.71 ～ 3.79 | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 3.81 ～ 3.89 | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| 3.91 ～ 3.99 | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| 4.01 ～ 4.09 | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| 4.11 ～ 4.19 | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| 4.21 ～ 4.29 | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| 4.31 ～ 4.39 | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| 4.41 ～ 4.49 | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| 4.51 ～ 4.59 | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| 4.61 ～ 4.69 | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| 4.71 ～ 4.79 | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| 4.81 ～ 4.89 | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| 4.91 ～ 4.99 | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| 5.01 ～ 5.09 | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| 5.11 ～ 5.19 | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| 5.21 ～ 5.29 | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| 5.31 ～ 5.39 | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| 5.41 ～ 5.49 | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| 5.51 ～ 5.59 | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| 5.61 ～ 5.69 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 5.71 ～ 5.79 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 5.81 ～ 5.89 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 5.91 ～ 5.99 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6.01 ～ 6.09 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6.11 ～ 6.19 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6.21 ～ 6.29 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6.31 ～ 6.39 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6.41 ～ 6.49 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6.51 ～ 6.59 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6.61 ～ 6.69 | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |
| 6.71 ～ 6.79 | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |
| 6.81 ～ 6.89 | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |
| 6.91 ～ 6.99 | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |
| 7.01 ～ 7.09 | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |
| 7.11 ～ 7.19 | 0.5 | 55 | 110 | 6 | 6 | 60° 凹 |
| 7.21 ～ 7.29 | 0.5 | 55 | 110 | 6 | 6 | 60° 凹 |

# TiN-SR TiNストレートリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 7.31 ～ 7.39 | 0.5 | 55 | 110 | 6 | 6 | 60° 凹 |
| 7.41 ～ 7.49 | 0.5 | 55 | 110 | 6 | 6 | 60° 凹 |
| 7.51 ～ 7.59 | 0.5 | 55 | 110 | 6 | 6 | 60° 凹 |
| 7.61 ～ 7.69 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 7.71 ～ 7.79 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 7.81 ～ 7.89 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 7.91 ～ 7.99 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 8.01 ～ 8.09 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 8.11 ～ 8.19 | 1 | 60 | 120 | 8 | 6 | 60° 凹 |
| 8.21 ～ 8.29 | 1 | 60 | 120 | 8 | 6 | 60° 凹 |
| 8.31 ～ 8.39 | 1 | 60 | 120 | 8 | 6 | 60° 凹 |
| 8.41 ～ 8.49 | 1 | 60 | 120 | 8 | 6 | 60° 凹 |
| 8.51 ～ 8.59 | 1 | 60 | 120 | 8 | 6 | 60° 凹 |
| 8.61 ～ 8.69 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 8.71 ～ 8.79 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 8.81 ～ 8.89 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 8.91 ～ 8.99 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.01 ～ 9.09 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 9.11 ～ 9.19 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.21 ～ 9.29 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.31 ～ 9.39 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.41 ～ 9.49 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.51 ～ 9.59 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.61 ～ 9.69 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 9.71 ～ 9.79 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 9.81 ～ 9.89 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 9.91 ～ 9.99 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 10.01 ～ 10.05 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 10.95 ～ 10.99 | 1 | 75 | 140 | 10 | 6 | 60° 凹 |
| 11.01 ～ 11.05 | 1 | 75 | 140 | 10 | 6 | 60° 凹 |
| 11.95 ～ 11.99 | 1 | 75 | 150 | 12 | 6 | 60° 凹 |
| 12.01 ～ 12.05 | 1 | 75 | 150 | 12 | 6 | 60° 凹 |
| 12.95 ～ 12.99 | 1 | 80 | 160 | 12 | 8 | 60° 凹 |
| 13.01 ～ 13.05 | 1 | 80 | 160 | 12 | 8 | 60° 凹 |
| 13.95 ～ 13.99 | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| 14.01 ～ 14.05 | 1 | 85 | 165 | 12 | 8 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 1.005 ～ 1.045 | 0.4 | 20 | 40 | 2 | 4 | 60° 凸 |
| 1.055 ～ 1.095 | 0.4 | 25 | 45 | 2 | 4 | 60° 凸 |
| 1.105 ～ 1.195 | 0.4 | 25 | 45 | 2 | 4 | 60° 凸 |
| 1.205 ～ 1.245 | 0.4 | 25 | 45 | 2 | 4 | 60° 凸 |
| 1.255 ～ 1.295 | 0.4 | 25 | 50 | 3 | 4 | 60° 凸 |
| 1.305 ～ 1.395 | 0.4 | 25 | 50 | 3 | 4 | 60° 凸 |
| 1.405 ～ 1.495 | 0.4 | 25 | 50 | 3 | 4 | 60° 凸 |
| 1.505 ～ 1.545 | 0.4 | 25 | 50 | 3 | 4 | 60° 凸 |
| 1.555 ～ 1.595 | 0.5 | 30 | 55 | 3 | 4 | 60° 凸 |
| 1.605 ～ 1.695 | 0.5 | 30 | 55 | 3 | 4 | 60° 凸 |
| 1.705 ～ 1.795 | 0.5 | 30 | 55 | 3 | 4 | 60° 凸 |
| 1.805 ～ 1.845 | 0.5 | 30 | 55 | 3 | 4 | 60° 凸 |
| 1.855 ～ 1.895 | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| 1.905 ～ 1.995 | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| 2.005 ～ 2.095 | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| 2.105 ～ 2.195 | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| 2.205 ～ 2.245 | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| 2.255 ～ 2.295 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.305 ～ 2.395 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.405 ～ 2.495 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.505 ～ 2.595 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.605 ～ 2.695 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.705 ～ 2.795 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.805 ～ 2.845 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.855 ～ 2.895 | 0.5 | 40 | 72 | 3 | 6 | 60° 凹 |
| 2.905 ～ 2.995 | 0.5 | 40 | 72 | 3 | 6 | 60° 凹 |
| 3.005 ～ 3.095 | 0.5 | 40 | 72 | 3 | 6 | 60° 凹 |
| 3.105 ～ 3.195 | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| 3.205 ～ 3.295 | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| 3.305 ～ 3.395 | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| 3.405 ～ 3.495 | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| 3.505 ～ 3.595 | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| 3.605 ～ 3.695 | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| 3.705 ～ 3.795 | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| 3.805 ～ 3.895 | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| 3.905 ～ 3.995 | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 4.005 ～ 4.095 | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| 4.105 ～ 4.195 | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| 4.205 ～ 4.295 | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| 4.305 ～ 4.395 | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| 4.405 ～ 4.495 | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| 4.505 ～ 4.595 | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| 4.605 ～ 4.695 | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| 4.705 ～ 4.795 | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| 4.805 ～ 4.895 | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| 4.905 ～ 4.995 | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| 5.005 ～ 5.095 | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| 5.105 ～ 5.195 | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| 5.205 ～ 5.295 | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| 5.305 ～ 5.395 | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| 5.405 ～ 5.495 | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| 5.505 ～ 5.595 | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| 5.605 ～ 5.695 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 5.705 ～ 5.795 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 5.805 ～ 5.895 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 5.905 ～ 5.995 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6.005 ～ 6.095 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6.975 ～ 6.995 | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |
| 7.005 ～ 7.035 | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |
| 7.975 ～ 7.995 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 8.005 ～ 8.035 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 8.975 ～ 8.995 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.005 ～ 9.035 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.975 ～ 9.995 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 10.005 ～ 10.035 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 10.975 ～ 10.995 | 1 | 75 | 140 | 10 | 6 | 60° 凹 |
| 11.005 ～ 11.035 | 1 | 75 | 140 | 10 | 6 | 60° 凹 |
| 11.975 ～ 11.995 | 1 | 75 | 150 | 12 | 6 | 60° 凹 |
| 12.005 ～ 12.035 | 1 | 75 | 150 | 12 | 6 | 60° 凹 |
| 12.975 ～ 12.995 | 1 | 80 | 160 | 12 | 8 | 60° 凹 |
| 13.005 ～ 13.035 | 1 | 80 | 160 | 12 | 8 | 60° 凹 |
| 13.975 ～ 13.995 | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| 14.005 ～ 14.035 | 1 | 85 | 165 | 12 | 8 | 60° 凹 |

ハイス

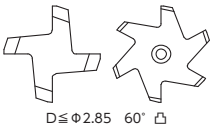
# TiN-SPR

## TiNスパイラルリーマ *TiN Spiral Reamer*

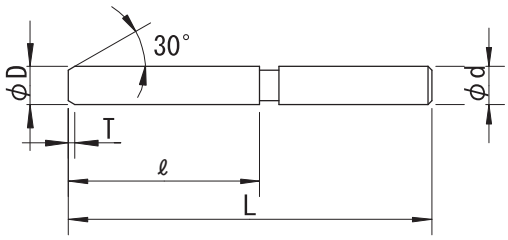
切削条件表 P139

貫通穴加工(スパイラル刃)

左ネジレ 12° | TiN | 食付 30° | HSS






| 公差(Tolerance) | D : $^{+0.005}_{0}$ | d : h6 |
|---|---|---|

右刃左ネジレ12° TiNコーティング 食付角度30° SKH51
Helix Angle-Left 12° TiN Coating Chamfer Angle30° HSS

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| 1 | 0.4 | 20 | 40 | 2 | 4 | 60° 凸 |
| 1.1 | 0.4 | 25 | 45 | 2 | 4 | 60° 凸 |
| 1.2 | 0.4 | 25 | 45 | 2 | 4 | 60° 凸 |
| 1.3 | 0.4 | 25 | 50 | 3 | 4 | 60° 凸 |
| 1.4 | 0.4 | 25 | 50 | 3 | 4 | 60° 凸 |
| 1.5 | 0.4 | 25 | 50 | 3 | 4 | 60° 凸 |
| 1.6 | 0.5 | 30 | 55 | 3 | 4 | 60° 凸 |
| 1.7 | 0.5 | 30 | 55 | 3 | 4 | 60° 凸 |
| 1.8 | 0.5 | 30 | 55 | 3 | 4 | 60° 凸 |
| 1.9 | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| 2 | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| 2.1 | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| 2.2 | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| 2.3 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.4 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.5 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.6 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.7 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.8 | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| 2.9 | 0.5 | 40 | 72 | 3 | 6 | 60° 凹 |
| 3 | 0.5 | 40 | 72 | 3 | 6 | 60° 凹 |
| 3.1 | 0.5 | 40 | 72 | 3 | 6 | 60° 凹 |
| 3.2 | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| 3.3 | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| 3.4 | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| 3.5 | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| 3.6 | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| 3.7 | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| 3.8 | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| 3.9 | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| 4 | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| 4.1 | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| 4.2 | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| 4.3 | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| 4.4 | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| 4.5 | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| 4.6 | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| 4.7 | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| 4.8 | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| 4.9 | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| 5 | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| 5.1 | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| 5.2 | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| 5.3 | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| 5.4 | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| 5.5 | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| 5.6 | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| 5.7 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 5.8 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 5.9 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6.1 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6.2 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6.3 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6.4 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6.5 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6.6 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6.7 | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |
| 6.8 | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |
| 6.9 | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |
| 7 | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |
| 7.1 | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |
| 7.2 | 0.5 | 55 | 110 | 6 | 6 | 60° 凹 |
| 7.3 | 0.5 | 55 | 110 | 6 | 6 | 60° 凹 |
| 7.4 | 0.5 | 55 | 110 | 6 | 6 | 60° 凹 |
| 7.5 | 0.5 | 55 | 110 | 6 | 6 | 60° 凹 |
| 7.6 | 0.5 | 55 | 110 | 6 | 6 | 60° 凹 |
| 7.7 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 7.8 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 7.9 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 8 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 8.1 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 8.2 | 1 | 60 | 120 | 8 | 6 | 60° 凹 |
| 8.3 | 1 | 60 | 120 | 8 | 6 | 60° 凹 |
| 8.4 | 1 | 60 | 120 | 8 | 6 | 60° 凹 |
| 8.5 | 1 | 60 | 120 | 8 | 6 | 60° 凹 |
| 8.6 | 1 | 60 | 120 | 8 | 6 | 60° 凹 |
| 8.7 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 8.8 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 8.9 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.1 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.2 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.3 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.4 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.5 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |

# TiN-SPR TiNスパイラルリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **9.6** | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| **9.7** | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| **9.8** | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| **9.9** | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| **10** | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| **10.1** | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| **10.2** | 1 | 70 | 135 | 10 | 6 | 60° 凹 |
| **10.3** | 1 | 70 | 135 | 10 | 6 | 60° 凹 |
| **10.4** | 1 | 70 | 135 | 10 | 6 | 60° 凹 |
| **10.5** | 1 | 70 | 135 | 10 | 6 | 60° 凹 |
| **10.6** | 1 | 70 | 135 | 10 | 6 | 60° 凹 |
| **10.7** | 1 | 75 | 140 | 10 | 6 | 60° 凹 |
| **10.8** | 1 | 75 | 140 | 10 | 6 | 60° 凹 |
| **10.9** | 1 | 75 | 140 | 10 | 6 | 60° 凹 |
| **11** | 1 | 75 | 140 | 10 | 6 | 60° 凹 |
| **11.1** | 1 | 75 | 140 | 10 | 6 | 60° 凹 |
| **11.2** | 1 | 75 | 145 | 10 | 6 | 60° 凹 |
| **11.3** | 1 | 75 | 145 | 10 | 6 | 60° 凹 |
| **11.4** | 1 | 75 | 145 | 10 | 6 | 60° 凹 |
| **11.5** | 1 | 75 | 145 | 10 | 6 | 60° 凹 |
| **11.6** | 1 | 75 | 145 | 10 | 6 | 60° 凹 |
| **11.7** | 1 | 75 | 150 | 12 | 6 | 60° 凹 |
| **11.8** | 1 | 75 | 150 | 12 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **11.9** | 1 | 75 | 150 | 12 | 6 | 60° 凹 |
| **12** | 1 | 75 | 150 | 12 | 6 | 60° 凹 |
| **12.1** | 1 | 75 | 150 | 12 | 6 | 60° 凹 |
| **12.2** | 1 | 80 | 155 | 12 | 6 | 60° 凹 |
| **12.3** | 1 | 80 | 155 | 12 | 6 | 60° 凹 |
| **12.4** | 1 | 80 | 155 | 12 | 6 | 60° 凹 |
| **12.5** | 1 | 80 | 155 | 12 | 6 | 60° 凹 |
| **12.6** | 1 | 80 | 155 | 12 | 6 | 60° 凹 |
| **12.7** | 1 | 80 | 160 | 12 | 8 | 60° 凹 |
| **12.8** | 1 | 80 | 160 | 12 | 8 | 60° 凹 |
| **12.9** | 1 | 80 | 160 | 12 | 8 | 60° 凹 |
| **13** | 1 | 80 | 160 | 12 | 8 | 60° 凹 |
| **13.1** | 1 | 80 | 160 | 12 | 8 | 60° 凹 |
| **13.2** | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| **13.3** | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| **13.4** | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| **13.5** | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| **13.6** | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| **13.7** | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| **13.8** | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| **13.9** | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| **14** | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| **14.1** | 1 | 85 | 165 | 12 | 8 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **1.01 ～ 1.05** | 0.4 | 20 | 40 | 2 | 4 | 60° 凸 |
| **1.06 ～ 1.09** | 0.4 | 25 | 45 | 2 | 4 | 60° 凸 |
| **1.11 ～ 1.19** | 0.4 | 25 | 45 | 2 | 4 | 60° 凸 |
| **1.21 ～ 1.25** | 0.4 | 25 | 45 | 2 | 4 | 60° 凸 |
| **1.26 ～ 1.29** | 0.4 | 25 | 50 | 3 | 4 | 60° 凸 |
| **1.31 ～ 1.39** | 0.4 | 25 | 50 | 3 | 4 | 60° 凸 |
| **1.41 ～ 1.49** | 0.4 | 25 | 50 | 3 | 4 | 60° 凸 |
| **1.51 ～ 1.55** | 0.4 | 25 | 50 | 3 | 4 | 60° 凸 |
| **1.56 ～ 1.59** | 0.5 | 30 | 55 | 3 | 4 | 60° 凸 |
| **1.61 ～ 1.69** | 0.5 | 30 | 55 | 3 | 4 | 60° 凸 |
| **1.71 ～ 1.79** | 0.5 | 30 | 55 | 3 | 4 | 60° 凸 |
| **1.81 ～ 1.85** | 0.5 | 30 | 55 | 3 | 4 | 60° 凸 |
| **1.86 ～ 1.89** | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| **1.91 ～ 1.99** | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| **2.01 ～ 2.09** | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| **2.11 ～ 2.19** | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| **2.21 ～ 2.25** | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| **2.26 ～ 2.29** | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| **2.31 ～ 2.39** | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| **2.41 ～ 2.49** | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| **2.51 ～ 2.59** | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| **2.61 ～ 2.69** | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| **2.71 ～ 2.79** | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| **2.81 ～ 2.85** | 0.5 | 35 | 65 | 3 | 4 | 60° 凸 |
| **2.86 ～ 2.89** | 0.5 | 40 | 72 | 3 | 6 | 60° 凹 |
| **2.91 ～ 2.99** | 0.5 | 40 | 72 | 3 | 6 | 60° 凹 |
| **3.01 ～ 3.09** | 0.5 | 40 | 72 | 3 | 6 | 60° 凹 |
| **3.11 ～ 3.19** | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| **3.21 ～ 3.29** | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| **3.31 ～ 3.39** | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| **3.41 ～ 3.49** | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| **3.51 ～ 3.59** | 0.5 | 40 | 75 | 3 | 6 | 60° 凹 |
| **3.61 ～ 3.69** | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| **3.71 ～ 3.79** | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **3.81 ～ 3.89** | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| **3.91 ～ 3.99** | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| **4.01 ～ 4.09** | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| **4.11 ～ 4.19** | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| **4.21 ～ 4.29** | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| **4.31 ～ 4.39** | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| **4.41 ～ 4.49** | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| **4.51 ～ 4.59** | 0.5 | 45 | 85 | 4 | 6 | 60° 凹 |
| **4.61 ～ 4.69** | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| **4.71 ～ 4.79** | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| **4.81 ～ 4.89** | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| **4.91 ～ 4.99** | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| **5.01 ～ 5.09** | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| **5.11 ～ 5.19** | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| **5.21 ～ 5.29** | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| **5.31 ～ 5.39** | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| **5.41 ～ 5.49** | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| **5.51 ～ 5.59** | 0.5 | 45 | 95 | 4 | 6 | 60° 凹 |
| **5.61 ～ 5.69** | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| **5.71 ～ 5.79** | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| **5.81 ～ 5.89** | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| **5.91 ～ 5.99** | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| **6.01 ～ 6.09** | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| **6.11 ～ 6.19** | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| **6.21 ～ 6.29** | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| **6.31 ～ 6.39** | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| **6.41 ～ 6.49** | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| **6.51 ～ 6.59** | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| **6.61 ～ 6.69** | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |
| **6.71 ～ 6.79** | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |
| **6.81 ～ 6.89** | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |
| **6.91 ～ 6.99** | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |
| **7.01 ～ 7.09** | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |
| **7.11 ～ 7.19** | 0.5 | 55 | 110 | 6 | 6 | 60° 凹 |
| **7.21 ～ 7.29** | 0.5 | 55 | 110 | 6 | 6 | 60° 凹 |

# TiN-SPR TiNスパイラルリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 7.31 ～ 7.39 | 0.5 | 55 | 110 | 6 | 6 | 60° 凹 |
| 7.41 ～ 7.49 | 0.5 | 55 | 110 | 6 | 6 | 60° 凹 |
| 7.51 ～ 7.59 | 0.5 | 55 | 110 | 6 | 6 | 60° 凹 |
| 7.61 ～ 7.69 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 7.71 ～ 7.79 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 7.81 ～ 7.89 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 7.91 ～ 7.99 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 8.01 ～ 8.09 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 8.11 ～ 8.19 | 1 | 60 | 120 | 8 | 6 | 60° 凹 |
| 8.21 ～ 8.29 | 1 | 60 | 120 | 8 | 6 | 60° 凹 |
| 8.31 ～ 8.39 | 1 | 60 | 120 | 8 | 6 | 60° 凹 |
| 8.41 ～ 8.49 | 1 | 60 | 120 | 8 | 6 | 60° 凹 |
| 8.51 ～ 8.59 | 1 | 60 | 120 | 8 | 6 | 60° 凹 |
| 8.61 ～ 8.69 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 8.71 ～ 8.79 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 8.81 ～ 8.89 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 8.91 ～ 8.99 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.01 ～ 9.09 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 9.11 ～ 9.19 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.21 ～ 9.29 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.31 ～ 9.39 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.41 ～ 9.49 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.51 ～ 9.59 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.61 ～ 9.69 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 9.71 ～ 9.79 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 9.81 ～ 9.89 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 9.91 ～ 9.99 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 10.01 ～ 10.05 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 10.95 ～ 10.99 | 1 | 75 | 140 | 10 | 6 | 60° 凹 |
| 11.01 ～ 11.05 | 1 | 75 | 140 | 10 | 6 | 60° 凹 |
| 11.95 ～ 11.99 | 1 | 75 | 150 | 12 | 6 | 60° 凹 |
| 12.01 ～ 12.05 | 1 | 75 | 150 | 12 | 6 | 60° 凹 |
| 12.95 ～ 12.99 | 1 | 80 | 160 | 12 | 8 | 60° 凹 |
| 13.01 ～ 13.05 | 1 | 80 | 160 | 12 | 8 | 60° 凹 |
| 13.95 ～ 13.99 | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| 14.01 ～ 14.05 | 1 | 85 | 165 | 12 | 8 | 60° 凹 |

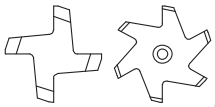
| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 1.005 ～ 1.035 | 0.4 | 20 | 40 | 2 | 4 | 60° 凸 |
| 1.975 ～ 1.995 | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| 2.005 ～ 2.035 | 0.5 | 30 | 60 | 3 | 4 | 60° 凸 |
| 2.975 ～ 2.995 | 0.5 | 40 | 72 | 3 | 6 | 60° 凹 |
| 3.005 ～ 3.035 | 0.5 | 40 | 72 | 3 | 6 | 60° 凹 |
| 3.975 ～ 3.995 | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| 4.005 ～ 4.035 | 0.5 | 40 | 80 | 4 | 6 | 60° 凹 |
| 4.975 ～ 4.995 | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| 5.005 ～ 5.035 | 0.5 | 45 | 90 | 4 | 6 | 60° 凹 |
| 5.975 ～ 5.995 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6.005 ～ 6.035 | 0.5 | 50 | 100 | 6 | 6 | 60° 凹 |
| 6.975 ～ 6.995 | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |
| 7.005 ～ 7.035 | 0.5 | 55 | 105 | 6 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 7.975 ～ 7.995 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 8.005 ～ 8.035 | 0.5 | 60 | 115 | 8 | 6 | 60° 凹 |
| 8.975 ～ 8.995 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.005 ～ 9.035 | 1 | 65 | 125 | 8 | 6 | 60° 凹 |
| 9.975 ～ 9.995 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 10.005 ～ 10.035 | 1 | 70 | 130 | 10 | 6 | 60° 凹 |
| 10.975 ～ 10.995 | 1 | 75 | 140 | 10 | 6 | 60° 凹 |
| 11.005 ～ 11.035 | 1 | 75 | 140 | 10 | 6 | 60° 凹 |
| 11.975 ～ 11.995 | 1 | 75 | 150 | 12 | 6 | 60° 凹 |
| 12.005 ～ 12.035 | 1 | 75 | 150 | 12 | 6 | 60° 凹 |
| 12.975 ～ 12.995 | 1 | 80 | 160 | 12 | 8 | 60° 凹 |
| 13.005 ～ 13.035 | 1 | 80 | 160 | 12 | 8 | 60° 凹 |
| 13.975 ～ 13.995 | 1 | 85 | 165 | 12 | 8 | 60° 凹 |
| 14.005 ～ 14.035 | 1 | 85 | 165 | 12 | 8 | 60° 凹 |

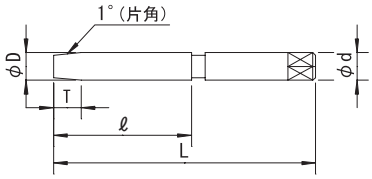
# HR

## ハンドリーマ　*Hand Reamer*

切削条件表 P140　**貫通穴加工(ストレート刃)**　右直刃　食付1°　HSS






| | D | | | | d |
|---|---|---|---|---|---|
| 公差 (Tolerance) | 0.01トビ Increment 0.01 +0.005 0 | 0.5～ 3 +0.007 +0.002 | 3.1～ 6 +0.009 +0.004 | 6.1～10 +0.012 +0.006 | −0.02 −0.05 |
| | 10.1～18 +0.015 +0.007 | 18.1～30 +0.017 +0.008 | 30.5～50 +0.02 +0.009 | 51 ～ +0.024 +0.011 | |
| | 0.005トビ Increment 0.005 | 0.505～0.905 +0.005 0 | 0.955～ +0.003 0 | | |

右刃ストレート　食付角度1°　SKH51
Straight Flute　Chamfer Angle1°　HSS

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| 0.5 | 2.5 | 12 | 30 | 2 | 4 | 60°凸 |
| 0.6 | 2.5 | 12 | 30 | 2 | 4 | 60°凸 |
| 0.7 | 2.5 | 12 | 30 | 2 | 4 | 60°凸 |
| 0.8 | 3 | 15 | 35 | 2 | 4 | 60°凸 |
| 0.9 | 4 | 20 | 40 | 2 | 4 | 60°凸 |
| 1 | 4 | 20 | 40 | 2 | 4 | 60°凸 |
| 1.1 | 5 | 25 | 45 | 2 | 4 | 60°凸 |
| 1.2 | 5 | 25 | 45 | 2 | 4 | 60°凸 |
| 1.3 | 5 | 25 | 50 | 3 | 4 | 60°凸 |
| 1.4 | 5 | 25 | 50 | 3 | 4 | 60°凸 |
| 1.5 | 5 | 25 | 50 | 3 | 4 | 60°凸 |
| 1.6 | 6 | 30 | 55 | 3 | 4 | 60°凸 |
| 1.7 | 6 | 30 | 55 | 3 | 4 | 60°凸 |
| 1.8 | 6 | 30 | 55 | 3 | 4 | 60°凸 |
| 1.9 | 6 | 30 | 60 | 3 | 4 | 60°凸 |
| 2 | 6 | 30 | 60 | 3 | 4 | 60°凸 |
| 2.1 | 6 | 30 | 60 | 3 | 4 | 60°凸 |
| 2.2 | 6 | 30 | 60 | 3 | 4 | 60°凸 |
| 2.3 | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.4 | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.5 | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.6 | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.7 | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.8 | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.9 | 8 | 40 | 72 | 3 | 6 | 60°凹 |
| 3 | 8 | 40 | 72 | 3 | 6 | 60°凹 |
| 3.1 | 8 | 40 | 72 | 3.1 | 6 | 60°凹 |
| 3.2 | 8 | 40 | 75 | 3.2 | 6 | 60°凹 |
| 3.3 | 8 | 40 | 75 | 3.3 | 6 | 60°凹 |
| 3.4 | 8 | 40 | 75 | 3.4 | 6 | 60°凹 |
| 3.5 | 8 | 40 | 75 | 3.5 | 6 | 60°凹 |
| 3.6 | 8 | 40 | 75 | 3.6 | 6 | 60°凹 |
| 3.7 | 8 | 40 | 80 | 3.7 | 6 | 60°凹 |
| 3.8 | 8 | 40 | 80 | 3.8 | 6 | 60°凹 |
| 3.9 | 8 | 40 | 80 | 3.9 | 6 | 60°凹 |
| 4 | 8 | 40 | 80 | 4 | 6 | 60°凹 |
| 4.1 | 8 | 40 | 80 | 4.1 | 6 | 60°凹 |
| 4.2 | 9 | 45 | 85 | 4.2 | 6 | 60°凹 |
| 4.3 | 9 | 45 | 85 | 4.3 | 6 | 60°凹 |
| 4.4 | 9 | 45 | 85 | 4.4 | 6 | 60°凹 |
| 4.5 | 9 | 45 | 85 | 4.5 | 6 | 60°凹 |
| 4.6 | 9 | 45 | 85 | 4.6 | 6 | 60°凹 |
| 4.7 | 9 | 45 | 90 | 4.7 | 6 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| 4.8 | 9 | 45 | 90 | 4.8 | 6 | 60°凹 |
| 4.9 | 9 | 45 | 90 | 4.9 | 6 | 60°凹 |
| 5 | 9 | 45 | 90 | 5 | 6 | 60°凹 |
| 5.1 | 9 | 45 | 90 | 5.1 | 6 | 60°凹 |
| 5.2 | 10 | 45 | 95 | 5.2 | 6 | 60°凹 |
| 5.3 | 10 | 45 | 95 | 5.3 | 6 | 60°凹 |
| 5.4 | 10 | 45 | 95 | 5.4 | 6 | 60°凹 |
| 5.5 | 10 | 45 | 95 | 5.5 | 6 | 60°凹 |
| 5.6 | 10 | 45 | 95 | 5.6 | 6 | 60°凹 |
| 5.7 | 10 | 50 | 100 | 5.7 | 6 | 60°凹 |
| 5.8 | 10 | 50 | 100 | 5.8 | 6 | 60°凹 |
| 5.9 | 10 | 50 | 100 | 5.9 | 6 | 60°凹 |
| 6 | 10 | 50 | 100 | 6 | 6 | 60°凹 |
| 6.1 | 10 | 50 | 100 | 6.1 | 6 | 60°凹 |
| 6.2 | 10 | 50 | 100 | 6.2 | 6 | 60°凹 |
| 6.3 | 10 | 50 | 100 | 6.3 | 6 | 60°凹 |
| 6.4 | 10 | 50 | 100 | 6.4 | 6 | 60°凹 |
| 6.5 | 10 | 50 | 100 | 6.5 | 6 | 60°凹 |
| 6.6 | 10 | 50 | 100 | 6.6 | 6 | 60°凹 |
| 6.7 | 11 | 55 | 105 | 6.7 | 6 | 60°凹 |
| 6.8 | 11 | 55 | 105 | 6.8 | 6 | 60°凹 |
| 6.9 | 11 | 55 | 105 | 6.9 | 6 | 60°凹 |
| 7 | 11 | 55 | 105 | 7 | 6 | 60°凹 |
| 7.1 | 11 | 55 | 105 | 7.1 | 6 | 60°凹 |
| 7.2 | 11 | 55 | 110 | 7.2 | 6 | 60°凹 |
| 7.3 | 11 | 55 | 110 | 7.3 | 6 | 60°凹 |
| 7.4 | 11 | 55 | 110 | 7.4 | 6 | 60°凹 |
| 7.5 | 11 | 55 | 110 | 7.5 | 6 | 60°凹 |
| 7.6 | 11 | 55 | 110 | 7.6 | 6 | 60°凹 |
| 7.7 | 12 | 60 | 115 | 7.7 | 6 | 60°凹 |
| 7.8 | 12 | 60 | 115 | 7.8 | 6 | 60°凹 |
| 7.9 | 12 | 60 | 115 | 7.9 | 6 | 60°凹 |
| 8 | 12 | 60 | 115 | 8 | 6 | 60°凹 |
| 8.1 | 12 | 60 | 115 | 8.1 | 6 | 60°凹 |
| 8.2 | 12 | 60 | 120 | 8.2 | 6 | 60°凹 |
| 8.3 | 12 | 60 | 120 | 8.3 | 6 | 60°凹 |
| 8.4 | 12 | 60 | 120 | 8.4 | 6 | 60°凹 |
| 8.5 | 12 | 60 | 120 | 8.5 | 6 | 60°凹 |
| 8.6 | 12 | 60 | 120 | 8.6 | 6 | 60°凹 |
| 8.7 | 13 | 65 | 125 | 8.7 | 6 | 60°凹 |
| 8.8 | 13 | 65 | 125 | 8.8 | 6 | 60°凹 |
| 8.9 | 13 | 65 | 125 | 8.9 | 6 | 60°凹 |
| 9 | 13 | 65 | 125 | 9 | 6 | 60°凹 |

# HR ハンドリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **9.1** | 13 | 65 | 125 | 9.1 | 6 | 60°凹 |
| **9.2** | 13 | 65 | 125 | 9.2 | 6 | 60°凹 |
| **9.3** | 13 | 65 | 125 | 9.3 | 6 | 60°凹 |
| **9.4** | 13 | 65 | 125 | 9.4 | 6 | 60°凹 |
| **9.5** | 13 | 65 | 125 | 9.5 | 6 | 60°凹 |
| **9.6** | 13 | 65 | 125 | 9.6 | 6 | 60°凹 |
| **9.7** | 14 | 70 | 130 | 9.7 | 6 | 60°凹 |
| **9.8** | 14 | 70 | 130 | 9.8 | 6 | 60°凹 |
| **9.9** | 14 | 70 | 130 | 9.9 | 6 | 60°凹 |
| **10** | 14 | 70 | 130 | 10 | 6 | 60°凹 |
| **10.1** | 14 | 70 | 130 | 10.1 | 6 | 60°凹 |
| **10.2** | 14 | 70 | 135 | 10.2 | 6 | 60°凹 |
| **10.3** | 14 | 70 | 135 | 10.3 | 6 | 60°凹 |
| **10.4** | 14 | 70 | 135 | 10.4 | 6 | 60°凹 |
| **10.5** | 14 | 70 | 135 | 10.5 | 6 | 60°凹 |
| **10.6** | 14 | 70 | 135 | 10.6 | 6 | 60°凹 |
| **10.7** | 15 | 75 | 140 | 10.7 | 6 | 60°凹 |
| **10.8** | 15 | 75 | 140 | 10.8 | 6 | 60°凹 |
| **10.9** | 15 | 75 | 140 | 10.9 | 6 | 60°凹 |
| **11** | 15 | 75 | 140 | 11 | 6 | 60°凹 |
| **11.1** | 15 | 75 | 140 | 11.1 | 6 | 60°凹 |
| **11.2** | 15 | 75 | 145 | 11.2 | 6 | 60°凹 |
| **11.3** | 15 | 75 | 145 | 11.3 | 6 | 60°凹 |
| **11.4** | 15 | 75 | 145 | 11.4 | 6 | 60°凹 |
| **11.5** | 15 | 75 | 145 | 11.5 | 6 | 60°凹 |
| **11.6** | 15 | 75 | 145 | 11.6 | 6 | 60°凹 |
| **11.7** | 15 | 75 | 150 | 11.7 | 6 | 60°凹 |
| **11.8** | 15 | 75 | 150 | 11.8 | 6 | 60°凹 |
| **11.9** | 15 | 75 | 150 | 11.9 | 6 | 60°凹 |
| **12** | 15 | 75 | 150 | 12 | 6 | 60°凹 |
| **12.1** | 15 | 75 | 150 | 12.1 | 6 | 60°凹 |
| **12.2** | 16 | 80 | 155 | 12.2 | 6 | 60°凹 |
| **12.3** | 16 | 80 | 155 | 12.3 | 6 | 60°凹 |
| **12.4** | 16 | 80 | 155 | 12.4 | 6 | 60°凹 |
| **12.5** | 16 | 80 | 155 | 12.5 | 6 | 60°凹 |
| **12.6** | 16 | 80 | 155 | 12.6 | 6 | 60°凹 |
| **12.7** | 16 | 80 | 160 | 12.7 | 8 | 60°凹 |
| **12.8** | 16 | 80 | 160 | 12.8 | 8 | 60°凹 |
| **12.9** | 16 | 80 | 160 | 12.9 | 8 | 60°凹 |
| **13** | 16 | 80 | 160 | 13 | 8 | 60°凹 |
| **13.1** | 16 | 80 | 160 | 13.1 | 8 | 60°凹 |
| **13.2** | 17 | 85 | 165 | 13.2 | 8 | 60°凹 |
| **13.3** | 17 | 85 | 165 | 13.3 | 8 | 60°凹 |
| **13.4** | 17 | 85 | 165 | 13.4 | 8 | 60°凹 |
| **13.5** | 17 | 85 | 165 | 13.5 | 8 | 60°凹 |
| **13.6** | 17 | 85 | 165 | 13.6 | 8 | 60°凹 |
| **13.7** | 17 | 85 | 165 | 13.7 | 8 | 60°凹 |
| **13.8** | 17 | 85 | 165 | 13.8 | 8 | 60°凹 |
| **13.9** | 17 | 85 | 165 | 13.9 | 8 | 60°凹 |
| **14** | 17 | 85 | 165 | 14 | 8 | 60°凹 |
| **14.1** | 17 | 85 | 165 | 14.1 | 8 | 60°凹 |
| **14.2** | 18 | 90 | 170 | 14.2 | 8 | 60°凹 |
| **14.3** | 18 | 90 | 170 | 14.3 | 8 | 60°凹 |
| **14.4** | 18 | 90 | 170 | 14.4 | 8 | 60°凹 |
| **14.5** | 18 | 90 | 170 | 14.5 | 8 | 60°凹 |
| **14.6** | 18 | 90 | 170 | 14.6 | 8 | 60°凹 |
| **14.7** | 18 | 90 | 175 | 14.7 | 8 | 60°凹 |
| **14.8** | 18 | 90 | 175 | 14.8 | 8 | 60°凹 |
| **14.9** | 18 | 90 | 175 | 14.9 | 8 | 60°凹 |
| **15** | 18 | 90 | 175 | 15 | 8 | 60°凹 |
| **15.1** | 18 | 90 | 175 | 15.1 | 8 | 60°凹 |
| **15.2** | 19 | 95 | 185 | 15.2 | 8 | 60°凹 |
| **15.3** | 19 | 95 | 185 | 15.3 | 8 | 60°凹 |
| **15.4** | 19 | 95 | 185 | 15.4 | 8 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **15.5** | 19 | 95 | 185 | 15.5 | 8 | 60°凹 |
| **15.6** | 19 | 95 | 185 | 15.6 | 8 | 60°凹 |
| **15.7** | 19 | 95 | 185 | 15.7 | 8 | 60°凹 |
| **15.8** | 19 | 95 | 185 | 15.8 | 8 | 60°凹 |
| **15.9** | 19 | 95 | 185 | 15.9 | 8 | 60°凹 |
| **16** | 19 | 95 | 185 | 16 | 8 | 60°凹 |
| **16.1** | 19 | 95 | 185 | 16.1 | 8 | 60°凹 |
| **16.2** | 20 | 100 | 190 | 16.2 | 8 | 60°凹 |
| **16.3** | 20 | 100 | 190 | 16.3 | 8 | 60°凹 |
| **16.4** | 20 | 100 | 190 | 16.4 | 8 | 60°凹 |
| **16.5** | 20 | 100 | 190 | 16.5 | 8 | 60°凹 |
| **16.6** | 20 | 100 | 190 | 16.6 | 8 | 60°凹 |
| **16.7** | 20 | 100 | 190 | 16.7 | 8 | 60°凹 |
| **16.8** | 20 | 100 | 190 | 16.8 | 8 | 60°凹 |
| **16.9** | 20 | 100 | 190 | 16.9 | 8 | 60°凹 |
| **17** | 20 | 100 | 190 | 17 | 8 | 60°凹 |
| **17.1** | 20 | 100 | 190 | 17.1 | 8 | 60°凹 |
| **17.2** | 21 | 105 | 200 | 17.2 | 8 | 60°凹 |
| **17.3** | 21 | 105 | 200 | 17.3 | 8 | 60°凹 |
| **17.4** | 21 | 105 | 200 | 17.4 | 8 | 60°凹 |
| **17.5** | 21 | 105 | 200 | 17.5 | 8 | 60°凹 |
| **17.6** | 21 | 105 | 200 | 17.6 | 8 | 60°凹 |
| **17.7** | 21 | 105 | 200 | 17.7 | 8 | 60°凹 |
| **17.8** | 21 | 105 | 200 | 17.8 | 8 | 60°凹 |
| **17.9** | 21 | 105 | 200 | 17.9 | 8 | 60°凹 |
| **18** | 21 | 105 | 200 | 18 | 8 | 60°凹 |
| **18.1** | 21 | 105 | 200 | 18.1 | 8 | 60°凹 |
| **18.2** | 21 | 105 | 210 | 18.2 | 8 | 60°凹 |
| **18.3** | 21 | 105 | 210 | 18.3 | 8 | 60°凹 |
| **18.4** | 21 | 105 | 210 | 18.4 | 8 | 60°凹 |
| **18.5** | 21 | 105 | 210 | 18.5 | 8 | 60°凹 |
| **18.6** | 21 | 105 | 210 | 18.6 | 8 | 60°凹 |
| **18.7** | 21 | 105 | 210 | 18.7 | 8 | 60°凹 |
| **18.8** | 21 | 105 | 210 | 18.8 | 8 | 60°凹 |
| **18.9** | 21 | 105 | 210 | 18.9 | 8 | 60°凹 |
| **19** | 21 | 105 | 210 | 19 | 8 | 60°凹 |
| **19.1** | 21 | 105 | 210 | 19.1 | 8 | 60°凹 |
| **19.2** | 22 | 110 | 220 | 19.2 | 8 | 60°凹 |
| **19.3** | 22 | 110 | 220 | 19.3 | 8 | 60°凹 |
| **19.4** | 22 | 110 | 220 | 19.4 | 8 | 60°凹 |
| **19.5** | 22 | 110 | 220 | 19.5 | 8 | 60°凹 |
| **19.6** | 22 | 110 | 220 | 19.6 | 8 | 60°凹 |
| **19.7** | 22 | 110 | 220 | 19.7 | 8 | 60°凹 |
| **19.8** | 22 | 110 | 220 | 19.8 | 8 | 60°凹 |
| **19.9** | 22 | 110 | 220 | 19.9 | 8 | 60°凹 |
| **20** | 22 | 110 | 220 | 20 | 8 | 60°凹 |
| **20.1** | 22 | 110 | 220 | 20.1 | 8 | 60°凹 |
| **20.2** | 24 | 120 | 230 | 20.2 | 8 | 60°凹 |
| **20.3** | 24 | 120 | 230 | 20.3 | 8 | 60°凹 |
| **20.4** | 24 | 120 | 230 | 20.4 | 8 | 60°凹 |
| **20.5** | 24 | 120 | 230 | 20.5 | 8 | 60°凹 |
| **20.6** | 24 | 120 | 230 | 20.6 | 8 | 60°凹 |
| **20.7** | 24 | 120 | 230 | 20.7 | 8 | 60°凹 |
| **20.8** | 24 | 120 | 230 | 20.8 | 8 | 60°凹 |
| **20.9** | 24 | 120 | 230 | 20.9 | 8 | 60°凹 |
| **21** | 24 | 120 | 230 | 21 | 8 | 60°凹 |
| **21.1** | 24 | 120 | 230 | 21.1 | 8 | 60°凹 |
| **21.2** | 24 | 120 | 235 | 21.2 | 8 | 60°凹 |
| **21.3** | 24 | 120 | 235 | 21.3 | 8 | 60°凹 |
| **21.4** | 24 | 120 | 235 | 21.4 | 8 | 60°凹 |
| **21.5** | 24 | 120 | 235 | 21.5 | 8 | 60°凹 |
| **21.6** | 24 | 120 | 235 | 21.6 | 8 | 60°凹 |
| **21.7** | 24 | 120 | 235 | 21.7 | 8 | 60°凹 |
| **21.8** | 24 | 120 | 235 | 21.8 | 8 | 60°凹 |

# HR ハンドリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **21.9** | 24 | 120 | 235 | 21.9 | 8 | 60°凹 |
| **22** | 24 | 120 | 235 | 22 | 8 | 60°凹 |
| **22.1** | 24 | 120 | 235 | 22.1 | 8 | 60°凹 |
| **22.2** | 25 | 130 | 250 | 22.2 | 8 | 60°凹 |
| **22.3** | 25 | 130 | 250 | 22.3 | 8 | 60°凹 |
| **22.4** | 25 | 130 | 250 | 22.4 | 8 | 60°凹 |
| **22.5** | 25 | 130 | 250 | 22.5 | 8 | 60°凹 |
| **22.6** | 25 | 130 | 250 | 22.6 | 8 | 60°凹 |
| **22.7** | 25 | 130 | 250 | 22.7 | 8 | 60°凹 |
| **22.8** | 25 | 130 | 250 | 22.8 | 8 | 60°凹 |
| **22.9** | 25 | 130 | 250 | 22.9 | 8 | 60°凹 |
| **23** | 25 | 130 | 250 | 23 | 8 | 60°凹 |
| **23.1** | 25 | 130 | 250 | 23.1 | 8 | 60°凹 |
| **23.2** | 25 | 130 | 255 | 23.2 | 8 | 60°凹 |
| **23.3** | 25 | 130 | 255 | 23.3 | 8 | 60°凹 |
| **23.4** | 25 | 130 | 255 | 23.4 | 8 | 60°凹 |
| **23.5** | 25 | 130 | 255 | 23.5 | 8 | 60°凹 |
| **23.6** | 25 | 130 | 255 | 23.6 | 8 | 60°凹 |
| **23.7** | 25 | 130 | 255 | 23.7 | 8 | 60°凹 |
| **23.8** | 25 | 130 | 255 | 23.8 | 8 | 60°凹 |
| **23.9** | 25 | 130 | 255 | 23.9 | 8 | 60°凹 |
| **24** | 25 | 130 | 255 | 24 | 8 | 60°凹 |
| **24.1** | 25 | 130 | 255 | 24.1 | 8 | 60°凹 |
| **24.2** | 25 | 130 | 260 | 24.2 | 8 | 60°凹 |
| **24.3** | 25 | 130 | 260 | 24.3 | 8 | 60°凹 |
| **24.4** | 25 | 130 | 260 | 24.4 | 8 | 60°凹 |
| **24.5** | 25 | 130 | 260 | 24.5 | 8 | 60°凹 |
| **24.6** | 25 | 130 | 260 | 24.6 | 8 | 60°凹 |
| **24.7** | 25 | 130 | 260 | 24.7 | 8 | 60°凹 |
| **24.8** | 25 | 130 | 260 | 24.8 | 8 | 60°凹 |
| **24.9** | 25 | 130 | 260 | 24.9 | 8 | 60°凹 |
| **25** | 25 | 130 | 260 | 25 | 8 | 60°凹 |
| **25.1** | 25 | 130 | 260 | 25.1 | 8 | 60°凹 |
| **25.2** | 25 | 140 | 270 | 25.2 | 10 | 60°凹 |
| **25.3** | 25 | 140 | 270 | 25.3 | 10 | 60°凹 |
| **25.4** | 25 | 140 | 270 | 25.4 | 10 | 60°凹 |
| **25.5** | 25 | 140 | 270 | 25.5 | 10 | 60°凹 |
| **25.6** | 25 | 140 | 270 | 25.6 | 10 | 60°凹 |
| **25.7** | 25 | 140 | 270 | 25.7 | 10 | 60°凹 |
| **25.8** | 25 | 140 | 270 | 25.8 | 10 | 60°凹 |
| **25.9** | 25 | 140 | 270 | 25.9 | 10 | 60°凹 |
| **26** | 25 | 140 | 270 | 26 | 10 | 60°凹 |
| **26.1** | 25 | 140 | 270 | 26.1 | 10 | 60°凹 |
| **26.2** | 25 | 140 | 290 | 26.2 | 10 | 60°凹 |
| **26.3** | 25 | 140 | 290 | 26.3 | 10 | 60°凹 |
| **26.4** | 25 | 140 | 290 | 26.4 | 10 | 60°凹 |
| **26.5** | 25 | 140 | 290 | 26.5 | 10 | 60°凹 |
| **26.6** | 25 | 140 | 290 | 26.6 | 10 | 60°凹 |
| **26.7** | 25 | 140 | 290 | 26.7 | 10 | 60°凹 |
| **26.8** | 25 | 140 | 290 | 26.8 | 10 | 60°凹 |
| **26.9** | 25 | 140 | 290 | 26.9 | 10 | 60°凹 |
| **27** | 25 | 140 | 290 | 27 | 10 | 60°凹 |
| **27.1** | 25 | 140 | 290 | 27.1 | 10 | 60°凹 |
| **27.2** | 25 | 140 | 290 | 27.2 | 10 | 60°凹 |
| **27.3** | 25 | 140 | 290 | 27.3 | 10 | 60°凹 |
| **27.4** | 25 | 140 | 290 | 27.4 | 10 | 60°凹 |
| **27.5** | 25 | 140 | 290 | 27.5 | 10 | 60°凹 |
| **27.6** | 25 | 140 | 290 | 27.6 | 10 | 60°凹 |
| **27.7** | 25 | 140 | 290 | 27.7 | 10 | 60°凹 |
| **27.8** | 25 | 140 | 290 | 27.8 | 10 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **27.9** | 25 | 140 | 290 | 27.9 | 10 | 60°凹 |
| **28** | 25 | 140 | 290 | 28 | 10 | 60°凹 |
| **28.1** | 25 | 140 | 290 | 28.1 | 10 | 60°凹 |
| **28.2** | 25 | 150 | 305 | 28.2 | 10 | 60°凹 |
| **28.3** | 25 | 150 | 305 | 28.3 | 10 | 60°凹 |
| **28.4** | 25 | 150 | 305 | 28.4 | 10 | 60°凹 |
| **28.5** | 25 | 150 | 305 | 28.5 | 10 | 60°凹 |
| **28.6** | 25 | 150 | 305 | 28.6 | 10 | 60°凹 |
| **28.7** | 25 | 150 | 305 | 28.7 | 10 | 60°凹 |
| **28.8** | 25 | 150 | 305 | 28.8 | 10 | 60°凹 |
| **28.9** | 25 | 150 | 305 | 28.9 | 10 | 60°凹 |
| **29** | 25 | 150 | 305 | 29 | 10 | 60°凹 |
| **29.1** | 25 | 150 | 305 | 29.1 | 10 | 60°凹 |
| **29.2** | 25 | 150 | 305 | 29.2 | 10 | 60°凹 |
| **29.3** | 25 | 150 | 305 | 29.3 | 10 | 60°凹 |
| **29.4** | 25 | 150 | 305 | 29.4 | 10 | 60°凹 |
| **29.5** | 25 | 150 | 305 | 29.5 | 10 | 60°凹 |
| **29.6** | 25 | 150 | 305 | 29.6 | 10 | 60°凹 |
| **29.7** | 25 | 150 | 305 | 29.7 | 10 | 60°凹 |
| **29.8** | 25 | 150 | 305 | 29.8 | 10 | 60°凹 |
| **29.9** | 25 | 150 | 305 | 29.9 | 10 | 60°凹 |
| **30** | 25 | 150 | 305 | 30 | 10 | 60°凹 |
| **30.5** | 25 | 160 | 315 | 30.5 | 10 | 60°凹 |
| **31** | 25 | 160 | 315 | 31 | 10 | 60°凹 |
| **31.5** | 25 | 160 | 315 | 31.5 | 10 | 60°凹 |
| **32** | 25 | 160 | 315 | 32 | 10 | 60°凹 |
| **32.5** | 25 | 160 | 315 | 32.5 | 10 | 60°凹 |
| **33** | 25 | 160 | 315 | 33 | 10 | 60°凹 |
| **33.5** | 25 | 160 | 315 | 33.5 | 10 | 60°凹 |
| **34** | 25 | 160 | 315 | 34 | 10 | 60°凹 |
| **34.5** | 25 | 165 | 320 | 34.5 | 10 | 60°凹 |
| **35** | 25 | 165 | 320 | 35 | 10 | 60°凹 |
| **35.5** | 25 | 165 | 320 | 35.5 | 10 | 60°凹 |
| **36** | 25 | 165 | 320 | 36 | 10 | 60°凹 |
| **36.5** | 25 | 165 | 325 | 36.5 | 10 | 60°凹 |
| **37** | 25 | 165 | 325 | 37 | 10 | 60°凹 |
| **37.5** | 25 | 165 | 325 | 37.5 | 10 | 60°凹 |
| **38** | 25 | 165 | 325 | 38 | 10 | 60°凹 |
| **38.5** | 25 | 165 | 330 | 38.5 | 12 | 60°凹 |
| **39** | 25 | 165 | 330 | 39 | 12 | 60°凹 |
| **39.5** | 25 | 165 | 330 | 39.5 | 12 | 60°凹 |
| **40** | 25 | 165 | 330 | 40 | 12 | 60°凹 |
| **41** | 25 | 170 | 335 | 41 | 12 | 60°凹 |
| **42** | 25 | 170 | 335 | 42 | 12 | 60°凹 |
| **43** | 25 | 170 | 340 | 43 | 12 | 60°凹 |
| **44** | 25 | 170 | 340 | 44 | 12 | 60°凹 |
| **45** | 25 | 175 | 345 | 45 | 12 | 60°凹 |
| **46** | 25 | 175 | 345 | 46 | 12 | 60°凹 |
| **47** | 25 | 180 | 350 | 47 | 12 | 60°凹 |
| **48** | 25 | 180 | 350 | 48 | 12 | 60°凹 |
| **49** | 25 | 180 | 355 | 49 | 12 | 60°凹 |
| **50** | 25 | 180 | 355 | 50 | 12 | 60°凹 |
| **51** | 25 | 180 | 360 | 51 | 12 | 60°凹 |
| **52** | 25 | 180 | 360 | 52 | 12 | 60°凹 |
| **53** | 25 | 185 | 370 | 53 | 14 | 60°凹 |
| **54** | 25 | 185 | 370 | 54 | 14 | 60°凹 |
| **55** | 25 | 185 | 370 | 55 | 14 | 60°凹 |
| **56** | 25 | 190 | 375 | 56 | 14 | 60°凹 |
| **57** | 25 | 190 | 375 | 57 | 14 | 60°凹 |
| **58** | 25 | 190 | 375 | 58 | 14 | 60°凹 |
| **59** | 25 | 190 | 380 | 59 | 14 | 60°凹 |
| **60** | 25 | 190 | 380 | 60 | 14 | 60°凹 |

# HR ハンドリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **1/16** | 6 | 30 | 55 | 3 | 4 | 60°凸 |
| **3/32** | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| **1/8** | 8 | 40 | 75 | 1/8 | 6 | 60°凹 |
| **5/32** | 8 | 40 | 80 | 5/32 | 6 | 60°凹 |
| **3/16** | 9 | 45 | 90 | 3/16 | 6 | 60°凹 |
| **7/32** | 10 | 45 | 95 | 7/32 | 6 | 60°凹 |
| **1/4** | 10 | 50 | 100 | 1/4 | 6 | 60°凹 |
| **9/32** | 11 | 55 | 110 | 9/32 | 6 | 60°凹 |
| **5/16** | 12 | 60 | 115 | 5/16 | 6 | 60°凹 |
| **11/32** | 13 | 65 | 125 | 11/32 | 6 | 60°凹 |
| **3/8** | 13 | 65 | 125 | 3/8 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **7/16** | 15 | 75 | 145 | 7/16 | 6 | 60°凹 |
| **1/2** | 16 | 80 | 160 | 1/2 | 8 | 60°凹 |
| **9/16** | 18 | 90 | 170 | 9/16 | 8 | 60°凹 |
| **5/8** | 19 | 95 | 185 | 5/8 | 8 | 60°凹 |
| **11/16** | 21 | 105 | 200 | 11/16 | 8 | 60°凹 |
| **3/4** | 21 | 105 | 210 | 3/4 | 8 | 60°凹 |
| **13/16** | 24 | 120 | 230 | 13/16 | 8 | 60°凹 |
| **7/8** | 25 | 130 | 250 | 7/8 | 8 | 60°凹 |
| **1"** | 25 | 140 | 270 | 1" | 10 | 60°凹 |
| **1"1/4** | 25 | 160 | 315 | 1"1/4 | 10 | 60°凹 |
| **1"1/2** | 25 | 165 | 330 | 1"1/2 | 12 | 60°凹 |
| **2"** | 25 | 180 | 360 | 2" | 12 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **0.51 ～ 0.59** | 2.5 | 12 | 30 | 2 | 4 | 60°凸 |
| **0.61 ～ 0.69** | 2.5 | 12 | 30 | | 4 | 60°凸 |
| **0.71 ～ 0.75** | 3 | 12 | 30 | | 4 | 60°凸 |
| **0.76 ～ 0.79** | 3 | 15 | 35 | | 4 | 60°凸 |
| **0.81 ～ 0.85** | 4 | 15 | 35 | | 4 | 60°凸 |
| **0.86 ～ 0.89** | 4 | 20 | 40 | | 4 | 60°凸 |
| **0.91 ～ 0.99** | 4 | 20 | 40 | | 4 | 60°凸 |
| **1.01 ～ 1.05** | 5 | 20 | 40 | | 4 | 60°凸 |
| **1.06 ～ 1.09** | 5 | 25 | 45 | | 4 | 60°凸 |
| **1.11 ～ 1.19** | 5 | 25 | 45 | | 4 | 60°凸 |
| **1.21 ～ 1.25** | 5 | 25 | 45 | | 4 | 60°凸 |
| **1.26 ～ 1.29** | 5 | 25 | 50 | 3 | 4 | 60°凸 |
| **1.31 ～ 1.39** | 5 | 25 | 50 | | 4 | 60°凸 |
| **1.41 ～ 1.49** | 5 | 25 | 50 | | 4 | 60°凸 |
| **1.51 ～ 1.55** | 6 | 25 | 50 | | 4 | 60°凸 |
| **1.56 ～ 1.59** | 6 | 30 | 55 | | 4 | 60°凸 |
| **1.61 ～ 1.69** | 6 | 30 | 55 | | 4 | 60°凸 |
| **1.71 ～ 1.79** | 6 | 30 | 55 | | 4 | 60°凸 |
| **1.81 ～ 1.85** | 6 | 30 | 55 | | 4 | 60°凸 |
| **1.86 ～ 1.89** | 6 | 30 | 60 | | 4 | 60°凸 |
| **1.91 ～ 1.99** | 6 | 30 | 60 | | 4 | 60°凸 |
| **2.01 ～ 2.09** | 6 | 30 | 60 | | 4 | 60°凸 |
| **2.11 ～ 2.19** | 6 | 30 | 60 | | 4 | 60°凸 |
| **2.21 ～ 2.25** | 7 | 30 | 60 | | 4 | 60°凸 |
| **2.26 ～ 2.29** | 7 | 35 | 65 | | 4 | 60°凸 |
| **2.31 ～ 2.39** | 7 | 35 | 65 | | 4 | 60°凸 |
| **2.41 ～ 2.49** | 7 | 35 | 65 | | 4 | 60°凸 |
| **2.51 ～ 2.59** | 7 | 35 | 65 | | 4 | 60°凸 |
| **2.61 ～ 2.69** | 7 | 35 | 65 | | 4 | 60°凸 |
| **2.71 ～ 2.79** | 7 | 35 | 65 | | 4 | 60°凸 |
| **2.81 ～ 2.85** | 7 | 35 | 65 | | 4 | 60°凸 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **2.86 ～ 2.89** | 8 | 40 | 72 | 3 | 6 | 60°凹 |
| **2.91 ～ 2.99** | 8 | 40 | 72 | | 6 | 60°凹 |
| **3.01 ～ 3.09** | 8 | 40 | 72 | 直径と同径 ※1 | 6 | 60°凹 |
| **3.11 ～ 3.19** | 8 | 40 | 75 | | 6 | 60°凹 |
| **3.21 ～ 3.29** | 8 | 40 | 75 | | 6 | 60°凹 |
| **3.31 ～ 3.39** | 8 | 40 | 75 | | 6 | 60°凹 |
| **3.41 ～ 3.49** | 8 | 40 | 75 | | 6 | 60°凹 |
| **3.51 ～ 3.59** | 8 | 40 | 75 | | 6 | 60°凹 |
| **3.61 ～ 3.69** | 8 | 40 | 80 | | 6 | 60°凹 |
| **3.71 ～ 3.79** | 8 | 40 | 80 | | 6 | 60°凹 |
| **3.81 ～ 3.89** | 8 | 40 | 80 | | 6 | 60°凹 |
| **3.91 ～ 3.99** | 8 | 40 | 80 | | 6 | 60°凹 |
| **4.01 ～ 4.09** | 8 | 40 | 80 | | 6 | 60°凹 |
| **4.11 ～ 4.19** | 9 | 45 | 85 | | 6 | 60°凹 |
| **4.21 ～ 4.29** | 9 | 45 | 85 | | 6 | 60°凹 |
| **4.31 ～ 4.39** | 9 | 45 | 85 | | 6 | 60°凹 |
| **4.41 ～ 4.49** | 9 | 45 | 85 | | 6 | 60°凹 |
| **4.51 ～ 4.59** | 9 | 45 | 85 | | 6 | 60°凹 |
| **4.61 ～ 4.69** | 9 | 45 | 90 | | 6 | 60°凹 |
| **4.71 ～ 4.79** | 9 | 45 | 90 | | 6 | 60°凹 |
| **4.81 ～ 4.89** | 9 | 45 | 90 | | 6 | 60°凹 |
| **4.91 ～ 4.99** | 9 | 45 | 90 | | 6 | 60°凹 |
| **5.01 ～ 5.09** | 9 | 45 | 90 | | 6 | 60°凹 |
| **5.11 ～ 5.19** | 10 | 45 | 95 | | 6 | 60°凹 |
| **5.21 ～ 5.29** | 10 | 45 | 95 | | 6 | 60°凹 |
| **5.31 ～ 5.39** | 10 | 45 | 95 | | 6 | 60°凹 |
| **5.41 ～ 5.49** | 10 | 45 | 95 | | 6 | 60°凹 |
| **5.51 ～ 5.59** | 10 | 45 | 95 | | 6 | 60°凹 |
| **5.61 ～ 5.69** | 10 | 50 | 100 | | 6 | 60°凹 |
| **5.71 ～ 5.79** | 10 | 50 | 100 | | 6 | 60°凹 |
| **5.81 ～ 5.89** | 10 | 50 | 100 | | 6 | 60°凹 |

※1 Shank diameter is same as φD

# HR ハンドリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 5.91～ 5.99 | 10 | 50 | 100 | | 6 | 60°凹 |
| 6.01～ 6.09 | 10 | 50 | 100 | | 6 | 60°凹 |
| 6.11～ 6.19 | 10 | 50 | 100 | | 6 | 60°凹 |
| 6.21～ 6.29 | 10 | 50 | 100 | | 6 | 60°凹 |
| 6.31～ 6.39 | 10 | 50 | 100 | | 6 | 60°凹 |
| 6.41～ 6.49 | 10 | 50 | 100 | | 6 | 60°凹 |
| 6.51～ 6.59 | 10 | 50 | 100 | | 6 | 60°凹 |
| 6.61～ 6.69 | 11 | 55 | 105 | | 6 | 60°凹 |
| 6.71～ 6.79 | 11 | 55 | 105 | | 6 | 60°凹 |
| 6.81～ 6.89 | 11 | 55 | 105 | | 6 | 60°凹 |
| 6.91～ 6.99 | 11 | 55 | 105 | | 6 | 60°凹 |
| 7.01～ 7.09 | 11 | 55 | 105 | | 6 | 60°凹 |
| 7.11～ 7.19 | 11 | 55 | 110 | | 6 | 60°凹 |
| 7.21～ 7.29 | 11 | 55 | 110 | | 6 | 60°凹 |
| 7.31～ 7.39 | 11 | 55 | 110 | | 6 | 60°凹 |
| 7.41～ 7.49 | 11 | 55 | 110 | | 6 | 60°凹 |
| 7.51～ 7.59 | 11 | 55 | 110 | | 6 | 60°凹 |
| 7.61～ 7.69 | 12 | 60 | 115 | | 6 | 60°凹 |
| 7.71～ 7.79 | 12 | 60 | 115 | | 6 | 60°凹 |
| 7.81～ 7.89 | 12 | 60 | 115 | | 6 | 60°凹 |
| 7.91～ 7.99 | 12 | 60 | 115 | | 6 | 60°凹 |
| 8.01～ 8.09 | 12 | 60 | 115 | | 6 | 60°凹 |
| 8.11～ 8.19 | 12 | 60 | 120 | | 6 | 60°凹 |
| 8.21～ 8.29 | 12 | 60 | 120 | | 6 | 60°凹 |
| 8.31～ 8.39 | 12 | 60 | 120 | 直 | 6 | 60°凹 |
| 8.41～ 8.49 | 12 | 60 | 120 | | 6 | 60°凹 |
| 8.51～ 8.59 | 12 | 60 | 120 | | 6 | 60°凹 |
| 8.61～ 8.69 | 13 | 65 | 125 | 径 | 6 | 60°凹 |
| 8.71～ 8.79 | 13 | 65 | 125 | | 6 | 60°凹 |
| 8.81～ 8.89 | 13 | 65 | 125 | | 6 | 60°凹 |
| 8.91～ 8.99 | 13 | 65 | 125 | | 6 | 60°凹 |
| 9.01～ 9.09 | 13 | 65 | 125 | と | 6 | 60°凹 |
| 9.11～ 9.19 | 13 | 65 | 125 | | 6 | 60°凹 |
| 9.21～ 9.29 | 13 | 65 | 125 | | 6 | 60°凹 |
| 9.31～ 9.39 | 13 | 65 | 125 | 同 | 6 | 60°凹 |
| 9.41～ 9.49 | 13 | 65 | 125 | | 6 | 60°凹 |
| 9.51～ 9.59 | 13 | 65 | 125 | | 6 | 60°凹 |
| 9.61～ 9.69 | 14 | 70 | 130 | 径 | 6 | 60°凹 |
| 9.71～ 9.79 | 14 | 70 | 130 | | 6 | 60°凹 |
| 9.81～ 9.89 | 14 | 70 | 130 | ※1 | 6 | 60°凹 |
| 9.91～ 9.99 | 14 | 70 | 130 | | 6 | 60°凹 |
| 10.01～10.09 | 14 | 70 | 130 | | 6 | 60°凹 |
| 10.11～10.19 | 14 | 70 | 135 | | 6 | 60°凹 |
| 10.21～10.29 | 14 | 70 | 135 | | 6 | 60°凹 |
| 10.31～10.39 | 14 | 70 | 135 | | 6 | 60°凹 |
| 10.41～10.49 | 14 | 70 | 135 | | 6 | 60°凹 |
| 10.51～10.59 | 14 | 70 | 135 | | 6 | 60°凹 |
| 10.61～10.69 | 15 | 75 | 140 | | 6 | 60°凹 |
| 10.71～10.79 | 15 | 75 | 140 | | 6 | 60°凹 |
| 10.81～10.89 | 15 | 75 | 140 | | 6 | 60°凹 |
| 10.91～10.99 | 15 | 75 | 140 | | 6 | 60°凹 |
| 11.01～11.09 | 15 | 75 | 140 | | 6 | 60°凹 |
| 11.11～11.19 | 15 | 75 | 145 | | 6 | 60°凹 |
| 11.21～11.29 | 15 | 75 | 145 | | 6 | 60°凹 |
| 11.31～11.39 | 15 | 75 | 145 | | 6 | 60°凹 |
| 11.41～11.49 | 15 | 75 | 145 | | 6 | 60°凹 |
| 11.51～11.59 | 15 | 75 | 145 | | 6 | 60°凹 |
| 11.61～11.69 | 15 | 75 | 150 | | 6 | 60°凹 |
| 11.71～11.79 | 15 | 75 | 150 | | 6 | 60°凹 |
| 11.81～11.89 | 15 | 75 | 150 | | 6 | 60°凹 |
| 11.91～11.99 | 15 | 75 | 150 | | 6 | 60°凹 |
| 12.01～12.09 | 15 | 75 | 150 | | 6 | 60°凹 |
| 12.11～12.19 | 16 | 80 | 155 | | 6 | 60°凹 |
| 12.21～12.29 | 16 | 80 | 155 | | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 12.31～12.39 | 16 | 80 | 155 | | 6 | 60°凹 |
| 12.41～12.49 | 16 | 80 | 155 | | 6 | 60°凹 |
| 12.51～12.59 | 16 | 80 | 155 | | 6 | 60°凹 |
| 12.61～12.69 | 16 | 80 | 160 | | 8 | 60°凹 |
| 12.71～12.79 | 16 | 80 | 160 | | 8 | 60°凹 |
| 12.81～12.89 | 16 | 80 | 160 | | 8 | 60°凹 |
| 12.91～12.99 | 16 | 80 | 160 | | 8 | 60°凹 |
| 13.01～13.09 | 16 | 80 | 160 | | 8 | 60°凹 |
| 13.11～13.19 | 17 | 85 | 165 | | 8 | 60°凹 |
| 13.21～13.29 | 17 | 85 | 165 | | 8 | 60°凹 |
| 13.31～13.39 | 17 | 85 | 165 | | 8 | 60°凹 |
| 13.41～13.49 | 17 | 85 | 165 | | 8 | 60°凹 |
| 13.51～13.59 | 17 | 85 | 165 | | 8 | 60°凹 |
| 13.61～13.69 | 17 | 85 | 165 | | 8 | 60°凹 |
| 13.71～13.79 | 17 | 85 | 165 | | 8 | 60°凹 |
| 13.81～13.89 | 17 | 85 | 165 | | 8 | 60°凹 |
| 13.91～13.99 | 17 | 85 | 165 | | 8 | 60°凹 |
| 14.01～14.09 | 17 | 85 | 165 | | 8 | 60°凹 |
| 14.11～14.19 | 18 | 90 | 170 | | 8 | 60°凹 |
| 14.21～14.29 | 18 | 90 | 170 | | 8 | 60°凹 |
| 14.31～14.39 | 18 | 90 | 170 | | 8 | 60°凹 |
| 14.41～14.49 | 18 | 90 | 170 | | 8 | 60°凹 |
| 14.51～14.59 | 18 | 90 | 170 | | 8 | 60°凹 |
| 14.61～14.69 | 18 | 90 | 175 | | 8 | 60°凹 |
| 14.71～14.79 | 18 | 90 | 175 | 直 | 8 | 60°凹 |
| 14.81～14.89 | 18 | 90 | 175 | | 8 | 60°凹 |
| 14.91～14.99 | 18 | 90 | 175 | | 8 | 60°凹 |
| 15.01～15.09 | 18 | 90 | 175 | 径 | 8 | 60°凹 |
| 15.11～15.19 | 19 | 95 | 185 | | 8 | 60°凹 |
| 15.21～15.29 | 19 | 95 | 185 | | 8 | 60°凹 |
| 15.31～15.39 | 19 | 95 | 185 | | 8 | 60°凹 |
| 15.41～15.49 | 19 | 95 | 185 | と | 8 | 60°凹 |
| 15.51～15.59 | 19 | 95 | 185 | | 8 | 60°凹 |
| 15.61～15.69 | 19 | 95 | 185 | | 8 | 60°凹 |
| 15.71～15.79 | 19 | 95 | 185 | 同 | 8 | 60°凹 |
| 15.81～15.89 | 19 | 95 | 185 | | 8 | 60°凹 |
| 15.91～15.99 | 19 | 95 | 185 | | 8 | 60°凹 |
| 16.01～16.09 | 19 | 95 | 185 | 径 | 8 | 60°凹 |
| 16.11～16.19 | 20 | 100 | 190 | | 8 | 60°凹 |
| 16.21～16.29 | 20 | 100 | 190 | ※1 | 8 | 60°凹 |
| 16.31～16.39 | 20 | 100 | 190 | | 8 | 60°凹 |
| 16.41～16.49 | 20 | 100 | 190 | | 8 | 60°凹 |
| 16.51～16.59 | 20 | 100 | 190 | | 8 | 60°凹 |
| 16.61～16.69 | 20 | 100 | 190 | | 8 | 60°凹 |
| 16.71～16.79 | 20 | 100 | 190 | | 8 | 60°凹 |
| 16.81～16.89 | 20 | 100 | 190 | | 8 | 60°凹 |
| 16.91～16.99 | 20 | 100 | 190 | | 8 | 60°凹 |
| 17.01～17.09 | 20 | 100 | 190 | | 8 | 60°凹 |
| 17.15 | 21 | 105 | 200 | | 8 | 60°凹 |
| 17.25 | 21 | 105 | 200 | | 8 | 60°凹 |
| 17.35 | 21 | 105 | 200 | | 8 | 60°凹 |
| 17.45 | 21 | 105 | 200 | | 8 | 60°凹 |
| 17.55 | 21 | 105 | 200 | | 8 | 60°凹 |
| 17.65 | 21 | 105 | 200 | | 8 | 60°凹 |
| 17.75 | 21 | 105 | 200 | | 8 | 60°凹 |
| 17.85 | 21 | 105 | 200 | | 8 | 60°凹 |
| 17.95～17.99 | 21 | 105 | 200 | | 8 | 60°凹 |
| 18.01～18.09 | 21 | 105 | 200 | | 8 | 60°凹 |
| 18.15 | 21 | 105 | 210 | | 8 | 60°凹 |
| 18.25 | 21 | 105 | 210 | | 8 | 60°凹 |
| 18.35 | 21 | 105 | 210 | | 8 | 60°凹 |
| 18.45 | 21 | 105 | 210 | | 8 | 60°凹 |
| 18.55 | 21 | 105 | 210 | | 8 | 60°凹 |
| 18.65 | 21 | 105 | 210 | | 8 | 60°凹 |

※1 Shank diameter is same as ϕD

# HR ハンドリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **18.75** | 21 | 105 | 210 | 直径と同径 ※1 | 8 | 60°凹 |
| **18.85** | 21 | 105 | 210 | | 8 | 60°凹 |
| **18.95 ～ 18.99** | 21 | 105 | 210 | | 8 | 60°凹 |
| **19.01 ～ 19.09** | 21 | 105 | 210 | | 8 | 60°凹 |
| **19.15** | 22 | 110 | 220 | | 8 | 60°凹 |
| **19.25** | 22 | 110 | 220 | | 8 | 60°凹 |
| **19.35** | 22 | 110 | 220 | | 8 | 60°凹 |
| **19.45** | 22 | 110 | 220 | | 8 | 60°凹 |
| **19.55** | 22 | 110 | 220 | | 8 | 60°凹 |
| **19.65** | 22 | 110 | 220 | | 8 | 60°凹 |
| **19.75** | 22 | 110 | 220 | | 8 | 60°凹 |
| **19.85** | 22 | 110 | 220 | | 8 | 60°凹 |
| **19.95 ～ 19.99** | 22 | 110 | 220 | | 8 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **20.01 ～ 20.09** | 22 | 110 | 220 | 直径と同径 ※1 | 8 | 60°凹 |
| **20.95 ～ 20.99** | 24 | 120 | 230 | | 8 | 60°凹 |
| **21.01 ～ 21.05** | 24 | 120 | 230 | | 8 | 60°凹 |
| **21.95 ～ 21.99** | 24 | 120 | 235 | | 8 | 60°凹 |
| **22.01 ～ 22.05** | 24 | 120 | 235 | | 8 | 60°凹 |
| **23.01 ～ 23.05** | 25 | 130 | 250 | | 8 | 60°凹 |
| **24.01 ～ 24.05** | 25 | 130 | 255 | | 8 | 60°凹 |
| **25.01 ～ 25.05** | 25 | 130 | 260 | | 8 | 60°凹 |
| **26.01 ～ 26.05** | 25 | 140 | 270 | | 10 | 60°凹 |
| **27.01 ～ 27.05** | 25 | 140 | 290 | | 10 | 60°凹 |
| **28.01 ～ 28.05** | 25 | 140 | 290 | | 10 | 60°凹 |
| **29.01 ～ 29.05** | 25 | 150 | 305 | | 10 | 60°凹 |
| **30.01 ～ 30.05** | 25 | 150 | 305 | | 10 | 60°凹 |

※1 Shank diameter is same as ϕD

# HR ハンドリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 0.505 | 2.5 | 12 | 30 | 2 | 4 | 60°凸 |
| 0.605 | 2.5 | 12 | 30 | 2 | 4 | 60°凸 |
| 0.705 | 3 | 12 | 30 | 2 | 4 | 60°凸 |
| 0.805 | 4 | 15 | 35 | 2 | 4 | 60°凸 |
| 0.905 | 4 | 20 | 40 | 2 | 4 | 60°凸 |
| 0.955 ～ 0.995 | 4 | 20 | 40 | 2 | 4 | 60°凸 |
| 1.005 ～ 1.045 | 5 | 20 | 40 | 2 | 4 | 60°凸 |
| 1.105 | 5 | 25 | 45 | 2 | 4 | 60°凸 |
| 1.205 | 5 | 25 | 45 | 2 | 4 | 60°凸 |
| 1.305 | 5 | 25 | 50 | 3 | 4 | 60°凸 |
| 1.405 | 5 | 25 | 50 | 3 | 4 | 60°凸 |
| 1.505 | 6 | 25 | 50 | 3 | 4 | 60°凸 |
| 1.605 | 6 | 30 | 55 | 3 | 4 | 60°凸 |
| 1.705 | 6 | 30 | 55 | 3 | 4 | 60°凸 |
| 1.805 | 6 | 30 | 55 | 3 | 4 | 60°凸 |
| 1.905 | 6 | 30 | 60 | 3 | 4 | 60°凸 |
| 1.955 ～ 1.995 | 6 | 30 | 60 | 3 | 4 | 60°凸 |
| 2.005 ～ 2.045 | 6 | 30 | 60 | 3 | 4 | 60°凸 |
| 2.105 | 6 | 30 | 60 | 3 | 4 | 60°凸 |
| 2.205 | 7 | 30 | 60 | 3 | 4 | 60°凸 |
| 2.305 | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.405 | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.505 | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.605 | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.705 | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.805 | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.905 | 8 | 40 | 72 | 3 | 6 | 60°凹 |
| 2.955 ～ 2.995 | 8 | 40 | 72 | 3 | 6 | 60°凹 |
| 3.005 ～ 3.045 | 8 | 40 | 72 | 直径と同径※1 | 6 | 60°凹 |
| 3.105 | 8 | 40 | 75 | | 6 | 60°凹 |
| 3.205 | 8 | 40 | 75 | | 6 | 60°凹 |
| 3.305 | 8 | 40 | 75 | | 6 | 60°凹 |
| 3.405 | 8 | 40 | 75 | | 6 | 60°凹 |
| 3.505 | 8 | 40 | 75 | | 6 | 60°凹 |
| 3.605 | 8 | 40 | 80 | | 6 | 60°凹 |
| 3.705 | 8 | 40 | 80 | | 6 | 60°凹 |
| 3.805 | 8 | 40 | 80 | | 6 | 60°凹 |
| 3.905 | 8 | 40 | 80 | | 6 | 60°凹 |
| 3.955 ～ 3.995 | 8 | 40 | 80 | | 6 | 60°凹 |
| 4.005 ～ 4.045 | 8 | 40 | 80 | | 6 | 60°凹 |
| 4.105 | 9 | 45 | 85 | | 6 | 60°凹 |
| 4.205 | 9 | 45 | 85 | | 6 | 60°凹 |
| 4.305 | 9 | 45 | 85 | | 6 | 60°凹 |
| 4.405 | 9 | 45 | 85 | | 6 | 60°凹 |
| 4.505 | 9 | 45 | 85 | | 6 | 60°凹 |
| 4.605 | 9 | 45 | 90 | | 6 | 60°凹 |
| 4.705 | 9 | 45 | 90 | | 6 | 60°凹 |
| 4.805 | 9 | 45 | 90 | | 6 | 60°凹 |
| 4.905 | 9 | 45 | 90 | | 6 | 60°凹 |
| 4.955 ～ 4.995 | 9 | 45 | 90 | | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 5.005 ～ 5.045 | 9 | 45 | 90 | 直径と同径※1 | 6 | 60°凹 |
| 5.105 | 10 | 45 | 95 | | 6 | 60°凹 |
| 5.205 | 10 | 45 | 95 | | 6 | 60°凹 |
| 5.305 | 10 | 45 | 95 | | 6 | 60°凹 |
| 5.405 | 10 | 45 | 95 | | 6 | 60°凹 |
| 5.505 | 10 | 45 | 95 | | 6 | 60°凹 |
| 5.605 | 10 | 50 | 100 | | 6 | 60°凹 |
| 5.705 | 10 | 50 | 100 | | 6 | 60°凹 |
| 5.805 | 10 | 50 | 100 | | 6 | 60°凹 |
| 5.905 | 10 | 50 | 100 | | 6 | 60°凹 |
| 5.955 ～ 5.995 | 10 | 50 | 100 | | 6 | 60°凹 |
| 6.005 ～ 6.045 | 10 | 50 | 100 | | 6 | 60°凹 |
| 6.105 | 10 | 50 | 100 | | 6 | 60°凹 |
| 6.205 | 10 | 50 | 100 | | 6 | 60°凹 |
| 6.305 | 10 | 50 | 100 | | 6 | 60°凹 |
| 6.405 | 10 | 50 | 100 | | 6 | 60°凹 |
| 6.505 | 10 | 50 | 100 | | 6 | 60°凹 |
| 6.605 | 11 | 55 | 105 | | 6 | 60°凹 |
| 6.705 | 11 | 55 | 105 | | 6 | 60°凹 |
| 6.805 | 11 | 55 | 105 | | 6 | 60°凹 |
| 6.905 | 11 | 55 | 105 | | 6 | 60°凹 |
| 6.955 ～ 6.995 | 11 | 55 | 105 | | 6 | 60°凹 |
| 7.005 ～ 7.045 | 11 | 55 | 105 | | 6 | 60°凹 |
| 7.105 | 11 | 55 | 110 | | 6 | 60°凹 |
| 7.205 | 11 | 55 | 110 | | 6 | 60°凹 |
| 7.305 | 11 | 55 | 110 | | 6 | 60°凹 |
| 7.405 | 11 | 55 | 110 | | 6 | 60°凹 |
| 7.505 | 11 | 55 | 110 | | 6 | 60°凹 |
| 7.605 | 12 | 60 | 115 | | 6 | 60°凹 |
| 7.705 | 12 | 60 | 115 | | 6 | 60°凹 |
| 7.805 | 12 | 60 | 115 | | 6 | 60°凹 |
| 7.905 | 12 | 60 | 115 | | 6 | 60°凹 |
| 7.955 ～ 7.995 | 12 | 60 | 115 | | 6 | 60°凹 |
| 8.005 ～ 8.045 | 12 | 60 | 115 | | 6 | 60°凹 |
| 8.105 | 12 | 60 | 120 | | 6 | 60°凹 |
| 8.205 | 12 | 60 | 120 | | 6 | 60°凹 |
| 8.305 | 12 | 60 | 120 | | 6 | 60°凹 |
| 8.405 | 12 | 60 | 120 | | 6 | 60°凹 |
| 8.505 | 12 | 60 | 120 | | 6 | 60°凹 |
| 8.605 | 13 | 65 | 125 | | 6 | 60°凹 |
| 8.705 | 13 | 65 | 125 | | 6 | 60°凹 |
| 8.805 | 13 | 65 | 125 | | 6 | 60°凹 |
| 8.905 | 13 | 65 | 125 | | 6 | 60°凹 |
| 8.955 ～ 8.995 | 13 | 65 | 125 | | 6 | 60°凹 |
| 9.005 ～ 9.045 | 13 | 65 | 125 | | 6 | 60°凹 |
| 9.955 ～ 9.995 | 14 | 70 | 130 | | 6 | 60°凹 |
| 10.005 ～ 10.045 | 14 | 70 | 130 | | 6 | 60°凹 |
| 10.955 ～ 10.995 | 15 | 75 | 140 | | 6 | 60°凹 |
| 11.005 ～ 11.045 | 15 | 75 | 140 | | 6 | 60°凹 |
| 11.955 ～ 11.995 | 15 | 75 | 150 | | 6 | 60°凹 |
| 12.005 ～ 12.045 | 15 | 75 | 150 | | 6 | 60°凹 |

※1 Shank diameter is same as ϕD

ハイス

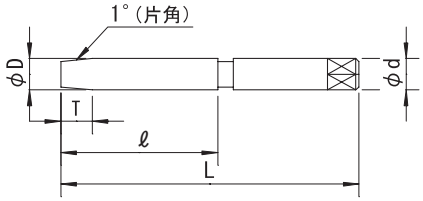
# SPHR

## スパイラルハンドリーマ　*Spiral Hand Reamer*

切削条件表 P140

貫通穴加工(スパイラル刃)　左ネジレ12°　食付1°　HSS




| 公差 (Tolerance) | D | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|
| 0.01 トビ Increment 0.01 | +0.005 0 | 2 ～ 3 | +0.007 +0.002 | 3.1～ 6 | +0.009 +0.004 | 6.1～ 10 | +0.012 +0.006 | | −0.02 −0.05 |
| 10.1～18 | +0.015 +0.007 | 18.1～30 | +0.017 +0.008 | 32 ～40 | +0.02 +0.009 | | | | |

右刃左ネジレ12°　食付角度1°　SKH51
Helix Angle-Left12°　Chamfer Angle1°　HSS

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| 2 | 6 | 30 | 60 | 3 | 4 | 60°凸 |
| 2.1 | 6 | 30 | 60 | 3 | 4 | 60°凸 |
| 2.2 | 6 | 30 | 60 | 3 | 4 | 60°凸 |
| 2.3 | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.4 | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.5 | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.6 | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.7 | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.8 | 7 | 35 | 65 | 3 | 4 | 60°凸 |
| 2.9 | 8 | 40 | 72 | 3 | 6 | 60°凹 |
| 3 | 8 | 40 | 72 | 3 | 6 | 60°凹 |
| 3.1 | 8 | 40 | 72 | 3.1 | 6 | 60°凹 |
| 3.2 | 8 | 40 | 75 | 3.2 | 6 | 60°凹 |
| 3.3 | 8 | 40 | 75 | 3.3 | 6 | 60°凹 |
| 3.4 | 8 | 40 | 75 | 3.4 | 6 | 60°凹 |
| 3.5 | 8 | 40 | 75 | 3.5 | 6 | 60°凹 |
| 3.6 | 8 | 40 | 75 | 3.6 | 6 | 60°凹 |
| 3.7 | 8 | 40 | 80 | 3.7 | 6 | 60°凹 |
| 3.8 | 8 | 40 | 80 | 3.8 | 6 | 60°凹 |
| 3.9 | 8 | 40 | 80 | 3.9 | 6 | 60°凹 |
| 4 | 8 | 40 | 80 | 4 | 6 | 60°凹 |
| 4.1 | 8 | 40 | 80 | 4.1 | 6 | 60°凹 |
| 4.2 | 9 | 45 | 85 | 4.2 | 6 | 60°凹 |
| 4.3 | 9 | 45 | 85 | 4.3 | 6 | 60°凹 |
| 4.4 | 9 | 45 | 85 | 4.4 | 6 | 60°凹 |
| 4.5 | 9 | 45 | 85 | 4.5 | 6 | 60°凹 |
| 4.6 | 9 | 45 | 85 | 4.6 | 6 | 60°凹 |
| 4.7 | 9 | 45 | 90 | 4.7 | 6 | 60°凹 |
| 4.8 | 9 | 45 | 90 | 4.8 | 6 | 60°凹 |
| 4.9 | 9 | 45 | 90 | 4.9 | 6 | 60°凹 |
| 5 | 9 | 45 | 90 | 5 | 6 | 60°凹 |
| 5.1 | 9 | 45 | 90 | 5.1 | 6 | 60°凹 |
| 5.2 | 10 | 45 | 95 | 5.2 | 6 | 60°凹 |
| 5.3 | 10 | 45 | 95 | 5.3 | 6 | 60°凹 |
| 5.4 | 10 | 45 | 95 | 5.4 | 6 | 60°凹 |
| 5.5 | 10 | 45 | 95 | 5.5 | 6 | 60°凹 |
| 5.6 | 10 | 45 | 95 | 5.6 | 6 | 60°凹 |
| 5.7 | 10 | 50 | 100 | 5.7 | 6 | 60°凹 |
| 5.8 | 10 | 50 | 100 | 5.8 | 6 | 60°凹 |
| 5.9 | 10 | 50 | 100 | 5.9 | 6 | 60°凹 |
| 6 | 10 | 50 | 100 | 6 | 6 | 60°凹 |
| 6.1 | 10 | 50 | 100 | 6.1 | 6 | 60°凹 |
| 6.2 | 10 | 50 | 100 | 6.2 | 6 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| 6.3 | 10 | 50 | 100 | 6.3 | 6 | 60°凹 |
| 6.4 | 10 | 50 | 100 | 6.4 | 6 | 60°凹 |
| 6.5 | 10 | 50 | 100 | 6.5 | 6 | 60°凹 |
| 6.6 | 10 | 50 | 100 | 6.6 | 6 | 60°凹 |
| 6.7 | 11 | 55 | 105 | 6.7 | 6 | 60°凹 |
| 6.8 | 11 | 55 | 105 | 6.8 | 6 | 60°凹 |
| 6.9 | 11 | 55 | 105 | 6.9 | 6 | 60°凹 |
| 7 | 11 | 55 | 105 | 7 | 6 | 60°凹 |
| 7.1 | 11 | 55 | 105 | 7.1 | 6 | 60°凹 |
| 7.2 | 11 | 55 | 110 | 7.2 | 6 | 60°凹 |
| 7.3 | 11 | 55 | 110 | 7.3 | 6 | 60°凹 |
| 7.4 | 11 | 55 | 110 | 7.4 | 6 | 60°凹 |
| 7.5 | 11 | 55 | 110 | 7.5 | 6 | 60°凹 |
| 7.6 | 11 | 55 | 110 | 7.6 | 6 | 60°凹 |
| 7.7 | 12 | 60 | 115 | 7.7 | 6 | 60°凹 |
| 7.8 | 12 | 60 | 115 | 7.8 | 6 | 60°凹 |
| 7.9 | 12 | 60 | 115 | 7.9 | 6 | 60°凹 |
| 8 | 12 | 60 | 115 | 8 | 6 | 60°凹 |
| 8.1 | 12 | 60 | 115 | 8.1 | 6 | 60°凹 |
| 8.2 | 12 | 60 | 120 | 8.2 | 6 | 60°凹 |
| 8.3 | 12 | 60 | 120 | 8.3 | 6 | 60°凹 |
| 8.4 | 12 | 60 | 120 | 8.4 | 6 | 60°凹 |
| 8.5 | 12 | 60 | 120 | 8.5 | 6 | 60°凹 |
| 8.6 | 12 | 60 | 120 | 8.6 | 6 | 60°凹 |
| 8.7 | 13 | 65 | 125 | 8.7 | 6 | 60°凹 |
| 8.8 | 13 | 65 | 125 | 8.8 | 6 | 60°凹 |
| 8.9 | 13 | 65 | 125 | 8.9 | 6 | 60°凹 |
| 9 | 13 | 65 | 125 | 9 | 6 | 60°凹 |
| 9.1 | 13 | 65 | 125 | 9.1 | 6 | 60°凹 |
| 9.2 | 13 | 65 | 125 | 9.2 | 6 | 60°凹 |
| 9.3 | 13 | 65 | 125 | 9.3 | 6 | 60°凹 |
| 9.4 | 13 | 65 | 125 | 9.4 | 6 | 60°凹 |
| 9.5 | 13 | 65 | 125 | 9.5 | 6 | 60°凹 |
| 9.6 | 13 | 65 | 125 | 9.6 | 6 | 60°凹 |
| 9.7 | 14 | 70 | 130 | 9.7 | 6 | 60°凹 |
| 9.8 | 14 | 70 | 130 | 9.8 | 6 | 60°凹 |
| 9.9 | 14 | 70 | 130 | 9.9 | 6 | 60°凹 |
| 10 | 14 | 70 | 130 | 10 | 6 | 60°凹 |
| 10.1 | 14 | 70 | 130 | 10.1 | 6 | 60°凹 |
| 10.2 | 14 | 70 | 135 | 10.2 | 6 | 60°凹 |
| 10.3 | 14 | 70 | 135 | 10.3 | 6 | 60°凹 |
| 10.4 | 14 | 70 | 135 | 10.4 | 6 | 60°凹 |
| 10.5 | 14 | 70 | 135 | 10.5 | 6 | 60°凹 |

# SPHR スパイラルハンドリーマ

| 直径（ΦD） Dia. | 食付長（T） Chamfer Length | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. | 刃数（N） Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **10.6** | 14 | 70 | 135 | 10.6 | 6 | 60°凹 |
| **10.7** | 15 | 75 | 140 | 10.7 | 6 | 60°凹 |
| **10.8** | 15 | 75 | 140 | 10.8 | 6 | 60°凹 |
| **10.9** | 15 | 75 | 140 | 10.9 | 6 | 60°凹 |
| **11** | 15 | 75 | 140 | 11 | 6 | 60°凹 |
| **11.1** | 15 | 75 | 140 | 11.1 | 6 | 60°凹 |
| **11.2** | 15 | 75 | 145 | 11.2 | 6 | 60°凹 |
| **11.3** | 15 | 75 | 145 | 11.3 | 6 | 60°凹 |
| **11.4** | 15 | 75 | 145 | 11.4 | 6 | 60°凹 |
| **11.5** | 15 | 75 | 145 | 11.5 | 6 | 60°凹 |
| **11.6** | 15 | 75 | 145 | 11.6 | 6 | 60°凹 |
| **11.7** | 15 | 75 | 150 | 11.7 | 6 | 60°凹 |
| **11.8** | 15 | 75 | 150 | 11.8 | 6 | 60°凹 |
| **11.9** | 15 | 75 | 150 | 11.9 | 6 | 60°凹 |
| **12** | 15 | 75 | 150 | 12 | 6 | 60°凹 |
| **12.1** | 15 | 75 | 150 | 12.1 | 6 | 60°凹 |
| **12.2** | 16 | 80 | 155 | 12.2 | 6 | 60°凹 |
| **12.3** | 16 | 80 | 155 | 12.3 | 6 | 60°凹 |
| **12.4** | 16 | 80 | 155 | 12.4 | 6 | 60°凹 |
| **12.5** | 16 | 80 | 155 | 12.5 | 6 | 60°凹 |
| **12.6** | 16 | 80 | 155 | 12.6 | 6 | 60°凹 |
| **12.7** | 16 | 80 | 160 | 12.7 | 8 | 60°凹 |
| **12.8** | 16 | 80 | 160 | 12.8 | 8 | 60°凹 |
| **12.9** | 16 | 80 | 160 | 12.9 | 8 | 60°凹 |
| **13** | 16 | 80 | 160 | 13 | 8 | 60°凹 |
| **13.1** | 16 | 80 | 160 | 13.1 | 8 | 60°凹 |
| **13.2** | 17 | 85 | 165 | 13.2 | 8 | 60°凹 |
| **13.3** | 17 | 85 | 165 | 13.3 | 8 | 60°凹 |
| **13.4** | 17 | 85 | 165 | 13.4 | 8 | 60°凹 |
| **13.5** | 17 | 85 | 165 | 13.5 | 8 | 60°凹 |
| **13.6** | 17 | 85 | 165 | 13.6 | 8 | 60°凹 |
| **13.7** | 17 | 85 | 165 | 13.7 | 8 | 60°凹 |
| **13.8** | 17 | 85 | 165 | 13.8 | 8 | 60°凹 |
| **13.9** | 17 | 85 | 165 | 13.9 | 8 | 60°凹 |
| **14** | 17 | 85 | 165 | 14 | 8 | 60°凹 |
| **14.1** | 17 | 85 | 165 | 14.1 | 8 | 60°凹 |
| **14.2** | 18 | 90 | 170 | 14.2 | 8 | 60°凹 |
| **14.3** | 18 | 90 | 170 | 14.3 | 8 | 60°凹 |
| **14.4** | 18 | 90 | 170 | 14.4 | 8 | 60°凹 |
| **14.5** | 18 | 90 | 170 | 14.5 | 8 | 60°凹 |
| **14.6** | 18 | 90 | 170 | 14.6 | 8 | 60°凹 |
| **14.7** | 18 | 90 | 175 | 14.7 | 8 | 60°凹 |
| **14.8** | 18 | 90 | 175 | 14.8 | 8 | 60°凹 |
| **14.9** | 18 | 90 | 175 | 14.9 | 8 | 60°凹 |
| **15** | 18 | 90 | 175 | 15 | 8 | 60°凹 |
| **15.1** | 18 | 90 | 175 | 15.1 | 8 | 60°凹 |
| **15.2** | 19 | 95 | 185 | 15.2 | 8 | 60°凹 |
| **15.3** | 19 | 95 | 185 | 15.3 | 8 | 60°凹 |
| **15.4** | 19 | 95 | 185 | 15.4 | 8 | 60°凹 |
| **15.5** | 19 | 95 | 185 | 15.5 | 8 | 60°凹 |
| **15.6** | 19 | 95 | 185 | 15.6 | 8 | 60°凹 |
| **15.7** | 19 | 95 | 185 | 15.7 | 8 | 60°凹 |
| **15.8** | 19 | 95 | 185 | 15.8 | 8 | 60°凹 |
| **15.9** | 19 | 95 | 185 | 15.9 | 8 | 60°凹 |
| **16** | 19 | 95 | 185 | 16 | 8 | 60°凹 |
| **16.1** | 19 | 95 | 185 | 16.1 | 8 | 60°凹 |
| **16.2** | 20 | 100 | 190 | 16.2 | 8 | 60°凹 |
| **16.3** | 20 | 100 | 190 | 16.3 | 8 | 60°凹 |
| **16.4** | 20 | 100 | 190 | 16.4 | 8 | 60°凹 |
| **16.5** | 20 | 100 | 190 | 16.5 | 8 | 60°凹 |
| **16.6** | 20 | 100 | 190 | 16.6 | 8 | 60°凹 |
| **16.7** | 20 | 100 | 190 | 16.7 | 8 | 60°凹 |
| **16.8** | 20 | 100 | 190 | 16.8 | 8 | 60°凹 |
| **16.9** | 20 | 100 | 190 | 16.9 | 8 | 60°凹 |

| 直径（ΦD） Dia. | 食付長（T） Chamfer Length | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. | 刃数（N） Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **17** | 20 | 100 | 190 | 17 | 8 | 60°凹 |
| **17.1** | 20 | 100 | 190 | 17.1 | 8 | 60°凹 |
| **17.2** | 21 | 105 | 200 | 17.2 | 8 | 60°凹 |
| **17.3** | 21 | 105 | 200 | 17.3 | 8 | 60°凹 |
| **17.4** | 21 | 105 | 200 | 17.4 | 8 | 60°凹 |
| **17.5** | 21 | 105 | 200 | 17.5 | 8 | 60°凹 |
| **17.6** | 21 | 105 | 200 | 17.6 | 8 | 60°凹 |
| **17.7** | 21 | 105 | 200 | 17.7 | 8 | 60°凹 |
| **17.8** | 21 | 105 | 200 | 17.8 | 8 | 60°凹 |
| **17.9** | 21 | 105 | 200 | 17.9 | 8 | 60°凹 |
| **18** | 21 | 105 | 200 | 18 | 8 | 60°凹 |
| **18.1** | 21 | 105 | 200 | 18.1 | 8 | 60°凹 |
| **18.2** | 21 | 105 | 210 | 18.2 | 8 | 60°凹 |
| **18.3** | 21 | 105 | 210 | 18.3 | 8 | 60°凹 |
| **18.4** | 21 | 105 | 210 | 18.4 | 8 | 60°凹 |
| **18.5** | 21 | 105 | 210 | 18.5 | 8 | 60°凹 |
| **18.6** | 21 | 105 | 210 | 18.6 | 8 | 60°凹 |
| **18.7** | 21 | 105 | 210 | 18.7 | 8 | 60°凹 |
| **18.8** | 21 | 105 | 210 | 18.8 | 8 | 60°凹 |
| **18.9** | 21 | 105 | 210 | 18.9 | 8 | 60°凹 |
| **19** | 21 | 105 | 210 | 19 | 8 | 60°凹 |
| **19.1** | 21 | 105 | 210 | 19.1 | 8 | 60°凹 |
| **19.2** | 22 | 110 | 220 | 19.2 | 8 | 60°凹 |
| **19.3** | 22 | 110 | 220 | 19.3 | 8 | 60°凹 |
| **19.4** | 22 | 110 | 220 | 19.4 | 8 | 60°凹 |
| **19.5** | 22 | 110 | 220 | 19.5 | 8 | 60°凹 |
| **19.6** | 22 | 110 | 220 | 19.6 | 8 | 60°凹 |
| **19.7** | 22 | 110 | 220 | 19.7 | 8 | 60°凹 |
| **19.8** | 22 | 110 | 220 | 19.8 | 8 | 60°凹 |
| **19.9** | 22 | 110 | 220 | 19.9 | 8 | 60°凹 |
| **20** | 22 | 110 | 220 | 20 | 8 | 60°凹 |
| **20.1** | 22 | 110 | 220 | 20.1 | 8 | 60°凹 |
| **20.2** | 24 | 120 | 230 | 20.2 | 8 | 60°凹 |
| **20.3** | 24 | 120 | 230 | 20.3 | 8 | 60°凹 |
| **20.4** | 24 | 120 | 230 | 20.4 | 8 | 60°凹 |
| **20.5** | 24 | 120 | 230 | 20.5 | 8 | 60°凹 |
| **20.6** | 24 | 120 | 230 | 20.6 | 8 | 60°凹 |
| **20.7** | 24 | 120 | 230 | 20.7 | 8 | 60°凹 |
| **20.8** | 24 | 120 | 230 | 20.8 | 8 | 60°凹 |
| **20.9** | 24 | 120 | 230 | 20.9 | 8 | 60°凹 |
| **21** | 24 | 120 | 230 | 21 | 8 | 60°凹 |
| **21.1** | 24 | 120 | 230 | 21.1 | 8 | 60°凹 |
| **21.2** | 24 | 120 | 235 | 21.2 | 8 | 60°凹 |
| **21.3** | 24 | 120 | 235 | 21.3 | 8 | 60°凹 |
| **21.4** | 24 | 120 | 235 | 21.4 | 8 | 60°凹 |
| **21.5** | 24 | 120 | 235 | 21.5 | 8 | 60°凹 |
| **21.6** | 24 | 120 | 235 | 21.6 | 8 | 60°凹 |
| **21.7** | 24 | 120 | 235 | 21.7 | 8 | 60°凹 |
| **21.8** | 24 | 120 | 235 | 21.8 | 8 | 60°凹 |
| **21.9** | 24 | 120 | 235 | 21.9 | 8 | 60°凹 |
| **22** | 24 | 120 | 235 | 22 | 8 | 60°凹 |
| **22.1** | 24 | 120 | 235 | 22.1 | 8 | 60°凹 |
| **22.2** | 25 | 130 | 250 | 22.2 | 8 | 60°凹 |
| **22.3** | 25 | 130 | 250 | 22.3 | 8 | 60°凹 |
| **22.4** | 25 | 130 | 250 | 22.4 | 8 | 60°凹 |
| **22.5** | 25 | 130 | 250 | 22.5 | 8 | 60°凹 |
| **22.6** | 25 | 130 | 250 | 22.6 | 8 | 60°凹 |
| **22.7** | 25 | 130 | 250 | 22.7 | 8 | 60°凹 |
| **22.8** | 25 | 130 | 250 | 22.8 | 8 | 60°凹 |
| **22.9** | 25 | 130 | 250 | 22.9 | 8 | 60°凹 |
| **23** | 25 | 130 | 250 | 23 | 8 | 60°凹 |
| **23.1** | 25 | 130 | 250 | 23.1 | 8 | 60°凹 |
| **23.2** | 25 | 130 | 255 | 23.2 | 8 | 60°凹 |
| **23.3** | 25 | 130 | 255 | 23.3 | 8 | 60°凹 |

# SPHR スパイラルハンドリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **23.4** | 25 | 130 | 255 | 23.4 | 8 | 60°凹 |
| **23.5** | 25 | 130 | 255 | 23.5 | 8 | 60°凹 |
| **23.6** | 25 | 130 | 255 | 23.6 | 8 | 60°凹 |
| **23.7** | 25 | 130 | 255 | 23.7 | 8 | 60°凹 |
| **23.8** | 25 | 130 | 255 | 23.8 | 8 | 60°凹 |
| **23.9** | 25 | 130 | 255 | 23.9 | 8 | 60°凹 |
| **24** | 25 | 130 | 255 | 24 | 8 | 60°凹 |
| **24.5** | 25 | 130 | 260 | 24.5 | 8 | 60°凹 |
| **25** | 25 | 130 | 260 | 25 | 8 | 60°凹 |
| **26** | 25 | 140 | 270 | 26 | 10 | 60°凹 |
| **27** | 25 | 140 | 290 | 27 | 10 | 60°凹 |
| **28** | 25 | 140 | 290 | 28 | 10 | 60°凹 |
| **29** | 25 | 150 | 305 | 29 | 10 | 60°凹 |
| **30** | 25 | 150 | 305 | 30 | 10 | 60°凹 |
| **32** | 25 | 160 | 315 | 32 | 10 | 60°凹 |
| **35** | 25 | 165 | 320 | 35 | 10 | 60°凹 |
| **36** | 25 | 165 | 320 | 36 | 10 | 60°凹 |
| **37** | 25 | 165 | 325 | 37 | 10 | 60°凹 |
| **38** | 25 | 165 | 325 | 38 | 10 | 60°凹 |
| **40** | 25 | 165 | 330 | 40 | 12 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **1/8** | 8 | 40 | 75 | 1/8 | 6 | 60°凹 |
| **5/32** | 8 | 40 | 80 | 5/32 | 6 | 60°凹 |
| **3/16** | 9 | 45 | 90 | 3/16 | 6 | 60°凹 |
| **7/32** | 10 | 45 | 95 | 7/32 | 6 | 60°凹 |
| **1/4** | 10 | 50 | 100 | 1/4 | 6 | 60°凹 |
| **5/16** | 12 | 60 | 115 | 5/16 | 6 | 60°凹 |
| **3/8** | 13 | 65 | 125 | 3/8 | 6 | 60°凹 |
| **7/16** | 15 | 75 | 145 | 7/16 | 6 | 60°凹 |
| **1/2** | 16 | 80 | 160 | 1/2 | 8 | 60°凹 |
| **5/8** | 19 | 95 | 185 | 5/8 | 8 | 60°凹 |
| **3/4** | 21 | 105 | 210 | 3/4 | 8 | 60°凹 |
| **7/8** | 25 | 130 | 250 | 7/8 | 8 | 60°凹 |
| **1"** | 25 | 140 | 270 | 1" | 10 | 60°凹 |
| **1"1/4** | 25 | 160 | 315 | 1"1/4 | 10 | 60°凹 |
| **2"** | 25 | 180 | 360 | 2" | 12 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **2.01 ～ 2.09** | 6 | 30 | 60 | 3 | 4 | 60°凸 |
| **3.01 ～ 3.09** | 8 | 40 | 72 | 直径と同径 ※1 | 6 | 60°凹 |
| **3.95 ～ 3.99** | 8 | 40 | 80 | | 6 | 60°凹 |
| **4.01 ～ 4.09** | 8 | 40 | 80 | | 6 | 60°凹 |
| **4.95 ～ 4.99** | 9 | 45 | 90 | | 6 | 60°凹 |
| **5.01 ～ 5.09** | 9 | 45 | 90 | | 6 | 60°凹 |
| **5.95 ～ 5.99** | 10 | 50 | 100 | | 6 | 60°凹 |
| **6.01 ～ 6.09** | 10 | 50 | 100 | | 6 | 60°凹 |
| **6.95 ～ 6.99** | 11 | 55 | 105 | | 6 | 60°凹 |
| **7.01 ～ 7.09** | 11 | 55 | 105 | | 6 | 60°凹 |
| **7.95 ～ 7.99** | 12 | 60 | 115 | | 6 | 60°凹 |
| **8.01 ～ 8.09** | 12 | 60 | 115 | | 6 | 60°凹 |
| **8.95 ～ 8.99** | 13 | 65 | 125 | | 6 | 60°凹 |
| **9.01 ～ 9.09** | 13 | 65 | 125 | | 6 | 60°凹 |
| **9.95 ～ 9.99** | 14 | 70 | 130 | | 6 | 60°凹 |
| **10.01 ～ 10.09** | 14 | 70 | 130 | | 6 | 60°凹 |
| **10.95 ～ 10.99** | 15 | 75 | 140 | | 6 | 60°凹 |
| **11.01 ～ 11.09** | 15 | 75 | 140 | | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **11.95 ～ 11.99** | 15 | 75 | 150 | 直径と同径 ※1 | 6 | 60°凹 |
| **12.01 ～ 12.09** | 15 | 75 | 150 | | 6 | 60°凹 |
| **12.95 ～ 12.99** | 16 | 80 | 160 | | 8 | 60°凹 |
| **13.01 ～ 13.09** | 16 | 80 | 160 | | 8 | 60°凹 |
| **13.95 ～ 13.99** | 17 | 85 | 165 | | 8 | 60°凹 |
| **14.01 ～ 14.09** | 17 | 85 | 165 | | 8 | 60°凹 |
| **14.95 ～ 14.99** | 18 | 90 | 175 | | 8 | 60°凹 |
| **15.01 ～ 15.09** | 18 | 90 | 175 | | 8 | 60°凹 |
| **15.95 ～ 15.99** | 19 | 95 | 185 | | 8 | 60°凹 |
| **16.01 ～ 16.09** | 19 | 95 | 185 | | 8 | 60°凹 |
| **16.95 ～ 16.99** | 20 | 100 | 190 | | 8 | 60°凹 |
| **17.01 ～ 17.09** | 20 | 100 | 190 | | 8 | 60°凹 |
| **17.95 ～ 17.99** | 21 | 105 | 200 | | 8 | 60°凹 |
| **18.01 ～ 18.09** | 21 | 105 | 200 | | 8 | 60°凹 |
| **18.95 ～ 18.99** | 21 | 105 | 210 | | 8 | 60°凹 |
| **19.01 ～ 19.09** | 21 | 105 | 210 | | 8 | 60°凹 |
| **19.95 ～ 19.99** | 22 | 110 | 220 | | 8 | 60°凹 |
| **20.01 ～ 20.09** | 22 | 110 | 220 | | 8 | 60°凹 |

※1 Shank diameter is same as ϕD

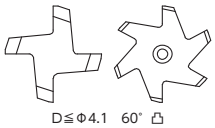
ハイス

# LHR

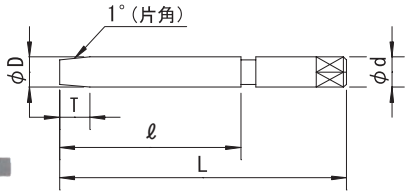
## ロングハンドリーマ　*Long Hand Reamer*

切削条件表 P140

貫通穴加工（ストレート刃）　右直刃　食付1°　HSS






| 公差 (Tolerance) | D | | | | | | d |
|---|---|---|---|---|---|---|---|
| | 0.01 トビ Increment 0.01 | +0.005 0 | 1 ～ 3 | +0.007 +0.002 | 3.1～ 6 | +0.009 +0.004 | −0.02 −0.05 |
| | 6.1～10 | +0.012 +0.006 | 10.1～18 | +0.015 +0.007 | 18.5～26 | +0.017 +0.008 | |

右刃ストレート　食付角度1°　SKH51
Straight Flute　Chamfer Angle1°　HSS

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| 1 | 4 | 40 | 80 | 3 | 4 | 60° |
| 2 | 6 | 50 | 80 | 3 | 4 | 60° |
| | 6 | 50 | 100 | 3 | 4 | 60° |
| | 6 | 60 | 100 | 3 | 4 | 60° |
| 2.1 | 6 | 50 | 80 | 3 | 4 | 60° |
| | 6 | 50 | 100 | 3 | 4 | 60° |
| | 6 | 60 | 100 | 3 | 4 | 60° |
| 2.2 | 6 | 50 | 80 | 3 | 4 | 60° |
| | 6 | 50 | 100 | 3 | 4 | 60° |
| | 6 | 60 | 100 | 3 | 4 | 60° |
| 2.3 | 7 | 50 | 80 | 3 | 4 | 60° |
| | 7 | 50 | 100 | 3 | 4 | 60° |
| | 7 | 60 | 100 | 3 | 4 | 60° |
| 2.4 | 7 | 50 | 80 | 3 | 4 | 60° |
| | 7 | 50 | 100 | 3 | 4 | 60° |
| | 7 | 60 | 100 | 3 | 4 | 60° |
| 2.5 | 7 | 60 | 100 | 3 | 4 | 60° |
| 2.6 | 7 | 60 | 100 | 3 | 4 | 60° |
| 2.7 | 7 | 60 | 100 | 3 | 4 | 60° |
| 2.8 | 7 | 60 | 100 | 3 | 4 | 60° |
| 2.9 | 8 | 60 | 100 | 3 | 6 | 60° |
| 3 | 8 | 60 | 100 | 3 | 6 | 60° |
| | 8 | 80 | 120 | 3 | 6 | 60° |
| | 8 | 100 | 130 | 3 | 6 | 60° |
| | 8 | 100 | 150 | 3 | 6 | 60° |
| | 8 | 120 | 170 | 3 | 6 | 60° |
| 3.01 | 8 | 80 | 120 | 3.01 | 6 | 60° |
| 3.02 | 8 | 80 | 120 | 3.02 | 6 | 60° |
| 3.03 | 8 | 80 | 120 | 3.03 | 6 | 60° |
| 3.04 | 8 | 80 | 120 | 3.04 | 6 | 60° |
| 3.05 | 8 | 80 | 120 | 3.05 | 6 | 60° |
| 3.06 | 8 | 80 | 120 | 3.06 | 6 | 60° |
| 3.07 | 8 | 80 | 120 | 3.07 | 6 | 60° |
| 3.08 | 8 | 80 | 120 | 3.08 | 6 | 60° |
| 3.09 | 8 | 80 | 120 | 3.09 | 6 | 60° |
| 3.1 | 8 | 80 | 120 | 3.1 | 6 | 60° |
| | 8 | 100 | 130 | 3.1 | 6 | 60° |
| | 8 | 100 | 140 | 3.1 | 6 | 60° |
| 3.2 | 8 | 80 | 120 | 3.2 | 6 | 60° |
| | 8 | 100 | 130 | 3.2 | 6 | 60° |
| | 8 | 100 | 140 | 3.2 | 6 | 60° |
| 3.3 | 8 | 80 | 120 | 3.3 | 6 | 60° |
| | 8 | 100 | 130 | 3.3 | 6 | 60° |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| 3.3 | 8 | 100 | 140 | 3.3 | 6 | 60° |
| 3.4 | 8 | 80 | 120 | 3.4 | 6 | 60° |
| | 8 | 100 | 130 | 3.4 | 6 | 60° |
| | 8 | 100 | 140 | 3.4 | 6 | 60° |
| 3.5 | 8 | 60 | 100 | 3.5 | 6 | 60° |
| | 8 | 80 | 120 | 3.5 | 6 | 60° |
| | 8 | 80 | 130 | 3.5 | 6 | 60° |
| | 8 | 100 | 130 | 3.5 | 6 | 60° |
| | 8 | 100 | 150 | 3.5 | 6 | 60° |
| | 8 | 150 | 200 | 3.5 | 6 | 60° |
| 3.6 | 8 | 60 | 100 | 3.6 | 6 | 60° |
| | 8 | 80 | 120 | 3.6 | 6 | 60° |
| | 8 | 100 | 130 | 3.6 | 6 | 60° |
| | 8 | 100 | 140 | 3.6 | 6 | 60° |
| 3.7 | 8 | 60 | 100 | 3.7 | 6 | 60° |
| | 8 | 80 | 120 | 3.7 | 6 | 60° |
| | 8 | 100 | 130 | 3.7 | 6 | 60° |
| | 8 | 100 | 140 | 3.7 | 6 | 60° |
| 3.8 | 8 | 60 | 100 | 3.8 | 6 | 60° |
| | 8 | 80 | 120 | 3.8 | 6 | 60° |
| | 8 | 100 | 130 | 3.8 | 6 | 60° |
| | 8 | 100 | 140 | 3.8 | 6 | 60° |
| 3.9 | 8 | 60 | 100 | 3.9 | 6 | 60° |
| | 8 | 80 | 120 | 3.9 | 6 | 60° |
| | 8 | 100 | 130 | 3.9 | 6 | 60° |
| | 8 | 100 | 140 | 3.9 | 6 | 60° |
| 4 | 8 | 60 | 100 | 4 | 6 | 60° |
| | 8 | 80 | 120 | 4 | 6 | 60° |
| | 8 | 100 | 140 | 4 | 6 | 60° |
| | 8 | 100 | 150 | 4 | 6 | 60° |
| | 8 | 120 | 170 | 4 | 6 | 60° |
| | 8 | 150 | 200 | 4 | 6 | 60° |
| 4.01 | 8 | 100 | 140 | 4.01 | 6 | 60° |
| 4.02 | 8 | 100 | 140 | 4.02 | 6 | 60° |
| 4.03 | 8 | 100 | 140 | 4.03 | 6 | 60° |
| 4.04 | 8 | 100 | 140 | 4.04 | 6 | 60° |
| 4.05 | 8 | 100 | 140 | 4.05 | 6 | 60° |
| 4.06 | 8 | 100 | 140 | 4.06 | 6 | 60° |
| 4.07 | 8 | 100 | 140 | 4.07 | 6 | 60° |
| 4.08 | 8 | 100 | 140 | 4.08 | 6 | 60° |
| 4.09 | 8 | 100 | 140 | 4.09 | 6 | 60° |
| 4.1 | 8 | 100 | 140 | 4.1 | 6 | 60° |
| | 8 | 120 | 170 | 4.1 | 6 | 60° |

※60°は2013.6月規格変更あり

# LHR ロングハンドリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 4.2 | 9 | 100 | 140 | 4.2 | 6 | 60° 凹 |
| | 9 | 120 | 170 | 4.2 | 6 | 60° 凹 |
| 4.3 | 9 | 100 | 140 | 4.3 | 6 | 60° 凹 |
| | 9 | 120 | 170 | 4.3 | 6 | 60° 凹 |
| 4.4 | 9 | 100 | 140 | 4.4 | 6 | 60° 凹 |
| | 9 | 120 | 170 | 4.4 | 6 | 60° 凹 |
| 4.5 | 9 | 80 | 120 | 4.5 | 6 | 60° 凹 |
| | 9 | 100 | 150 | 4.5 | 6 | 60° 凹 |
| | 9 | 120 | 170 | 4.5 | 6 | 60° 凹 |
| | 9 | 150 | 200 | 4.5 | 6 | 60° 凹 |
| 4.6 | 9 | 100 | 140 | 4.6 | 6 | 60° 凹 |
| | 9 | 120 | 170 | 4.6 | 6 | 60° 凹 |
| 4.7 | 9 | 100 | 140 | 4.7 | 6 | 60° 凹 |
| | 9 | 120 | 170 | 4.7 | 6 | 60° 凹 |
| 4.8 | 9 | 100 | 140 | 4.8 | 6 | 60° 凹 |
| | 9 | 120 | 170 | 4.8 | 6 | 60° 凹 |
| 4.9 | 9 | 100 | 140 | 4.9 | 6 | 60° 凹 |
| | 9 | 120 | 170 | 4.9 | 6 | 60° 凹 |
| 5 | 9 | 100 | 140 | 5 | 6 | 60° 凹 |
| | 9 | 100 | 150 | 5 | 6 | 60° 凹 |
| | 9 | 120 | 170 | 5 | 6 | 60° 凹 |
| | 9 | 150 | 200 | 5 | 6 | 60° 凹 |
| 5.01 | 9 | 120 | 170 | 5.01 | 6 | 60° 凹 |
| 5.02 | 9 | 120 | 170 | 5.02 | 6 | 60° 凹 |
| 5.03 | 9 | 120 | 170 | 5.03 | 6 | 60° 凹 |
| 5.04 | 9 | 120 | 170 | 5.04 | 6 | 60° 凹 |
| 5.05 | 9 | 120 | 170 | 5.05 | 6 | 60° 凹 |
| 5.06 | 9 | 120 | 170 | 5.06 | 6 | 60° 凹 |
| 5.07 | 9 | 120 | 170 | 5.07 | 6 | 60° 凹 |
| 5.08 | 9 | 120 | 170 | 5.08 | 6 | 60° 凹 |
| 5.09 | 9 | 120 | 170 | 5.09 | 6 | 60° 凹 |
| 5.1 | 9 | 100 | 140 | 5.1 | 6 | 60° 凹 |
| | 9 | 120 | 170 | 5.1 | 6 | 60° 凹 |
| | 9 | 150 | 200 | 5.1 | 6 | 60° 凹 |
| 5.2 | 10 | 100 | 140 | 5.2 | 6 | 60° 凹 |
| | 10 | 120 | 170 | 5.2 | 6 | 60° 凹 |
| | 10 | 150 | 200 | 5.2 | 6 | 60° 凹 |
| 5.3 | 10 | 100 | 140 | 5.3 | 6 | 60° 凹 |
| | 10 | 120 | 170 | 5.3 | 6 | 60° 凹 |
| | 10 | 150 | 200 | 5.3 | 6 | 60° 凹 |
| 5.4 | 10 | 120 | 170 | 5.4 | 6 | 60° 凹 |
| | 10 | 150 | 200 | 5.4 | 6 | 60° 凹 |
| 5.5 | 10 | 120 | 170 | 5.5 | 6 | 60° 凹 |
| | 10 | 150 | 200 | 5.5 | 6 | 60° 凹 |
| 5.6 | 10 | 120 | 170 | 5.6 | 6 | 60° 凹 |
| | 10 | 150 | 200 | 5.6 | 6 | 60° 凹 |
| 5.7 | 10 | 120 | 170 | 5.7 | 6 | 60° 凹 |
| | 10 | 150 | 200 | 5.7 | 6 | 60° 凹 |
| 5.8 | 10 | 120 | 170 | 5.8 | 6 | 60° 凹 |
| | 10 | 150 | 200 | 5.8 | 6 | 60° 凹 |
| 5.9 | 10 | 120 | 170 | 5.9 | 6 | 60° 凹 |
| | 10 | 150 | 200 | 5.9 | 6 | 60° 凹 |
| 6 | 10 | 120 | 170 | 6 | 6 | 60° 凹 |
| | 10 | 150 | 200 | 6 | 6 | 60° 凹 |
| | 10 | 150 | 210 | 6 | 6 | 60° 凹 |
| 6.01 | 10 | 120 | 170 | 6.01 | 6 | 60° 凹 |
| 6.02 | 10 | 120 | 170 | 6.02 | 6 | 60° 凹 |
| 6.03 | 10 | 120 | 170 | 6.03 | 6 | 60° 凹 |
| 6.04 | 10 | 120 | 170 | 6.04 | 6 | 60° 凹 |
| 6.05 | 10 | 120 | 170 | 6.05 | 6 | 60° 凹 |
| 6.06 | 10 | 120 | 170 | 6.06 | 6 | 60° 凹 |
| 6.07 | 10 | 120 | 170 | 6.07 | 6 | 60° 凹 |
| 6.08 | 10 | 120 | 170 | 6.08 | 6 | 60° 凹 |
| 6.09 | 10 | 120 | 170 | 6.09 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 6.1 | 10 | 120 | 170 | 6.1 | 6 | 60° 凹 |
| | 10 | 150 | 200 | 6.1 | 6 | 60° 凹 |
| 6.2 | 10 | 120 | 170 | 6.2 | 6 | 60° 凹 |
| | 10 | 150 | 200 | 6.2 | 6 | 60° 凹 |
| 6.3 | 10 | 120 | 170 | 6.3 | 6 | 60° 凹 |
| | 10 | 150 | 200 | 6.3 | 6 | 60° 凹 |
| 6.4 | 10 | 120 | 170 | 6.4 | 6 | 60° 凹 |
| | 10 | 150 | 200 | 6.4 | 6 | 60° 凹 |
| 6.5 | 10 | 120 | 170 | 6.5 | 6 | 60° 凹 |
| | 10 | 150 | 200 | 6.5 | 6 | 60° 凹 |
| | 10 | 150 | 210 | 6.5 | 6 | 60° 凹 |
| 6.6 | 10 | 120 | 170 | 6.6 | 6 | 60° 凹 |
| | 10 | 150 | 200 | 6.6 | 6 | 60° 凹 |
| 6.7 | 11 | 120 | 170 | 6.7 | 6 | 60° 凹 |
| | 11 | 150 | 200 | 6.7 | 6 | 60° 凹 |
| 6.8 | 11 | 120 | 170 | 6.8 | 6 | 60° 凹 |
| | 11 | 150 | 200 | 6.8 | 6 | 60° 凹 |
| 6.9 | 11 | 120 | 170 | 6.9 | 6 | 60° 凹 |
| | 11 | 150 | 200 | 6.9 | 6 | 60° 凹 |
| 7 | 11 | 120 | 170 | 7 | 6 | 60° 凹 |
| | 11 | 150 | 200 | 7 | 6 | 60° 凹 |
| | 11 | 150 | 210 | 7 | 6 | 60° 凹 |
| 7.01 | 11 | 120 | 170 | 7.01 | 6 | 60° 凹 |
| | 11 | 150 | 210 | 7.01 | 6 | 60° 凹 |
| 7.02 | 11 | 120 | 170 | 7.02 | 6 | 60° 凹 |
| | 11 | 150 | 210 | 7.02 | 6 | 60° 凹 |
| 7.03 | 11 | 120 | 170 | 7.03 | 6 | 60° 凹 |
| | 11 | 150 | 210 | 7.03 | 6 | 60° 凹 |
| 7.04 | 11 | 120 | 170 | 7.04 | 6 | 60° 凹 |
| | 11 | 150 | 210 | 7.04 | 6 | 60° 凹 |
| 7.05 | 11 | 120 | 170 | 7.05 | 6 | 60° 凹 |
| | 11 | 150 | 210 | 7.05 | 6 | 60° 凹 |
| 7.06 | 11 | 150 | 210 | 7.06 | 6 | 60° 凹 |
| 7.07 | 11 | 120 | 170 | 7.07 | 6 | 60° 凹 |
| | 11 | 150 | 210 | 7.07 | 6 | 60° 凹 |
| 7.08 | 11 | 120 | 170 | 7.08 | 6 | 60° 凹 |
| | 11 | 150 | 210 | 7.08 | 6 | 60° 凹 |
| 7.09 | 11 | 120 | 170 | 7.09 | 6 | 60° 凹 |
| | 11 | 150 | 210 | 7.09 | 6 | 60° 凹 |
| 7.1 | 11 | 120 | 170 | 7.1 | 6 | 60° 凹 |
| | 11 | 150 | 200 | 7.1 | 6 | 60° 凹 |
| | 11 | 150 | 210 | 7.1 | 6 | 60° 凹 |
| 7.2 | 11 | 120 | 170 | 7.2 | 6 | 60° 凹 |
| | 11 | 150 | 200 | 7.2 | 6 | 60° 凹 |
| | 11 | 150 | 210 | 7.2 | 6 | 60° 凹 |
| 7.3 | 11 | 120 | 170 | 7.3 | 6 | 60° 凹 |
| | 11 | 150 | 200 | 7.3 | 6 | 60° 凹 |
| | 11 | 150 | 210 | 7.3 | 6 | 60° 凹 |
| 7.4 | 11 | 120 | 170 | 7.4 | 6 | 60° 凹 |
| | 11 | 150 | 200 | 7.4 | 6 | 60° 凹 |
| | 11 | 150 | 210 | 7.4 | 6 | 60° 凹 |
| 7.5 | 11 | 120 | 170 | 7.5 | 6 | 60° 凹 |
| | 11 | 120 | 200 | 7.5 | 6 | 60° 凹 |
| | 11 | 130 | 200 | 7.5 | 6 | 60° 凹 |
| | 11 | 150 | 200 | 7.5 | 6 | 60° 凹 |
| | 11 | 150 | 210 | 7.5 | 6 | 60° 凹 |
| 7.6 | 11 | 120 | 170 | 7.6 | 6 | 60° 凹 |
| | 11 | 150 | 200 | 7.6 | 6 | 60° 凹 |
| | 11 | 150 | 210 | 7.6 | 6 | 60° 凹 |
| 7.7 | 12 | 120 | 170 | 7.7 | 6 | 60° 凹 |
| | 12 | 150 | 200 | 7.7 | 6 | 60° 凹 |
| | 12 | 150 | 210 | 7.7 | 6 | 60° 凹 |
| 7.8 | 12 | 120 | 170 | 7.8 | 6 | 60° 凹 |
| | 12 | 150 | 200 | 7.8 | 6 | 60° 凹 |
| | 12 | 150 | 210 | 7.8 | 6 | 60° 凹 |

# LHR ロングハンドリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **7.9** | 12 | 120 | 170 | 7.9 | 6 | 60°凹 |
| | 12 | 150 | 200 | 7.9 | 6 | 60°凹 |
| | 12 | 150 | 210 | 7.9 | 6 | 60°凹 |
| **8** | 12 | 120 | 170 | 8 | 6 | 60°凹 |
| | 12 | 150 | 200 | 8 | 6 | 60°凹 |
| | 12 | 150 | 210 | 8 | 6 | 60°凹 |
| | 12 | 150 | 250 | 8 | 6 | 60°凹 |
| | 12 | 200 | 250 | 8 | 6 | 60°凹 |
| | 12 | 200 | 270 | 8 | 6 | 60°凹 |
| | 12 | 250 | 350 | 8 | 6 | 60°凹 |
| **8.01** | 12 | 150 | 210 | 8.01 | 6 | 60°凹 |
| **8.02** | 12 | 150 | 210 | 8.02 | 6 | 60°凹 |
| **8.03** | 12 | 150 | 210 | 8.03 | 6 | 60°凹 |
| **8.04** | 12 | 150 | 210 | 8.04 | 6 | 60°凹 |
| **8.05** | 12 | 150 | 210 | 8.05 | 6 | 60°凹 |
| **8.06** | 12 | 150 | 210 | 8.06 | 6 | 60°凹 |
| **8.07** | 12 | 150 | 210 | 8.07 | 6 | 60°凹 |
| **8.08** | 12 | 150 | 210 | 8.08 | 6 | 60°凹 |
| **8.09** | 12 | 150 | 210 | 8.09 | 6 | 60°凹 |
| **8.1** | 12 | 150 | 200 | 8.1 | 6 | 60°凹 |
| | 12 | 150 | 210 | 8.1 | 6 | 60°凹 |
| **8.2** | 12 | 150 | 200 | 8.2 | 6 | 60°凹 |
| | 12 | 150 | 210 | 8.2 | 6 | 60°凹 |
| **8.3** | 12 | 150 | 200 | 8.3 | 6 | 60°凹 |
| | 12 | 150 | 210 | 8.3 | 6 | 60°凹 |
| **8.4** | 12 | 150 | 200 | 8.4 | 6 | 60°凹 |
| | 12 | 150 | 210 | 8.4 | 6 | 60°凹 |
| **8.5** | 12 | 120 | 170 | 8.5 | 6 | 60°凹 |
| | 12 | 130 | 200 | 8.5 | 6 | 60°凹 |
| | 12 | 150 | 200 | 8.5 | 6 | 60°凹 |
| | 12 | 150 | 210 | 8.5 | 6 | 60°凹 |
| | 12 | 200 | 270 | 8.5 | 6 | 60°凹 |
| | 12 | 250 | 350 | 8.5 | 6 | 60°凹 |
| **8.6** | 12 | 150 | 200 | 8.6 | 6 | 60°凹 |
| | 12 | 150 | 210 | 8.6 | 6 | 60°凹 |
| **8.7** | 13 | 150 | 200 | 8.7 | 6 | 60°凹 |
| | 13 | 150 | 210 | 8.7 | 6 | 60°凹 |
| **8.8** | 13 | 150 | 200 | 8.8 | 6 | 60°凹 |
| | 13 | 150 | 210 | 8.8 | 6 | 60°凹 |
| **8.9** | 13 | 150 | 200 | 8.9 | 6 | 60°凹 |
| | 13 | 150 | 210 | 8.9 | 6 | 60°凹 |
| **9** | 13 | 150 | 200 | 9 | 6 | 60°凹 |
| | 13 | 150 | 210 | 9 | 6 | 60°凹 |
| | 13 | 150 | 250 | 9 | 6 | 60°凹 |
| | 13 | 200 | 270 | 9 | 6 | 60°凹 |
| | 13 | 250 | 350 | 9 | 6 | 60°凹 |
| **9.01** | 13 | 150 | 210 | 9.01 | 6 | 60°凹 |
| **9.02** | 13 | 150 | 210 | 9.02 | 6 | 60°凹 |
| **9.03** | 13 | 150 | 210 | 9.03 | 6 | 60°凹 |
| **9.04** | 13 | 150 | 210 | 9.04 | 6 | 60°凹 |
| **9.05** | 13 | 150 | 210 | 9.05 | 6 | 60°凹 |
| **9.06** | 13 | 150 | 210 | 9.06 | 6 | 60°凹 |
| **9.07** | 13 | 150 | 210 | 9.07 | 6 | 60°凹 |
| **9.08** | 13 | 150 | 210 | 9.08 | 6 | 60°凹 |
| **9.09** | 13 | 150 | 210 | 9.09 | 6 | 60°凹 |
| **9.1** | 13 | 150 | 200 | 9.1 | 6 | 60°凹 |
| | 13 | 150 | 210 | 9.1 | 6 | 60°凹 |
| **9.2** | 13 | 150 | 200 | 9.2 | 6 | 60°凹 |
| | 13 | 150 | 210 | 9.2 | 6 | 60°凹 |
| **9.3** | 13 | 150 | 200 | 9.3 | 6 | 60°凹 |
| | 13 | 150 | 210 | 9.3 | 6 | 60°凹 |
| **9.4** | 13 | 150 | 200 | 9.4 | 6 | 60°凹 |
| | 13 | 150 | 210 | 9.4 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **9.5** | 13 | 150 | 200 | 9.5 | 6 | 60°凹 |
| | 13 | 150 | 210 | 9.5 | 6 | 60°凹 |
| | 13 | 200 | 270 | 9.5 | 6 | 60°凹 |
| | 13 | 250 | 350 | 9.5 | 6 | 60°凹 |
| **9.6** | 13 | 150 | 200 | 9.6 | 6 | 60°凹 |
| | 13 | 150 | 210 | 9.6 | 6 | 60°凹 |
| **9.7** | 14 | 150 | 200 | 9.7 | 6 | 60°凹 |
| | 14 | 150 | 210 | 9.7 | 6 | 60°凹 |
| **9.8** | 14 | 150 | 200 | 9.8 | 6 | 60°凹 |
| | 14 | 150 | 210 | 9.8 | 6 | 60°凹 |
| **9.9** | 14 | 150 | 200 | 9.9 | 6 | 60°凹 |
| | 14 | 150 | 210 | 9.9 | 6 | 60°凹 |
| **10** | 14 | 150 | 200 | 10 | 6 | 60°凹 |
| | 14 | 150 | 210 | 10 | 6 | 60°凹 |
| | 14 | 200 | 250 | 10 | 6 | 60°凹 |
| | 14 | 200 | 270 | 10 | 6 | 60°凹 |
| | 14 | 250 | 350 | 10 | 6 | 60°凹 |
| **10.01** | 14 | 150 | 210 | 10.01 | 6 | 60°凹 |
| **10.02** | 14 | 150 | 210 | 10.02 | 6 | 60°凹 |
| **10.03** | 14 | 150 | 210 | 10.03 | 6 | 60°凹 |
| **10.04** | 14 | 150 | 210 | 10.04 | 6 | 60°凹 |
| **10.05** | 14 | 150 | 210 | 10.05 | 6 | 60°凹 |
| **10.06** | 14 | 150 | 210 | 10.06 | 6 | 60°凹 |
| **10.07** | 14 | 150 | 210 | 10.07 | 6 | 60°凹 |
| **10.08** | 14 | 150 | 210 | 10.08 | 6 | 60°凹 |
| **10.09** | 14 | 150 | 210 | 10.09 | 6 | 60°凹 |
| **10.1** | 14 | 150 | 210 | 10.1 | 6 | 60°凹 |
| **10.2** | 14 | 150 | 210 | 10.2 | 6 | 60°凹 |
| **10.3** | 14 | 150 | 210 | 10.3 | 6 | 60°凹 |
| **10.4** | 14 | 150 | 210 | 10.4 | 6 | 60°凹 |
| **10.5** | 14 | 150 | 210 | 10.5 | 6 | 60°凹 |
| | 14 | 200 | 250 | 10.5 | 6 | 60°凹 |
| | 14 | 200 | 270 | 10.5 | 6 | 60°凹 |
| | 14 | 250 | 350 | 10.5 | 6 | 60°凹 |
| **10.6** | 14 | 150 | 210 | 10.6 | 6 | 60°凹 |
| **10.7** | 15 | 150 | 210 | 10.7 | 6 | 60°凹 |
| **10.8** | 15 | 150 | 210 | 10.8 | 6 | 60°凹 |
| **10.9** | 15 | 150 | 210 | 10.9 | 6 | 60°凹 |
| **11** | 15 | 150 | 200 | 11 | 6 | 60°凹 |
| | 15 | 150 | 210 | 11 | 6 | 60°凹 |
| | 15 | 200 | 250 | 11 | 6 | 60°凹 |
| | 15 | 200 | 270 | 11 | 6 | 60°凹 |
| | 15 | 250 | 350 | 11 | 6 | 60°凹 |
| **11.01** | 15 | 150 | 210 | 11.01 | 6 | 60°凹 |
| **11.02** | 15 | 150 | 210 | 11.02 | 6 | 60°凹 |
| **11.03** | 15 | 150 | 210 | 11.03 | 6 | 60°凹 |
| **11.04** | 15 | 150 | 210 | 11.04 | 6 | 60°凹 |
| **11.05** | 15 | 150 | 210 | 11.05 | 6 | 60°凹 |
| **11.06** | 15 | 150 | 210 | 11.06 | 6 | 60°凹 |
| **11.07** | 15 | 150 | 210 | 11.07 | 6 | 60°凹 |
| **11.08** | 15 | 150 | 210 | 11.08 | 6 | 60°凹 |
| **11.09** | 15 | 150 | 210 | 11.09 | 6 | 60°凹 |
| **11.1** | 15 | 150 | 210 | 11.1 | 6 | 60°凹 |
| **11.2** | 15 | 150 | 210 | 11.2 | 6 | 60°凹 |
| **11.3** | 15 | 150 | 210 | 11.3 | 6 | 60°凹 |
| **11.4** | 15 | 150 | 210 | 11.4 | 6 | 60°凹 |
| **11.5** | 15 | 150 | 210 | 11.5 | 6 | 60°凹 |
| **11.6** | 15 | 150 | 210 | 11.6 | 6 | 60°凹 |
| | 15 | 160 | 230 | 11.6 | 6 | 60°凹 |
| **11.7** | 15 | 150 | 210 | 11.7 | 6 | 60°凹 |
| | 15 | 160 | 230 | 11.7 | 6 | 60°凹 |
| **11.8** | 15 | 150 | 210 | 11.8 | 6 | 60°凹 |
| | 15 | 160 | 230 | 11.8 | 6 | 60°凹 |
| **11.9** | 15 | 150 | 210 | 11.9 | 6 | 60°凹 |

# LHR ロングハンドリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **11.9** | 15 | 160 | 230 | 11.9 | 6 | 60°凹 |
| **12** | 15 | 150 | 210 | 12 | 6 | 60°凹 |
| | 15 | 160 | 230 | 12 | 6 | 60°凹 |
| | 15 | 200 | 250 | 12 | 6 | 60°凹 |
| | 15 | 200 | 270 | 12 | 6 | 60°凹 |
| | 15 | 250 | 350 | 12 | 6 | 60°凹 |
| **12.01** | 15 | 160 | 230 | 12.01 | 6 | 60°凹 |
| **12.02** | 15 | 160 | 230 | 12.02 | 6 | 60°凹 |
| **12.03** | 15 | 160 | 230 | 12.03 | 6 | 60°凹 |
| **12.04** | 15 | 160 | 230 | 12.04 | 6 | 60°凹 |
| **12.05** | 15 | 160 | 230 | 12.05 | 6 | 60°凹 |
| **12.06** | 15 | 160 | 230 | 12.06 | 6 | 60°凹 |
| **12.07** | 15 | 160 | 230 | 12.07 | 6 | 60°凹 |
| **12.08** | 15 | 160 | 230 | 12.08 | 6 | 60°凹 |
| **12.09** | 15 | 160 | 230 | 12.09 | 6 | 60°凹 |
| **12.1** | 15 | 160 | 230 | 12.1 | 6 | 60°凹 |
| | 15 | 200 | 270 | 12.1 | 6 | 60°凹 |
| **12.2** | 16 | 160 | 230 | 12.2 | 6 | 60°凹 |
| | 16 | 200 | 270 | 12.2 | 6 | 60°凹 |
| **12.3** | 16 | 160 | 230 | 12.3 | 6 | 60°凹 |
| | 16 | 200 | 270 | 12.3 | 6 | 60°凹 |
| **12.4** | 16 | 160 | 230 | 12.4 | 6 | 60°凹 |
| | 16 | 200 | 270 | 12.4 | 6 | 60°凹 |
| **12.5** | 16 | 160 | 230 | 12.5 | 6 | 60°凹 |
| | 16 | 200 | 270 | 12.5 | 6 | 60°凹 |
| **12.6** | 16 | 160 | 230 | 12.6 | 6 | 60°凹 |
| | 16 | 200 | 270 | 12.6 | 6 | 60°凹 |
| **12.7** | 16 | 160 | 230 | 12.7 | 8 | 60°凹 |
| | 16 | 200 | 270 | 12.7 | 8 | 60°凹 |
| **12.8** | 16 | 160 | 230 | 12.8 | 8 | 60°凹 |
| | 16 | 200 | 270 | 12.8 | 8 | 60°凹 |
| **12.9** | 16 | 160 | 230 | 12.9 | 8 | 60°凹 |
| | 16 | 200 | 270 | 12.9 | 8 | 60°凹 |
| **13** | 16 | 160 | 230 | 13 | 8 | 60°凹 |
| | 16 | 200 | 250 | 13 | 8 | 60°凹 |
| | 16 | 200 | 270 | 13 | 8 | 60°凹 |
| | 16 | 200 | 280 | 13 | 8 | 60°凹 |
| **13.01** | 16 | 160 | 230 | 13.01 | 8 | 60°凹 |
| **13.02** | 16 | 160 | 230 | 13.02 | 8 | 60°凹 |
| **13.03** | 16 | 160 | 230 | 13.03 | 8 | 60°凹 |
| **13.04** | 16 | 160 | 230 | 13.04 | 8 | 60°凹 |
| **13.05** | 16 | 160 | 230 | 13.05 | 8 | 60°凹 |
| **13.06** | 16 | 160 | 230 | 13.06 | 8 | 60°凹 |
| **13.07** | 16 | 160 | 230 | 13.07 | 8 | 60°凹 |
| **13.08** | 16 | 160 | 230 | 13.08 | 8 | 60°凹 |
| **13.09** | 16 | 160 | 230 | 13.09 | 8 | 60°凹 |
| **13.1** | 16 | 160 | 230 | 13.1 | 8 | 60°凹 |
| | 16 | 200 | 270 | 13.1 | 8 | 60°凹 |
| **13.2** | 17 | 160 | 230 | 13.2 | 8 | 60°凹 |
| | 17 | 200 | 270 | 13.2 | 8 | 60°凹 |
| **13.3** | 17 | 160 | 230 | 13.3 | 8 | 60°凹 |
| | 17 | 200 | 270 | 13.3 | 8 | 60°凹 |
| **13.4** | 17 | 160 | 230 | 13.4 | 8 | 60°凹 |
| | 17 | 200 | 270 | 13.4 | 8 | 60°凹 |
| **13.5** | 17 | 160 | 230 | 13.5 | 8 | 60°凹 |
| | 17 | 200 | 270 | 13.5 | 8 | 60°凹 |
| | 17 | 200 | 280 | 13.5 | 8 | 60°凹 |
| **13.6** | 17 | 160 | 230 | 13.6 | 8 | 60°凹 |
| | 17 | 200 | 270 | 13.6 | 8 | 60°凹 |
| **13.7** | 17 | 160 | 230 | 13.7 | 8 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **13.7** | 17 | 200 | 270 | 13.7 | 8 | 60°凹 |
| **13.8** | 17 | 160 | 230 | 13.8 | 8 | 60°凹 |
| | 17 | 200 | 270 | 13.8 | 8 | 60°凹 |
| **13.9** | 17 | 160 | 230 | 13.9 | 8 | 60°凹 |
| | 17 | 200 | 270 | 13.9 | 8 | 60°凹 |
| **14** | 17 | 160 | 230 | 14 | 8 | 60°凹 |
| | 17 | 160 | 240 | 14 | 8 | 60°凹 |
| | 17 | 200 | 280 | 14 | 8 | 60°凹 |
| **14.01** | 17 | 160 | 230 | 14.01 | 8 | 60°凹 |
| **14.02** | 17 | 160 | 230 | 14.02 | 8 | 60°凹 |
| **14.03** | 17 | 160 | 230 | 14.03 | 8 | 60°凹 |
| **14.04** | 17 | 160 | 230 | 14.04 | 8 | 60°凹 |
| **14.05** | 17 | 160 | 230 | 14.05 | 8 | 60°凹 |
| **14.06** | 17 | 160 | 230 | 14.06 | 8 | 60°凹 |
| **14.07** | 17 | 160 | 230 | 14.07 | 8 | 60°凹 |
| **14.08** | 17 | 160 | 230 | 14.08 | 8 | 60°凹 |
| **14.09** | 17 | 160 | 230 | 14.09 | 8 | 60°凹 |
| **14.5** | 18 | 160 | 230 | 14.5 | 8 | 60°凹 |
| | 18 | 200 | 270 | 14.5 | 8 | 60°凹 |
| **15** | 18 | 160 | 230 | 15 | 8 | 60°凹 |
| | 18 | 200 | 280 | 15 | 8 | 60°凹 |
| | 18 | 200 | 300 | 15 | 8 | 60°凹 |
| **15.5** | 19 | 180 | 250 | 15.5 | 8 | 60°凹 |
| | 19 | 200 | 300 | 15.5 | 8 | 60°凹 |
| **16** | 19 | 180 | 280 | 16 | 8 | 60°凹 |
| | 19 | 200 | 300 | 16 | 8 | 60°凹 |
| **16.5** | 20 | 200 | 270 | 16.5 | 8 | 60°凹 |
| | 20 | 200 | 300 | 16.5 | 8 | 60°凹 |
| **17** | 20 | 200 | 300 | 17 | 8 | 60°凹 |
| **17.5** | 21 | 200 | 280 | 17.5 | 8 | 60°凹 |
| | 21 | 200 | 300 | 17.5 | 8 | 60°凹 |
| **18** | 21 | 200 | 300 | 18 | 8 | 60°凹 |
| | 21 | 270 | 370 | 18 | 8 | 60°凹 |
| **18.5** | 21 | 200 | 300 | 18.5 | 8 | 60°凹 |
| **19** | 21 | 200 | 300 | 19 | 8 | 60°凹 |
| **19.5** | 22 | 200 | 300 | 19.5 | 8 | 60°凹 |
| **20** | 22 | 200 | 250 | 20 | 8 | 60°凹 |
| | 22 | 200 | 300 | 20 | 8 | 60°凹 |
| | 22 | 250 | 350 | 20 | 8 | 60°凹 |
| **20.5** | 24 | 200 | 300 | 20.5 | 8 | 60°凹 |
| **21** | 24 | 200 | 300 | 21 | 8 | 60°凹 |
| **21.5** | 24 | 200 | 300 | 21.5 | 8 | 60°凹 |
| **22** | 24 | 200 | 300 | 22 | 8 | 60°凹 |
| **22.5** | 25 | 200 | 300 | 22.5 | 8 | 60°凹 |
| **23** | 25 | 200 | 300 | 23 | 8 | 60°凹 |
| **23.5** | 25 | 200 | 300 | 23.5 | 8 | 60°凹 |
| **24** | 25 | 200 | 300 | 24 | 8 | 60°凹 |
| **24.5** | 25 | 200 | 300 | 24.5 | 8 | 60°凹 |
| **25** | 25 | 200 | 300 | 25 | 8 | 60°凹 |
| **25.5** | 25 | 200 | 300 | 25.5 | 10 | 60°凹 |
| **26** | 25 | 200 | 300 | 26 | 10 | 60°凹 |
| | 25 | 220 | 350 | 26 | 10 | 60°凹 |
| **1/4** | 10 | 120 | 170 | 1/4 | 6 | 60°凹 |
| | 10 | 150 | 200 | 1/4 | 6 | 60°凹 |
| | 10 | 150 | 210 | 1/4 | 6 | 60°凹 |
| **5/16** | 12 | 150 | 200 | 5/16 | 6 | 60°凹 |
| **3/8** | 13 | 150 | 200 | 3/8 | 6 | 60°凹 |
| **1/2** | 16 | 160 | 230 | 1/2 | 8 | 60°凹 |
| | 16 | 200 | 270 | 1/2 | 8 | 60°凹 |

ハイス

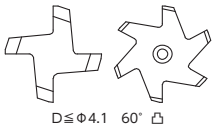
# SPLHR

## スパイラルロングハンドリーマ　*Spiral Long Hand Reamer*

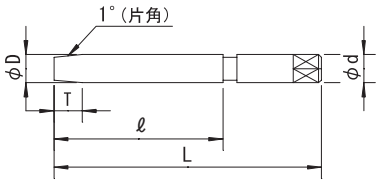
切削条件表 P140

貫通穴加工（スパイラル刃）

左ネジレ 12°　食付 1°　HSS






| 公差 (Tolerance) | D | | | | | | | | d | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | +0.007 +0.002 | 3.5～6 | +0.009 +0.004 | 6.1～10 | +0.012 +0.006 | 10.5～14 | +0.015 +0.007 | −0.02 | −0.05 |

右刃左ネジレ12°　食付角度1°　SKH51
Helix Angle-Left12°　Chamfer Angle1°　HSS

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| 3 | 8 | 80 | 120 | 3 | 6 | 60°凸 |
| | 8 | 100 | 140 | 3 | 6 | 60°凸 |
| 3.5 | 8 | 80 | 120 | 3.5 | 6 | 60°凸 |
| | 8 | 100 | 140 | 3.5 | 6 | 60°凸 |
| 4 | 8 | 100 | 140 | 4 | 6 | 60°凸 |
| | 8 | 120 | 170 | 4 | 6 | 60°凸 |
| 4.1 | 8 | 100 | 140 | 4.1 | 6 | 60°凸 |
| 4.2 | 9 | 100 | 140 | 4.2 | 6 | 60°凸 |
| 4.3 | 9 | 100 | 140 | 4.3 | 6 | 60°凸 |
| 4.4 | 9 | 100 | 140 | 4.4 | 6 | 60°凸 |
| 4.5 | 9 | 120 | 170 | 4.5 | 6 | 60°凸 |
| 4.6 | 9 | 120 | 170 | 4.6 | 6 | 60°凸 |
| 4.7 | 9 | 120 | 170 | 4.7 | 6 | 60°凸 |
| 4.8 | 9 | 120 | 170 | 4.8 | 6 | 60°凸 |
| 4.9 | 9 | 120 | 170 | 4.9 | 6 | 60°凸 |
| 5 | 9 | 120 | 170 | 5 | 6 | 60°凸 |
| 5.1 | 9 | 120 | 170 | 5.1 | 6 | 60°凸 |
| 5.2 | 10 | 120 | 170 | 5.2 | 6 | 60°凸 |
| 5.3 | 10 | 120 | 170 | 5.3 | 6 | 60°凸 |
| 5.4 | 10 | 120 | 170 | 5.4 | 6 | 60°凸 |
| 5.5 | 10 | 120 | 170 | 5.5 | 6 | 60°凸 |
| 5.6 | 10 | 120 | 170 | 5.6 | 6 | 60°凸 |
| 5.7 | 10 | 120 | 170 | 5.7 | 6 | 60°凸 |
| 5.8 | 10 | 120 | 170 | 5.8 | 6 | 60°凸 |
| 5.9 | 10 | 120 | 170 | 5.9 | 6 | 60°凸 |
| 6 | 10 | 120 | 170 | 6 | 6 | 60°凸 |
| 6.1 | 10 | 120 | 170 | 6.1 | 6 | 60°凸 |
| 6.2 | 10 | 120 | 170 | 6.2 | 6 | 60°凹 |
| 6.3 | 10 | 120 | 170 | 6.3 | 6 | 60°凹 |
| 6.4 | 10 | 120 | 170 | 6.4 | 6 | 60°凹 |
| 6.5 | 10 | 120 | 170 | 6.5 | 6 | 60°凹 |
| 6.6 | 10 | 120 | 170 | 6.6 | 6 | 60°凹 |
| 6.7 | 11 | 120 | 170 | 6.7 | 6 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| 6.8 | 11 | 120 | 170 | 6.8 | 6 | 60°凹 |
| 6.9 | 11 | 120 | 170 | 6.9 | 6 | 60°凹 |
| 7 | 11 | 120 | 170 | 7 | 6 | 60°凹 |
| 7.1 | 11 | 150 | 210 | 7.1 | 6 | 60°凹 |
| 7.2 | 11 | 150 | 210 | 7.2 | 6 | 60°凹 |
| 7.3 | 11 | 150 | 210 | 7.3 | 6 | 60°凹 |
| 7.4 | 11 | 150 | 210 | 7.4 | 6 | 60°凹 |
| 7.5 | 11 | 120 | 170 | 7.5 | 6 | 60°凹 |
| 7.6 | 11 | 150 | 210 | 7.6 | 6 | 60°凹 |
| 7.7 | 12 | 150 | 210 | 7.7 | 6 | 60°凹 |
| 7.8 | 12 | 150 | 210 | 7.8 | 6 | 60°凹 |
| 7.9 | 12 | 150 | 210 | 7.9 | 6 | 60°凹 |
| 8 | 12 | 150 | 210 | 8 | 6 | 60°凹 |
| 8.1 | 12 | 150 | 210 | 8.1 | 6 | 60°凹 |
| 8.2 | 12 | 150 | 210 | 8.2 | 6 | 60°凹 |
| 8.3 | 12 | 150 | 210 | 8.3 | 6 | 60°凹 |
| 8.4 | 12 | 150 | 210 | 8.4 | 6 | 60°凹 |
| 8.5 | 12 | 150 | 210 | 8.5 | 6 | 60°凹 |
| 8.6 | 12 | 150 | 210 | 8.6 | 6 | 60°凹 |
| 8.7 | 13 | 150 | 210 | 8.7 | 6 | 60°凹 |
| 8.8 | 13 | 150 | 210 | 8.8 | 6 | 60°凹 |
| 8.9 | 13 | 150 | 210 | 8.9 | 6 | 60°凹 |
| 9 | 13 | 150 | 210 | 9 | 6 | 60°凹 |
| 9.5 | 13 | 150 | 210 | 9.5 | 6 | 60°凹 |
| 10 | 14 | 150 | 210 | 10 | 6 | 60°凹 |
| | 14 | 200 | 280 | 10 | 6 | 60°凹 |
| 10.5 | 14 | 150 | 210 | 10.5 | 6 | 60°凹 |
| 11 | 15 | 150 | 210 | 11 | 6 | 60°凹 |
| 11.5 | 15 | 150 | 210 | 11.5 | 6 | 60°凹 |
| 12 | 15 | 200 | 270 | 12 | 6 | 60°凹 |
| | 15 | 200 | 280 | 12 | 6 | 60°凹 |
| 12.5 | 16 | 200 | 270 | 12.5 | 6 | 60°凹 |
| 13 | 16 | 200 | 270 | 13 | 8 | 60°凹 |
| 14 | 17 | 200 | 300 | 14 | 8 | 60°凹 |

※60°凸は2013.6月規格変更あり

ハイス

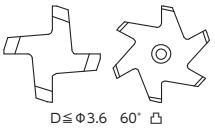
# SCR

## ストレートシャンクチャッキングリーマ　*Straight Shank Chucking Reamer*

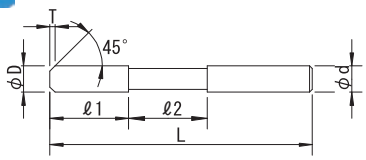
切削条件表 P141

貫通穴加工(ストレート刃)

右直刃　食付45°　HSS Co　HSS






| 公差 (Tolerance) | D | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|
| | 0.01 トビ Increment 0.01 | +0.005 0 | 1 ～ 3 | +0.007 +0.002 | 3.1～ 6 | +0.009 +0.004 | 6.1～10 | +0.012 +0.006 | h7 |
| | 0.005 トビ Increment 0.005 | +0.003 0 | 10.1～18 | +0.015 +0.007 | 18.1～30 | +0.017 +0.008 | 31 ～32 | +0.02 +0.009 | |

右刃ストレート　食付角度45°　φ10.1までSKH56 φ10.2からSKH51
Straight Flute　Chamfer Angle45°　HSS-Co. up to φ10.1
HSS　φ10.2 and over.

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| 1 | 0.2 | 15 | – | 60 | 1 | 4 | 60°凸 |
| 1.1 | 0.2 | 15 | – | 60 | 1 | 4 | 60°凸 |
| 1.2 | 0.2 | 15 | – | 60 | 1.1 | 4 | 60°凸 |
| 1.3 | 0.2 | 15 | – | 60 | 1.2 | 4 | 60°凸 |
| 1.4 | 0.2 | 15 | – | 60 | 1.3 | 4 | 60°凸 |
| 1.5 | 0.3 | 18 | – | 70 | 1.4 | 4 | 60°凸 |
| 1.6 | 0.3 | 18 | – | 70 | 1.4 | 4 | 60°凸 |
| 1.7 | 0.3 | 20 | – | 80 | 1.5 | 4 | 60°凸 |
| 1.8 | 0.3 | 20 | – | 80 | 1.6 | 4 | 60°凸 |
| 1.9 | 0.3 | 20 | – | 80 | 1.6 | 4 | 60°凸 |
| 2 | 0.4 | 20 | – | 80 | 1.8 | 4 | 60°凸 |
| 2.1 | 0.4 | 20 | – | 80 | 1.8 | 4 | 60°凸 |
| 2.2 | 0.4 | 25 | – | 90 | 2 | 4 | 60°凸 |
| 2.3 | 0.4 | 25 | – | 90 | 2 | 4 | 60°凸 |
| 2.4 | 0.4 | 25 | – | 90 | 2.2 | 4 | 60°凸 |
| 2.5 | 0.5 | 25 | – | 90 | 2.2 | 4 | 60°凸 |
| 2.6 | 0.5 | 25 | – | 90 | 2.2 | 4 | 60°凸 |
| 2.7 | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| 2.8 | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| 2.9 | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| 3 | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| 3.1 | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| 3.2 | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| 3.3 | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| 3.4 | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| 3.5 | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| 3.6 | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| 3.7 | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| 3.8 | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| 3.9 | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| 4 | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| 4.1 | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| 4.2 | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| 4.3 | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| 4.4 | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| 4.5 | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| 4.6 | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| 4.7 | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| 4.8 | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| 4.9 | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| 5 | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| 5.1 | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| 5.2 | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| 5.3 | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| 5.4 | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| 5.5 | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| 5.6 | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| 5.7 | 0.5 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| 5.8 | 0.5 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| 5.9 | 0.5 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| 6 | 0.7 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| 6.1 | 0.7 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| 6.2 | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| 6.3 | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| 6.4 | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| 6.5 | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| 6.6 | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| 6.7 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 6.8 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 6.9 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 7 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 7.1 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 7.2 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 7.3 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 7.4 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 7.5 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 7.6 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 7.7 | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| 7.8 | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| 7.9 | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| 8 | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| 8.1 | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| 8.2 | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| 8.3 | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| 8.4 | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| 8.5 | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| 8.6 | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| 8.7 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 8.8 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 8.9 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 9 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 9.1 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 9.2 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 9.3 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 9.4 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 9.5 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 9.6 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |

※60°凸は2013.6月規格変更あり

# SCR ストレートシャンクチャッキングリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **9.7** | 1 | 40 | 50 | 160 | 8 | 6 | 60° 凹 |
| **9.8** | 1 | 40 | 50 | 160 | 8 | 6 | 60° 凹 |
| **9.9** | 1 | 40 | 50 | 160 | 8 | 6 | 60° 凹 |
| **10** | 1 | 40 | 50 | 160 | 8 | 6 | 60° 凹 |
| **10.1** | 1 | 40 | 50 | 160 | 8 | 6 | 60° 凹 |
| **10.2** | 1 | 40 | 50 | 160 | 8 | 6 | 60° 凹 |
| **10.3** | 1 | 40 | 50 | 160 | 8 | 6 | 60° 凹 |
| **10.4** | 1 | 40 | 50 | 160 | 8 | 6 | 60° 凹 |
| **10.5** | 1 | 40 | 50 | 160 | 8 | 6 | 60° 凹 |
| **10.6** | 1 | 40 | 50 | 160 | 8 | 6 | 60° 凹 |
| **10.7** | 1 | 45 | 45 | 170 | 8 | 6 | 60° 凹 |
| **10.8** | 1 | 45 | 45 | 170 | 8 | 6 | 60° 凹 |
| **10.9** | 1 | 45 | 45 | 170 | 8 | 6 | 60° 凹 |
| **11** | 1 | 45 | 45 | 170 | 8 | 6 | 60° 凹 |
| **11.1** | 1 | 45 | 45 | 170 | 8 | 6 | 60° 凹 |
| **11.2** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **11.3** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **11.4** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **11.5** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **11.6** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **11.7** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **11.8** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **11.9** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **12** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **12.1** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **12.2** | 1 | 45 | 55 | 180 | 9 | 6 | 60° 凹 |
| **12.3** | 1 | 45 | 55 | 180 | 9 | 6 | 60° 凹 |
| **12.4** | 1 | 45 | 55 | 180 | 9 | 6 | 60° 凹 |
| **12.5** | 1 | 45 | 55 | 180 | 9 | 6 | 60° 凹 |
| **12.6** | 1 | 45 | 55 | 180 | 9 | 6 | 60° 凹 |
| **12.7** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **12.8** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **12.9** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **13** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **13.1** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **13.2** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **13.3** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **13.4** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **13.5** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **13.6** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **13.7** | 1 | 50 | 60 | 190 | 10 | 8 | 60° 凹 |
| **13.8** | 1 | 50 | 60 | 190 | 10 | 8 | 60° 凹 |
| **13.9** | 1 | 50 | 60 | 190 | 10 | 8 | 60° 凹 |
| **14** | 1 | 50 | 60 | 190 | 10 | 8 | 60° 凹 |
| **14.1** | 1 | 50 | 60 | 190 | 10 | 8 | 60° 凹 |
| **14.2** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **14.3** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **14.4** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **14.5** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **14.6** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **14.7** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **14.8** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **14.9** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **15** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **15.1** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **15.2** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **15.3** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **15.4** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **15.5** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **15.6** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **15.7** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **15.8** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **15.9** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **16** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **16.1** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **16.2** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **16.3** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **16.4** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **16.5** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **16.6** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **16.7** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **16.8** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **16.9** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **17** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **17.1** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **17.2** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **17.3** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **17.4** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **17.5** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **17.6** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **17.7** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **17.8** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **17.9** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.1** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.2** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.3** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.4** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.5** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.6** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.7** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.8** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.9** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **19** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **19.1** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **19.2** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **19.3** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **19.4** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **19.5** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **19.6** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **19.7** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **19.8** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **19.9** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **20** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **20.5** | 1.5 | 60 | 80 | 240 | 15* | 8 | 60° 凹 |
| **21** | 1.5 | 60 | 80 | 240 | 15* | 8 | 60° 凹 |
| **21.5** | 1.5 | 60 | 80 | 240 | 16* | 8 | 60° 凹 |
| **22** | 1.5 | 60 | 80 | 240 | 16* | 8 | 60° 凹 |
| **22.5** | 1.5 | 65 | 85 | 250 | 16* | 8 | 60° 凹 |
| **23** | 1.5 | 65 | 85 | 250 | 16* | 8 | 60° 凹 |
| **23.5** | 1.5 | 65 | 95 | 260 | 18* | 8 | 60° 凹 |
| **24** | 1.5 | 65 | 95 | 260 | 18* | 8 | 60° 凹 |
| **24.5** | 1.5 | 65 | 95 | 260 | 18* | 8 | 60° 凹 |
| **25** | 1.5 | 65 | 95 | 260 | 18* | 8 | 60° 凹 |
| **25.4** | 1.5 | 70 | 90 | 270 | 18* | 10 | 60° 凹 |
| **25.5** | 1.5 | 70 | 90 | 270 | 18* | 10 | 60° 凹 |
| **26** | 1.5 | 70 | 90 | 270 | 18* | 10 | 60° 凹 |
| **26.5** | 1.5 | 70 | 90 | 270 | 20* | 10 | 60° 凹 |
| **27** | 1.5 | 70 | 90 | 270 | 20* | 10 | 60° 凹 |
| **27.5** | 1.5 | 70 | 90 | 270 | 20* | 10 | 60° 凹 |
| **28** | 1.5 | 70 | 90 | 270 | 20* | 10 | 60° 凹 |
| **28.5** | 1.5 | 75 | 95 | 280 | 20* | 10 | 60° 凹 |
| **29** | 1.5 | 75 | 95 | 280 | 20* | 10 | 60° 凹 |
| **29.5** | 1.5 | 75 | 95 | 280 | 20* | 10 | 60° 凹 |
| **30** | 1.5 | 75 | 95 | 280 | 20* | 10 | 60° 凹 |
| **31** | 1.5 | 75 | 95 | 290 | 20* | 10 | 60° 凹 |
| **32** | 1.5 | 75 | 95 | 290 | 20* | 10 | 60° 凹 |

*シャンク径φ15以上はフラット付ストレートシャンク(Type Ⅲ)P373参照

# SCR ストレートシャンクチャッキングリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **1/8** | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| **5/32** | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| **3/16** | 1 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| **7/32** | 1 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| **1/4** | 1 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| **5/16** | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **3/8** | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| **7/16** | 1 | 45 | 45 | 170 | 9 | 6 | 60°凹 |
| **1/2** | 1 | 45 | 55 | 180 | 10 | 8 | 60°凹 |
| **5/8** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60°凹 |
| **3/4** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60°凹 |
| **1"** | 1.5 | 70 | 90 | 270 | 18 | 10 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **1.01 ～ 1.09** | 0.2 | 15 | – | 60 | 1 | 4 | 60°凸 |
| **1.11 ～ 1.19** | 0.2 | 15 | – | 60 | 1.1 | 4 | 60°凸 |
| **1.21 ～ 1.29** | 0.2 | 15 | – | 60 | 1.1 | 4 | 60°凸 |
| **1.31 ～ 1.39** | 0.2 | 15 | – | 60 | 1.2 | 4 | 60°凸 |
| **1.41 ～ 1.49** | 0.2 | 15 | – | 60 | 1.3 | 4 | 60°凸 |
| **1.51 ～ 1.59** | 0.3 | 18 | – | 70 | 1.4 | 4 | 60°凸 |
| **1.61 ～ 1.69** | 0.3 | 18 | – | 70 | 1.4 | 4 | 60°凸 |
| **1.71 ～ 1.79** | 0.3 | 20 | – | 80 | 1.5 | 4 | 60°凸 |
| **1.81 ～ 1.89** | 0.3 | 20 | – | 80 | 1.6 | 4 | 60°凸 |
| **1.91 ～ 1.99** | 0.3 | 20 | – | 80 | 1.8 | 4 | 60°凸 |
| **2.01 ～ 2.09** | 0.4 | 20 | – | 80 | 1.8 | 4 | 60°凸 |
| **2.11 ～ 2.19** | 0.4 | 25 | – | 90 | 2 | 4 | 60°凸 |
| **2.21 ～ 2.29** | 0.4 | 25 | – | 90 | 2 | 4 | 60°凸 |
| **2.31 ～ 2.39** | 0.4 | 25 | – | 90 | 2.2 | 4 | 60°凸 |
| **2.41 ～ 2.49** | 0.4 | 25 | – | 90 | 2.2 | 4 | 60°凸 |
| **2.51 ～ 2.59** | 0.5 | 25 | – | 90 | 2.2 | 4 | 60°凸 |
| **2.61 ～ 2.69** | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| **2.71 ～ 2.79** | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| **2.81 ～ 2.89** | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| **2.91 ～ 2.95** | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| **2.96 ～ 2.99** | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| **3.01 ～ 3.09** | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| **3.11 ～ 3.19** | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| **3.21 ～ 3.29** | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| **3.31 ～ 3.39** | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| **3.41 ～ 3.49** | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| **3.51 ～ 3.59** | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| **3.61 ～ 3.69** | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| **3.71 ～ 3.79** | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| **3.81 ～ 3.89** | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| **3.91 ～ 3.99** | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| **4.01 ～ 4.09** | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| **4.11 ～ 4.19** | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| **4.21 ～ 4.29** | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| **4.31 ～ 4.39** | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| **4.41 ～ 4.49** | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| **4.51 ～ 4.59** | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| **4.61 ～ 4.69** | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| **4.71 ～ 4.79** | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| **4.81 ～ 4.89** | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| **4.91 ～ 4.99** | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| **5.01 ～ 5.09** | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| **5.11 ～ 5.19** | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| **5.21 ～ 5.29** | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| **5.31 ～ 5.39** | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| **5.41 ～ 5.49** | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| **5.51 ～ 5.59** | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| **5.61 ～ 5.69** | 0.5 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| **5.71 ～ 5.79** | 0.5 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| **5.81 ～ 5.89** | 0.5 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| **5.91 ～ 5.99** | 0.7 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| **6.01 ～ 6.09** | 0.7 | 30 | 40 | 130 | 5 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **6.11 ～ 6.19** | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| **6.21 ～ 6.29** | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| **6.31 ～ 6.39** | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| **6.41 ～ 6.49** | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| **6.51 ～ 6.59** | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| **6.61 ～ 6.69** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **6.71 ～ 6.79** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **6.81 ～ 6.89** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **6.91 ～ 6.99** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **7.01 ～ 7.09** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **7.11 ～ 7.19** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **7.21 ～ 7.29** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **7.31 ～ 7.39** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **7.41 ～ 7.49** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **7.51 ～ 7.59** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **7.61 ～ 7.69** | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| **7.71 ～ 7.79** | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| **7.81 ～ 7.89** | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| **7.91 ～ 7.99** | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| **8.01 ～ 8.09** | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| **8.11 ～ 8.19** | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| **8.21 ～ 8.29** | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| **8.31 ～ 8.39** | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| **8.41 ～ 8.49** | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| **8.51 ～ 8.59** | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| **8.61 ～ 8.69** | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| **8.71 ～ 8.79** | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| **8.81 ～ 8.89** | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| **8.91 ～ 8.99** | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| **9.01 ～ 9.09** | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| **9.11 ～ 9.19** | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| **9.21 ～ 9.29** | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| **9.31 ～ 9.39** | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| **9.41 ～ 9.49** | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| **9.51 ～ 9.59** | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| **9.61 ～ 9.69** | 1 | 40 | 50 | 160 | 8 | 6 | 60°凹 |
| **9.71 ～ 9.79** | 1 | 40 | 50 | 160 | 8 | 6 | 60°凹 |
| **9.81 ～ 9.89** | 1 | 40 | 50 | 160 | 8 | 6 | 60°凹 |
| **9.91 ～ 9.99** | 1 | 40 | 50 | 160 | 8 | 6 | 60°凹 |
| **10.01 ～ 10.09** | 1 | 40 | 50 | 160 | 8 | 6 | 60°凹 |
| **10.95 ～ 10.99** | 1 | 45 | 45 | 170 | 8 | 6 | 60°凹 |
| **11.01 ～ 11.09** | 1 | 45 | 45 | 170 | 8 | 6 | 60°凹 |
| **11.95 ～ 11.99** | 1 | 45 | 45 | 170 | 9 | 6 | 60°凹 |
| **12.01 ～ 12.09** | 1 | 45 | 45 | 170 | 9 | 6 | 60°凹 |
| **12.95 ～ 12.99** | 1 | 45 | 55 | 180 | 10 | 8 | 60°凹 |
| **13.01 ～ 13.09** | 1 | 45 | 55 | 180 | 10 | 8 | 60°凹 |
| **14.01 ～ 14.09** | 1 | 50 | 60 | 190 | 10 | 8 | 60°凹 |
| **15.01 ～ 15.09** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60°凹 |
| **16.01 ～ 16.09** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60°凹 |
| **17.01 ～ 17.09** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60°凹 |
| **18.01 ～ 18.09** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60°凹 |
| **19.01 ～ 19.09** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60°凹 |
| **20.01 ～ 20.09** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60°凹 |

※60°凸は2013.6月規格変更あり

# SCR ストレートシャンクチャッキングリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **1.005 ～ 1.045** | 0.2 | 15 | – | 60 | 1 | 4 | 60°凸 |
| **1.105** | 0.2 | 15 | – | 60 | 1.1 | 4 | 60°凸 |
| **1.205** | 0.2 | 15 | – | 60 | 1.1 | 4 | 60°凸 |
| **1.305** | 0.2 | 15 | – | 60 | 1.2 | 4 | 60°凸 |
| **1.405** | 0.2 | 15 | – | 60 | 1.3 | 4 | 60°凸 |
| **1.505** | 0.3 | 18 | – | 70 | 1.4 | 4 | 60°凸 |
| **1.605** | 0.3 | 18 | – | 70 | 1.4 | 4 | 60°凸 |
| **1.705** | 0.3 | 20 | – | 80 | 1.5 | 4 | 60°凸 |
| **1.805** | 0.3 | 20 | – | 80 | 1.6 | 4 | 60°凸 |
| **1.905** | 0.3 | 20 | – | 80 | 1.8 | 4 | 60°凸 |
| **1.955 ～ 1.995** | 0.3 | 20 | – | 80 | 1.8 | 4 | 60°凸 |
| **2.005 ～ 2.045** | 0.4 | 20 | – | 80 | 1.8 | 4 | 60°凸 |
| **2.105** | 0.4 | 25 | 5 | 90 | 2 | 4 | 60°凸 |
| **2.205** | 0.4 | 25 | 5 | 90 | 2 | 4 | 60°凸 |
| **2.305** | 0.4 | 25 | 5 | 90 | 2.2 | 4 | 60°凸 |
| **2.405** | 0.4 | 25 | 5 | 90 | 2.2 | 4 | 60°凸 |
| **2.505** | 0.5 | 25 | 5 | 90 | 2.2 | 4 | 60°凸 |
| **2.605** | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| **2.705** | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| **2.805** | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| **2.905** | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| **2.955 ～ 2.995** | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| **3.005 ～ 3.045** | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| **3.105** | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| **3.205** | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| **3.305** | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| **3.405** | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| **3.505** | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| **3.605** | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| **3.705** | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| **3.805** | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| **3.905** | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| **3.955 ～ 3.995** | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| **4.005 ～ 4.045** | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| **4.105** | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| **4.205** | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| **4.305** | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| **4.405** | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| **4.505** | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| **4.605** | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| **4.705** | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| **4.805** | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| **4.905** | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| **4.955 ～ 4.995** | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| **5.005 ～ 5.045** | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| **5.105** | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| **5.205** | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| **5.305** | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **5.405** | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| **5.505** | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| **5.605** | 0.5 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| **5.705** | 0.5 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| **5.805** | 0.5 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| **5.905** | 0.7 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| **5.955 ～ 5.995** | 0.7 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| **6.005 ～ 6.045** | 0.7 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| **6.105** | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| **6.205** | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| **6.305** | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| **6.405** | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| **6.505** | 0.7 | 35 | 35 | 130 | 6 | 6 | 60°凹 |
| **6.605** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **6.705** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **6.805** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **6.905** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **6.955 ～ 6.995** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **7.005 ～ 7.045** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **7.105** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **7.205** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **7.305** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **7.405** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **7.505** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| **7.605** | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| **7.705** | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| **7.805** | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| **7.905** | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| **7.955 ～ 7.995** | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| **8.005 ～ 8.045** | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| **8.105** | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| **8.205** | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| **8.305** | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| **8.405** | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| **8.505** | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| **8.605** | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| **8.705** | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| **8.805** | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| **8.905** | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| **8.955 ～ 8.995** | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| **9.005 ～ 9.045** | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| **9.955 ～ 9.995** | 1 | 40 | 50 | 160 | 8 | 6 | 60°凹 |
| **10.005 ～ 10.045** | 1 | 40 | 50 | 160 | 8 | 6 | 60°凹 |
| **10.955 ～ 10.995** | 1 | 45 | 45 | 170 | 8 | 6 | 60°凹 |
| **11.005 ～ 11.045** | 1 | 45 | 45 | 170 | 8 | 6 | 60°凹 |
| **11.955 ～ 11.995** | 1 | 45 | 45 | 170 | 9 | 6 | 60°凹 |
| **12.005 ～ 12.045** | 1 | 45 | 45 | 170 | 9 | 6 | 60°凹 |

ハイス

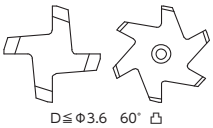
# SPSCR

## ストレートシャンクスパイラルチャッキングリーマ *Straight Shank Spiral Chucking Reamer*

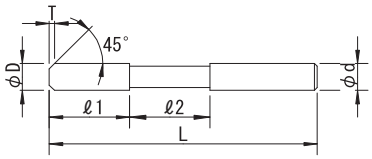
切削条件表 P141

貫通穴加工(スパイラル刃)

左ネジレ 12°　食付 45°　HSS Co






| 公差 (Tolerance) | D | | | | | | d |
|---|---|---|---|---|---|---|---|
| | 0.01トビ Increment 0.01 | +0.005 0 | 2 ～ 3 | +0.007 +0.002 | 3.1～ 6 | +0.009 +0.004 | h7 |
| | 6.1～10 | +0.012 +0.006 | 10.1～18 | +0.015 +0.007 | 18.1～25 | +0.017 +0.008 | |

右刃左ネジレ12°　食付角度45°　SKH56
Helix Angle-Left12°　Chamfer Angle45°　HSS-Co.

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| 2 | 0.5 | 20 | – | 80 | 1.8 | 4 | 60°凸 |
| 2.1 | 0.5 | 20 | – | 80 | 1.8 | 4 | 60°凸 |
| 2.2 | 0.5 | 25 | – | 90 | 2 | 4 | 60°凸 |
| 2.3 | 0.5 | 25 | – | 90 | 2 | 4 | 60°凸 |
| 2.4 | 0.5 | 25 | – | 90 | 2.2 | 4 | 60°凸 |
| 2.5 | 0.5 | 25 | – | 90 | 2.2 | 4 | 60°凸 |
| 2.6 | 0.5 | 25 | – | 90 | 2.2 | 4 | 60°凸 |
| 2.7 | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| 2.8 | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| 2.9 | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| 3 | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| 3.1 | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60°凸 |
| 3.2 | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| 3.3 | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| 3.4 | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| 3.5 | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| 3.6 | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60°凸 |
| 3.7 | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| 3.8 | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| 3.9 | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| 4 | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| 4.1 | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60°凹 |
| 4.2 | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| 4.3 | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| 4.4 | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| 4.5 | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| 4.6 | 0.5 | 30 | 40 | 120 | 3.5 | 6 | 60°凹 |
| 4.7 | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| 4.8 | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| 4.9 | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| 5 | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| 5.1 | 0.5 | 30 | 40 | 120 | 4 | 6 | 60°凹 |
| 5.2 | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| 5.3 | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| 5.4 | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| 5.5 | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| 5.6 | 0.5 | 30 | 40 | 120 | 4.5 | 6 | 60°凹 |
| 5.7 | 0.5 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| 5.8 | 0.5 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| 5.9 | 0.5 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| 6 | 0.7 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| 6.1 | 0.7 | 30 | 40 | 130 | 5 | 6 | 60°凹 |
| 6.2 | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| 6.3 | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| 6.4 | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| 6.5 | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| 6.6 | 0.7 | 35 | 35 | 130 | 5 | 6 | 60°凹 |
| 6.7 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 6.8 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 6.9 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 7 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 7.1 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 7.2 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 7.3 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 7.4 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 7.5 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 7.6 | 0.7 | 35 | 45 | 140 | 6 | 6 | 60°凹 |
| 7.7 | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| 7.8 | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| 7.9 | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| 8 | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| 8.1 | 1 | 40 | 40 | 150 | 6 | 6 | 60°凹 |
| 8.2 | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| 8.3 | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| 8.4 | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| 8.5 | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| 8.6 | 1 | 40 | 40 | 150 | 7 | 6 | 60°凹 |
| 8.7 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 8.8 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 8.9 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 9 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 9.1 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 9.2 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 9.3 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 9.4 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 9.5 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 9.6 | 1 | 40 | 50 | 160 | 7 | 6 | 60°凹 |
| 9.7 | 1 | 40 | 50 | 160 | 8 | 6 | 60°凹 |
| 9.8 | 1 | 40 | 50 | 160 | 8 | 6 | 60°凹 |
| 9.9 | 1 | 40 | 50 | 160 | 8 | 6 | 60°凹 |
| 10 | 1 | 40 | 50 | 160 | 8 | 6 | 60°凹 |
| 10.1 | 1 | 40 | 50 | 160 | 8 | 6 | 60°凹 |
| 10.2 | 1 | 40 | 50 | 160 | 8 | 6 | 60°凹 |
| 10.3 | 1 | 40 | 50 | 160 | 8 | 6 | 60°凹 |
| 10.4 | 1 | 40 | 50 | 160 | 8 | 6 | 60°凹 |
| 10.5 | 1 | 40 | 50 | 160 | 8 | 6 | 60°凹 |

※60°凸は2013.6月規格変更あり

# SPSCR ストレートシャンクスパイラルチャッキングリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **10.6** | 1 | 40 | 50 | 160 | 8 | 6 | 60° 凹 |
| **10.7** | 1 | 45 | 45 | 170 | 8 | 6 | 60° 凹 |
| **10.8** | 1 | 45 | 45 | 170 | 8 | 6 | 60° 凹 |
| **10.9** | 1 | 45 | 45 | 170 | 8 | 6 | 60° 凹 |
| **11** | 1 | 45 | 45 | 170 | 8 | 6 | 60° 凹 |
| **11.1** | 1 | 45 | 45 | 170 | 8 | 6 | 60° 凹 |
| **11.2** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **11.3** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **11.4** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **11.5** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **11.6** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **11.7** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **11.8** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **11.9** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **12** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **12.1** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **12.2** | 1 | 45 | 55 | 180 | 9 | 6 | 60° 凹 |
| **12.3** | 1 | 45 | 55 | 180 | 9 | 6 | 60° 凹 |
| **12.4** | 1 | 45 | 55 | 180 | 9 | 6 | 60° 凹 |
| **12.5** | 1 | 45 | 55 | 180 | 9 | 6 | 60° 凹 |
| **12.6** | 1 | 45 | 55 | 180 | 9 | 6 | 60° 凹 |
| **12.7** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **12.8** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **12.9** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **13** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **13.1** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **13.2** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **13.3** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **13.4** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **13.5** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **13.6** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **13.7** | 1 | 50 | 60 | 190 | 10 | 8 | 60° 凹 |
| **13.8** | 1 | 50 | 60 | 190 | 10 | 8 | 60° 凹 |
| **13.9** | 1 | 50 | 60 | 190 | 10 | 8 | 60° 凹 |
| **14** | 1 | 50 | 60 | 190 | 10 | 8 | 60° 凹 |
| **14.1** | 1 | 50 | 60 | 190 | 10 | 8 | 60° 凹 |
| **14.2** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **14.3** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **14.4** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **14.5** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **14.6** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **14.7** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **14.8** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **14.9** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **15** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **15.1** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **15.2** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **15.3** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **15.4** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **15.5** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **15.6** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **15.7** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **15.8** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **15.9** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **16** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **16.1** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **16.2** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **16.3** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **16.4** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **16.5** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **16.6** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **16.7** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **16.8** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **16.9** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **17** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **17.1** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **17.2** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **17.3** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **17.4** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **17.5** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **17.6** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **17.7** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **17.8** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **17.9** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.1** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.2** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.3** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.4** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.5** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.6** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.7** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.8** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.9** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **19** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **19.1** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **19.2** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **19.3** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **19.4** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **19.5** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **19.6** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **19.7** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **19.8** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **19.9** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **20** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **20.1** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **20.2** | 1.5 | 60 | 80 | 240 | 15* | 8 | 60° 凹 |
| **20.3** | 1.5 | 60 | 80 | 240 | 15* | 8 | 60° 凹 |
| **20.4** | 1.5 | 60 | 80 | 240 | 15* | 8 | 60° 凹 |
| **20.5** | 1.5 | 60 | 80 | 240 | 15* | 8 | 60° 凹 |
| **21** | 1.5 | 60 | 80 | 240 | 15* | 8 | 60° 凹 |
| **21.5** | 1.5 | 60 | 80 | 240 | 16* | 8 | 60° 凹 |
| **22** | 1.5 | 60 | 80 | 240 | 16* | 8 | 60° 凹 |
| **22.5** | 1.5 | 65 | 85 | 250 | 16* | 8 | 60° 凹 |
| **23** | 1.5 | 65 | 85 | 250 | 16* | 8 | 60° 凹 |
| **23.5** | 1.5 | 65 | 95 | 260 | 18* | 8 | 60° 凹 |
| **24** | 1.5 | 65 | 95 | 260 | 18* | 8 | 60° 凹 |
| **24.5** | 1.5 | 65 | 95 | 260 | 18* | 8 | 60° 凹 |
| **25** | 1.5 | 65 | 95 | 260 | 18* | 8 | 60° 凹 |

*シャンク径φ15以上はフラット付ストレートシャンク(Type Ⅲ)P373参照

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1/8** | 0.5 | 30 | 30 | 110 | 2.8 | 6 | 60° 凸 |
| **3/16** | 1 | 30 | 40 | 120 | 4 | 6 | 60° 凹 |
| **1/4** | 1 | 35 | 35 | 130 | 5 | 6 | 60° 凹 |
| **5/16** | 1 | 40 | 40 | 150 | 6 | 6 | 60° 凹 |
| **3/8** | 1 | 40 | 50 | 160 | 7 | 6 | 60° 凹 |
| **1/2** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |

※60°凸は2013.6月規格変更あり

# SPSCR ストレートシャンクスパイラルチャッキングリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **2.95** | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60° 凸 |
| **2.96 ～ 2.99** | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60° 凸 |
| **3.01 ～ 3.09** | 0.5 | 30 | 30 | 110 | 2.5 | 6 | 60° 凸 |
| **3.95 ～ 3.99** | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60° 凹 |
| **4.01 ～ 4.09** | 0.5 | 30 | 30 | 110 | 3.5 | 6 | 60° 凹 |
| **4.95 ～ 4.99** | 0.5 | 30 | 40 | 120 | 4 | 6 | 60° 凹 |
| **5.01 ～ 5.09** | 0.5 | 30 | 40 | 120 | 4 | 6 | 60° 凹 |
| **5.95 ～ 5.99** | 0.7 | 30 | 40 | 130 | 5 | 6 | 60° 凹 |
| **6.01 ～ 6.09** | 0.7 | 30 | 40 | 130 | 5 | 6 | 60° 凹 |
| **6.95 ～ 6.99** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60° 凹 |
| **7.01 ～ 7.09** | 0.7 | 35 | 45 | 140 | 6 | 6 | 60° 凹 |
| **7.95 ～ 7.99** | 1 | 40 | 40 | 150 | 6 | 6 | 60° 凹 |
| **8.01 ～ 8.09** | 1 | 40 | 40 | 150 | 6 | 6 | 60° 凹 |
| **8.95 ～ 8.99** | 1 | 40 | 50 | 160 | 7 | 6 | 60° 凹 |
| **9.01 ～ 9.09** | 1 | 40 | 50 | 160 | 7 | 6 | 60° 凹 |
| **9.95 ～ 9.99** | 1 | 40 | 50 | 160 | 8 | 6 | 60° 凹 |
| **10.01 ～ 10.09** | 1 | 40 | 50 | 160 | 8 | 6 | 60° 凹 |
| **10.95 ～ 10.99** | 1 | 45 | 45 | 170 | 8 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **11.01 ～ 11.09** | 1 | 45 | 45 | 170 | 8 | 6 | 60° 凹 |
| **11.95 ～ 11.99** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **12.01 ～ 12.09** | 1 | 45 | 45 | 170 | 9 | 6 | 60° 凹 |
| **12.95 ～ 12.99** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **13.01 ～ 13.09** | 1 | 45 | 55 | 180 | 10 | 8 | 60° 凹 |
| **13.95 ～ 13.99** | 1 | 50 | 60 | 190 | 10 | 8 | 60° 凹 |
| **14.01 ～ 14.09** | 1 | 50 | 60 | 190 | 10 | 8 | 60° 凹 |
| **14.95 ～ 14.99** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **15.01 ～ 15.09** | 1.5 | 50 | 60 | 200 | 11 | 8 | 60° 凹 |
| **15.95 ～ 15.99** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **16.01 ～ 16.09** | 1.5 | 50 | 60 | 200 | 12 | 8 | 60° 凹 |
| **16.95 ～ 16.99** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **17.01 ～ 17.09** | 1.5 | 55 | 55 | 200 | 12 | 8 | 60° 凹 |
| **17.95 ～ 17.99** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.01 ～ 18.09** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **18.95 ～ 18.99** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **19.01 ～ 19.09** | 1.5 | 55 | 65 | 220 | 14 | 8 | 60° 凹 |
| **19.95 ～ 19.99** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |
| **20.01 ～ 20.09** | 1.5 | 60 | 70 | 230 | 14 | 8 | 60° 凹 |

※60° 凸は2013.6月規格変更あり

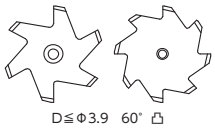
ハイス

# SCRL

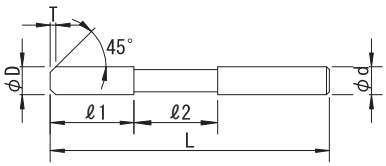
## ロングシャンクチャッキングリーマ　*Long Shank Chucking Reamer*

切削条件表 P141

貫通穴加工（ストレート刃）　右直刃　食付45°　HSS Co






| 公差(Tolerance) | D | | | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | +0.006 +0.002 | 3.1～6 | +0.009 +0.004 | 6.1～10 | +0.012 +0.006 | 10.1～18 | +0.015 +0.007 | 18.5～ | +0.017 +0.008 | h7 |

右刃ストレート　食付角度45°　SKH56
Straight Flute　Chamfer Angle45°　HSS-Co.

| 直径（ΦD） Dia. | 食付長（T） Chamfer Length | 刃長（ℓ1） Length of Flutes | 首長（ℓ2） Neck Length | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. | 刃数（N） Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| 3 | 0.5 | 35 | 55 | 165 | 3 | 6 | 60°凸 |
| 3.1 | 0.5 | 35 | 55 | 165 | 3 | 6 | 60°凸 |
| 3.2 | 0.5 | 35 | 55 | 165 | 3 | 6 | 60°凸 |
| 3.3 | 0.5 | 35 | 55 | 165 | 3 | 6 | 60°凸 |
| 3.4 | 0.5 | 35 | 55 | 165 | 3 | 6 | 60°凸 |
| 3.5 | 0.5 | 35 | 55 | 165 | 3.5 | 6 | 60°凸 |
| 3.6 | 0.5 | 35 | 55 | 165 | 3.5 | 6 | 60°凸 |
| 3.7 | 0.5 | 35 | 55 | 165 | 3.5 | 6 | 60°凸 |
| 3.8 | 0.5 | 35 | 55 | 165 | 3.5 | 6 | 60°凸 |
| 3.9 | 0.5 | 35 | 55 | 165 | 3.5 | 6 | 60°凸 |
| 4 | 0.5 | 35 | 55 | 165 | 4 | 6 | 60°凹 |
| 4.1 | 0.5 | 35 | 55 | 165 | 4 | 6 | 60°凹 |
| 4.2 | 0.5 | 35 | 55 | 165 | 4 | 6 | 60°凹 |
| 4.3 | 0.5 | 35 | 55 | 165 | 4 | 6 | 60°凹 |
| 4.4 | 0.5 | 35 | 55 | 165 | 4 | 6 | 60°凹 |
| 4.5 | 0.5 | 35 | 55 | 165 | 4.5 | 6 | 60°凹 |
| 4.6 | 0.5 | 35 | 55 | 165 | 4.5 | 6 | 60°凹 |
| 4.7 | 0.5 | 35 | 55 | 165 | 4.5 | 6 | 60°凹 |
| 4.8 | 0.5 | 35 | 55 | 165 | 4.5 | 6 | 60°凹 |
| 4.9 | 0.5 | 35 | 55 | 165 | 4.5 | 6 | 60°凹 |
| 5 | 0.5 | 35 | 55 | 180 | 5 | 6 | 60°凹 |
| 5.1 | 0.8 | 35 | 55 | 180 | 5 | 6 | 60°凹 |
| 5.2 | 0.8 | 35 | 55 | 180 | 5 | 6 | 60°凹 |
| 5.3 | 0.8 | 35 | 55 | 180 | 5 | 6 | 60°凹 |
| 5.4 | 0.8 | 35 | 55 | 180 | 5 | 6 | 60°凹 |
| 5.5 | 0.8 | 35 | 55 | 180 | 5.5 | 6 | 60°凹 |
| 5.6 | 0.8 | 35 | 55 | 180 | 5.5 | 6 | 60°凹 |
| 5.7 | 0.8 | 35 | 55 | 180 | 5.5 | 6 | 60°凹 |
| 5.8 | 0.8 | 35 | 55 | 180 | 5.5 | 6 | 60°凹 |
| 5.9 | 0.8 | 35 | 55 | 180 | 5.5 | 6 | 60°凹 |
| 6 | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| 6.1 | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| 6.2 | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| 6.3 | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| 6.4 | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| 6.5 | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| 6.6 | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| 6.7 | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| 6.8 | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| 6.9 | 0.8 | 35 | 70 | 195 | 6 | 6 | 60°凹 |
| 7 | 0.8 | 35 | 80 | 205 | 7 | 6 | 60°凹 |
| 7.1 | 0.8 | 35 | 80 | 205 | 7 | 6 | 60°凹 |
| 7.2 | 0.8 | 35 | 80 | 205 | 7 | 6 | 60°凹 |
| 7.3 | 0.8 | 35 | 80 | 205 | 7 | 6 | 60°凹 |
| 7.4 | 0.8 | 35 | 80 | 205 | 7 | 6 | 60°凹 |
| 7.5 | 0.8 | 35 | 80 | 205 | 7 | 6 | 60°凹 |

| 直径（ΦD） Dia. | 食付長（T） Chamfer Length | 刃長（ℓ） Length of Flutes | 首長（ℓ2） Neck Length | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. | 刃数（N） Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| 7.6 | 0.8 | 35 | 80 | 205 | 7 | 6 | 60°凹 |
| 7.7 | 0.8 | 35 | 80 | 205 | 7 | 6 | 60°凹 |
| 7.8 | 0.8 | 35 | 80 | 205 | 7 | 6 | 60°凹 |
| 7.9 | 0.8 | 35 | 80 | 205 | 7 | 6 | 60°凹 |
| 8 | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| 8.1 | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| 8.2 | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| 8.3 | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| 8.4 | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| 8.5 | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| 8.6 | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| 8.7 | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| 8.8 | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| 8.9 | 0.8 | 40 | 80 | 225 | 8 | 6 | 60°凹 |
| 9 | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| 9.1 | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| 9.2 | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| 9.3 | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| 9.4 | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| 9.5 | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| 9.6 | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| 9.7 | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| 9.8 | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| 9.9 | 0.8 | 40 | 80 | 225 | 9 | 6 | 60°凹 |
| 10 | 0.8 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| 10.1 | 1 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| 10.2 | 1 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| 10.3 | 1 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| 10.4 | 1 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| 10.5 | 1 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| 10.6 | 1 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| 10.7 | 1 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| 10.8 | 1 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| 10.9 | 1 | 40 | 95 | 240 | 10 | 6 | 60°凹 |
| 11 | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| 11.1 | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| 11.2 | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| 11.3 | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| 11.4 | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| 11.5 | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| 11.6 | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| 11.7 | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| 11.8 | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| 11.9 | 1 | 45 | 90 | 240 | 10 | 6 | 60°凹 |
| 12 | 1 | 45 | 105 | 255 | 12 | 6 | 60°凹 |
| 12.1 | 1 | 45 | 105 | 255 | 12 | 6 | 60°凹 |

# SCRL ロングシャンクチャッキングリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **12.2** | 1 | 45 | 105 | 255 | 12 | 6 | 60° 凹 |
| **12.3** | 1 | 45 | 105 | 255 | 12 | 6 | 60° 凹 |
| **12.4** | 1 | 45 | 105 | 255 | 12 | 6 | 60° 凹 |
| **12.5** | 1 | 45 | 105 | 255 | 12 | 6 | 60° 凹 |
| **12.6** | 1 | 45 | 105 | 255 | 12 | 6 | 60° 凹 |
| **12.7** | 1 | 45 | 105 | 255 | 12 | 6 | 60° 凹 |
| **12.8** | 1 | 45 | 105 | 255 | 12 | 6 | 60° 凹 |
| **12.9** | 1 | 45 | 105 | 255 | 12 | 6 | 60° 凹 |
| **13** | 1 | 45 | 100 | 265 | 13 | 8 | 60° 凹 |
| **13.5** | 1 | 45 | 100 | 265 | 13 | 8 | 60° 凹 |
| **14** | 1 | 50 | 115 | 285 | 14 | 8 | 60° 凹 |

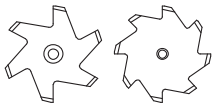
| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **14.5** | 1.5 | 50 | 115 | 285 | 14 | 8 | 60° 凹 |
| **15** | 1.5 | 50 | 115 | 285 | 15 | 8 | 60° 凹 |
| **15.5** | 1.5 | 50 | 115 | 285 | 15 | 8 | 60° 凹 |
| **16** | 1.5 | 50 | 115 | 300 | 16 | 8 | 60° 凹 |
| **16.5** | 1.5 | 50 | 115 | 300 | 16 | 8 | 60° 凹 |
| **17** | 1.5 | 55 | 110 | 300 | 16 | 8 | 60° 凹 |
| **17.5** | 1.5 | 55 | 110 | 300 | 16 | 8 | 60° 凹 |
| **18** | 1.5 | 55 | 125 | 320 | 18 | 8 | 60° 凹 |
| **18.5** | 1.5 | 55 | 125 | 320 | 18 | 8 | 60° 凹 |
| **19** | 1.5 | 55 | 125 | 320 | 18 | 8 | 60° 凹 |
| **19.5** | 1.5 | 55 | 125 | 320 | 18 | 8 | 60° 凹 |
| **20** | 1.5 | 60 | 135 | 345 | 20 | 8 | 60° 凹 |

# TCR

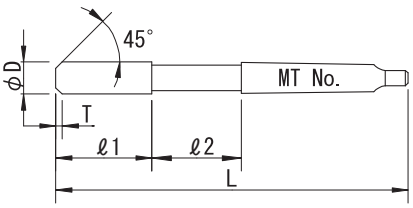
## テーパーシャンクチャッキングリーマ　*Taper Shank Chucking Reamer*

切削条件表 P141

**貫通穴加工（ストレート刃）**　右直刃　食付45°　HSS








| 公差 (Tolerance) | D | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 3 | +0.007 +0.002 | 3.5～ 6 | +0.009 +0.004 | 6.5～10 | +0.012 +0.006 | 10.5～18 | +0.015 +0.007 |
| | 18.5～30 | +0.017 +0.008 | 30.5～50 | +0.02 +0.009 | 50.5～70 | +0.024 +0.011 | | |

右刃ストレート　食付角度45°　SKH51
Straight Flute　Chamfer Angle45°　HSS

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | MTNo. *Shank MTNo.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **3** | 0.5 | 30 | 14.5 | 110 | 1 | 6 | 60° 凹 |
| **3.5** | 0.5 | 30 | 14.5 | 110 | 1 | 6 | 60° 凹 |
| **4** | 0.5 | 30 | 14.5 | 110 | 1 | 6 | 60° 凹 |
| **4.5** | 0.5 | 30 | 24.5 | 120 | 1 | 6 | 60° 凹 |
| **5** | 1 | 30 | 24.5 | 120 | 1 | 6 | 60° 凹 |
| **5.5** | 1 | 30 | 24.5 | 120 | 1 | 6 | 60° 凹 |
| **6** | 1 | 35 | 29.5 | 130 | 1 | 6 | 60° 凹 |
| **6.5** | 1 | 35 | 29.5 | 130 | 1 | 6 | 60° 凹 |
| **7** | 1 | 35 | 39.5 | 140 | 1 | 6 | 60° 凹 |
| **7.5** | 1 | 35 | 39.5 | 140 | 1 | 6 | 60° 凹 |
| **8** | 1 | 40 | 44.5 | 150 | 1 | 6 | 60° 凹 |
| **8.5** | 1 | 40 | 44.5 | 150 | 1 | 6 | 60° 凹 |
| **9** | 1 | 40 | 54.5 | 160 | 1 | 6 | 60° 凹 |
| **9.5** | 1 | 40 | 54.5 | 160 | 1 | 6 | 60° 凹 |
| **10** | 1 | 40 | 54.5 | 160 | 1 | 6 | 60° 凹 |
| **10.5** | 1 | 40 | 54.5 | 160 | 1 | 6 | 60° 凹 |
| **11** | 1 | 45 | 59.5 | 170 | 1 | 6 | 60° 凹 |
| **11.5** | 1 | 45 | 59.5 | 170 | 1 | 6 | 60° 凹 |
| **12** | 1 | 45 | 59.5 | 170 | 1 | 6 | 60° 凹 |
| **12.5** | 1 | 45 | 69.5 | 180 | 1 | 6 | 60° 凹 |
| **13** | 1 | 45 | 69.5 | 180 | 1 | 8 | 60° 凹 |
| **13.5** | 1 | 45 | 69.5 | 180 | 1 | 8 | 60° 凹 |
| **14** | 1 | 50 | 74.5 | 190 | 1 | 8 | 60° 凹 |
| **14.5** | 1.5 | 50 | 75 | 205 | 2 | 8 | 60° 凹 |
| **15** | 1.5 | 50 | 75 | 205 | 2 | 8 | 60° 凹 |
| **15.5** | 1.5 | 50 | 75 | 205 | 2 | 8 | 60° 凹 |
| **16** | 1.5 | 50 | 75 | 205 | 2 | 8 | 60° 凹 |
| **16.5** | 1.5 | 55 | 75 | 210 | 2 | 8 | 60° 凹 |
| **17** | 1.5 | 55 | 75 | 210 | 2 | 8 | 60° 凹 |
| **17.5** | 1.5 | 55 | 85 | 220 | 2 | 8 | 60° 凹 |
| **18** | 1.5 | 55 | 85 | 220 | 2 | 8 | 60° 凹 |
| **18.5** | 1.5 | 55 | 85 | 220 | 2 | 8 | 60° 凹 |
| **19** | 1.5 | 55 | 85 | 220 | 2 | 8 | 60° 凹 |
| **19.5** | 1.5 | 60 | 90 | 230 | 2 | 8 | 60° 凹 |
| **20** | 1.5 | 60 | 90 | 230 | 2 | 8 | 60° 凹 |
| **20.5** | 1.5 | 60 | 100 | 240 | 2 | 8 | 60° 凹 |
| **21** | 1.5 | 60 | 100 | 240 | 2 | 8 | 60° 凹 |
| **21.5** | 1.5 | 60 | 100 | 240 | 2 | 8 | 60° 凹 |
| **22** | 1.5 | 60 | 100 | 240 | 2 | 8 | 60° 凹 |
| **22.5** | 1.5 | 65 | 105 | 250 | 2 | 8 | 60° 凹 |
| **23** | 1.5 | 65 | 105 | 250 | 2 | 8 | 60° 凹 |
| **23.5** | 1.5 | 65 | 101 | 265 | 3 | 8 | 60° 凹 |
| **24** | 1.5 | 65 | 101 | 265 | 3 | 8 | 60° 凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | MTNo. *Shank MTNo.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **24.5** | 1.5 | 65 | 101 | 265 | 3 | 8 | 60° 凹 |
| **25** | 1.5 | 65 | 101 | 265 | 3 | 8 | 60° 凹 |
| **25.5** | 1.5 | 70 | 101 | 270 | 3 | 10 | 60° 凹 |
| **26** | 1.5 | 70 | 101 | 270 | 3 | 10 | 60° 凹 |
| **26.5** | 1.5 | 70 | 101 | 270 | 3 | 10 | 60° 凹 |
| **27** | 1.5 | 70 | 101 | 270 | 3 | 10 | 60° 凹 |
| **27.5** | 1.5 | 70 | 101 | 270 | 3 | 10 | 60° 凹 |
| **28** | 1.5 | 70 | 101 | 270 | 3 | 10 | 60° 凹 |
| **28.5** | 1.5 | 75 | 106 | 280 | 3 | 10 | 60° 凹 |
| **29** | 1.5 | 75 | 106 | 280 | 3 | 10 | 60° 凹 |
| **29.5** | 1.5 | 75 | 106 | 280 | 3 | 10 | 60° 凹 |
| **30** | 1.5 | 75 | 106 | 280 | 3 | 10 | 60° 凹 |
| **30.5** | 1.5 | 75 | 106 | 280 | 3 | 10 | 60° 凹 |
| **31** | 1.5 | 75 | 106 | 280 | 3 | 10 | 60° 凹 |
| **31.5** | 1.5 | 75 | 106 | 280 | 3 | 10 | 60° 凹 |
| **32** | 1.5 | 75 | 106 | 280 | 3 | 10 | 60° 凹 |
| **32.5** | 2 | 80 | 116 | 320 | 4 | 10 | 60° 凹 |
| **33** | 2 | 80 | 116 | 320 | 4 | 10 | 60° 凹 |
| **33.5** | 2 | 80 | 116 | 320 | 4 | 10 | 60° 凹 |
| **34** | 2 | 80 | 116 | 320 | 4 | 10 | 60° 凹 |
| **34.5** | 2 | 80 | 116 | 320 | 4 | 10 | 60° 凹 |
| **35** | 2 | 80 | 116 | 320 | 4 | 10 | 60° 凹 |
| **35.5** | 2 | 80 | 116 | 320 | 4 | 10 | 60° 凹 |
| **36** | 2 | 80 | 116 | 320 | 4 | 10 | 60° 凹 |
| **36.5** | 2 | 85 | 116 | 325 | 4 | 10 | 60° 凹 |
| **37** | 2 | 85 | 116 | 325 | 4 | 10 | 60° 凹 |
| **37.5** | 2 | 85 | 116 | 325 | 4 | 10 | 60° 凹 |
| **38** | 2 | 85 | 116 | 325 | 4 | 10 | 60° 凹 |
| **38.5** | 2 | 90 | 116 | 330 | 4 | 12 | 60° 凹 |
| **39** | 2 | 90 | 116 | 330 | 4 | 12 | 60° 凹 |
| **39.5** | 2 | 90 | 116 | 330 | 4 | 12 | 60° 凹 |
| **40** | 2 | 90 | 116 | 330 | 4 | 12 | 60° 凹 |
| **40.5** | 2 | 90 | 116 | 330 | 4 | 12 | 60° 凹 |
| **41** | 2 | 90 | 116 | 330 | 4 | 12 | 60° 凹 |
| **41.5** | 2 | 90 | 116 | 330 | 4 | 12 | 60° 凹 |
| **42** | 2 | 90 | 116 | 330 | 4 | 12 | 60° 凹 |
| **42.5** | 2 | 95 | 121 | 340 | 4 | 12 | 60° 凹 |
| **43** | 2 | 95 | 121 | 340 | 4 | 12 | 60° 凹 |
| **43.5** | 2 | 95 | 121 | 340 | 4 | 12 | 60° 凹 |
| **44** | 2 | 95 | 121 | 340 | 4 | 12 | 60° 凹 |
| **44.5** | 2 | 95 | 121 | 340 | 4 | 12 | 60° 凹 |
| **45** | 2 | 95 | 121 | 340 | 4 | 12 | 60° 凹 |
| **45.5** | 2 | 95 | 121 | 340 | 4 | 12 | 60° 凹 |

# TCR テーパーシャンクチャッキングリーマ

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | MTNo. *Shank MTNo.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **46** | 2 | 95 | 121 | 340 | 4 | 12 | 60° 凹 |
| **46.5** | 2 | 100 | 126 | 350 | 4 | 12 | 60° 凹 |
| **47** | 2 | 100 | 126 | 350 | 4 | 12 | 60° 凹 |
| **47.5** | 2 | 100 | 126 | 350 | 4 | 12 | 60° 凹 |
| **48** | 2 | 100 | 126 | 350 | 4 | 12 | 60° 凹 |
| **48.5** | 2 | 100 | 129 | 385 | 5 | 12 | 60° 凹 |
| **49** | 2 | 100 | 129 | 385 | 5 | 12 | 60° 凹 |
| **49.5** | 2 | 100 | 129 | 385 | 5 | 12 | 60° 凹 |
| **50** | 2 | 100 | 129 | 385 | 5 | 12 | 60° 凹 |
| **50.5** | 2 | 105 | 129 | 390 | 5 | 12 | 60° 凹 |
| **51** | 2 | 105 | 129 | 390 | 5 | 12 | 60° 凹 |
| **51.5** | 2 | 105 | 129 | 390 | 5 | 12 | 60° 凹 |
| **52** | 2 | 105 | 129 | 390 | 5 | 12 | 60° 凹 |
| **52.5** | 2.5 | 105 | 129 | 390 | 5 | 14 | 60° 凹 |
| **53** | 2.5 | 105 | 129 | 390 | 5 | 14 | 60° 凹 |
| **53.5** | 2.5 | 105 | 129 | 390 | 5 | 14 | 60° 凹 |
| **54** | 2.5 | 105 | 129 | 390 | 5 | 14 | 60° 凹 |
| **54.5** | 2.5 | 105 | 134 | 395 | 5 | 14 | 60° 凹 |
| **55** | 2.5 | 105 | 134 | 395 | 5 | 14 | 60° 凹 |
| **56** | 2.5 | 105 | 134 | 395 | 5 | 14 | 60° 凹 |
| **57** | 2.5 | 110 | 139 | 405 | 5 | 14 | 60° 凹 |
| **58** | 2.5 | 110 | 139 | 405 | 5 | 14 | 60° 凹 |
| **59** | 2.5 | 110 | 149 | 415 | 5 | 14 | 60° 凹 |
| **60** | 2.5 | 110 | 149 | 415 | 5 | 14 | 60° 凹 |
| **61** | 2.5 | 115 | 149 | 420 | 5 | 14 | 60° 凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | MTNo. *Shank MTNo.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **62** | 2.5 | 115 | 149 | 420 | 5 | 14 | 60° 凹 |
| **63** | 2.5 | 115 | 149 | 420 | 5 | 14 | 60° 凹 |
| **64** | 2.5 | 115 | 149 | 420 | 5 | 14 | 60° 凹 |
| **65** | 2.5 | 115 | 159 | 430 | 5 | 14 | 60° 凹 |
| **66** | 2.5 | 115 | 159 | 430 | 5 | 14 | 60° 凹 |
| **67** | 2.5 | 120 | 154 | 430 | 5 | 14 | 60° 凹 |
| **68** | 2.5 | 120 | 154 | 430 | 5 | 14 | 60° 凹 |
| **69** | 2.5 | 125 | 164 | 445 | 5 | 14 | 60° 凹 |
| **70** | 2.5 | 125 | 164 | 445 | 5 | 14 | 60° 凹 |

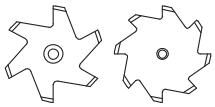
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1/4** | 1 | 35 | 29.5 | 130 | 1 | 6 | 60° 凹 |
| **5/16** | 1 | 35 | 39.5 | 140 | 1 | 6 | 60° 凹 |
| **3/8** | 1 | 40 | 54.5 | 160 | 1 | 6 | 60° 凹 |
| **7/16** | 1 | 45 | 59.5 | 170 | 1 | 6 | 60° 凹 |
| **1/2** | 1 | 45 | 69.5 | 180 | 1 | 8 | 60° 凹 |
| **9/16** | 1.5 | 50 | 75 | 205 | 2 | 8 | 60° 凹 |
| **5/8** | 1.5 | 50 | 75 | 205 | 2 | 8 | 60° 凹 |
| **3/4** | 1.5 | 55 | 85 | 220 | 2 | 8 | 60° 凹 |
| **7/8** | 1.5 | 65 | 86 | 250 | 2 | 8 | 60° 凹 |
| **1"** | 1.5 | 70 | 101 | 270 | 3 | 10 | 60° 凹 |
| **1"1/8** | 1.5 | 75 | 106 | 280 | 3 | 10 | 60° 凹 |
| **1"1/4** | 1.5 | 75 | 106 | 280 | 3 | 10 | 60° 凹 |
| **1"1/2** | 2 | 90 | 116 | 330 | 4 | 12 | 60° 凹 |
| **2"** | 2 | 105 | 129 | 390 | 5 | 12 | 60° 凹 |

# MR

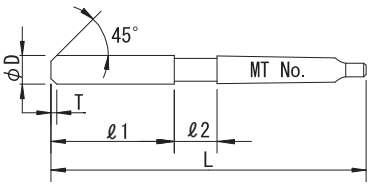
## マシンリーマ　*Machine Reamer*

切削条件表 P141

貫通穴加工（ストレート刃）　右直刃　食付45°　HSS








| 公差 (Tolerance) | D | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0.01トビ Increment 0.01 | +0.005 0 | 3 | +0.007 +0.002 | 3.1～ 6 | +0.009 +0.004 | 6.1～ 10 | +0.012 +0.006 | 10.1～18 | +0.015 +0.007 |
| | 18.1～30 | +0.017 +0.008 | 30.1～50 | +0.02 +0.009 | 50.5～80 | +0.024 +0.011 | 81 ～100 | +0.028 +0.013 | | |

右刃ストレート　食付角度45°　SKH51
Straight Flute　Chamfer Angle45°　HSS

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | MTNo. *Shank MTNo.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| 3 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| 3.1 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| 3.2 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| 3.3 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| 3.4 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| 3.5 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| 3.6 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| 3.7 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| 3.8 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| 3.9 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| 4 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| 4.1 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| 4.2 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| 4.3 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| 4.4 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| 4.5 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| 4.6 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| 4.7 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| 4.8 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| 4.9 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| 5 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| 5.1 | 1 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| 5.2 | 1 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| 5.3 | 1 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| 5.4 | 1 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| 5.5 | 1 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| 5.6 | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| 5.7 | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| 5.8 | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| 5.9 | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| 6 | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| 6.1 | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| 6.2 | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| 6.3 | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| 6.4 | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| 6.5 | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| 6.6 | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| 6.7 | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| 6.8 | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| 6.9 | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| 7 | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| 7.1 | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| 7.2 | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | MTNo. *Shank MTNo.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| 7.3 | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| 7.4 | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| 7.5 | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| 7.6 | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| 7.7 | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| 7.8 | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| 7.9 | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| 8 | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| 8.1 | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| 8.2 | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| 8.3 | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| 8.4 | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| 8.5 | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| 8.6 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 8.7 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 8.8 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 8.9 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 9 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 9.1 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 9.2 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 9.3 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 9.4 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 9.5 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 9.6 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 9.7 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 9.8 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 9.9 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 10 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 10.1 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 10.2 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 10.3 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 10.4 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 10.5 | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| 10.6 | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| 10.7 | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| 10.8 | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| 10.9 | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| 11 | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| 11.1 | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| 11.2 | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| 11.3 | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| 11.4 | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| 11.5 | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |

# MR マシンリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **11.6** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **11.7** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **11.8** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **11.9** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **12** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **12.1** | 1 | 80 | 34.5 | 180 | 1 | 6 | 60° 凹 |
| **12.2** | 1 | 80 | 34.5 | 180 | 1 | 6 | 60° 凹 |
| **12.3** | 1 | 80 | 34.5 | 180 | 1 | 6 | 60° 凹 |
| **12.4** | 1 | 80 | 34.5 | 180 | 1 | 6 | 60° 凹 |
| **12.5** | 1 | 80 | 34.5 | 180 | 1 | 6 | 60° 凹 |
| **12.6** | 1 | 80 | 34.5 | 180 | 1 | 8 | 60° 凹 |
| **12.7** | 1 | 80 | 34.5 | 180 | 1 | 8 | 60° 凹 |
| **12.8** | 1 | 80 | 34.5 | 180 | 1 | 8 | 60° 凹 |
| **12.9** | 1 | 80 | 34.5 | 180 | 1 | 8 | 60° 凹 |
| **13** | 1 | 80 | 34.5 | 180 | 1 | 8 | 60° 凹 |
| **13.1** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **13.2** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **13.3** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **13.4** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **13.5** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **13.6** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **13.7** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **13.8** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **13.9** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **14** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **14.1** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **14.2** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **14.3** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **14.4** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **14.5** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **14.6** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **14.7** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **14.8** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **14.9** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **15** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **15.1** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **15.2** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **15.3** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **15.4** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **15.5** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **15.6** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **15.7** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **15.8** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **15.9** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **16** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **16.1** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **16.2** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **16.3** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **16.4** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **16.5** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **16.6** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **16.7** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **16.8** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **16.9** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **17** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **17.1** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **17.2** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **17.3** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **17.4** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **17.5** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **17.6** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **17.7** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **17.8** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **17.9** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **18** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.1** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.2** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.3** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.4** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.5** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.6** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.7** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.8** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.9** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **19** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **19.1** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **19.2** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **19.3** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **19.4** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **19.5** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **19.6** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **19.7** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **19.8** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **19.9** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **20** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **20.1** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **20.2** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **20.3** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **20.4** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **20.5** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **20.6** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **20.7** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **20.8** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **20.9** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.1** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.2** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.3** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.4** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.5** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.6** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.7** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.8** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.9** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **22** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **22.1** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **22.2** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **22.3** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **22.4** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **22.5** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **22.6** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **22.7** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **22.8** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **22.9** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **23** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **23.1** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **23.2** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **23.3** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **23.4** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **23.5** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **23.6** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **23.7** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **23.8** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **23.9** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24.1** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24.2** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24.3** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |

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| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **24.4** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24.5** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24.6** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24.7** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24.8** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24.9** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **25** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **25.1** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **25.2** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **25.3** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **25.4** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **25.5** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **25.6** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **25.7** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **25.8** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **25.9** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26.1** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26.2** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26.3** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26.4** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26.5** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26.6** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26.7** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26.8** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26.9** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.1** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.2** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.3** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.4** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.5** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.6** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.7** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.8** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.9** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **28** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **28.1** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **28.2** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **28.3** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **28.4** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **28.5** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **28.6** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **28.7** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **28.8** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **28.9** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29.1** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29.2** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29.3** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29.4** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29.5** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29.6** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29.7** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29.8** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29.9** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **30** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **30.1** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **30.2** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **30.3** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **30.4** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **30.5** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **30.6** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **30.7** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **30.8** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **30.9** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **31** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **31.1** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **31.2** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **31.3** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **31.4** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **31.5** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **31.6** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **31.7** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **31.8** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **31.9** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **32** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **32.5** | 2 | 160 | 41 | 325 | 4 | 10 | 60° 凹 |
| **33** | 2 | 160 | 41 | 325 | 4 | 10 | 60° 凹 |
| **33.5** | 2 | 160 | 41 | 325 | 4 | 10 | 60° 凹 |
| **34** | 2 | 160 | 41 | 325 | 4 | 10 | 60° 凹 |
| **34.5** | 2 | 165 | 41 | 330 | 4 | 10 | 60° 凹 |
| **35** | 2 | 165 | 41 | 330 | 4 | 10 | 60° 凹 |
| **35.5** | 2 | 165 | 41 | 330 | 4 | 10 | 60° 凹 |
| **36** | 2 | 165 | 41 | 330 | 4 | 10 | 60° 凹 |
| **36.5** | 2 | 165 | 41 | 330 | 4 | 10 | 60° 凹 |
| **37** | 2 | 165 | 41 | 330 | 4 | 10 | 60° 凹 |
| **37.5** | 2 | 165 | 41 | 330 | 4 | 10 | 60° 凹 |
| **38** | 2 | 165 | 41 | 330 | 4 | 10 | 60° 凹 |
| **38.5** | 2 | 165 | 41 | 330 | 4 | 12 | 60° 凹 |
| **39** | 2 | 165 | 41 | 330 | 4 | 12 | 60° 凹 |
| **39.5** | 2 | 165 | 41 | 330 | 4 | 12 | 60° 凹 |
| **40** | 2 | 165 | 41 | 330 | 4 | 12 | 60° 凹 |
| **40.1** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **40.2** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **40.3** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **40.4** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **40.5** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **41** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **41.5** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **42** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **42.5** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **43** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **43.5** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **44** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **44.5** | 2 | 175 | 41 | 340 | 4 | 12 | 60° 凹 |
| **45** | 2 | 175 | 41 | 340 | 4 | 12 | 60° 凹 |
| **45.5** | 2 | 175 | 41 | 340 | 4 | 12 | 60° 凹 |
| **46** | 2 | 175 | 41 | 340 | 4 | 12 | 60° 凹 |
| **46.5** | 2 | 180 | 46 | 350 | 4 | 12 | 60° 凹 |
| **47** | 2 | 180 | 46 | 350 | 4 | 12 | 60° 凹 |
| **47.5** | 2 | 180 | 46 | 350 | 4 | 12 | 60° 凹 |
| **48** | 2 | 180 | 46 | 350 | 4 | 12 | 60° 凹 |
| **48.5** | 2 | 180 | 49 | 385 | 5 | 12 | 60° 凹 |
| **49** | 2 | 180 | 49 | 385 | 5 | 12 | 60° 凹 |
| **49.5** | 2 | 180 | 49 | 385 | 5 | 12 | 60° 凹 |
| **50** | 2 | 180 | 49 | 385 | 5 | 12 | 60° 凹 |
| **50.5** | 2 | 180 | 49 | 385 | 5 | 12 | 60° 凹 |
| **51** | 2 | 180 | 49 | 385 | 5 | 12 | 60° 凹 |
| **52** | 2 | 180 | 49 | 385 | 5 | 12 | 60° 凹 |
| **53** | 2 | 185 | 49 | 390 | 5 | 14 | 60° 凹 |
| **54** | 2.5 | 185 | 49 | 390 | 5 | 14 | 60° 凹 |
| **55** | 2.5 | 185 | 54 | 395 | 5 | 14 | 60° 凹 |
| **56** | 2.5 | 185 | 54 | 395 | 5 | 14 | 60° 凹 |
| **57** | 2.5 | 190 | 59 | 405 | 5 | 14 | 60° 凹 |
| **58** | 2.5 | 190 | 59 | 405 | 5 | 14 | 60° 凹 |
| **59** | 2.5 | 190 | 69 | 415 | 5 | 14 | 60° 凹 |
| **60** | 2.5 | 190 | 69 | 415 | 5 | 14 | 60° 凹 |

# MR マシンリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **61** | 2.5 | 195 | 69 | 420 | 5 | 14 | 60° 凹 |
| **62** | 2.5 | 195 | 69 | 420 | 5 | 14 | 60° 凹 |
| **63** | 2.5 | 195 | 69 | 420 | 5 | 14 | 60° 凹 |
| **64** | 2.5 | 195 | 69 | 420 | 5 | 14 | 60° 凹 |
| **65** | 2.5 | 200 | 74 | 430 | 5 | 14 | 60° 凹 |
| **66** | 2.5 | 200 | 74 | 430 | 5 | 14 | 60° 凹 |
| **67** | 2.5 | 200 | 74 | 430 | 5 | 14 | 60° 凹 |
| **68** | 2.5 | 200 | 74 | 430 | 5 | 14 | 60° 凹 |
| **69** | 2.5 | 205 | 84 | 445 | 5 | 14 | 60° 凹 |
| **70** | 2.5 | 205 | 84 | 445 | 5 | 14 | 60° 凹 |
| **71** | 2.5 | 205 | 84 | 445 | 5 | 14 | 60° 凹 |
| **72** | 2.5 | 205 | 84 | 445 | 5 | 14 | 60° 凹 |
| **73** | 2.5 | 210 | 89 | 455 | 5 | 14 | 60° 凹 |
| **74** | 2.5 | 210 | 89 | 455 | 5 | 14 | 60° 凹 |
| **75** | 2.5 | 210 | 89 | 455 | 5 | 14 | 60° 凹 |
| **76** | 2.5 | 210 | 89 | 455 | 5 | 14 | 60° 凹 |
| **77** | 2.5 | 210 | 89 | 455 | 5 | 14 | 60° 凹 |
| **78** | 2.5 | 210 | 89 | 455 | 5 | 14 | 60° 凹 |
| **79** | 2.5 | 215 | 89 | 460 | 5 | 16 | 60° 凹 |
| **80** | 3 | 215 | 89 | 460 | 5 | 16 | 60° 凹 |
| **81** | 3 | 215 | 89 | 460 | 5 | 16 | 60° 凹 |
| **82** | 3 | 215 | 89 | 460 | 5 | 16 | 60° 凹 |
| **83** | 3 | 215 | 89 | 460 | 5 | 16 | 60° 凹 |
| **84** | 3 | 215 | 89 | 460 | 5 | 16 | 60° 凹 |
| **85** | 3 | 215 | 89 | 460 | 5 | 16 | 60° 凹 |
| **86** | 3 | 220 | 90 | 466 | 5 | 16 | 60° 凹 |
| **87** | 3 | 220 | 90 | 466 | 5 | 16 | 60° 凹 |
| **88** | 3 | 220 | 90 | 466 | 5 | 16 | 60° 凹 |
| **89** | 3 | 220 | 90 | 466 | 5 | 16 | 60° 凹 |
| **90** | 3 | 220 | 90 | 466 | 5 | 16 | 60° 凹 |
| **91** | 3 | 220 | 90 | 466 | 5 | 16 | 60° 凹 |
| **92** | 3 | 220 | 90 | 466 | 5 | 16 | 60° 凹 |
| **93** | 3 | 220 | 90 | 466 | 5 | 16 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **94** | 3 | 220 | 90 | 466 | 5 | 16 | 60° 凹 |
| **95** | 3 | 220 | 90 | 466 | 5 | 16 | 60° 凹 |
| **96** | 3 | 220 | 90 | 466 | 5 | 16 | 60° 凹 |
| **97** | 3 | 220 | 90 | 466 | 5 | 16 | 60° 凹 |
| **98** | 3 | 220 | 90 | 466 | 5 | 16 | 60° 凹 |
| **99** | 3 | 220 | 90 | 466 | 5 | 16 | 60° 凹 |
| **100** | 3 | 220 | 90 | 466 | 5 | 16 | 60° 凹 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1/8** | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| **3/16** | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| **7/32** | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| **1/4** | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| **9/32** | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| **5/16** | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| **3/8** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **7/16** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **1/2** | 1 | 80 | 34.5 | 180 | 1 | 8 | 60° 凹 |
| **9/16** | 1 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **5/8** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **11/16** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **3/4** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **13/16** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **7/8** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **1"** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **1"1/8** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **1"1/4** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **1"3/8** | 2 | 165 | 41 | 330 | 4 | 10 | 60° 凹 |
| **1"1/2** | 2 | 165 | 41 | 330 | 4 | 12 | 60° 凹 |
| **1"5/8** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **1"3/4** | 2 | 175 | 41 | 340 | 4 | 12 | 60° 凹 |
| **2"** | 2 | 180 | 49 | 385 | 5 | 12 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **2.95 ～ 2.99** | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| **3.01 ～ 3.09** | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| **3.95 ～ 3.99** | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| **4.01 ～ 4.09** | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| **4.95 ～ 4.99** | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| **5.01 ～ 5.09** | 1 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| **5.95 ～ 5.99** | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| **6.01 ～ 6.09** | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| **6.95 ～ 6.99** | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| **7.01 ～ 7.09** | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| **7.95 ～ 7.99** | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| **8.01 ～ 8.09** | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| **8.95 ～ 8.99** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **9.01 ～ 9.09** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **9.95 ～ 9.99** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **10.01 ～ 10.09** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **10.95 ～ 10.99** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **11.01 ～ 11.09** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **11.95 ～ 11.99** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **12.01 ～ 12.09** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **12.95 ～ 12.99** | 1 | 80 | 34.5 | 180 | 1 | 8 | 60° 凹 |
| **13.01 ～ 13.09** | 1 | 80 | 34.5 | 180 | 1 | 8 | 60° 凹 |
| **13.95 ～ 13.99** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **14.01 ～ 14.09** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **14.95 ～ 14.99** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **15.01 ～ 15.09** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **15.95 ～ 15.99** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **16.01 ～ 16.09** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **16.95 ～ 16.99** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **17.01 ～ 17.09** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **17.95 ～ 17.99** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.01 ～ 18.09** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.95 ～ 18.99** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **19.01 ～ 19.09** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **19.95 ～ 19.99** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **20.01 ～ 20.09** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **20.95 ～ 20.99** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.01 ～ 21.09** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.95 ～ 21.99** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **22.01 ～ 22.09** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |

# MR マシンリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| 22.95 ～ 22.99 | 1.5 | 130 | 40 | 250 | 2 | 8 | 60°凹 |
| 23.01 ～ 23.09 | 1.5 | 130 | 40 | 250 | 2 | 8 | 60°凹 |
| 23.95 ～ 23.99 | 1.5 | 130 | 41 | 270 | 3 | 8 | 60°凹 |
| 24.01 ～ 24.09 | 1.5 | 130 | 41 | 270 | 3 | 8 | 60°凹 |
| 24.95 ～ 24.99 | 1.5 | 130 | 41 | 270 | 3 | 8 | 60°凹 |
| 25.01 ～ 25.09 | 1.5 | 130 | 41 | 270 | 3 | 8 | 60°凹 |
| 25.95 ～ 25.99 | 1.5 | 140 | 41 | 280 | 3 | 10 | 60°凹 |
| 26.01 ～ 26.09 | 1.5 | 140 | 41 | 280 | 3 | 10 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| 26.95 ～ 26.99 | 1.5 | 140 | 41 | 280 | 3 | 10 | 60°凹 |
| 27.01 ～ 27.09 | 1.5 | 140 | 41 | 280 | 3 | 10 | 60°凹 |
| 27.95 ～ 27.99 | 1.5 | 140 | 41 | 280 | 3 | 10 | 60°凹 |
| 28.01 ～ 28.09 | 1.5 | 140 | 41 | 280 | 3 | 10 | 60°凹 |
| 28.95 ～ 28.99 | 1.5 | 150 | 41 | 290 | 3 | 10 | 60°凹 |
| 29.01 ～ 29.09 | 1.5 | 150 | 41 | 290 | 3 | 10 | 60°凹 |
| 29.95 ～ 29.99 | 1.5 | 150 | 41 | 290 | 3 | 10 | 60°凹 |
| 30.01 ～ 30.09 | 1.5 | 150 | 41 | 290 | 3 | 10 | 60°凹 |

ハイス

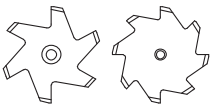
# SPMR

## スパイラルマシンリーマ *Spiral Machine Reamer*

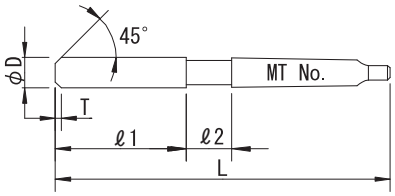
切削条件表 P141

貫通穴加工(スパイラル刃)

左ネジレ 12°　食付 45°　HSS








| 公差 (Tolerance) | D | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 0.01トビ Increment 0.01 | +0.005 0 | 3 | +0.007 +0.002 | 3.1～ 6 | +0.009 +0.004 | 6.1～10 | +0.012 +0.006 |
| | 10.1～18 | +0.015 +0.007 | 18.1～30 | +0.017 +0.008 | 30.1～50 | +0.02 +0.009 | 51 ～60 | +0.024 +0.011 |

右刃左ネジレ12°　食付角度45°　SKH51
Helix Angle-Left12°　Chamfer Angle45°　HSS

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| 3 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60°凹 |
| 3.1 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60°凹 |
| 3.2 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60°凹 |
| 3.3 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60°凹 |
| 3.4 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60°凹 |
| 3.5 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60°凹 |
| 3.6 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60°凹 |
| 3.7 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60°凹 |
| 3.8 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60°凹 |
| 3.9 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60°凹 |
| 4 | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60°凹 |
| 4.1 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60°凹 |
| 4.2 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60°凹 |
| 4.3 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60°凹 |
| 4.4 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| 4.5 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60°凹 |
| 4.6 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60°凹 |
| 4.7 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60°凹 |
| 4.8 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60°凹 |
| 4.9 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60°凹 |
| 5 | 0.5 | 45 | 9.5 | 120 | 1 | 6 | 60°凹 |
| 5.1 | 1 | 45 | 9.5 | 120 | 1 | 6 | 60°凹 |
| 5.2 | 1 | 45 | 9.5 | 120 | 1 | 6 | 60°凹 |
| 5.3 | 1 | 45 | 9.5 | 120 | 1 | 6 | 60°凹 |
| 5.4 | 1 | 45 | 9.5 | 120 | 1 | 6 | 60°凹 |
| 5.5 | 1 | 45 | 9.5 | 120 | 1 | 6 | 60°凹 |
| 5.6 | 1 | 50 | 14.5 | 130 | 1 | 6 | 60°凹 |
| 5.7 | 1 | 50 | 14.5 | 130 | 1 | 6 | 60°凹 |
| 5.8 | 1 | 50 | 14.5 | 130 | 1 | 6 | 60°凹 |
| 5.9 | 1 | 50 | 14.5 | 130 | 1 | 6 | 60°凹 |

# SPMR スパイラルマシンリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **6** | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| **6.1** | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| **6.2** | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| **6.3** | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| **6.4** | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| **6.5** | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| **6.6** | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| **6.7** | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| **6.8** | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| **6.9** | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| **7** | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| **7.1** | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| **7.2** | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| **7.3** | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| **7.4** | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| **7.5** | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| **7.6** | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| **7.7** | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| **7.8** | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| **7.9** | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| **8** | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| **8.1** | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| **8.2** | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| **8.3** | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| **8.4** | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| **8.5** | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| **8.6** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **8.7** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **8.8** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **8.9** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **9** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **9.1** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **9.2** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **9.3** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **9.4** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **9.5** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **9.6** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **9.7** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **9.8** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **9.9** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **10** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **10.1** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **10.2** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **10.3** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **10.4** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **10.5** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **10.6** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **10.7** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **10.8** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **10.9** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **11** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **11.1** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **11.2** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **11.3** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **11.4** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **11.5** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **11.6** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **11.7** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **11.8** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **11.9** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **12** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **12.1** | 1 | 80 | 34.5 | 180 | 1 | 6 | 60° 凹 |
| **12.2** | 1 | 80 | 34.5 | 180 | 1 | 6 | 60° 凹 |
| **12.3** | 1 | 80 | 34.5 | 180 | 1 | 6 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **12.4** | 1 | 80 | 34.5 | 180 | 1 | 6 | 60° 凹 |
| **12.5** | 1 | 80 | 34.5 | 180 | 1 | 6 | 60° 凹 |
| **12.6** | 1 | 80 | 34.5 | 180 | 1 | 8 | 60° 凹 |
| **12.7** | 1 | 80 | 34.5 | 180 | 1 | 8 | 60° 凹 |
| **12.8** | 1 | 80 | 34.5 | 180 | 1 | 8 | 60° 凹 |
| **12.9** | 1 | 80 | 34.5 | 180 | 1 | 8 | 60° 凹 |
| **13** | 1 | 80 | 34.5 | 180 | 1 | 8 | 60° 凹 |
| **13.1** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **13.2** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **13.3** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **13.4** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **13.5** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **13.6** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **13.7** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **13.8** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **13.9** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **14** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **14.1** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **14.2** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **14.3** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **14.4** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **14.5** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **14.6** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **14.7** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **14.8** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **14.9** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **15** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **15.1** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **15.2** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **15.3** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **15.4** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **15.5** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **15.6** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **15.7** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **15.8** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **15.9** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **16** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **16.1** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **16.2** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **16.3** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **16.4** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **16.5** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **16.6** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **16.7** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **16.8** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **16.9** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **17** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **17.1** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **17.2** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **17.3** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **17.4** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **17.5** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **17.6** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **17.7** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **17.8** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **17.9** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.1** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.2** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.3** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.4** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.5** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.6** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.7** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |

# SPMR スパイラルマシンリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **18.8** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **18.9** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **19** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **19.1** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **19.2** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **19.3** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **19.4** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **19.5** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **19.6** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **19.7** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **19.8** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **19.9** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **20** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **20.1** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **20.2** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **20.3** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **20.4** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **20.5** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **20.6** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **20.7** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **20.8** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **20.9** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.1** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.2** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.3** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.4** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.5** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.6** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.7** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.8** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **21.9** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **22** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **22.1** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **22.2** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **22.3** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **22.4** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **22.5** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **22.6** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **22.7** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **22.8** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **22.9** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **23** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **23.1** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **23.2** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **23.3** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **23.4** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **23.5** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **23.6** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **23.7** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **23.8** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **23.9** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24.1** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24.2** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24.3** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24.4** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24.5** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24.6** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24.7** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24.8** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **24.9** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **25** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **25.1** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **25.2** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **25.3** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **25.4** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **25.5** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **25.6** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **25.7** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **25.8** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **25.9** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26.1** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26.2** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26.3** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26.4** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26.5** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26.6** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26.7** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26.8** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **26.9** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.1** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.2** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.3** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.4** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.5** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.6** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.7** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.8** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.9** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **28** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **28.1** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **28.2** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **28.3** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **28.4** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **28.5** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **28.6** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **28.7** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **28.8** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **28.9** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29.1** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29.2** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29.3** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29.4** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29.5** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29.6** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29.7** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29.8** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **29.9** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **30** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **30.1** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **30.2** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **30.3** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **30.4** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **30.5** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **30.6** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **30.7** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **30.8** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **30.9** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **31** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **31.5** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **32** | 1.5 | 160 | 41 | 300 | 3 | 10 | 60° 凹 |
| **32.5** | 2 | 160 | 41 | 325 | 4 | 10 | 60° 凹 |
| **33** | 2 | 160 | 41 | 325 | 4 | 10 | 60° 凹 |
| **33.5** | 2 | 160 | 41 | 325 | 4 | 10 | 60° 凹 |

# SPMR スパイラルマシンリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **34** | 2 | 160 | 41 | 325 | 4 | 10 | 60° 凹 |
| **34.5** | 2 | 165 | 41 | 330 | 4 | 10 | 60° 凹 |
| **35** | 2 | 165 | 41 | 330 | 4 | 10 | 60° 凹 |
| **35.5** | 2 | 165 | 41 | 330 | 4 | 10 | 60° 凹 |
| **36** | 2 | 165 | 41 | 330 | 4 | 10 | 60° 凹 |
| **36.5** | 2 | 165 | 41 | 330 | 4 | 10 | 60° 凹 |
| **37** | 2 | 165 | 41 | 330 | 4 | 10 | 60° 凹 |
| **37.5** | 2 | 165 | 41 | 330 | 4 | 10 | 60° 凹 |
| **38** | 2 | 165 | 41 | 330 | 4 | 10 | 60° 凹 |
| **38.5** | 2 | 165 | 41 | 330 | 4 | 12 | 60° 凹 |
| **39** | 2 | 165 | 41 | 330 | 4 | 12 | 60° 凹 |
| **39.5** | 2 | 165 | 41 | 330 | 4 | 12 | 60° 凹 |
| **40** | 2 | 165 | 41 | 330 | 4 | 12 | 60° 凹 |
| **40.5** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **41** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **41.5** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **42** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **42.5** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **43** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **43.5** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **44** | 2 | 170 | 41 | 335 | 4 | 12 | 60° 凹 |
| **44.5** | 2 | 175 | 41 | 340 | 4 | 12 | 60° 凹 |
| **45** | 2 | 175 | 41 | 340 | 4 | 12 | 60° 凹 |
| **45.5** | 2 | 175 | 41 | 340 | 4 | 12 | 60° 凹 |
| **46** | 2 | 175 | 41 | 340 | 4 | 12 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **46.5** | 2 | 180 | 46 | 350 | 4 | 12 | 60° 凹 |
| **47** | 2 | 180 | 46 | 350 | 4 | 12 | 60° 凹 |
| **47.5** | 2 | 180 | 46 | 350 | 4 | 12 | 60° 凹 |
| **48** | 2 | 180 | 46 | 350 | 4 | 12 | 60° 凹 |
| **48.5** | 2 | 180 | 49 | 385 | 5 | 12 | 60° 凹 |
| **49** | 2 | 180 | 49 | 385 | 5 | 12 | 60° 凹 |
| **49.5** | 2 | 180 | 49 | 385 | 5 | 12 | 60° 凹 |
| **50** | 2 | 180 | 49 | 385 | 5 | 12 | 60° 凹 |
| **51** | 2 | 180 | 49 | 385 | 5 | 12 | 60° 凹 |
| **52** | 2 | 180 | 49 | 385 | 5 | 12 | 60° 凹 |
| **53** | 2 | 185 | 49 | 390 | 5 | 14 | 60° 凹 |
| **55** | 2.5 | 185 | 54 | 395 | 5 | 14 | 60° 凹 |
| **56** | 2.5 | 185 | 54 | 395 | 5 | 14 | 60° 凹 |
| **60** | 2.5 | 190 | 69 | 415 | 5 | 14 | 60° 凹 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1/8** | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| **1/4** | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| **5/16** | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| **3/8** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **1/2** | 1 | 80 | 34.5 | 180 | 1 | 8 | 60° 凹 |
| **5/8** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |
| **3/4** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **7/8** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **3.01 ～ 3.09** | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| **4.01 ～ 4.09** | 0.5 | 35 | 9.5 | 110 | 1 | 6 | 60° 凹 |
| **5.01 ～ 5.09** | 1 | 45 | 9.5 | 120 | 1 | 6 | 60° 凹 |
| **6.01 ～ 6.09** | 1 | 50 | 14.5 | 130 | 1 | 6 | 60° 凹 |
| **7.01 ～ 7.09** | 1 | 55 | 19.5 | 140 | 1 | 6 | 60° 凹 |
| **8.01 ～ 8.09** | 1 | 60 | 24.5 | 150 | 1 | 6 | 60° 凹 |
| **9.01 ～ 9.09** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **10.01 ～ 10.09** | 1 | 70 | 24.5 | 160 | 1 | 6 | 60° 凹 |
| **11.01 ～ 11.09** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **12.01 ～ 12.09** | 1 | 75 | 29.5 | 170 | 1 | 6 | 60° 凹 |
| **13.01 ～ 13.09** | 1 | 80 | 34.5 | 180 | 1 | 8 | 60° 凹 |
| **14.01 ～ 14.09** | 1 | 85 | 39.5 | 190 | 1 | 8 | 60° 凹 |
| **15.01 ～ 15.09** | 1.5 | 90 | 40 | 210 | 2 | 8 | 60° 凹 |
| **16.01 ～ 16.09** | 1.5 | 95 | 40 | 215 | 2 | 8 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **17.01 ～ 17.09** | 1.5 | 100 | 40 | 220 | 2 | 8 | 60° 凹 |
| **18.01 ～ 18.09** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **19.01 ～ 19.09** | 1.5 | 105 | 40 | 225 | 2 | 8 | 60° 凹 |
| **20.01 ～ 20.09** | 1.5 | 110 | 40 | 230 | 2 | 8 | 60° 凹 |
| **21.01 ～ 21.05** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **22.01 ～ 22.05** | 1.5 | 120 | 40 | 240 | 2 | 8 | 60° 凹 |
| **23.01 ～ 23.09** | 1.5 | 130 | 40 | 250 | 2 | 8 | 60° 凹 |
| **24.01 ～ 24.09** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **25.01 ～ 25.09** | 1.5 | 130 | 41 | 270 | 3 | 8 | 60° 凹 |
| **26.01 ～ 26.05** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **27.01 ～ 27.05** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **28.01 ～ 28.05** | 1.5 | 140 | 41 | 280 | 3 | 10 | 60° 凹 |
| **29.01 ～ 29.05** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |
| **30.01 ～ 30.05** | 1.5 | 150 | 41 | 290 | 3 | 10 | 60° 凹 |

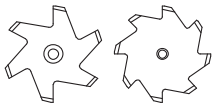
ハイス

# LMR

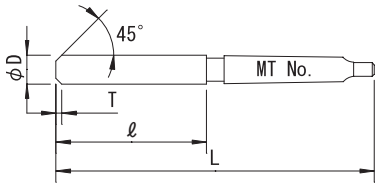
## ロングマシンリーマ　*Long Machine Reamer*

切削条件表 P141

貫通穴加工（ストレート刃）　右直刃　食付45°　HSS








| 公差 (Tolerance) | D | | | | | |
|---|---|---|---|---|---|---|
| | 5 ～ 6 | +0.009 +0.004 | 6.1～10 | +0.012 +0.006 | 10.1～18 | +0.015 +0.007 |
| | 18.1～30 | +0.017 +0.008 | 30.5～50 | +0.02 +0.009 | 55 ～60 | +0.024 +0.011 |

右刃ストレート　食付角度45°　SKH51
Straight Flute　Chamfer Angle45°　HSS

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | MTNo. *Shank MTNo.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| 5 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| 5.1 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 5.2 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 5.3 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 5.4 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 5.5 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| 6 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| 6.1 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 6.2 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 6.3 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 6.4 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 6.5 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| 7 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| 7.1 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 7.2 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 7.3 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 7.4 | 1 | 120 | 250 | 1 | 6 | 60°凹 |
| 7.5 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| | 1 | 200 | 300 | 1 | 6 | 60°凹 |
| 8 | 1 | 100 | 200 | 1 | 6 | 60°凹 |
| | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| | 1 | 200 | 300 | 1 | 6 | 60°凹 |
| 8.1 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 8.2 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 8.3 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 8.4 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 8.5 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| | 1 | 200 | 300 | 1 | 6 | 60°凹 |
| 9 | 1 | 100 | 200 | 1 | 6 | 60°凹 |
| | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| | 1 | 200 | 300 | 1 | 6 | 60°凹 |
| 9.1 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 9.2 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 9.3 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 9.4 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 9.5 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| | 1 | 200 | 300 | 1 | 6 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | MTNo. *Shank MTNo.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| 10 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| | 1 | 160 | 250 | 1 | 6 | 60°凹 |
| | 1 | 200 | 300 | 1 | 6 | 60°凹 |
| 10.1 | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| 10.2 | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| 10.3 | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| 10.4 | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| 10.5 | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| | 1 | 200 | 300 | 1 | 6 | 60°凹 |
| 11 | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| | 1 | 150 | 300 | 1 | 6 | 60°凹 |
| | 1 | 200 | 300 | 1 | 6 | 60°凹 |
| | 1 | 200 | 350 | 1 | 6 | 60°凹 |
| | 1 | 250 | 350 | 1 | 6 | 60°凹 |
| 11.1 | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| 11.2 | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| 11.3 | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| 11.4 | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| 11.5 | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| | 1 | 150 | 300 | 1 | 6 | 60°凹 |
| | 1 | 160 | 250 | 1 | 6 | 60°凹 |
| | 1 | 200 | 300 | 1 | 6 | 60°凹 |
| | 1 | 200 | 350 | 1 | 6 | 60°凹 |
| 12 | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| | 1 | 200 | 300 | 1 | 6 | 60°凹 |
| | 1 | 200 | 350 | 1 | 6 | 60°凹 |
| | 1 | 250 | 350 | 1 | 6 | 60°凹 |
| | 1 | 300 | 400 | 1 | 6 | 60°凹 |
| 12.1 | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| | 1 | 160 | 250 | 1 | 6 | 60°凹 |
| | 1 | 150 | 350 | 1 | 6 | 60°凹 |
| 12.2 | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| | 1 | 160 | 250 | 1 | 6 | 60°凹 |
| | 1 | 150 | 350 | 1 | 6 | 60°凹 |
| 12.3 | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| | 1 | 150 | 350 | 1 | 6 | 60°凹 |
| 12.4 | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| | 1 | 150 | 350 | 1 | 6 | 60°凹 |
| 12.5 | 1 | 150 | 300 | 1 | 6 | 60°凹 |
| | 1 | 200 | 300 | 1 | 6 | 60°凹 |
| | 1 | 200 | 350 | 1 | 6 | 60°凹 |

# LMR ロングマシンリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 13 | 1 | 150 | 250 | 1 | 8 | 60°凹 |
| | 1 | 150 | 300 | 1 | 8 | 60°凹 |
| | 1 | 200 | 300 | 1 | 8 | 60°凹 |
| | 1 | 200 | 350 | 1 | 8 | 60°凹 |
| | 1 | 300 | 400 | 1 | 8 | 60°凹 |
| 13.1 | 1 | 150 | 250 | 1 | 8 | 60°凹 |
| 13.2 | 1 | 150 | 250 | 1 | 8 | 60°凹 |
| 13.3 | 1 | 150 | 250 | 1 | 8 | 60°凹 |
| 13.4 | 1 | 150 | 250 | 1 | 8 | 60°凹 |
| 13.5 | 1 | 200 | 300 | 1 | 8 | 60°凹 |
| | 1 | 200 | 350 | 1 | 8 | 60°凹 |
| 14 | 1 | 150 | 250 | 1 | 8 | 60°凹 |
| | 1 | 160 | 250 | 1 | 8 | 60°凹 |
| | 1 | 200 | 300 | 1 | 8 | 60°凹 |
| | 1 | 200 | 350 | 1 | 8 | 60°凹 |
| | 1 | 200 | 400 | 1 | 8 | 60°凹 |
| | 1 | 250 | 350 | 1 | 8 | 60°凹 |
| | 1 | 250 | 400 | 1 | 8 | 60°凹 |
| | 1 | 300 | 400 | 1 | 8 | 60°凹 |
| 14.1 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 14.2 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 14.3 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 14.4 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 14.5 | 1.5 | 150 | 300 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 15 | 1.5 | 150 | 300 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 300 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 300 | 450 | 2 | 8 | 60°凹 |
| | 1.5 | 400 | 600 | 2 | 8 | 60°凹 |
| 15.1 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 15.2 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 15.3 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 15.4 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 15.5 | 1.5 | 150 | 300 | 2 | 8 | 60°凹 |
| | 1.5 | 180 | 300 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 16 | 1.5 | 150 | 300 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 300 | 450 | 2 | 8 | 60°凹 |
| | 1.5 | 400 | 600 | 2 | 8 | 60°凹 |
| 16.1 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 16.2 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 16.3 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 16.4 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 16.5 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 400 | 600 | 2 | 8 | 60°凹 |
| 17 | 1.5 | 180 | 300 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 300 | 450 | 2 | 8 | 60°凹 |
| | 1.5 | 400 | 600 | 2 | 8 | 60°凹 |
| 17.1 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 17.5 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| 18 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 300 | 450 | 2 | 8 | 60°凹 |
| 18.1 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 18.2 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 18.3 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 18.4 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 18.5 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 19 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 400 | 600 | 2 | 8 | 60°凹 |
| 19.5 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 20 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 300 | 450 | 2 | 8 | 60°凹 |
| | 1.5 | 350 | 500 | 2 | 8 | 60°凹 |
| | 1.5 | 400 | 600 | 2 | 8 | 60°凹 |
| 20.1 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 20.2 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 20.3 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 20.4 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| 20.5 | 1.5 | 200 | 300 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 350 | 500 | 2 | 8 | 60°凹 |
| 21 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 21.5 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 350 | 500 | 2 | 8 | 60°凹 |
| 22 | 1.5 | 200 | 300 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 300 | 500 | 2 | 8 | 60°凹 |
| 22.5 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 350 | 500 | 2 | 8 | 60°凹 |
| 23 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 23.5 | 1.5 | 200 | 350 | 3 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 3 | 8 | 60°凹 |
| | 1.5 | 350 | 500 | 3 | 8 | 60°凹 |
| 24 | 1.5 | 200 | 350 | 3 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 3 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 3 | 8 | 60°凹 |
| | 1.5 | 250 | 450 | 3 | 8 | 60°凹 |
| | 1.5 | 300 | 450 | 3 | 8 | 60°凹 |
| | 1.5 | 400 | 600 | 3 | 8 | 60°凹 |
| 24.5 | 1.5 | 200 | 350 | 3 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 3 | 8 | 60°凹 |
| | 1.5 | 350 | 500 | 3 | 8 | 60°凹 |
| 25 | 1.5 | 200 | 350 | 3 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 3 | 8 | 60°凹 |
| | 1.5 | 250 | 450 | 3 | 8 | 60°凹 |
| | 1.5 | 300 | 450 | 3 | 8 | 60°凹 |

# LMR ロングマシンリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **25** | 1.5 | 300 | 500 | 3 | 8 | 60°凹 |
| | 1.5 | 350 | 500 | 3 | 8 | 60°凹 |
| | 1.5 | 400 | 600 | 3 | 8 | 60°凹 |
| **25.5** | 1.5 | 250 | 400 | 3 | 10 | 60°凹 |
| | 1.5 | 300 | 500 | 3 | 10 | 60°凹 |
| | 1.5 | 350 | 500 | 3 | 10 | 60°凹 |
| **26** | 1.5 | 200 | 350 | 3 | 10 | 60°凹 |
| | 1.5 | 250 | 400 | 3 | 10 | 60°凹 |
| | 1.5 | 250 | 450 | 3 | 10 | 60°凹 |
| | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |
| **26.5** | 1.5 | 250 | 400 | 3 | 10 | 60°凹 |
| | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |
| | 1.5 | 350 | 500 | 3 | 10 | 60°凹 |
| **27** | 1.5 | 200 | 350 | 3 | 10 | 60°凹 |
| | 1.5 | 250 | 400 | 3 | 10 | 60°凹 |
| | 1.5 | 250 | 450 | 3 | 10 | 60°凹 |
| | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |
| **27.5** | 1.5 | 250 | 400 | 3 | 10 | 60°凹 |
| | 1.5 | 350 | 500 | 3 | 10 | 60°凹 |
| **28** | 1.5 | 200 | 350 | 3 | 10 | 60°凹 |
| | 1.5 | 250 | 400 | 3 | 10 | 60°凹 |
| | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |
| | 1.5 | 400 | 600 | 3 | 10 | 60°凹 |
| **28.5** | 1.5 | 250 | 400 | 3 | 10 | 60°凹 |
| | 1.5 | 350 | 500 | 3 | 10 | 60°凹 |
| **29** | 1.5 | 200 | 350 | 3 | 10 | 60°凹 |
| | 1.5 | 200 | 400 | 3 | 10 | 60°凹 |
| | 1.5 | 250 | 400 | 3 | 10 | 60°凹 |
| | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |
| **29.5** | 1.5 | 250 | 400 | 3 | 10 | 60°凹 |
| | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |
| | 1.5 | 350 | 500 | 3 | 10 | 60°凹 |
| **30** | 1.5 | 200 | 350 | 3 | 10 | 60°凹 |
| | 1.5 | 250 | 400 | 3 | 10 | 60°凹 |
| | 1.5 | 250 | 450 | 3 | 10 | 60°凹 |
| | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |
| | 1.5 | 300 | 500 | 3 | 10 | 60°凹 |
| | 1.5 | 350 | 500 | 3 | 10 | 60°凹 |
| | 1.5 | 400 | 600 | 3 | 10 | 60°凹 |
| **30.5** | 1.5 | 250 | 400 | 3 | 10 | 60°凹 |
| | 1.5 | 350 | 500 | 3 | 10 | 60°凹 |
| **31** | 1.5 | 250 | 400 | 3 | 10 | 60°凹 |
| | 1.5 | 250 | 450 | 3 | 10 | 60°凹 |
| | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |
| **31.5** | 1.5 | 250 | 400 | 3 | 10 | 60°凹 |
| | 1.5 | 350 | 500 | 3 | 10 | 60°凹 |
| **32** | 1.5 | 250 | 400 | 3 | 10 | 60°凹 |
| | 1.5 | 250 | 450 | 3 | 10 | 60°凹 |
| | 1.5 | 300 | 500 | 3 | 10 | 60°凹 |
| | 1.5 | 400 | 550 | 3 | 10 | 60°凹 |
| | 1.5 | 400 | 580 | 3 | 10 | 60°凹 |
| | 1.5 | 400 | 600 | 3 | 10 | 60°凹 |
| **32.5** | 2 | 300 | 500 | 4 | 10 | 60°凹 |
| | 2 | 400 | 600 | 4 | 10 | 60°凹 |
| **33** | 2 | 250 | 450 | 4 | 10 | 60°凹 |
| | 2 | 400 | 550 | 4 | 10 | 60°凹 |
| | 2 | 400 | 600 | 4 | 10 | 60°凹 |
| **33.5** | 2 | 300 | 500 | 4 | 10 | 60°凹 |
| | 2 | 400 | 600 | 4 | 10 | 60°凹 |
| **34** | 2 | 250 | 450 | 4 | 10 | 60°凹 |
| | 2 | 300 | 470 | 4 | 10 | 60°凹 |
| | 2 | 300 | 500 | 4 | 10 | 60°凹 |
| | 2 | 400 | 600 | 4 | 10 | 60°凹 |
| **34.5** | 2 | 300 | 500 | 4 | 10 | 60°凹 |
| | 2 | 400 | 600 | 4 | 10 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|
| **35** | 2 | 250 | 450 | 4 | 10 | 60°凹 |
| | 2 | 300 | 500 | 4 | 10 | 60°凹 |
| | 2 | 350 | 500 | 4 | 10 | 60°凹 |
| | 2 | 400 | 600 | 4 | 10 | 60°凹 |
| **35.5** | 2 | 300 | 500 | 4 | 10 | 60°凹 |
| | 2 | 400 | 600 | 4 | 10 | 60°凹 |
| **36** | 2 | 250 | 450 | 4 | 10 | 60°凹 |
| | 2 | 300 | 500 | 4 | 10 | 60°凹 |
| | 2 | 400 | 600 | 4 | 10 | 60°凹 |
| **36.5** | 2 | 300 | 500 | 4 | 10 | 60°凹 |
| | 2 | 400 | 600 | 4 | 10 | 60°凹 |
| **37** | 2 | 300 | 500 | 4 | 10 | 60°凹 |
| | 2 | 400 | 600 | 4 | 10 | 60°凹 |
| **37.5** | 2 | 300 | 500 | 4 | 10 | 60°凹 |
| | 2 | 400 | 600 | 4 | 10 | 60°凹 |
| **38** | 2 | 250 | 450 | 4 | 10 | 60°凹 |
| | 2 | 300 | 450 | 4 | 10 | 60°凹 |
| | 2 | 300 | 500 | 4 | 10 | 60°凹 |
| | 2 | 400 | 600 | 4 | 10 | 60°凹 |
| **38.5** | 2 | 300 | 500 | 4 | 12 | 60°凹 |
| | 2 | 400 | 600 | 4 | 12 | 60°凹 |
| **39** | 2 | 300 | 500 | 4 | 12 | 60°凹 |
| | 2 | 400 | 600 | 4 | 12 | 60°凹 |
| **39.5** | 2 | 300 | 500 | 4 | 12 | 60°凹 |
| | 2 | 400 | 600 | 4 | 12 | 60°凹 |
| **40** | 2 | 250 | 450 | 4 | 12 | 60°凹 |
| | 2 | 300 | 500 | 4 | 12 | 60°凹 |
| | 2 | 400 | 600 | 4 | 12 | 60°凹 |
| **41** | 2 | 300 | 500 | 4 | 12 | 60°凹 |
| | 2 | 400 | 600 | 4 | 12 | 60°凹 |
| **42** | 2 | 300 | 500 | 4 | 12 | 60°凹 |
| | 2 | 400 | 600 | 4 | 12 | 60°凹 |
| **43** | 2 | 300 | 500 | 4 | 12 | 60°凹 |
| | 2 | 400 | 600 | 4 | 12 | 60°凹 |
| **44** | 2 | 300 | 500 | 4 | 12 | 60°凹 |
| **45** | 2 | 300 | 500 | 4 | 12 | 60°凹 |
| | 2 | 400 | 600 | 4 | 12 | 60°凹 |
| **46** | 2 | 300 | 500 | 4 | 12 | 60°凹 |
| | 2 | 450 | 600 | 4 | 12 | 60°凹 |
| **47** | 2 | 300 | 500 | 4 | 12 | 60°凹 |
| **48** | 2 | 300 | 500 | 4 | 12 | 60°凹 |
| | 2 | 450 | 650 | 4 | 12 | 60°凹 |
| **49** | 2 | 300 | 500 | 5 | 12 | 60°凹 |
| **50** | 2 | 300 | 500 | 5 | 12 | 60°凹 |
| | 2 | 400 | 600 | 5 | 12 | 60°凹 |
| | 2 | 450 | 650 | 5 | 12 | 60°凹 |
| **55** | 2.5 | 450 | 650 | 5 | 14 | 60°凹 |
| **60** | 2.5 | 450 | 650 | 5 | 14 | 60°凹 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **1/4** | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| **3/8** | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| | 1 | 200 | 300 | 1 | 6 | 60°凹 |
| **1/2** | 1 | 150 | 250 | 1 | 8 | 60°凹 |
| | 1 | 200 | 300 | 1 | 8 | 60°凹 |
| | 1 | 250 | 350 | 1 | 8 | 60°凹 |
| **5/8** | 1.5 | 180 | 300 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| **3/4** | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| **7/8** | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| **1"** | 1.5 | 250 | 400 | 3 | 8 | 60°凹 |
| **1"1/4** | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |
| **1"1/2** | 2 | 300 | 500 | 4 | 12 | 60°凹 |

ハイス

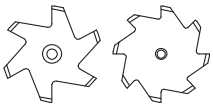
# SPLMR

## スパイラルロングマシンリーマ　*Spiral Long Machine Reamer*

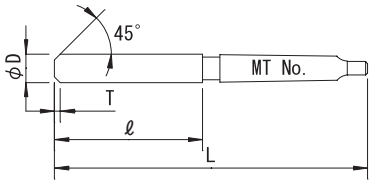
切削条件表 P141

貫通穴加工(スパイラル刃)

左ネジレ 12°　食付 45°　HSS








| 公差 (Tolerance) | D | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 5～6 | +0.009 +0.004 | 7～10 | +0.012 +0.006 | 10.5～18 | +0.015 +0.007 | 18.5～30 | +0.017 +0.008 |

右刃左ネジレ12°　食付角度45°　SKH51
Helix Angle-Left12°　Chamfer Angle45°　HSS

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | MTNo. *Shank MTNo.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| 5 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 6 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 7 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| 8 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| 9 | 1 | 120 | 200 | 1 | 6 | 60°凹 |
| | 1 | 160 | 250 | 1 | 6 | 60°凹 |
| 10 | 1 | 150 | 250 | 1 | 6 | 60°凹 |
| | 1 | 150 | 300 | 1 | 6 | 60°凹 |
| | 1 | 200 | 300 | 1 | 6 | 60°凹 |
| 10.5 | 1 | 200 | 300 | 1 | 6 | 60°凹 |
| 11 | 1 | 200 | 300 | 1 | 6 | 60°凹 |
| 11.5 | 1 | 200 | 300 | 1 | 6 | 60°凹 |
| 12 | 1 | 150 | 300 | 1 | 6 | 60°凹 |
| | 1 | 160 | 250 | 1 | 6 | 60°凹 |
| | 1 | 200 | 300 | 1 | 6 | 60°凹 |
| | 1 | 200 | 350 | 1 | 6 | 60°凹 |
| 12.5 | 1 | 200 | 350 | 1 | 6 | 60°凹 |
| 13 | 1 | 150 | 300 | 1 | 8 | 60°凹 |
| | 1 | 200 | 300 | 1 | 8 | 60°凹 |
| | 1 | 200 | 350 | 1 | 8 | 60°凹 |
| 13.5 | 1 | 200 | 350 | 1 | 8 | 60°凹 |
| 14 | 1 | 200 | 300 | 1 | 8 | 60°凹 |
| | 1 | 200 | 350 | 1 | 8 | 60°凹 |
| 14.5 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 15 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 15.5 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 16 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 16.5 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 17 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 17.5 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | MTNo. *Shank MTNo.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|
| 18 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 450 | 2 | 8 | 60°凹 |
| 18.5 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 19 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 19.5 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 20 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 200 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 20.5 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 21 | 1.5 | 200 | 350 | 2 | 8 | 60°凹 |
| | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 21.5 | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 22 | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 22.5 | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| | 1.5 | 300 | 450 | 2 | 8 | 60°凹 |
| 23 | 1.5 | 250 | 400 | 2 | 8 | 60°凹 |
| 23.5 | 1.5 | 300 | 450 | 3 | 8 | 60°凹 |
| 24 | 1.5 | 300 | 450 | 3 | 8 | 60°凹 |
| 24.5 | 1.5 | 300 | 450 | 3 | 8 | 60°凹 |
| 25 | 1.5 | 300 | 450 | 3 | 8 | 60°凹 |
| 25.5 | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |
| 26 | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |
| 26.5 | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |
| 27 | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |
| 27.5 | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |
| 28 | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |
| 28.5 | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |
| 29 | 1.5 | 200 | 450 | 3 | 10 | 60°凹 |
| | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |
| 29.5 | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |
| 30 | 1.5 | 300 | 450 | 3 | 10 | 60°凹 |

ハイス

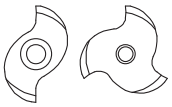
# HHHR

## ハイヘリカルリーマ　*High Helical Reamer*

切削条件表 P140

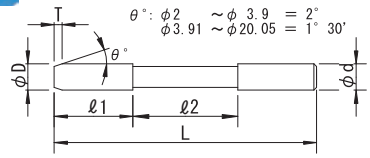
貫通穴加工（スパイラル刃）

左ネジレ 60°　食付 2°　食付 30'　HSS Co



D≦Φ2.99　60° 凸






| 公差 (Tolerance) | D | | | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.01トビ Increment 0.01 | +0.005 0 | 2～2.6 | +0.005 +0.001 | 2.7～5.9 | +0.006 +0.002 | 6～17.5 | +0.007 +0.003 | 17.6～20 | +0.008 +0.004 | h7 |

右刃左ネジレ60°　食付角度 ～φ3.9まで2° φ3.91～1°30'　SKH56

Helix Angle-Left60°　Chamfer Angle : 2° for up to φ3.9 and 1.5° for φ3.91 and over.　HSS-Co.

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| 2 | 5.7 | 15 | 20 | 60 | 2 | 2 | 60° 凸 |
| 2.1 | 5.7 | 15 | 20 | 60 | 2.1 | 2 | 60° 凸 |
| 2.2 | 5.7 | 15 | 20 | 60 | 2.2 | 2 | 60° 凸 |
| 2.3 | 5.7 | 15 | 20 | 60 | 2.3 | 2 | 60° 凸 |
| 2.4 | 5.7 | 15 | 20 | 60 | 2.4 | 2 | 60° 凸 |
| 2.5 | 5.7 | 15 | 20 | 60 | 2.5 | 2 | 60° 凸 |
| 2.6 | 5.7 | 15 | 20 | 60 | 2.6 | 2 | 60° 凸 |
| 2.7 | 5.7 | 15 | 20 | 60 | 2.7 | 2 | 60° 凸 |
| 2.8 | 5.7 | 15 | 20 | 60 | 2.8 | 2 | 60° 凸 |
| 2.9 | 5.7 | 15 | 20 | 60 | 2.9 | 2 | 60° 凸 |
| 3 | 5.7 | 22 | 23 | 70 | 3 | 2 | 60° 凹 |
| 3.1 | 5.7 | 22 | 23 | 70 | 3.1 | 2 | 60° 凹 |
| 3.2 | 5.7 | 22 | 23 | 70 | 3.2 | 2 | 60° 凹 |
| 3.3 | 5.7 | 22 | 23 | 70 | 3.3 | 2 | 60° 凹 |
| 3.4 | 5.7 | 22 | 23 | 70 | 3.4 | 2 | 60° 凹 |
| 3.5 | 5.7 | 24 | 29 | 80 | 3.5 | 2 | 60° 凹 |
| 3.6 | 5.7 | 24 | 29 | 80 | 3.6 | 2 | 60° 凹 |
| 3.7 | 5.7 | 24 | 29 | 80 | 3.7 | 2 | 60° 凹 |
| 3.8 | 5.7 | 24 | 29 | 80 | 3.8 | 2 | 60° 凹 |
| 3.9 | 5.7 | 24 | 29 | 80 | 3.9 | 2 | 60° 凹 |
| 4 | 6.55 | 24 | 29 | 80 | 4 | 2 | 60° 凹 |
| 4.1 | 7.6 | 24 | 29 | 80 | 4.1 | 2 | 60° 凹 |
| 4.2 | 7.6 | 24 | 29 | 80 | 4.2 | 2 | 60° 凹 |
| 4.3 | 7.6 | 24 | 29 | 80 | 4.3 | 2 | 60° 凹 |
| 4.4 | 7.6 | 24 | 29 | 80 | 4.4 | 2 | 60° 凹 |
| 4.5 | 7.6 | 25 | 35 | 90 | 4.5 | 2 | 60° 凹 |
| 4.6 | 7.6 | 25 | 35 | 90 | 4.6 | 2 | 60° 凹 |
| 4.7 | 7.6 | 25 | 35 | 90 | 4.7 | 2 | 60° 凹 |
| 4.8 | 7.6 | 25 | 35 | 90 | 4.8 | 2 | 60° 凹 |
| 4.9 | 7.6 | 25 | 35 | 90 | 4.9 | 2 | 60° 凹 |
| 5 | 7.6 | 25 | 35 | 90 | 5 | 2 | 60° 凹 |
| 5.1 | 7.6 | 25 | 35 | 90 | 5.1 | 2 | 60° 凹 |
| 5.2 | 7.6 | 25 | 35 | 90 | 5.2 | 2 | 60° 凹 |
| 5.3 | 7.6 | 25 | 35 | 90 | 5.3 | 2 | 60° 凹 |
| 5.4 | 7.6 | 25 | 35 | 90 | 5.4 | 2 | 60° 凹 |
| 5.5 | 7.6 | 30 | 35 | 100 | 5.5 | 2 | 60° 凹 |
| 5.6 | 7.6 | 30 | 35 | 100 | 5.6 | 2 | 60° 凹 |
| 5.7 | 7.6 | 30 | 35 | 100 | 5.7 | 2 | 60° 凹 |
| 5.8 | 7.6 | 30 | 35 | 100 | 5.8 | 2 | 60° 凹 |
| 5.9 | 7.6 | 30 | 35 | 100 | 5.9 | 2 | 60° 凹 |
| 6 | 7.6 | 30 | 35 | 100 | 6 | 3 | 60° 凹 |
| 6.1 | 7.6 | 30 | 35 | 100 | 6.1 | 3 | 60° 凹 |
| 6.2 | 9.5 | 30 | 35 | 100 | 6.2 | 3 | 60° 凹 |
| 6.3 | 9.5 | 30 | 35 | 100 | 6.3 | 3 | 60° 凹 |
| 6.4 | 9.5 | 30 | 35 | 100 | 6.4 | 3 | 60° 凹 |
| 6.5 | 9.5 | 30 | 40 | 110 | 6.5 | 3 | 60° 凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| 6.6 | 9.5 | 30 | 40 | 110 | 6.6 | 3 | 60° 凹 |
| 6.7 | 9.5 | 30 | 40 | 110 | 6.7 | 3 | 60° 凹 |
| 6.8 | 9.5 | 30 | 40 | 110 | 6.8 | 3 | 60° 凹 |
| 6.9 | 9.5 | 30 | 40 | 110 | 6.9 | 3 | 60° 凹 |
| 7 | 9.5 | 30 | 40 | 110 | 7 | 3 | 60° 凹 |
| 7.1 | 9.5 | 30 | 40 | 110 | 7.1 | 3 | 60° 凹 |
| 7.2 | 9.5 | 30 | 40 | 110 | 7.2 | 3 | 60° 凹 |
| 7.3 | 9.5 | 30 | 40 | 110 | 7.3 | 3 | 60° 凹 |
| 7.4 | 9.5 | 30 | 40 | 110 | 7.4 | 3 | 60° 凹 |
| 7.5 | 9.5 | 30 | 40 | 110 | 7.5 | 3 | 60° 凹 |
| 7.6 | 9.5 | 30 | 40 | 110 | 7.6 | 3 | 60° 凹 |
| 7.7 | 9.5 | 30 | 40 | 110 | 7.7 | 3 | 60° 凹 |
| 7.8 | 9.5 | 30 | 40 | 110 | 7.8 | 3 | 60° 凹 |
| 7.9 | 9.5 | 30 | 40 | 110 | 7.9 | 3 | 60° 凹 |
| 8 | 9.5 | 35 | 50 | 125 | 8 | 3 | 60° 凹 |
| 8.1 | 9.5 | 35 | 50 | 125 | 8.1 | 3 | 60° 凹 |
| 8.2 | 9.5 | 35 | 50 | 125 | 8.2 | 3 | 60° 凹 |
| 8.3 | 9.5 | 35 | 50 | 125 | 8.3 | 3 | 60° 凹 |
| 8.4 | 9.5 | 35 | 50 | 125 | 8.4 | 3 | 60° 凹 |
| 8.5 | 9.5 | 35 | 55 | 135 | 8.5 | 3 | 60° 凹 |
| 8.6 | 9.5 | 35 | 55 | 135 | 8.6 | 3 | 60° 凹 |
| 8.7 | 9.5 | 35 | 55 | 135 | 8.7 | 3 | 60° 凹 |
| 8.8 | 9.5 | 35 | 55 | 135 | 8.8 | 3 | 60° 凹 |
| 8.9 | 9.5 | 35 | 55 | 135 | 8.9 | 3 | 60° 凹 |
| 9 | 9.5 | 35 | 55 | 135 | 9 | 3 | 60° 凹 |
| 9.1 | 9.5 | 35 | 55 | 135 | 9.1 | 3 | 60° 凹 |
| 9.2 | 9.5 | 35 | 55 | 135 | 9.2 | 3 | 60° 凹 |
| 9.3 | 9.5 | 35 | 55 | 135 | 9.3 | 3 | 60° 凹 |
| 9.4 | 9.5 | 35 | 55 | 135 | 9.4 | 3 | 60° 凹 |
| 9.5 | 9.5 | 40 | 60 | 150 | 9.5 | 3 | 60° 凹 |
| 9.6 | 9.5 | 40 | 60 | 150 | 9.6 | 3 | 60° 凹 |
| 9.7 | 9.5 | 40 | 60 | 150 | 9.7 | 3 | 60° 凹 |
| 9.8 | 9.5 | 40 | 60 | 150 | 9.8 | 3 | 60° 凹 |
| 9.9 | 9.5 | 40 | 60 | 150 | 9.9 | 3 | 60° 凹 |
| 10 | 9.5 | 40 | 60 | 150 | 10 | 3 | 60° 凹 |
| 10.1 | 9.5 | 40 | 60 | 150 | 10.1 | 3 | 60° 凹 |
| 10.2 | 9.5 | 40 | 60 | 150 | 10.2 | 3 | 60° 凹 |
| 10.3 | 9.5 | 40 | 60 | 150 | 10.3 | 3 | 60° 凹 |
| 10.4 | 9.5 | 40 | 60 | 150 | 10.4 | 3 | 60° 凹 |
| 10.5 | 9.5 | 40 | 60 | 155 | 10.5 | 3 | 60° 凹 |
| 10.6 | 9.5 | 40 | 60 | 155 | 10.6 | 3 | 60° 凹 |
| 10.7 | 9.5 | 40 | 60 | 155 | 10.7 | 3 | 60° 凹 |
| 10.8 | 9.5 | 40 | 60 | 155 | 10.8 | 3 | 60° 凹 |
| 10.9 | 9.5 | 40 | 60 | 155 | 10.9 | 3 | 60° 凹 |
| 11 | 9.5 | 40 | 60 | 155 | 11 | 3 | 60° 凹 |
| 11.1 | 9.5 | 40 | 60 | 155 | 11.1 | 3 | 60° 凹 |

# HHHR ハイヘリカルリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **11.2** | 9.5 | 40 | 60 | 155 | 11.2 | 3 | 60° 凹 |
| **11.3** | 9.5 | 40 | 60 | 155 | 11.3 | 3 | 60° 凹 |
| **11.4** | 9.5 | 40 | 60 | 155 | 11.4 | 3 | 60° 凹 |
| **11.5** | 9.5 | 40 | 65 | 160 | 11.5 | 3 | 60° 凹 |
| **11.6** | 9.5 | 40 | 65 | 160 | 11.6 | 3 | 60° 凹 |
| **11.7** | 9.5 | 40 | 65 | 160 | 11.7 | 3 | 60° 凹 |
| **11.8** | 9.5 | 40 | 65 | 160 | 11.8 | 3 | 60° 凹 |
| **11.9** | 9.5 | 40 | 65 | 160 | 11.9 | 3 | 60° 凹 |
| **12** | 9.5 | 40 | 65 | 160 | 12 | 3 | 60° 凹 |
| **12.1** | 9.5 | 40 | 65 | 160 | 12.1 | 3 | 60° 凹 |
| **12.2** | 9.5 | 40 | 65 | 160 | 12.2 | 3 | 60° 凹 |
| **12.3** | 9.5 | 40 | 65 | 160 | 12.3 | 3 | 60° 凹 |
| **12.4** | 9.5 | 40 | 65 | 160 | 12.4 | 3 | 60° 凹 |
| **12.5** | 9.5 | 45 | 65 | 165 | 12.5 | 3 | 60° 凹 |
| **12.6** | 9.5 | 45 | 65 | 165 | 12.6 | 3 | 60° 凹 |
| **12.7** | 9.5 | 45 | 65 | 165 | 12.7 | 3 | 60° 凹 |
| **12.8** | 9.5 | 45 | 65 | 165 | 12.8 | 3 | 60° 凹 |
| **12.9** | 9.5 | 45 | 65 | 165 | 12.9 | 3 | 60° 凹 |
| **13** | 9.5 | 45 | 65 | 165 | 13 | 3 | 60° 凹 |
| **13.1** | 9.5 | 45 | 65 | 165 | 13.1 | 3 | 60° 凹 |
| **13.2** | 9.5 | 45 | 65 | 165 | 13.2 | 3 | 60° 凹 |
| **13.3** | 9.5 | 45 | 65 | 165 | 13.3 | 3 | 60° 凹 |
| **13.4** | 9.5 | 45 | 65 | 165 | 13.4 | 3 | 60° 凹 |
| **13.5** | 9.5 | 45 | 70 | 170 | 13.5 | 3 | 60° 凹 |
| **13.6** | 9.5 | 45 | 70 | 170 | 13.6 | 3 | 60° 凹 |
| **13.7** | 9.5 | 45 | 70 | 170 | 13.7 | 3 | 60° 凹 |
| **13.8** | 9.5 | 45 | 70 | 170 | 13.8 | 3 | 60° 凹 |
| **13.9** | 9.5 | 45 | 70 | 170 | 13.9 | 3 | 60° 凹 |
| **14** | 9.5 | 45 | 70 | 170 | 14 | 3 | 60° 凹 |
| **14.1** | 9.5 | 45 | 70 | 170 | 16 | 3 | 60° 凹 |
| **14.2** | 9.5 | 45 | 70 | 170 | 16 | 3 | 60° 凹 |
| **14.3** | 9.5 | 45 | 70 | 170 | 16 | 3 | 60° 凹 |
| **14.4** | 9.5 | 45 | 70 | 170 | 16 | 3 | 60° 凹 |
| **14.5** | 9.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **14.6** | 9.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **14.7** | 9.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **14.8** | 9.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **14.9** | 9.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **15** | 9.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **15.1** | 9.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **15.2** | 9.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **15.3** | 9.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **15.4** | 9.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **15.5** | 11.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **15.6** | 11.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **15.7** | 11.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **15.8** | 11.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **15.9** | 11.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **16** | 11.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **16.1** | 11.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **16.2** | 11.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **16.3** | 11.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **16.4** | 11.5 | 45 | 80 | 180 | 16 | 3 | 60° 凹 |
| **16.5** | 11.5 | 50 | 80 | 185 | 16 | 3 | 60° 凹 |
| **16.6** | 11.5 | 50 | 80 | 185 | 16 | 3 | 60° 凹 |
| **16.7** | 11.5 | 50 | 80 | 185 | 16 | 3 | 60° 凹 |
| **16.8** | 11.5 | 50 | 80 | 185 | 16 | 3 | 60° 凹 |
| **16.9** | 11.5 | 50 | 80 | 185 | 16 | 3 | 60° 凹 |
| **17** | 11.5 | 50 | 80 | 185 | 16 | 3 | 60° 凹 |
| **17.1** | 11.5 | 50 | 80 | 185 | 20 | 3 | 60° 凹 |
| **17.2** | 11.5 | 50 | 80 | 185 | 20 | 3 | 60° 凹 |
| **17.3** | 11.5 | 50 | 80 | 185 | 20 | 3 | 60° 凹 |
| **17.4** | 11.5 | 50 | 80 | 185 | 20 | 3 | 60° 凹 |
| **17.5** | 11.5 | 50 | 80 | 185 | 20 | 3 | 60° 凹 |
| **17.6** | 11.5 | 50 | 80 | 185 | 20 | 4 | 60° 凹 |
| **17.7** | 11.5 | 50 | 80 | 185 | 20 | 4 | 60° 凹 |
| **17.8** | 11.5 | 50 | 80 | 185 | 20 | 4 | 60° 凹 |
| **17.9** | 11.5 | 50 | 80 | 185 | 20 | 4 | 60° 凹 |
| **18** | 11.5 | 50 | 80 | 185 | 20 | 4 | 60° 凹 |
| **18.1** | 11.5 | 50 | 70 | 185 | 20 | 4 | 60° 凹 |
| **18.2** | 11.5 | 50 | 70 | 185 | 20 | 4 | 60° 凹 |
| **18.3** | 11.5 | 50 | 70 | 185 | 20 | 4 | 60° 凹 |
| **18.4** | 11.5 | 50 | 70 | 185 | 20 | 4 | 60° 凹 |
| **18.5** | 11.5 | 50 | 70 | 185 | 20 | 4 | 60° 凹 |
| **18.6** | 11.5 | 50 | 70 | 185 | 20 | 4 | 60° 凹 |
| **18.7** | 11.5 | 50 | 70 | 185 | 20 | 4 | 60° 凹 |
| **18.8** | 11.5 | 50 | 70 | 185 | 20 | 4 | 60° 凹 |
| **18.9** | 11.5 | 50 | 70 | 185 | 20 | 4 | 60° 凹 |
| **19** | 11.5 | 50 | 70 | 185 | 20 | 4 | 60° 凹 |
| **19.1** | 11.5 | 50 | 70 | 185 | 20 | 4 | 60° 凹 |
| **19.2** | 11.5 | 50 | 70 | 185 | 20 | 4 | 60° 凹 |
| **19.3** | 11.5 | 50 | 70 | 185 | 20 | 4 | 60° 凹 |
| **19.4** | 11.5 | 50 | 70 | 185 | 20 | 4 | 60° 凹 |
| **19.5** | 11.5 | 55 | 65 | 190 | 20 | 4 | 60° 凹 |
| **19.6** | 11.5 | 55 | 65 | 190 | 20 | 4 | 60° 凹 |
| **19.7** | 11.5 | 55 | 65 | 190 | 20 | 4 | 60° 凹 |
| **19.8** | 11.5 | 55 | 65 | 190 | 20 | 4 | 60° 凹 |
| **19.9** | 11.5 | 55 | 65 | 190 | 20 | 4 | 60° 凹 |
| **20** | 11.5 | 55 | 65 | 190 | 20 | 4 | 60° 凹 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1/4** | 9.5 | 30 | 35 | 100 | 1/4 | 3 | 60° 凹 |
| **3/8** | 9.5 | 40 | 60 | 150 | 3/8 | 3 | 60° 凹 |
| **1/2** | 9.5 | 45 | 65 | 165 | 1/2 | 3 | 60° 凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **2.01 ～ 2.09** | 5.7 | 15 | 20 | 60 | 直径と同径 ※1 | 2 | 60° 凸 |
| **2.11 ～ 2.19** | 5.7 | 15 | 20 | 60 | | 2 | 60° 凸 |
| **2.21 ～ 2.29** | 5.7 | 15 | 20 | 60 | | 2 | 60° 凸 |
| **2.31 ～ 2.39** | 5.7 | 15 | 20 | 60 | | 2 | 60° 凸 |
| **2.41 ～ 2.49** | 5.7 | 15 | 20 | 60 | | 2 | 60° 凸 |
| **2.51 ～ 2.59** | 5.7 | 15 | 20 | 60 | | 2 | 60° 凸 |
| **2.61 ～ 2.69** | 5.7 | 15 | 20 | 60 | | 2 | 60° 凸 |
| **2.71 ～ 2.79** | 5.7 | 15 | 20 | 60 | | 2 | 60° 凸 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **2.81 ～ 2.89** | 5.7 | 15 | 20 | 60 | 直径と同径 ※1 | 2 | 60° 凸 |
| **2.91 ～ 2.99** | 5.7 | 22 | 23 | 70 | | 2 | 60° 凸 |
| **3.01 ～ 3.09** | 5.7 | 22 | 23 | 70 | | 2 | 60° 凹 |
| **3.11 ～ 3.19** | 5.7 | 22 | 23 | 70 | | 2 | 60° 凹 |
| **3.21 ～ 3.29** | 5.7 | 22 | 23 | 70 | | 2 | 60° 凹 |
| **3.31 ～ 3.39** | 5.7 | 22 | 23 | 70 | | 2 | 60° 凹 |
| **3.41 ～ 3.49** | 5.7 | 24 | 29 | 80 | | 2 | 60° 凹 |
| **3.51 ～ 3.59** | 5.7 | 24 | 29 | 80 | | 2 | 60° 凹 |

※1 Shank diameter is same as ϕD

# HHHR ハイヘリカルリーマ

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| 3.61～ 3.69 | 5.7 | 24 | 29 | 80 | 直径と同径※1 | 2 | 60°凹 |
| 3.71～ 3.79 | 5.7 | 24 | 29 | 80 | | 2 | 60°凹 |
| 3.81～ 3.89 | 5.7 | 24 | 29 | 80 | | 2 | 60°凹 |
| 3.91～ 3.99 | 6.55 | 24 | 29 | 80 | | 2 | 60°凹 |
| 4.01～ 4.09 | 7.6 | 24 | 29 | 80 | | 2 | 60°凹 |
| 4.11～ 4.19 | 7.6 | 24 | 29 | 80 | | 2 | 60°凹 |
| 4.21～ 4.29 | 7.6 | 24 | 29 | 80 | | 2 | 60°凹 |
| 4.31～ 4.39 | 7.6 | 24 | 29 | 80 | | 2 | 60°凹 |
| 4.41～ 4.49 | 7.6 | 25 | 35 | 90 | | 2 | 60°凹 |
| 4.51～ 4.59 | 7.6 | 25 | 35 | 90 | | 2 | 60°凹 |
| 4.61～ 4.69 | 7.6 | 25 | 35 | 90 | | 2 | 60°凹 |
| 4.71～ 4.79 | 7.6 | 25 | 35 | 90 | | 2 | 60°凹 |
| 4.81～ 4.89 | 7.6 | 25 | 35 | 90 | | 2 | 60°凹 |
| 4.91～ 4.99 | 7.6 | 25 | 35 | 90 | | 2 | 60°凹 |
| 5.01～ 5.09 | 7.6 | 25 | 35 | 90 | | 2 | 60°凹 |
| 5.11～ 5.19 | 7.6 | 25 | 35 | 90 | | 2 | 60°凹 |
| 5.21～ 5.29 | 7.6 | 25 | 35 | 90 | | 2 | 60°凹 |
| 5.31～ 5.39 | 7.6 | 25 | 35 | 90 | | 2 | 60°凹 |
| 5.41～ 5.49 | 7.6 | 30 | 35 | 100 | | 2 | 60°凹 |
| 5.51～ 5.59 | 7.6 | 30 | 35 | 100 | | 2 | 60°凹 |
| 5.61～ 5.69 | 7.6 | 30 | 35 | 100 | | 2 | 60°凹 |
| 5.71～ 5.79 | 7.6 | 30 | 35 | 100 | | 2 | 60°凹 |
| 5.81～ 5.89 | 7.6 | 30 | 35 | 100 | | 2 | 60°凹 |
| 5.91～ 5.99 | 7.6 | 30 | 35 | 100 | | 3 | 60°凹 |
| 6.01～ 6.09 | 7.6 | 30 | 35 | 100 | | 3 | 60°凹 |
| 6.11～ 6.19 | 9.5 | 30 | 35 | 100 | | 3 | 60°凹 |
| 6.21～ 6.29 | 9.5 | 30 | 35 | 100 | | 3 | 60°凹 |
| 6.31～ 6.39 | 9.5 | 30 | 35 | 100 | | 3 | 60°凹 |
| 6.41～ 6.49 | 9.5 | 30 | 40 | 110 | | 3 | 60°凹 |
| 6.51～ 6.59 | 9.5 | 30 | 40 | 110 | | 3 | 60°凹 |
| 6.61～ 6.69 | 9.5 | 30 | 40 | 110 | | 3 | 60°凹 |
| 6.71～ 6.79 | 9.5 | 30 | 40 | 110 | | 3 | 60°凹 |
| 6.81～ 6.89 | 9.5 | 30 | 40 | 110 | | 3 | 60°凹 |
| 6.91～ 6.99 | 9.5 | 30 | 40 | 110 | | 3 | 60°凹 |
| 7.01～ 7.09 | 9.5 | 30 | 40 | 110 | | 3 | 60°凹 |
| 7.11～ 7.19 | 9.5 | 30 | 40 | 110 | | 3 | 60°凹 |
| 7.21～ 7.29 | 9.5 | 30 | 40 | 110 | | 3 | 60°凹 |
| 7.31～ 7.39 | 9.5 | 30 | 40 | 110 | | 3 | 60°凹 |
| 7.41～ 7.49 | 9.5 | 30 | 40 | 110 | | 3 | 60°凹 |
| 7.51～ 7.59 | 9.5 | 30 | 40 | 110 | | 3 | 60°凹 |
| 7.61～ 7.69 | 9.5 | 30 | 40 | 110 | | 3 | 60°凹 |
| 7.71～ 7.79 | 9.5 | 30 | 40 | 110 | | 3 | 60°凹 |
| 7.81～ 7.89 | 9.5 | 30 | 40 | 110 | | 3 | 60°凹 |
| 7.91～ 7.99 | 9.5 | 35 | 50 | 125 | | 3 | 60°凹 |
| 8.01～ 8.09 | 9.5 | 35 | 50 | 125 | | 3 | 60°凹 |
| 8.11～ 8.19 | 9.5 | 35 | 50 | 125 | | 3 | 60°凹 |
| 8.21～ 8.29 | 9.5 | 35 | 50 | 125 | | 3 | 60°凹 |
| 8.31～ 8.39 | 9.5 | 35 | 50 | 125 | | 3 | 60°凹 |
| 8.41～ 8.49 | 9.5 | 35 | 55 | 135 | | 3 | 60°凹 |
| 8.51～ 8.59 | 9.5 | 35 | 55 | 135 | | 3 | 60°凹 |
| 8.61～ 8.69 | 9.5 | 35 | 55 | 135 | | 3 | 60°凹 |
| 8.71～ 8.79 | 9.5 | 35 | 55 | 135 | | 3 | 60°凹 |
| 8.81～ 8.89 | 9.5 | 35 | 55 | 135 | | 3 | 60°凹 |
| 8.91～ 8.99 | 9.5 | 35 | 55 | 135 | | 3 | 60°凹 |
| 9.01～ 9.09 | 9.5 | 35 | 55 | 135 | | 3 | 60°凹 |
| 9.11～ 9.19 | 9.5 | 35 | 55 | 135 | | 3 | 60°凹 |
| 9.21～ 9.29 | 9.5 | 35 | 55 | 135 | | 3 | 60°凹 |
| 9.31～ 9.39 | 9.5 | 35 | 55 | 135 | | 3 | 60°凹 |
| 9.41～ 9.49 | 9.5 | 40 | 60 | 150 | | 3 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| 9.51～ 9.59 | 9.5 | 40 | 60 | 150 | 直径と同径※1 | 3 | 60°凹 |
| 9.61～ 9.69 | 9.5 | 40 | 60 | 150 | | 3 | 60°凹 |
| 9.71～ 9.79 | 9.5 | 40 | 60 | 150 | | 3 | 60°凹 |
| 9.81～ 9.89 | 9.5 | 40 | 60 | 150 | | 3 | 60°凹 |
| 9.91～ 9.99 | 9.5 | 40 | 60 | 150 | | 3 | 60°凹 |
| 10.01～10.09 | 9.5 | 40 | 60 | 150 | | 3 | 60°凹 |
| 10.11～10.19 | 9.5 | 40 | 60 | 150 | | 3 | 60°凹 |
| 10.21～10.29 | 9.5 | 40 | 60 | 150 | | 3 | 60°凹 |
| 10.31～10.39 | 9.5 | 40 | 60 | 150 | | 3 | 60°凹 |
| 10.41～10.49 | 9.5 | 40 | 60 | 155 | | 3 | 60°凹 |
| 10.51～10.59 | 9.5 | 40 | 60 | 155 | | 3 | 60°凹 |
| 10.61～10.69 | 9.5 | 40 | 60 | 155 | | 3 | 60°凹 |
| 10.71～10.79 | 9.5 | 40 | 60 | 155 | | 3 | 60°凹 |
| 10.81～10.89 | 9.5 | 40 | 60 | 155 | | 3 | 60°凹 |
| 10.91～10.99 | 9.5 | 40 | 60 | 155 | | 3 | 60°凹 |
| 11.01～11.09 | 9.5 | 40 | 60 | 155 | | 3 | 60°凹 |
| 11.11～11.19 | 9.5 | 40 | 60 | 155 | | 3 | 60°凹 |
| 11.21～11.29 | 9.5 | 40 | 60 | 155 | | 3 | 60°凹 |
| 11.31～11.39 | 9.5 | 40 | 60 | 155 | | 3 | 60°凹 |
| 11.41～11.49 | 9.5 | 40 | 65 | 160 | | 3 | 60°凹 |
| 11.51～11.59 | 9.5 | 40 | 65 | 160 | | 3 | 60°凹 |
| 11.61～11.69 | 9.5 | 40 | 65 | 160 | | 3 | 60°凹 |
| 11.71～11.79 | 9.5 | 40 | 65 | 160 | | 3 | 60°凹 |
| 11.81～11.89 | 9.5 | 40 | 65 | 160 | | 3 | 60°凹 |
| 11.91～11.99 | 9.5 | 40 | 65 | 160 | | 3 | 60°凹 |
| 12.01～12.09 | 9.5 | 40 | 65 | 160 | | 3 | 60°凹 |
| 12.11～12.19 | 9.5 | 40 | 65 | 160 | | 3 | 60°凹 |
| 12.21～12.29 | 9.5 | 40 | 65 | 160 | | 3 | 60°凹 |
| 12.31～12.39 | 9.5 | 40 | 65 | 160 | | 3 | 60°凹 |
| 12.41～12.49 | 9.5 | 45 | 65 | 165 | | 3 | 60°凹 |
| 12.51～12.59 | 9.5 | 45 | 65 | 165 | | 3 | 60°凹 |
| 12.61～12.69 | 9.5 | 45 | 65 | 165 | | 3 | 60°凹 |
| 12.71～12.79 | 9.5 | 45 | 65 | 165 | | 3 | 60°凹 |
| 12.81～12.89 | 9.5 | 45 | 65 | 165 | | 3 | 60°凹 |
| 12.91～12.99 | 9.5 | 45 | 65 | 165 | | 3 | 60°凹 |
| 13.01～13.09 | 9.5 | 45 | 65 | 165 | | 3 | 60°凹 |
| 13.11～13.19 | 9.5 | 45 | 65 | 165 | | 3 | 60°凹 |
| 13.21～13.29 | 9.5 | 45 | 65 | 165 | | 3 | 60°凹 |
| 13.31～13.39 | 9.5 | 45 | 65 | 165 | | 3 | 60°凹 |
| 13.41～13.49 | 9.5 | 45 | 70 | 170 | | 3 | 60°凹 |
| 13.51～13.59 | 9.5 | 45 | 70 | 170 | | 3 | 60°凹 |
| 13.61～13.69 | 9.5 | 45 | 70 | 170 | | 3 | 60°凹 |
| 13.71～13.79 | 9.5 | 45 | 70 | 170 | | 3 | 60°凹 |
| 13.81～13.89 | 9.5 | 45 | 70 | 170 | | 3 | 60°凹 |
| 13.91～13.99 | 9.5 | 45 | 70 | 170 | | 3 | 60°凹 |
| 14.01～14.05 | 9.5 | 45 | 70 | 170 | 16 | 3 | 60°凹 |
| 14.95～14.99 | 9.5 | 45 | 80 | 180 | | 3 | 60°凹 |
| 15.01～15.05 | 9.5 | 45 | 80 | 180 | | 3 | 60°凹 |
| 15.95～15.99 | 11.5 | 45 | 80 | 180 | | 3 | 60°凹 |
| 16.01～16.05 | 11.5 | 45 | 80 | 180 | | 3 | 60°凹 |
| 16.95～16.99 | 11.5 | 50 | 80 | 185 | | 3 | 60°凹 |
| 17.01～17.05 | 11.5 | 50 | 80 | 185 | | 3 | 60°凹 |
| 17.95～17.99 | 11.5 | 50 | 80 | 185 | 20 | 4 | 60°凹 |
| 18.01～18.05 | 11.5 | 50 | 80 | 185 | | 4 | 60°凹 |
| 18.95～18.99 | 11.5 | 50 | 70 | 185 | | 4 | 60°凹 |
| 19.01～19.05 | 11.5 | 50 | 70 | 185 | | 4 | 60°凹 |
| 19.95～19.99 | 11.5 | 55 | 65 | 190 | | 4 | 60°凹 |
| 20.01～20.05 | 11.5 | 55 | 65 | 190 | | 4 | 60°凹 |

※1 Shank diameter is same as ΦD

ハイス

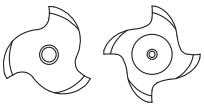
# HHHRT

## ハイヘリカルリーマ（テーパーシャンク） *High Helical Reamer with Taper Shank*

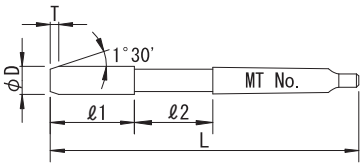
切削条件表 P140

貫通穴加工（スパイラル刃）

左ネジレ 60°　食付 1°30'　HSS Co








| 公差 (Tolerance) | D | | | | | |
|---|---|---|---|---|---|---|
| | 4～5.5 | +0.006 +0.002 | 5.6～17.5 | +0.007 +0.003 | 17.6～25.4 | +0.008 +0.004 | 25.5～40 | +0.01 +0.005 |

右刃左ネジレ60°　食付角度1°30'　SKH56
Helix Angle-Left60°　Chamfer Angle1°30'　HSS-Co.

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | MTNo. *Shank MTNo.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **4** | 7.6 | 24 | 25.5 | 115 | 1 | 2 | 60°凹 |
| **4.1** | 7.6 | 24 | 25.5 | 115 | 1 | 2 | 60°凹 |
| **4.2** | 7.6 | 24 | 25.5 | 115 | 1 | 2 | 60°凹 |
| **4.3** | 7.6 | 24 | 25.5 | 115 | 1 | 2 | 60°凹 |
| **4.4** | 7.6 | 24 | 25.5 | 115 | 1 | 2 | 60°凹 |
| **4.5** | 7.6 | 24 | 30.5 | 120 | 1 | 2 | 60°凹 |
| **4.6** | 7.6 | 24 | 30.5 | 120 | 1 | 2 | 60°凹 |
| **4.7** | 7.6 | 24 | 30.5 | 120 | 1 | 2 | 60°凹 |
| **4.8** | 7.6 | 24 | 30.5 | 120 | 1 | 2 | 60°凹 |
| **4.9** | 7.6 | 24 | 30.5 | 120 | 1 | 2 | 60°凹 |
| **5** | 7.6 | 24 | 30.5 | 120 | 1 | 2 | 60°凹 |
| **5.1** | 7.6 | 24 | 30.5 | 120 | 1 | 2 | 60°凹 |
| **5.2** | 7.6 | 24 | 30.5 | 120 | 1 | 2 | 60°凹 |
| **5.3** | 7.6 | 24 | 30.5 | 120 | 1 | 2 | 60°凹 |
| **5.4** | 7.6 | 24 | 30.5 | 120 | 1 | 2 | 60°凹 |
| **5.5** | 7.6 | 30 | 34.5 | 130 | 1 | 2 | 60°凹 |
| **5.6** | 7.6 | 30 | 34.5 | 130 | 1 | 2 | 60°凹 |
| **5.7** | 7.6 | 30 | 34.5 | 130 | 1 | 2 | 60°凹 |
| **5.8** | 7.6 | 30 | 34.5 | 130 | 1 | 2 | 60°凹 |
| **5.9** | 7.6 | 30 | 34.5 | 130 | 1 | 2 | 60°凹 |
| **6** | 7.6 | 30 | 34.5 | 130 | 1 | 3 | 60°凹 |
| **6.1** | 7.6 | 30 | 34.5 | 130 | 1 | 3 | 60°凹 |
| **6.2** | 9.5 | 30 | 34.5 | 130 | 1 | 3 | 60°凹 |
| **6.3** | 9.5 | 30 | 34.5 | 130 | 1 | 3 | 60°凹 |
| **6.4** | 9.5 | 30 | 34.5 | 130 | 1 | 3 | 60°凹 |
| **6.5** | 9.5 | 35 | 39.5 | 140 | 1 | 3 | 60°凹 |
| **6.6** | 9.5 | 35 | 39.5 | 140 | 1 | 3 | 60°凹 |
| **6.7** | 9.5 | 35 | 39.5 | 140 | 1 | 3 | 60°凹 |
| **6.8** | 9.5 | 35 | 39.5 | 140 | 1 | 3 | 60°凹 |
| **6.9** | 9.5 | 35 | 39.5 | 140 | 1 | 3 | 60°凹 |
| **7** | 9.5 | 35 | 39.5 | 140 | 1 | 3 | 60°凹 |
| **7.1** | 9.5 | 35 | 39.5 | 140 | 1 | 3 | 60°凹 |
| **7.2** | 9.5 | 35 | 39.5 | 140 | 1 | 3 | 60°凹 |
| **7.3** | 9.5 | 35 | 39.5 | 140 | 1 | 3 | 60°凹 |
| **7.4** | 9.5 | 35 | 39.5 | 140 | 1 | 3 | 60°凹 |
| **7.5** | 9.5 | 40 | 44.5 | 150 | 1 | 3 | 60°凹 |
| **7.6** | 9.5 | 40 | 44.5 | 150 | 1 | 3 | 60°凹 |
| **7.7** | 9.5 | 40 | 44.5 | 150 | 1 | 3 | 60°凹 |
| **7.8** | 9.5 | 40 | 44.5 | 150 | 1 | 3 | 60°凹 |
| **7.9** | 9.5 | 40 | 44.5 | 150 | 1 | 3 | 60°凹 |
| **8** | 9.5 | 40 | 44.5 | 150 | 1 | 3 | 60°凹 |
| **8.1** | 9.5 | 40 | 44.5 | 150 | 1 | 3 | 60°凹 |
| **8.2** | 9.5 | 40 | 44.5 | 150 | 1 | 3 | 60°凹 |
| **8.3** | 9.5 | 40 | 44.5 | 150 | 1 | 3 | 60°凹 |
| **8.4** | 9.5 | 40 | 44.5 | 150 | 1 | 3 | 60°凹 |

| 直径 (ΦD) *Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ1) *Length of Flutes* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | MTNo. *Shank MTNo.* | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|
| **8.5** | 9.5 | 40 | 54.5 | 160 | 1 | 3 | 60°凹 |
| **8.6** | 9.5 | 40 | 54.5 | 160 | 1 | 3 | 60°凹 |
| **8.7** | 9.5 | 40 | 54.5 | 160 | 1 | 3 | 60°凹 |
| **8.8** | 9.5 | 40 | 54.5 | 160 | 1 | 3 | 60°凹 |
| **8.9** | 9.5 | 40 | 54.5 | 160 | 1 | 3 | 60°凹 |
| **9** | 9.5 | 40 | 59.5 | 165 | 1 | 3 | 60°凹 |
| **9.1** | 9.5 | 40 | 59.5 | 165 | 1 | 3 | 60°凹 |
| **9.2** | 9.5 | 40 | 59.5 | 165 | 1 | 3 | 60°凹 |
| **9.3** | 9.5 | 40 | 59.5 | 165 | 1 | 3 | 60°凹 |
| **9.4** | 9.5 | 40 | 59.5 | 165 | 1 | 3 | 60°凹 |
| **9.5** | 9.5 | 40 | 59.5 | 165 | 1 | 3 | 60°凹 |
| **9.6** | 9.5 | 40 | 59.5 | 165 | 1 | 3 | 60°凹 |
| **9.7** | 9.5 | 40 | 59.5 | 165 | 1 | 3 | 60°凹 |
| **9.8** | 9.5 | 40 | 59.5 | 165 | 1 | 3 | 60°凹 |
| **9.9** | 9.5 | 40 | 59.5 | 165 | 1 | 3 | 60°凹 |
| **10** | 9.5 | 40 | 59.5 | 165 | 1 | 3 | 60°凹 |
| **10.1** | 9.5 | 40 | 59.5 | 165 | 1 | 3 | 60°凹 |
| **10.2** | 9.5 | 40 | 59.5 | 165 | 1 | 3 | 60°凹 |
| **10.3** | 9.5 | 40 | 59.5 | 165 | 1 | 3 | 60°凹 |
| **10.4** | 9.5 | 40 | 59.5 | 165 | 1 | 3 | 60°凹 |
| **10.5** | 9.5 | 40 | 64.5 | 170 | 1 | 3 | 60°凹 |
| **10.6** | 9.5 | 40 | 64.5 | 170 | 1 | 3 | 60°凹 |
| **10.7** | 9.5 | 40 | 64.5 | 170 | 1 | 3 | 60°凹 |
| **10.8** | 9.5 | 40 | 64.5 | 170 | 1 | 3 | 60°凹 |
| **10.9** | 9.5 | 40 | 64.5 | 170 | 1 | 3 | 60°凹 |
| **11** | 9.5 | 40 | 64.5 | 170 | 1 | 3 | 60°凹 |
| **11.1** | 9.5 | 40 | 64.5 | 170 | 1 | 3 | 60°凹 |
| **11.2** | 9.5 | 40 | 64.5 | 170 | 1 | 3 | 60°凹 |
| **11.3** | 9.5 | 40 | 64.5 | 170 | 1 | 3 | 60°凹 |
| **11.4** | 9.5 | 40 | 64.5 | 170 | 1 | 3 | 60°凹 |
| **11.5** | 9.5 | 40 | 69.5 | 175 | 1 | 3 | 60°凹 |
| **11.6** | 9.5 | 40 | 69.5 | 175 | 1 | 3 | 60°凹 |
| **11.7** | 9.5 | 40 | 69.5 | 175 | 1 | 3 | 60°凹 |
| **11.8** | 9.5 | 40 | 69.5 | 175 | 1 | 3 | 60°凹 |
| **11.9** | 9.5 | 40 | 69.5 | 175 | 1 | 3 | 60°凹 |
| **12** | 9.5 | 40 | 69.5 | 175 | 1 | 3 | 60°凹 |
| **12.1** | 9.5 | 40 | 69.5 | 175 | 1 | 3 | 60°凹 |
| **12.2** | 9.5 | 40 | 69.5 | 175 | 1 | 3 | 60°凹 |
| **12.3** | 9.5 | 40 | 69.5 | 175 | 1 | 3 | 60°凹 |
| **12.4** | 9.5 | 40 | 69.5 | 175 | 1 | 3 | 60°凹 |
| **12.5** | 9.5 | 40 | 74.5 | 180 | 1 | 3 | 60°凹 |
| **12.6** | 9.5 | 40 | 74.5 | 180 | 1 | 3 | 60°凹 |
| **12.7** | 9.5 | 40 | 74.5 | 180 | 1 | 3 | 60°凹 |
| **12.8** | 9.5 | 40 | 74.5 | 180 | 1 | 3 | 60°凹 |
| **12.9** | 9.5 | 40 | 74.5 | 180 | 1 | 3 | 60°凹 |

# HHHRT ハイヘリカルリーマ（テーパーシャンク）

| 直径（ΦD） Dia. | 食付長（T） Chamfer Length | 刃長（ℓ1） Length of Flutes | 首長（ℓ2） Neck Length | 全長（L） Overall Length | MTNo. Shank MTNo. | 刃数（N） Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| **13** | 9.5 | 40 | 74.5 | 180 | 1 | 3 | 60° 凹 |
| **13.1** | 9.5 | 40 | 74.5 | 180 | 1 | 3 | 60° 凹 |
| **13.2** | 9.5 | 40 | 74.5 | 180 | 1 | 3 | 60° 凹 |
| **13.3** | 9.5 | 40 | 74.5 | 180 | 1 | 3 | 60° 凹 |
| **13.4** | 9.5 | 40 | 74.5 | 180 | 1 | 3 | 60° 凹 |
| **13.5** | 9.5 | 45 | 69.5 | 180 | 1 | 3 | 60° 凹 |
| **13.6** | 9.5 | 45 | 69.5 | 180 | 1 | 3 | 60° 凹 |
| **13.7** | 9.5 | 45 | 69.5 | 180 | 1 | 3 | 60° 凹 |
| **13.8** | 9.5 | 45 | 69.5 | 180 | 1 | 3 | 60° 凹 |
| **13.9** | 9.5 | 45 | 69.5 | 180 | 1 | 3 | 60° 凹 |
| **14** | 9.5 | 45 | 69.5 | 180 | 1 | 3 | 60° 凹 |
| **14.1** | 9.5 | 45 | 69.5 | 180 | 1 | 3 | 60° 凹 |
| **14.2** | 9.5 | 45 | 69.5 | 180 | 1 | 3 | 60° 凹 |
| **14.3** | 9.5 | 45 | 69.5 | 180 | 1 | 3 | 60° 凹 |
| **14.4** | 9.5 | 45 | 69.5 | 180 | 1 | 3 | 60° 凹 |
| **14.5** | 9.5 | 45 | 75 | 200 | 2 | 3 | 60° 凹 |
| **14.6** | 9.5 | 45 | 75 | 200 | 2 | 3 | 60° 凹 |
| **14.7** | 9.5 | 45 | 75 | 200 | 2 | 3 | 60° 凹 |
| **14.8** | 9.5 | 45 | 75 | 200 | 2 | 3 | 60° 凹 |
| **14.9** | 9.5 | 45 | 75 | 200 | 2 | 3 | 60° 凹 |
| **15** | 9.5 | 45 | 75 | 200 | 2 | 3 | 60° 凹 |
| **15.1** | 9.5 | 45 | 75 | 200 | 2 | 3 | 60° 凹 |
| **15.2** | 9.5 | 45 | 75 | 200 | 2 | 3 | 60° 凹 |
| **15.3** | 9.5 | 45 | 75 | 200 | 2 | 3 | 60° 凹 |
| **15.4** | 9.5 | 45 | 75 | 200 | 2 | 3 | 60° 凹 |
| **15.5** | 11.5 | 45 | 80 | 205 | 2 | 3 | 60° 凹 |
| **15.6** | 11.5 | 45 | 80 | 205 | 2 | 3 | 60° 凹 |
| **15.7** | 11.5 | 45 | 80 | 205 | 2 | 3 | 60° 凹 |
| **15.8** | 11.5 | 45 | 80 | 205 | 2 | 3 | 60° 凹 |
| **15.9** | 11.5 | 45 | 80 | 205 | 2 | 3 | 60° 凹 |
| **16** | 11.5 | 45 | 80 | 205 | 2 | 3 | 60° 凹 |
| **16.1** | 11.5 | 45 | 80 | 205 | 2 | 3 | 60° 凹 |
| **16.2** | 11.5 | 45 | 80 | 205 | 2 | 3 | 60° 凹 |
| **16.3** | 11.5 | 45 | 80 | 205 | 2 | 3 | 60° 凹 |
| **16.4** | 11.5 | 45 | 80 | 205 | 2 | 3 | 60° 凹 |
| **16.5** | 11.5 | 50 | 75 | 205 | 2 | 3 | 60° 凹 |
| **16.6** | 11.5 | 50 | 75 | 205 | 2 | 3 | 60° 凹 |
| **16.7** | 11.5 | 50 | 75 | 205 | 2 | 3 | 60° 凹 |
| **16.8** | 11.5 | 50 | 75 | 205 | 2 | 3 | 60° 凹 |
| **16.9** | 11.5 | 50 | 75 | 205 | 2 | 3 | 60° 凹 |
| **17** | 11.5 | 50 | 75 | 205 | 2 | 3 | 60° 凹 |
| **17.1** | 11.5 | 50 | 75 | 205 | 2 | 3 | 60° 凹 |
| **17.2** | 11.5 | 50 | 75 | 205 | 2 | 3 | 60° 凹 |
| **17.3** | 11.5 | 50 | 75 | 205 | 2 | 3 | 60° 凹 |
| **17.4** | 11.5 | 50 | 75 | 205 | 2 | 3 | 60° 凹 |
| **17.5** | 11.5 | 50 | 80 | 210 | 2 | 3 | 60° 凹 |
| **17.6** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **17.7** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **17.8** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **17.9** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **18** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **18.1** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **18.2** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **18.3** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **18.4** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **18.5** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **18.6** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **18.7** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **18.8** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **18.9** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **19** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **19.1** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **19.2** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **19.3** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **19.4** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **19.5** | 11.5 | 55 | 85 | 220 | 2 | 4 | 60° 凹 |
| **19.6** | 11.5 | 55 | 85 | 220 | 2 | 4 | 60° 凹 |
| **19.7** | 11.5 | 55 | 85 | 220 | 2 | 4 | 60° 凹 |
| **19.8** | 11.5 | 55 | 85 | 220 | 2 | 4 | 60° 凹 |
| **19.9** | 11.5 | 55 | 85 | 220 | 2 | 4 | 60° 凹 |
| **20** | 11.5 | 55 | 85 | 220 | 2 | 4 | 60° 凹 |
| **20.5** | 11.5 | 55 | 90 | 225 | 2 | 4 | 60° 凹 |
| **21** | 11.5 | 55 | 95 | 230 | 2 | 4 | 60° 凹 |
| **21.5** | 11.5 | 55 | 95 | 230 | 2 | 4 | 60° 凹 |
| **22** | 11.5 | 55 | 95 | 230 | 2 | 4 | 60° 凹 |
| **22.5** | 11.5 | 55 | 95 | 230 | 2 | 4 | 60° 凹 |
| **23** | 11.5 | 60 | 100 | 240 | 2 | 4 | 60° 凹 |
| **23.5** | 11.5 | 60 | 81 | 240 | 3 | 4 | 60° 凹 |
| **24** | 11.5 | 60 | 91 | 250 | 3 | 4 | 60° 凹 |
| **24.5** | 11.5 | 60 | 91 | 250 | 3 | 4 | 60° 凹 |
| **25** | 11.5 | 60 | 96 | 255 | 3 | 4 | 60° 凹 |
| **25.5** | 11.5 | 60 | 96 | 255 | 3 | 4 | 60° 凹 |
| **26** | 11.5 | 60 | 96 | 255 | 3 | 4 | 60° 凹 |
| **26.5** | 11.5 | 60 | 96 | 255 | 3 | 4 | 60° 凹 |
| **27** | 11.5 | 60 | 96 | 255 | 3 | 4 | 60° 凹 |
| **27.5** | 11.5 | 60 | 101 | 260 | 3 | 4 | 60° 凹 |
| **28** | 11.5 | 60 | 101 | 260 | 3 | 4 | 60° 凹 |
| **28.5** | 11.5 | 60 | 101 | 260 | 3 | 4 | 60° 凹 |
| **29** | 11.5 | 60 | 101 | 260 | 3 | 4 | 60° 凹 |
| **29.5** | 11.5 | 60 | 101 | 260 | 3 | 4 | 60° 凹 |
| **30** | 11.5 | 60 | 101 | 260 | 3 | 4 | 60° 凹 |
| **31** | 11.5 | 60 | 141 | 300 | 3 | 4 | 60° 凹 |
| **32** | 11.5 | 60 | 141 | 300 | 3 | 4 | 60° 凹 |
| **33** | 11.5 | 60 | 141 | 325 | 4 | 6 | 60° 凹 |
| **34** | 11.5 | 60 | 141 | 325 | 4 | 6 | 60° 凹 |
| **35** | 11.5 | 60 | 141 | 325 | 4 | 6 | 60° 凹 |
| **36** | 11.5 | 60 | 146 | 330 | 4 | 6 | 60° 凹 |
| **37** | 11.5 | 60 | 146 | 330 | 4 | 6 | 60° 凹 |
| **38** | 11.5 | 60 | 146 | 330 | 4 | 6 | 60° 凹 |
| **39** | 11.5 | 60 | 146 | 330 | 4 | 6 | 60° 凹 |
| **40** | 11.5 | 60 | 146 | 330 | 4 | 6 | 60° 凹 |
| **5/8** | 11.5 | 45 | 80 | 205 | 2 | 3 | 60° 凹 |
| **3/4** | 11.5 | 50 | 80 | 210 | 2 | 4 | 60° 凹 |
| **1"** | 11.5 | 60 | 96 | 255 | 3 | 4 | 60° 凹 |

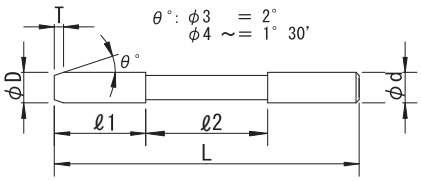
ハイス

# HHHRL/HHHRTL

## ロングハイヘリカルリーマ　*Long High Helical Reamer*

切削条件表 P140　貫通穴加工(スパイラル刃)　左ネジレ60°　食付2°　食付1°30'　HSS Co






| 公差 (Tolerance) | D | | | | d |
|---|---|---|---|---|---|
| | 3～5 | +0.006 +0.002 | 6～14 | +0.007 +0.003 | h7 |

### 《HHHRL》 右刃左ネジレ60°　食付角度 Φ3は2° φ4～1°30'　SKH56

Helix Angle-Left60°　Chamfer Angle :2° for φ3, 1°30' for φ4 and over.　HSS-Co.

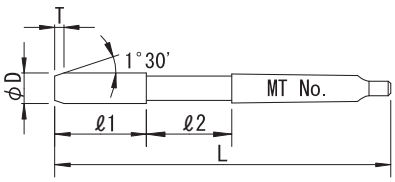
| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| 3 | 5.7 | 24 | 56 | 110 | 3 | 2 | 60°凹 |
| 4 | 6.55 | 24 | 56 | 110 | 4 | 2 | 60°凹 |
| 5 | 7.6 | 24 | 56 | 120 | 5 | 2 | 60°凹 |
| 6 | 7.6 | 40 | 60 | 140 | 6 | 3 | 60°凹 |
| 7 | 9.5 | 40 | 60 | 150 | 7 | 3 | 60°凹 |
| 8 | 9.5 | 40 | 60 | 150 | 8 | 3 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| 9 | 9.5 | 60 | 50 | 160 | 9 | 3 | 60°凹 |
| 10 | 9.5 | 60 | 60 | 180 | 10 | 3 | 60°凹 |
| 11 | 9.5 | 60 | 60 | 180 | 11 | 3 | 60°凹 |
| 12 | 9.5 | 60 | 75 | 200 | 12 | 3 | 60°凹 |
| 13 | 9.5 | 60 | 75 | 200 | 13 | 3 | 60°凹 |
| 14 | 9.5 | 60 | 75 | 200 | 14 | 3 | 60°凹 |

## ロングハイヘリカルリーマ（テーパーシャンク）　*Long High Helical Reamer with Taper Shank*

切削条件表 P140　貫通穴加工(スパイラル刃)　左ネジレ60°　食付1°30'　HSS Co






| 公差 (Tolerance) | D | | | | | |
|---|---|---|---|---|---|---|
| | 8～17 | +0.007 +0.003 | 18～25 | +0.008 +0.004 | 30 | +0.01 +0.005 |

### 《HHHRTL》 右刃左ネジレ60°　食付角度1°30'　SKH56

Helix Angle-Left60°　Chamfer Angle1°30'　HSS-Co.

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| 8 | 9.5 | 40 | 74.5 | 180 | 1 | 3 | 60°凹 |
| 9 | 9.5 | 60 | 74.5 | 200 | 1 | 3 | 60°凹 |
| 10 | 9.5 | 60 | 74.5 | 200 | 1 | 3 | 60°凹 |
| 11 | 9.5 | 60 | 74.5 | 200 | 1 | 3 | 60°凹 |
| 12 | 9.5 | 60 | 84.5 | 210 | 1 | 3 | 60°凹 |
| 13 | 9.5 | 60 | 94.5 | 220 | 1 | 3 | 60°凹 |
| 14 | 9.5 | 60 | 94.5 | 220 | 1 | 3 | 60°凹 |

| 直径 (ΦD) Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ1) Length of Flutes | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|
| 15 | 9.5 | 60 | 100 | 240 | 2 | 3 | 60°凹 |
| 16 | 11.5 | 75 | 95 | 250 | 2 | 3 | 60°凹 |
| 17 | 11.5 | 75 | 95 | 250 | 2 | 4 | 60°凹 |
| 18 | 11.5 | 75 | 105 | 260 | 2 | 4 | 60°凹 |
| 19 | 11.5 | 75 | 105 | 260 | 2 | 4 | 60°凹 |
| 20 | 11.5 | 75 | 125 | 280 | 2 | 4 | 60°凹 |
| 25 | 11.5 | 75 | 106 | 280 | 3 | 4 | 60°凹 |
| 30 | 11.5 | 75 | 136 | 310 | 3 | 4 | 60°凹 |

# DR

## ドリルリーマ *Drill Reamer*

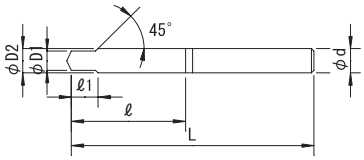
切削条件表 P141

ドリル・リーマー体型

右ネジレ 30°　食付 45°　HSS Co








| 公差 (Tolerance) | D1 | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|
| | 2.8 | $^{0}_{-0.014}$ | 2.9～5.7 | $^{0}_{-0.018}$ | 5.8～ 9.7 | $^{0}_{-0.022}$ | 9.8～12.7 | $^{0}_{-0.027}$ | h7 |
| | D2 | | | | | | | | |
| | 3 | $^{+0.007}_{+0.002}$ | 3.1～6 | $^{+0.009}_{+0.004}$ | 6.1～10 | $^{+0.012}_{+0.006}$ | 10.1～13 | $^{+0.015}_{+0.007}$ | |

右刃右ネジレ30°　リーマ部食付角度45°　SKH56
Helix Angle-Right30°　Angle of Leading Edge45°　HSS-Co.

| 呼び寸法 Size | ドリル径 (ΦD1) Drill Dia. | リーマ径 (ΦD2) Reamer Dia. | ドリル長 (ℓ1) Drill Length | 溝長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|---|
| **3** | 2.8 | 3 | 13 | 52 | 65 | 3 | 4 |
| **3.1** | 2.9 | 3.1 | 15 | 52 | 75 | 3.1 | 4 |
| **3.2** | 3 | 3.2 | 15 | 52 | 75 | 3.2 | 4 |
| **3.3** | 3.1 | 3.3 | 15 | 52 | 75 | 3.3 | 4 |
| **3.4** | 3.2 | 3.4 | 15 | 52 | 75 | 3.4 | 4 |
| **3.5** | 3.3 | 3.5 | 15 | 52 | 75 | 3.5 | 4 |
| **3.6** | 3.4 | 3.6 | 15 | 52 | 75 | 3.6 | 4 |
| **3.7** | 3.5 | 3.7 | 15 | 52 | 75 | 3.7 | 4 |
| **3.8** | 3.6 | 3.8 | 15 | 52 | 75 | 3.8 | 4 |
| **3.9** | 3.7 | 3.9 | 15 | 52 | 75 | 3.9 | 4 |
| **4** | 3.8 | 4 | 15 | 52 | 75 | 4 | 4 |
| **4.1** | 3.9 | 4.1 | 18 | 62 | 87 | 4.1 | 4 |
| **4.2** | 4 | 4.2 | 18 | 62 | 87 | 4.2 | 4 |
| **4.3** | 4.1 | 4.3 | 18 | 62 | 87 | 4.3 | 4 |
| **4.4** | 4.2 | 4.4 | 18 | 62 | 87 | 4.4 | 4 |
| **4.5** | 4.25 | 4.5 | 18 | 62 | 87 | 4.5 | 4 |
| **4.6** | 4.35 | 4.6 | 18 | 62 | 87 | 4.6 | 4 |
| **4.7** | 4.45 | 4.7 | 18 | 62 | 87 | 4.7 | 4 |
| **4.8** | 4.55 | 4.8 | 18 | 62 | 87 | 4.8 | 4 |
| **4.9** | 4.65 | 4.9 | 18 | 62 | 87 | 4.9 | 4 |
| **5** | 4.75 | 5 | 18 | 62 | 87 | 5 | 4 |
| **5.1** | 4.85 | 5.1 | 20 | 68 | 95 | 5.1 | 4 |
| **5.2** | 4.95 | 5.2 | 20 | 68 | 95 | 5.2 | 4 |
| **5.3** | 5.05 | 5.3 | 20 | 68 | 95 | 5.3 | 4 |
| **5.4** | 5.15 | 5.4 | 20 | 68 | 95 | 5.4 | 4 |
| **5.5** | 5.2 | 5.5 | 20 | 68 | 95 | 5.5 | 4 |
| **5.6** | 5.3 | 5.6 | 20 | 68 | 95 | 5.6 | 4 |
| **5.7** | 5.4 | 5.7 | 20 | 68 | 95 | 5.7 | 4 |
| **5.8** | 5.5 | 5.8 | 20 | 68 | 95 | 5.8 | 4 |
| **5.9** | 5.6 | 5.9 | 20 | 68 | 95 | 5.9 | 4 |
| **6** | 5.7 | 6 | 20 | 68 | 95 | 6 | 4 |
| **6.1** | 5.8 | 6.1 | 21 | 75 | 105 | 6.1 | 4 |
| **6.2** | 5.9 | 6.2 | 21 | 75 | 105 | 6.2 | 4 |
| **6.3** | 6 | 6.3 | 21 | 75 | 105 | 6.3 | 4 |
| **6.4** | 6.1 | 6.4 | 21 | 75 | 105 | 6.4 | 4 |
| **6.5** | 6.2 | 6.5 | 21 | 75 | 105 | 6.5 | 4 |
| **6.6** | 6.3 | 6.6 | 21 | 75 | 105 | 6.6 | 4 |
| **6.7** | 6.4 | 6.7 | 21 | 75 | 105 | 6.7 | 4 |
| **6.8** | 6.5 | 6.8 | 21 | 75 | 105 | 6.8 | 4 |
| **6.9** | 6.6 | 6.9 | 21 | 75 | 105 | 6.9 | 4 |
| **7** | 6.7 | 7 | 21 | 75 | 105 | 7 | 4 |
| **7.1** | 6.8 | 7.1 | 22 | 80 | 110 | 7.1 | 4 |
| **7.2** | 6.9 | 7.2 | 22 | 80 | 110 | 7.2 | 4 |
| **7.3** | 7 | 7.3 | 22 | 80 | 110 | 7.3 | 4 |

| 呼び寸法 Size | ドリル径 (ΦD1) Drill Dia. | リーマ径 (ΦD2) Reamer Dia. | ドリル長 (ℓ1) Drill Length | 溝長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|---|
| **7.4** | 7.1 | 7.4 | 22 | 80 | 110 | 7.4 | 4 |
| **7.5** | 7.2 | 7.5 | 22 | 80 | 110 | 7.5 | 4 |
| **7.6** | 7.3 | 7.6 | 22 | 80 | 110 | 7.6 | 4 |
| **7.7** | 7.4 | 7.7 | 22 | 80 | 110 | 7.7 | 4 |
| **7.8** | 7.5 | 7.8 | 22 | 80 | 110 | 7.8 | 4 |
| **7.9** | 7.6 | 7.9 | 22 | 80 | 110 | 7.9 | 4 |
| **8** | 7.7 | 8 | 22 | 80 | 110 | 8 | 4 |
| **8.1** | 7.8 | 8.1 | 23 | 89 | 119 | 8.1 | 4 |
| **8.2** | 7.9 | 8.2 | 23 | 89 | 119 | 8.2 | 4 |
| **8.3** | 8 | 8.3 | 23 | 89 | 119 | 8.3 | 4 |
| **8.4** | 8.1 | 8.4 | 23 | 89 | 119 | 8.4 | 4 |
| **8.5** | 8.2 | 8.5 | 23 | 89 | 119 | 8.5 | 4 |
| **8.6** | 8.3 | 8.6 | 23 | 89 | 119 | 8.6 | 4 |
| **8.7** | 8.4 | 8.7 | 23 | 89 | 119 | 8.7 | 4 |
| **8.8** | 8.5 | 8.8 | 23 | 89 | 119 | 8.8 | 4 |
| **8.9** | 8.6 | 8.9 | 23 | 89 | 119 | 8.9 | 4 |
| **9** | 8.7 | 9 | 23 | 89 | 119 | 9 | 4 |
| **9.1** | 8.8 | 9.1 | 25 | 90 | 125 | 9.1 | 4 |
| **9.2** | 8.9 | 9.2 | 25 | 90 | 125 | 9.2 | 4 |
| **9.3** | 9 | 9.3 | 25 | 90 | 125 | 9.3 | 4 |
| **9.4** | 9.1 | 9.4 | 25 | 90 | 125 | 9.4 | 4 |
| **9.5** | 9.2 | 9.5 | 25 | 90 | 125 | 9.5 | 4 |
| **9.6** | 9.3 | 9.6 | 25 | 90 | 125 | 9.6 | 4 |
| **9.7** | 9.4 | 9.7 | 25 | 90 | 125 | 9.7 | 4 |
| **9.8** | 9.5 | 9.8 | 25 | 90 | 125 | 9.8 | 4 |
| **9.9** | 9.6 | 9.9 | 25 | 90 | 125 | 9.9 | 4 |
| **10** | 9.7 | 10 | 25 | 90 | 125 | 10 | 4 |
| **10.1** | 9.8 | 10.1 | 25 | 95 | 135 | 10.1 | 4 |
| **10.2** | 9.9 | 10.2 | 25 | 95 | 135 | 10.2 | 4 |
| **10.3** | 10 | 10.3 | 25 | 95 | 135 | 10.3 | 4 |
| **10.4** | 10.1 | 10.4 | 25 | 95 | 135 | 10.4 | 4 |
| **10.5** | 10.2 | 10.5 | 25 | 95 | 135 | 10.5 | 4 |
| **10.6** | 10.3 | 10.6 | 25 | 95 | 135 | 10.6 | 4 |
| **10.7** | 10.4 | 10.7 | 25 | 95 | 135 | 10.7 | 4 |
| **10.8** | 10.5 | 10.8 | 25 | 95 | 135 | 10.8 | 4 |
| **10.9** | 10.6 | 10.9 | 25 | 95 | 135 | 10.9 | 4 |
| **11** | 10.7 | 11 | 25 | 95 | 135 | 11 | 4 |
| **11.1** | 10.8 | 11.1 | 26 | 95 | 135 | 11.1 | 6 |
| **11.2** | 10.9 | 11.2 | 26 | 95 | 135 | 11.2 | 6 |
| **11.3** | 11 | 11.3 | 26 | 95 | 135 | 11.3 | 6 |
| **11.4** | 11.1 | 11.4 | 26 | 95 | 135 | 11.4 | 6 |
| **11.5** | 11.2 | 11.5 | 26 | 95 | 135 | 11.5 | 6 |
| **11.6** | 11.3 | 11.6 | 26 | 95 | 135 | 11.6 | 6 |
| **11.7** | 11.4 | 11.7 | 26 | 95 | 135 | 11.7 | 6 |

# DR ドリルリーマ

| 呼び寸法 Size | ドリル径 (ΦD1) Drill Dia. | リーマ径 (ΦD2) Reamer Dia. | ドリル長 (ℓ1) Drill Length | 溝長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|---|
| **11.8** | 11.5 | 11.8 | 26 | 95 | 135 | 11.8 | 6 |
| **11.9** | 11.6 | 11.9 | 26 | 95 | 135 | 11.9 | 6 |
| **12** | 11.7 | 12 | 26 | 95 | 135 | 12 | 6 |
| **12.1** | 11.8 | 12.1 | 28 | 100 | 145 | 12.1 | 6 |
| **12.2** | 11.9 | 12.2 | 28 | 100 | 145 | 12.2 | 6 |
| **12.3** | 12 | 12.3 | 28 | 100 | 145 | 12.3 | 6 |

| 呼び寸法 Size | ドリル径 (ΦD1) Drill Dia. | リーマ径 (ΦD2) Reamer Dia. | ドリル長 (ℓ1) Drill Length | 溝長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|---|
| **12.4** | 12.1 | 12.4 | 28 | 100 | 145 | 12.4 | 6 |
| **12.5** | 12.2 | 12.5 | 28 | 100 | 145 | 12.5 | 6 |
| **12.6** | 12.3 | 12.6 | 28 | 100 | 145 | 12.6 | 6 |
| **12.7** | 12.4 | 12.7 | 28 | 100 | 145 | 12.7 | 6 |
| **12.8** | 12.5 | 12.8 | 28 | 100 | 145 | 12.8 | 6 |
| **12.9** | 12.6 | 12.9 | 28 | 100 | 145 | 12.9 | 6 |
| **13** | 12.7 | 13 | 28 | 100 | 145 | 13 | 6 |

ハイス

# DRT

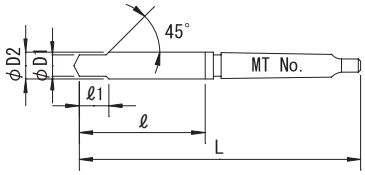
## ドリルリーマ（テーパーシャンク） *Drill Reamer With Taper Shank*

切削条件表 **P141**

**ドリル・リーマー体型** 右ネジレ 30° 食付 45° HSS Co








| 公差 (Tolerance) | D1 | | | | |
|---|---|---|---|---|---|
| | 4.75～5.75 $^{0}_{-0.018}$ | 6.25～ 9.7 $^{0}_{-0.022}$ | 10.2～17.6 $^{0}_{-0.027}$ | 18.1～29.3 $^{0}_{-0.033}$ | 30.3～39.1 $^{0}_{-0.039}$ |
| | **D2** | | | | |
| | 5 ～6 $^{+0.009}_{+0.004}$ | 6.5 ～10 $^{+0.012}_{+0.006}$ | 10.5～18 $^{+0.015}_{+0.007}$ | 18.5～30 $^{+0.017}_{+0.008}$ | 31 ～40 $^{+0.02}_{+0.009}$ |

右刃右ネジレ30° リーマ部食付角度45° SKH56
Helix Angle-Right30° Angle of Leading Edge45° HSS-Co.

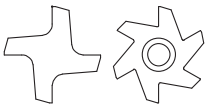
| 呼び寸法 Size | ドリル径 (ΦD1) Drill Dia. | リーマ径 (ΦD2) Reamer Dia. | ドリル長 (ℓ1) Drill Length | 溝長 (ℓ) Length of Flutes | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|---|
| **5** | 4.75 | 5 | 20 | 68 | 143 | 1 | 4 |
| **6** | 5.75 | 6 | 20 | 68 | 143 | 1 | 4 |
| **6.5** | 6.25 | 6.5 | 21 | 75 | 150 | 1 | 4 |
| **7** | 6.75 | 7 | 21 | 75 | 150 | 1 | 4 |
| **7.5** | 7.2 | 7.5 | 22 | 82 | 157 | 1 | 4 |
| **8** | 7.7 | 8 | 22 | 82 | 157 | 1 | 4 |
| **8.5** | 8.2 | 8.5 | 23 | 88 | 167 | 1 | 4 |
| **9** | 8.7 | 9 | 23 | 88 | 167 | 1 | 4 |
| **9.5** | 9.2 | 9.5 | 25 | 95 | 173 | 1 | 4 |
| **10** | 9.7 | 10 | 25 | 95 | 173 | 1 | 4 |
| **10.5** | 10.2 | 10.5 | 25 | 102 | 180 | 1 | 4 |
| **11** | 10.7 | 11 | 25 | 102 | 180 | 1 | 4 |
| **11.5** | 11.2 | 11.5 | 26 | 108 | 187 | 1 | 4 |
| **12** | 11.7 | 12 | 26 | 108 | 187 | 1 | 6 |
| **12.5** | 12.2 | 12.5 | 28 | 115 | 193 | 1 | 6 |
| **13** | 12.7 | 13 | 28 | 115 | 193 | 1 | 6 |
| **13.5** | 13.1 | 13.5 | 30 | 120 | 200 | 1 | 6 |
| **14** | 13.6 | 14 | 30 | 120 | 200 | 1 | 6 |
| **14.5** | 14.1 | 14.5 | 32 | 125 | 220 | 2 | 6 |
| **15** | 14.6 | 15 | 32 | 125 | 220 | 2 | 6 |
| **15.5** | 15.1 | 15.5 | 35 | 130 | 225 | 2 | 6 |
| **16** | 15.6 | 16 | 35 | 130 | 225 | 2 | 6 |
| **16.5** | 16.1 | 16.5 | 36 | 135 | 230 | 2 | 6 |

| 呼び寸法 Size | ドリル径 (ΦD1) Drill Dia. | リーマ径 (ΦD2) Reamer Dia. | ドリル長 (ℓ1) Drill Length | 溝長 (ℓ) Length of Flutes | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|---|
| **17** | 16.6 | 17 | 36 | 135 | 230 | 2 | 6 |
| **17.5** | 17.1 | 17.5 | 38 | 140 | 235 | 2 | 6 |
| **18** | 17.6 | 18 | 38 | 140 | 235 | 2 | 6 |
| **18.5** | 18.1 | 18.5 | 39 | 145 | 240 | 2 | 6 |
| **19** | 18.6 | 19 | 39 | 145 | 240 | 2 | 6 |
| **19.5** | 19.1 | 19.5 | 40 | 150 | 245 | 2 | 6 |
| **20** | 19.5 | 20 | 40 | 150 | 245 | 2 | 6 |
| **21** | 20.5 | 21 | 43 | 155 | 250 | 2 | 6 |
| **22** | 21.5 | 22 | 45 | 160 | 255 | 2 | 6 |
| **23** | 22.45 | 23 | 46 | 165 | 260 | 2 | 6 |
| **24** | 23.45 | 24 | 47 | 165 | 280 | 3 | 6 |
| **25** | 24.4 | 25 | 50 | 165 | 280 | 3 | 6 |
| **26** | 25.4 | 26 | 55 | 165 | 280 | 3 | 6 |
| **27** | 26.4 | 27 | 57 | 175 | 290 | 3 | 6 |
| **28** | 27.4 | 28 | 57 | 175 | 290 | 3 | 6 |
| **29** | 28.3 | 29 | 60 | 185 | 300 | 3 | 6 |
| **30** | 29.3 | 30 | 60 | 185 | 300 | 3 | 6 |
| **31** | 30.3 | 31 | 65 | 195 | 310 | 3 | 6 |
| **32** | 31.3 | 32 | 65 | 195 | 310 | 3 | 6 |
| **33** | 32.2 | 33 | 65 | 200 | 340 | 4 | 6 |
| **34** | 33.2 | 34 | 70 | 205 | 345 | 4 | 6 |
| **35** | 34.2 | 35 | 70 | 205 | 345 | 4 | 6 |
| **38** | 37.2 | 38 | 75 | 215 | 355 | 4 | 6 |
| **40** | 39.1 | 40 | 80 | 220 | 360 | 4 | 6 |

# TPR

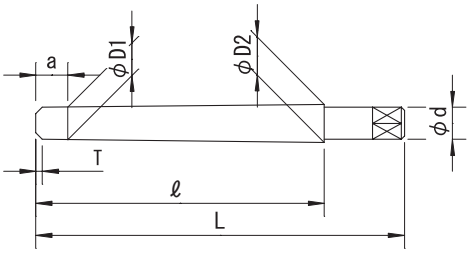
## テーパーピンリーマ　*Taper Pin Reamer*

切削条件表 P142　テーパー穴加工　右直刃　食付45°　HSS



D1≦Φ2.99　60°凸






| 公差(Tolerance) | D1：±0.05 | d：±0.2 |
|---|---|---|

### 1/50テーパー　右刃ストレート　食付角度45°　SKH51

1/50Taper　Straight Flute　Chamfer Angle45°　HSS

| 小径 (ΦD1) *First Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 大径 (ΦD2) *Dia at Large End* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | a | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|---|
| **0.8** | – | 24 | 1.18 | 40 | 2 | 5 | 4 | 60°凸 |
| **0.9** | – | 28 | 1.36 | 40 | 2 | 5 | 4 | 60°凸 |
| **1** | – | 28 | 1.46 | 45 | 2 | 5 | 4 | 60°凸 |
| **1.1** | – | 32 | 1.64 | 50 | 2.5 | 5 | 4 | 60°凸 |
| **1.2** | – | 32 | 1.74 | 50 | 2.5 | 5 | 4 | 60°凸 |
| **1.3** | – | 37 | 1.94 | 58 | 3.5 | 5 | 4 | 60°凸 |
| **1.4** | – | 37 | 2.04 | 58 | 3.5 | 5 | 4 | 60°凸 |
| **1.5** | – | 37 | 2.14 | 58 | 3.5 | 5 | 4 | 60°凸 |
| **1.6** | – | 37 | 2.24 | 58 | 3.5 | 5 | 4 | 60°凸 |
| **1.7** | – | 48 | 2.56 | 70 | 3.5 | 5 | 4 | 60°凸 |
| **1.8** | – | 48 | 2.66 | 70 | 3.5 | 5 | 4 | 60°凸 |
| **1.9** | – | 48 | 2.76 | 70 | 3.5 | 5 | 4 | 60°凸 |
| **2** | – | 48 | 2.86 | 70 | 3.5 | 5 | 4 | 60°凸 |
| **2.1** | – | 53 | 3.06 | 75 | 4 | 5 | 4 | 60°凸 |
| **2.2** | – | 53 | 3.16 | 75 | 4 | 5 | 4 | 60°凸 |
| **2.3** | – | 53 | 3.26 | 75 | 4 | 5 | 4 | 60°凸 |
| **2.4** | – | 53 | 3.36 | 75 | 4 | 5 | 4 | 60°凸 |
| **2.5** | – | 53 | 3.46 | 75 | 4 | 5 | 4 | 60°凸 |
| **2.6** | – | 63 | 3.76 | 88 | 5 | 5 | 4 | 60°凸 |
| **2.7** | – | 63 | 3.86 | 88 | 5 | 5 | 4 | 60°凸 |
| **2.8** | – | 63 | 3.96 | 88 | 5 | 5 | 4 | 60°凸 |
| **2.9** | – | 63 | 4.06 | 88 | 5 | 5 | 4 | 60°凸 |
| **3** | – | 63 | 4.16 | 88 | 5 | 5 | 6 | 60°凹 |
| **3.5** | 0.5 | 75 | 4.9 | 102 | 6 | 5 | 6 | 60°凹 |
| **4** | 0.5 | 75 | 5.4 | 102 | 6 | 5 | 6 | 60°凹 |
| **4.5** | 0.5 | 87 | 6.14 | 115 | 6 | 5 | 6 | 60°凹 |
| **5** | 0.5 | 87 | 6.64 | 115 | 6.5 | 5 | 6 | 60°凹 |
| **5.5** | 0.5 | 99 | 7.38 | 130 | 6.5 | 5 | 6 | 60°凹 |
| **6** | 1 | 99 | 7.88 | 130 | 6.5 | 5 | 6 | 60°凹 |
| **6.5** | 1 | 119 | 8.78 | 152 | 7.5 | 5 | 6 | 60°凹 |
| **7** | 1 | 119 | 9.28 | 152 | 7.5 | 5 | 6 | 60°凹 |
| **7.5** | 1 | 141 | 10.22 | 178 | 9 | 5 | 6 | 60°凹 |
| **8** | 1 | 141 | 10.72 | 178 | 9 | 5 | 6 | 60°凹 |
| **8.5** | 1 | 163 | 11.66 | 205 | 11 | 5 | 8 | 60°凹 |
| **9** | 1 | 163 | 12.16 | 205 | 11 | 5 | 8 | 60°凹 |
| **9.5** | 1 | 163 | 12.66 | 205 | 11 | 5 | 8 | 60°凹 |
| **10** | 1 | 163 | 13.16 | 205 | 11 | 5 | 8 | 60°凹 |
| **11** | 1 | 194 | 14.74 | 240 | 12 | 7 | 8 | 60°凹 |

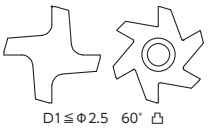
| 小径 (ΦD1) *First Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 大径 (ΦD2) *Dia at Large End* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | a | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|---|
| **12** | 1 | 194 | 15.74 | 240 | 13 | 7 | 8 | 60°凹 |
| **13** | 1 | 194 | 16.74 | 240 | 14 | 7 | 8 | 60°凹 |
| **14** | 1.5 | 234 | 18.52 | 290 | 17 | 8 | 8 | 60°凹 |
| **15** | 1.5 | 234 | 19.52 | 290 | 17 | 8 | 8 | 60°凹 |
| **16** | 1.5 | 234 | 20.52 | 290 | 17 | 8 | 8 | 60°凹 |
| **17** | 1.5 | 270 | 22.2 | 340 | 20 | 10 | 8 | 60°凹 |
| **18** | 1.5 | 270 | 23.2 | 340 | 22 | 10 | 8 | 60°凹 |
| **19** | 1.5 | 270 | 24.2 | 340 | 22 | 10 | 8 | 60°凹 |
| **20** | 1.5 | 270 | 25.2 | 340 | 22 | 10 | 8 | 60°凹 |
| **21** | 1.5 | 310 | 26.94 | 390 | 23 | 13 | 10 | 60°凹 |
| **22** | 1.5 | 310 | 27.94 | 390 | 23 | 13 | 10 | 60°凹 |
| **23** | 1.5 | 310 | 28.94 | 390 | 23 | 13 | 10 | 60°凹 |
| **24** | 1.5 | 310 | 29.94 | 390 | 27 | 13 | 10 | 60°凹 |
| **25** | 1.5 | 310 | 30.94 | 390 | 27 | 13 | 10 | 60°凹 |
| **26** | 1.5 | 318 | 32.06 | 405 | 27 | 15 | 10 | 60°凹 |
| **27** | 1.5 | 318 | 33.06 | 405 | 27 | 15 | 10 | 60°凹 |
| **28** | 1.5 | 318 | 34.06 | 405 | 32 | 15 | 10 | 60°凹 |
| **29** | 1.5 | 318 | 35.06 | 405 | 32 | 15 | 10 | 60°凹 |
| **30** | 1.5 | 318 | 36.06 | 405 | 32 | 15 | 10 | 60°凹 |
| **31** | 2 | 335 | 37.3 | 430 | 32 | 20 | 12 | 60°凹 |
| **32** | 2 | 335 | 38.3 | 430 | 32 | 20 | 12 | 60°凹 |
| **33** | 2 | 335 | 39.3 | 430 | 32 | 20 | 12 | 60°凹 |
| **34** | 2 | 335 | 40.3 | 430 | 36 | 20 | 12 | 60°凹 |
| **35** | 2 | 335 | 41.3 | 430 | 36 | 20 | 12 | 60°凹 |
| **36** | 2 | 335 | 42.3 | 430 | 36 | 20 | 12 | 60°凹 |
| **37** | 2 | 335 | 43.3 | 430 | 36 | 20 | 12 | 60°凹 |
| **38** | 2 | 335 | 44.3 | 430 | 42 | 20 | 12 | 60°凹 |
| **39** | 2 | 335 | 45.3 | 430 | 42 | 20 | 12 | 60°凹 |
| **40** | 2 | 335 | 46.3 | 430 | 42 | 20 | 12 | 60°凹 |
| **41** | 2 | 351 | 47.52 | 460 | 46 | 25 | 14 | 60°凹 |
| **42** | 2 | 351 | 48.52 | 460 | 46 | 25 | 14 | 60°凹 |
| **43** | 2 | 351 | 49.52 | 460 | 46 | 25 | 14 | 60°凹 |
| **44** | 2 | 351 | 50.52 | 460 | 46 | 25 | 14 | 60°凹 |
| **45** | 2 | 351 | 51.52 | 460 | 46 | 25 | 14 | 60°凹 |
| **46** | 2 | 351 | 52.52 | 460 | 50 | 25 | 14 | 60°凹 |
| **47** | 2 | 351 | 53.52 | 460 | 50 | 25 | 14 | 60°凹 |
| **48** | 2 | 351 | 54.52 | 460 | 50 | 25 | 14 | 60°凹 |
| **49** | 2 | 351 | 55.52 | 460 | 50 | 25 | 14 | 60°凹 |
| **50** | 2 | 351 | 56.52 | 460 | 50 | 25 | 14 | 60°凹 |

ハイス

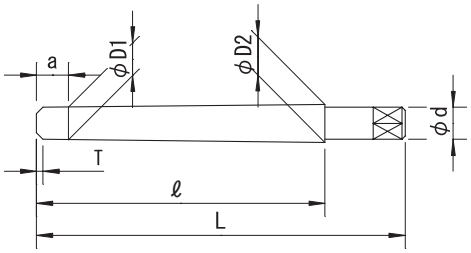
# SPTPR

## スパイラルテーパーピンリーマ *Spiral Taper Pin Reamer*

切削条件表 P142 | テーパー穴加工 | 左ネジレ12° | 食付45° | HSS






| 公差(Tolerance) | D1：±0.05 | d：±0.2 |
|---|---|---|

**1/50テーパー** 右刃左ネジレ12° 食付角度45° SKH51
1/50Taper Helix Angle-Left12° Chamfer Angle45° HSS

| 小径 (ΦD1) First Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 大径 (ΦD2) Dia at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | a | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|---|
| **2** | – | 48 | 2.86 | 70 | 3.5 | 5 | 4 | 60°凸 |
| **2.5** | – | 53 | 3.46 | 75 | 4 | 5 | 4 | 60°凸 |
| **3** | – | 63 | 4.16 | 88 | 5 | 5 | 6 | 60°凹 |
| **3.5** | 0.5 | 75 | 4.9 | 102 | 6 | 5 | 6 | 60°凹 |
| **4** | 0.5 | 75 | 5.4 | 102 | 6 | 5 | 6 | 60°凹 |
| **4.5** | 0.5 | 87 | 6.14 | 115 | 6 | 5 | 6 | 60°凹 |
| **5** | 0.5 | 87 | 6.64 | 115 | 6.5 | 5 | 6 | 60°凹 |
| **5.5** | 0.5 | 99 | 7.38 | 130 | 6.5 | 5 | 6 | 60°凹 |
| **6** | 1 | 99 | 7.88 | 130 | 6.5 | 5 | 6 | 60°凹 |
| **6.5** | 1 | 119 | 8.78 | 152 | 7.5 | 5 | 6 | 60°凹 |
| **7** | 1 | 119 | 9.28 | 152 | 7.5 | 5 | 6 | 60°凹 |
| **7.5** | 1 | 141 | 10.22 | 178 | 9 | 5 | 6 | 60°凹 |
| **8** | 1 | 141 | 10.72 | 178 | 9 | 5 | 6 | 60°凹 |
| **8.5** | 1 | 163 | 11.66 | 205 | 11 | 5 | 8 | 60°凹 |
| **9** | 1 | 163 | 12.16 | 205 | 11 | 5 | 8 | 60°凹 |
| **9.5** | 1 | 163 | 12.66 | 205 | 11 | 5 | 8 | 60°凹 |
| **10** | 1 | 163 | 13.16 | 205 | 11 | 5 | 8 | 60°凹 |
| **11** | 1 | 194 | 14.74 | 240 | 12 | 7 | 8 | 60°凹 |

| 小径 (ΦD1) First Dia. | 食付長 (T) Chamfer Length | 刃長 (ℓ) Length of Flutes | 大径 (ΦD2) Dia at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | a | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|---|
| **12** | 1 | 194 | 15.74 | 240 | 13 | 7 | 8 | 60°凹 |
| **13** | 1 | 194 | 16.74 | 240 | 14 | 7 | 8 | 60°凹 |
| **14** | 1.5 | 234 | 18.52 | 290 | 17 | 8 | 8 | 60°凹 |
| **15** | 1.5 | 234 | 19.52 | 290 | 17 | 8 | 8 | 60°凹 |
| **16** | 1.5 | 234 | 20.52 | 290 | 17 | 8 | 8 | 60°凹 |
| **17** | 1.5 | 270 | 22.2 | 340 | 20 | 10 | 8 | 60°凹 |
| **18** | 1.5 | 270 | 23.2 | 340 | 22 | 10 | 8 | 60°凹 |
| **19** | 1.5 | 270 | 24.2 | 340 | 22 | 10 | 8 | 60°凹 |
| **20** | 1.5 | 270 | 25.2 | 340 | 22 | 10 | 8 | 60°凹 |
| **21** | 1.5 | 310 | 26.94 | 390 | 23 | 13 | 10 | 60°凹 |
| **22** | 1.5 | 310 | 27.94 | 390 | 23 | 13 | 10 | 60°凹 |
| **23** | 1.5 | 310 | 28.94 | 390 | 23 | 13 | 10 | 60°凹 |
| **24** | 1.5 | 310 | 29.94 | 390 | 27 | 13 | 10 | 60°凹 |
| **25** | 1.5 | 310 | 30.94 | 390 | 27 | 13 | 10 | 60°凹 |
| **26** | 1.5 | 318 | 32.06 | 405 | 27 | 15 | 10 | 60°凹 |
| **27** | 1.5 | 318 | 33.06 | 405 | 27 | 15 | 10 | 60°凹 |
| **28** | 1.5 | 318 | 34.06 | 405 | 32 | 15 | 10 | 60°凹 |
| **29** | 1.5 | 318 | 35.06 | 405 | 32 | 15 | 10 | 60°凹 |
| **30** | 1.5 | 318 | 36.06 | 405 | 32 | 15 | 10 | 60°凹 |

ハイス

# HTPR

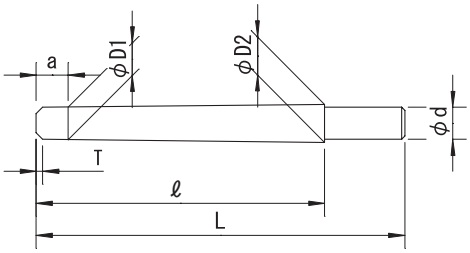
## ヘリカルテーパーピンリーマ　*Helical Taper Pin Reamer*

切削条件表 P142　テーパー穴加工　左ネジレ 35～45°　食付 45°　HSS



D1≦Φ2.5　60°凸






| 公差(Tolerance) | D1：±0.05 | d：h8 |
|---|---|---|

### 1/50テーパー　右刃左ネジレ35°～45°　食付角度45°　SKH51

1/50Taper　Helix Angle-Left35°～45°　Chamfer Angle45°　HSS

| 小径 (ΦD1) *First Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 大径 (ΦD2) *Dia at Large End* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | a | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|---|
| **1** | – | 28 | 1.46 | 45 | 2 | 5 | 3 | 60°凸 |
| **1.2** | – | 32 | 1.74 | 50 | 2.5 | 5 | 3 | 60°凸 |
| **1.3** | – | 37 | 1.94 | 58 | 3.5 | 5 | 3 | 60°凸 |
| **1.4** | – | 37 | 2.04 | 58 | 3.5 | 5 | 3 | 60°凸 |
| **1.5** | – | 37 | 2.14 | 58 | 3.5 | 5 | 3 | 60°凸 |
| **1.6** | – | 37 | 2.24 | 58 | 3.5 | 5 | 3 | 60°凸 |
| **1.7** | – | 48 | 2.56 | 70 | 3.5 | 5 | 3 | 60°凸 |
| **1.8** | – | 48 | 2.66 | 70 | 3.5 | 5 | 3 | 60°凸 |
| **1.9** | – | 48 | 2.76 | 70 | 3.5 | 5 | 3 | 60°凸 |
| **2** | – | 48 | 2.86 | 70 | 3.5 | 5 | 3 | 60°凸 |
| **2.5** | – | 53 | 3.46 | 75 | 4 | 5 | 3 | 60°凸 |
| **3** | – | 63 | 4.16 | 88 | 5 | 5 | 3 | 60°凹 |
| **3.5** | 0.5 | 75 | 4.9 | 102 | 6 | 5 | 3 | 60°凹 |
| **4** | 0.5 | 75 | 5.4 | 102 | 6 | 5 | 3 | 60°凹 |
| **4.5** | 1 | 87 | 6.14 | 115 | 6 | 5 | 3 | 60°凹 |
| **5** | 1 | 87 | 6.64 | 115 | 6.5 | 5 | 3 | 60°凹 |
| **5.5** | 1 | 99 | 7.38 | 130 | 6.5 | 5 | 3 | 60°凹 |
| **6** | 1 | 99 | 7.88 | 130 | 6.5 | 5 | 3 | 60°凹 |
| **6.5** | 1 | 119 | 8.78 | 152 | 7.5 | 5 | 3 | 60°凹 |

| 小径 (ΦD1) *First Dia.* | 食付長 (T) *Chamfer Length* | 刃長 (ℓ) *Length of Flutes* | 大径 (ΦD2) *Dia at Large End* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | a | 刃数 (N) *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|---|
| **7** | 1 | 119 | 9.28 | 152 | 7.5 | 5 | 3 | 60°凹 |
| **7.5** | 1 | 141 | 10.22 | 178 | 9 | 5 | 3 | 60°凹 |
| **8** | 1 | 141 | 10.72 | 178 | 9 | 5 | 3 | 60°凹 |
| **8.5** | 1 | 163 | 11.66 | 205 | 11 | 5 | 3 | 60°凹 |
| **9** | 1 | 163 | 12.16 | 205 | 11 | 5 | 3 | 60°凹 |
| **9.5** | 1 | 163 | 12.66 | 205 | 11 | 5 | 3 | 60°凹 |
| **10** | 1 | 163 | 13.16 | 205 | 11 | 5 | 3 | 60°凹 |
| **11** | 1 | 194 | 14.74 | 240 | 12 | 7 | 3 | 60°凹 |
| **12** | 1 | 194 | 15.74 | 240 | 13 | 7 | 3 | 60°凹 |
| **13** | 1 | 194 | 16.74 | 240 | 14 | 7 | 3 | 60°凹 |
| **14** | 1.5 | 234 | 18.52 | 290 | 17 | 8 | 3 | 60°凹 |
| **15** | 1.5 | 234 | 19.52 | 290 | 17 | 8 | 3 | 60°凹 |
| **16** | 1.5 | 234 | 20.52 | 290 | 17 | 8 | 3 | 60°凹 |
| **17** | 1.5 | 270 | 22.2 | 340 | 20 | 10 | 3 | 60°凹 |
| **18** | 1.5 | 270 | 23.2 | 340 | 22 | 10 | 3 | 60°凹 |
| **19** | 1.5 | 270 | 24.2 | 340 | 22 | 10 | 3 | 60°凹 |
| **20** | 1.5 | 270 | 25.2 | 340 | 22 | 10 | 3 | 60°凹 |
| **25** | 1.5 | 310 | 30.94 | 390 | 27 | 13 | 3 | 60°凹 |
| **30** | 1.5 | 318 | 36.06 | 405 | 32 | 15 | 3 | 60°凹 |

ハイス

# TPR/SPTPR/HTPR 1/48テーパーシリーズ

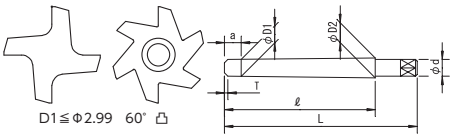
## テーパーピンリーマ/スパイラルテーパーピンリーマ/ヘリカルテーパーピンリーマ

*Taper Pin Reamer/Spiral Taper Pin Reamer/Helical Taper Pin Reamer*

### 《TPR》 右刃ストレート SKH51

Straight Flute HSS

切削条件表 P142 | 右直刃 | HSS



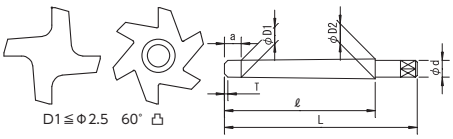

| 公差(Tolerance) | D1：±0.05 | d：±0.2 |
|---|---|---|

| 呼び寸法 Size | 小径(ΦD1) First Dia. | 食付長(T) Chamfer Length | 刃長(ℓ) Length of Flutes | 大径(ΦD2) Dia at Large End | 全長(L) Overall Length | シャンク径(Φd) Shank Dia. | a | 刃数(N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|---|---|
| 7/0# | 1.36 | – | 21 | 1.69 | 40 | 1.984 | 5 | 4 | 60°凸 |
| 6/0# | 1.65 | – | 24 | 2.05 | 40 | 2.381 | 5 | 4 | 60°凸 |
| 5/0# | 1.93 | – | 30 | 2.45 | 45 | 2.778 | 5 | 4 | 60°凸 |
| 4/0# | 2.33 | – | 32 | 2.9 | 45 | 3.5 | 5 | 4 | 60°凸 |
| 3/0# | 2.65 | – | 35 | 3.28 | 50 | 4 | 5 | 4 | 60°凸 |
| 2/0# | 2.99 | – | 38 | 3.68 | 58 | 4 | 5 | 4 | 60°凸 |
| 0# | 3.32 | 0.5 | 42 | 4.09 | 60 | 4.5 | 5 | 6 | 60°凹 |
| 1# | 3.8 | 0.5 | 45 | 4.64 | 65 | 5 | 5 | 6 | 60°凹 |
| 2# | 4.21 | 0.5 | 52 | 5.19 | 75 | 5.5 | 5 | 6 | 60°凹 |
| 3# | 4.74 | 0.5 | 58 | 5.85 | 90 | 5.5 | 5 | 6 | 60°凹 |
| 4# | 5.38 | 0.5 | 65 | 6.63 | 105 | 6.5 | 5 | 6 | 60°凹 |
| 5# | 6.19 | 1 | 78 | 7.71 | 115 | 6.5 | 5 | 6 | 60°凹 |
| 6# | 7.18 | 1 | 92 | 9 | 130 | 7.5 | 5 | 6 | 60°凹 |
| 7# | 8.5 | 1 | 115 | 10.8 | 155 | 9 | 5 | 6 | 60°凹 |
| 8# | 10.21 | 1 | 135 | 12.92 | 175 | 11 | 5 | 8 | 60°凹 |
| 9# | 12.4 | 1 | 155 | 15.47 | 205 | 13 | 8 | 8 | 60°凹 |
| 10# | 14.9 | 1.5 | 180 | 18.5 | 230 | 16 | 8 | 8 | 60°凹 |
| 11# | 18.13 | 1.5 | 210 | 22.3 | 285 | 19 | 10 | 8 | 60°凹 |
| 12# | 21.58 | 1.5 | 255 | 26.69 | 340 | 23 | 10 | 8 | 60°凹 |
| 13# | 25.83 | 1.5 | 305 | 31.98 | 405 | 27 | 10 | 10 | 60°凹 |
| 14# | 31.95 | 1.5 | 355 | 39.14 | 465 | 35 | 10 | 10 | 60°凹 |

### 《SPTPR》 右刃左ネジレ12° SKH51

Helix Angle-left12° HSS

切削条件表 P142 | 左ネジレ 12° | HSS



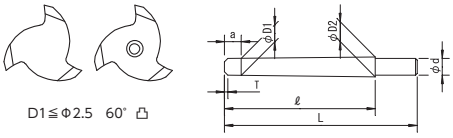

| 公差(Tolerance) | D1：±0.05 | d：±0.2 |
|---|---|---|

| 呼び寸法 Size | 小径(ΦD1) First Dia. | 食付長(T) Chamfer Length | 刃長(ℓ) Length of Flutes | 大径(ΦD2) Dia at Large End | 全長(L) Overall Length | シャンク径(Φd) Shank Dia. | a | 刃数(N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|---|---|
| 0# | 3.32 | 0.5 | 42 | 4.09 | 60 | 4.5 | 5 | 6 | 60°凹 |
| 1# | 3.8 | 0.5 | 45 | 4.64 | 65 | 5 | 5 | 6 | 60°凹 |
| 2# | 4.21 | 0.5 | 52 | 5.19 | 75 | 5.5 | 5 | 6 | 60°凹 |
| 3# | 4.74 | 0.5 | 58 | 5.85 | 90 | 5.5 | 5 | 6 | 60°凹 |
| 4# | 5.38 | 0.5 | 65 | 6.63 | 105 | 6.5 | 5 | 6 | 60°凹 |
| 5# | 6.19 | 1 | 78 | 7.71 | 115 | 6.5 | 5 | 6 | 60°凹 |
| 6# | 7.18 | 1 | 92 | 9 | 130 | 7.5 | 5 | 6 | 60°凹 |
| 7# | 8.5 | 1 | 115 | 10.8 | 155 | 9 | 5 | 6 | 60°凹 |
| 8# | 10.21 | 1 | 135 | 12.92 | 175 | 11 | 5 | 8 | 60°凹 |
| 9# | 12.4 | 1 | 155 | 15.47 | 205 | 13 | 8 | 8 | 60°凹 |

### 《HTPR》 右刃左ネジレ35°~45° SKH51

Helix Angle-left35°~45° HSS

切削条件表 P142 | 左ネジレ 35~45° | HSS



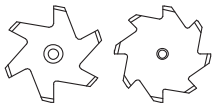

| 公差(Tolerance) | D1：±0.05 | d：h8 |
|---|---|---|

| 呼び寸法 Size | 小径(ΦD1) First Dia. | 食付長(T) Chamfer Length | 刃長(ℓ) Length of Flutes | 大径(ΦD2) Dia at Large End | 全長(L) Overall Length | シャンク径(Φd) Shank Dia. | a | 刃数(N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|---|---|
| 5/0# | 1.93 | – | 30 | 2.45 | 45 | 2.77 | 5 | 3 | 60°凸 |
| 4/0# | 2.33 | – | 32 | 2.9 | 45 | 3.5 | 5 | 3 | 60°凸 |
| 3/0# | 2.65 | – | 35 | 3.28 | 50 | 4 | 5 | 3 | 60°凸 |
| 2/0# | 2.99 | – | 38 | 3.68 | 58 | 4 | 5 | 3 | 60°凸 |
| 0# | 3.32 | 0.5 | 42 | 4.09 | 60 | 4.5 | 5 | 3 | 60°凹 |
| 1# | 3.8 | 0.5 | 45 | 4.64 | 65 | 5 | 5 | 3 | 60°凹 |
| 2# | 4.21 | 0.5 | 52 | 5.19 | 75 | 5.5 | 5 | 3 | 60°凹 |
| 3# | 4.74 | 0.5 | 58 | 5.85 | 90 | 5.5 | 5 | 3 | 60°凹 |
| 4# | 5.38 | 1 | 65 | 6.63 | 105 | 6.5 | 5 | 3 | 60°凹 |
| 5# | 6.19 | 1 | 78 | 7.71 | 115 | 6.5 | 5 | 3 | 60°凹 |
| 6# | 7.18 | 1 | 92 | 9 | 130 | 7.5 | 5 | 3 | 60°凹 |
| 7# | 8.5 | 1 | 115 | 10.8 | 155 | 9 | 5 | 3 | 60°凹 |
| 8# | 10.21 | 1 | 135 | 12.92 | 175 | 11 | 5 | 3 | 60°凹 |
| 9# | 12.4 | 1 | 155 | 15.47 | 205 | 13 | 8 | 3 | 60°凹 |
| 10# | 14.91 | 1.5 | 180 | 18.5 | 230 | 16 | 8 | 3 | 60°凹 |

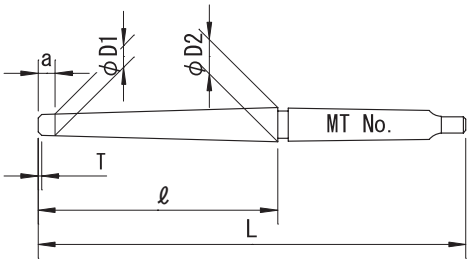
# TPRT

## マシン用テーパーピンリーマ　*Taper Pin Reamer With Taper Shank*

切削条件表 P142　テーパー穴加工　右直刃　食付45°　HSS








| 公差(Tolerance) | D1 ：±0.05 |
|---|---|

### 1/50テーパー　右刃ストレート　食付角度45°　SKH51
1/50Taper　Straight Flute　Chamfer Angle45°　HSS

| 小径（ΦD1）<br>*First Dia.* | 食付長（T）<br>*Chamfer Length* | 刃長（ℓ）<br>*Length of Flutes* | 大径（ΦD2）<br>*Dia at Large End* | 全長（L）<br>*Overall Length* | MTNo.<br>*Shank MTNo.* | a | 刃数（N）<br>*Number of Flutes* | センタ<br>*Center* |
|---|---|---|---|---|---|---|---|---|
| **3** | – | 63 | 4.16 | 140.5 | 1 | 5 | 6 | 60°凹 |
| **4** | 0.5 | 75 | 5.4 | 152.5 | 1 | 5 | 6 | 60°凹 |
| **5** | 0.5 | 87 | 6.64 | 165 | 1 | 5 | 6 | 60°凹 |
| **6** | 1 | 99 | 7.88 | 180 | 1 | 5 | 6 | 60°凹 |
| **7** | 1 | 119 | 9.28 | 200 | 1 | 5 | 6 | 60°凹 |
| **8** | 1 | 141 | 10.72 | 222 | 1 | 5 | 6 | 60°凹 |
| **9** | 1 | 163 | 12.16 | 245 | 1 | 5 | 8 | 60°凹 |
| **10** | 1 | 163 | 13.16 | 245 | 1 | 5 | 8 | 60°凹 |
| **11** | 1 | 194 | 14.74 | 295 | 2 | 7 | 8 | 60°凹 |
| **12** | 1 | 194 | 15.74 | 295 | 2 | 7 | 8 | 60°凹 |
| **13** | 1 | 194 | 16.74 | 295 | 2 | 7 | 8 | 60°凹 |
| **14** | 1.5 | 234 | 18.52 | 335 | 2 | 8 | 8 | 60°凹 |
| **15** | 1.5 | 234 | 19.52 | 335 | 2 | 8 | 8 | 60°凹 |
| **16** | 1.5 | 234 | 20.52 | 335 | 2 | 8 | 8 | 60°凹 |
| **17** | 1.5 | 270 | 22.2 | 370 | 2 | 10 | 8 | 60°凹 |
| **18** | 1.5 | 270 | 23.2 | 370 | 2 | 10 | 8 | 60°凹 |
| **19** | 1.5 | 270 | 24.2 | 370 | 2 | 10 | 8 | 60°凹 |
| **20** | 1.5 | 270 | 25.2 | 370 | 2 | 10 | 8 | 60°凹 |
| **21** | 1.5 | 310 | 26.94 | 430 | 3 | 13 | 10 | 60°凹 |
| **22** | 1.5 | 310 | 27.94 | 430 | 3 | 13 | 10 | 60°凹 |
| **23** | 1.5 | 310 | 28.94 | 430 | 3 | 13 | 10 | 60°凹 |

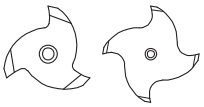
| 小径（ΦD1）<br>*First Dia.* | 食付長（T）<br>*Chamfer Length* | 刃長（ℓ）<br>*Length of Flutes* | 大径（ΦD2）<br>*Dia at Large End* | 全長（L）<br>*Overall Length* | MTNo.<br>*Shank MTNo.* | a | 刃数（N）<br>*Number of Flutes* | センタ<br>*Center* |
|---|---|---|---|---|---|---|---|---|
| **24** | 1.5 | 310 | 29.94 | 430 | 3 | 13 | 10 | 60°凹 |
| **25** | 1.5 | 310 | 30.94 | 430 | 3 | 13 | 10 | 60°凹 |
| **26** | 1.5 | 318 | 32.06 | 445 | 3 | 15 | 10 | 60°凹 |
| **27** | 1.5 | 318 | 33.06 | 445 | 3 | 15 | 10 | 60°凹 |
| **28** | 1.5 | 318 | 34.06 | 445 | 3 | 15 | 10 | 60°凹 |
| **29** | 1.5 | 318 | 35.06 | 445 | 3 | 15 | 10 | 60°凹 |
| **30** | 1.5 | 318 | 36.06 | 445 | 3 | 15 | 10 | 60°凹 |
| **31** | 2 | 335 | 37.3 | 500 | 4 | 20 | 12 | 60°凹 |
| **32** | 2 | 335 | 38.3 | 500 | 4 | 20 | 12 | 60°凹 |
| **33** | 2 | 335 | 39.3 | 500 | 4 | 20 | 12 | 60°凹 |
| **34** | 2 | 335 | 40.3 | 500 | 4 | 20 | 12 | 60°凹 |
| **35** | 2 | 335 | 41.3 | 500 | 4 | 20 | 12 | 60°凹 |
| **36** | 2 | 335 | 42.3 | 500 | 4 | 20 | 12 | 60°凹 |
| **37** | 2 | 335 | 43.3 | 500 | 4 | 20 | 12 | 60°凹 |
| **38** | 2 | 335 | 44.3 | 500 | 4 | 20 | 12 | 60°凹 |
| **39** | 2 | 335 | 45.3 | 500 | 4 | 20 | 12 | 60°凹 |
| **40** | 2 | 335 | 46.3 | 500 | 4 | 20 | 12 | 60°凹 |
| **42** | 2 | 351 | 48.52 | 525 | 4 | 25 | 14 | 60°凹 |
| **45** | 2 | 351 | 51.52 | 525 | 4 | 25 | 14 | 60°凹 |
| **48** | 2 | 351 | 54.52 | 525 | 4 | 25 | 14 | 60°凹 |
| **50** | 2 | 351 | 56.52 | 525 | 4 | 25 | 14 | 60°凹 |

ハイス

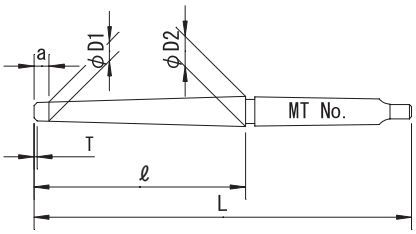
# HTPRT

## マシン用ヘリカルテーパーピンリーマ　*Helical Taper Pin Reamer With Taper Shank*

切削条件表 P142　テーパー穴加工　左ネジレ 35～45°　食付 45°　HSS








| 公差(Tolerance) | D1：±0.05 |
|---|---|

### 1/50テーパー　右刃左ネジレ35°～45°　食付角度45°　SKH51

1/50Taper　Helix Angle-Left35°～45°　Chamfer Angle45°　HSS

| 小径（ΦD1）*First Dia.* | 食付長（T）*Chamfer Length* | 刃長（ℓ）*Length of Flutes* | 大径（ΦD2）*Dia at Large End* | 全長（L）*Overall Length* | MTNo. *Shank MTNo.* | a | 刃数（N）*Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|---|
| **3** | – | 63 | 4.16 | 140.5 | 1 | 5 | 3 | 60°凹 |
| **4** | 0.5 | 75 | 5.4 | 152.5 | 1 | 5 | 3 | 60°凹 |
| **5** | 1 | 87 | 6.64 | 165 | 1 | 5 | 3 | 60°凹 |
| **6** | 1 | 99 | 7.88 | 180 | 1 | 5 | 3 | 60°凹 |
| **7** | 1 | 119 | 9.28 | 200 | 1 | 5 | 3 | 60°凹 |
| **8** | 1 | 141 | 10.72 | 222 | 1 | 5 | 3 | 60°凹 |
| **9** | 1 | 163 | 12.16 | 245 | 1 | 5 | 3 | 60°凹 |
| **10** | 1 | 163 | 13.16 | 245 | 1 | 5 | 3 | 60°凹 |
| **11** | 1 | 194 | 14.74 | 295 | 2 | 7 | 3 | 60°凹 |
| **12** | 1 | 194 | 15.74 | 295 | 2 | 7 | 3 | 60°凹 |
| **13** | 1 | 194 | 16.74 | 295 | 2 | 7 | 3 | 60°凹 |
| **14** | 1.5 | 234 | 18.52 | 335 | 2 | 8 | 3 | 60°凹 |
| **15** | 1.5 | 234 | 19.52 | 335 | 2 | 8 | 3 | 60°凹 |
| **16** | 1.5 | 234 | 20.52 | 335 | 2 | 8 | 3 | 60°凹 |
| **18** | 1.5 | 270 | 23.2 | 370 | 2 | 10 | 3 | 60°凹 |
| **20** | 1.5 | 270 | 25.2 | 370 | 2 | 10 | 3 | 60°凹 |
| **21** | 1.5 | 310 | 26.94 | 430 | 3 | 13 | 3 | 60°凹 |

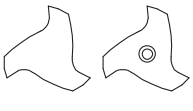
| 小径（ΦD1）*First Dia.* | 食付長（T）*Chamfer Length* | 刃長（ℓ）*Length of Flutes* | 大径（ΦD2）*Dia at Large End* | 全長（L）*Overall Length* | MTNo. *Shank MTNo.* | a | 刃数（N）*Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|---|
| **22** | 1.5 | 310 | 27.94 | 430 | 3 | 13 | 3 | 60°凹 |
| **23** | 1.5 | 310 | 28.94 | 430 | 3 | 13 | 3 | 60°凹 |
| **24** | 1.5 | 310 | 29.94 | 430 | 3 | 13 | 3 | 60°凹 |
| **25** | 1.5 | 310 | 30.94 | 430 | 3 | 13 | 3 | 60°凹 |
| **26** | 1.5 | 318 | 32.06 | 445 | 3 | 15 | 3 | 60°凹 |
| **28** | 1.5 | 318 | 34.06 | 445 | 3 | 15 | 3 | 60°凹 |
| **30** | 1.5 | 318 | 36.06 | 445 | 3 | 15 | 3 | 60°凹 |
| **32** | 2 | 335 | 38.3 | 500 | 4 | 20 | 4 | 60°凹 |
| **35** | 2 | 335 | 41.3 | 500 | 4 | 20 | 4 | 60°凹 |
| **36** | 2 | 335 | 42.3 | 500 | 4 | 20 | 4 | 60°凹 |
| **38** | 2 | 335 | 44.3 | 500 | 4 | 20 | 4 | 60°凹 |
| **40** | 2 | 335 | 46.3 | 500 | 4 | 20 | 4 | 60°凹 |
| **42** | 2 | 351 | 48.52 | 525 | 4 | 25 | 4 | 60°凹 |
| **45** | 2 | 351 | 51.52 | 525 | 4 | 25 | 4 | 60°凹 |
| **46** | 2 | 351 | 52.52 | 525 | 4 | 25 | 4 | 60°凹 |
| **48** | 2 | 351 | 54.52 | 525 | 4 | 25 | 4 | 60°凹 |
| **50** | 2 | 351 | 56.52 | 525 | 4 | 25 | 4 | 60°凹 |

ハイス

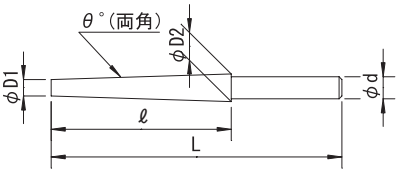
# SUR

## スプールリーマ　*Sprue Reamer*

切削条件表 P143 | テーパー穴加工 | 左ネジレ 20° | 左ネジレ 12° | 刃数 3 | HSS Co






| 公差(Tolerance) | D1 : $^{0}_{-0.08}$ | θ : ±5' | d : h7 |
|---|---|---|---|

両角1°30' まで右刃左ネジレ20°　2°から右刃左ネジレ12°　刃数:3　SKH56

Helix Angle : Left 20° for Taper Angle up to 1.5°, Left 12° for Taper Angle 2° and over. 3 Flutes　HSS-Co.

| 呼び寸法 Size | 小径(ΦD1) First Dia. | 両角(θ) Taper Angle | 刃長(ℓ) Length of Flutes | 大径(ΦD2) Dia at Large End | 全長(L) Overall Length | シャンク径(Φd) Shank Dia. | センタ Center |
|---|---|---|---|---|---|---|---|
| 1 - 1 | 2 | 1° | 60 | 3.04 | 110 | 6 | 60°凸 |
| 1 - 2 | 2 | | 100 | 3.74 | 150 | 6 | 60°凸 |
| 1 - 3 | 2.5 | | 60 | 3.54 | 110 | 6 | 60°凸 |
| 1 - 4 | 2.5 | | 100 | 4.24 | 150 | 6 | 60°凸 |
| 1 - 5 | 3 | | 60 | 4.04 | 110 | 6 | 60°凸 |
| 1 - 6 | 3 | | 100 | 4.74 | 150 | 6 | 60°凸 |
| 1 - 7 | 3 | | 160 | 5.79 | 210 | 6 | 60°凸 |
| 1 - 8 | 3.5 | | 80 | 4.89 | 130 | 6 | 60°凸 |
| 1 - 9 | 3.5 | | 120 | 5.59 | 170 | 6 | 60°凸 |
| 1 - 10 | 4 | | 80 | 5.39 | 130 | 6 | 60°凸 |
| 1 - 11 | 4 | | 120 | 6.09 | 170 | 6 | 60°凸 |
| 1 - 12 | 4 | | 160 | 6.79 | 210 | 8 | 60°凸 |
| 1 - 13 | 4.5 | | 100 | 6.24 | 150 | 8 | 60°凸 |
| 1 - 14 | 4.5 | | 140 | 6.94 | 190 | 8 | 60°凸 |
| 1 - 15 | 5 | | 120 | 7.09 | 170 | 8 | 60°凸 |
| 1 - 16 | 5 | | 160 | 7.79 | 210 | 8 | 60°凸 |
| 1 - 17 | 6 | | 120 | 8.09 | 170 | 8 | 60°凸 |
| 1 - 18 | 6 | | 160 | 8.79 | 210 | 8 | 60°凸 |
| 1 - 19 | 8 | | 120 | 10.09 | 170 | 10 | 60°凹 |
| 1 - 20 | 8 | | 160 | 10.79 | 210 | 10 | 60°凹 |
| 1 - 21 | 10 | | 120 | 12.09 | 170 | 12 | 60°凹 |
| 1 - 22 | 10 | | 160 | 12.79 | 210 | 12 | 60°凹 |
| 1.5 - 1 | 2 | 1°30' | 60 | 3.57 | 110 | 6 | 60°凸 |
| 1.5 - 2 | 2 | | 100 | 4.61 | 150 | 6 | 60°凸 |
| 1.5 - 3 | 2.5 | | 60 | 4.07 | 110 | 6 | 60°凸 |
| 1.5 - 4 | 2.5 | | 100 | 5.11 | 150 | 6 | 60°凸 |
| 1.5 - 5 | 3 | | 60 | 4.57 | 110 | 6 | 60°凸 |
| 1.5 - 6 | 3 | | 100 | 5.61 | 150 | 6 | 60°凸 |
| 1.5 - 7 | 3 | | 160 | 7.19 | 210 | 8 | 60°凸 |
| 1.5 - 8 | 3.5 | | 80 | 5.59 | 130 | 6 | 60°凸 |
| 1.5 - 9 | 3.5 | | 120 | 6.64 | 170 | 8 | 60°凸 |
| 1.5 - 10 | 4 | | 80 | 6.09 | 130 | 6 | 60°凸 |
| 1.5 - 11 | 4 | | 120 | 7.14 | 170 | 8 | 60°凸 |
| 1.5 - 12 | 4 | | 160 | 8.19 | 210 | 8 | 60°凸 |
| 1.5 - 13 | 4.5 | | 100 | 7.11 | 150 | 8 | 60°凸 |
| 1.5 - 14 | 4.5 | | 140 | 8.16 | 190 | 8 | 60°凸 |
| 1.5 - 15 | 5 | | 120 | 8.14 | 170 | 8 | 60°凸 |
| 1.5 - 16 | 5 | | 160 | 9.19 | 210 | 8 | 60°凸 |
| 1.5 - 17 | 6 | | 120 | 9.14 | 170 | 8 | 60°凸 |
| 1.5 - 18 | 6 | | 160 | 10.19 | 210 | 10 | 60°凸 |
| 1.5 - 19 | 8 | | 120 | 11.14 | 170 | 12 | 60°凹 |
| 1.5 - 20 | 8 | | 160 | 12.19 | 210 | 12 | 60°凹 |
| 1.5 - 21 | 10 | | 120 | 13.14 | 170 | 12 | 60°凹 |
| 1.5 - 22 | 10 | | 160 | 14.19 | 210 | 12 | 60°凹 |

| 呼び寸法 Size | 小径(ΦD1) First Dia. | 両角(θ) Taper Angle | 刃長(ℓ) Length of Flutes | 大径(ΦD2) Dia at Large End | 全長(L) Overall Length | シャンク径(Φd) Shank Dia. | センタ Center |
|---|---|---|---|---|---|---|---|
| 2 - 1 | 2 | 2° | 60 | 4.09 | 110 | 6 | 60°凸 |
| 2 - 2 | 2 | | 100 | 5.49 | 150 | 6 | 60°凸 |
| 2 - 3 | 2.5 | | 60 | 5.59 | 110 | 6 | 60°凸 |
| 2 - 4 | 2.5 | | 100 | 5.99 | 150 | 6 | 60°凸 |
| 2 - 5 | 3 | | 60 | 5.09 | 110 | 6 | 60°凸 |
| 2 - 6 | 3 | | 100 | 6.49 | 150 | 8 | 60°凸 |
| 2 - 7 | 3 | | 160 | 8.59 | 210 | 8 | 60°凸 |
| 2 - 8 | 3.5 | | 80 | 6.29 | 130 | 8 | 60°凸 |
| 2 - 9 | 3.5 | | 120 | 7.69 | 170 | 8 | 60°凸 |
| 2 - 10 | 4 | | 80 | 6.79 | 130 | 8 | 60°凸 |
| 2 - 11 | 4 | | 120 | 8.19 | 170 | 8 | 60°凸 |
| 2 - 12 | 4 | | 160 | 9.59 | 210 | 10 | 60°凸 |
| 2 - 13 | 4.5 | | 100 | 7.99 | 150 | 8 | 60°凸 |
| 2 - 14 | 4.5 | | 140 | 9.39 | 190 | 10 | 60°凸 |
| 2 - 15 | 5 | | 120 | 9.19 | 170 | 8 | 60°凸 |
| 2 - 16 | 5 | | 160 | 10.59 | 210 | 10 | 60°凸 |
| 2 - 17 | 6 | | 120 | 10.19 | 170 | 10 | 60°凸 |
| 2 - 18 | 6 | | 160 | 11.59 | 210 | 10 | 60°凸 |
| 2 - 19 | 8 | | 120 | 12.19 | 170 | 12 | 60°凹 |
| 2 - 20 | 8 | | 160 | 13.59 | 210 | 12 | 60°凹 |
| 2 - 21 | 10 | | 120 | 14.19 | 170 | 12 | 60°凹 |
| 2 - 22 | 10 | | 160 | 15.59 | 210 | 12 | 60°凹 |
| 2.5 - 1 | 2 | 2°30' | 60 | 4.62 | 110 | 6 | 60°凸 |
| 2.5 - 2 | 2 | | 100 | 6.36 | 150 | 8 | 60°凸 |
| 2.5 - 3 | 2.5 | | 60 | 5.12 | 110 | 6 | 60°凸 |
| 2.5 - 4 | 2.5 | | 100 | 6.86 | 150 | 8 | 60°凸 |
| 2.5 - 5 | 3 | | 60 | 5.62 | 110 | 6 | 60°凸 |
| 2.5 - 6 | 3 | | 100 | 7.36 | 150 | 8 | 60°凸 |
| 2.5 - 7 | 3 | | 160 | 9.98 | 210 | 10 | 60°凸 |
| 2.5 - 8 | 3.5 | | 80 | 6.99 | 130 | 8 | 60°凸 |
| 2.5 - 9 | 3.5 | | 120 | 8.74 | 170 | 8 | 60°凸 |
| 2.5 - 10 | 4 | | 80 | 7.49 | 130 | 8 | 60°凸 |
| 2.5 - 11 | 4 | | 120 | 9.24 | 170 | 8 | 60°凸 |
| 2.5 - 12 | 4 | | 160 | 10.98 | 210 | 10 | 60°凸 |
| 2.5 - 13 | 4.5 | | 100 | 8.86 | 150 | 8 | 60°凸 |
| 2.5 - 14 | 4.5 | | 140 | 10.61 | 190 | 10 | 60°凸 |
| 2.5 - 15 | 5 | | 120 | 10.24 | 170 | 10 | 60°凸 |
| 2.5 - 16 | 5 | | 160 | 11.98 | 210 | 12 | 60°凸 |
| 2.5 - 17 | 6 | | 120 | 11.24 | 170 | 10 | 60°凸 |
| 2.5 - 18 | 6 | | 160 | 12.98 | 210 | 12 | 60°凸 |
| 2.5 - 19 | 8 | | 120 | 13.24 | 170 | 12 | 60°凹 |
| 2.5 - 20 | 8 | | 160 | 14.98 | 210 | 12 | 60°凹 |
| 2.5 - 21 | 10 | | 120 | 15.24 | 170 | 12 | 60°凹 |
| 2.5 - 22 | 10 | | 160 | 16.98 | 210 | 16 | 60°凹 |

# SUR スプールリーマ

| 呼び寸法 Size | 小径 (ΦD1) First Dia. | 両角 (θ) Taper Angle | 刃長 (ℓ) Length of Flutes | 大径 (ΦD2) Dia at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | センタ Center |
|---|---|---|---|---|---|---|---|
| 3 - 1 | 2 | 3° | 60 | 5.14 | 110 | 6 | 60°凸 |
| 3 - 2 | 2 | | 100 | 7.24 | 150 | 8 | 60°凸 |
| 3 - 3 | 2.5 | | 60 | 5.64 | 110 | 6 | 60°凸 |
| 3 - 4 | 2.5 | | 100 | 7.74 | 150 | 8 | 60°凸 |
| 3 - 5 | 3 | | 60 | 6.14 | 110 | 8 | 60°凸 |
| 3 - 6 | 3 | | 100 | 8.24 | 150 | 8 | 60°凸 |
| 3 - 7 | 3 | | 160 | 11.38 | 210 | 12 | 60°凸 |
| 3 - 8 | 3.5 | | 80 | 7.69 | 130 | 8 | 60°凸 |
| 3 - 9 | 3.5 | | 120 | 9.78 | 170 | 10 | 60°凸 |
| 3 - 10 | 4 | | 80 | 8.19 | 130 | 8 | 60°凸 |
| 3 - 11 | 4 | | 120 | 10.28 | 170 | 10 | 60°凸 |
| 3 - 12 | 4 | | 160 | 12.38 | 210 | 12 | 60°凸 |
| 3 - 13 | 4.5 | | 100 | 9.74 | 150 | 10 | 60°凸 |
| 3 - 14 | 4.5 | | 140 | 11.83 | 190 | 12 | 60°凸 |
| 3 - 15 | 5 | | 120 | 11.28 | 170 | 12 | 60°凸 |
| 3 - 16 | 5 | | 160 | 13.38 | 210 | 12 | 60°凸 |
| 3 - 17 | 6 | | 120 | 12.28 | 170 | 12 | 60°凸 |
| 3 - 18 | 6 | | 160 | 14.38 | 210 | 12 | 60°凸 |
| 3 - 19 | 8 | | 120 | 14.28 | 170 | 12 | 60°凹 |
| 3 - 20 | 8 | | 160 | 16.38 | 210 | 16 | 60°凹 |
| 3 - 21 | 10 | | 120 | 16.28 | 170 | 16 | 60°凹 |
| 3 - 22 | 10 | | 160 | 18.38 | 210 | 16 | 60°凹 |
| 3.5 - 1 | 2 | 3°30' | 60 | 5.67 | 110 | 6 | 60°凸 |
| 3.5 - 2 | 2 | | 100 | 8.11 | 150 | 8 | 60°凸 |
| 3.5 - 3 | 2.5 | | 60 | 6.17 | 110 | 6 | 60°凸 |
| 3.5 - 4 | 2.5 | | 100 | 8.61 | 150 | 8 | 60°凸 |
| 3.5 - 5 | 3 | | 60 | 6.67 | 110 | 6 | 60°凸 |
| 3.5 - 6 | 3 | | 100 | 9.11 | 150 | 8 | 60°凸 |
| 3.5 - 7 | 3 | | 160 | 12.78 | 210 | 12 | 60°凸 |
| 3.5 - 8 | 3.5 | | 80 | 8.39 | 130 | 8 | 60°凸 |
| 3.5 - 9 | 3.5 | | 120 | 10.83 | 170 | 10 | 60°凸 |
| 3.5 - 10 | 4 | | 80 | 8.89 | 130 | 8 | 60°凸 |
| 3.5 - 11 | 4 | | 120 | 11.33 | 170 | 12 | 60°凸 |
| 3.5 - 12 | 4 | | 160 | 13.78 | 210 | 12 | 60°凸 |
| 3.5 - 13 | 4.5 | | 100 | 10.61 | 150 | 10 | 60°凸 |
| 3.5 - 14 | 4.5 | | 140 | 13.05 | 190 | 12 | 60°凸 |
| 3.5 - 15 | 5 | | 120 | 12.33 | 170 | 12 | 60°凸 |
| 3.5 - 16 | 5 | | 160 | 14.78 | 210 | 12 | 60°凸 |
| 3.5 - 17 | 6 | | 120 | 13.33 | 170 | 12 | 60°凸 |
| 3.5 - 18 | 6 | | 160 | 15.78 | 210 | 12 | 60°凸 |
| 3.5 - 19 | 8 | | 120 | 15.33 | 170 | 12 | 60°凹 |
| 3.5 - 20 | 8 | | 160 | 17.78 | 210 | 16 | 60°凹 |
| 3.5 - 21 | 10 | | 120 | 17.33 | 170 | 16 | 60°凹 |
| 3.5 - 22 | 10 | | 160 | 19.78 | 210 | 16 | 60°凹 |
| 4 - 1 | 2 | 4° | 60 | 6.19 | 110 | 8 | 60°凸 |
| 4 - 2 | 2 | | 100 | 8.98 | 150 | 8 | 60°凸 |
| 4 - 3 | 2.5 | | 60 | 6.69 | 110 | 8 | 60°凸 |
| 4 - 4 | 2.5 | | 100 | 9.48 | 150 | 8 | 60°凸 |
| 4 - 5 | 3 | | 60 | 7.19 | 110 | 8 | 60°凸 |
| 4 - 6 | 3 | | 100 | 9.98 | 150 | 10 | 60°凸 |
| 4 - 7 | 3 | | 160 | 14.17 | 210 | 12 | 60°凸 |
| 4 - 8 | 3.5 | | 80 | 9.09 | 130 | 8 | 60°凸 |
| 4 - 9 | 3.5 | | 120 | 11.88 | 170 | 12 | 60°凸 |
| 4 - 10 | 4 | | 80 | 9.59 | 130 | 10 | 60°凸 |
| 4 - 11 | 4 | | 120 | 12.38 | 170 | 12 | 60°凸 |
| 4 - 12 | 4 | | 160 | 15.17 | 210 | 12 | 60°凸 |
| 4 - 13 | 4.5 | | 100 | 11.48 | 150 | 10 | 60°凸 |
| 4 - 14 | 4.5 | | 140 | 14.28 | 190 | 12 | 60°凸 |
| 4 - 15 | 5 | | 120 | 13.38 | 170 | 12 | 60°凸 |
| 4 - 16 | 5 | | 160 | 16.17 | 210 | 12 | 60°凸 |
| 4 - 17 | 6 | | 120 | 14.38 | 170 | 12 | 60°凸 |
| 4 - 18 | 6 | | 160 | 17.17 | 210 | 16 | 60°凸 |
| 4 - 19 | 8 | | 120 | 16.38 | 170 | 16 | 60°凹 |
| 4 - 20 | 8 | | 160 | 19.17 | 210 | 16 | 60°凹 |
| 4 - 21 | 10 | | 120 | 18.38 | 170 | 16 | 60°凹 |
| 4 - 22 | 10 | | 160 | 21.17 | 210 | 16 | 60°凹 |

| 呼び寸法 Size | 小径 (ΦD1) First Dia. | 両角 (θ) Taper Angle | 刃長 (ℓ) Length of Flutes | 大径 (ΦD2) Dia at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | センタ Center |
|---|---|---|---|---|---|---|---|
| 5 - 1 | 2 | 5° | 60 | 7.23 | 110 | 8 | 60°凸 |
| 5 - 2 | 2 | | 100 | 10.73 | 150 | 10 | 60°凸 |
| 5 - 3 | 2.5 | | 60 | 7.73 | 110 | 8 | 60°凸 |
| 5 - 4 | 2.5 | | 100 | 11.23 | 150 | 12 | 60°凸 |
| 5 - 5 | 3 | | 60 | 8.23 | 110 | 8 | 60°凸 |
| 5 - 6 | 3 | | 100 | 11.73 | 150 | 12 | 60°凸 |
| 5 - 7 | 3 | | 160 | 16.97 | 210 | 16 | 60°凸 |
| 5 - 8 | 3.5 | | 80 | 10.48 | 130 | 10 | 60°凸 |
| 5 - 9 | 3.5 | | 120 | 13.97 | 170 | 12 | 60°凸 |
| 5 - 10 | 4 | | 80 | 10.98 | 130 | 10 | 60°凸 |
| 5 - 11 | 4 | | 120 | 14.47 | 170 | 16 | 60°凸 |
| 5 - 12 | 4 | | 160 | 17.97 | 210 | 16 | 60°凸 |
| 5 - 13 | 4.5 | | 100 | 13.23 | 150 | 12 | 60°凸 |
| 5 - 14 | 4.5 | | 140 | 16.72 | 190 | 16 | 60°凸 |
| 5 - 15 | 5 | | 120 | 15.48 | 170 | 16 | 60°凸 |
| 5 - 16 | 5 | | 160 | 18.97 | 210 | 16 | 60°凸 |
| 5 - 17 | 6 | | 120 | 16.47 | 170 | 16 | 60°凸 |
| 5 - 18 | 6 | | 160 | 19.97 | 210 | 16 | 60°凸 |
| 5 - 19 | 8 | | 120 | 18.47 | 170 | 16 | 60°凹 |
| 5 - 20 | 8 | | 160 | 21.97 | 210 | 16 | 60°凹 |
| 5 - 21 | 10 | | 120 | 20.47 | 170 | 16 | 60°凹 |
| 5 - 22 | 10 | | 160 | 23.97 | 210 | 20 | 60°凹 |
| 6 - 1 | 2 | 6° | 60 | 8.28 | 110 | 8 | 60°凸 |
| 6 - 2 | 2 | | 100 | 12.48 | 150 | 12 | 60°凸 |
| 6 - 3 | 2.5 | | 60 | 8.78 | 110 | 8 | 60°凸 |
| 6 - 4 | 2.5 | | 100 | 12.98 | 150 | 12 | 60°凸 |
| 6 - 5 | 3 | | 60 | 9.28 | 110 | 10 | 60°凸 |
| 6 - 6 | 3 | | 100 | 13.48 | 150 | 12 | 60°凸 |
| 6 - 7 | 3 | | 160 | 19.77 | 210 | 16 | 60°凸 |
| 6 - 8 | 3.5 | | 80 | 11.88 | 130 | 12 | 60°凸 |
| 6 - 9 | 3.5 | | 120 | 16.07 | 170 | 16 | 60°凸 |
| 6 - 10 | 4 | | 80 | 12.38 | 130 | 12 | 60°凸 |
| 6 - 11 | 4 | | 120 | 16.57 | 170 | 16 | 60°凸 |
| 6 - 12 | 4 | | 160 | 20.77 | 210 | 16 | 60°凸 |
| 6 - 13 | 4.5 | | 100 | 14.98 | 150 | 16 | 60°凸 |
| 6 - 14 | 4.5 | | 140 | 19.17 | 190 | 16 | 60°凸 |
| 6 - 15 | 5 | | 120 | 17.57 | 170 | 16 | 60°凸 |
| 6 - 16 | 5 | | 160 | 21.77 | 210 | 16 | 60°凸 |
| 6 - 17 | 6 | | 120 | 18.57 | 170 | 16 | 60°凸 |
| 6 - 18 | 6 | | 160 | 22.77 | 210 | 16 | 60°凸 |
| 6 - 19 | 8 | | 120 | 20.57 | 170 | 16 | 60°凹 |
| 6 - 20 | 8 | | 160 | 24.77 | 210 | 20 | 60°凹 |
| 6 - 21 | 10 | | 120 | 22.57 | 170 | 16 | 60°凹 |
| 6 - 22 | 10 | | 160 | 26.77 | 210 | 20 | 60°凹 |
| 7 - 1 | 2 | 7° | 60 | 9.34 | 110 | 10 | 60°凸 |
| 7 - 2 | 2 | | 100 | 14.23 | 150 | 12 | 60°凸 |
| 7 - 3 | 2.5 | | 60 | 9.84 | 110 | 10 | 60°凸 |
| 7 - 4 | 2.5 | | 100 | 14.73 | 150 | 12 | 60°凸 |
| 7 - 5 | 3 | | 60 | 10.34 | 110 | 10 | 60°凸 |
| 7 - 6 | 3 | | 100 | 15.23 | 150 | 12 | 60°凸 |
| 7 - 7 | 3 | | 160 | 22.57 | 230 | 20 | 60°凸 |
| 7 - 8 | 3.5 | | 80 | 13.28 | 130 | 12 | 60°凸 |
| 7 - 9 | 3.5 | | 120 | 18.17 | 180 | 16 | 60°凸 |
| 7 - 10 | 4 | | 80 | 13.78 | 130 | 12 | 60°凸 |
| 7 - 11 | 4 | | 120 | 18.67 | 180 | 16 | 60°凸 |
| 7 - 12 | 4 | | 160 | 23.57 | 230 | 20 | 60°凸 |
| 7 - 13 | 4.5 | | 100 | 16.73 | 150 | 16 | 60°凸 |
| 7 - 14 | 4.5 | | 140 | 21.62 | 210 | 16 | 60°凸 |
| 7 - 15 | 5 | | 120 | 19.67 | 180 | 16 | 60°凸 |
| 7 - 16 | 5 | | 160 | 24.57 | 230 | 20 | 60°凸 |
| 7 - 17 | 6 | | 120 | 20.67 | 180 | 16 | 60°凸 |
| 7 - 18 | 6 | | 160 | 25.57 | 230 | 20 | 60°凸 |
| 7 - 19 | 8 | | 120 | 22.67 | 180 | 16 | 60°凹 |
| 7 - 20 | 8 | | 160 | 27.57 | 230 | 20 | 60°凹 |
| 7 - 21 | 10 | | 120 | 24.67 | 180 | 20 | 60°凹 |
| 7 - 22 | 10 | | 160 | 29.57 | 230 | 25 | 60°凹 |

# SUR スプールリーマ

| 呼び寸法 Size | 小径 (ΦD1) First Dia. | 両角 (θ) Taper Angle | 刃長 (ℓ) Length of Flutes | 大径 (ΦD2) Dia at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | センタ Center |
|---|---|---|---|---|---|---|---|
| **8 - 1** | 2 | 8° | 60 | 10.39 | 110 | 10 | 60°凸 |
| **8 - 2** | 2 | | 100 | 15.98 | 150 | 12 | 60°凸 |
| **8 - 3** | 2.5 | | 60 | 10.89 | 110 | 10 | 60°凸 |
| **8 - 4** | 2.5 | | 100 | 16.48 | 150 | 16 | 60°凸 |
| **8 - 5** | 3 | | 60 | 11.39 | 110 | 12 | 60°凸 |
| **8 - 6** | 3 | | 100 | 16.98 | 150 | 16 | 60°凸 |
| **8 - 7** | 3 | | 160 | 25.37 | 230 | 20 | 60°凸 |
| **8 - 8** | 3.5 | | 80 | 14.68 | 130 | 12 | 60°凸 |
| **8 - 9** | 3.5 | | 120 | 20.28 | 180 | 16 | 60°凸 |
| **8 - 10** | 4 | | 80 | 15.18 | 130 | 12 | 60°凸 |
| **8 - 11** | 4 | | 120 | 20.78 | 180 | 16 | 60°凸 |
| **8 - 12** | 4 | | 160 | 26.37 | 230 | 20 | 60°凸 |
| **8 - 13** | 4.5 | | 100 | 18.48 | 150 | 16 | 60°凸 |
| **8 - 14** | 4.5 | | 140 | 24.08 | 210 | 20 | 60°凸 |
| **8 - 15** | 5 | | 120 | 21.78 | 180 | 16 | 60°凸 |
| **8 - 16** | 5 | | 160 | 27.37 | 230 | 20 | 60°凸 |
| **8 - 17** | 6 | | 120 | 22.78 | 180 | 16 | 60°凸 |
| **8 - 18** | 6 | | 160 | 28.37 | 230 | 20 | 60°凸 |
| **8 - 19** | 8 | | 120 | 24.48 | 180 | 20 | 60°凹 |
| **8 - 20** | 8 | | 160 | 30.37 | 230 | 25 | 60°凹 |
| **8 - 21** | 10 | | 120 | 26.78 | 180 | 20 | 60°凹 |
| **8 - 22** | 10 | | 160 | 32.37 | 230 | 25 | 60°凹 |

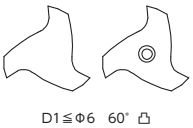
| 呼び寸法 Size | 小径 (ΦD1) First Dia. | 両角 (θ) Taper Angle | 刃長 (ℓ) Length of Flutes | 大径 (ΦD2) Dia at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | センタ Center |
|---|---|---|---|---|---|---|---|
| **10 - 1** | 2 | 10° | 60 | 12.49 | 110 | 12 | 60°凸 |
| **10 - 2** | 2 | | 100 | 19.49 | 150 | 16 | 60°凸 |
| **10 - 3** | 2.5 | | 60 | 12.99 | 110 | 12 | 60°凸 |
| **10 - 4** | 2.5 | | 100 | 19.99 | 150 | 16 | 60°凸 |
| **10 - 5** | 3 | | 60 | 13.49 | 110 | 12 | 60°凸 |
| **10 - 6** | 3 | | 100 | 20.49 | 150 | 16 | 60°凸 |
| **10 - 7** | 3 | | 160 | 30.99 | 230 | 25 | 60°凸 |
| **10 - 8** | 3.5 | | 80 | 17.49 | 130 | 16 | 60°凸 |
| **10 - 9** | 3.5 | | 120 | 24.49 | 180 | 20 | 60°凸 |
| **10 - 10** | 4 | | 80 | 17.99 | 130 | 16 | 60°凸 |
| **10 - 11** | 4 | | 120 | 24.99 | 170 | 20 | 60°凸 |
| **10 - 12** | 4 | | 160 | 31.99 | 230 | 25 | 60°凸 |
| **10 - 13** | 4.5 | | 100 | 21.99 | 150 | 16 | 60°凸 |
| **10 - 14** | 4.5 | | 140 | 28.99 | 210 | 25 | 60°凸 |
| **10 - 15** | 5 | | 120 | 25.99 | 180 | 20 | 60°凸 |
| **10 - 16** | 5 | | 160 | 32.99 | 230 | 25 | 60°凸 |
| **10 - 17** | 6 | | 120 | 26.99 | 180 | 20 | 60°凸 |
| **10 - 18** | 6 | | 160 | 33.99 | 230 | 25 | 60°凸 |
| **10 - 19** | 8 | | 120 | 28.99 | 180 | 20 | 60°凹 |
| **10 - 20** | 8 | | 160 | 35.99 | 230 | 25 | 60°凹 |
| **10 - 21** | 10 | | 120 | 30.99 | 180 | 25 | 60°凹 |
| **10 - 22** | 10 | | 160 | 37.99 | 230 | 25 | 60°凹 |

ハイス

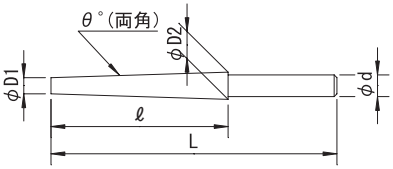
# SURN

## ニック付スプールリーマ　*Sprue Reamer With Nick*

切削条件表 P143 | テーパー穴加工 | 左ネジレ 25° | 刃数 3 | HSS Co






| 公差(Tolerance) | D1：$^{0}_{-0.08}$ | θ ：±5' | d：h7 |
|---|---|---|---|

右刃左ネジレ25°（中間径）　刃数:3　SKH56
Helix Angle-Left25°(Middle of Flute)　3 Flutes　HSS-Co.

| 呼び寸法 Size | 小径 (ΦD1) First Dia. | 両角 (θ) Taper Angle | 刃長 (ℓ) Length of Flutes | 大径 (ΦD2) Dia at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | センタ Center |
|---|---|---|---|---|---|---|---|
| 1 - 1 | 2 | 1° | 60 | 3.04 | 110 | 6 | 60°凸 |
| 1 - 2 | 2 | | 100 | 3.74 | 150 | 6 | 60°凸 |
| 1 - 3 | 2.5 | | 60 | 3.54 | 110 | 6 | 60°凸 |
| 1 - 4 | 2.5 | | 100 | 4.24 | 150 | 6 | 60°凸 |
| 1 - 5 | 3 | | 60 | 4.04 | 110 | 6 | 60°凸 |
| 1 - 6 | 3 | | 100 | 4.74 | 150 | 6 | 60°凸 |
| 1 - 7 | 3 | | 160 | 5.79 | 210 | 6 | 60°凸 |
| 1 - 8 | 3.5 | | 80 | 4.89 | 130 | 6 | 60°凸 |
| 1 - 9 | 3.5 | | 120 | 5.59 | 170 | 6 | 60°凸 |
| 1 - 10 | 4 | | 80 | 5.39 | 130 | 6 | 60°凸 |
| 1 - 11 | 4 | | 120 | 6.09 | 170 | 6 | 60°凸 |
| 1 - 12 | 4 | | 200 | 7.49 | 250 | 8 | 60°凸 |
| 1 - 13 | 4.5 | | 100 | 6.24 | 150 | 8 | 60°凸 |
| 1 - 14 | 4.5 | | 140 | 6.94 | 190 | 8 | 60°凸 |
| 1 - 15 | 5 | | 120 | 7.09 | 170 | 8 | 60°凸 |
| 1 - 16 | 5 | | 200 | 8.49 | 250 | 8 | 60°凸 |
| 1 - 17 | 6 | | 120 | 8.09 | 170 | 8 | 60°凸 |
| 1 - 18 | 6 | | 200 | 9.49 | 250 | 8 | 60°凸 |
| 1 - 19 | 8 | | 120 | 10.09 | 170 | 10 | 60°凹 |
| 1 - 20 | 8 | | 200 | 11.49 | 250 | 10 | 60°凹 |
| 1.5 - 1 | 2 | 1°30' | 60 | 3.57 | 110 | 6 | 60°凸 |
| 1.5 - 2 | 2 | | 100 | 4.61 | 150 | 6 | 60°凸 |
| 1.5 - 3 | 2.5 | | 60 | 4.07 | 110 | 6 | 60°凸 |
| 1.5 - 4 | 2.5 | | 100 | 5.11 | 150 | 6 | 60°凸 |
| 1.5 - 5 | 3 | | 60 | 4.57 | 110 | 6 | 60°凸 |
| 1.5 - 6 | 3 | | 100 | 5.61 | 150 | 6 | 60°凸 |
| 1.5 - 7 | 3 | | 160 | 7.18 | 210 | 8 | 60°凸 |
| 1.5 - 8 | 3.5 | | 80 | 5.59 | 130 | 6 | 60°凸 |
| 1.5 - 9 | 3.5 | | 120 | 6.61 | 170 | 8 | 60°凸 |
| 1.5 - 10 | 4 | | 80 | 6.09 | 130 | 6 | 60°凸 |
| 1.5 - 11 | 4 | | 120 | 7.14 | 170 | 8 | 60°凸 |
| 1.5 - 12 | 4 | | 200 | 9.23 | 250 | 8 | 60°凸 |
| 1.5 - 13 | 4.5 | | 100 | 7.11 | 150 | 8 | 60°凸 |
| 1.5 - 14 | 4.5 | | 140 | 8.16 | 190 | 8 | 60°凸 |
| 1.5 - 15 | 5 | | 120 | 8.14 | 170 | 8 | 60°凸 |
| 1.5 - 16 | 5 | | 200 | 10.23 | 250 | 10 | 60°凸 |
| 1.5 - 17 | 6 | | 120 | 9.14 | 170 | 8 | 60°凸 |
| 1.5 - 18 | 6 | | 200 | 11.23 | 250 | 10 | 60°凸 |
| 1.5 - 19 | 8 | | 120 | 11.14 | 170 | 12 | 60°凹 |
| 1.5 - 20 | 8 | | 200 | 13.23 | 250 | 12 | 60°凹 |

| 呼び寸法 Size | 小径 (ΦD1) First Dia. | 両角 (θ) Taper Angle | 刃長 (ℓ) Length of Flutes | 大径 (ΦD2) Dia at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | センタ Center |
|---|---|---|---|---|---|---|---|
| 2 - 1 | 2 | 2° | 60 | 4.09 | 110 | 6 | 60°凸 |
| 2 - 2 | 2 | | 100 | 5.49 | 150 | 6 | 60°凸 |
| 2 - 3 | 2.5 | | 60 | 4.59 | 110 | 6 | 60°凸 |
| 2 - 4 | 2.5 | | 100 | 5.99 | 150 | 6 | 60°凸 |
| 2 - 5 | 3 | | 60 | 5.09 | 110 | 6 | 60°凸 |
| 2 - 6 | 3 | | 100 | 6.49 | 150 | 8 | 60°凸 |
| 2 - 7 | 3 | | 160 | 8.58 | 210 | 8 | 60°凸 |
| 2 - 8 | 3.5 | | 80 | 6.29 | 130 | 8 | 60°凸 |
| 2 - 9 | 3.5 | | 120 | 7.68 | 170 | 8 | 60°凸 |
| 2 - 10 | 4 | | 80 | 6.79 | 130 | 8 | 60°凸 |
| 2 - 11 | 4 | | 120 | 8.18 | 170 | 8 | 60°凸 |
| 2 - 12 | 4 | | 200 | 10.98 | 250 | 10 | 60°凸 |
| 2 - 13 | 4.5 | | 100 | 7.99 | 150 | 8 | 60°凸 |
| 2 - 14 | 4.5 | | 140 | 9.38 | 190 | 10 | 60°凸 |
| 2 - 15 | 5 | | 120 | 9.18 | 170 | 8 | 60°凸 |
| 2 - 16 | 5 | | 200 | 11.98 | 250 | 10 | 60°凸 |
| 2 - 17 | 6 | | 120 | 10.18 | 170 | 10 | 60°凸 |
| 2 - 18 | 6 | | 200 | 12.98 | 250 | 12 | 60°凸 |
| 2 - 19 | 8 | | 120 | 12.18 | 170 | 12 | 60°凹 |
| 2 - 20 | 8 | | 200 | 14.98 | 250 | 12 | 60°凹 |
| 2.5 - 1 | 2 | 2°30' | 60 | 4.61 | 110 | 6 | 60°凸 |
| 2.5 - 2 | 2 | | 100 | 6.36 | 150 | 8 | 60°凸 |
| 2.5 - 3 | 2.5 | | 60 | 5.11 | 110 | 6 | 60°凸 |
| 2.5 - 4 | 2.5 | | 100 | 6.86 | 150 | 8 | 60°凸 |
| 2.5 - 5 | 3 | | 60 | 5.61 | 110 | 6 | 60°凸 |
| 2.5 - 6 | 3 | | 100 | 7.36 | 150 | 8 | 60°凸 |
| 2.5 - 7 | 3 | | 160 | 9.98 | 210 | 10 | 60°凸 |
| 2.5 - 8 | 3.5 | | 80 | 6.99 | 130 | 8 | 60°凸 |
| 2.5 - 9 | 3.5 | | 120 | 8.73 | 170 | 8 | 60°凸 |
| 2.5 - 10 | 4 | | 80 | 7.49 | 130 | 8 | 60°凸 |
| 2.5 - 11 | 4 | | 120 | 9.23 | 170 | 8 | 60°凸 |
| 2.5 - 12 | 4 | | 200 | 12.72 | 250 | 12 | 60°凸 |
| 2.5 - 13 | 4.5 | | 100 | 8.86 | 150 | 8 | 60°凸 |
| 2.5 - 14 | 4.5 | | 140 | 10.6 | 190 | 10 | 60°凸 |
| 2.5 - 15 | 5 | | 120 | 10.23 | 170 | 10 | 60°凸 |
| 2.5 - 16 | 5 | | 200 | 13.72 | 250 | 12 | 60°凸 |
| 2.5 - 17 | 6 | | 120 | 11.23 | 170 | 10 | 60°凸 |
| 2.5 - 18 | 6 | | 200 | 14.72 | 250 | 12 | 60°凸 |
| 2.5 - 19 | 8 | | 120 | 13.23 | 170 | 12 | 60°凹 |
| 2.5 - 20 | 8 | | 200 | 16.72 | 250 | 16 | 60°凹 |

# SURN ニック付スプールリーマ

| 呼び寸法 Size | 小径 (ΦD1) First Dia. | 両角 (θ) Taper Angle | 刃長 (ℓ) Length of Flutes | 大径 (ΦD2) Dia at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | センタ Center |
|---|---|---|---|---|---|---|---|
| 3 - 1 | 2 | 3° | 60 | 5.14 | 110 | 6 | 60°凸 |
| 3 - 2 | 2 | | 100 | 7.23 | 150 | 8 | 60°凸 |
| 3 - 3 | 2.5 | | 60 | 5.64 | 110 | 6 | 60°凸 |
| 3 - 4 | 2.5 | | 100 | 7.73 | 150 | 8 | 60°凸 |
| 3 - 5 | 3 | | 60 | 6.14 | 110 | 8 | 60°凸 |
| 3 - 6 | 3 | | 100 | 8.23 | 150 | 8 | 60°凸 |
| 3 - 7 | 3 | | 160 | 11.37 | 210 | 10 | 60°凸 |
| 3 - 8 | 3.5 | | 80 | 7.69 | 130 | 8 | 60°凸 |
| 3 - 9 | 3.5 | | 120 | 9.78 | 170 | 10 | 60°凸 |
| 3 - 10 | 4 | | 80 | 8.19 | 130 | 8 | 60°凸 |
| 3 - 11 | 4 | | 120 | 10.28 | 170 | 10 | 60°凸 |
| 3 - 12 | 4 | | 200 | 14.47 | 250 | 12 | 60°凸 |
| 3 - 13 | 4.5 | | 100 | 9.73 | 150 | 10 | 60°凸 |
| 3 - 14 | 4.5 | | 140 | 11.83 | 190 | 12 | 60°凸 |
| 3 - 15 | 5 | | 120 | 11.28 | 170 | 12 | 60°凸 |
| 3 - 16 | 5 | | 200 | 15.47 | 250 | 12 | 60°凸 |
| 3 - 17 | 6 | | 120 | 12.28 | 170 | 12 | 60°凸 |
| 3 - 18 | 6 | | 200 | 16.47 | 250 | 16 | 60°凸 |
| 3 - 19 | 8 | | 120 | 14.28 | 170 | 12 | 60°凹 |
| 3 - 20 | 8 | | 200 | 18.47 | 250 | 16 | 60°凹 |
| 3.5 - 1 | 2 | 3°30' | 60 | 5.66 | 110 | 6 | 60°凸 |
| 3.5 - 2 | 2 | | 100 | 8.11 | 150 | 8 | 60°凸 |
| 3.5 - 3 | 2.5 | | 60 | 6.16 | 110 | 6 | 60°凸 |
| 3.5 - 4 | 2.5 | | 100 | 8.61 | 150 | 8 | 60°凸 |
| 3.5 - 5 | 3 | | 60 | 6.66 | 110 | 6 | 60°凸 |
| 3.5 - 6 | 3 | | 100 | 9.11 | 150 | 8 | 60°凸 |
| 3.5 - 7 | 3 | | 160 | 12.77 | 210 | 12 | 60°凸 |
| 3.5 - 8 | 3.5 | | 80 | 8.38 | 130 | 8 | 60°凸 |
| 3.5 - 9 | 3.5 | | 120 | 10.83 | 170 | 10 | 60°凸 |
| 3.5 - 10 | 4 | | 80 | 8.88 | 130 | 8 | 60°凸 |
| 3.5 - 11 | 4 | | 120 | 11.33 | 170 | 12 | 60°凸 |
| 3.5 - 12 | 4 | | 200 | 16.22 | 250 | 16 | 60°凸 |
| 3.5 - 13 | 4.5 | | 100 | 10.61 | 150 | 10 | 60°凸 |
| 3.5 - 14 | 4.5 | | 140 | 13.05 | 190 | 12 | 60°凸 |
| 3.5 - 15 | 5 | | 120 | 12.33 | 170 | 12 | 60°凸 |
| 3.5 - 16 | 5 | | 200 | 17.22 | 250 | 16 | 60°凸 |
| 3.5 - 17 | 6 | | 120 | 13.33 | 170 | 12 | 60°凸 |
| 3.5 - 18 | 6 | | 200 | 18.22 | 250 | 16 | 60°凸 |
| 3.5 - 19 | 8 | | 120 | 15.33 | 170 | 12 | 60°凹 |
| 3.5 - 20 | 8 | | 200 | 20.22 | 250 | 20 | 60°凹 |
| 4 - 1 | 2 | 4° | 60 | 6.19 | 110 | 8 | 60°凸 |
| 4 - 2 | 2 | | 100 | 8.98 | 150 | 8 | 60°凸 |
| 4 - 3 | 2.5 | | 60 | 6.69 | 110 | 8 | 60°凸 |
| 4 - 4 | 2.5 | | 100 | 9.48 | 150 | 8 | 60°凸 |
| 4 - 5 | 3 | | 60 | 7.19 | 110 | 8 | 60°凸 |
| 4 - 6 | 3 | | 100 | 9.98 | 150 | 10 | 60°凸 |
| 4 - 7 | 3 | | 160 | 14.17 | 210 | 12 | 60°凸 |
| 4 - 8 | 3.5 | | 80 | 9.08 | 130 | 8 | 60°凸 |
| 4 - 9 | 3.5 | | 120 | 11.88 | 170 | 12 | 60°凸 |
| 4 - 10 | 4 | | 80 | 9.58 | 130 | 10 | 60°凸 |
| 4 - 11 | 4 | | 120 | 12.38 | 170 | 12 | 60°凸 |
| 4 - 12 | 4 | | 200 | 17.96 | 250 | 16 | 60°凸 |
| 4 - 13 | 4.5 | | 100 | 11.48 | 150 | 10 | 60°凸 |
| 4 - 14 | 4.5 | | 140 | 14.27 | 190 | 12 | 60°凸 |
| 4 - 15 | 5 | | 120 | 13.38 | 170 | 12 | 60°凸 |
| 4 - 16 | 5 | | 200 | 18.96 | 250 | 16 | 60°凸 |
| 4 - 17 | 6 | | 120 | 14.38 | 170 | 12 | 60°凸 |
| 4 - 18 | 6 | | 200 | 19.96 | 250 | 16 | 60°凸 |
| 4 - 19 | 8 | | 120 | 16.38 | 170 | 16 | 60°凹 |
| 4 - 20 | 8 | | 200 | 21.96 | 250 | 20 | 60°凹 |

| 呼び寸法 Size | 小径 (ΦD1) First Dia. | 両角 (θ) Taper Angle | 刃長 (ℓ) Length of Flutes | 大径 (ΦD2) Dia at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | センタ Center |
|---|---|---|---|---|---|---|---|
| 5 - 1 | 2 | 5° | 60 | 7.23 | 110 | 8 | 60°凸 |
| 5 - 2 | 2 | | 100 | 10.73 | 150 | 10 | 60°凸 |
| 5 - 3 | 2.5 | | 60 | 7.73 | 110 | 8 | 60°凸 |
| 5 - 4 | 2.5 | | 100 | 11.23 | 150 | 12 | 60°凸 |
| 5 - 5 | 3 | | 60 | 8.23 | 110 | 8 | 60°凸 |
| 5 - 6 | 3 | | 100 | 11.73 | 150 | 12 | 60°凸 |
| 5 - 7 | 3 | | 160 | 16.97 | 210 | 16 | 60°凸 |
| 5 - 8 | 3.5 | | 80 | 10.48 | 130 | 10 | 60°凸 |
| 5 - 9 | 3.5 | | 120 | 13.97 | 170 | 12 | 60°凸 |
| 5 - 10 | 4 | | 80 | 10.98 | 130 | 10 | 60°凸 |
| 5 - 11 | 4 | | 120 | 14.47 | 170 | 16 | 60°凸 |
| 5 - 12 | 4 | | 200 | 21.46 | 250 | 20 | 60°凸 |
| 5 - 13 | 4.5 | | 100 | 13.23 | 150 | 12 | 60°凸 |
| 5 - 14 | 4.5 | | 140 | 16.72 | 190 | 16 | 60°凸 |
| 5 - 15 | 5 | | 120 | 15.47 | 170 | 16 | 60°凸 |
| 5 - 16 | 5 | | 200 | 22.46 | 250 | 20 | 60°凸 |
| 5 - 17 | 6 | | 120 | 16.47 | 170 | 16 | 60°凸 |
| 5 - 18 | 6 | | 200 | 23.46 | 250 | 20 | 60°凸 |
| 5 - 19 | 8 | | 120 | 18.47 | 170 | 16 | 60°凹 |
| 5 - 20 | 8 | | 200 | 25.46 | 250 | 20 | 60°凹 |
| 6 - 1 | 2 | 6° | 60 | 8.28 | 110 | 8 | 60°凸 |
| 6 - 2 | 2 | | 100 | 12.48 | 150 | 12 | 60°凸 |
| 6 - 3 | 2.5 | | 60 | 8.78 | 110 | 8 | 60°凸 |
| 6 - 4 | 2.5 | | 100 | 12.98 | 150 | 12 | 60°凸 |
| 6 - 5 | 3 | | 60 | 9.28 | 110 | 10 | 60°凸 |
| 6 - 6 | 3 | | 100 | 13.48 | 150 | 12 | 60°凸 |
| 6 - 7 | 3 | | 160 | 19.77 | 210 | 16 | 60°凸 |
| 6 - 8 | 3.5 | | 80 | 11.88 | 130 | 12 | 60°凸 |
| 6 - 9 | 3.5 | | 120 | 16.07 | 170 | 16 | 60°凸 |
| 6 - 10 | 4 | | 80 | 12.38 | 130 | 12 | 60°凸 |
| 6 - 11 | 4 | | 120 | 16.57 | 170 | 16 | 60°凸 |
| 6 - 12 | 4 | | 200 | 24.96 | 250 | 20 | 60°凸 |
| 6 - 13 | 4.5 | | 100 | 14.98 | 150 | 16 | 60°凸 |
| 6 - 14 | 4.5 | | 140 | 19.17 | 190 | 16 | 60°凸 |
| 6 - 15 | 5 | | 120 | 17.57 | 170 | 16 | 60°凸 |
| 6 - 16 | 5 | | 200 | 25.96 | 250 | 20 | 60°凸 |
| 6 - 17 | 6 | | 120 | 18.57 | 170 | 16 | 60°凸 |
| 6 - 18 | 6 | | 200 | 26.96 | 250 | 20 | 60°凸 |
| 6 - 19 | 8 | | 120 | 20.57 | 170 | 16 | 60°凹 |
| 6 - 20 | 8 | | 200 | 28.96 | 250 | 20 | 60°凹 |

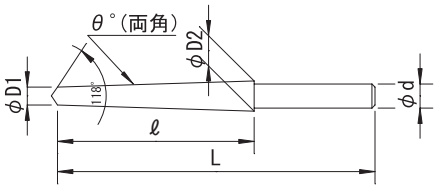
ハイス

# SURH

## 半月スプールリーマ *Half Sprue Reamer*

切削条件表 P143 | テーパー穴加工 | 右直刃 | HSS Co






| 公差(Tolerance) | D1：$^{0}_{-0.08}$ | θ ：±5' | d：h7 |
|---|---|---|---|

右刃ストレート刃　SKH56
Straight Flute　HSS-Co.

| 呼び寸法 Size | 小径（ΦD1） First Dia. | 両角（θ） Taper Angle | 刃長（ℓ） Length of Flutes | 大径（ΦD2） Dia at Large End | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| 1 - 03 | 1 | 1° | 60 | 2.04 | 110 | 6 |
| 1 - 02 | 1 | | 100 | 2.74 | 150 | 6 |
| 1 - 01 | 1.5 | | 60 | 2.54 | 110 | 6 |
| 1 - 0 | 1.5 | | 100 | 3.24 | 150 | 6 |
| 1 - 1 | 2 | | 60 | 3.04 | 110 | 6 |
| 1 - 2 | 2 | | 100 | 3.74 | 150 | 6 |
| 1 - 3 | 2.5 | | 60 | 3.54 | 110 | 6 |
| 1 - 4 | 2.5 | | 100 | 4.24 | 150 | 6 |
| 1 - 5 | 3 | | 60 | 4.04 | 110 | 6 |
| 1 - 6 | 3 | | 100 | 4.74 | 150 | 6 |
| 1 - 7 | 3 | | 160 | 5.79 | 210 | 6 |
| 1 - 8 | 3.5 | | 80 | 4.89 | 130 | 6 |
| 1 - 9 | 3.5 | | 120 | 5.59 | 170 | 6 |
| 1 - 10 | 4 | | 80 | 5.39 | 130 | 6 |
| 1 - 11 | 4 | | 120 | 6.09 | 170 | 6 |
| 1 - 12 | 4 | | 160 | 6.79 | 210 | 8 |
| 1 - 13 | 4.5 | | 100 | 6.24 | 150 | 8 |
| 1 - 14 | 4.5 | | 140 | 6.94 | 190 | 8 |
| 1 - 15 | 5 | | 120 | 7.09 | 170 | 8 |
| 1 - 16 | 5 | | 160 | 7.79 | 210 | 8 |
| 1.5 - 03 | 1 | 1°30' | 60 | 2.57 | 110 | 6 |
| 1.5 - 02 | 1 | | 100 | 3.61 | 150 | 6 |
| 1.5 - 01 | 1.5 | | 60 | 3.07 | 110 | 6 |
| 1.5 - 0 | 1.5 | | 100 | 4.11 | 150 | 6 |
| 1.5 - 1 | 2 | | 60 | 3.57 | 110 | 6 |
| 1.5 - 2 | 2 | | 100 | 4.61 | 150 | 6 |
| 1.5 - 3 | 2.5 | | 60 | 4.07 | 110 | 6 |
| 1.5 - 4 | 2.5 | | 100 | 5.11 | 150 | 6 |
| 1.5 - 5 | 3 | | 60 | 4.57 | 110 | 6 |
| 1.5 - 6 | 3 | | 100 | 5.61 | 150 | 6 |
| 1.5 - 7 | 3 | | 160 | 7.19 | 210 | 8 |
| 1.5 - 8 | 3.5 | | 80 | 5.59 | 130 | 6 |
| 1.5 - 9 | 3.5 | | 120 | 6.64 | 170 | 8 |
| 1.5 - 10 | 4 | | 80 | 6.09 | 130 | 6 |
| 1.5 - 11 | 4 | | 120 | 7.14 | 170 | 8 |
| 1.5 - 12 | 4 | | 160 | 8.19 | 210 | 8 |
| 1.5 - 13 | 4.5 | | 100 | 7.11 | 150 | 8 |
| 1.5 - 14 | 4.5 | | 140 | 8.16 | 190 | 8 |
| 1.5 - 15 | 5 | | 120 | 8.14 | 170 | 8 |
| 1.5 - 16 | 5 | | 160 | 9.19 | 210 | 8 |

| 呼び寸法 Size | 小径（ΦD1） First Dia. | 両角（θ） Taper Angle | 刃長（ℓ） Length of Flutes | 大径（ΦD2） Dia at Large End | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| 2 - 03 | 1 | 2° | 60 | 3.09 | 110 | 6 |
| 2 - 02 | 1 | | 100 | 4.49 | 150 | 6 |
| 2 - 01 | 1.5 | | 60 | 3.59 | 110 | 6 |
| 2 - 0 | 1.5 | | 100 | 4.99 | 150 | 6 |
| 2 - 1 | 2 | | 60 | 4.09 | 110 | 6 |
| 2 - 2 | 2 | | 100 | 5.49 | 150 | 6 |
| 2 - 3 | 2.5 | | 60 | 4.59 | 110 | 6 |
| 2 - 4 | 2.5 | | 100 | 5.99 | 150 | 6 |
| 2 - 5 | 3 | | 60 | 5.09 | 110 | 6 |
| 2 - 6 | 3 | | 100 | 6.49 | 150 | 8 |
| 2 - 7 | 3 | | 160 | 8.59 | 210 | 8 |
| 2 - 8 | 3.5 | | 80 | 6.29 | 130 | 8 |
| 2 - 9 | 3.5 | | 120 | 7.69 | 170 | 8 |
| 2 - 10 | 4 | | 80 | 6.79 | 130 | 8 |
| 2 - 11 | 4 | | 120 | 8.19 | 170 | 8 |
| 2 - 12 | 4 | | 160 | 9.59 | 210 | 10 |
| 2 - 13 | 4.5 | | 100 | 7.99 | 150 | 8 |
| 2 - 14 | 4.5 | | 140 | 9.39 | 190 | 10 |
| 2 - 15 | 5 | | 120 | 9.19 | 170 | 8 |
| 2 - 16 | 5 | | 160 | 10.59 | 210 | 10 |
| 2.5 - 03 | 1 | 2°30' | 60 | 3.61 | 110 | 6 |
| 2.5 - 02 | 1 | | 100 | 5.36 | 150 | 6 |
| 2.5 - 01 | 1.5 | | 60 | 4.11 | 110 | 6 |
| 2.5 - 0 | 1.5 | | 100 | 5.86 | 150 | 6 |
| 2.5 - 1 | 2 | | 60 | 4.62 | 110 | 6 |
| 2.5 - 2 | 2 | | 100 | 6.36 | 150 | 8 |
| 2.5 - 3 | 2.5 | | 60 | 5.12 | 110 | 6 |
| 2.5 - 4 | 2.5 | | 100 | 6.86 | 150 | 8 |
| 2.5 - 5 | 3 | | 60 | 5.62 | 110 | 6 |
| 2.5 - 6 | 3 | | 100 | 7.36 | 150 | 8 |
| 2.5 - 7 | 3 | | 160 | 9.98 | 210 | 10 |
| 2.5 - 8 | 3.5 | | 80 | 6.99 | 130 | 8 |
| 2.5 - 9 | 3.5 | | 120 | 8.74 | 170 | 8 |
| 2.5 - 10 | 4 | | 80 | 7.49 | 130 | 8 |
| 2.5 - 11 | 4 | | 120 | 9.24 | 170 | 8 |
| 2.5 - 12 | 4 | | 160 | 10.98 | 210 | 10 |
| 2.5 - 13 | 4.5 | | 100 | 8.86 | 150 | 8 |
| 2.5 - 14 | 4.5 | | 140 | 10.61 | 190 | 10 |
| 2.5 - 15 | 5 | | 120 | 10.24 | 170 | 10 |
| 2.5 - 16 | 5 | | 160 | 11.98 | 210 | 12 |

# SURH 半月スプールリーマ

| 呼び寸法 Size | 小径 (ΦD1) First Dia. | 両角 (θ) Taper Angle | 刃長 (ℓ) Length of Flutes | 大径 (ΦD2) Dia at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|
| 3 -03 | 1 | 3° | 60 | 4.14 | 110 | 6 |
| 3 -02 | 1 | | 100 | 6.23 | 150 | 8 |
| 3 -01 | 1.5 | | 60 | 4.64 | 110 | 6 |
| 3 - 0 | 1.5 | | 100 | 6.73 | 150 | 8 |
| 3 - 1 | 2 | | 60 | 5.14 | 110 | 6 |
| 3 - 2 | 2 | | 100 | 7.24 | 150 | 8 |
| 3 - 3 | 2.5 | | 60 | 5.64 | 110 | 6 |
| 3 - 4 | 2.5 | | 100 | 7.74 | 150 | 8 |
| 3 - 5 | 3 | | 60 | 6.14 | 110 | 8 |
| 3 - 6 | 3 | | 100 | 8.24 | 150 | 8 |
| 3 - 7 | 3 | | 160 | 11.38 | 210 | 12 |
| 3 - 8 | 3.5 | | 80 | 7.69 | 130 | 8 |
| 3 - 9 | 3.5 | | 120 | 9.78 | 170 | 10 |
| 3 -10 | 4 | | 80 | 8.19 | 130 | 8 |
| 3 -11 | 4 | | 120 | 10.28 | 170 | 10 |
| 3 -12 | 4 | | 160 | 12.38 | 210 | 12 |
| 3 -13 | 4.5 | | 100 | 9.74 | 150 | 10 |
| 3 -14 | 4.5 | | 140 | 11.83 | 190 | 12 |
| 3 -15 | 5 | | 120 | 11.28 | 170 | 12 |
| 3 -16 | 5 | | 160 | 13.38 | 210 | 12 |
| 3.5 -03 | 1 | 3°30' | 60 | 4.66 | 110 | 6 |
| 3.5 -02 | 1 | | 100 | 7.11 | 150 | 8 |
| 3.5 -01 | 1.5 | | 60 | 5.16 | 110 | 6 |
| 3.5 - 0 | 1.5 | | 100 | 7.61 | 150 | 8 |
| 3.5 - 1 | 2 | | 60 | 5.67 | 110 | 6 |
| 3.5 - 2 | 2 | | 100 | 8.11 | 150 | 8 |
| 3.5 - 3 | 2.5 | | 60 | 6.17 | 110 | 6 |
| 3.5 - 4 | 2.5 | | 100 | 8.61 | 150 | 8 |
| 3.5 - 5 | 3 | | 60 | 6.67 | 110 | 6 |
| 3.5 - 6 | 3 | | 100 | 9.11 | 150 | 8 |
| 3.5 - 7 | 3 | | 160 | 12.78 | 210 | 12 |
| 3.5 - 8 | 3.5 | | 80 | 8.39 | 130 | 8 |
| 3.5 - 9 | 3.5 | | 120 | 10.83 | 170 | 10 |
| 3.5 -10 | 4 | | 80 | 8.89 | 130 | 8 |
| 3.5 -11 | 4 | | 120 | 11.33 | 170 | 12 |
| 3.5 -12 | 4 | | 160 | 13.78 | 210 | 12 |
| 3.5 -13 | 4.5 | | 100 | 10.61 | 150 | 10 |
| 3.5 -14 | 4.5 | | 140 | 13.05 | 190 | 12 |
| 3.5 -15 | 5 | | 120 | 12.33 | 170 | 12 |
| 3.5 -16 | 5 | | 160 | 14.78 | 210 | 12 |
| 4 -03 | 1 | 4° | 60 | 5.19 | 110 | 6 |
| 4 -02 | 1 | | 100 | 7.98 | 150 | 8 |
| 4 -01 | 1.5 | | 60 | 5.69 | 110 | 6 |
| 4 - 0 | 1.5 | | 100 | 8.48 | 150 | 8 |
| 4 - 1 | 2 | | 60 | 6.19 | 110 | 8 |
| 4 - 2 | 2 | | 100 | 8.98 | 150 | 8 |
| 4 - 3 | 2.5 | | 60 | 6.69 | 110 | 8 |
| 4 - 4 | 2.5 | | 100 | 9.48 | 150 | 8 |
| 4 - 5 | 3 | | 60 | 7.19 | 110 | 8 |
| 4 - 6 | 3 | | 100 | 9.98 | 150 | 10 |
| 4 - 7 | 3 | | 160 | 14.17 | 210 | 12 |
| 4 - 8 | 3.5 | | 80 | 9.09 | 130 | 8 |
| 4 - 9 | 3.5 | | 120 | 11.88 | 170 | 12 |
| 4 -10 | 4 | | 80 | 9.59 | 130 | 10 |
| 4 -11 | 4 | | 120 | 12.38 | 170 | 12 |
| 4 -12 | 4 | | 160 | 15.17 | 210 | 12 |
| 4 -13 | 4.5 | | 100 | 11.48 | 150 | 10 |
| 4 -14 | 4.5 | | 140 | 14.28 | 190 | 12 |
| 4 -15 | 5 | | 120 | 13.38 | 170 | 12 |
| 4 -16 | 5 | | 160 | 16.17 | 210 | 12 |

| 呼び寸法 Size | 小径 (ΦD1) First Dia. | 両角 (θ) Taper Angle | 刃長 (ℓ) Length of Flutes | 大径 (ΦD2) Dia at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|
| 5 -03 | 1 | 5° | 60 | 6.23 | 110 | 8 |
| 5 -02 | 1 | | 100 | 9.73 | 150 | 8 |
| 5 -01 | 1.5 | | 60 | 6.73 | 110 | 8 |
| 5 - 0 | 1.5 | | 100 | 10.23 | 150 | 10 |
| 5 - 1 | 2 | | 60 | 7.23 | 110 | 8 |
| 5 - 2 | 2 | | 100 | 10.73 | 150 | 10 |
| 5 - 3 | 2.5 | | 60 | 7.73 | 110 | 8 |
| 5 - 4 | 2.5 | | 100 | 11.23 | 150 | 12 |
| 5 - 5 | 3 | | 60 | 8.23 | 110 | 8 |
| 5 - 6 | 3 | | 100 | 11.73 | 150 | 12 |
| 5 - 7 | 3 | | 160 | 16.97 | 210 | 16 |
| 5 - 8 | 3.5 | | 80 | 10.48 | 130 | 10 |
| 5 - 9 | 3.5 | | 120 | 13.97 | 170 | 12 |
| 5 -10 | 4 | | 80 | 10.98 | 130 | 10 |
| 5 -11 | 4 | | 120 | 14.47 | 170 | 16 |
| 5 -12 | 4 | | 160 | 17.97 | 210 | 16 |
| 5 -13 | 4.5 | | 100 | 13.23 | 150 | 12 |
| 5 -14 | 4.5 | | 140 | 16.72 | 190 | 16 |
| 5 -15 | 5 | | 120 | 15.48 | 170 | 16 |
| 5 -16 | 5 | | 160 | 18.97 | 210 | 16 |
| 6 -03 | 1 | 6° | 60 | 7.28 | 110 | 8 |
| 6 -02 | 1 | | 100 | 11.48 | 150 | 12 |
| 6 -01 | 1.5 | | 60 | 7.78 | 110 | 8 |
| 6 - 0 | 1.5 | | 100 | 11.98 | 150 | 12 |
| 6 - 1 | 2 | | 60 | 8.28 | 110 | 8 |
| 6 - 2 | 2 | | 100 | 12.48 | 150 | 12 |
| 6 - 3 | 2.5 | | 60 | 8.78 | 110 | 8 |
| 6 - 4 | 2.5 | | 100 | 12.98 | 150 | 12 |
| 6 - 5 | 3 | | 60 | 9.28 | 110 | 10 |
| 6 - 6 | 3 | | 100 | 13.48 | 150 | 12 |
| 6 - 7 | 3 | | 160 | 19.77 | 210 | 16 |
| 6 - 8 | 3.5 | | 80 | 11.88 | 130 | 12 |
| 6 - 9 | 3.5 | | 120 | 16.07 | 170 | 16 |
| 6 -10 | 4 | | 80 | 12.38 | 130 | 12 |
| 6 -11 | 4 | | 120 | 16.57 | 170 | 16 |
| 6 -12 | 4 | | 160 | 20.77 | 210 | 16 |
| 6 -13 | 4.5 | | 100 | 14.98 | 150 | 16 |
| 6 -14 | 4.5 | | 140 | 19.17 | 190 | 16 |
| 6 -15 | 5 | | 120 | 17.57 | 170 | 16 |
| 6 -16 | 5 | | 160 | 21.77 | 210 | 16 |
| 7 -03 | 1 | 7° | 60 | 8.33 | 110 | 8 |
| 7 -02 | 1 | | 100 | 13.23 | 150 | 12 |
| 7 -01 | 1.5 | | 60 | 8.83 | 110 | 8 |
| 7 - 0 | 1.5 | | 100 | 13.73 | 150 | 12 |
| 7 - 1 | 2 | | 60 | 9.34 | 110 | 10 |
| 7 - 2 | 2 | | 100 | 14.23 | 150 | 12 |
| 7 - 3 | 2.5 | | 60 | 9.84 | 110 | 10 |
| 7 - 4 | 2.5 | | 100 | 14.73 | 150 | 12 |
| 7 - 5 | 3 | | 60 | 10.34 | 110 | 10 |
| 7 - 6 | 3 | | 100 | 15.23 | 150 | 12 |
| 7 - 7 | 3 | | 160 | 22.57 | 230 | 20 |
| 7 - 8 | 3.5 | | 80 | 13.28 | 130 | 12 |
| 7 - 9 | 3.5 | | 120 | 18.17 | 180 | 16 |
| 7 -10 | 4 | | 80 | 13.78 | 130 | 12 |
| 7 -11 | 4 | | 120 | 18.67 | 180 | 16 |
| 7 -12 | 4 | | 160 | 23.57 | 230 | 20 |
| 7 -13 | 4.5 | | 100 | 16.73 | 150 | 16 |
| 7 -14 | 4.5 | | 140 | 21.62 | 210 | 16 |
| 7 -15 | 5 | | 120 | 19.67 | 180 | 16 |
| 7 -16 | 5 | | 160 | 24.57 | 230 | 20 |

# SURH 半月スプールリーマ

| 呼び寸法 Size | 小径 (ΦD1) First Dia. | 両角 (θ) Taper Angle | 刃長 (ℓ) Length of Flutes | 大径 (ΦD2) Dia at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|
| **8 -03** | 1 | 8° | 60 | 9.39 | 110 | 10 |
| **8 -02** | 1 | | 100 | 14.98 | 150 | 12 |
| **8 -01** | 1.5 | | 60 | 9.89 | 110 | 10 |
| **8 - 0** | 1.5 | | 100 | 15.48 | 150 | 16 |
| **8 - 1** | 2 | | 60 | 10.39 | 110 | 10 |
| **8 - 2** | 2 | | 100 | 15.98 | 150 | 12 |
| **8 - 3** | 2.5 | | 60 | 10.89 | 110 | 10 |
| **8 - 4** | 2.5 | | 100 | 16.48 | 150 | 12 |
| **8 - 5** | 3 | | 60 | 11.39 | 110 | 12 |
| **8 - 6** | 3 | | 100 | 16.98 | 150 | 16 |
| **8 - 7** | 3 | | 160 | 25.37 | 230 | 20 |
| **8 - 8** | 3.5 | | 80 | 14.68 | 130 | 12 |
| **8 - 9** | 3.5 | | 120 | 20.28 | 180 | 16 |
| **8 -10** | 4 | | 80 | 15.18 | 130 | 12 |
| **8 -11** | 4 | | 120 | 20.78 | 180 | 16 |
| **8 -12** | 4 | | 160 | 26.37 | 230 | 20 |
| **8 -13** | 4.5 | | 100 | 18.48 | 150 | 16 |
| **8 -14** | 4.5 | | 140 | 24.08 | 210 | 20 |
| **8 -15** | 5 | | 120 | 21.78 | 180 | 16 |
| **8 -16** | 5 | | 160 | 27.37 | 230 | 20 |

| 呼び寸法 Size | 小径 (ΦD1) First Dia. | 両角 (θ) Taper Angle | 刃長 (ℓ) Length of Flutes | 大径 (ΦD2) Dia at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|
| **10 -03** | 1 | 10° | 60 | 11.49 | 110 | 12 |
| **10 -02** | 1 | | 100 | 18.49 | 150 | 16 |
| **10 -01** | 1.5 | | 60 | 11.99 | 110 | 12 |
| **10 - 0** | 1.5 | | 100 | 18.99 | 150 | 16 |
| **10 - 1** | 2 | | 60 | 12.49 | 110 | 12 |
| **10 - 2** | 2 | | 100 | 19.49 | 150 | 16 |
| **10 - 3** | 2.5 | | 60 | 12.99 | 110 | 12 |
| **10 - 4** | 2.5 | | 100 | 19.99 | 150 | 16 |
| **10 - 5** | 3 | | 60 | 13.49 | 110 | 12 |
| **10 - 6** | 3 | | 100 | 20.49 | 150 | 16 |
| **10 - 7** | 3 | | 160 | 30.99 | 230 | 25 |
| **10 - 8** | 3.5 | | 80 | 17.49 | 130 | 16 |
| **10 - 9** | 3.5 | | 120 | 24.49 | 180 | 20 |
| **10 -10** | 4 | | 80 | 17.99 | 130 | 16 |
| **10 -11** | 4 | | 120 | 24.99 | 170 | 20 |
| **10 -12** | 4 | | 160 | 31.99 | 230 | 25 |
| **10 -13** | 4.5 | | 100 | 21.99 | 150 | 16 |
| **10 -14** | 4.5 | | 140 | 28.99 | 210 | 25 |
| **10 -15** | 5 | | 120 | 25.99 | 180 | 20 |
| **10 -16** | 5 | | 160 | 32.99 | 230 | 25 |

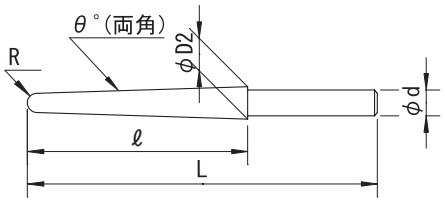
ハイス

# SUR2-R

## R付スプールリーマ 2枚刃 *Sprue Reamer With R Flute:2*

切削条件表 P143 | テーパー穴加工 | 右直刃 | 刃数 2 | HSS Co






| 公差(Tolerance) | R：$^{0}_{-0.1}$ | θ：±5' | d：h7 |
|---|---|---|---|

右刃ストレート 刃数:2 SKH56
Straight Flute 2 Flutes HSS-Co.

| 先端 R | 両角（θ） Taper Angle | 刃長（ℓ） Length of Flutes | 大径（ΦD2） Dia at Large End | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|
| **0.75** | 1°30' | 35 | 2.39 | 80 | 6 |
| **1** | | 35 | 2.89 | 80 | 6 |
| **1.15** | | 35 | 3.18 | 80 | 6 |
| **1.5** | | 35 | 3.87 | 80 | 6 |
| **2** | | 35 | 4.86 | 80 | 6 |
| **0.75** | 2° | 35 | 2.69 | 80 | 6 |
| **0.75** | | 50 | 3.21 | 100 | 6 |
| **1** | | 35 | 3.18 | 80 | 6 |
| **1** | | 50 | 3.71 | 100 | 6 |
| **1.5** | | 35 | 4.16 | 80 | 6 |
| **1.5** | | 50 | 4.69 | 100 | 6 |
| **2** | | 35 | 5.15 | 80 | 6 |
| **2** | | 50 | 5.67 | 100 | 6 |
| **0.75** | 3° | 35 | 3.29 | 80 | 6 |
| **0.75** | | 50 | 4.07 | 100 | 6 |
| **1** | | 35 | 3.78 | 80 | 6 |
| **1** | | 50 | 4.56 | 100 | 6 |
| **1.15** | | 35 | 4.07 | 80 | 6 |
| **1.15** | | 50 | 4.85 | 100 | 6 |
| **1.5** | | 35 | 4.75 | 80 | 6 |
| **1.5** | | 50 | 5.54 | 100 | 6 |
| **2** | | 35 | 5.72 | 80 | 6 |
| **2** | | 50 | 6.51 | 100 | 8 |

| 先端 R | 両角（θ） Taper Angle | 刃長（ℓ） Length of Flutes | 大径（ΦD2） Dia at Large End | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|
| **0.75** | 4° | 35 | 3.89 | 80 | 6 |
| **0.75** | | 50 | 4.94 | 100 | 6 |
| **1** | | 35 | 4.37 | 80 | 6 |
| **1** | | 50 | 5.42 | 100 | 6 |
| **1.15** | | 35 | 4.66 | 80 | 6 |
| **1.15** | | 50 | 5.71 | 100 | 6 |
| **1.5** | | 35 | 5.34 | 80 | 6 |
| **1.5** | | 50 | 6.38 | 100 | 6 |
| **1.5** | | 75 | 8.13 | 120 | 8 |
| **2** | | 50 | 7.35 | 100 | 8 |
| **2** | | 75 | 9.1 | 120 | 8 |
| **2** | | 90 | 10.14 | 135 | 8 |
| **0.75** | 5° | 35 | 4.49 | 80 | 6 |
| **0.75** | | 50 | 5.8 | 100 | 6 |
| **1** | | 35 | 4.97 | 80 | 6 |
| **1** | | 50 | 6.28 | 100 | 6 |
| **1.15** | | 35 | 5.25 | 80 | 6 |
| **1.15** | | 50 | 6.56 | 100 | 6 |
| **1.5** | | 35 | 5.92 | 80 | 6 |
| **1.5** | | 50 | 7.23 | 100 | 8 |
| **1.5** | | 75 | 9.42 | 120 | 8 |
| **2** | | 75 | 10.37 | 120 | 10 |
| **2** | | 90 | 11.68 | 135 | 10 |

ハイス

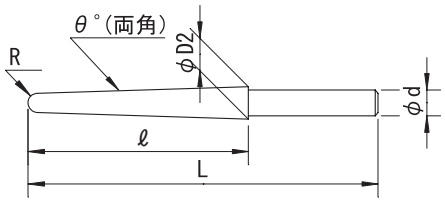
# SP-SUR2-R

## R付スプールリーマ 2枚刃スパイラル *Spiral Sprue Reamer With R Flute:2*

切削条件表 P143 | テーパー穴加工 | 右ネジレ 12° | 刃数 2 | HSS Co








| 公差(Tolerance) | R：$^{0}_{-0.1}$ | θ：±5' | d：h7 |
|---|---|---|---|

右刃右ネジレ12° 刃数:2 SKH56
Helix Angle-Right12° 2 Flutes HSS-Co.

| 先端 R | 両角(θ) *Taper Angle* | 刃長(ℓ) *Length of Flutes* | 大径(ΦD2) *Dia at Large End* | 全長(L) *Overall Length* | シャンク径(Φd) *Shank Dia.* |
|---|---|---|---|---|---|
| **0.75** | 1°30' | 35 | 2.39 | 80 | 6 |
| **1** | | 35 | 2.89 | 80 | 6 |
| **1.15** | | 35 | 3.18 | 80 | 6 |
| **1.5** | | 35 | 3.87 | 80 | 6 |
| **2** | | 35 | 4.86 | 80 | 6 |
| **0.75** | 3° | 35 | 3.29 | 80 | 6 |
| **0.75** | | 50 | 4.07 | 100 | 6 |
| **1** | | 35 | 3.78 | 80 | 6 |
| **1** | | 50 | 4.56 | 100 | 6 |
| **1.15** | | 35 | 4.07 | 80 | 6 |
| **1.15** | | 50 | 4.85 | 100 | 6 |
| **1.5** | | 35 | 4.75 | 80 | 6 |
| **1.5** | | 50 | 5.54 | 100 | 6 |
| **2** | | 35 | 5.72 | 80 | 6 |
| **2** | | 50 | 6.51 | 100 | 8 |
| **0.75** | 4° | 35 | 3.89 | 80 | 6 |
| **0.75** | | 50 | 4.94 | 100 | 6 |
| **1** | | 35 | 4.37 | 80 | 6 |
| **1** | | 50 | 5.42 | 100 | 6 |
| **1.15** | | 35 | 4.66 | 80 | 6 |
| **1.15** | | 50 | 5.71 | 100 | 6 |
| **1.5** | | 35 | 5.34 | 80 | 6 |
| **1.5** | | 50 | 6.38 | 100 | 6 |
| **1.5** | | 75 | 8.13 | 120 | 8 |
| **2** | | 50 | 7.35 | 100 | 8 |
| **2** | | 75 | 9.1 | 120 | 8 |
| **2** | | 90 | 10.14 | 135 | 8 |

| 先端 R | 両角(θ) *Taper Angle* | 刃長(ℓ) *Length of Flutes* | 大径(ΦD2) *Dia at Large End* | 全長(L) *Overall Length* | シャンク径(Φd) *Shank Dia.* |
|---|---|---|---|---|---|
| **0.75** | 5° | 35 | 4.49 | 80 | 6 |
| **0.75** | | 50 | 5.8 | 100 | 6 |
| **1** | | 35 | 4.97 | 80 | 6 |
| **1** | | 50 | 6.28 | 100 | 6 |
| **1.15** | | 35 | 5.25 | 80 | 6 |
| **1.15** | | 50 | 6.56 | 100 | 6 |
| **1.5** | | 35 | 5.92 | 80 | 6 |
| **1.5** | | 50 | 7.23 | 100 | 8 |
| **1.5** | | 75 | 9.42 | 120 | 8 |
| **2** | | 75 | 10.37 | 120 | 10 |
| **2** | | 90 | 11.68 | 135 | 10 |

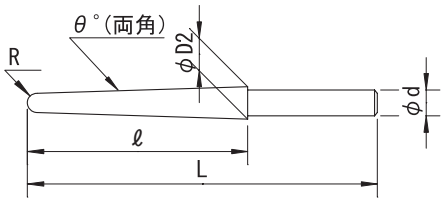
ハイス

# SUR3-R

## R付スプールリーマ 3枚刃 *Sprue Reamer With R Flute:3*

切削条件表 P143 | テーパー穴加工 | 右直刃 | 刃数 3 | HSS Co






| 公差(Tolerance) | R : $^{0}_{-0.1}$ | θ : ±5' | d : h7 |
|---|---|---|---|

右刃ストレート 刃数:3 SKH56
Straight Flute 3 Flutes HSS-Co.

| 先端 R | 両角(θ) Taper Angle | 刃長(ℓ) Length of Flutes | 大径(ΦD2) Dia at Large End | 全長(L) Overall Length | シャンク径(Φd) Shank Dia. |
|---|---|---|---|---|---|
| 0.75 | 1°30' | 50 | 2.78 | 100 | 6 |
| 1 | | 50 | 3.28 | 100 | 6 |
| 1.15 | | 50 | 3.57 | 100 | 6 |
| 1.5 | | 50 | 4.27 | 100 | 6 |
| 1.5 | | 100 | 5.57 | 150 | 6 |
| 2 | | 50 | 5.25 | 100 | 6 |
| 2 | | 100 | 6.56 | 150 | 6 |
| 0.75 | 2° | 35 | 2.69 | 80 | 6 |
| 0.75 | | 50 | 3.21 | 100 | 6 |
| 1 | | 35 | 3.18 | 80 | 6 |
| 1 | | 50 | 3.71 | 100 | 6 |
| 1 | | 100 | 5.45 | 150 | 6 |
| 1.15 | | 35 | 3.48 | 80 | 6 |
| 1.15 | | 50 | 4 | 100 | 6 |
| 1.15 | | 100 | 5.75 | 150 | 6 |
| 1.5 | | 35 | 4.16 | 80 | 6 |
| 1.5 | | 50 | 4.69 | 100 | 6 |
| 1.5 | | 100 | 6.43 | 150 | 6 |
| 1.5 | | 160 | 8.53 | 210 | 8 |
| 2 | | 35 | 5.15 | 80 | 6 |
| 2 | | 50 | 5.67 | 100 | 6 |
| 2 | | 100 | 7.42 | 150 | 8 |
| 2 | | 160 | 9.51 | 210 | 8 |
| 2.5 | | 100 | 8.4 | 150 | 8 |
| 2.5 | | 160 | 10.49 | 210 | 10 |
| 0.75 | 2°30' | 35 | 2.99 | 80 | 6 |
| 0.75 | | 50 | 3.64 | 100 | 6 |
| 1 | | 35 | 3.48 | 80 | 6 |
| 1 | | 50 | 4.13 | 100 | 6 |
| 1 | | 100 | 6.32 | 150 | 6 |
| 1.15 | | 35 | 3.77 | 80 | 6 |
| 1.15 | | 50 | 4.43 | 100 | 6 |
| 1.15 | | 100 | 6.61 | 150 | 6 |
| 1.5 | | 35 | 4.46 | 80 | 6 |
| 1.5 | | 50 | 5.11 | 100 | 6 |
| 1.5 | | 100 | 7.29 | 150 | 8 |
| 1.5 | | 160 | 9.91 | 210 | 8 |
| 2 | | 35 | 5.44 | 80 | 6 |
| 2 | | 50 | 6.09 | 100 | 6 |
| 2 | | 100 | 8.27 | 150 | 8 |
| 2 | | 160 | 10.89 | 210 | 10 |
| 2.5 | | 100 | 9.25 | 150 | 8 |
| 2.5 | | 160 | 11.87 | 210 | 12 |

| 先端 R | 両角(θ) Taper Angle | 刃長(ℓ) Length of Flutes | 大径(ΦD2) Dia at Large End | 全長(L) Overall Length | シャンク径(Φd) Shank Dia. |
|---|---|---|---|---|---|
| 1 | 3° | 100 | 7.18 | 150 | 8 |
| 1.15 | | 100 | 7.47 | 150 | 8 |
| 1.15 | | 160 | 10.62 | 210 | 10 |
| 1.5 | | 100 | 8.15 | 150 | 8 |
| 1.5 | | 160 | 11.3 | 210 | 10 |
| 2 | | 100 | 9.13 | 150 | 8 |
| 2 | | 160 | 12.27 | 210 | 12 |
| 2.5 | | 100 | 10.1 | 150 | 10 |
| 2.5 | | 160 | 13.25 | 210 | 12 |
| 1 | 4° | 100 | 8.91 | 150 | 8 |
| 1.15 | | 100 | 9.2 | 150 | 8 |
| 1.5 | | 100 | 9.88 | 150 | 8 |
| 1.5 | | 160 | 14.07 | 210 | 12 |
| 2 | | 160 | 15.03 | 210 | 12 |
| 2.5 | | 100 | 11.81 | 150 | 12 |
| 2.5 | | 160 | 16 | 210 | 16 |
| 1 | 5° | 75 | 8.46 | 120 | 8 |
| 1.15 | | 75 | 8.75 | 120 | 8 |
| 1.5 | | 90 | 10.73 | 135 | 10 |
| 1.5 | | 160 | 16.84 | 210 | 16 |
| 2 | | 160 | 17.8 | 210 | 16 |
| 2.5 | | 160 | 18.75 | 210 | 16 |

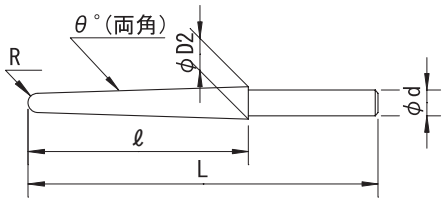
ハイス

# SP-SUR3-R

## R付スプールリーマ 3枚刃スパイラル *Spiral Sprue Reamer With R Flute:3*

切削条件表 P143 | テーパー穴加工 | 右ネジレ 12° | 刃数 3 | HSS Co






| 公差(Tolerance) | R：$^{0}_{-0.1}$ | θ：±5' | d：h7 |
|---|---|---|---|

右刃右ネジレ12° 刃数:3 SKH56
Helix Angle-Right12° 3 Flutes HSS-Co.

| 先端 R | 両角(θ) Taper Angle | 刃長(ℓ) Length of Flutes | 大径(ΦD2) Dia at Large End | 全長(L) Overall Length | シャンク径(Φd) Shank Dia. |
|---|---|---|---|---|---|
| 0.75 | 1°30' | 50 | 2.78 | 100 | 6 |
| 1 | | 50 | 3.28 | 100 | 6 |
| 1.15 | | 50 | 3.57 | 100 | 6 |
| 1.5 | | 50 | 4.27 | 100 | 6 |
| 1.5 | | 100 | 5.57 | 150 | 6 |
| 2 | | 50 | 5.25 | 100 | 6 |
| 2 | | 100 | 6.56 | 150 | 6 |
| 0.75 | 2° | 35 | 2.69 | 80 | 6 |
| 0.75 | | 50 | 3.21 | 100 | 6 |
| 1 | | 35 | 3.18 | 80 | 6 |
| 1 | | 50 | 3.71 | 100 | 6 |
| 1 | | 100 | 5.45 | 150 | 6 |
| 1.15 | | 35 | 3.48 | 80 | 6 |
| 1.15 | | 50 | 4 | 100 | 6 |
| 1.15 | | 100 | 5.75 | 150 | 6 |
| 1.5 | | 35 | 4.16 | 80 | 6 |
| 1.5 | | 50 | 4.69 | 100 | 6 |
| 1.5 | | 100 | 6.43 | 150 | 6 |
| 1.5 | | 160 | 8.53 | 210 | 8 |
| 2 | | 35 | 5.15 | 80 | 6 |
| 2 | | 50 | 5.67 | 100 | 6 |
| 2 | | 100 | 7.42 | 150 | 8 |
| 2 | | 160 | 9.51 | 210 | 8 |
| 2.5 | | 100 | 8.4 | 150 | 8 |
| 2.5 | | 160 | 10.49 | 210 | 10 |
| 0.75 | 2°30' | 35 | 2.99 | 80 | 6 |
| 0.75 | | 50 | 3.64 | 100 | 6 |
| 1 | | 35 | 3.48 | 80 | 6 |
| 1 | | 50 | 4.13 | 100 | 6 |
| 1 | | 100 | 6.32 | 150 | 6 |
| 1.15 | | 35 | 3.77 | 80 | 6 |
| 1.15 | | 50 | 4.43 | 100 | 6 |
| 1.15 | | 100 | 6.61 | 150 | 6 |
| 1.5 | | 35 | 4.46 | 80 | 6 |
| 1.5 | | 50 | 5.11 | 100 | 6 |
| 1.5 | | 100 | 7.29 | 150 | 8 |
| 1.5 | | 160 | 9.91 | 210 | 8 |
| 2 | | 35 | 5.44 | 80 | 6 |
| 2 | | 50 | 6.09 | 100 | 6 |
| 2 | | 100 | 8.27 | 150 | 8 |
| 2 | | 160 | 10.89 | 210 | 10 |
| 2.5 | | 100 | 9.25 | 150 | 8 |
| 2.5 | | 160 | 11.87 | 210 | 12 |

| 先端 R | 両角(θ) Taper Angle | 刃長(ℓ) Length of Flutes | 大径(ΦD2) Dia at Large End | 全長(L) Overall Length | シャンク径(Φd) Shank Dia. |
|---|---|---|---|---|---|
| 1 | 3° | 100 | 7.18 | 150 | 8 |
| 1.15 | | 100 | 7.47 | 150 | 8 |
| 1.15 | | 160 | 10.62 | 210 | 10 |
| 1.5 | | 100 | 8.15 | 150 | 8 |
| 1.5 | | 160 | 11.3 | 210 | 10 |
| 2 | | 100 | 9.13 | 150 | 8 |
| 2 | | 160 | 12.27 | 210 | 12 |
| 2.5 | | 100 | 10.1 | 150 | 10 |
| 2.5 | | 160 | 13.25 | 210 | 12 |
| 1 | 4° | 100 | 8.91 | 150 | 8 |
| 1.15 | | 100 | 9.2 | 150 | 8 |
| 1.5 | | 100 | 9.88 | 150 | 8 |
| 1.5 | | 160 | 14.07 | 210 | 12 |
| 2 | | 160 | 15.03 | 210 | 12 |
| 2.5 | | 100 | 11.81 | 150 | 12 |
| 2.5 | | 160 | 16 | 210 | 16 |
| 1 | 5° | 75 | 8.46 | 120 | 8 |
| 1.15 | | 75 | 8.75 | 120 | 8 |
| 1.5 | | 90 | 10.73 | 135 | 10 |
| 1.5 | | 160 | 16.84 | 210 | 16 |
| 2 | | 160 | 17.8 | 210 | 16 |
| 2.5 | | 160 | 18.75 | 210 | 16 |

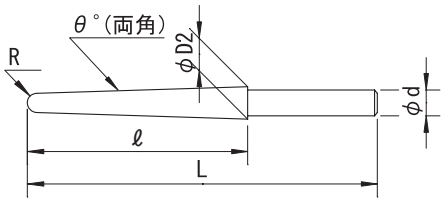
ハイス

# PGR

## ピンゲートリーマ　*Pin Gate Reamer*

切削条件表 P143　テーパー穴加工　右ネジレ 8°　刃数 4　HSS Co






| 公差(Tolerance) | R：$^{0}_{-0.1}$ | θ：±5' | d：h7 |
|---|---|---|---|

右刃右ネジレ8°　刃数:4　SKH56
Helix Angle-Right8°　4 Flutes　HSS-Co.

| 先端 R | 両角（θ） *Taper Angle* | 刃長（ℓ） *Length of Flutes* | 大径（ΦD2） *Dia at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|
| 0.5 | 1° | 25 | 1.43 | 70 | 4 |
| | 2° | 25 | 1.86 | 70 | 4 |
| | 3° | 25 | 2.28 | 70 | 4 |
| | 4° | 25 | 2.71 | 70 | 4 |
| | 5° | 25 | 3.14 | 70 | 4 |
| 0.75 | 1° | 30 | 2.01 | 80 | 6 |
| | 2° | 30 | 2.52 | 80 | 6 |
| | 3° | 30 | 3.03 | 80 | 6 |
| | 4° | 30 | 3.54 | 80 | 6 |
| | 5° | 30 | 4.06 | 80 | 6 |
| 1 | 1° | 40 | 2.68 | 90 | 6 |
| | 1° | 70 | 3.2 | 120 | 6 |
| | 1° | 120 | 4.08 | 170 | 6 |
| | 2° | 40 | 3.36 | 90 | 6 |
| | 2° | 70 | 4.41 | 120 | 6 |
| | 2° | 120 | 6.15 | 170 | 6 |
| | 3° | 40 | 4.04 | 90 | 6 |
| | 3° | 70 | 5.61 | 120 | 6 |
| | 3° | 120 | 8.23 | 170 | 8 |
| | 4° | 40 | 4.73 | 90 | 6 |
| | 4° | 70 | 6.82 | 120 | 6 |
| | 4° | 120 | 10.31 | 170 | 10 |
| | 5° | 40 | 5.41 | 90 | 6 |
| | 5° | 70 | 8.03 | 120 | 8 |
| | 5° | 120 | 12.39 | 170 | 12 |
| 1.25 | 1° | 60 | 3.53 | 110 | 6 |
| | 2° | 60 | 4.55 | 110 | 6 |
| | 3° | 60 | 5.58 | 110 | 6 |
| | 4° | 60 | 6.6 | 110 | 6 |
| | 5° | 60 | 7.63 | 110 | 8 |
| 1.5 | 1° | 45 | 3.76 | 95 | 6 |
| | 1° | 80 | 4.37 | 130 | 6 |
| | 1° | 130 | 5.24 | 180 | 6 |
| | 2° | 45 | 4.52 | 95 | 6 |
| | 2° | 80 | 5.74 | 130 | 6 |
| | 2° | 130 | 7.49 | 180 | 8 |
| | 3° | 45 | 5.28 | 95 | 6 |
| | 3° | 80 | 7.11 | 130 | 8 |
| | 3° | 130 | 9.73 | 180 | 10 |
| | 4° | 45 | 6.04 | 95 | 6 |
| | 4° | 80 | 8.48 | 130 | 8 |
| | 4° | 130 | 11.98 | 180 | 12 |
| | 5° | 45 | 6.8 | 95 | 6 |
| | 5° | 80 | 9.86 | 130 | 10 |
| | 5° | 130 | 14.22 | 180 | 12 |

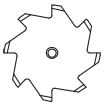
| 先端 R | 両角（θ） *Taper Angle* | 刃長（ℓ） *Length of Flutes* | 大径（ΦD2） *Dia at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|
| 2 | 1° | 50 | 4.84 | 100 | 6 |
| | 1° | 90 | 5.54 | 140 | 6 |
| | 1° | 130 | 6.23 | 180 | 6 |
| | 2° | 50 | 5.68 | 100 | 6 |
| | 2° | 90 | 7.07 | 140 | 8 |
| | 2° | 130 | 8.47 | 180 | 8 |
| | 3° | 50 | 6.51 | 100 | 6 |
| | 3° | 90 | 8.61 | 140 | 8 |
| | 3° | 130 | 10.7 | 180 | 10 |
| | 4° | 50 | 7.35 | 100 | 8 |
| | 4° | 90 | 10.14 | 140 | 10 |
| | 4° | 130 | 12.94 | 180 | 12 |
| | 5° | 50 | 8.19 | 100 | 8 |
| | 5° | 90 | 11.68 | 140 | 12 |
| | 5° | 130 | 15.18 | 180 | 16 |
| 2.5 | 1° | 60 | 6 | 110 | 6 |
| | 1° | 100 | 6.7 | 150 | 6 |
| | 1° | 150 | 7.57 | 200 | 8 |
| | 2° | 60 | 7.01 | 110 | 8 |
| | 2° | 100 | 8.4 | 150 | 8 |
| | 2° | 150 | 10.15 | 200 | 10 |
| | 3° | 60 | 8.01 | 110 | 8 |
| | 3° | 100 | 10.11 | 150 | 10 |
| | 3° | 150 | 12.73 | 200 | 12 |
| | 4° | 60 | 9.02 | 110 | 10 |
| | 4° | 100 | 11.81 | 150 | 12 |
| | 4° | 150 | 15.3 | 200 | 16 |

ハイス

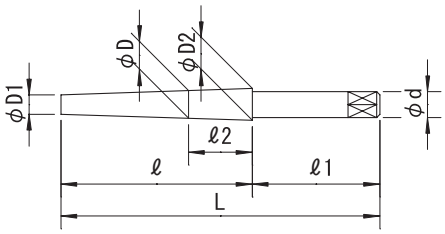
# MTR-F/MTR-RF

## モールステーパーリーマ（ハンド用） *Morse Taper Reamer (Hand) For Finish / For Rough Finish*

切削条件表 P144 | テーパー穴加工 | 右直刃 | HSS







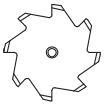

公差(Tolerance) d：h9

### 《MTR-F（仕上用）》 右刃ストレート SKH51 Straight Flute HSS

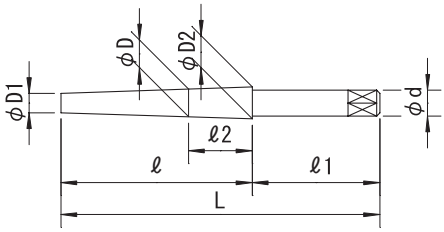
For Finish

| MT No. | テーパー Taper Angle | (D) 寸法 Size | (D) 許容差 Tolerance | 小径 (ΦD1) First Dia. | 刃長 (ℓ) Length of Flutes | 大径 (ΦD2) Dia at Large End | シャンク長 (ℓ1) Length of Shank | (ℓ2) | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1/19.212 | 9.045 | ±0.03 | 6.547 | 65 | 9.93 | 30 | 17 | 95 | 8 | 6 | 60°凹 |
| 1 | 1/20.047 | 12.065 | ±0.03 | 9.571 | 68 | 12.963 | 32 | 18 | 100 | 10 | 6 | 60°凹 |
| 2 | 1/20.02 | 17.78 | ±0.03 | 14.733 | 80 | 18.729 | 45 | 19 | 125 | 15 | 8 | 60°凹 |
| 3 | 1/19.922 | 23.825 | ±0.03 | 20.01 | 98 | 24.929 | 52 | 22 | 150 | 18 | 8 | 60°凹 |
| 4 | 1/19.254 | 31.267 | ±0.06 | 26.229 | 120 | 32.462 | 60 | 23 | 180 | 25 | 10 | 60°凹 |
| 5 | 1/19.002 | 44.399 | ±0.06 | 37.873 | 150 | 45.767 | 80 | 26 | 230 | 35 | 12 | 60°凹 |
| 6 | 1/19.18 | 63.348 | ±0.06 | 54.388 | 205 | 65.076 | 105 | 33 | 310 | 45 | 14 | 60°凹 |

切削条件表 P144 | テーパー穴加工 | 右直刃 | HSS








公差(Tolerance) d：h9

### 《MTR-RF（荒仕上用）》 右刃ストレート SKH51 Straight Flute HSS

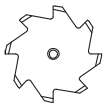
For Rough Finish

| MT No. | テーパー Taper Angle | (D) 寸法 Size | (D) 許容差 Tolerance | 小径 (ΦD1) First Dia. | 刃長 (ℓ) Length of Flutes | 大径 (ΦD2) Dia at Large End | シャンク長 (ℓ1) Length of Shank | (ℓ2) | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1/19.212 | 8.795 | ±0.03 | 6.297 | 65 | 9.68 | 30 | 17 | 95 | 8 | 6 | 60°凹 |
| 1 | 1/20.047 | 11.815 | ±0.03 | 9.321 | 68 | 12.713 | 32 | 18 | 100 | 10 | 6 | 60°凹 |
| 2 | 1/20.02 | 17.53 | ±0.03 | 14.483 | 80 | 18.479 | 45 | 19 | 125 | 15 | 8 | 60°凹 |
| 3 | 1/19.922 | 23.575 | ±0.03 | 19.76 | 98 | 24.679 | 52 | 22 | 150 | 18 | 8 | 60°凹 |
| 4 | 1/19.254 | 31.017 | ±0.06 | 25.979 | 120 | 32.212 | 60 | 23 | 180 | 25 | 10 | 60°凹 |
| 5 | 1/19.002 | 44.149 | ±0.06 | 37.623 | 150 | 45.517 | 80 | 26 | 230 | 35 | 12 | 60°凹 |
| 6 | 1/19.18 | 63.098 | ±0.06 | 54.13 | 205 | 64.819 | 105 | 33 | 310 | 45 | 14 | 60°凹 |

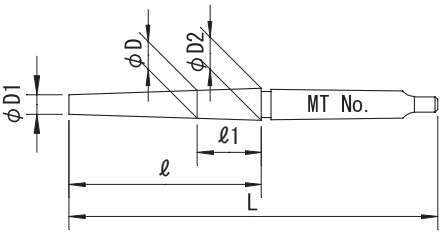
# MTRT-F/MTRT-RF

## モールステーパーリーマ（マシン用） *Morse Taper Reamer (Machine) For Finish / For Rough Finish*

切削条件表 P144 | テーパー穴加工 | 右直刃 | HSS





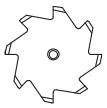



## 《MTRT-F（仕上用）》右刃ストレート　SKH51 Straight Flute　HSS

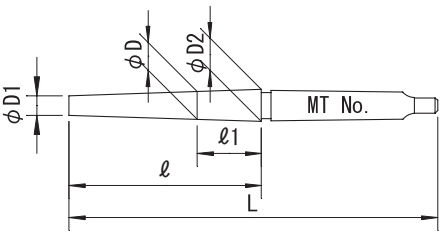
For Finish

| MT No. | テーパー Taper Angle | (D) 寸法 Size | (D) 許容差 Tolerance | 小径 (ΦD1) First Dia. | 刃長 (ℓ) Length of Flutes | 大径 (ΦD2) Dia at Large End | (ℓ1) | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1/19.212 | 9.045 | ±0.03 | 6.547 | 65 | 9.93 | 17 | 155 | 1 | 6 | 60°凹 |
| 1 | 1/20.047 | 12.065 | ±0.03 | 9.571 | 68 | 12.963 | 18 | 155 | 1 | 6 | 60°凹 |
| 2 | 1/20.02 | 17.78 | ±0.03 | 14.733 | 80 | 18.729 | 19 | 180 | 2 | 8 | 60°凹 |
| 3 | 1/19.922 | 23.825 | ±0.03 | 20.01 | 98 | 24.929 | 22 | 220 | 3 | 8 | 60°凹 |
| 4 | 1/19.254 | 31.267 | ±0.06 | 26.229 | 120 | 32.462 | 23 | 265 | 4 | 10 | 60°凹 |
| 5 | 1/19.002 | 44.399 | ±0.06 | 37.873 | 150 | 45.767 | 26 | 330 | 5 | 12 | 60°凹 |
| 6 | 1/19.18 | 63.348 | ±0.06 | 54.388 | 205 | 65.076 | 33 | 455 | 6 | 14 | 60°凹 |

切削条件表 P144 | テーパー穴加工 | 右直刃 | HSS








## 《MTRT-RF（荒仕上用）》右刃ストレート　SKH51 Straight Flute　HSS

For Rough Finish

| MT No. | テーパー Taper Angle | (D) 寸法 Size | (D) 許容差 Tolerance | 小径 (ΦD1) First Dia. | 刃長 (ℓ) Length of Flutes | 大径 (ΦD2) Dia at Large End | (ℓ1) | 全長 (L) Overall Length | MTNo. Shank MTNo. | 刃数 (N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1/19.212 | 8.795 | ±0.03 | 6.297 | 65 | 9.68 | 17 | 155 | 1 | 6 | 60°凹 |
| 1 | 1/20.047 | 11.815 | ±0.03 | 9.321 | 68 | 12.713 | 18 | 155 | 1 | 6 | 60°凹 |
| 2 | 1/20.02 | 17.53 | ±0.03 | 14.483 | 80 | 18.479 | 19 | 180 | 2 | 8 | 60°凹 |
| 3 | 1/19.922 | 23.575 | ±0.03 | 19.76 | 98 | 24.679 | 22 | 220 | 3 | 8 | 60°凹 |
| 4 | 1/19.254 | 31.017 | ±0.06 | 25.979 | 120 | 32.212 | 23 | 265 | 4 | 10 | 60°凹 |
| 5 | 1/19.002 | 44.149 | ±0.06 | 37.623 | 150 | 45.517 | 26 | 330 | 5 | 12 | 60°凹 |
| 6 | 1/19.18 | 63.098 | ±0.06 | 54.13 | 205 | 64.819 | 33 | 455 | 6 | 14 | 60°凹 |

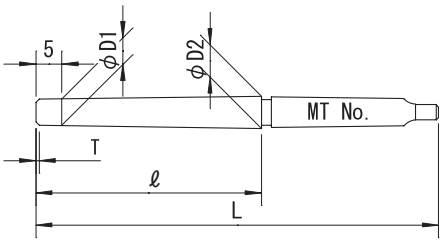
ハイス

# SPTR-F/SPTR-RF

## 1/10テーパー,スパイラルテーパーリーマ *Spiral Taper Reamer 1/10T For Finish / For Rough Finish*

切削条件表 P144 | テーパー穴加工 | 左ネジレ12° | 食付45° | HSS Co






| 公差(Tolerance) | D1：±0.05 |
|---|---|

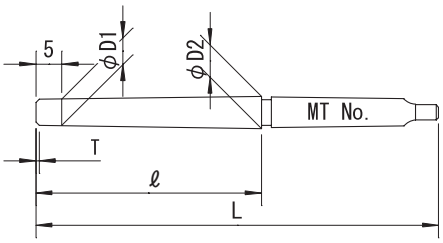
## 《SPTR-F（仕上用）》 1/10テーパー 右刃左ネジレ12° 食付角度45° SKH56

1/10Taper Helix Angle-Left12° Chamfer Angle45° HSS-Co. For Finish

| 呼び寸法 Size | 基準径(D1) Std. Dia. | 食付長(T) Chamfer Length | 刃長(ℓ) Length of Flutes | 大径(ΦD2) Dia at Large End | 全長(L) Overall Length | MTNo. Shank MTNo. | 刃数(N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|---|
| **13** - 1/10 | 10.5 | 1 | 60 | 16 | 150 | 2 | 6 | 60°凹 |
| **16** - 1/10 | 13.5 | 1 | 60 | 19 | 150 | 2 | 8 | 60°凹 |
| **20** - 1/10 | 17 | 1.5 | 70 | 23.5 | 184 | 3 | 8 | 60°凹 |
| **22** - 1/10 | 19.2 | 1.5 | 70 | 25.7 | 184 | 3 | 8 | 60°凹 |
| **27** - 1/10 | 23.5 | 1.5 | 85 | 31.5 | 202 | 3 | 10 | 60°凹 |
| **30** - 1/10 | 25 | 1.5 | 100 | 34.5 | 244 | 4 | 10 | 60°凹 |

切削条件表 P144 | テーパー穴加工 | 左ネジレ12° | 食付45° | HSS Co






| 公差(Tolerance) | D1：±0.05 |
|---|---|

## 《SPTR-RF（荒仕上用）》 1/10テーパー 右刃左ネジレ12° 食付角度45° SKH56

1/10Taper Helix Angle-Left12° Chamfer Angle45° HSS-Co. For Rough Finish

| 呼び寸法 Size | 基準径(D1) Std. Dia. | 食付長(T) Chamfer Length | 刃長(ℓ) Length of Flutes | 大径(ΦD2) Dia at Large End | 全長(L) Overall Length | MTNo. Shank MTNo. | 刃数(N) Number of Flutes | センタ Center |
|---|---|---|---|---|---|---|---|---|
| **13** - 1/10 | 10.25 | 1 | 60 | 15.75 | 150 | 2 | 6 | 60°凹 |
| **16** - 1/10 | 13.25 | 1 | 60 | 18.75 | 150 | 2 | 8 | 60°凹 |
| **20** - 1/10 | 16.75 | 1.5 | 70 | 23.25 | 184 | 3 | 8 | 60°凹 |
| **22** - 1/10 | 18.95 | 1.5 | 70 | 25.45 | 184 | 3 | 8 | 60°凹 |
| **27** - 1/10 | 23.2 | 1.5 | 85 | 31.2 | 202 | 3 | 10 | 60°凹 |
| **30** - 1/10 | 24.7 | 1.5 | 100 | 34.2 | 244 | 4 | 10 | 60°凹 |

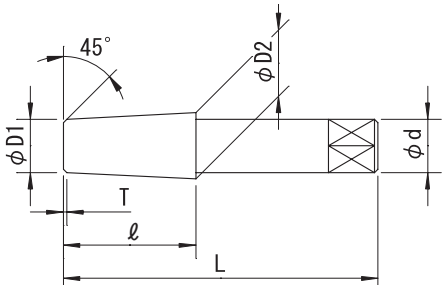
# PR

## パイプリーマ *Pipe Reamer*

切削条件表 P144 | テーパー穴加工 | 右直刃 | 食付45° | HSS








| 公差(Tolerance) | d： $^{-0.02}_{-0.05}$ |
|---|---|

1/16T 右刃ストレート 食付角度45° SKH51
1/16Taper Straight Flute Chamfer Angle45° HSS

| 呼び寸法 *Size* | 小径（ΦD1） *First Dia.* | 食付長（T） *Chamfer Length* | 刃長（ℓ） *Length of Flutes* | 大径（ΦD2） *Dia at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 刃数（N） *Number of Flutes* | センタ *Center* |
|---|---|---|---|---|---|---|---|---|
| **1/8** | 8.025 | 1 | 19 | 9.213 | 54 | 8 | 6 | 60°凹 |
| **1/4** | 10.312 | 1 | 27 | 12 | 62 | 10 | 6 | 60°凹 |
| **3/8** | 13.716 | 1.5 | 27 | 15.404 | 65 | 12 | 6 | 60°凹 |
| **1/2** | 16.891 | 1.5 | 35 | 19.079 | 80 | 16 | 8 | 60°凹 |
| **3/4** | 22.251 | 1.5 | 35 | 24.439 | 83 | 20 | 8 | 60°凹 |
| **1"** | 28.017 | 1.5 | 45 | 30.83 | 95 | 26 | 10 | 60°凹 |
| **1"1/4** | 36.678 | 2 | 45 | 39.491 | 100 | 32 | 10 | 60°凹 |
| **1"1/2** | 42.775 | 2 | 45 | 45.588 | 108 | 40 | 12 | 60°凹 |
| **2"** | 54.84 | 2.5 | 45 | 57.653 | 115 | 50 | 12 | 60°凹 |

ハイス

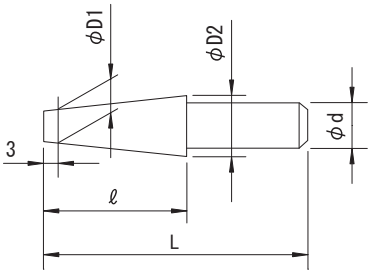
# HSPTR

## 粉末ハイス スパイラルテーパーリーマ *Powder Metallurgy Spiral Taper Reamer*

切削条件表 P142 | テーパー穴加工 | 左ネジレ20° | 左ネジレ30° | 粉末ハイス








| 公差(Tolerance) | D1：±0.05 | d：h7 |
|---|---|---|

1/5, 1/6テーパー 右刃左ネジレ20° 1/8, 1/10テーパー 右刃左ネジレ30° 粉末ハイス
1/5, 1/6 Taper Helix Angle-left20° 1/8, 1/10 Taper Helix Angle-left30° Powder Metallurgy

| 呼び寸法 Size | 基準径（ΦD1） Std. Dia. | 刃長（ℓ） Length of Flutes | 大径（ΦD2） Dia at Large End | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. | 刃数（N） Number of Flutes |
|---|---|---|---|---|---|---|
| **8 - 1/ 5** | 8 | 40 | 15.4 | 95 | 16 | 4 |
| **10 - 1/ 5** | 10 | 40 | 17.4 | 95 | 16 | 4 |
| **12 - 1/ 5** | 12 | 40 | 19.4 | 95 | 20 | 4 |
| **15 - 1/ 5** | 15 | 45 | 23.4 | 100 | 20 | 6 |
| **16 - 1/ 5** | 16 | 45 | 24.4 | 100 | 20 | 6 |
| **18 - 1/ 5** | 18 | 45 | 26.4 | 100 | 25 | 6 |
| **20 - 1/ 5** | 20 | 45 | 28.4 | 100 | 25 | 6 |
| **8 - 1/ 6** | 8 | 40 | 14.16 | 95 | 16 | 4 |
| **10 - 1/ 6** | 10 | 40 | 16.16 | 95 | 16 | 4 |
| **12 - 1/ 6** | 12 | 40 | 18.16 | 95 | 16 | 4 |
| **15 - 1/ 6** | 15 | 45 | 22 | 100 | 20 | 6 |
| **16 - 1/ 6** | 16 | 45 | 23 | 100 | 20 | 6 |
| **18 - 1/ 6** | 18 | 45 | 25 | 100 | 25 | 6 |
| **20 - 1/ 6** | 20 | 45 | 27 | 100 | 25 | 6 |

| 呼び寸法 Size | 基準径（ΦD1） Std. Dia. | 刃長（ℓ） Length of Flutes | 大径（ΦD2） Dia at Large End | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. | 刃数（N） Number of Flutes |
|---|---|---|---|---|---|---|
| **8 - 1/ 8** | 8 | 45 | 13.25 | 100 | 12 | 4 |
| **10 - 1/ 8** | 10 | 45 | 15.25 | 100 | 16 | 4 |
| **12 - 1/ 8** | 12 | 45 | 17.25 | 100 | 16 | 4 |
| **15 - 1/ 8** | 15 | 50 | 20.88 | 105 | 20 | 6 |
| **16 - 1/ 8** | 16 | 50 | 21.88 | 105 | 20 | 6 |
| **18 - 1/ 8** | 18 | 50 | 23.88 | 105 | 20 | 6 |
| **20 - 1/ 8** | 20 | 50 | 25.88 | 105 | 25 | 6 |
| **8 - 1/10** | 8 | 45 | 12.2 | 100 | 12 | 4 |
| **10 - 1/10** | 10 | 45 | 14.2 | 100 | 12 | 4 |
| **12 - 1/10** | 12 | 45 | 16.2 | 100 | 16 | 4 |
| **15 - 1/10** | 15 | 50 | 19.7 | 105 | 20 | 6 |
| **16 - 1/10** | 16 | 50 | 20.7 | 105 | 20 | 6 |
| **18 - 1/10** | 18 | 50 | 22.7 | 105 | 20 | 6 |
| **20 - 1/10** | 20 | 50 | 24.7 | 105 | 25 | 6 |
| **22 - 1/10** | 22 | 55 | 27.2 | 115 | 25 | 6 |
| **25 - 1/10** | 25 | 55 | 30.2 | 115 | 25 | 6 |



南魚沼市長森　菜の花

Reamer Cutting Condition Talbe

# リーマ
# 切削条件参考表

安全上の注意：切削条件は、被削材の硬さ、
切り込み量、ツーリング、機械の状態により
条件を増減してください。
切削油を使用してください。
Adjust cutting conditions according to
rigidity of work material, tooling, machine
and depth of cut.
Use cutting fluid.

## ●CSUSR-A　超硬ステンレス用リーマ

| 直径 Dia. | SUS304 Stainless Steel 切削速度 Cutting Speed 18~25m/min | | SUS316L Stainless Steel 切削速度 Cutting Speed 15~21m/min | | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 0.5 | 11,459 ~ 15,914 | 13 ~ 18 | 9,549 ~ 13,369 | 11 ~ 15 | 0.05 |
| 1 | 5,730 ~ 7,957 | 13 ~ 18 | 4,775 ~ 6,685 | 11 ~ 15 | 0.06 |
| 2 | 2,865 ~ 3,978 | 37 ~ 51 | 2,387 ~ 3,342 | 30 ~ 43 | 0.08 |
| 3 | 1,910 ~ 2,652 | 41 ~ 57 | 1,592 ~ 2,228 | 34 ~ 48 | 0.1 |
| 4 | 1,432 ~ 1,989 | 33 ~ 45 | 1,194 ~ 1,671 | 27 ~ 38 | 0.1 |
| 5 | 1,146 ~ 1,591 | 28 ~ 38 | 955 ~ 1,337 | 23 ~ 32 | 0.1 |
| 6 | 955 ~ 1,326 | 24 ~ 33 | 796 ~ 1,114 | 20 ~ 28 | 0.1 |
| 7 | 819 ~ 1,137 | 22 ~ 30 | 682 ~ 955 | 18 ~ 25 | 0.1 |
| 8 | 716 ~ 995 | 20 ~ 27 | 597 ~ 836 | 16 ~ 23 | 0.1 |
| 10 | 573 ~ 796 | 17 ~ 24 | 477 ~ 668 | 14 ~ 20 | 0.15 |
| 11 | 521 ~ 723 | 16 ~ 23 | 434 ~ 608 | 14 ~ 19 | 0.15 |
| 12 | 477 ~ 663 | 15 ~ 21 | 398 ~ 557 | 13 ~ 18 | 0.15 |

## ●CNCR-C　超硬自動旋盤用リーマ
## ●CSR-C　コーティング ソリッドリーマ
## ●CSPR-C　コーティング ソリッドスパイラルリーマ

| 直径 Dia. | 非鉄金属 Al. Cu 切削速度 Cutting Speed 18~33m/min | | 炭素鋼 FC. FCD. S50C 切削速度 Cutting Speed 13~17m/min | | 合金鋼 SCM. SKD. SUS304 切削速度 Cutting Speed 12~15m/min | | 調質鋼 HPM. NAK 切削速度 Cutting Speed 9~12m/min | | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 0.8 | 7,162 ~ 13,130 | 46 ~ 142 | 5,173 ~ 6,764 | 34 ~ 73 | 4,775 ~ 5,968 | 31 ~ 64 | 3,581 ~ 4,775 | 23 ~ 52 | 0.06 |
| 1 | 5,730 ~ 10,504 | 46 ~ 142 | 4,138 ~ 5,411 | 34 ~ 73 | 3,820 ~ 4,775 | 31 ~ 64 | 2,865 ~ 3,820 | 23 ~ 52 | 0.06 |
| 2 | 2,865 ~ 5,252 | 131 ~ 402 | 2,069 ~ 2,706 | 95 ~ 207 | 1,910 ~ 2,387 | 88 ~ 183 | 1,432 ~ 1,910 | 66 ~ 146 | 0.08 |
| 3 | 1,910 ~ 3,501 | 149 ~ 454 | 1,379 ~ 1,804 | 107 ~ 234 | 1,273 ~ 1,592 | 99 ~ 206 | 955 ~ 1,273 | 74 ~ 165 | 0.1 |
| 4 | 1,432 ~ 2,626 | 118 ~ 359 | 1,035 ~ 1,353 | 85 ~ 185 | 955 ~ 1,194 | 78 ~ 163 | 716 ~ 955 | 59 ~ 131 | 0.1 |
| 5 | 1,146 ~ 2,101 | 99 ~ 303 | 828 ~ 1,082 | 72 ~ 156 | 764 ~ 955 | 66 ~ 138 | 573 ~ 764 | 50 ~ 110 | 0.1 |
| 6 | 955 ~ 1,751 | 87 ~ 265 | 690 ~ 902 | 63 ~ 136 | 637 ~ 796 | 58 ~ 120 | 477 ~ 637 | 43 ~ 96 | 0.1 |
| 7 | 819 ~ 1,501 | 78 ~ 238 | 591 ~ 773 | 56 ~ 122 | 546 ~ 682 | 52 ~ 108 | 409 ~ 546 | 39 ~ 86 | 0.1 |
| 8 | 716 ~ 1,313 | 71 ~ 217 | 517 ~ 676 | 51 ~ 112 | 477 ~ 597 | 47 ~ 99 | 358 ~ 477 | 36 ~ 79 | 0.1 |
| 9 | 637 ~ 1,167 | 66 ~ 202 | 460 ~ 601 | 48 ~ 104 | 424 ~ 531 | 44 ~ 92 | 318 ~ 424 | 33 ~ 73 | 0.15 |
| 10 | 573 ~ 1,050 | 62 ~ 189 | 414 ~ 541 | 45 ~ 97 | 382 ~ 477 | 41 ~ 86 | 286 ~ 382 | 31 ~ 69 | 0.15 |
| 11 | 521 ~ 955 | 59 ~ 179 | 376 ~ 492 | 42 ~ 92 | 347 ~ 434 | 39 ~ 81 | 260 ~ 347 | 29 ~ 65 | 0.15 |
| 12 | 477 ~ 875 | 56 ~ 170 | 345 ~ 451 | 40 ~ 88 | 318 ~ 398 | 37 ~ 77 | 239 ~ 318 | 28 ~ 62 | 0.15 |

## ●CSR-DLC　超硬ソリッドアルミ用リーマ

| 直径 Dia. | 非鉄金属 Al. Cu 切削速度 Cutting Speed 20~35m/min | | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 0.5 | 12,732 ~ 22,282 | 38 ~ 112 | 0.05 |
| 1 | 6,366 ~ 11,141 | 38 ~ 112 | 0.06 |
| 2 | 3,183 ~ 5,570 | 108 ~ 317 | 0.08 |
| 3 | 2,122 ~ 3,714 | 122 ~ 358 | 0.1 |
| 4 | 1,592 ~ 2,785 | 97 ~ 284 | 0.1 |
| 5 | 1,273 ~ 2,228 | 81 ~ 239 | 0.1 |
| 6 | 1,061 ~ 1,857 | 71 ~ 209 | 0.1 |
| 7 | 909 ~ 1,592 | 64 ~ 188 | 0.1 |
| 8 | 796 ~ 1,393 | 59 ~ 172 | 0.1 |
| 9 | 707 ~ 1,238 | 53 ~ 156 | 0.15 |
| 10 | 637 ~ 1,114 | 51 ~ 149 | 0.15 |
| 11 | 579 ~ 1,013 | 48 ~ 136 | 0.15 |
| 12 | 531 ~ 928 | 46 ~ 124 | 0.15 |

## ●CSRH-P　ソリッド高硬度用リーマ

| 直径 Dia. | 高硬度材 SKD. NAK(HRC55-62) 切削速度 Cutting Speed 8~14m/min | | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 3 | 849 ~ 1,485 | 34 ~ 89 | 0.1 |
| 3.5 | 728 ~ 1,273 | 29 ~ 76 | 0.1 |
| 4 | 637 ~ 1,114 | 25 ~ 67 | 0.1 |
| 4.5 | 566 ~ 990 | 23 ~ 59 | 0.1 |
| 5 | 509 ~ 891 | 20 ~ 53 | 0.1 |
| 5.5 | 463 ~ 810 | 19 ~ 49 | 0.1 |
| 6 | 424 ~ 743 | 17 ~ 45 | 0.1 |
| 7 | 364 ~ 637 | 15 ~ 38 | 0.1 |
| 8 | 318 ~ 557 | 13 ~ 33 | 0.1 |
| 9 | 283 ~ 495 | 11 ~ 30 | 0.15 |
| 10 | 255 ~ 446 | 10 ~ 27 | 0.15 |
| 11 | 231 ~ 405 | 9 ~ 24 | 0.15 |
| 12 | 212 ~ 371 | 8 ~ 22 | 0.15 |

## ●CSER-C　超硬エンド刃付リーマ

| 直径 Dia. | 非鉄金属 Al. Cu<br>切削速度 Cutting Speed 20~40m/min | | 炭素鋼 FC. FCD. S50C<br>切削速度 Cutting Speed 12~20m/min | | 合金鋼 SCM. SKD. SUS304<br>切削速度 Cutting Speed 15~25m/min | | 調質鋼 ～ 38HRC HPM. NAK<br>切削速度 Cutting Speed 25~40m/min | | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 1 | 6,366 ～ 12,733 | 255 ～ 509 | 3,820 ～ 6,366 | 229 ～ 255 | 4,775 ～ 7,958 | 143 ～ 199 | 7,949 ～ 12,733 | 238 ～ 255 | 0.06 |
| 1.5 | 4,244 ～ 8,489 | 170 ～ 340 | 2,546 ～ 4,244 | 153 ～ 170 | 3,183 ～ 5,305 | 95 ～ 133 | 5,299 ～ 8,489 | 159 ～ 170 | 0.08 |
| 2 | 3,183 ～ 6,366 | 127 ～ 255 | 1,910 ～ 3,183 | 115 ～ 127 | 2,387 ～ 3,979 | 72 ～ 99 | 3,975 ～ 6,366 | 119 ～ 127 | 0.08 |
| 3 | 2,122 ～ 4,244 | 85 ～ 170 | 1,273 ～ 2,122 | 76 ～ 85 | 1,592 ～ 2,653 | 48 ～ 66 | 2,650 ～ 4,244 | 79 ～ 85 | 0.1 |
| 4 | 1,592 ～ 3,183 | 64 ～ 127 | 955 ～ 1,592 | 57 ～ 64 | 1,194 ～ 1,989 | 36 ～ 50 | 1,987 ～ 3,183 | 60 ～ 64 | 0.1 |
| 5 | 1,273 ～ 2,547 | 51 ～ 102 | 764 ～ 1,273 | 46 ～ 51 | 955 ～ 1,592 | 29 ～ 40 | 1,590 ～ 2,547 | 48 ～ 51 | 0.1 |
| 6 | 1,061 ～ 2,122 | 42 ～ 85 | 637 ～ 1,061 | 38 ～ 42 | 796 ～ 1,326 | 24 ～ 33 | 1,325 ～ 2,122 | 40 ～ 42 | 0.1 |
| 7 | 909 ～ 1,819 | 36 ～ 73 | 546 ～ 909 | 33 ～ 36 | 682 ～ 1,137 | 20 ～ 28 | 1,136 ～ 1,819 | 34 ～ 36 | 0.1 |
| 8 | 796 ～ 1,592 | 32 ～ 64 | 477 ～ 796 | 29 ～ 32 | 597 ～ 995 | 18 ～ 25 | 994 ～ 1,592 | 30 ～ 32 | 0.1 |
| 9 | 707 ～ 1,415 | 28 ～ 57 | 424 ～ 707 | 25 ～ 28 | 531 ～ 884 | 16 ～ 22 | 883 ～ 1,415 | 26 ～ 28 | 0.15 |
| 10 | 637 ～ 1,273 | 25 ～ 51 | 382 ～ 637 | 23 ～ 25 | 477 ～ 796 | 14 ～ 20 | 795 ～ 1,273 | 24 ～ 25 | 0.15 |
| 11 | 579 ～ 1,158 | 23 ～ 46 | 347 ～ 579 | 21 ～ 23 | 434 ～ 723 | 13 ～ 18 | 723 ～ 1,158 | 22 ～ 23 | 0.15 |
| 12 | 531 ～ 1,061 | 21 ～ 42 | 318 ～ 531 | 19 ～ 21 | 398 ～ 663 | 12 ～ 17 | 662 ～ 1,061 | 20 ～ 21 | 0.15 |

## ●CSOER　超硬オイルホール付止穴用リーマ

| 直径 Dia. | 非鉄金属 Al. Cu<br>切削速度 Cutting Speed 18~32m/min | | 炭素鋼 FC. FCD. S50C<br>切削速度 Cutting Speed 13~18m/min | | 合金鋼 SCM. SKD. SUS304<br>切削速度 Cutting Speed 11~16m/min | | 調質鋼 HPM. NAK<br>切削速度 Cutting Speed 7~11m/min | | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 3 | 1,910 ～ 3,395 | 150 ～ 445 | 1,379 ～ 1,910 | 109 ～ 251 | 1,167 ～ 1,698 | 92 ～ 223 | 743 ～ 1,167 | 60 ～ 157 | 0.1 |
| 3.5 | 1,637 ～ 2,910 | 129 ～ 382 | 1,182 ～ 1,637 | 93 ～ 215 | 1,000 ～ 1,455 | 79 ～ 191 | 637 ～ 1,000 | 51 ～ 134 | 0.1 |
| 4 | 1,432 ～ 2,546 | 113 ～ 334 | 1,035 ～ 1,432 | 81 ～ 188 | 875 ～ 1,273 | 69 ～ 167 | 557 ～ 875 | 45 ～ 118 | 0.1 |
| 4.5 | 1,273 ～ 2,264 | 100 ～ 297 | 920 ～ 1,273 | 72 ～ 167 | 778 ～ 1,132 | 61 ～ 148 | 495 ～ 778 | 40 ～ 105 | 0.1 |
| 5 | 1,146 ～ 2,037 | 90 ～ 267 | 828 ～ 1,146 | 65 ～ 150 | 700 ～ 1,019 | 55 ～ 134 | 446 ～ 700 | 36 ～ 94 | 0.1 |
| 5.5 | 1,042 ～ 1,852 | 82 ～ 243 | 752 ～ 1,042 | 59 ～ 137 | 637 ～ 926 | 50 ～ 121 | 405 ～ 637 | 33 ～ 86 | 0.1 |
| 6 | 955 ～ 1,698 | 77 ～ 228 | 690 ～ 955 | 56 ～ 128 | 584 ～ 849 | 47 ～ 114 | 371 ～ 584 | 30 ～ 78 | 0.1 |
| 6.5 | 881 ～ 1,567 | 73 ～ 216 | 637 ～ 881 | 53 ～ 121 | 539 ～ 784 | 44 ～ 108 | 343 ～ 539 | 28 ～ 74 | 0.1 |
| 7 | 819 ～ 1,455 | 69 ～ 205 | 591 ～ 819 | 50 ～ 115 | 500 ～ 728 | 42 ～ 102 | 318 ～ 500 | 27 ～ 70 | 0.1 |
| 7.5 | 764 ～ 1,358 | 66 ～ 196 | 552 ～ 764 | 48 ～ 110 | 467 ～ 679 | 40 ～ 98 | 297 ～ 467 | 26 ～ 67 | 0.1 |
| 8 | 716 ～ 1,273 | 63 ～ 187 | 517 ～ 716 | 46 ～ 105 | 438 ～ 637 | 39 ～ 94 | 279 ～ 438 | 25 ～ 64 | 0.1 |
| 8.5 | 674 ～ 1,198 | 61 ～ 180 | 487 ～ 674 | 44 ～ 101 | 412 ～ 599 | 37 ～ 90 | 262 ～ 412 | 24 ～ 62 | 0.1 |
| 9 | 637 ～ 1,132 | 59 ～ 174 | 460 ～ 637 | 42 ～ 98 | 389 ～ 566 | 36 ～ 87 | 248 ～ 389 | 23 ～ 60 | 0.15 |
| 9.5 | 603 ～ 1,072 | 57 ～ 168 | 436 ～ 603 | 41 ～ 95 | 369 ～ 536 | 35 ～ 84 | 235 ～ 369 | 22 ～ 58 | 0.15 |
| 10 | 573 ～ 1,019 | 55 ～ 163 | 414 ～ 573 | 40 ～ 92 | 350 ～ 509 | 34 ～ 81 | 223 ～ 350 | 21 ～ 56 | 0.15 |
| 10.5 | 546 ～ 970 | 53 ～ 158 | 394 ～ 546 | 39 ～ 89 | 333 ～ 485 | 33 ～ 79 | 212 ～ 333 | 21 ～ 54 | 0.15 |
| 11 | 521 ～ 926 | 52 ～ 154 | 376 ～ 521 | 38 ～ 87 | 318 ～ 463 | 32 ～ 77 | 203 ～ 318 | 20 ～ 53 | 0.15 |
| 11.5 | 498 ～ 886 | 51 ～ 150 | 360 ～ 498 | 37 ～ 84 | 304 ～ 443 | 31 ～ 75 | 194 ～ 304 | 20 ～ 52 | 0.15 |
| 12 | 477 ～ 849 | 50 ～ 147 | 345 ～ 477 | 36 ～ 83 | 292 ～ 424 | 30 ～ 73 | 186 ～ 292 | 19 ～ 50 | 0.15 |

## ●CSGR-A　超硬ソリッドリーマ シャンクスルークーラント

| 直径 Dia. | 非鉄金属 Al. Cu<br>切削速度 Cutting Speed 45~70m/min | | 炭素鋼 FC. FCD. S50C<br>切削速度 Cutting Speed 35~50m/min | | 合金鋼 SCM. SKD. SUS304<br>切削速度 Cutting Speed 30~45m/min | | 調質鋼 ～ 38HRC HPM. NAK<br>切削速度 Cutting Speed 25~40m/min | | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 3 | 4,775 ～ 7,427 | 573 ～ 891 | 3,714 ～ 5,305 | 223 ～ 212 | 3,183 ～ 4,775 | 191 ～ 287 | 2,653 ～ 4,244 | 143 ～ 229 | 0.1 |
| 4 | 3,581 ～ 5,570 | 430 ～ 668 | 2,785 ～ 3,979 | 167 ～ 159 | 2,387 ～ 3,581 | 143 ～ 215 | 1,989 ～ 3,183 | 107 ～ 172 | 0.1 |
| 5 | 2,865 ～ 4,456 | 344 ～ 535 | 2,228 ～ 3,183 | 134 ～ 191 | 1,910 ～ 2,865 | 115 ～ 172 | 1,592 ～ 2,546 | 86 ～ 137 | 0.1 |
| 6 | 2,387 ～ 3,714 | 286 ～ 446 | 1,857 ～ 2,653 | 111 ～ 159 | 1,592 ～ 2,387 | 96 ～ 143 | 1,326 ～ 2,122 | 72 ～ 115 | 0.1 |
| 7 | 2,046 ～ 3,183 | 246 ～ 382 | 1,592 ～ 2,274 | 95 ～ 136 | 1,364 ～ 2,046 | 82 ～ 123 | 1,137 ～ 1,819 | 61 ～ 98 | 0.1 |
| 8 | 1,790 ～ 2,785 | 215 ～ 334 | 1,393 ～ 1,989 | 84 ～ 119 | 1,194 ～ 1,790 | 72 ～ 107 | 995 ～ 1,592 | 54 ～ 86 | 0.1 |
| 9 | 1,592 ～ 2,476 | 191 ～ 297 | 1,238 ～ 1,768 | 74 ～ 106 | 1,061 ～ 1,592 | 64 ～ 96 | 884 ～ 1,415 | 48 ～ 76 | 0.15 |
| 10 | 1,432 ～ 2,228 | 172 ～ 267 | 1,114 ～ 1,592 | 67 ～ 95 | 955 ～ 1,432 | 57 ～ 86 | 796 ～ 1,273 | 43 ～ 69 | 0.15 |
| 12 | 1,194 ～ 1,857 | 143 ～ 223 | 928 ～ 1,326 | 56 ～ 80 | 796 ～ 1,194 | 48 ～ 72 | 663 ～ 1,061 | 36 ～ 57 | 0.15 |
| 13 | 1,102 ～ 1,714 | 176 ～ 274 | 857 ～ 1,224 | 69 ～ 102 | 735 ～ 1,102 | 59 ～ 88 | 612 ～ 979 | 44 ～ 70 | 0.15 |
| 14 | 1,023 ～ 1,592 | 164 ～ 255 | 796 ～ 1,137 | 64 ～ 91 | 682 ～ 1,023 | 55 ～ 82 | 568 ～ 909 | 41 ～ 65 | 0.15 |
| 16 | 895 ～ 1,393 | 143 ～ 223 | 696 ～ 995 | 56 ～ 80 | 597 ～ 895 | 48 ～ 72 | 497 ～ 796 | 36 ～ 57 | 0.15 |
| 18 | 796 ～ 1,238 | 127 ～ 198 | 619 ～ 884 | 50 ～ 71 | 531 ～ 796 | 42 ～ 64 | 442 ～ 707 | 32 ～ 51 | 0.15 |
| 20 | 716 ～ 1,114 | 115 ～ 178 | 557 ～ 796 | 45 ～ 64 | 477 ～ 716 | 38 ～ 57 | 398 ～ 637 | 29 ～ 46 | 0.2 |

## ●CSGR-DLC　超硬ソリッドリーマ シャンクスルークーラント アルミ用

| 直径 Dia. | 非鉄金属 Al. Cu 切削速度 Cutting Speed 60~120m/min 回転数 Spindle speed rpm | 送り feed mm/min | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|
| 4 | 4,775 ~ 9,549 | 487 ~ 688 | 0.1 |
| 5 | 3,820 ~ 7,639 | 390 ~ 550 | 0.1 |
| 6 | 3,183 ~ 6,366 | 325 ~ 458 | 0.1 |
| 7 | 2,728 ~ 5,457 | 278 ~ 393 | 0.1 |
| 8 | 2,387 ~ 4,775 | 243 ~ 344 | 0.1 |
| 10 | 1,910 ~ 3,820 | 195 ~ 275 | 0.15 |
| 12 | 1,592 ~ 3,183 | 162 ~ 229 | 0.15 |
| 14 | 1,364 ~ 2,728 | 186 ~ 262 | 0.15 |
| 16 | 1,194 ~ 2,387 | 162 ~ 229 | 0.15 |
| 18 | 1,061 ~ 2,122 | 144 ~ 204 | 0.15 |
| 20 | 955 ~ 1,910 | 130 ~ 183 | 0.2 |

## ●CSCER　超硬エンド刃付クーラントリーマ（止まり穴用）

| 直径 Dia. | 非鉄金属 Al. Cu 切削速度 Cutting Speed 17~30m/min | | 炭素鋼 FC. FCD. S50C 切削速度 Cutting Speed 12~17m/min | | 合金鋼 SCM. SKD. SUS304 切削速度 Cutting Speed 10~15m/min | | 調質鋼 HPM. NAK 切削速度 Cutting Speed 7~11m/min | | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 5 | 1,082 ~ 1,910 | 83 ~ 244 | 764 ~ 1,082 | 59 ~ 139 | 637 ~ 955 | 49 ~ 122 | 446 ~ 700 | 34 ~ 90 | 0.1 |
| 6 | 902 ~ 1,592 | 73 ~ 214 | 637 ~ 902 | 51 ~ 121 | 531 ~ 796 | 43 ~ 107 | 371 ~ 584 | 30 ~ 78 | 0.1 |
| 7 | 773 ~ 1,364 | 65 ~ 192 | 546 ~ 773 | 46 ~ 109 | 455 ~ 682 | 38 ~ 96 | 318 ~ 500 | 27 ~ 70 | 0.1 |
| 8 | 676 ~ 1,194 | 60 ~ 176 | 477 ~ 676 | 42 ~ 100 | 398 ~ 597 | 35 ~ 88 | 279 ~ 438 | 25 ~ 64 | 0.1 |
| 9 | 601 ~ 1,061 | 55 ~ 163 | 424 ~ 601 | 39 ~ 92 | 354 ~ 531 | 33 ~ 81 | 248 ~ 389 | 23 ~ 60 | 0.1 |
| 10 | 541 ~ 955 | 52 ~ 153 | 382 ~ 541 | 37 ~ 87 | 318 ~ 477 | 31 ~ 76 | 223 ~ 350 | 21 ~ 56 | 0.1 |
| 11 | 492 ~ 868 | 49 ~ 144 | 347 ~ 492 | 35 ~ 82 | 289 ~ 434 | 29 ~ 72 | 203 ~ 318 | 20 ~ 53 | 0.1 |
| 12 | 451 ~ 796 | 47 ~ 138 | 318 ~ 451 | 33 ~ 78 | 265 ~ 398 | 28 ~ 69 | 186 ~ 292 | 19 ~ 50 | 0.1 |
| 12.5 | 433 ~ 764 | 33 ~ 98 | 306 ~ 433 | 23 ~ 55 | 255 ~ 382 | 20 ~ 49 | 178 ~ 280 | 14 ~ 36 | 0.1 |

## ●CSR-MC　超硬ミクロンリーマ
## ●CSRR-3　超硬ルーマー型リーマ
## ●CSRM　ソリッドミディアムリーマ
## ●CSLHR　ソリッドロングハンドリーマ
## ●CSSPSCR　ソリッドスパイラルチャッキングリーマ
## ●CSR-ECO　超硬高精度用リーマ
## ●CSR　ソリッドリーマ

| 直径 Dia. | 非鉄金属 Al. Cu 切削速度 Cutting Speed 16~30m/min | | 炭素鋼 FC. FCD. S50C 切削速度 Cutting Speed 11~15m/min | | 合金鋼 SCM. SKD. SUS304 切削速度 Cutting Speed 10~14m/min | | 調質鋼 HPM. NAK 切削速度 Cutting Speed 7~10m/min | | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 0.2 | 25,465 ~ 47,746 | 25 ~ 77 | 17,507 ~ 23,873 | 16 ~ 37 | 15,915 ~ 22,282 | 15 ~ 36 | 11,141 ~ 15,915 | 11 ~ 26 | 0.05 |
| 0.4 | 12,732 ~ 23,873 | 36 ~ 112 | 8,754 ~ 11,937 | 25 ~ 56 | 7,958 ~ 11,141 | 22 ~ 52 | 5,570 ~ 7,958 | 16 ~ 37 | 0.05 |
| 0.8 | 6,366 ~ 11,937 | 39 ~ 122 | 4,377 ~ 5,968 | 27 ~ 61 | 3,979 ~ 5,570 | 24 ~ 57 | 2,785 ~ 3,979 | 17 ~ 41 | 0.06 |
| 1 | 5,093 ~ 9,549 | 39 ~ 122 | 3,501 ~ 4,775 | 27 ~ 61 | 3,183 ~ 4,456 | 24 ~ 57 | 2,228 ~ 3,183 | 17 ~ 41 | 0.06 |
| 1.6 | 3,183 ~ 5,968 | 73 ~ 228 | 2,188 ~ 2,984 | 50 ~ 114 | 1,989 ~ 2,785 | 46 ~ 107 | 1,393 ~ 1,989 | 32 ~ 76 | 0.08 |
| 2 | 2,546 ~ 4,775 | 110 ~ 345 | 1,751 ~ 2,387 | 76 ~ 172 | 1,592 ~ 2,228 | 69 ~ 161 | 1,114 ~ 1,592 | 48 ~ 115 | 0.08 |
| 3 | 1,698 ~ 3,183 | 125 ~ 390 | 1,167 ~ 1,592 | 86 ~ 195 | 1,061 ~ 1,485 | 78 ~ 182 | 743 ~ 1,061 | 55 ~ 130 | 0.1 |
| 4 | 1,273 ~ 2,387 | 99 ~ 308 | 875 ~ 1,194 | 68 ~ 154 | 796 ~ 1,114 | 62 ~ 144 | 557 ~ 796 | 43 ~ 103 | 0.1 |
| 5 | 1,019 ~ 1,910 | 83 ~ 260 | 700 ~ 955 | 57 ~ 130 | 637 ~ 891 | 52 ~ 121 | 446 ~ 637 | 36 ~ 87 | 0.1 |
| 6 | 849 ~ 1,592 | 73 ~ 227 | 584 ~ 796 | 50 ~ 114 | 531 ~ 743 | 45 ~ 106 | 371 ~ 531 | 32 ~ 76 | 0.1 |
| 7 | 728 ~ 1,364 | 65 ~ 204 | 500 ~ 682 | 45 ~ 102 | 455 ~ 637 | 41 ~ 95 | 318 ~ 455 | 29 ~ 68 | 0.1 |
| 8 | 637 ~ 1,194 | 60 ~ 187 | 438 ~ 597 | 41 ~ 93 | 398 ~ 557 | 37 ~ 87 | 279 ~ 398 | 26 ~ 62 | 0.1 |
| 9 | 566 ~ 1,061 | 55 ~ 173 | 389 ~ 531 | 38 ~ 87 | 354 ~ 495 | 35 ~ 81 | 248 ~ 354 | 24 ~ 58 | 0.15 |
| 10 | 509 ~ 955 | 52 ~ 162 | 350 ~ 477 | 36 ~ 81 | 318 ~ 446 | 32 ~ 76 | 223 ~ 318 | 23 ~ 54 | 0.15 |
| 12 | 424 ~ 796 | 47 ~ 146 | 292 ~ 398 | 32 ~ 73 | 265 ~ 371 | 29 ~ 68 | 186 ~ 265 | 20 ~ 49 | 0.15 |
| 14 | 364 ~ 682 | 43 ~ 135 | 250 ~ 341 | 30 ~ 67 | 227 ~ 318 | 27 ~ 63 | 159 ~ 227 | 19 ~ 45 | 0.15 |
| 16 | 318 ~ 597 | 40 ~ 148 | 219 ~ 298 | 28 ~ 74 | 199 ~ 279 | 25 ~ 69 | 139 ~ 199 | 18 ~ 49 | 0.15 |
| 18 | 283 ~ 531 | 38 ~ 119 | 195 ~ 265 | 26 ~ 60 | 177 ~ 248 | 24 ~ 56 | 124 ~ 177 | 17 ~ 40 | 0.15 |
| 20 | 255 ~ 477 | 36 ~ 114 | 175 ~ 239 | 25 ~ 57 | 159 ~ 223 | 23 ~ 53 | 111 ~ 159 | 16 ~ 38 | 0.2 |

## ●CSCRS　超硬チャッキングリーマ　※φ6.1～φ30まで付刃　※Tipped Carbide for φ6.1～φ30

| 直径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 16~30m/min | | 切削速度 Cutting Speed 11~15m/min | | 切削速度 Cutting Speed 10~14m/min | | 切削速度 Cutting Speed 7~10m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 2 | 2,546 ～ 4,775 | 104 ～ 325 | 1,751 ～ 2,387 | 71 ～ 162 | 1,592 ～ 2,228 | 65 ～ 152 | 1,114 ～ 1,592 | 45 ～ 108 | 0.08 |
| 3 | 1,698 ～ 3,183 | 117 ～ 367 | 1,167 ～ 1,592 | 81 ～ 183 | 1,061 ～ 1,485 | 73 ～ 171 | 743 ～ 1,061 | 51 ～ 122 | 0.1 |
| 4 | 1,273 ～ 2,387 | 93 ～ 290 | 875 ～ 1,194 | 64 ～ 145 | 796 ～ 1,114 | 58 ～ 135 | 557 ～ 796 | 41 ～ 97 | 0.1 |
| 5 | 1,019 ～ 1,910 | 78 ～ 244 | 700 ～ 955 | 54 ～ 122 | 637 ～ 891 | 49 ～ 114 | 446 ～ 637 | 34 ～ 81 | 0.1 |
| 6 | 849 ～ 1,592 | 68 ～ 214 | 584 ～ 796 | 47 ～ 107 | 531 ～ 743 | 43 ～ 100 | 371 ～ 531 | 30 ～ 71 | 0.1 |
| 直径 Dia. | 切削速度 Cutting Speed 15~26m/min | | 切削速度 Cutting Speed 10~14m/min | | 切削速度 Cutting Speed 8~12m/min | | 切削速度 Cutting Speed 6~8m/min | | リーマ取代 (mm/直径) |
| 8 | 597 ～ 1,035 | 49 ～ 148 | 398 ～ 557 | 33 ～ 80 | 318 ～ 477 | 26 ～ 69 | 239 ～ 318 | 20 ～ 46 | 0.1 |
| 10 | 477 ～ 828 | 43 ～ 129 | 318 ～ 446 | 29 ～ 70 | 255 ～ 382 | 23 ～ 60 | 191 ～ 255 | 17 ～ 40 | 0.15 |
| 12 | 398 ～ 690 | 39 ～ 116 | 265 ～ 371 | 26 ～ 63 | 212 ～ 318 | 21 ～ 54 | 159 ～ 212 | 15 ～ 36 | 0.15 |
| 14 | 341 ～ 591 | 36 ～ 107 | 227 ～ 318 | 24 ～ 58 | 182 ～ 273 | 19 ～ 49 | 136 ～ 182 | 14 ～ 33 | 0.15 |
| 16 | 298 ～ 517 | 33 ～ 100 | 199 ～ 279 | 22 ～ 54 | 159 ～ 239 | 18 ～ 46 | 119 ～ 159 | 13 ～ 31 | 0.15 |
| 18 | 265 ～ 460 | 32 ～ 95 | 177 ～ 248 | 21 ～ 51 | 141 ～ 212 | 17 ～ 44 | 106 ～ 141 | 13 ～ 29 | 0.15 |
| 20 | 239 ～ 414 | 30 ～ 90 | 159 ～ 223 | 20 ～ 49 | 127 ～ 191 | 16 ～ 42 | 95 ～ 127 | 12 ～ 28 | 0.2 |
| 22 | 217 ～ 376 | 29 ～ 87 | 145 ～ 203 | 19 ～ 47 | 116 ～ 174 | 15 ～ 40 | 87 ～ 116 | 12 ～ 27 | 0.2 |
| 24 | 199 ～ 345 | 28 ～ 84 | 133 ～ 186 | 19 ～ 45 | 106 ～ 159 | 15 ～ 39 | 80 ～ 106 | 11 ～ 26 | 0.2 |
| 26 | 184 ～ 318 | 27 ～ 81 | 122 ～ 171 | 18 ～ 44 | 98 ～ 147 | 14 ～ 38 | 73 ～ 98 | 11 ～ 25 | 0.2 |
| 28 | 171 ～ 296 | 26 ～ 79 | 114 ～ 159 | 18 ～ 43 | 91 ～ 136 | 14 ～ 37 | 68 ～ 91 | 11 ～ 24 | 0.2 |
| 30 | 159 ～ 276 | 26 ～ 77 | 106 ～ 149 | 17 ～ 42 | 85 ～ 127 | 14 ～ 36 | 64 ～ 85 | 10 ～ 24 | 0.2 |

## ●CSCRL　超硬ロングシャンクチャッキングリーマ　※φ8～φ20まで先ムク　※Solid Head Carbide for φ8～φ20

| 直径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 16~30m/min | | 切削速度 Cutting Speed 11~15m/min | | 切削速度 Cutting Speed 10~14m/min | | 切削速度 Cutting Speed 7~10m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 3 | 1,698 ～ 3,183 | 117 ～ 367 | 1,167 ～ 1,592 | 81 ～ 183 | 1,061 ～ 1,485 | 73 ～ 171 | 743 ～ 1,061 | 51 ～ 122 | 0.1 |
| 4 | 1,273 ～ 2,387 | 93 ～ 290 | 875 ～ 1,194 | 64 ～ 145 | 796 ～ 1,114 | 58 ～ 135 | 557 ～ 796 | 41 ～ 97 | 0.1 |
| 5 | 1,019 ～ 1,910 | 78 ～ 244 | 700 ～ 955 | 54 ～ 122 | 637 ～ 891 | 49 ～ 114 | 446 ～ 637 | 34 ～ 81 | 0.1 |
| 6 | 849 ～ 1,592 | 68 ～ 214 | 584 ～ 796 | 47 ～ 107 | 531 ～ 743 | 43 ～ 100 | 371 ～ 531 | 30 ～ 71 | 0.1 |
| 7 | 728 ～ 1,364 | 61 ～ 192 | 500 ～ 682 | 42 ～ 96 | 455 ～ 637 | 38 ～ 90 | 318 ～ 455 | 27 ～ 64 | 0.1 |
| 直径 Dia. | 切削速度 Cutting Speed 16~26m/min | | 切削速度 Cutting Speed 10~14m/min | | 切削速度 Cutting Speed 8~12m/min | | 切削速度 Cutting Speed 6~8m/min | | リーマ取代 (mm/直径) |
| 8 | 637 ～ 1,035 | 53 ～ 148 | 398 ～ 557 | 33 ～ 80 | 318 ～ 477 | 26 ～ 69 | 239 ～ 318 | 20 ～ 46 | 0.1 |
| 9 | 566 ～ 920 | 49 ～ 138 | 354 ～ 495 | 31 ～ 74 | 283 ～ 424 | 24 ～ 64 | 212 ～ 283 | 18 ～ 42 | 0.15 |
| 10 | 509 ～ 828 | 46 ～ 129 | 318 ～ 446 | 29 ～ 70 | 255 ～ 382 | 23 ～ 60 | 191 ～ 255 | 17 ～ 40 | 0.15 |
| 12 | 424 ～ 690 | 41 ～ 116 | 265 ～ 371 | 26 ～ 63 | 212 ～ 318 | 21 ～ 54 | 159 ～ 212 | 15 ～ 36 | 0.15 |
| 14 | 364 ～ 591 | 38 ～ 107 | 227 ～ 318 | 24 ～ 58 | 182 ～ 273 | 19 ～ 49 | 136 ～ 182 | 14 ～ 33 | 0.15 |
| 16 | 318 ～ 517 | 36 ～ 100 | 199 ～ 279 | 22 ～ 54 | 159 ～ 239 | 18 ～ 46 | 119 ～ 159 | 13 ～ 31 | 0.15 |
| 18 | 283 ～ 460 | 34 ～ 95 | 177 ～ 248 | 21 ～ 51 | 141 ～ 212 | 17 ～ 44 | 106 ～ 141 | 13 ～ 29 | 0.15 |
| 20 | 255 ～ 414 | 32 ～ 90 | 159 ～ 223 | 20 ～ 49 | 127 ～ 191 | 16 ～ 42 | 95 ～ 127 | 12 ～ 28 | 0.2 |

## ●CSHR　ソリッドヘリカルリーマ

| 直径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 16~30m/min | | 切削速度 Cutting Speed 11~15m/min | | 切削速度 Cutting Speed 10~14m/min | | 切削速度 Cutting Speed 7~9m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 1 | 5,093 ～ 9,549 | 43 ～ 134 | 3,501 ～ 4,775 | 29 ～ 67 | 3,183 ～ 4,456 | 27 ～ 63 | 2,228 ～ 2,865 | 19 ～ 40 | 0.06 |
| 2 | 2,546 ～ 4,775 | 117 ～ 366 | 1,751 ～ 2,387 | 80 ～ 183 | 1,592 ～ 2,228 | 73 ～ 171 | 1,114 ～ 1,432 | 51 ～ 110 | 0.08 |
| 3 | 1,698 ～ 3,183 | 137 ～ 429 | 1,167 ～ 1,592 | 94 ～ 214 | 1,061 ～ 1,485 | 86 ～ 200 | 743 ～ 955 | 60 ～ 129 | 0.1 |
| 4 | 1,273 ～ 2,387 | 108 ～ 339 | 875 ～ 1,194 | 75 ～ 170 | 796 ～ 1,114 | 68 ～ 158 | 557 ～ 716 | 47 ～ 102 | 0.1 |
| 5 | 1,019 ～ 1,910 | 91 ～ 286 | 700 ～ 955 | 63 ～ 143 | 637 ～ 891 | 57 ～ 133 | 446 ～ 573 | 40 ～ 86 | 0.1 |
| 6 | 849 ～ 1,592 | 80 ～ 250 | 584 ～ 796 | 55 ～ 125 | 531 ～ 743 | 50 ～ 117 | 371 ～ 477 | 35 ～ 75 | 0.1 |
| 7 | 728 ～ 1,364 | 72 ～ 224 | 500 ～ 682 | 49 ～ 112 | 455 ～ 637 | 45 ～ 105 | 318 ～ 409 | 31 ～ 67 | 0.1 |
| 8 | 637 ～ 1,194 | 66 ～ 205 | 438 ～ 597 | 45 ～ 103 | 398 ～ 557 | 41 ～ 96 | 279 ～ 358 | 29 ～ 62 | 0.1 |
| 9 | 566 ～ 1,061 | 61 ～ 190 | 389 ～ 531 | 42 ～ 95 | 354 ～ 495 | 38 ～ 89 | 248 ～ 318 | 27 ～ 57 | 0.15 |
| 10 | 509 ～ 955 | 57 ～ 179 | 350 ～ 477 | 39 ～ 89 | 318 ～ 446 | 36 ～ 83 | 223 ～ 286 | 25 ～ 54 | 0.15 |

## ●CHHR　超硬ハイヘリカルリーマ　※φ5.1 ～φ30まで先ムク　※Solid Head Carbide forφ5.1 ～φ30
## ●CHHRT　超硬ハイヘリカルリーマ（テーパーシャンク）

| 直径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 18~34m/min | | 切削速度 Cutting Speed 12~16m/min | | 切削速度 Cutting Speed 11~15m/min | | 切削速度 Cutting Speed 8~10m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 2 | 2,865 ～ 5,411 | 129 ～ 408 | 1,910 ～ 2,546 | 86 ～ 192 | 1,751 ～ 2,387 | 79 ～ 180 | 1,273 ～ 1,592 | 57 ～ 120 | 0.08 |
| 3 | 1,910 ～ 3,608 | 151 ～ 478 | 1,273 ～ 1,698 | 101 ～ 225 | 1,167 ～ 1,592 | 92 ～ 211 | 849 ～ 1,061 | 67 ～ 141 | 0.1 |
| 4 | 1,432 ～ 2,706 | 120 ～ 378 | 955 ～ 1,273 | 80 ～ 178 | 875 ～ 1,194 | 73 ～ 167 | 637 ～ 796 | 53 ～ 111 | 0.1 |
| 5 | 1,146 ～ 2,165 | 101 ～ 319 | 764 ～ 1,019 | 67 ～ 150 | 700 ～ 955 | 62 ～ 141 | 509 ～ 637 | 45 ～ 94 | 0.1 |
| 直径 Dia. | 切削速度 Cutting Speed 18~34m/min | | 切削速度 Cutting Speed 12~16m/min | | 切削速度 Cutting Speed 11~15m/min | | 切削速度 Cutting Speed 8~10m/min | | リーマ取代 (mm/直径) |
| 6 | 955 ～ 1,804 | 80 ～ 242 | 637 ～ 849 | 53 ～ 114 | 584 ～ 796 | 49 ～ 107 | 424 ～ 531 | 36 ～ 71 | 0.1 |
| 7 | 819 ～ 1,546 | 72 ～ 218 | 546 ～ 728 | 48 ～ 102 | 500 ～ 682 | 44 ～ 96 | 364 ～ 455 | 32 ～ 64 | 0.1 |
| 8 | 716 ～ 1,353 | 66 ～ 199 | 477 ～ 637 | 44 ～ 94 | 438 ～ 597 | 40 ～ 88 | 318 ～ 398 | 29 ～ 59 | 0.1 |
| 9 | 637 ～ 1,203 | 61 ～ 185 | 424 ～ 566 | 41 ～ 87 | 389 ～ 531 | 37 ～ 81 | 283 ～ 354 | 27 ～ 54 | 0.15 |
| 10 | 573 ～ 1,082 | 57 ～ 173 | 382 ～ 509 | 38 ～ 81 | 350 ～ 477 | 35 ～ 76 | 255 ～ 318 | 25 ～ 51 | 0.15 |
| 12 | 477 ～ 902 | 52 ～ 156 | 318 ～ 424 | 34 ～ 73 | 292 ～ 398 | 32 ～ 69 | 212 ～ 265 | 23 ～ 46 | 0.15 |
| 14 | 409 ～ 773 | 47 ～ 143 | 273 ～ 364 | 32 ～ 68 | 250 ～ 341 | 29 ～ 63 | 182 ～ 227 | 21 ～ 42 | 0.15 |
| 16 | 358 ～ 676 | 44 ～ 134 | 239 ～ 318 | 30 ～ 63 | 219 ～ 298 | 27 ～ 59 | 159 ～ 199 | 20 ～ 39 | 0.15 |
| 18 | 318 ～ 601 | 42 ～ 127 | 212 ～ 283 | 28 ～ 60 | 195 ～ 265 | 26 ～ 56 | 141 ～ 177 | 19 ～ 37 | 0.15 |
| 20 | 286 ～ 541 | 40 ～ 121 | 191 ～ 255 | 27 ～ 57 | 175 ～ 239 | 25 ～ 53 | 127 ～ 159 | 18 ～ 36 | 0.2 |
| 25 | 229 ～ 433 | 37 ～ 111 | 153 ～ 204 | 24 ～ 52 | 140 ～ 191 | 22 ～ 49 | 102 ～ 127 | 16 ～ 33 | 0.2 |
| 30 | 191 ～ 361 | 34 ～ 104 | 127 ～ 170 | 23 ～ 49 | 117 ～ 159 | 21 ～ 46 | 85 ～ 106 | 15 ～ 31 | 0.2 |

## ●CSTPR　ソリッドテーパーピンリーマ
## ●CSPGR　ソリッドピンゲートリーマ

| 直径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 12~18m/min | | 切削速度 Cutting Speed 8~12m/min | | 切削速度 Cutting Speed 6~9m/min | | 切削速度 Cutting Speed 4~8m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 1 | 3,820 ～ 5,730 | 46 ～ 69 | 2,546 ～ 3,820 | 31 ～ 46 | 1,910 ～ 2,865 | 23 ～ 34 | 1,273 ～ 2,546 | 15 ～ 31 |
| 2 | 1,910 ～ 2,865 | 27 ～ 41 | 1,273 ～ 1,910 | 18 ～ 27 | 955 ～ 1,432 | 14 ～ 20 | 637 ～ 1,273 | 9 ～ 18 |
| 3 | 1,273 ～ 1,910 | 21 ～ 32 | 849 ～ 1,273 | 14 ～ 21 | 637 ～ 955 | 11 ～ 16 | 424 ～ 849 | 7 ～ 14 |
| 4 | 955 ～ 1,432 | 18 ～ 27 | 637 ～ 955 | 12 ～ 18 | 477 ～ 716 | 9 ～ 13 | 318 ～ 637 | 6 ～ 12 |
| 5 | 764 ～ 1,146 | 16 ～ 24 | 509 ～ 764 | 11 ～ 16 | 382 ～ 573 | 8 ～ 12 | 255 ～ 509 | 5 ～ 11 |
| 6 | 637 ～ 955 | 15 ～ 22 | 424 ～ 637 | 10 ～ 15 | 318 ～ 477 | 7 ～ 11 | 212 ～ 424 | 5 ～ 10 |
| 7 | 546 ～ 819 | 14 ～ 21 | 364 ～ 546 | 9 ～ 14 | 273 ～ 409 | 7 ～ 10 | 182 ～ 364 | 5 ～ 9 |
| 8 | 477 ～ 716 | 13 ～ 20 | 318 ～ 477 | 9 ～ 13 | 239 ～ 358 | 7 ～ 10 | 159 ～ 318 | 4 ～ 9 |
| 10 | 382 ～ 573 | 12 ～ 18 | 255 ～ 382 | 8 ～ 12 | 191 ～ 286 | 6 ～ 9 | 127 ～ 255 | 4 ～ 8 |
| 12 | 318 ～ 477 | 12 ～ 18 | 212 ～ 318 | 8 ～ 12 | 159 ～ 239 | 6 ～ 9 | 106 ～ 212 | 4 ～ 8 |
| 13 | 294 ～ 441 | 11 ～ 17 | 196 ～ 294 | 8 ～ 11 | 147 ～ 220 | 6 ～ 9 | 98 ～ 196 | 4 ～ 8 |

※表中の加工径とは加工される穴径の大径値としています。
※推奨加工長は4°まで加工径の3倍　4°以上は加工径の2倍を目安にしてください。（CSTPRは3倍で設定しております）
※推奨加工長を超える場合は、ハンドリングで様子を見ながら加工してください。

＊Dia. is maximum milling diameter.
＊Recommended milling length.
CSPGR; In case that Taper Angle is up to 4°, milling length is 3 times of milling diameter.
In case that Taper Angle is over 4°, milling length is 2 times of milling diameter.
CSTPR; Milling length is 3 times of milling diameter.
＊In case of exceeding recommended length, proceed milling by adjusting feed rate.

## ●CSPOTR　超硬オイルホールスパイラルテーパーリーマ

| 加工径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 ～ 38HRC HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~25m/min | | 切削速度 Cutting Speed 11~15m/min | | 切削速度 Cutting Speed 10~12m/min | | 切削速度 Cutting Speed 8~10m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| **10** | 477 ～ 796 | 15 ～ 24 | 350 ～ 477 | 11 ～ 15 | 318 ～ 382 | 10 ～ 12 | 255 ～ 318 | 8 ～ 10 |
| **12** | 398 ～ 663 | 14 ～ 23 | 292 ～ 398 | 10 ～ 14 | 265 ～ 318 | 9 ～ 11 | 212 ～ 265 | 7 ～ 9 |
| **14** | 341 ～ 568 | 13 ～ 22 | 250 ～ 341 | 10 ～ 13 | 227 ～ 273 | 9 ～ 11 | 182 ～ 227 | 7 ～ 9 |
| **16** | 298 ～ 497 | 13 ～ 22 | 219 ～ 298 | 10 ～ 13 | 199 ～ 239 | 9 ～ 10 | 159 ～ 199 | 7 ～ 9 |
| **18** | 265 ～ 442 | 13 ～ 21 | 195 ～ 265 | 9 ～ 13 | 177 ～ 212 | 9 ～ 10 | 141 ～ 177 | 7 ～ 8 |
| **20** | 239 ～ 398 | 12 ～ 21 | 175 ～ 239 | 9 ～ 12 | 159 ～ 191 | 8 ～ 10 | 127 ～ 159 | 7 ～ 8 |
| **25** | 191 ～ 318 | 12 ～ 20 | 140 ～ 191 | 9 ～ 12 | 127 ～ 153 | 8 ～ 10 | 102 ～ 127 | 6 ～ 8 |
| **30** | 159 ～ 265 | 12 ～ 19 | 117 ～ 159 | 9 ～ 12 | 106 ～ 127 | 8 ～ 9 | 85 ～ 106 | 6 ～ 8 |

※表中の加工径とは加工される穴径の大径値としています。
※推奨加工長は加工径の3倍を目安にしてください。
※推奨加工長を超える場合は、ハンドリングで様子を見ながら加工してください。
Dia. is maximum milling diameter.
Recommended milling length is 3 times of milling diameter.
In case of exceeding recommended length, proceed milling by adjusting feed rate.

## ●NCR-C　自動旋盤用リーマ
## ●TiN-SR　TiNストレートリーマ

## ●MCR-TiN　マシンチャッキングリーマ
## ●TiN-SPR　TiNスパイラルリーマ

| 直径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～38HRC HPM. NAK | | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~25m/min | | 切削速度 Cutting Speed 9~12m/min | | 切削速度 Cutting Speed 8~11m/min | | 切削速度 Cutting Speed 6~9m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 2 | 2,387 ～ 3,979 | 123 ～ 343 | 1,432 ～ 1,910 | 74 ～ 164 | 1,273 ～ 1,751 | 66 ～ 151 | 955 ～ 1,432 | 49 ～ 123 | 0.08 |
| 3 | 1,592 ～ 2,653 | 138 ～ 401 | 955 ～ 1,273 | 78 ～ 193 | 849 ～ 1,167 | 73 ～ 176 | 637 ～ 955 | 55 ～ 144 | 0.1 |
| 4 | 1,194 ～ 1,989 | 109 ～ 318 | 716 ～ 955 | 62 ～ 152 | 637 ～ 875 | 58 ～ 140 | 477 ～ 716 | 44 ～ 114 | 0.1 |
| 5 | 955 ～ 1,592 | 92 ～ 267 | 573 ～ 764 | 52 ～ 128 | 509 ～ 700 | 49 ～ 118 | 382 ～ 573 | 37 ～ 96 | 0.1 |
| 6 | 796 ～ 1,326 | 80 ～ 234 | 477 ～ 637 | 46 ～ 112 | 424 ～ 584 | 43 ～ 103 | 318 ～ 477 | 32 ～ 84 | 0.1 |
| 7 | 682 ～ 1,137 | 72 ～ 210 | 409 ～ 546 | 41 ～ 101 | 364 ～ 500 | 38 ～ 92 | 273 ～ 409 | 29 ～ 76 | 0.1 |
| 8 | 597 ～ 995 | 66 ～ 192 | 358 ～ 477 | 38 ～ 92 | 318 ～ 438 | 35 ～ 85 | 239 ～ 358 | 26 ～ 69 | 0.1 |
| 9 | 531 ～ 884 | 61 ～ 178 | 318 ～ 424 | 35 ～ 86 | 283 ～ 389 | 33 ～ 78 | 212 ～ 318 | 24 ～ 64 | 0.15 |
| 10 | 477 ～ 796 | 57 ～ 167 | 286 ～ 382 | 33 ～ 80 | 255 ～ 350 | 31 ～ 74 | 191 ～ 286 | 23 ～ 60 | 0.15 |
| 12 | 398 ～ 663 | 52 ～ 150 | 239 ～ 318 | 29 ～ 72 | 212 ～ 292 | 28 ～ 66 | 159 ～ 239 | 21 ～ 54 | 0.15 |
| 14 | 341 ～ 568 | 47 ～ 138 | 205 ～ 273 | 27 ～ 66 | 182 ～ 250 | 25 ～ 61 | 136 ～ 205 | 19 ～ 50 | 0.15 |
| 16 | 298 ～ 497 | 44 ～ 130 | 179 ～ 239 | 25 ～ 62 | 159 ～ 219 | 24 ～ 57 | 119 ～ 179 | 18 ～ 47 | 0.15 |
| 18 | 265 ～ 442 | 42 ～ 123 | 159 ～ 212 | 24 ～ 59 | 141 ～ 195 | 22 ～ 54 | 106 ～ 159 | 17 ～ 44 | 0.15 |
| 20 | 239 ～ 398 | 40 ～ 117 | 143 ～ 191 | 23 ～ 56 | 126 ～ 175 | 21 ～ 51 | 95 ～ 143 | 16 ～ 42 | 0.15 |

## ●ERR-TiN　エンド刃付止穴用リーマ

| 直径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～38HRC HPM. NAK | | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 16~30m/min | | 切削速度 Cutting Speed 10~15m/min | | 切削速度 Cutting Speed 9~13m/min | | 切削速度 Cutting Speed 6~10m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 3 | 1,698 ～ 3,183 | 147 ～ 481 | 1,061 ～ 1,592 | 76 ～ 241 | 955 ～ 1,379 | 83 ～ 209 | 637 ～ 1,061 | 55 ～ 160 | 0.1 |
| 3.5 | 1,455 ～ 2,728 | 129 ～ 424 | 909 ～ 1,364 | 79 ～ 212 | 819 ～ 1,182 | 73 ～ 184 | 546 ～ 909 | 48 ～ 141 | 0.1 |
| 4 | 1,273 ～ 2,387 | 116 ～ 381 | 796 ～ 1,194 | 71 ～ 191 | 716 ～ 1,035 | 65 ～ 165 | 477 ～ 796 | 44 ～ 127 | 0.1 |
| 4.5 | 1,132 ～ 2,122 | 106 ～ 348 | 707 ～ 1,061 | 65 ～ 174 | 637 ～ 920 | 60 ～ 151 | 424 ～ 707 | 40 ～ 116 | 0.1 |
| 5 | 1,019 ～ 1,910 | 98 ～ 321 | 637 ～ 955 | 60 ～ 160 | 573 ～ 828 | 55 ～ 139 | 382 ～ 637 | 37 ～ 107 | 0.1 |
| 5.5 | 926 ～ 1,736 | 91 ～ 299 | 579 ～ 868 | 56 ～ 149 | 521 ～ 752 | 51 ～ 130 | 347 ～ 579 | 34 ～ 100 | 0.1 |
| 6 | 849 ～ 1,592 | 86 ～ 281 | 531 ～ 796 | 52 ～ 140 | 477 ～ 690 | 48 ～ 122 | 318 ～ 531 | 32 ～ 94 | 0.1 |
| 7 | 728 ～ 1,364 | 77 ～ 252 | 455 ～ 682 | 46 ～ 126 | 409 ～ 591 | 43 ～ 109 | 273 ～ 455 | 29 ～ 84 | 0.15 |
| 8 | 637 ～ 1,194 | 70 ～ 231 | 398 ～ 597 | 42 ～ 115 | 358 ～ 517 | 40 ～ 100 | 239 ～ 398 | 26 ～ 77 | 0.15 |
| 9 | 566 ～ 1,061 | 65 ～ 214 | 354 ～ 531 | 39 ～ 107 | 318 ～ 460 | 37 ～ 93 | 212 ～ 354 | 24 ～ 71 | 0.15 |
| 10 | 509 ～ 955 | 61 ～ 201 | 318 ～ 477 | 37 ～ 100 | 286 ～ 414 | 34 ～ 87 | 191 ～ 318 | 23 ～ 67 | 0.15 |
| 11 | 463 ～ 868 | 58 ～ 190 | 289 ～ 434 | 35 ～ 95 | 260 ～ 376 | 33 ～ 82 | 174 ～ 289 | 22 ～ 63 | 0.15 |
| 12 | 424 ～ 796 | 55 ～ 180 | 265 ～ 398 | 33 ～ 90 | 239 ～ 345 | 31 ～ 78 | 159 ～ 265 | 21 ～ 60 | 0.15 |
| 13 | 392 ～ 735 | 53 ～ 173 | 245 ～ 367 | 32 ～ 86 | 220 ～ 318 | 30 ～ 75 | 147 ～ 245 | 20 ～ 58 | 0.15 |
| 14 | 364 ～ 682 | 51 ～ 166 | 227 ～ 341 | 31 ～ 83 | 205 ～ 296 | 28 ～ 72 | 136 ～ 227 | 19 ～ 55 | 0.15 |
| 15 | 340 ～ 637 | 49 ～ 160 | 212 ～ 318 | 30 ～ 80 | 191 ～ 276 | 28 ～ 70 | 127 ～ 212 | 18 ～ 53 | 0.15 |
| 16 | 318 ～ 597 | 47 ～ 155 | 199 ～ 298 | 29 ～ 78 | 179 ～ 259 | 27 ～ 67 | 119 ～ 199 | 18 ～ 52 | 0.15 |
| 17 | 300 ～ 562 | 46 ～ 151 | 187 ～ 281 | 28 ～ 75 | 169 ～ 243 | 26 ～ 35 | 112 ～ 187 | 17 ～ 50 | 0.15 |
| 18 | 283 ～ 531 | 45 ～ 147 | 177 ～ 265 | 27 ～ 74 | 159 ～ 230 | 25 ～ 34 | 106 ～ 177 | 17 ～ 49 | 0.15 |
| 19 | 268 ～ 503 | 44 ～ 144 | 168 ～ 251 | 27 ～ 72 | 151 ～ 218 | 25 ～ 32 | 101 ～ 168 | 16 ～ 48 | 0.15 |
| 20 | 255 ～ 477 | 43 ～ 140 | 159 ～ 239 | 26 ～ 70 | 143 ～ 207 | 24 ～ 31 | 95 ～ 159 | 16 ～ 47 | 0.2 |
| 22 | 231 ～ 434 | 41 ～ 135 | 145 ～ 217 | 24 ～ 67 | 130 ～ 188 | 23 ～ 58 | 87 ～ 145 | 15 ～ 45 | 0.2 |
| 25 | 204 ～ 382 | 39 ～ 128 | 127 ～ 191 | 23 ～ 64 | 115 ～ 166 | 22 ～ 56 | 76 ～ 127 | 15 ～ 43 | 0.2 |
| 30 | 170 ～ 318 | 37 ～ 120 | 106 ～ 159 | 20 ～ 60 | 95 ～ 138 | 21 ～ 52 | 64 ～ 106 | 14 ～ 40 | 0.2 |
| 35 | 146 ～ 273 | 35 ～ 115 | 91 ～ 136 | 20 ～ 57 | 82 ～ 118 | 20 ～ 50 | 55 ～ 91 | 13 ～ 38 | 0.3 |
| 40 | 127 ～ 239 | 34 ～ 110 | 80 ～ 119 | 19 ～ 55 | 72 ～ 103 | 19 ～ 48 | 48 ～ 80 | 13 ～ 37 | 0.3 |
| 50 | 102 ～ 191 | 32 ～ 104 | 64 ～ 95 | 17 ～ 52 | 57 ～ 83 | 18 ～ 45 | 38 ～ 64 | 12 ～ 35 | 0.4 |

## ●HR　ハンドリーマ
## ●LHR　ロングハンドリーマ
## ●SPHR　スパイラルハンドリーマ
## ●SPLHR　スパイラルロングハンドリーマ

| 直径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～38HRC HPM. NAK | | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 7~10m/min | | 切削速度 Cutting Speed 6~9m/min | | 切削速度 Cutting Speed 4~6m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 0.5 | 7,639～12,732 | 34～95 | 4,456～6,366 | 20～48 | 3,820～5,730 | 17～43 | 2,546～3,820 | 11～29 | 0.05 |
| 1 | 3,820～6,366 | 34～95 | 2,228～3,183 | 20～48 | 1,910～2,865 | 17～43 | 1,273～1,910 | 11～29 | 0.06 |
| 2 | 1,910～3,183 | 97～271 | 1,114～1,592 | 57～135 | 955～1,432 | 49～122 | 637～955 | 32～81 | 0.08 |
| 3 | 1,273～2,122 | 110～306 | 743～1,061 | 64～153 | 637～955 | 55～138 | 424～637 | 37～92 | 0.1 |
| 4 | 955～1,592 | 77～242 | 557～796 | 45～121 | 477～716 | 39～109 | 318～477 | 26～73 | 0.1 |
| 5 | 764～1,273 | 73～204 | 446～637 | 43～102 | 382～573 | 37～92 | 255～382 | 24～61 | 0.1 |
| 6 | 637～1,061 | 64～178 | 371～531 | 37～89 | 318～477 | 32～80 | 212～318 | 21～53 | 0.1 |
| 7 | 546～909 | 58～160 | 318～455 | 34～80 | 273～409 | 29～72 | 182～273 | 19～48 | 0.1 |
| 8 | 477～796 | 53～146 | 279～398 | 31～73 | 239～358 | 26～66 | 159～239 | 18～44 | 0.1 |
| 9 | 424～707 | 49～136 | 248～354 | 29～68 | 212～318 | 24～61 | 141～212 | 16～41 | 0.15 |
| 10 | 382～637 | 46～127 | 223～318 | 27～64 | 191～286 | 23～57 | 127～191 | 15～38 | 0.15 |
| 12 | 318～531 | 41～115 | 186～265 | 24～57 | 159～239 | 21～52 | 106～159 | 14～34 | 0.15 |
| 14 | 273～455 | 38～105 | 159～227 | 22～53 | 136～205 | 19～47 | 91～136 | 13～32 | 0.15 |
| 16 | 239～398 | 36～99 | 139～199 | 21～49 | 119～179 | 18～44 | 80～119 | 12～30 | 0.15 |
| 18 | 212～354 | 34～93 | 124～177 | 20～47 | 106～159 | 17～42 | 71～106 | 11～28 | 0.15 |
| 20 | 191～318 | 32～89 | 111～159 | 19～45 | 95～143 | 16～40 | 64～95 | 11～27 | 0.2 |
| 22 | 174～289 | 31～86 | 101～145 | 18～43 | 87～130 | 15～39 | 58～87 | 10～26 | 0.2 |
| 24 | 159～265 | 30～83 | 93～133 | 17～41 | 80～119 | 15～37 | 53～80 | 10～25 | 0.2 |
| 26 | 147～245 | 29～80 | 86～122 | 17～40 | 73～110 | 14～36 | 49～73 | 10～24 | 0.2 |
| 28 | 136～227 | 28～78 | 80～114 | 16～39 | 68～102 | 14～35 | 45～68 | 9～23 | 0.2 |
| 30 | 127～212 | 28～76 | 74～106 | 16～38 | 64～95 | 14～34 | 42～64 | 9～23 | 0.3 |
| 32 | 119～199 | 27～75 | 70～99 | 16～37 | 60～90 | 13～34 | 40～60 | 9～22 | 0.3 |
| 35 | 109～182 | 26～71 | 64～91 | 15～36 | 55～82 | 13～32 | 36～55 | 9～21 | 0.3 |
| 40 | 95～159 | 25～70 | 56～80 | 15～35 | 48～72 | 13～32 | 32～48 | 8～21 | 0.3 |
| 45 | 85～141 | 24～68 | 50～71 | 14～34 | 42～64 | 12～31 | 28～42 | 8～20 | 0.3 |
| 50 | 76～127 | 24～66 | 45～64 | 14～33 | 38～57 | 12～30 | 25～38 | 8～20 | 0.4 |
| 55 | 69～116 | 23～65 | 41～58 | 14～32 | 35～52 | 12～29 | 23～35 | 8～19 | 0.4 |
| 60 | 64～106 | 23～64 | 37～53 | 13～32 | 32～48 | 11～29 | 21～32 | 8～19 | 0.4 |

## ●HHHR　ハイヘリカルリーマ
## ●HHHRT　ハイヘリカルリーマ（テーパーシャンク）
## ●HHHRL　ロングハイヘリカルリーマ
## ●HHHRTL　ロングハイヘリカルリーマ（テーパーシャンク）

| 直径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～38HRC HPM. NAK | | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 16~25m/min | | 切削速度 Cutting Speed 9~13m/min | | 切削速度 Cutting Speed 8~12m/min | | 切削速度 Cutting Speed 5~8m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 2 | 2,546～3,979 | 126～328 | 1,432～2,069 | 71～171 | 1,273～1,910 | 63～157 | 796～1,273 | 39～105 | 0.08 |
| 3 | 1,698～2,653 | 142～371 | 955～1,379 | 80～193 | 849～1,273 | 71～178 | 531～849 | 44～119 | 0.1 |
| 4 | 1,273～1,989 | 113～293 | 716～1,035 | 63～153 | 637～955 | 56～141 | 398～637 | 35～94 | 0.1 |
| 5 | 1,019～1,592 | 95～247 | 573～828 | 53～128 | 509～764 | 47～119 | 318～509 | 30～79 | 0.1 |
| 6 | 849～1,326 | 83～216 | 477～690 | 47～112 | 424～637 | 41～104 | 265～424 | 26～69 | 0.1 |
| 7 | 728～1,137 | 75～194 | 409～591 | 42～101 | 364～546 | 37～93 | 227～364 | 23～62 | 0.1 |
| 8 | 637～995 | 68～178 | 358～517 | 38～92 | 318～477 | 34～85 | 199～318 | 21～57 | 0.1 |
| 9 | 566～884 | 63～165 | 318～460 | 36～86 | 283～424 | 32～79 | 177～283 | 20～53 | 0.15 |
| 10 | 509～796 | 59～150 | 286～414 | 33～78 | 255～382 | 30～72 | 159～255 | 19～48 | 0.15 |
| 12 | 424～663 | 53～139 | 239～345 | 30～72 | 212～318 | 27～67 | 133～212 | 17～44 | 0.15 |
| 14 | 364～568 | 49～128 | 205～296 | 28～67 | 182～273 | 25～61 | 114～182 | 15～41 | 0.15 |
| 16 | 318～497 | 46～120 | 179～259 | 26～62 | 159～239 | 23～57 | 99～159 | 14～38 | 0.15 |
| 18 | 283～442 | 43～113 | 159～230 | 24～59 | 141～212 | 22～54 | 88～141 | 14～36 | 0.15 |
| 20 | 255～398 | 41～108 | 143～207 | 23～56 | 127～191 | 21～52 | 80～127 | 13～35 | 0.2 |
| 22 | 231～362 | 40～104 | 130～188 | 22～54 | 116～174 | 20～50 | 72～116 | 12～33 | 0.2 |
| 24 | 212～332 | 39～100 | 119～172 | 22～52 | 106～159 | 19～48 | 66～106 | 12～32 | 0.2 |
| 26 | 196～306 | 37～97 | 110～159 | 21～51 | 98～147 | 19～47 | 61～98 | 12～31 | 0.2 |
| 28 | 182～284 | 36～95 | 102～148 | 20～49 | 91～136 | 18～46 | 57～91 | 11～30 | 0.2 |
| 30 | 170～265 | 36～93 | 95～138 | 20～48 | 85～127 | 18～44 | 53～85 | 11～30 | 0.3 |
| 35 | 146～227 | 34～88 | 82～118 | 19～46 | 73～109 | 17～42 | 45～73 | 11～28 | 0.3 |
| 40 | 127～199 | 33～85 | 72～103 | 18～44 | 64～95 | 16～41 | 40～64 | 10～27 | 0.3 |

**●SCR** ストレートシャンクチャッキングリーマ
**●SPSCR** ストレートシャンクスパイラルチャッキングリーマ
**●SCRL** ロングシャンクチャッキングリーマ
**●TCR** テーパーシャンクチャッキングリーマ
**●MR** マシンリーマ
**●SPMR** スパイラルマシンリーマ
**●LMR** ロングマシンリーマ
**●SPLMR** スパイラルロングマシンリーマ

| 直径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 ～38HRC HPM. NAK | | リーマ取代 (mm/直径) Removal amount (mm/dia) |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 7~10m/min | | 切削速度 Cutting Speed 6~9m/min | | 切削速度 Cutting Speed 4~6m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 2 | 1,910 ～ 3,183 | 102 ～ 284 | 1,114 ～ 1,592 | 60 ～ 142 | 955 ～ 1,432 | 51 ～ 128 | 637 ～ 955 | 34 ～ 85 | 0.08 |
| 3 | 1,273 ～ 2,122 | 116 ～ 321 | 743 ～ 1,061 | 67 ～ 160 | 637 ～ 955 | 58 ～ 144 | 424 ～ 637 | 39 ～ 96 | 0.1 |
| 4 | 955 ～ 1,592 | 91 ～ 254 | 557 ～ 796 | 53 ～ 127 | 477 ～ 716 | 46 ～ 114 | 318 ～ 477 | 30 ～ 76 | 0.1 |
| 5 | 764 ～ 1,273 | 77 ～ 214 | 446 ～ 637 | 45 ～ 107 | 382 ～ 573 | 39 ～ 96 | 255 ～ 382 | 26 ～ 64 | 0.1 |
| 6 | 637 ～ 1,061 | 67 ～ 187 | 371 ～ 531 | 39 ～ 94 | 318 ～ 477 | 34 ～ 84 | 212 ～ 318 | 22 ～ 56 | 0.1 |
| 7 | 546 ～ 909 | 61 ～ 168 | 318 ～ 455 | 35 ～ 84 | 273 ～ 409 | 30 ～ 76 | 182 ～ 273 | 20 ～ 50 | 0.1 |
| 8 | 477 ～ 796 | 55 ～ 154 | 279 ～ 398 | 32 ～ 77 | 239 ～ 358 | 28 ～ 69 | 159 ～ 239 | 18 ～ 46 | 0.1 |
| 9 | 424 ～ 707 | 51 ～ 143 | 248 ～ 354 | 30 ～ 71 | 212 ～ 318 | 26 ～ 64 | 141 ～ 212 | 17 ～ 43 | 0.15 |
| 10 | 382 ～ 637 | 48 ～ 134 | 223 ～ 318 | 28 ～ 67 | 191 ～ 286 | 24 ～ 60 | 127 ～ 191 | 16 ～ 40 | 0.15 |
| 12 | 318 ～ 531 | 43 ～ 120 | 186 ～ 265 | 25 ～ 60 | 159 ～ 239 | 22 ～ 54 | 106 ～ 159 | 14 ～ 36 | 0.15 |
| 15 | 255 ～ 424 | 37 ～ 103 | 149 ～ 212 | 22 ～ 52 | 127 ～ 191 | 19 ～ 47 | 85 ～ 127 | 12 ～ 31 | 0.15 |
| 20 | 191 ～ 318 | 34 ～ 94 | 111 ～ 159 | 20 ～ 47 | 95 ～ 143 | 17 ～ 42 | 64 ～ 95 | 11 ～ 28 | 0.2 |
| 25 | 153 ～ 255 | 31 ～ 86 | 89 ～ 127 | 18 ～ 43 | 76 ～ 115 | 15 ～ 39 | 51 ～ 76 | 10 ～ 26 | 0.2 |
| 30 | 127 ～ 212 | 29 ～ 80 | 74 ～ 106 | 17 ～ 40 | 64 ～ 95 | 14 ～ 36 | 42 ～ 64 | 10 ～ 24 | 0.3 |
| 35 | 109 ～ 182 | 28 ～ 76 | 64 ～ 91 | 16 ～ 38 | 55 ～ 82 | 14 ～ 34 | 36 ～ 55 | 9 ～ 23 | 0.3 |
| 40 | 95 ～ 159 | 26 ～ 74 | 56 ～ 80 | 15 ～ 37 | 48 ～ 72 | 13 ～ 33 | 32 ～ 48 | 9 ～ 22 | 0.3 |
| 45 | 85 ～ 141 | 26 ～ 71 | 50 ～ 71 | 15 ～ 36 | 42 ～ 64 | 13 ～ 32 | 28 ～ 42 | 9 ～ 21 | 0.3 |
| 50 | 76 ～ 127 | 25 ～ 70 | 45 ～ 64 | 15 ～ 35 | 38 ～ 57 | 13 ～ 31 | 25 ～ 38 | 8 ～ 21 | 0.4 |
| 55 | 69 ～ 116 | 25 ～ 68 | 41 ～ 58 | 14 ～ 34 | 35 ～ 52 | 12 ～ 31 | 23 ～ 35 | 8 ～ 20 | 0.4 |
| 60 | 64 ～ 106 | 24 ～ 67 | 37 ～ 53 | 14 ～ 33 | 32 ～ 48 | 12 ～ 30 | 21 ～ 32 | 8 ～ 20 | 0.4 |
| 65 | 59 ～ 98 | 24 ～ 66 | 34 ～ 49 | 14 ～ 33 | 29 ～ 44 | 12 ～ 30 | 20 ～ 29 | 8 ～ 20 | 0.4 |
| 70 | 55 ～ 91 | 23 ～ 65 | 32 ～ 45 | 14 ～ 32 | 27 ～ 41 | 12 ～ 29 | 18 ～ 27 | 8 ～ 19 | 0.4 |
| 75 | 51 ～ 85 | 23 ～ 64 | 30 ～ 42 | 13 ～ 32 | 25 ～ 38 | 12 ～ 29 | 17 ～ 25 | 8 ～ 19 | 0.4 |
| 80 | 48 ～ 80 | 23 ～ 64 | 28 ～ 40 | 13 ～ 32 | 24 ～ 36 | 11 ～ 29 | 16 ～ 24 | 8 ～ 19 | 0.4 |
| 85 | 45 ～ 75 | 23 ～ 63 | 26 ～ 37 | 13 ～ 31 | 22 ～ 34 | 11 ～ 28 | 15 ～ 22 | 8 ～ 19 | 0.4 |
| 90 | 42 ～ 71 | 22 ～ 62 | 25 ～ 35 | 13 ～ 31 | 21 ～ 32 | 11 ～ 28 | 14 ～ 21 | 7 ～ 19 | 0.4 |
| 100 | 38 ～ 64 | 22 ～ 61 | 22 ～ 32 | 13 ～ 31 | 19 ～ 29 | 11 ～ 28 | 13 ～ 19 | 7 ～ 18 | 0.4 |

**●DR** ドリルリーマ
**●DRT** ドリルリーマ（テーパーシャンク）

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | |
|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 16~25m/min | | 切削速度 Cutting Speed 12~18m/min | | 切削速度 Cutting Speed 10~16m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 5 | 1,019 ～ 1,592 | 20 ～ 127 | 764 ～ 1,146 | 15 ～ 92 | 637 ～ 1,019 | 13 ～ 81 |
| 6 | 849 ～ 1,326 | 17 ～ 106 | 637 ～ 955 | 13 ～ 76 | 531 ～ 849 | 11 ～ 68 |
| 7 | 728 ～ 1,137 | 15 ～ 91 | 546 ～ 819 | 11 ～ 65 | 455 ～ 728 | 9 ～ 58 |
| 8 | 637 ～ 995 | 13 ～ 80 | 477 ～ 716 | 10 ～ 57 | 398 ～ 637 | 8 ～ 51 |
| 9 | 566 ～ 884 | 11 ～ 71 | 424 ～ 637 | 8 ～ 51 | 354 ～ 566 | 7 ～ 45 |
| 10 | 509 ～ 796 | 10 ～ 64 | 382 ～ 573 | 8 ～ 46 | 318 ～ 509 | 6 ～ 41 |
| 12 | 424 ～ 663 | 8 ～ 53 | 318 ～ 477 | 6 ～ 38 | 265 ～ 424 | 5 ～ 34 |
| 14 | 364 ～ 568 | 7 ～ 45 | 273 ～ 409 | 5 ～ 33 | 227 ～ 364 | 5 ～ 29 |
| 16 | 318 ～ 497 | 6 ～ 40 | 239 ～ 358 | 5 ～ 29 | 199 ～ 318 | 4 ～ 25 |
| 18 | 283 ～ 442 | 6 ～ 35 | 212 ～ 318 | 4 ～ 25 | 177 ～ 283 | 4 ～ 23 |
| 20 | 255 ～ 398 | 5 ～ 32 | 191 ～ 286 | 4 ～ 23 | 159 ～ 255 | 3 ～ 20 |
| 25 | 204 ～ 318 | 4 ～ 25 | 153 ～ 229 | 3 ～ 18 | 127 ～ 204 | 3 ～ 16 |
| 30 | 170 ～ 265 | 3 ～ 21 | 127 ～ 191 | 3 ～ 15 | 106 ～ 170 | 2 ～ 14 |
| 35 | 146 ～ 227 | 3 ～ 18 | 109 ～ 164 | 2 ～ 13 | 91 ～ 146 | 2 ～ 12 |
| 40 | 127 ～ 199 | 3 ～ 16 | 95 ～ 143 | 2 ～ 11 | 80 ～ 127 | 2 ～ 10 |

## ●TPR　テーパーピンリーマ
## ●SPTPR　スパイラルテーパーピンリーマ
## ●HTPR　ヘリカルテーパーピンリーマ
## ●TPRT　マシン用テーパーピンリーマ
## ●HTPRT　マシン用ヘリカルテーパーピンリーマ

| 加工径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 ～38HRC HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 10~15m/min | | 切削速度 Cutting Speed 7~10m/min | | 切削速度 Cutting Speed 5~8m/min | | 切削速度 Cutting Speed 4~7m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 1 | 3,183 ～ 4,775 | 38 ～ 57 | 2,228 ～ 3,183 | 27 ～ 38 | 1,592 ～ 2,546 | 19 ～ 31 | 1,273 ～ 2,228 | 15 ～ 27 |
| 2 | 1,592 ～ 2,387 | 23 ～ 34 | 1,114 ～ 1,592 | 16 ～ 23 | 796 ～ 1,273 | 11 ～ 18 | 637 ～ 1,114 | 9 ～ 16 |
| 3 | 1,061 ～ 1,592 | 18 ～ 26 | 743 ～ 1,061 | 12 ～ 18 | 531 ～ 849 | 9 ～ 14 | 424 ～ 743 | 7 ～ 12 |
| 4 | 796 ～ 1,194 | 15 ～ 22 | 557 ～ 796 | 10 ～ 15 | 398 ～ 637 | 7 ～ 12 | 318 ～ 557 | 6 ～ 10 |
| 5 | 637 ～ 955 | 13 ～ 20 | 446 ～ 637 | 9 ～ 13 | 318 ～ 509 | 7 ～ 11 | 255 ～ 446 | 5 ～ 9 |
| 6 | 531 ～ 796 | 12 ～ 19 | 371 ～ 531 | 9 ～ 12 | 265 ～ 424 | 6 ～ 10 | 212 ～ 371 | 5 ～ 9 |
| 7 | 455 ～ 682 | 12 ～ 17 | 318 ～ 455 | 8 ～ 12 | 227 ～ 364 | 6 ～ 9 | 182 ～ 318 | 5 ～ 8 |
| 8 | 398 ～ 597 | 11 ～ 17 | 279 ～ 398 | 8 ～ 11 | 199 ～ 318 | 6 ～ 9 | 159 ～ 279 | 4 ～ 8 |
| 10 | 318 ～ 477 | 10 ～ 15 | 223 ～ 318 | 7 ～ 10 | 159 ～ 255 | 5 ～ 8 | 127 ～ 223 | 4 ～ 7 |
| 12 | 265 ～ 398 | 9 ～ 14 | 186 ～ 265 | 6 ～ 9 | 133 ～ 212 | 5 ～ 7 | 106 ～ 186 | 4 ～ 6 |
| 14 | 227 ～ 341 | 8 ～ 13 | 159 ～ 227 | 6 ～ 8 | 114 ～ 182 | 4 ～ 7 | 91 ～ 159 | 3 ～ 6 |
| 16 | 199 ～ 298 | 8 ～ 12 | 139 ～ 199 | 5 ～ 8 | 99 ～ 159 | 4 ～ 6 | 80 ～ 139 | 3 ～ 5 |
| 18 | 177 ～ 265 | 7 ～ 11 | 124 ～ 177 | 5 ～ 7 | 88 ～ 141 | 4 ～ 6 | 71 ～ 124 | 3 ～ 5 |
| 20 | 159 ～ 239 | 7 ～ 10 | 111 ～ 159 | 5 ～ 7 | 80 ～ 127 | 3 ～ 6 | 64 ～ 111 | 3 ～ 5 |
| 25 | 127 ～ 191 | 6 ～ 9 | 89 ～ 127 | 4 ～ 6 | 64 ～ 102 | 3 ～ 5 | 51 ～ 89 | 2 ～ 4 |
| 30 | 106 ～ 159 | 5 ～ 8 | 74 ～ 106 | 4 ～ 5 | 53 ～ 85 | 3 ～ 4 | 42 ～ 74 | 2 ～ 4 |
| 35 | 91 ～ 136 | 5 ～ 7 | 64 ～ 91 | 3 ～ 5 | 45 ～ 73 | 2 ～ 4 | 36 ～ 64 | 2 ～ 3 |
| 40 | 80 ～ 119 | 4 ～ 6 | 56 ～ 80 | 3 ～ 4 | 40 ～ 64 | 2 ～ 3 | 32 ～ 56 | 2 ～ 3 |
| 45 | 71 ～ 106 | 4 ～ 6 | 50 ～ 71 | 3 ～ 4 | 35 ～ 57 | 2 ～ 3 | 28 ～ 50 | 2 ～ 3 |
| 50 | 64 ～ 95 | 4 ～ 5 | 45 ～ 64 | 3 ～ 4 | 32 ～ 51 | 2 ～ 3 | 25 ～ 45 | 1 ～ 3 |
| 55 | 58 ～ 87 | 3 ～ 5 | 41 ～ 58 | 2 ～ 3 | 29 ～ 46 | 2 ～ 3 | 23 ～ 41 | 1 ～ 2 |
| 60 | 53 ～ 80 | 3 ～ 5 | 37 ～ 53 | 2 ～ 3 | 27 ～ 42 | 2 ～ 3 | 21 ～ 37 | 1 ～ 2 |
| 65 | 49 ～ 73 | 3 ～ 5 | 34 ～ 49 | 2 ～ 3 | 24 ～ 39 | 2 ～ 2 | 20 ～ 34 | 1 ～ 2 |

※表中の加工径とは、加工される穴径の大径値としています。
※推奨加工長は、加工径の3倍を目安にしてください。
※推奨加工長を超える場合は、ハンドリングで様子を見ながら加工してください。
Dia. is maximum milling diameter.
Recommended milling length is 3 times of milling diameter.
In case of exceeding recommended length, proceed milling by adjusting feed rate.

## ●HSPTR　粉末ハイス スパイラルテーパーリーマ

| 加工径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 ～ 38HRC HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 12~19m/min | | 切削速度 Cutting Speed 9~12m/min | | 切削速度 Cutting Speed 8~10m/min | | 切削速度 Cutting Speed 6~9m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 10 | 382 ～ 605 | 12 ～ 20 | 286 ～ 382 | 9 ～ 12 | 255 ～ 318 | 8 ～ 10 | 191 ～ 286 | 6 ～ 9 |
| 12 | 318 ～ 504 | 12 ～ 19 | 239 ～ 318 | 9 ～ 12 | 212 ～ 265 | 8 ～ 10 | 159 ～ 239 | 6 ～ 9 |
| 14 | 273 ～ 432 | 11 ～ 18 | 205 ～ 273 | 8 ～ 11 | 182 ～ 227 | 8 ～ 9 | 136 ～ 205 | 6 ～ 8 |
| 16 | 239 ～ 378 | 11 ～ 17 | 179 ～ 239 | 8 ～ 11 | 159 ～ 199 | 7 ～ 9 | 119 ～ 179 | 5 ～ 8 |
| 18 | 212 ～ 336 | 11 ～ 17 | 159 ～ 212 | 8 ～ 11 | 141 ～ 177 | 7 ～ 9 | 106 ～ 159 | 5 ～ 8 |
| 20 | 191 ～ 302 | 10 ～ 17 | 143 ～ 191 | 8 ～ 10 | 127 ～ 159 | 7 ～ 9 | 95 ～ 143 | 5 ～ 8 |
| 25 | 153 ～ 242 | 10 ～ 16 | 115 ～ 153 | 8 ～ 10 | 102 ～ 127 | 7 ～ 8 | 76 ～ 115 | 5 ～ 8 |
| 30 | 127 ～ 202 | 10 ～ 16 | 95 ～ 127 | 7 ～ 10 | 85 ～ 106 | 7 ～ 8 | 64 ～ 95 | 5 ～ 7 |

※表中の加工径とは加工される穴径の大径値としています。
※推奨加工長は加工径の3倍を目安にしてください。
※推奨加工長を超える場合は、ハンドリングで様子を見ながら加工してください。
Dia. is maximum milling diameter.
Recommended milling length is 3 times of milling diameter.
In case of exceeding recommended length, proceed milling by adjusting feed rate.

**●SUR** スプールリーマ　　**●SURN** ニック付スプールリーマ
**●SURH** 半月スプールリーマ ※半月スプールリーマは、送りを半分にしてください。
**●SUR2-R** R付スプールリーマ 2枚刃
**●SP-SUR2-R** R付スプールリーマ 2枚刃スパイラル ※2枚刃のスプールリーマは、送りを30%落としてください。
**●SUR3-R** R付スプールリーマ 3枚刃
**●SP-SUR3-R** R付スプールリーマ 3枚刃スパイラル
**●PGR** ピンゲートリーマ

| 加工径 *Dia.* | 非鉄金属 *Al. Cu* | | 炭素鋼 *FC. FCD. S50C* | | 合金鋼 *SCM. SKD. SUS304* | | 調質鋼 ～38HRC *HPM. NAK* | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 *Cutting Speed* 10~15m/min | | 切削速度 *Cutting Speed* 7~10m/min | | 切削速度 *Cutting Speed* 5~8m/min | | 切削速度 *Cutting Speed* 4~7m/min | |
| | 回転数 *Spindle speed* rpm | 送り *feed* mm/min | 回転数 *Spindle speed* rpm | 送り *feed* mm/min | 回転数 *Spindle speed* rpm | 送り *feed* mm/min | 回転数 *Spindle speed* rpm | 送り *feed* mm/min |
| **1** | 3,183 ～ 4,775 | 25 ～ 38 | 2,228 ～ 3,183 | 18 ～ 25 | 1,592 ～ 2,546 | 13 ～ 20 | 1,273 ～ 2,228 | 10 ～ 18 |
| **2** | 1,592 ～ 2,387 | 15 ～ 23 | 1,114 ～ 1,592 | 11 ～ 15 | 796 ～ 1,273 | 8 ～ 12 | 637 ～ 1,114 | 6 ～ 11 |
| **4** | 796 ～ 1,194 | 10 ～ 15 | 557 ～ 796 | 7 ～ 10 | 398 ～ 637 | 5 ～ 8 | 318 ～ 557 | 4 ～ 7 |
| **5** | 637 ～ 955 | 9 ～ 13 | 446 ～ 637 | 6 ～ 9 | 318 ～ 509 | 4 ～ 7 | 255 ～ 446 | 4 ～ 6 |
| **6** | 531 ～ 796 | 8 ～ 12 | 371 ～ 531 | 6 ～ 8 | 265 ～ 424 | 4 ～ 7 | 212 ～ 371 | 3 ～ 6 |
| **8** | 398 ～ 597 | 7 ～ 11 | 279 ～ 398 | 5 ～ 7 | 199 ～ 318 | 4 ～ 6 | 159 ～ 279 | 3 ～ 5 |
| **10** | 318 ～ 477 | 7 ～ 10 | 223 ～ 318 | 5 ～ 7 | 159 ～ 255 | 3 ～ 5 | 127 ～ 223 | 3 ～ 5 |
| **12** | 265 ～ 398 | 6 ～ 10 | 186 ～ 265 | 5 ～ 6 | 133 ～ 212 | 3 ～ 5 | 106 ～ 186 | 3 ～ 5 |
| **14** | 227 ～ 341 | 6 ～ 9 | 159 ～ 227 | 4 ～ 6 | 114 ～ 182 | 3 ～ 5 | 91 ～ 159 | 3 ～ 4 |
| **15** | 212 ～ 318 | 6 ～ 9 | 149 ～ 212 | 4 ～ 6 | 106 ～ 170 | 3 ～ 5 | 85 ～ 149 | 2 ～ 4 |
| **16** | 199 ～ 298 | 6 ～ 9 | 139 ～ 199 | 4 ～ 6 | 99 ～ 159 | 3 ～ 5 | 80 ～ 139 | 2 ～ 4 |
| **18** | 177 ～ 265 | 6 ～ 9 | 124 ～ 177 | 4 ～ 6 | 88 ～ 141 | 3 ～ 5 | 71 ～ 124 | 2 ～ 4 |
| **20** | 159 ～ 239 | 6 ～ 9 | 111 ～ 159 | 4 ～ 6 | 80 ～ 127 | 3 ～ 5 | 64 ～ 111 | 2 ～ 4 |
| **22** | 145 ～ 217 | 6 ～ 9 | 101 ～ 145 | 4 ～ 6 | 72 ～ 116 | 3 ～ 5 | 58 ～ 101 | 2 ～ 4 |
| **24** | 133 ～ 199 | 6 ～ 8 | 93 ～ 133 | 4 ～ 6 | 66 ～ 106 | 3 ～ 5 | 53 ～ 93 | 2 ～ 4 |
| **25** | 127 ～ 191 | 6 ～ 8 | 89 ～ 127 | 4 ～ 6 | 64 ～ 102 | 3 ～ 4 | 51 ～ 89 | 2 ～ 4 |
| **26** | 122 ～ 184 | 6 ～ 8 | 86 ～ 122 | 4 ～ 6 | 61 ～ 98 | 3 ～ 4 | 49 ～ 86 | 2 ～ 4 |
| **28** | 114 ～ 171 | 6 ～ 8 | 80 ～ 114 | 4 ～ 6 | 57 ～ 91 | 3 ～ 4 | 45 ～ 80 | 2 ～ 4 |
| **30** | 106 ～ 159 | 5 ～ 8 | 74 ～ 106 | 4 ～ 5 | 53 ～ 85 | 3 ～ 4 | 42 ～ 74 | 2 ～ 4 |

※表中の加工径とは、加工される穴径の大径値としています。
※推奨加工長は、4°まで加工径の3倍　4°以上は加工径の2倍を目安にしてください。
※推奨加工長を超える場合は、ハンドリングで様子を見ながら加工してください。
Dia. is maximum milling diameter.
Recommended milling length
In case Taper Angle is up to 4°, milling length is 3 times of milling diameter.
In case Taper Angle is over 4°, milling length is 2 times of milling diameter.
In case of exceeding recommended length, proceed milling by adjusting feed rate.

**●MTR-F** モールステーパーリーマ（ハンド用）
**●MTR-RF** モールステーパーリーマ（ハンド用）
**●MTRT-F** モールステーパーリーマ（マシン用）
**●MTRT-RF** モールステーパーリーマ（マシン用）
**●SPTR-F** 1/10Tスパイラルテーパーリーマ
**●SPTR-RF** 1/10Tスパイラルテーパーリーマ
**●PR** パイプリーマ

| 加工径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～ 38HRC HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 7~10m/min | | 切削速度 Cutting Speed 6~9m/min | | 切削速度 Cutting Speed 4~6m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| **8** | 398 ～ 597 | 11 ～ 17 | 279 ～ 398 | 8 ～ 11 | 199 ～ 318 | 6 ～ 9 | 159 ～ 279 | 4 ～ 8 |
| **10** | 318 ～ 477 | 10 ～ 15 | 223 ～ 318 | 7 ～ 10 | 159 ～ 255 | 5 ～ 8 | 127 ～ 223 | 4 ～ 7 |
| **12** | 265 ～ 398 | 10 ～ 15 | 186 ～ 265 | 7 ～ 10 | 133 ～ 212 | 5 ～ 8 | 106 ～ 186 | 4 ～ 7 |
| **14** | 227 ～ 341 | 9 ～ 14 | 159 ～ 227 | 7 ～ 9 | 114 ～ 182 | 5 ～ 8 | 91 ～ 159 | 4 ～ 7 |
| **16** | 199 ～ 298 | 9 ～ 14 | 139 ～ 199 | 6 ～ 9 | 99 ～ 159 | 5 ～ 7 | 80 ～ 139 | 4 ～ 6 |
| **18** | 177 ～ 265 | 9 ～ 13 | 124 ～ 177 | 6 ～ 9 | 88 ～ 141 | 4 ～ 7 | 71 ～ 124 | 4 ～ 6 |
| **20** | 159 ～ 239 | 9 ～ 13 | 111 ～ 159 | 6 ～ 9 | 80 ～ 127 | 4 ～ 7 | 64 ～ 111 | 3 ～ 6 |
| **25** | 127 ～ 191 | 8 ～ 13 | 89 ～ 127 | 6 ～ 8 | 64 ～ 102 | 4 ～ 7 | 51 ～ 89 | 3 ～ 6 |
| **30** | 106 ～ 159 | 8 ～ 12 | 74 ～ 106 | 6 ～ 8 | 53 ～ 85 | 4 ～ 7 | 42 ～ 74 | 3 ～ 6 |
| **35** | 91 ～ 136 | 8 ～ 12 | 64 ～ 91 | 6 ～ 8 | 45 ～ 73 | 4 ～ 6 | 36 ～ 64 | 3 ～ 6 |
| **40** | 80 ～ 119 | 8 ～ 12 | 56 ～ 80 | 6 ～ 8 | 40 ～ 64 | 4 ～ 6 | 32 ～ 56 | 3 ～ 6 |
| **45** | 71 ～ 106 | 8 ～ 12 | 50 ～ 71 | 5 ～ 8 | 35 ～ 57 | 4 ～ 6 | 28 ～ 50 | 3 ～ 5 |
| **50** | 64 ～ 95 | 8 ～ 12 | 45 ～ 64 | 5 ～ 8 | 32 ～ 51 | 4 ～ 6 | 25 ～ 45 | 3 ～ 5 |
| **55** | 58 ～ 87 | 8 ～ 12 | 41 ～ 58 | 5 ～ 8 | 29 ～ 46 | 4 ～ 6 | 23 ～ 41 | 3 ～ 5 |

※表中の加工径とは加工される穴径の大径値としています。
※推奨加工長は加工径の3倍を目安にしてください。（SPTR-F、RFは加工径の2倍となります。）
※推奨加工長を超える場合は、ハンドリングで様子を見ながら加工してください。
Dia. is maximum milling diameter.
Recommended milling length is 3 times of milling diameter. (As for SPTRF and RF, 2 times of milling length)
In case of exceeding recommended length, proceed milling by adjusting feed rate.



魚沼市根小屋　花と緑と雪の里公園　芝桜

# CUTTER SERIES



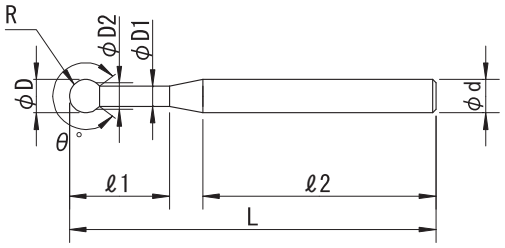
超硬

# CSQCS2-A/CSQCL2-A
# CSQCS4-A/CSQCL4-A

## 超硬ソリッド球面カッター　*Solid Carbide Spherical Cutter*

切削条件表 P239　R 加 工






| 公差 (Tolerance) | R | | | | d |
|---|---|---|---|---|---|
| | 0.5～4 | ±0.01 | 4.5～10 | ±0.02 | h6 |

## 《CSQCS2-A》 右ネジレ15° TiAlN 刃数2 超微粒子

右刃右ネジレ15° TiAlNコーティング 刃数:2 超微粒子
Helix Angle-Right15° TiAlN Coating 2 Flutes Ultra Micro Grain Carbide

| 寸法 R | 刃径 (ΦD) Dia. | 首下長 (ℓ1) Neck Length | 首径 (ΦD1) Neck Dia. | 切刃有効径 (ΦD2) Effective Dia. | シャンク長 (ℓ2) Shank Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 球面有効角 (θ°) Effective Angle |
|---|---|---|---|---|---|---|---|---|
| 0.5 | 1 | 4 | 0.8 | 0.94 | 60 | 70 | 4 | 220 |
| | 1 | 6 | 0.8 | 0.94 | 58 | 70 | 4 | 220 |
| | 1 | 8 | 0.8 | 0.94 | 56 | 70 | 4 | 220 |
| 1 | 2 | 6 | 1.6 | 1.73 | 59.5 | 70 | 4 | 240 |
| | 2 | 8 | 1.6 | 1.73 | 57.5 | 70 | 4 | 240 |
| | 2 | 10 | 1.6 | 1.73 | 55.5 | 70 | 4 | 240 |
| | 2 | 16 | 1.6 | 1.73 | 49.5 | 70 | 4 | 240 |
| | 2 | 20 | 1.6 | 1.73 | 45.5 | 70 | 4 | 240 |
| 1.5 | 3 | 9 | 2.4 | 2.6 | 58 | 70 | 4 | 240 |
| 2 | 4 | 12 | 2.4 | 2.57 | 55 | 70 | 4 | 280 |
| 2.5 | 5 | 15 | 3 | 3.21 | 53 | 70 | 4 | 280 |
| 3 | 6 | 18 | 3.6 | 3.86 | 47.5 | 70 | 6 | 280 |
| 3.5 | 7 | 21 | 4.2 | 4.5 | 45.6 | 70 | 6 | 280 |
| 4 | 8 | 24 | 4.8 | 5.14 | 55 | 85 | 8 | 280 |
| 4.5 | 9 | 27 | 5.4 | 5.79 | 53 | 85 | 8 | 280 |
| 5 | 10 | 30 | 6 | 6.43 | 62.5 | 100 | 10 | 280 |
| 5.5 | 11 | 33 | 6.6 | 7.07 | 60.7 | 100 | 10 | 280 |
| 6 | 12 | 36 | 7.2 | 7.71 | 55 | 100 | 12 | 280 |
| 8 | 16 | 38 | 9.6 | 10.28 | 57.5 | 100 | 12 | 280 |
| 10 | 20 | 42 | 12 | 12.86 | 50.5 | 100 | 16 | 280 |

## 《CSQCS4-A》 右ネジレ15° TiAlN 刃数4 超微粒子

右刃右ネジレ15° TiAlNコーティング 刃数:4 超微粒子
Helix Angle-Right15° TiAlN Coating 4 Flutes Ultra Micro Grain Carbide

| 寸法 R | 刃径 (ΦD) Dia. | 首下長 (ℓ1) Neck Length | 首径 (ΦD1) Neck Dia. | 切刃有効径 (ΦD2) Effective Dia. | シャンク長 (ℓ2) Shank Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 球面有効角 (θ°) Effective Angle |
|---|---|---|---|---|---|---|---|---|
| 3 | 6 | 18 | 3.6 | 3.86 | 47.5 | 70 | 6 | 280 |
| 3.5 | 7 | 21 | 4.2 | 4.5 | 45.6 | 70 | 6 | 280 |
| 4 | 8 | 24 | 4.8 | 5.14 | 55 | 85 | 8 | 280 |
| 4.5 | 9 | 27 | 5.4 | 5.79 | 53 | 85 | 8 | 280 |
| 5 | 10 | 30 | 6 | 6.43 | 62.5 | 100 | 10 | 280 |
| 5.5 | 11 | 33 | 6.6 | 7.07 | 60.7 | 100 | 10 | 280 |
| 6 | 12 | 36 | 7.2 | 7.71 | 55 | 100 | 12 | 280 |
| 8 | 16 | 38 | 9.6 | 10.28 | 57.5 | 100 | 12 | 280 |
| 10 | 20 | 42 | 12 | 12.86 | 50.5 | 100 | 16 | 280 |

## 《CSQCL2-A》 右ネジレ15° TiAlN 刃数2 超微粒子 ●ロング

右刃右ネジレ15° TiAlNコーティング 刃数:2 超微粒子 ●ロング
Helix Angle-Right15° TiAlN Coating 2 Flutes Ultra Micro Grain Carbide ●Long

| 寸法 R | 刃径 (ΦD) Dia. | 首下長 (ℓ1) Neck Length | 首径 (ΦD1) Neck Dia. | 切刃有効径 (ΦD2) Effective Dia. | シャンク長 (ℓ2) Shank Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 球面有効角 (θ°) Effective Angle |
|---|---|---|---|---|---|---|---|---|
| 3 | 6 | 18 | 3.6 | 3.86 | 47.5 | 100 | 6 | 280 |
| 3.5 | 7 | 21 | 4.2 | 4.5 | 45.6 | 100 | 6 | 280 |
| 4 | 8 | 24 | 4.8 | 5.14 | 55 | 115 | 8 | 280 |
| 4.5 | 9 | 27 | 5.4 | 5.79 | 53 | 115 | 8 | 280 |
| 5 | 10 | 30 | 6 | 6.43 | 62.5 | 130 | 10 | 280 |
| 5.5 | 11 | 33 | 6.6 | 7.07 | 60.7 | 130 | 10 | 280 |
| 6 | 12 | 36 | 7.2 | 7.71 | 55 | 130 | 12 | 280 |
| 8 | 16 | 38 | 9.6 | 10.28 | 57.5 | 130 | 12 | 280 |
| 10 | 20 | 42 | 12 | 12.86 | 50.5 | 130 | 16 | 280 |

## 《CSQCL4-A》 右ネジレ15° TiAlN 刃数4 超微粒子 ●ロング

右刃右ネジレ15° TiAlNコーティング 刃数:4 超微粒子 ●ロング
Helix Angle-Right15° TiAlN Coating 4 Flutes Ultra Micro Grain Carbide ●Long

| 寸法 R | 刃径 (ΦD) Dia. | 首下長 (ℓ1) Neck Length | 首径 (ΦD1) Neck Dia. | 切刃有効径 (ΦD2) Effective Dia. | シャンク長 (ℓ2) Shank Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 球面有効角 (θ°) Effective Angle |
|---|---|---|---|---|---|---|---|---|
| 3 | 6 | 18 | 3.6 | 3.86 | 47.5 | 100 | 6 | 280 |
| 3.5 | 7 | 21 | 4.2 | 4.5 | 45.6 | 100 | 6 | 280 |
| 4 | 8 | 24 | 4.8 | 5.14 | 55 | 115 | 8 | 280 |
| 4.5 | 9 | 27 | 5.4 | 5.79 | 53 | 115 | 8 | 280 |
| 5 | 10 | 30 | 6 | 6.43 | 62.5 | 130 | 10 | 280 |
| 5.5 | 11 | 33 | 6.6 | 7.07 | 60.7 | 130 | 10 | 280 |
| 6 | 12 | 36 | 7.2 | 7.71 | 55 | 130 | 12 | 280 |
| 8 | 16 | 38 | 9.6 | 10.28 | 57.5 | 130 | 12 | 280 |
| 10 | 20 | 42 | 12 | 12.86 | 50.5 | 130 | 16 | 280 |

超硬

# CSMT-H

## 超硬スーパーミニスロット 高硬度用 *Solid Carbide Super Mini Slot Cutter For Hard Steel*

切削条件表 P239

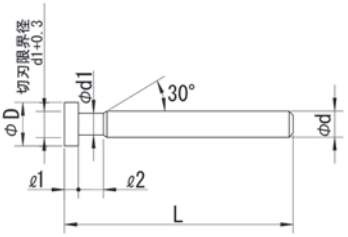
スクエア溝加工（Tスロットカッター）

右直刃　P Coating　超微粒子



センターカット






| 公差(Tolerance) | D： $^{0}_{-0.05}$ | ℓ 1： $^{0}_{-0.03}$ | d：h6 |
|---|---|---|---|

右刃ストレート　Pコーティング　超微粒子
Straight Flute　P Coating　Ultra Micro Grain Carbide

| 刃径（ΦD） *Dia.* | 刃厚（ℓ1） *Cut Width* | 首径（Φd1） *Neck Dia.* | 首長（ℓ2） *Neck Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 刃数（N） *Number of Flutes* |
|---|---|---|---|---|---|---|
| 5 | 0.5 | 2.5 | 5 | 50 | 3 | 3 |
| | 0.6 | 2.5 | 5 | 50 | 3 | 3 |
| | 0.8 | 2.5 | 5 | 50 | 3 | 3 |
| | 1 | 2.5 | 5 | 50 | 3 | 3 |
| | 1.2 | 2.5 | 5 | 50 | 3 | 3 |
| | 1.5 | 2.5 | 5 | 50 | 3 | 3 |
| | 2 | 2.5 | 5 | 50 | 3 | 3 |
| | 2.5 | 2.5 | 5 | 50 | 3 | 3 |
| 6 | 0.6 | 2.9 | 5 | 50 | 3 | 3 |
| | 0.8 | 2.9 | 5 | 50 | 3 | 3 |
| | 1 | 2.9 | 5 | 50 | 3 | 3 |
| | 1.2 | 2.9 | 5 | 50 | 3 | 3 |
| | 1.5 | 2.9 | 5 | 50 | 3 | 3 |
| | 2 | 2.9 | 5 | 50 | 3 | 3 |
| | 2.5 | 2.9 | 5 | 50 | 3 | 3 |
| | 3 | 2.9 | 5 | 50 | 3 | 3 |
| 8 | 0.8 | 3.9 | 5 | 60 | 4 | 3 |
| | 1 | 3.9 | 5 | 60 | 4 | 3 |

| 刃径（ΦD） *Dia.* | 刃厚（ℓ1） *Cut Width* | 首径（Φd1） *Neck Dia.* | 首長（ℓ2） *Neck Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 刃数（N） *Number of Flutes* |
|---|---|---|---|---|---|---|
| 8 | 1.2 | 3.9 | 5 | 60 | 4 | 3 |
| | 1.5 | 3.9 | 5 | 60 | 4 | 3 |
| | 2 | 3.9 | 5 | 60 | 4 | 3 |
| | 2.5 | 3.9 | 5 | 60 | 4 | 3 |
| | 3 | 3.9 | 5 | 60 | 4 | 3 |
| 10 | 1 | 5 | 5 | 70 | 6 | 3 |
| | 1.2 | 5 | 5 | 70 | 6 | 3 |
| | 1.5 | 5 | 5 | 70 | 6 | 3 |
| | 2 | 5 | 5 | 70 | 6 | 3 |
| | 2.5 | 5 | 5 | 70 | 6 | 3 |
| | 3 | 5 | 5 | 70 | 6 | 3 |
| 12 | 1 | 5.9 | 5 | 70 | 6 | 3 |
| | 1.2 | 5.9 | 5 | 70 | 6 | 3 |
| | 1.5 | 5.9 | 5 | 70 | 6 | 3 |
| | 2 | 5.9 | 5 | 70 | 6 | 3 |
| | 2.5 | 5.9 | 5 | 70 | 6 | 3 |
| | 3 | 5.9 | 5 | 70 | 6 | 3 |

超硬

# CSMT-Re

## 超硬スーパーミニスロット 樹脂用 *Solid Carbide Super Mini Slot Cutter For Resin*

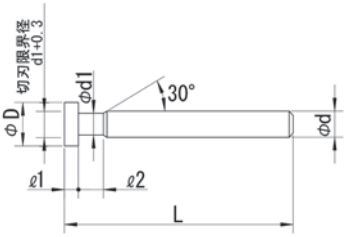
切削条件表 P239

スクエア溝加工（Tスロットカッター） 右直刃 超微粒子



センター穴ナシ






| 公差(Tolerance) | D： $^{0}_{-0.05}$ | ℓ1： $^{0}_{-0.03}$ | d：h6 |
|---|---|---|---|

右刃ストレート 超微粒子
Straight Flute Ultra Micro Grain Carbide

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 5 | 0.5 | 2.5 | 5 | 50 | 3 | 4 |
| | 0.6 | 2.5 | 5 | 50 | 3 | 4 |
| | 0.8 | 2.5 | 5 | 50 | 3 | 4 |
| | 1 | 2.5 | 5 | 50 | 3 | 4 |
| | 1.2 | 2.5 | 5 | 50 | 3 | 4 |
| | 1.5 | 2.5 | 5 | 50 | 3 | 4 |
| | 2 | 2.5 | 5 | 50 | 3 | 4 |
| | 2.5 | 2.5 | 5 | 50 | 3 | 4 |
| 6 | 0.6 | 2.7 | 5 | 50 | 3 | 6 |
| | 0.8 | 2.7 | 5 | 50 | 3 | 6 |
| | 1 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.2 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.5 | 2.7 | 5 | 50 | 3 | 6 |
| | 2 | 2.7 | 5 | 50 | 3 | 6 |
| | 2.5 | 2.7 | 5 | 50 | 3 | 6 |
| | 3 | 2.7 | 5 | 50 | 3 | 6 |
| 8 | 0.8 | 3.5 | 5 | 60 | 4 | 6 |
| | 1 | 3.5 | 5 | 60 | 4 | 6 |

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 8 | 1.2 | 3.5 | 5 | 60 | 4 | 6 |
| | 1.5 | 3.5 | 5 | 60 | 4 | 6 |
| | 2 | 3.5 | 5 | 60 | 4 | 6 |
| | 2.5 | 3.5 | 5 | 60 | 4 | 6 |
| | 3 | 3.5 | 5 | 60 | 4 | 6 |
| 10 | 1 | 5.5 | 5 | 70 | 6 | 6 |
| | 1.2 | 5.5 | 5 | 70 | 6 | 6 |
| | 1.5 | 5.5 | 5 | 70 | 6 | 6 |
| | 2 | 5.5 | 5 | 70 | 6 | 6 |
| | 2.5 | 5.5 | 5 | 70 | 6 | 6 |
| | 3 | 5.5 | 5 | 70 | 6 | 6 |
| 12 | 1 | 5.5 | 5 | 70 | 6 | 6 |
| | 1.2 | 5.5 | 5 | 70 | 6 | 6 |
| | 1.5 | 5.5 | 5 | 70 | 6 | 6 |
| | 2 | 5.5 | 5 | 70 | 6 | 6 |
| | 2.5 | 5.5 | 5 | 70 | 6 | 6 |
| | 3 | 5.5 | 5 | 70 | 6 | 6 |

超硬

# CSMT-Al

## 超硬スーパーミニスロット アルミ用 *Solid Carbide Super Mini Slot Cutter For Aluminum*

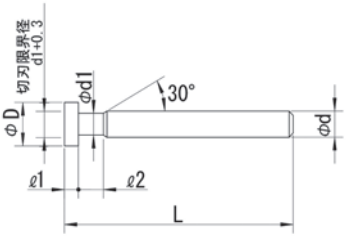
切削条件表 P240

スクエア溝加工（Tスロットカッター）

右直刃　HF DLC　超微粒子






| 公差(Tolerance) | D： $^{0}_{-0.05}$ | ℓ1： $^{0}_{-0.03}$ | d：h6 |
|---|---|---|---|

右刃ストレート　水素フリーDLCコーティング　超微粒子
Straight Flute　Hydrogen Free DLC Coating　Ultra Micro Grain Carbide

| 刃径（ΦD） *Dia.* | 刃厚（ℓ1） *Cut Width* | 首径（Φd1） *Neck Dia.* | 首長（ℓ2） *Neck Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 刃数（N） *Number of Flutes* |
|---|---|---|---|---|---|---|
| 5 | 0.5 | 2.5 | 5 | 50 | 3 | 4 |
| | 0.6 | 2.5 | 5 | 50 | 3 | 4 |
| | 0.8 | 2.5 | 5 | 50 | 3 | 4 |
| | 1 | 2.5 | 5 | 50 | 3 | 4 |
| | 1.2 | 2.5 | 5 | 50 | 3 | 4 |
| | 1.5 | 2.5 | 5 | 50 | 3 | 4 |
| | 2 | 2.5 | 5 | 50 | 3 | 4 |
| | 2.5 | 2.5 | 5 | 50 | 3 | 4 |
| 6 | 0.6 | 2.7 | 5 | 50 | 3 | 6 |
| | 0.8 | 2.7 | 5 | 50 | 3 | 6 |
| | 1 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.2 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.5 | 2.7 | 5 | 50 | 3 | 6 |
| | 2 | 2.7 | 5 | 50 | 3 | 6 |
| | 2.5 | 2.7 | 5 | 50 | 3 | 6 |
| | 3 | 2.7 | 5 | 50 | 3 | 6 |
| 8 | 0.8 | 3.5 | 5 | 60 | 4 | 6 |
| | 1 | 3.5 | 5 | 60 | 4 | 6 |

| 刃径（ΦD） *Dia.* | 刃厚（ℓ1） *Cut Width* | 首径（Φd1） *Neck Dia.* | 首長（ℓ2） *Neck Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 刃数（N） *Number of Flutes* |
|---|---|---|---|---|---|---|
| 8 | 1.2 | 3.5 | 5 | 60 | 4 | 6 |
| | 1.5 | 3.5 | 5 | 60 | 4 | 6 |
| | 2 | 3.5 | 5 | 60 | 4 | 6 |
| | 2.5 | 3.5 | 5 | 60 | 4 | 6 |
| | 3 | 3.5 | 5 | 60 | 4 | 6 |
| 10 | 1 | 5.5 | 5 | 70 | 6 | 6 |
| | 1.2 | 5.5 | 5 | 70 | 6 | 6 |
| | 1.5 | 5.5 | 5 | 70 | 6 | 6 |
| | 2 | 5.5 | 5 | 70 | 6 | 6 |
| | 2.5 | 5.5 | 5 | 70 | 6 | 6 |
| | 3 | 5.5 | 5 | 70 | 6 | 6 |
| 12 | 1 | 5.5 | 5 | 70 | 6 | 6 |
| | 1.2 | 5.5 | 5 | 70 | 6 | 6 |
| | 1.5 | 5.5 | 5 | 70 | 6 | 6 |
| | 2 | 5.5 | 5 | 70 | 6 | 6 |
| | 2.5 | 5.5 | 5 | 70 | 6 | 6 |
| | 3 | 5.5 | 5 | 70 | 6 | 6 |

超硬

# CSMS-H

## 超硬スーパーミニアンギュラ 高硬度用 *Solid Carbide Super Mini Angular Cutter For Hard Steel*

切削条件表 P240

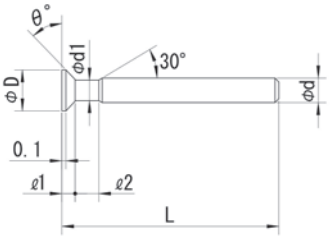
アリ溝・角度付溝・面取り加工

右直刃　P Coating　超微粒子



センター穴ナシ






| 公差(Tolerance) | D：±0.05 | ℓ1：$^{+0.3}_{0}$ | θ：±10' | d：h6 |
|---|---|---|---|---|

右刃ストレート　Pコーティング　超微粒子
Straight Flute　P Coating　Ultra Micro Grain Carbide

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| **5** | 45° | 1.1 | 2.5 | 5 | 60 | 3 | 3 |
| **6** | | 1.4 | 2.9 | 5 | 60 | 3 | 3 |
| **8** | | 1.9 | 3.9 | 5 | 60 | 4 | 3 |
| **10** | | 2.2 | 5 | 5 | 70 | 6 | 3 |
| **12** | | 2.9 | 5.5 | 5 | 70 | 6 | 3 |

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| **5** | 60° | 1.7 | 2.5 | 5 | 60 | 3 | 3 |
| **6** | | 2.4 | 2.9 | 5 | 60 | 3 | 3 |
| **8** | | 3 | 3.9 | 5 | 60 | 4 | 3 |
| **10** | | 3.7 | 5 | 5 | 70 | 6 | 3 |
| **12** | | 4.5 | 5.5 | 5 | 70 | 6 | 3 |

超硬

# CSMS-Re

## 超硬スーパーミニアンギュラ 樹脂用 *Solid Carbide Super Mini Angular Cutter For Resin*

切削条件表 P240

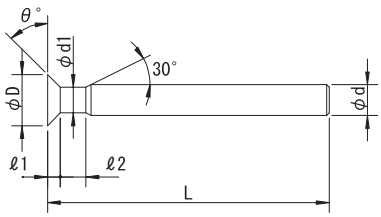
アリ溝・角度付溝・面取り加工

右直刃　超微粒子



センター穴ナシ






| 公差(Tolerance) | D：±0.05 | ℓ1：$^{+0.3}_{0}$ | θ：±10' | d：h6 |
|---|---|---|---|---|

右刃ストレート　超微粒子
Straight Flute　Ultra Micro Grain Carbide

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| **5** | 45° | 0.8 | 2.9 | 5 | 60 | 3 | 6 |
| **6** | | 1.1 | 2.9 | 5 | 60 | 3 | 6 |
| **8** | | 1.6 | 3.9 | 5 | 60 | 4 | 6 |
| **10** | | 1.8 | 5.5 | 5 | 70 | 6 | 6 |
| **12** | | 2.5 | 5.8 | 5 | 70 | 6 | 6 |

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| **5** | 60° | 1.2 | 2.9 | 5 | 60 | 3 | 6 |
| **6** | | 2 | 2.9 | 5 | 60 | 3 | 6 |
| **8** | | 2.5 | 3.9 | 5 | 60 | 4 | 6 |
| **10** | | 3 | 5.5 | 5 | 70 | 6 | 6 |
| **12** | | 4 | 5.8 | 5 | 70 | 6 | 6 |

超硬

# CSMS-Al

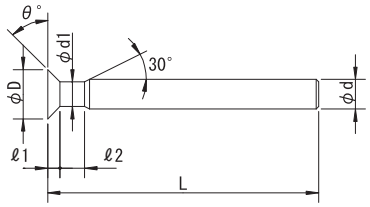
## 超硬スーパーミニアンギュラ アルミ用 *Solid Carbide Super Mini Angular Cutter For Aluminum*

切削条件表 P240

アリ溝・角度付溝・面取り加工 右直刃 HF DLC 超微粒子


センター穴ナシ






| 公差(Tolerance) | D：±0.05 | ℓ1：$^{+0.3}_{0}$ | θ：±10' | d：h6 |
|---|---|---|---|---|

右刃ストレート 水素フリーDLCコーティング 超微粒子
Straight Flute Hydrogen Free DLC Coating Ultra Micro Grain Carbide

| 刃径 (ΦD) Dia. | 角度 (θ) Cut Angle | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|---|
| 5 | 45° | 0.8 | 2.9 | 5 | 60 | 3 | 6 |
| 6 | | 1.1 | 2.9 | 5 | 60 | 3 | 6 |
| 8 | | 1.6 | 3.9 | 5 | 60 | 4 | 6 |
| 10 | | 1.8 | 5.5 | 5 | 70 | 6 | 6 |
| 12 | | 2.5 | 5.8 | 5 | 70 | 6 | 6 |

| 刃径 (ΦD) Dia. | 角度 (θ) Cut Angle | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|---|
| 5 | 60° | 1.2 | 2.9 | 5 | 60 | 3 | 6 |
| 6 | | 2 | 2.9 | 5 | 60 | 3 | 6 |
| 8 | | 2.5 | 3.9 | 5 | 60 | 4 | 6 |
| 10 | | 3 | 5.5 | 5 | 70 | 6 | 6 |
| 12 | | 4 | 5.8 | 5 | 70 | 6 | 6 |

超硬

# CSMW-H

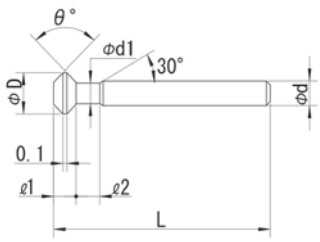
## 超硬スーパーミニWアンギュラ 高硬度用 *Solid Carbide Super Mini W-Angular Cutter For Hard Steel*

切削条件表 P240

アリ溝・角度付溝・面取り加工 右直刃 P Coating 超微粒子


センター穴ナシ






| 公差(Tolerance) | D：±0.05 | ℓ1：$^{0}_{-0.05}$ | θ：±20' | d：h6 |
|---|---|---|---|---|

右刃ストレート Pコーティング 超微粒子
Straight Flute P Coating Ultra Micro Grain Carbide

| 刃径 (ΦD) Dia. | 角度 (θ) Cut Angle | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|---|
| 5 | W60° | 1 | 2.5 | 5 | 60 | 3 | 3 |
| 6 | | 1.6 | 2.9 | 5 | 60 | 3 | 3 |
| 8 | | 2.2 | 3.9 | 5 | 60 | 4 | 3 |
| 10 | | 2.4 | 5 | 5 | 70 | 6 | 3 |
| 12 | | 3.4 | 5.5 | 5 | 70 | 6 | 3 |
| 5 | W90° | 2 | 2.5 | 5 | 60 | 3 | 3 |
| 6 | | 2.7 | 2.9 | 5 | 60 | 3 | 3 |
| 8 | | 3.5 | 3.9 | 5 | 60 | 4 | 3 |

| 刃径 (ΦD) Dia. | 角度 (θ) Cut Angle | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|---|
| 10 | W90° | 4 | 5 | 5 | 70 | 6 | 3 |
| 12 | | 5 | 5.5 | 5 | 70 | 6 | 3 |
| 5 | W120° | 3 | 2.5 | 5 | 60 | 3 | 3 |
| 6 | | 4.5 | 2.9 | 5 | 60 | 3 | 3 |
| 8 | | 5.5 | 3.9 | 5 | 60 | 4 | 3 |
| 10 | | 6.9 | 5 | 5 | 70 | 6 | 3 |
| 12 | | 8.1 | 5.5 | 5 | 70 | 6 | 3 |

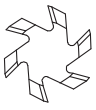
超硬

# CSMW-Re

## 超硬スーパーミニWアンギュラ 樹脂用 *Solid Carbide Super Mini W-Angular Cutter For Resin*

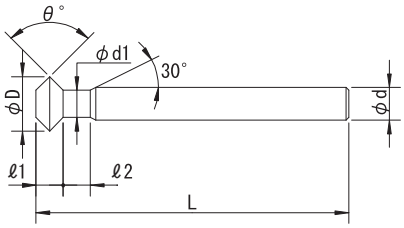
切削条件表 P240

アリ溝・角度付溝・面取り加工 右直刃 超微粒子



センター穴ナシ






| 公差(Tolerance) | D：±0.05 | ℓ1：$^{0}_{-0.05}$ | θ：±15' | d：h6 |
|---|---|---|---|---|

右刃ストレート 超微粒子
Straight Flute Ultra Micro Grain Carbide

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| 5 | W60° | 0.9 | 2.9 | 5 | 60 | 3 | 6 |
| 6 | | 1.4 | 2.9 | 5 | 60 | 3 | 6 |
| 8 | | 1.7 | 3.9 | 5 | 60 | 4 | 6 |
| 10 | | 2 | 5.5 | 5 | 70 | 6 | 6 |
| 12 | | 2.5 | 5.8 | 5 | 70 | 6 | 6 |
| 5 | W90° | 1.2 | 2.9 | 5 | 60 | 3 | 6 |
| 6 | | 2 | 2.9 | 5 | 60 | 3 | 6 |
| 8 | | 2.7 | 3.9 | 5 | 60 | 4 | 6 |

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| 10 | W90° | 3.4 | 5.5 | 5 | 70 | 6 | 6 |
| 12 | | 4 | 5.8 | 5 | 70 | 6 | 6 |
| 5 | W120° | 2 | 2.9 | 5 | 60 | 3 | 6 |
| 6 | | 3.5 | 2.9 | 5 | 60 | 3 | 6 |
| 8 | | 4.6 | 3.9 | 5 | 60 | 4 | 6 |
| 10 | | 6 | 5.5 | 5 | 70 | 6 | 6 |
| 12 | | 7 | 5.8 | 5 | 70 | 6 | 6 |

超硬

# CSMW-Al

## 超硬スーパーミニWアンギュラ アルミ用 *Solid Carbide Super Mini W-Angular Cutter For Aluminum*

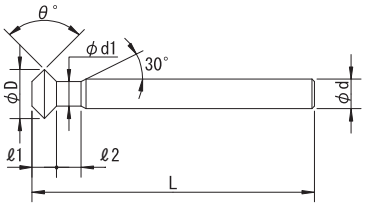
切削条件表 P241

アリ溝・角度付溝・面取り加工 右直刃 HF DLC 超微粒子



センター穴ナシ






| 公差(Tolerance) | D：±0.05 | ℓ1：$^{0}_{-0.05}$ | θ：±15' | d：h6 |
|---|---|---|---|---|

右刃ストレート 水素フリーDLCコーティング 超微粒子
Straight Flute Hydrogen Free DLC Coating Ultra Micro Grain Carbide

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| 5 | W60° | 0.9 | 2.9 | 5 | 60 | 3 | 6 |
| 6 | | 1.4 | 2.9 | 5 | 60 | 3 | 6 |
| 8 | | 1.7 | 3.9 | 5 | 60 | 4 | 6 |
| 10 | | 2 | 5.5 | 5 | 70 | 6 | 6 |
| 12 | | 2.5 | 5.8 | 5 | 70 | 6 | 6 |
| 5 | W90° | 1.2 | 2.9 | 5 | 60 | 3 | 6 |
| 6 | | 2 | 2.9 | 5 | 60 | 3 | 6 |
| 8 | | 2.7 | 3.9 | 5 | 60 | 4 | 6 |

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| 10 | W90° | 3.4 | 5.5 | 5 | 70 | 6 | 6 |
| 12 | | 4 | 5.8 | 5 | 70 | 6 | 6 |
| 5 | W120° | 2 | 2.9 | 5 | 60 | 3 | 6 |
| 6 | | 3.5 | 2.9 | 5 | 60 | 3 | 6 |
| 8 | | 4.6 | 3.9 | 5 | 60 | 4 | 6 |
| 10 | | 6 | 5.5 | 5 | 70 | 6 | 6 |
| 12 | | 7 | 5.8 | 5 | 70 | 6 | 6 |

超硬

# CSMK-Re

## 超硬スーパーミニキーシードカッター 樹脂用 *Solid Carbide Super Mini Keyseat Cutter For Resin*

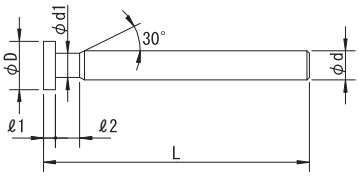
切削条件表 P241

スクエア溝加工(キーシードカッター) 右直刃 超微粒子



Φ8≦Dセンター穴付






右刃ストレート 超微粒子
Straight Flute Ultra Micro Grain Carbide

| 公差(Tolerance) | D : $^{0}_{-0.05}$ | ℓ1 : $^{0}_{-0.02}$ | d : h6 |
|---|---|---|---|

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 5 | 0.3 | 2.5 | 5 | 50 | 3 | 6 |
| | 0.4 | 2.5 | 5 | 50 | 3 | 6 |
| | 0.5 | 2.5 | 5 | 50 | 3 | 6 |
| | 0.6 | 2.5 | 5 | 50 | 3 | 6 |
| | 0.7 | 2.5 | 5 | 50 | 3 | 6 |
| | 0.8 | 2.5 | 5 | 50 | 3 | 6 |
| | 0.9 | 2.5 | 5 | 50 | 3 | 6 |
| | 1 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.1 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.2 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.3 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.4 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.5 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.6 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.7 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.8 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.9 | 2.5 | 5 | 50 | 3 | 6 |
| | 2 | 2.5 | 5 | 50 | 3 | 6 |
| | 2.5 | 2.5 | 5 | 50 | 3 | 6 |
| 6 | 0.3 | 2.7 | 5 | 50 | 3 | 6 |
| | 0.4 | 2.7 | 5 | 50 | 3 | 6 |
| | 0.5 | 2.7 | 5 | 50 | 3 | 6 |
| | 0.6 | 2.7 | 5 | 50 | 3 | 6 |
| | 0.7 | 2.7 | 5 | 50 | 3 | 6 |
| | 0.8 | 2.7 | 5 | 50 | 3 | 6 |
| | 0.9 | 2.7 | 5 | 50 | 3 | 6 |
| | 1 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.1 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.2 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.3 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.4 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.5 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.6 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.7 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.8 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.9 | 2.7 | 5 | 50 | 3 | 6 |
| | 2 | 2.7 | 5 | 50 | 3 | 6 |
| | 2.5 | 2.7 | 5 | 50 | 3 | 6 |
| | 3 | 2.7 | 5 | 50 | 3 | 6 |
| 8 | 0.3 | 3.5 | 5 | 60 | 4 | 6 |
| | 0.4 | 3.5 | 5 | 60 | 4 | 6 |
| | 0.5 | 3.5 | 5 | 60 | 4 | 6 |
| | 0.6 | 3.5 | 5 | 60 | 4 | 6 |
| | 0.7 | 3.5 | 5 | 60 | 4 | 6 |
| | 0.8 | 3.5 | 5 | 60 | 4 | 6 |
| | 0.9 | 3.5 | 5 | 60 | 4 | 6 |
| | 1 | 3.5 | 5 | 60 | 4 | 6 |
| | 1.1 | 3.5 | 5 | 60 | 4 | 6 |
| | 1.2 | 3.5 | 5 | 60 | 4 | 6 |
| | 1.3 | 3.5 | 5 | 60 | 4 | 6 |
| | 1.4 | 3.5 | 5 | 60 | 4 | 6 |
| | 1.5 | 3.5 | 5 | 60 | 4 | 6 |
| | 1.6 | 3.5 | 5 | 60 | 4 | 6 |
| | 1.7 | 3.5 | 5 | 60 | 4 | 6 |
| | 1.8 | 3.5 | 5 | 60 | 4 | 6 |

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 8 | 1.9 | 3.5 | 5 | 60 | 4 | 6 |
| | 2 | 3.5 | 5 | 60 | 4 | 6 |
| | 2.5 | 3.5 | 5 | 60 | 4 | 6 |
| | 3 | 3.5 | 5 | 60 | 4 | 6 |
| | 3.5 | 3.5 | 5 | 60 | 4 | 6 |
| | 4 | 3.5 | 5 | 60 | 4 | 6 |
| 10 | 0.3 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.4 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.6 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.7 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.8 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.9 | 5.5 | 5 | 70 | 6 | 8 |
| | 1 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.1 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.2 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.3 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.4 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.6 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.7 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.8 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.9 | 5.5 | 5 | 70 | 6 | 8 |
| | 2 | 5.5 | 5 | 70 | 6 | 8 |
| | 2.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 3 | 5.5 | 5 | 70 | 6 | 8 |
| | 3.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 4 | 5.5 | 5 | 70 | 6 | 8 |
| | 4.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 5 | 5.5 | 5 | 70 | 6 | 8 |
| 12 | 0.3 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.4 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.6 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.7 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.8 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.9 | 5.5 | 5 | 70 | 6 | 8 |
| | 1 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.1 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.2 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.3 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.4 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.6 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.7 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.8 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.9 | 5.5 | 5 | 70 | 6 | 8 |
| | 2 | 5.5 | 5 | 70 | 6 | 8 |
| | 2.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 3 | 5.5 | 5 | 70 | 6 | 8 |
| | 3.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 4 | 5.5 | 5 | 70 | 6 | 8 |
| | 4.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 5 | 5.5 | 5 | 70 | 6 | 8 |

超硬

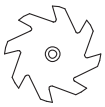
# CSMK-Al

## 超硬スーパーミニキーシードカッター アルミ用 *Solid Carbide Super Mini Keyseat Cutter For Aluminum*

切削条件表 P241

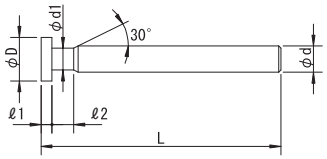
スクエア溝加工(キーシードカッター)

右直刃 HF DLC 超微粒子



Φ8≦Dセンター穴付






右刃ストレート 水素フリーDLCコーティング 超微粒子
Straight Flute Hydrogen Free DLC Coating Ultra Micro Grain Carbide

| 公差(Tolerance) | D : $^{0}_{-0.05}$ | ℓ1 : $^{0}_{-0.02}$ | d : h6 |
|---|---|---|---|

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 5 | 0.3 | 2.5 | 5 | 50 | 3 | 6 |
| | 0.4 | 2.5 | 5 | 50 | 3 | 6 |
| | 0.5 | 2.5 | 5 | 50 | 3 | 6 |
| | 0.6 | 2.5 | 5 | 50 | 3 | 6 |
| | 0.7 | 2.5 | 5 | 50 | 3 | 6 |
| | 0.8 | 2.5 | 5 | 50 | 3 | 6 |
| | 0.9 | 2.5 | 5 | 50 | 3 | 6 |
| | 1 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.1 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.2 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.3 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.4 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.5 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.6 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.7 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.8 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.9 | 2.5 | 5 | 50 | 3 | 6 |
| | 2 | 2.5 | 5 | 50 | 3 | 6 |
| | 2.5 | 2.5 | 5 | 50 | 3 | 6 |
| 6 | 0.3 | 2.7 | 5 | 50 | 3 | 6 |
| | 0.4 | 2.7 | 5 | 50 | 3 | 6 |
| | 0.5 | 2.7 | 5 | 50 | 3 | 6 |
| | 0.6 | 2.7 | 5 | 50 | 3 | 6 |
| | 0.7 | 2.7 | 5 | 50 | 3 | 6 |
| | 0.8 | 2.7 | 5 | 50 | 3 | 6 |
| | 0.9 | 2.7 | 5 | 50 | 3 | 6 |
| | 1 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.1 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.2 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.3 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.4 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.5 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.6 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.7 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.8 | 2.7 | 5 | 50 | 3 | 6 |
| | 1.9 | 2.7 | 5 | 50 | 3 | 6 |
| | 2 | 2.7 | 5 | 50 | 3 | 6 |
| | 2.5 | 2.7 | 5 | 50 | 3 | 6 |
| | 3 | 2.7 | 5 | 50 | 3 | 6 |
| 8 | 0.3 | 3.5 | 5 | 60 | 4 | 6 |
| | 0.4 | 3.5 | 5 | 60 | 4 | 6 |
| | 0.5 | 3.5 | 5 | 60 | 4 | 6 |
| | 0.6 | 3.5 | 5 | 60 | 4 | 6 |
| | 0.7 | 3.5 | 5 | 60 | 4 | 6 |
| | 0.8 | 3.5 | 5 | 60 | 4 | 6 |
| | 0.9 | 3.5 | 5 | 60 | 4 | 6 |
| | 1 | 3.5 | 5 | 60 | 4 | 6 |
| | 1.1 | 3.5 | 5 | 60 | 4 | 6 |
| | 1.2 | 3.5 | 5 | 60 | 4 | 6 |
| | 1.3 | 3.5 | 5 | 60 | 4 | 6 |
| | 1.4 | 3.5 | 5 | 60 | 4 | 6 |
| | 1.5 | 3.5 | 5 | 60 | 4 | 6 |
| | 1.6 | 3.5 | 5 | 60 | 4 | 6 |
| | 1.7 | 3.5 | 5 | 60 | 4 | 6 |
| | 1.8 | 3.5 | 5 | 60 | 4 | 6 |

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 8 | 1.9 | 3.5 | 5 | 60 | 4 | 6 |
| | 2 | 3.5 | 5 | 60 | 4 | 6 |
| | 2.5 | 3.5 | 5 | 60 | 4 | 6 |
| | 3 | 3.5 | 5 | 60 | 4 | 6 |
| | 3.5 | 3.5 | 5 | 60 | 4 | 6 |
| | 4 | 3.5 | 5 | 60 | 4 | 6 |
| 10 | 0.3 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.4 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.6 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.7 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.8 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.9 | 5.5 | 5 | 70 | 6 | 8 |
| | 1 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.1 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.2 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.3 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.4 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.6 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.7 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.8 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.9 | 5.5 | 5 | 70 | 6 | 8 |
| | 2 | 5.5 | 5 | 70 | 6 | 8 |
| | 2.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 3 | 5.5 | 5 | 70 | 6 | 8 |
| | 3.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 4 | 5.5 | 5 | 70 | 6 | 8 |
| | 4.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 5 | 5.5 | 5 | 70 | 6 | 8 |
| 12 | 0.3 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.4 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.6 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.7 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.8 | 5.5 | 5 | 70 | 6 | 8 |
| | 0.9 | 5.5 | 5 | 70 | 6 | 8 |
| | 1 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.1 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.2 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.3 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.4 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.6 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.7 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.8 | 5.5 | 5 | 70 | 6 | 8 |
| | 1.9 | 5.5 | 5 | 70 | 6 | 8 |
| | 2 | 5.5 | 5 | 70 | 6 | 8 |
| | 2.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 3 | 5.5 | 5 | 70 | 6 | 8 |
| | 3.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 4 | 5.5 | 5 | 70 | 6 | 8 |
| | 4.5 | 5.5 | 5 | 70 | 6 | 8 |
| | 5 | 5.5 | 5 | 70 | 6 | 8 |

超硬

# CSMT-S

## 超硬スーパーミニスロット スリムシャンク *Solid Carbide Super Mini Slot Cutter Slim Shank*

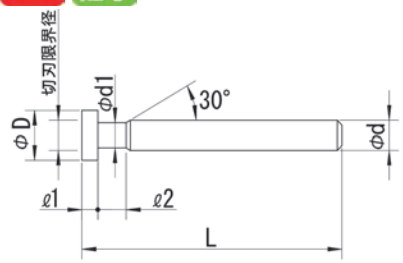
切削条件表 P242

スクエア溝加工（Tスロットカッター）

右直刃　超微粒子


センターカット






| D | 5 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|
| 切刃限界径 | Φ2.8 | Φ3.5 | Φ4.5 | Φ5.9 | Φ6.9 |

※Cutting Edge Limit Diameter

| 公差(Tolerance) | D：$^{0}_{-0.05}$ | ℓ1：$^{0}_{-0.035}$ | d：h6 |
|---|---|---|---|

右刃ストレート　超微粒子
Straight Flute　Ultra Micro Grain Carbide

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 5 | 0.5 | 2.5 | 5 | 50 | 3 | 4 |
| | 0.6 | 2.5 | 5 | 50 | 3 | 4 |
| | 0.8 | 2.5 | 5 | 50 | 3 | 4 |
| | 1 | 2.5 | 5 | 50 | 3 | 4 |
| | 1.2 | 2.5 | 5 | 50 | 3 | 4 |
| | 1.5 | 2.5 | 5 | 50 | 3 | 4 |
| | 2 | 2.5 | 5 | 50 | 3 | 4 |
| | 2.5 | 2.5 | 5 | 50 | 3 | 4 |
| 6 | 0.5 | 2.9 | 5 | 50 | 3 | 6 |
| | 0.6 | 2.9 | 5 | 50 | 3 | 6 |
| | 0.8 | 2.9 | 5 | 50 | 3 | 6 |
| | 1 | 2.9 | 5 | 50 | 3 | 6 |
| | 1.2 | 2.9 | 5 | 50 | 3 | 6 |
| | 1.5 | 2.9 | 5 | 50 | 3 | 6 |
| | 2 | 2.9 | 5 | 50 | 3 | 6 |
| | 2.5 | 2.9 | 5 | 50 | 3 | 6 |
| | 3 | 2.9 | 5 | 50 | 3 | 6 |
| 8 | 0.5 | 3.9 | 5 | 60 | 4 | 6 |
| | 0.6 | 3.9 | 5 | 60 | 4 | 6 |
| | 0.8 | 3.9 | 5 | 60 | 4 | 6 |
| | 1 | 3.9 | 5 | 60 | 4 | 6 |
| | 1.2 | 3.9 | 5 | 60 | 4 | 6 |

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 8 | 1.5 | 3.9 | 5 | 60 | 4 | 6 |
| | 2 | 3.9 | 5 | 60 | 4 | 6 |
| | 2.5 | 3.9 | 5 | 60 | 4 | 6 |
| | 3 | 3.9 | 5 | 60 | 4 | 6 |
| 10 | 0.5 | 5 | 5 | 70 | 6 | 6 |
| | 0.6 | 5 | 5 | 70 | 6 | 6 |
| | 0.8 | 5 | 5 | 70 | 6 | 6 |
| | 1 | 5 | 5 | 70 | 6 | 6 |
| | 1.2 | 5 | 5 | 70 | 6 | 6 |
| | 1.5 | 5 | 5 | 70 | 6 | 6 |
| | 2 | 5 | 5 | 70 | 6 | 6 |
| | 2.5 | 5 | 5 | 70 | 6 | 6 |
| | 3 | 5 | 5 | 70 | 6 | 6 |
| 12 | 0.5 | 5.9 | 5 | 70 | 6 | 6 |
| | 0.6 | 5.9 | 5 | 70 | 6 | 6 |
| | 0.8 | 5.9 | 5 | 70 | 6 | 6 |
| | 1 | 5.9 | 5 | 70 | 6 | 6 |
| | 1.2 | 5.9 | 5 | 70 | 6 | 6 |
| | 1.5 | 5.9 | 5 | 70 | 6 | 6 |
| | 2 | 5.9 | 5 | 70 | 6 | 6 |
| | 2.5 | 5.9 | 5 | 70 | 6 | 6 |
| | 3 | 5.9 | 5 | 70 | 6 | 6 |

超硬

# CSMS-S

## 超硬スーパーミニアンギュラ スリムシャンク *Solid Carbide Super Mini Angular Cutter Slim Shank*

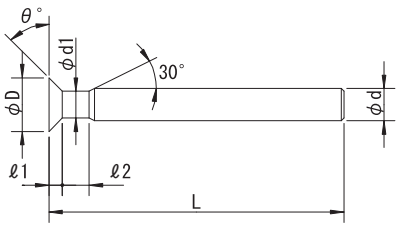
切削条件表 P242

**アリ溝・角度付溝・面取り加工** 右直刃 超微粒子



センターカット






右刃ストレート 超微粒子
Straight Flute Ultra Micro Grain Carbide

| 刃径 (D1) Dia. | 角度 (θ) Cut Angle | 刃厚 (L1) Cut Width | 首径 (D2) Neck Dia. | 首長 (L2) Neck Length | 全長 (L3) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|---|
| 5 | 45° | 1.2 | 2.5 | 5 | 60 | 3 | 4 |
| 6 | | 1.4 | 2.8 | 5 | 60 | 3 | 4 |
| 8 | | 1.9 | 4 | 5 | 60 | 4 | 6 |
| 10 | | 2.4 | 5 | 5 | 70 | 6 | 6 |
| 12 | | 2.9 | 5.9 | 5 | 70 | 6 | 6 |
| 5 | 50° | 1.4 | 2.5 | 5 | 60 | 3 | 4 |
| 6 | | 1.6 | 2.8 | 5 | 60 | 3 | 4 |
| 8 | | 2.2 | 4 | 5 | 60 | 4 | 6 |
| 10 | | 2.7 | 5 | 5 | 70 | 6 | 6 |
| 12 | | 3.3 | 5.9 | 5 | 70 | 6 | 6 |
| 5 | 55° | 1.6 | 2.5 | 5 | 60 | 3 | 4 |
| 6 | | 1.9 | 2.8 | 5 | 60 | 3 | 4 |
| 8 | | 2.6 | 4 | 5 | 60 | 4 | 6 |
| 10 | | 3.3 | 5 | 5 | 70 | 6 | 6 |
| 12 | | 4 | 5.9 | 5 | 70 | 6 | 6 |

| 公差(Tolerance) | D：$^{0}_{-0.05}$ | θ：±5' | d：h6 |
|---|---|---|---|

| 刃径 (D1) Dia. | 角度 (θ) Cut Angle | 刃厚 (L1) Cut Width | 首径 (D2) Neck Dia. | 首長 (L2) Neck Length | 全長 (L3) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|---|
| 5 | 60° | 2.2 | 2.3 | 5 | 60 | 3 | 4 |
| 6 | | 2.7 | 2.8 | 5 | 60 | 3 | 4 |
| 8 | | 3.7 | 3.6 | 5 | 60 | 4 | 6 |
| 10 | | 4.6 | 4.5 | 5 | 70 | 6 | 6 |
| 12 | | 5.6 | 5.4 | 5 | 70 | 6 | 6 |
| 5 | 70° | 3 | 2.3 | 5 | 60 | 3 | 4 |
| 6 | | 3.5 | 2.8 | 5 | 60 | 3 | 4 |
| 8 | | 4.7 | 3.6 | 5 | 60 | 4 | 6 |
| 10 | | 6 | 4.5 | 5 | 70 | 6 | 6 |
| 12 | | 7 | 5.4 | 5 | 70 | 6 | 6 |
| 5 | 75° | 3 | 2.3 | 5 | 60 | 3 | 4 |
| 6 | | 3.5 | 2.8 | 5 | 60 | 3 | 4 |
| 8 | | 4.7 | 3.6 | 5 | 60 | 4 | 6 |
| 10 | | 6 | 4.5 | 5 | 70 | 6 | 6 |
| 12 | | 7 | 5.4 | 5 | 70 | 6 | 6 |

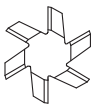
超硬

# CSMW-S

## 超硬スーパーミニWアンギュラ スリムシャンク *Solid Carbide Super Mini W-Angular Cutter Slim Shank*

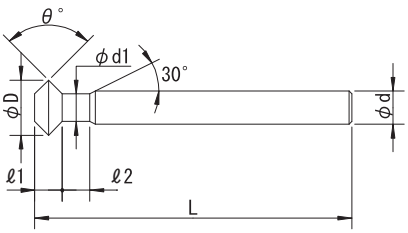
切削条件表 P243

**アリ溝・角度付溝・面取り加工** 右直刃 超微粒子



センター穴ナシ






右刃ストレート 超微粒子
Straight Flute Ultra Micro Grain Carbide

| 刃径 (ΦD) Dia. | 角度 (θ) Cut Angle | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|---|
| 5 | W60° | 1.5 | 2.3 | 5 | 60 | 3 | 4 |
| 6 | | 1.8 | 2.7 | 5 | 60 | 3 | 4 |
| 8 | | 2.4 | 3.6 | 5 | 60 | 4 | 6 |
| 10 | | 3.1 | 4.5 | 5 | 70 | 6 | 8 |
| 12 | | 3.7 | 5.4 | 5 | 70 | 6 | 8 |
| 5 | W90° | 2.4 | 2.5 | 5 | 60 | 3 | 4 |
| 6 | | 2.8 | 2.9 | 5 | 60 | 3 | 4 |

| 公差(Tolerance) | D：$^{0}_{-0.05}$ | θ：±10' | d：h6 |
|---|---|---|---|

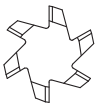
| 刃径 (ΦD) Dia. | 角度 (θ) Cut Angle | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|---|
| 8 | W90° | 3.8 | 3.9 | 5 | 60 | 4 | 6 |
| 10 | | 4.8 | 5 | 5 | 70 | 6 | 8 |
| 12 | | 5.8 | 5.9 | 5 | 70 | 6 | 8 |
| 5 | W120° | 4.4 | 2.3 | 5 | 60 | 3 | 4 |
| 6 | | 5.4 | 2.7 | 5 | 60 | 3 | 4 |
| 8 | | 7.4 | 3.6 | 5 | 60 | 4 | 6 |
| 10 | | 9.3 | 4.5 | 5 | 70 | 6 | 8 |
| 12 | | 11.2 | 5.4 | 5 | 70 | 6 | 8 |

超硬

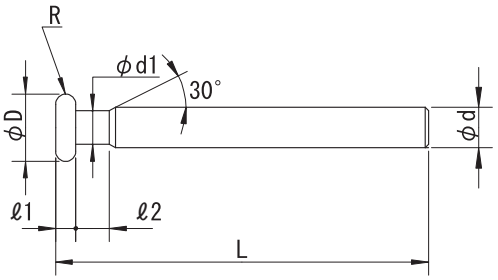
# CSMU-S

## 超硬スーパーミニコンベックス スリムシャンク *Solid Carbide Super Mini Convex Cutter Slim Shank*

切削条件表 P243 | R 加 工 | 右直刃 | 超微粒子






| 公差(Tolerance) | D：$^{0}_{-0.05}$ | ℓ1：$^{0}_{-0.035}$ | R：±0.01 | d：h6 |
|---|---|---|---|---|

右刃ストレート 超微粒子
Straight Flute Ultra Micro Grain Carbide

| 刃径 (ΦD) *Dia.* | R | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| 5 | 0.25 | 0.5 | 2.6 | 5 | 50 | 3 | 4 |
| | 0.3 | 0.6 | 2.6 | 5 | 50 | 3 | 4 |
| | 0.5 | 1 | 2.6 | 5 | 50 | 3 | 4 |
| | 0.75 | 1.5 | 2.6 | 5 | 50 | 3 | 4 |
| | 1 | 2 | 2.6 | 5 | 50 | 3 | 4 |
| 6 | 0.25 | 0.5 | 2.9 | 5 | 50 | 3 | 4 |
| | 0.3 | 0.6 | 2.9 | 5 | 50 | 3 | 4 |
| | 0.5 | 1 | 2.9 | 5 | 50 | 3 | 4 |
| | 0.75 | 1.5 | 2.9 | 5 | 50 | 3 | 4 |
| | 1 | 2 | 2.9 | 5 | 50 | 3 | 4 |
| 8 | 0.25 | 0.5 | 3.9 | 5 | 60 | 4 | 6 |
| | 0.3 | 0.6 | 3.9 | 5 | 60 | 4 | 6 |
| | 0.5 | 1 | 3.9 | 5 | 60 | 4 | 6 |
| | 0.75 | 1.5 | 3.9 | 5 | 60 | 4 | 6 |
| | 1 | 2 | 3.9 | 5 | 60 | 4 | 6 |
| | 1.25 | 2.5 | 3.9 | 5 | 60 | 4 | 6 |

| 刃径 (ΦD) *Dia.* | R | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| 10 | 0.25 | 0.5 | 5 | 6 | 70 | 6 | 6 |
| | 0.3 | 0.6 | 5 | 6 | 70 | 6 | 6 |
| | 0.5 | 1 | 5 | 6 | 70 | 6 | 6 |
| | 0.75 | 1.5 | 5 | 6 | 70 | 6 | 6 |
| | 1 | 2 | 5 | 6 | 70 | 6 | 6 |
| | 1.25 | 2.5 | 5 | 6 | 70 | 6 | 6 |
| | 1.5 | 3 | 5 | 6 | 70 | 6 | 6 |
| | 2 | 4 | 5 | 6 | 70 | 6 | 6 |
| 12 | 0.25 | 0.5 | 5.9 | 6 | 70 | 6 | 6 |
| | 0.3 | 0.6 | 5.9 | 6 | 70 | 6 | 6 |
| | 0.5 | 1 | 5.9 | 6 | 70 | 6 | 6 |
| | 0.75 | 1.5 | 5.9 | 6 | 70 | 6 | 6 |
| | 1 | 2 | 5.9 | 6 | 70 | 6 | 6 |
| | 1.25 | 2.5 | 5.9 | 6 | 70 | 6 | 6 |
| | 1.5 | 3 | 5.9 | 6 | 70 | 6 | 6 |
| | 2 | 4 | 5.9 | 6 | 70 | 6 | 6 |
| | 2.5 | 5 | 5.9 | 6 | 70 | 6 | 6 |

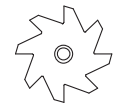
超硬

# CSMK-S

## 超硬スーパーミニキーシードカッター スリムシャンク *Solid Carbide Super Mini Keyseat Cutter Slim Shank*

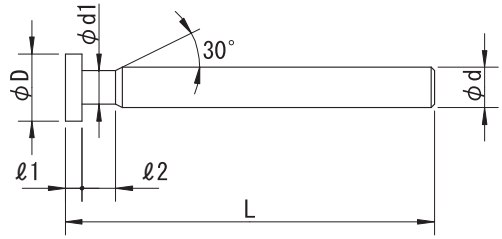
切削条件表 P243

**スクエア溝加工（キーシードカッター）** 右直刃 超微粒子



Φ8≦Dセンター穴付






| 公差(Tolerance) | D：$^{0}_{-0.05}$ | ℓ1：$^{0}_{-0.035}$ | d：h6 |
|---|---|---|---|

右刃ストレート 超微粒子
Straight Flute Ultra Micro Grain Carbide

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 5 | 0.5 | 2.5 | 5 | 50 | 3 | 6 |
| | 0.6 | 2.5 | 5 | 50 | 3 | 6 |
| | 0.7 | 2.5 | 5 | 50 | 3 | 6 |
| | 0.8 | 2.5 | 5 | 50 | 3 | 6 |
| | 0.9 | 2.5 | 5 | 50 | 3 | 6 |
| | 1 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.1 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.2 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.3 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.4 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.5 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.6 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.7 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.8 | 2.5 | 5 | 50 | 3 | 6 |
| | 1.9 | 2.5 | 5 | 50 | 3 | 6 |
| | 2 | 2.5 | 5 | 50 | 3 | 6 |
| | 2.5 | 2.5 | 5 | 50 | 3 | 6 |
| 6 | 0.5 | 2.9 | 5 | 50 | 3 | 8 |
| | 0.6 | 2.9 | 5 | 50 | 3 | 8 |
| | 0.7 | 2.9 | 5 | 50 | 3 | 8 |
| | 0.8 | 2.9 | 5 | 50 | 3 | 8 |
| | 0.9 | 2.9 | 5 | 50 | 3 | 8 |
| | 1 | 2.9 | 5 | 50 | 3 | 8 |
| | 1.1 | 2.9 | 5 | 50 | 3 | 8 |
| | 1.2 | 2.9 | 5 | 50 | 3 | 8 |
| | 1.3 | 2.9 | 5 | 50 | 3 | 8 |
| | 1.4 | 2.9 | 5 | 50 | 3 | 8 |
| | 1.5 | 2.9 | 5 | 50 | 3 | 8 |
| | 1.6 | 2.9 | 5 | 50 | 3 | 8 |
| | 1.7 | 2.9 | 5 | 50 | 3 | 8 |
| | 1.8 | 2.9 | 5 | 50 | 3 | 8 |
| | 1.9 | 2.9 | 5 | 50 | 3 | 8 |
| | 2 | 2.9 | 5 | 50 | 3 | 8 |
| | 2.5 | 2.9 | 5 | 50 | 3 | 8 |
| | 3 | 2.9 | 5 | 50 | 3 | 8 |
| 8 | 0.5 | 3.9 | 5 | 60 | 4 | 8 |
| | 0.6 | 3.9 | 5 | 60 | 4 | 8 |
| | 0.7 | 3.9 | 5 | 60 | 4 | 8 |
| | 0.8 | 3.9 | 5 | 60 | 4 | 8 |
| | 0.9 | 3.9 | 5 | 60 | 4 | 8 |
| | 1 | 3.9 | 5 | 60 | 4 | 8 |
| | 1.1 | 3.9 | 5 | 60 | 4 | 8 |
| | 1.2 | 3.9 | 5 | 60 | 4 | 8 |
| | 1.3 | 3.9 | 5 | 60 | 4 | 8 |
| | 1.4 | 3.9 | 5 | 60 | 4 | 8 |
| | 1.5 | 3.9 | 5 | 60 | 4 | 8 |
| | 1.6 | 3.9 | 5 | 60 | 4 | 8 |
| | 1.7 | 3.9 | 5 | 60 | 4 | 8 |
| | 1.8 | 3.9 | 5 | 60 | 4 | 8 |

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 8 | 1.9 | 3.9 | 5 | 60 | 4 | 8 |
| | 2 | 3.9 | 5 | 60 | 4 | 8 |
| | 2.5 | 3.9 | 5 | 60 | 4 | 8 |
| | 3 | 3.9 | 5 | 60 | 4 | 8 |
| | 3.5 | 3.9 | 5 | 60 | 4 | 8 |
| | 4 | 3.9 | 5 | 60 | 4 | 8 |
| 10 | 0.5 | 5 | 5 | 70 | 6 | 8 |
| | 0.6 | 5 | 5 | 70 | 6 | 8 |
| | 0.7 | 5 | 5 | 70 | 6 | 8 |
| | 0.8 | 5 | 5 | 70 | 6 | 8 |
| | 0.9 | 5 | 5 | 70 | 6 | 8 |
| | 1 | 5 | 5 | 70 | 6 | 8 |
| | 1.1 | 5 | 5 | 70 | 6 | 8 |
| | 1.2 | 5 | 5 | 70 | 6 | 8 |
| | 1.3 | 5 | 5 | 70 | 6 | 8 |
| | 1.4 | 5 | 5 | 70 | 6 | 8 |
| | 1.5 | 5 | 5 | 70 | 6 | 8 |
| | 1.6 | 5 | 5 | 70 | 6 | 8 |
| | 1.7 | 5 | 5 | 70 | 6 | 8 |
| | 1.8 | 5 | 5 | 70 | 6 | 8 |
| | 1.9 | 5 | 5 | 70 | 6 | 8 |
| | 2 | 5 | 5 | 70 | 6 | 8 |
| | 2.5 | 5 | 5 | 70 | 6 | 8 |
| | 3 | 5 | 5 | 70 | 6 | 8 |
| | 3.5 | 5 | 5 | 70 | 6 | 8 |
| | 4 | 5 | 5 | 70 | 6 | 8 |
| | 4.5 | 5 | 5 | 70 | 6 | 8 |
| | 5 | 5 | 5 | 70 | 6 | 8 |
| 12 | 0.5 | 5.9 | 5 | 70 | 6 | 8 |
| | 0.6 | 5.9 | 5 | 70 | 6 | 8 |
| | 0.7 | 5.9 | 5 | 70 | 6 | 8 |
| | 0.8 | 5.9 | 5 | 70 | 6 | 8 |
| | 0.9 | 5.9 | 5 | 70 | 6 | 8 |
| | 1 | 5.9 | 5 | 70 | 6 | 8 |
| | 1.1 | 5.9 | 5 | 70 | 6 | 8 |
| | 1.2 | 5.9 | 5 | 70 | 6 | 8 |
| | 1.3 | 5.9 | 5 | 70 | 6 | 8 |
| | 1.4 | 5.9 | 5 | 70 | 6 | 8 |
| | 1.5 | 5.9 | 5 | 70 | 6 | 8 |
| | 1.6 | 5.9 | 5 | 70 | 6 | 8 |
| | 1.7 | 5.9 | 5 | 70 | 6 | 8 |
| | 1.8 | 5.9 | 5 | 70 | 6 | 8 |
| | 1.9 | 5.9 | 5 | 70 | 6 | 8 |
| | 2 | 5.9 | 5 | 70 | 6 | 8 |
| | 2.5 | 5.9 | 5 | 70 | 6 | 8 |
| | 3 | 5.9 | 5 | 70 | 6 | 8 |
| | 3.5 | 5.9 | 5 | 70 | 6 | 8 |
| | 4 | 5.9 | 5 | 70 | 6 | 8 |
| | 4.5 | 5.9 | 5 | 70 | 6 | 8 |
| | 5 | 5.9 | 5 | 70 | 6 | 8 |

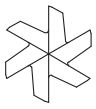
超硬

# CSMT

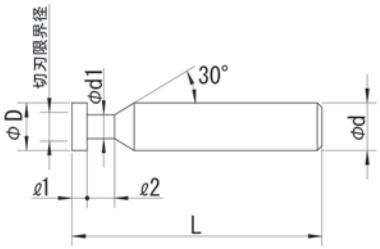
## 超硬スーパーミニスロット　*Solid Carbide Super Mini Slot Cutter*

切削条件表 P244

**スクエア溝加工（Tスロットカッター）** 右直刃 超微粒子


センターカット






| D | 2 | 2.5 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 切刃限界径 | Φ1.5 | Φ1.55 | Φ1.8 | Φ2.8 | Φ2.8 |
| D | 6 | 7 | 8 | 10 | 12 |
| 切刃限界径 | Φ3.5 | Φ4 | Φ4.5 | Φ5.9 | Φ6.9 |

※Cutting Edge Limit Diameter

| 公差(Tolerance) | D： $^{0}_{-0.05}$ | ℓ1： $^{0}_{-0.035}$ | d： $^{0}_{-0.01}$ |
|---|---|---|---|

右刃ストレート　超微粒子
Straight Flute　Ultra Micro Grain Carbide

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 2 | 0.5 | 1.2 | 3.5 | 40 | 4 | 4 |
| | 0.6 | 1.2 | 3.5 | 40 | 4 | 4 |
| | 0.7 | 1.2 | 3.5 | 40 | 4 | 4 |
| | 0.8 | 1.2 | 3.5 | 40 | 4 | 4 |
| | 0.9 | 1.2 | 3.5 | 40 | 4 | 4 |
| | 1 | 1.2 | 3.5 | 40 | 4 | 4 |
| | 1.2 | 1.2 | 3.5 | 40 | 4 | 4 |
| 2.5 | 0.5 | 1.25 | 3.5 | 40 | 4 | 4 |
| | 0.6 | 1.25 | 3.5 | 40 | 4 | 4 |
| | 0.7 | 1.25 | 3.5 | 40 | 4 | 4 |
| | 0.8 | 1.25 | 3.5 | 40 | 4 | 4 |
| | 0.9 | 1.25 | 3.5 | 40 | 4 | 4 |
| | 1 | 1.25 | 3.5 | 40 | 4 | 4 |
| | 1.2 | 1.25 | 3.5 | 40 | 4 | 4 |
| 3 | 0.5 | 1.5 | 3.5 | 50 | 4 | 4 |
| | 0.6 | 1.5 | 3.5 | 50 | 4 | 4 |
| | 0.7 | 1.5 | 3.5 | 50 | 4 | 4 |
| | 0.8 | 1.5 | 3.5 | 50 | 4 | 4 |
| | 0.9 | 1.5 | 3.5 | 50 | 4 | 4 |
| | 1 | 1.5 | 3.5 | 50 | 4 | 4 |
| | 1.2 | 1.5 | 3.5 | 50 | 4 | 4 |
| | 1.4 | 1.5 | 3.5 | 50 | 4 | 4 |
| | 1.5 | 1.5 | 3.5 | 50 | 4 | 4 |
| 4 | 0.5 | 2.5 | 3.5 | 50 | 4 | 4 |
| | 0.6 | 2.5 | 3.5 | 50 | 4 | 4 |
| | 0.7 | 2.5 | 3.5 | 50 | 4 | 4 |
| | 0.8 | 2.5 | 3.5 | 50 | 4 | 4 |
| | 0.9 | 2.5 | 3.5 | 50 | 4 | 4 |
| | 1 | 2.5 | 3.5 | 50 | 4 | 4 |
| | 1.2 | 2.5 | 3.5 | 50 | 4 | 4 |
| | 1.4 | 2.5 | 3.5 | 50 | 4 | 4 |
| | 1.5 | 2.5 | 3.5 | 50 | 4 | 4 |
| | 1.6 | 2.5 | 3.5 | 50 | 4 | 4 |
| | 1.8 | 2.5 | 3.5 | 50 | 4 | 4 |
| | 2 | 2.5 | 3.5 | 50 | 4 | 4 |
| 5 | 0.5 | 2.5 | 4 | 50 | 6 | 4 |
| | 0.6 | 2.5 | 4 | 50 | 6 | 4 |
| | 0.7 | 2.5 | 4 | 50 | 6 | 4 |
| | 0.8 | 2.5 | 4 | 50 | 6 | 4 |
| | 0.9 | 2.5 | 4 | 50 | 6 | 4 |
| | 1 | 2.5 | 4 | 50 | 6 | 4 |
| | 1.2 | 2.5 | 4 | 50 | 6 | 4 |
| | 1.4 | 2.5 | 4 | 50 | 6 | 4 |
| | 1.5 | 2.5 | 4 | 50 | 6 | 4 |
| | 1.6 | 2.5 | 4 | 50 | 6 | 4 |
| | 1.8 | 2.5 | 4 | 50 | 6 | 4 |

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 5 | 2 | 2.5 | 4 | 50 | 6 | 4 |
| | 2.5 | 2.5 | 4 | 50 | 6 | 4 |
| 6 | 0.5 | 3 | 4 | 50 | 6 | 6 |
| | 0.6 | 3 | 4 | 50 | 6 | 6 |
| | 0.7 | 3 | 4 | 50 | 6 | 6 |
| | 0.8 | 3 | 4 | 50 | 6 | 6 |
| | 0.9 | 3 | 4 | 50 | 6 | 6 |
| | 1 | 3 | 4 | 50 | 6 | 6 |
| | 1.2 | 3 | 4 | 50 | 6 | 6 |
| | 1.4 | 3 | 4 | 50 | 6 | 6 |
| | 1.5 | 3 | 4 | 50 | 6 | 6 |
| | 1.6 | 3 | 4 | 50 | 6 | 6 |
| | 1.8 | 3 | 4 | 50 | 6 | 6 |
| | 2 | 3 | 4 | 50 | 6 | 6 |
| | 2.5 | 3 | 4 | 50 | 6 | 6 |
| | 3 | 3 | 4 | 50 | 6 | 6 |
| 7 | 0.5 | 3.5 | 4 | 60 | 8 | 6 |
| | 0.6 | 3.5 | 4 | 60 | 8 | 6 |
| | 0.7 | 3.5 | 4 | 60 | 8 | 6 |
| | 0.8 | 3.5 | 4 | 60 | 8 | 6 |
| | 0.9 | 3.5 | 4 | 60 | 8 | 6 |
| | 1 | 3.5 | 4 | 60 | 8 | 6 |
| | 1.2 | 3.5 | 4 | 60 | 8 | 6 |
| | 1.4 | 3.5 | 4 | 60 | 8 | 6 |
| | 1.5 | 3.5 | 4 | 60 | 8 | 6 |
| | 1.6 | 3.5 | 4 | 60 | 8 | 6 |
| | 1.8 | 3.5 | 4 | 60 | 8 | 6 |
| | 2 | 3.5 | 4 | 60 | 8 | 6 |
| | 2.5 | 3.5 | 4 | 60 | 8 | 6 |
| | 3 | 3.5 | 4 | 60 | 8 | 6 |
| | 3.5 | 3.5 | 4 | 60 | 8 | 6 |
| 8 | 0.5 | 4 | 4 | 60 | 8 | 6 |
| | 0.6 | 4 | 4 | 60 | 8 | 6 |
| | 0.7 | 4 | 4 | 60 | 8 | 6 |
| | 0.8 | 4 | 4 | 60 | 8 | 6 |
| | 0.9 | 4 | 4 | 60 | 8 | 6 |
| | 1 | 4 | 4 | 60 | 8 | 6 |
| | 1.2 | 4 | 4 | 60 | 8 | 6 |
| | 1.4 | 4 | 4 | 60 | 8 | 6 |
| | 1.5 | 4 | 4 | 60 | 8 | 6 |
| | 1.6 | 4 | 4 | 60 | 8 | 6 |
| | 1.8 | 4 | 4 | 60 | 8 | 6 |
| | 2 | 4 | 4 | 60 | 8 | 6 |
| | 2.5 | 4 | 4 | 60 | 8 | 6 |
| | 3 | 4 | 4 | 60 | 8 | 6 |
| | 3.5 | 4 | 4 | 60 | 8 | 6 |

# CSMT 超硬スーパーミニスロット

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 8 | 4 | 4 | 4 | 60 | 8 | 6 |
| 10 | 0.5 | 5 | 6 | 70 | 10 | 6 |
| | 0.6 | 5 | 6 | 70 | 10 | 6 |
| | 0.7 | 5 | 6 | 70 | 10 | 6 |
| | 0.8 | 5 | 6 | 70 | 10 | 6 |
| | 0.9 | 5 | 6 | 70 | 10 | 6 |
| | 1 | 5 | 6 | 70 | 10 | 6 |
| | 1.2 | 5 | 6 | 70 | 10 | 6 |
| | 1.4 | 5 | 6 | 70 | 10 | 6 |
| | 1.5 | 5 | 6 | 70 | 10 | 6 |
| | 1.6 | 5 | 6 | 70 | 10 | 6 |
| | 1.8 | 5 | 6 | 70 | 10 | 6 |
| | 2 | 5 | 6 | 70 | 10 | 6 |
| | 2.5 | 5 | 6 | 70 | 10 | 6 |
| | 3 | 5 | 6 | 70 | 10 | 6 |
| | 3.5 | 5 | 6 | 70 | 10 | 6 |
| | 4 | 5 | 6 | 70 | 10 | 6 |
| | 4.5 | 5 | 6 | 70 | 10 | 6 |
| | 5 | 5 | 6 | 70 | 10 | 6 |

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 12 | 0.5 | 6 | 7 | 70 | 12 | 6 |
| | 0.6 | 6 | 7 | 70 | 12 | 6 |
| | 0.7 | 6 | 7 | 70 | 12 | 6 |
| | 0.8 | 6 | 7 | 70 | 12 | 6 |
| | 0.9 | 6 | 7 | 70 | 12 | 6 |
| | 1 | 6 | 7 | 70 | 12 | 6 |
| | 1.2 | 6 | 7 | 70 | 12 | 6 |
| | 1.4 | 6 | 7 | 70 | 12 | 6 |
| | 1.5 | 6 | 7 | 70 | 12 | 6 |
| | 1.6 | 6 | 7 | 70 | 12 | 6 |
| | 1.8 | 6 | 7 | 70 | 12 | 6 |
| | 2 | 6 | 7 | 70 | 12 | 6 |
| | 2.5 | 6 | 7 | 70 | 12 | 6 |
| | 3 | 6 | 7 | 70 | 12 | 6 |
| | 3.5 | 6 | 7 | 70 | 12 | 6 |
| | 4 | 6 | 7 | 70 | 12 | 6 |
| | 4.5 | 6 | 7 | 70 | 12 | 6 |
| | 5 | 6 | 7 | 70 | 12 | 6 |

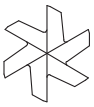
超硬

# CSMTL-A

## 超硬スーパーミニスロットロング *Solid Carbide Super Mini Slot Cutter Long*

切削条件表 P244

スクエア溝加工（Tスロットカッター） 右直刃 TiAlN 超微粒子

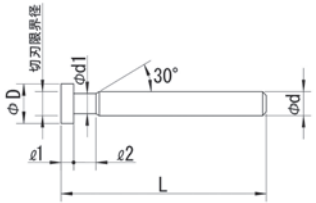


センターカット



| D | 5 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|
| 切刃限界径 | Φ2.8 | Φ3.5 | Φ4.5 | Φ5.9 | Φ6.9 |

※Cutting Edge Limit Diameter




| 公差(Tolerance) | D： $^{0}_{-0.05}$ | ℓ1： $^{0}_{-0.03}$ | d： $^{0}_{-0.01}$ |
|---|---|---|---|

右刃ストレート　TiAlNコーティング　超微粒子
Straight Flute　TiAlN Coating　Ultra Micro Grain Carbide

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 5 | 0.5 | 2.5 | 5 | 80 | 3 | 4 |
| | 0.6 | 2.5 | 5 | 80 | 3 | 4 |
| | 0.8 | 2.5 | 5 | 80 | 3 | 4 |
| | 1 | 2.5 | 5 | 80 | 3 | 4 |
| | 1.2 | 2.5 | 5 | 80 | 3 | 4 |
| | 1.5 | 2.5 | 5 | 80 | 3 | 4 |
| | 2 | 2.5 | 5 | 80 | 3 | 4 |
| | 2.5 | 2.5 | 5 | 80 | 3 | 4 |
| 6 | 0.5 | 2.9 | 5 | 80 | 3 | 6 |
| | 0.6 | 2.9 | 5 | 80 | 3 | 6 |
| | 0.8 | 2.9 | 5 | 80 | 3 | 6 |
| | 1 | 2.9 | 5 | 80 | 3 | 6 |
| | 1.2 | 2.9 | 5 | 80 | 3 | 6 |
| | 1.5 | 2.9 | 5 | 80 | 3 | 6 |
| | 2 | 2.9 | 5 | 80 | 3 | 6 |
| | 2.5 | 2.9 | 5 | 80 | 3 | 6 |
| | 3 | 2.9 | 5 | 80 | 3 | 6 |
| 8 | 0.5 | 3.9 | 5 | 80 | 4 | 6 |
| | 0.6 | 3.9 | 5 | 80 | 4 | 6 |
| | 0.8 | 3.9 | 5 | 80 | 4 | 6 |
| | 1 | 3.9 | 5 | 80 | 4 | 6 |
| | 1.2 | 3.9 | 5 | 80 | 4 | 6 |
| | 1.5 | 3.9 | 5 | 80 | 4 | 6 |
| | 2 | 3.9 | 5 | 80 | 4 | 6 |
| | 2.5 | 3.9 | 5 | 80 | 4 | 6 |
| | 3 | 3.9 | 5 | 80 | 4 | 6 |

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 10 | 0.5 | 5 | 5 | 100 | 6 | 6 |
| | 0.6 | 5 | 5 | 100 | 6 | 6 |
| | 0.8 | 5 | 5 | 100 | 6 | 6 |
| | 1 | 5 | 5 | 100 | 6 | 6 |
| | 1.2 | 5 | 5 | 100 | 6 | 6 |
| | 1.5 | 5 | 5 | 100 | 6 | 6 |
| | 2 | 5 | 5 | 100 | 6 | 6 |
| | 2.5 | 5 | 5 | 100 | 6 | 6 |
| | 3 | 5 | 5 | 100 | 6 | 6 |
| 12 | 0.5 | 5.9 | 5 | 100 | 6 | 6 |
| | 0.6 | 5.9 | 5 | 100 | 6 | 6 |
| | 0.8 | 5.9 | 5 | 100 | 6 | 6 |
| | 1 | 5.9 | 5 | 100 | 6 | 6 |
| | 1.2 | 5.9 | 5 | 100 | 6 | 6 |
| | 1.5 | 5.9 | 5 | 100 | 6 | 6 |
| | 2 | 5.9 | 5 | 100 | 6 | 6 |
| | 2.5 | 5.9 | 5 | 100 | 6 | 6 |
| | 3 | 5.9 | 5 | 100 | 6 | 6 |

超硬

# CSMS

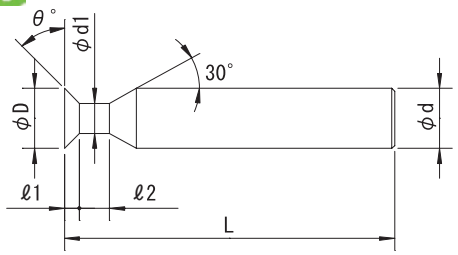
## 超硬スーパーミニアンギュラ　*Solid Carbide Super Mini Angular Cutter*

切削条件表 P244

アリ溝・角度付溝・面取り加工　右直刃　超微粒子


センターカット






| 公差(Tolerance) | D：$^{0}_{-0.05}$ | θ：±5′ | d：$^{0}_{-0.01}$ |
|---|---|---|---|

右刃ストレート　超微粒子
Straight Flute　Ultra Micro Grain Carbide

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| 2 | 45° | 0.5 | 1 | 3 | 50 | 3 | 4 |
| 2.5 | | 0.65 | 1.2 | 3 | 50 | 3 | 4 |
| 3 | | 0.75 | 1.5 | 4 | 50 | 3 | 4 |
| 4 | | 1 | 2 | 4 | 50 | 4 | 4 |
| 5 | | 1.2 | 2.5 | 4 | 60 | 6 | 4 |
| 6 | | 1.4 | 3 | 4 | 60 | 6 | 4 |
| 8 | | 1.9 | 4 | 5 | 60 | 8 | 6 |
| 10 | | 2.4 | 5 | 6 | 70 | 10 | 6 |
| 12 | | 2.9 | 6 | 7 | 70 | 12 | 6 |

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| 2 | 60° | 0.86 | 1 | 3 | 50 | 3 | 4 |
| 2.5 | | 1.12 | 1.2 | 3 | 50 | 3 | 4 |
| 3 | | 1.29 | 1.5 | 4 | 50 | 3 | 4 |
| 4 | | 1.73 | 2 | 4 | 50 | 4 | 4 |
| 5 | | 2.2 | 2.3 | 4 | 60 | 6 | 4 |
| 6 | | 2.7 | 2.7 | 4 | 60 | 6 | 4 |
| 8 | | 3.7 | 3.6 | 5 | 60 | 8 | 6 |
| 10 | | 4.6 | 4.5 | 6 | 70 | 10 | 6 |
| 12 | | 5.6 | 5.4 | 7 | 70 | 12 | 6 |

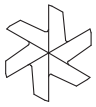
超硬

# CSMSL-A

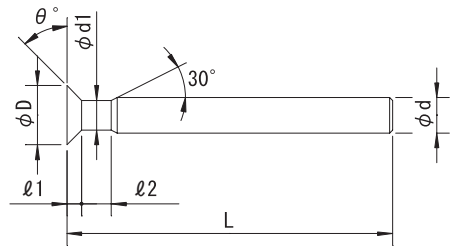
## 超硬スーパーミニアンギュラロング　*Solid Carbide Super Mini Angular Cutter Long*

切削条件表 P245

アリ溝・角度付溝・面取り加工　右直刃　TiAlN　超微粒子


センターカット






| 公差(Tolerance) | D：$^{0}_{-0.05}$ | θ：±5′ | d：$^{0}_{-0.01}$ |
|---|---|---|---|

右刃ストレート　TiAlNコーティング　超微粒子
Straight Flute　TiAlN Coating　Ultra Micro Grain Carbide

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| 5 | 45° | 1.2 | 2.5 | 5 | 80 | 3 | 4 |
| 6 | | 1.4 | 2.8 | 5 | 80 | 3 | 4 |
| 8 | | 1.9 | 4 | 5 | 80 | 4 | 6 |
| 10 | | 2.4 | 5 | 5 | 90 | 6 | 6 |
| 12 | | 2.9 | 5.9 | 5 | 90 | 6 | 6 |

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| 5 | 60° | 2.2 | 2.3 | 5 | 80 | 3 | 4 |
| 6 | | 2.7 | 2.8 | 5 | 80 | 3 | 4 |
| 8 | | 3.7 | 3.6 | 5 | 80 | 4 | 6 |
| 10 | | 4.6 | 4.5 | 5 | 90 | 6 | 6 |
| 12 | | 5.6 | 5.4 | 5 | 90 | 6 | 6 |

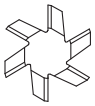
超硬

# CSMW

## 超硬スーパーミニWアンギュラ　*Solid Carbide Super Mini W-Angular Cutter*

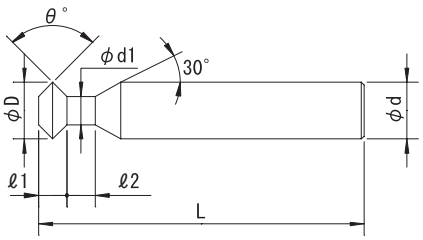
切削条件表 P245

アリ溝・角度付溝・面取り加工　右直刃　超微粒子



センター穴ナシ






右刃ストレート　超微粒子
Straight Flute　Ultra Micro Grain Carbide

| 公差(Tolerance) | D：$^{0}_{-0.05}$ | θ：±10′ | d：$^{0}_{-0.01}$ |
|---|---|---|---|

| 刃径（ΦD） Dia. | 角度（θ） Cut Angle | 刃厚（ℓ1） Cut Width | 首径（Φd1） Neck Dia. | 首長（ℓ2） Neck Length | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. | 刃数（N） Number of Flutes |
|---|---|---|---|---|---|---|---|
| 2 | W60° | 0.57 | 1 | 3 | 50 | 3 | 4 |
| 2.5 | | 0.75 | 1.2 | 3 | 50 | 3 | 4 |
| 3 | | 0.86 | 1.5 | 4 | 50 | 3 | 4 |
| 4 | | 1.15 | 2 | 4 | 50 | 4 | 4 |
| 5 | | 1.5 | 2.3 | 4 | 60 | 6 | 4 |
| 6 | | 1.8 | 2.7 | 4 | 60 | 6 | 4 |
| 8 | | 2.4 | 3.6 | 5 | 60 | 8 | 6 |
| 10 | | 3.1 | 4.5 | 6 | 70 | 10 | 8 |
| 12 | | 3.7 | 5.4 | 7 | 70 | 12 | 8 |
| 2 | W90° | 1 | 1 | 3 | 50 | 3 | 4 |
| 2.5 | | 1.3 | 1.2 | 3 | 50 | 3 | 4 |
| 3 | | 1.5 | 1.5 | 4 | 50 | 3 | 4 |
| 4 | | 2 | 2 | 4 | 50 | 4 | 4 |
| 5 | W90° | 2.4 | 2.5 | 4 | 60 | 6 | 4 |
| 6 | | 2.8 | 3 | 4 | 60 | 6 | 4 |
| 8 | | 3.8 | 4 | 5 | 60 | 8 | 6 |
| 10 | | 4.8 | 5 | 6 | 70 | 10 | 8 |
| 12 | | 5.8 | 6 | 7 | 70 | 12 | 8 |
| 2 | W120° | 1.73 | 1 | 3 | 50 | 3 | 4 |
| 2.5 | | 2.25 | 1.2 | 3 | 50 | 3 | 4 |
| 3 | | 2.59 | 1.5 | 4 | 50 | 3 | 4 |
| 4 | | 3.46 | 2 | 4 | 50 | 4 | 4 |
| 5 | | 4.4 | 2.3 | 4 | 60 | 6 | 4 |
| 6 | | 5.4 | 2.7 | 4 | 60 | 6 | 4 |
| 8 | | 7.4 | 3.6 | 5 | 60 | 8 | 6 |
| 10 | | 9.3 | 4.5 | 6 | 70 | 10 | 8 |
| 12 | | 11.2 | 5.4 | 7 | 70 | 12 | 8 |

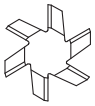
超硬

# CSMWL-A

## 超硬スーパーミニWアンギュラロング　*Solid Carbide Super Mini W-Angular Cutter Long*

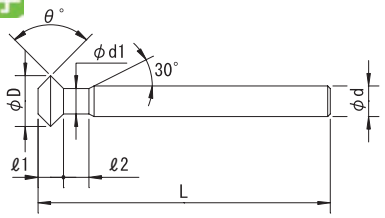
切削条件表 P246

アリ溝・角度付溝・面取り加工　右直刃　TiAlN　超微粒子



センター穴ナシ






右刃ストレート　TiAlNコーティング　超微粒子
Straight Flute　TiAlN Coating　Ultra Micro Grain Carbide

| 公差(Tolerance) | D：$^{0}_{-0.05}$ | θ：±10′ | d：$^{0}_{-0.01}$ |
|---|---|---|---|

| 刃径（ΦD） Dia. | 角度（θ） Cut Angle | 刃厚（ℓ1） Cut Width | 首径（Φd1） Neck Dia. | 首長（ℓ2） Neck Length | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. | 刃数（N） Number of Flutes |
|---|---|---|---|---|---|---|---|
| 5 | W60° | 1.5 | 2.3 | 5 | 80 | 3 | 4 |
| 6 | | 1.8 | 2.7 | 5 | 80 | 3 | 4 |
| 8 | | 2.4 | 3.6 | 5 | 80 | 4 | 6 |
| 10 | | 3.1 | 4.5 | 5 | 90 | 6 | 8 |
| 12 | | 3.7 | 5.4 | 5 | 90 | 6 | 8 |
| 5 | W90° | 2.4 | 2.5 | 5 | 80 | 3 | 4 |
| 6 | | 2.8 | 2.9 | 5 | 80 | 3 | 4 |
| 8 | | 3.8 | 3.9 | 5 | 80 | 4 | 6 |
| 10 | | 4.8 | 5 | 5 | 90 | 6 | 8 |
| 12 | | 5.8 | 5.9 | 5 | 90 | 6 | 8 |
| 5 | W120° | 4.4 | 2.3 | 5 | 80 | 3 | 4 |
| 6 | | 5.4 | 2.7 | 5 | 80 | 3 | 4 |
| 8 | | 7.4 | 3.6 | 5 | 80 | 4 | 6 |
| 10 | | 9.3 | 4.5 | 5 | 90 | 6 | 8 |
| 12 | | 11.2 | 5.4 | 5 | 90 | 6 | 8 |

超硬

# CSMST2-P

## 超硬ソリッドミニストロングアンギュラ　*Solid Carbide Mini Strong Angular Cutter*

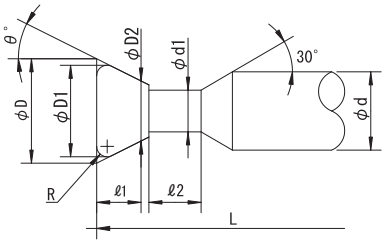
切削条件表 P246

アリ溝・角度付溝・面取り加工

右ネジレ 15°　P Coating　刃数 2　超微粒子


センターカット






| 公差(Tolerance) | D2：±0.05 | ℓ1：$^{0}_{-0.05}$ | R：±0.05 | θ：±30° | d：$^{0}_{-0.009}$ |
|---|---|---|---|---|---|

右刃右ネジレ15°　Pコーティング　刃数:2　超微粒子
Helix Angle-Right15°　P Coating　Number of Flute:2　Ultra Micro Grain Carbide

| 呼び寸法 (ΦD) Size | 刃径 (ΦD1) Dia. | 角度 (θ) Cut Angle | R | 刃長 (ℓ1) Length of Cut | 基準径 (ΦD2) Std. Dia. | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|---|---|---|
| 3 | 3 | 5° | – | 2 | 2.65 | 2.5 | 4 | 50 | 4 |
| | 2.95 | | 0.3 | 2 | 2.65 | 2.5 | 4 | 50 | 4 |
| | 2.91 | | 0.5 | 2 | 2.65 | 2.5 | 4 | 50 | 4 |
| | 3 | 10° | – | 2 | 2.29 | 2.2 | 4 | 50 | 4 |
| | 2.88 | | 0.3 | 2 | 2.29 | 2.2 | 4 | 50 | 4 |
| | 2.81 | | 0.5 | 2 | 2.29 | 2.2 | 4 | 50 | 4 |
| | 3 | 15° | – | 2 | 1.93 | 1.7 | 4 | 50 | 4 |
| | 2.82 | | 0.3 | 2 | 1.93 | 1.7 | 4 | 50 | 4 |
| | 2.7 | | 0.5 | 2 | 1.93 | 1.7 | 4 | 50 | 4 |
| | 3 | 20° | – | 2 | 1.54 | 1.35 | 4 | 50 | 4 |
| | 2.74 | | 0.3 | 2 | 1.54 | 1.35 | 4 | 50 | 4 |
| | 2.57 | | 0.5 | 2 | 1.54 | 1.35 | 4 | 50 | 4 |
| | 3 | 25° | – | 1.6 | 1.51 | 1.3 | 4 | 50 | 4 |
| | 2.66 | | 0.3 | 1.6 | 1.51 | 1.3 | 4 | 50 | 4 |
| | 2.43 | | 0.5 | 1.6 | 1.51 | 1.3 | 4 | 50 | 4 |
| 4 | 4 | 5° | – | 2.5 | 3.56 | 3.4 | 4 | 50 | 4 |
| | 3.95 | | 0.3 | 2.5 | 3.56 | 3.4 | 4 | 50 | 4 |
| | 3.91 | | 0.5 | 2.5 | 3.56 | 3.4 | 4 | 50 | 4 |
| | 4 | 10° | – | 2.5 | 3.12 | 3 | 4 | 50 | 4 |
| | 3.88 | | 0.3 | 2.5 | 3.12 | 3 | 4 | 50 | 4 |
| | 3.81 | | 0.5 | 2.5 | 3.12 | 3 | 4 | 50 | 4 |
| | 4 | 15° | – | 2.5 | 2.66 | 2.4 | 4 | 50 | 4 |
| | 3.82 | | 0.3 | 2.5 | 2.66 | 2.4 | 4 | 50 | 4 |
| | 3.7 | | 0.5 | 2.5 | 2.66 | 2.4 | 4 | 50 | 4 |
| | 4 | 20° | – | 2.5 | 2.18 | 1.95 | 4 | 50 | 4 |
| | 3.74 | | 0.3 | 2.5 | 2.18 | 1.95 | 4 | 50 | 4 |
| | 3.57 | | 0.5 | 2.5 | 2.18 | 1.95 | 4 | 50 | 4 |
| | 4 | 25° | – | 2.5 | 1.67 | 1.45 | 4 | 50 | 4 |
| | 3.66 | | 0.3 | 2.5 | 1.67 | 1.45 | 4 | 50 | 4 |
| | 3.43 | | 0.5 | 2.5 | 1.67 | 1.45 | 4 | 50 | 4 |
| 5 | 5 | 5° | – | 3 | 4.48 | 4.3 | 7 | 60 | 6 |
| | 4.95 | | 0.3 | 3 | 4.48 | 4.3 | 7 | 60 | 6 |
| | 4.91 | | 0.5 | 3 | 4.48 | 4.3 | 7 | 60 | 6 |
| | 5 | 10° | – | 3 | 3.94 | 3.7 | 7 | 60 | 6 |
| | 4.88 | | 0.3 | 3 | 3.94 | 3.7 | 7 | 60 | 6 |
| | 4.81 | | 0.5 | 3 | 3.94 | 3.7 | 7 | 60 | 6 |
| | 5 | 15° | – | 3 | 3.39 | 3.2 | 7 | 60 | 6 |
| | 4.82 | | 0.3 | 3 | 3.39 | 3.2 | 7 | 60 | 6 |
| | 4.7 | | 0.5 | 3 | 3.39 | 3.2 | 7 | 60 | 6 |
| | 5 | 20° | – | 3 | 2.82 | 2.6 | 7 | 60 | 6 |
| | 4.74 | | 0.3 | 3 | 2.82 | 2.6 | 7 | 60 | 6 |
| | 4.57 | | 0.5 | 3 | 2.82 | 2.6 | 7 | 60 | 6 |
| | 5 | 25° | – | 3 | 2.2 | 1.95 | 7 | 60 | 6 |
| | 4.66 | | 0.3 | 3 | 2.2 | 1.95 | 7 | 60 | 6 |
| | 4.43 | | 0.5 | 3 | 2.2 | 1.95 | 7 | 60 | 6 |
| 6 | 6 | 5° | – | 4 | 5.3 | 5.1 | 7 | 60 | 6 |
| | 5.95 | | 0.3 | 4 | 5.3 | 5.1 | 7 | 60 | 6 |
| | 5.91 | | 0.5 | 4 | 5.3 | 5.1 | 7 | 60 | 6 |
| | 6 | 10° | – | 4 | 4.59 | 4.3 | 7 | 60 | 6 |
| | 5.88 | | 0.3 | 4 | 4.59 | 4.3 | 7 | 60 | 6 |
| | 5.81 | | 0.5 | 4 | 4.59 | 4.3 | 7 | 60 | 6 |
| | 6 | 15° | – | 4 | 3.86 | 3.5 | 7 | 60 | 6 |
| | 5.82 | | 0.3 | 4 | 3.86 | 3.5 | 7 | 60 | 6 |
| | 5.7 | | 0.5 | 4 | 3.86 | 3.5 | 7 | 60 | 6 |
| | 6 | 20° | – | 4 | 3.09 | 2.9 | 7 | 60 | 6 |
| | 5.74 | | 0.3 | 4 | 3.09 | 2.9 | 7 | 60 | 6 |
| | 5.57 | | 0.5 | 4 | 3.09 | 2.9 | 7 | 60 | 6 |
| | 6 | 25° | – | 3.5 | 2.74 | 2.5 | 7 | 60 | 6 |
| | 5.66 | | 0.3 | 3.5 | 2.74 | 2.5 | 7 | 60 | 6 |
| | 5.43 | | 0.5 | 3.5 | 2.74 | 2.5 | 7 | 60 | 6 |
| 8 | 8 | 5° | – | 5 | 7.13 | 6.9 | 7 | 60 | 8 |
| | 7.95 | | 0.3 | 5 | 7.13 | 6.9 | 7 | 60 | 8 |
| | 7.91 | | 0.5 | 5 | 7.13 | 6.9 | 7 | 60 | 8 |
| | 8 | 10° | – | 5 | 6.24 | 6 | 7 | 60 | 8 |
| | 7.88 | | 0.3 | 5 | 6.24 | 6 | 7 | 60 | 8 |
| | 7.81 | | 0.5 | 5 | 6.24 | 6 | 7 | 60 | 8 |
| | 8 | 15° | – | 5 | 5.32 | 5 | 7 | 60 | 8 |
| | 7.82 | | 0.3 | 5 | 5.32 | 5 | 7 | 60 | 8 |
| | 7.7 | | 0.5 | 5 | 5.32 | 5 | 7 | 60 | 8 |
| | 8 | 20° | – | 5 | 4.36 | 4.1 | 7 | 60 | 8 |
| | 7.74 | | 0.3 | 5 | 4.36 | 4.1 | 7 | 60 | 8 |
| | 7.57 | | 0.5 | 5 | 4.36 | 4.1 | 7 | 60 | 8 |
| | 8 | 25° | – | 5 | 3.34 | 3.1 | 7 | 60 | 8 |
| | 7.66 | | 0.3 | 5 | 3.34 | 3.1 | 7 | 60 | 8 |
| | 7.43 | | 0.5 | 5 | 3.34 | 3.1 | 7 | 60 | 8 |
| 10 | 10 | 5° | – | 6 | 8.95 | 8.7 | 7 | 70 | 10 |
| | 9.95 | | 0.3 | 6 | 8.95 | 8.7 | 7 | 70 | 10 |
| | 9.91 | | 0.5 | 6 | 8.95 | 8.7 | 7 | 70 | 10 |
| | 10 | 10° | – | 6 | 7.88 | 7.6 | 7 | 70 | 10 |
| | 9.88 | | 0.3 | 6 | 7.88 | 7.6 | 7 | 70 | 10 |
| | 9.81 | | 0.5 | 6 | 7.88 | 7.6 | 7 | 70 | 10 |
| | 10 | 15° | – | 6 | 6.78 | 6.5 | 7 | 70 | 10 |
| | 9.82 | | 0.3 | 6 | 6.78 | 6.5 | 7 | 70 | 10 |
| | 9.7 | | 0.5 | 6 | 6.78 | 6.5 | 7 | 70 | 10 |
| | 10 | 20° | – | 6 | 5.63 | 5.4 | 7 | 70 | 10 |
| | 9.74 | | 0.3 | 6 | 5.63 | 5.4 | 7 | 70 | 10 |
| | 9.57 | | 0.5 | 6 | 5.63 | 5.4 | 7 | 70 | 10 |
| | 10 | 25° | – | 6 | 4.4 | 4.1 | 7 | 70 | 10 |
| | 9.66 | | 0.3 | 6 | 4.4 | 4.1 | 7 | 70 | 10 |
| | 9.43 | | 0.5 | 6 | 4.4 | 4.1 | 7 | 70 | 10 |

# CSMST2-P 超硬ソリッドミニストロングアンギュラ

| 呼び寸法 (ΦD) Size | 刃径 (ΦD1) Dia. | 角度 (θ) Cut Angle | R | 刃長 (ℓ1) Length of Cut | 基準径 (ΦD2) Std. Dia. | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|---|---|---|
| 12 | 12 | 5° | – | 7 | 10.78 | 10.5 | 7 | 70 | 12 |
| | 11.95 | | 0.3 | 7 | 10.78 | 10.5 | 7 | 70 | 12 |
| | 11.91 | | 0.5 | 7 | 10.78 | 10.5 | 7 | 70 | 12 |
| | 12 | 10° | – | 7 | 9.53 | 9.3 | 7 | 70 | 12 |
| | 11.88 | | 0.3 | 7 | 9.53 | 9.3 | 7 | 70 | 12 |
| | 11.81 | | 0.5 | 7 | 9.53 | 9.3 | 7 | 70 | 12 |
| | 12 | 15° | – | 7 | 8.25 | 8 | 7 | 70 | 12 |
| | 11.82 | | 0.3 | 7 | 8.25 | 8 | 7 | 70 | 12 |
| | 11.7 | | 0.5 | 7 | 8.25 | 8 | 7 | 70 | 12 |
| | 12 | 20° | – | 7 | 6.9 | 6.6 | 7 | 70 | 12 |
| | 11.74 | | 0.3 | 7 | 6.9 | 6.6 | 7 | 70 | 12 |
| | 11.57 | | 0.5 | 7 | 6.9 | 6.6 | 7 | 70 | 12 |
| | 12 | 25° | – | 7 | 5.47 | 5.2 | 7 | 70 | 12 |
| | 11.66 | | 0.3 | 7 | 5.47 | 5.2 | 7 | 70 | 12 |
| | 11.43 | | 0.5 | 7 | 5.47 | 5.2 | 7 | 70 | 12 |

超硬

# CSMST4-P

## 超硬ソリッドミニストロングアンギュラ *Solid Carbide Mini Strong Angular Cutter*

切削条件表 P247

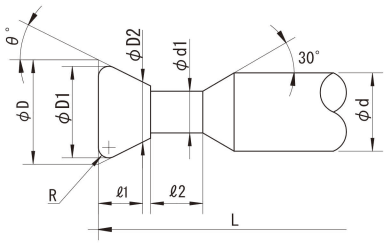
**アリ溝・角度付溝・面取り加工**

右ネジレ 15° | P Coating | 刃数 4 | 超微粒子



センターカット






| 公差(Tolerance) | D2：±0.05 | ℓ1：$^{0}_{-0.05}$ | R：±0.05 | θ：±30′ | d：$^{0}_{-0.009}$ |
|---|---|---|---|---|---|

右刃右ネジレ15° Pコーティング 刃数:4 超微粒子
Helix Angle-Right15° P Coating Number of Flute:4 Ultra Micro Grain Carbide

| 呼び寸法 (ΦD) Size | 刃径 (ΦD1) Dia. | 角度 (θ) Cut Angle | R | 刃長 (ℓ1) Length of Cut | 基準径 (ΦD2) Std. Dia. | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|---|---|---|
| 3 | 3 | 5° | – | 2 | 2.65 | 2.5 | 4 | 50 | 4 |
| | 2.95 | | 0.3 | 2 | 2.65 | 2.5 | 4 | 50 | 4 |
| | 2.91 | | 0.5 | 2 | 2.65 | 2.5 | 4 | 50 | 4 |
| | 3 | 10° | – | 2 | 2.29 | 2.2 | 4 | 50 | 4 |
| | 2.88 | | 0.3 | 2 | 2.29 | 2.2 | 4 | 50 | 4 |
| | 2.81 | | 0.5 | 2 | 2.29 | 2.2 | 4 | 50 | 4 |
| | 3 | 15° | – | 2 | 1.93 | 1.7 | 4 | 50 | 4 |
| | 2.82 | | 0.3 | 2 | 1.93 | 1.7 | 4 | 50 | 4 |
| | 2.7 | | 0.5 | 2 | 1.93 | 1.7 | 4 | 50 | 4 |
| | 3 | 20° | – | 2 | 1.54 | 1.35 | 4 | 50 | 4 |
| | 2.74 | | 0.3 | 2 | 1.54 | 1.35 | 4 | 50 | 4 |
| | 2.57 | | 0.5 | 2 | 1.54 | 1.35 | 4 | 50 | 4 |
| | 3 | 25° | – | 1.6 | 1.51 | 1.3 | 4 | 50 | 4 |
| | 2.66 | | 0.3 | 1.6 | 1.51 | 1.3 | 4 | 50 | 4 |
| | 2.43 | | 0.5 | 1.6 | 1.51 | 1.3 | 4 | 50 | 4 |
| 4 | 4 | 5° | – | 2.5 | 3.56 | 3.4 | 4 | 50 | 4 |
| | 3.95 | | 0.3 | 2.5 | 3.56 | 3.4 | 4 | 50 | 4 |
| | 3.91 | | 0.5 | 2.5 | 3.56 | 3.4 | 4 | 50 | 4 |
| | 4 | 10° | – | 2.5 | 3.12 | 3 | 4 | 50 | 4 |
| | 3.88 | | 0.3 | 2.5 | 3.12 | 3 | 4 | 50 | 4 |
| | 3.81 | | 0.5 | 2.5 | 3.12 | 3 | 4 | 50 | 4 |
| | 4 | 15° | – | 2.5 | 2.66 | 2.4 | 4 | 50 | 4 |
| | 3.82 | | 0.3 | 2.5 | 2.66 | 2.4 | 4 | 50 | 4 |
| | 3.7 | | 0.5 | 2.5 | 2.66 | 2.4 | 4 | 50 | 4 |
| | 4 | 20° | – | 2.5 | 2.18 | 1.95 | 4 | 50 | 4 |
| | 3.74 | | 0.3 | 2.5 | 2.18 | 1.95 | 4 | 50 | 4 |
| | 3.57 | | 0.5 | 2.5 | 2.18 | 1.95 | 4 | 50 | 4 |
| | 4 | 25° | – | 2.5 | 1.67 | 1.45 | 4 | 50 | 4 |
| | 3.66 | | 0.3 | 2.5 | 1.67 | 1.45 | 4 | 50 | 4 |
| | 3.43 | | 0.5 | 2.5 | 1.67 | 1.45 | 4 | 50 | 4 |

# CSMST4-P 超硬ソリッドミニストロングアンギュラ

| 呼び寸法 (ΦD) Size | 刃径 (ΦD1) Dia. | 角度 (θ) Cut Angle | R | 刃長 (ℓ1) Length of Cut | 基準径 (ΦD2) Std. Dia. | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 5 | 5° | – | 3 | 4.48 | 4.3 | 7 | 60 | 6 |
| | 4.95 | | 0.3 | 3 | 4.48 | 4.3 | 7 | 60 | 6 |
| | 4.91 | | 0.5 | 3 | 4.48 | 4.3 | 7 | 60 | 6 |
| | 5 | 10° | – | 3 | 3.94 | 3.7 | 7 | 60 | 6 |
| | 4.88 | | 0.3 | 3 | 3.94 | 3.7 | 7 | 60 | 6 |
| | 4.81 | | 0.5 | 3 | 3.94 | 3.7 | 7 | 60 | 6 |
| | 5 | 15° | – | 3 | 3.39 | 3.2 | 7 | 60 | 6 |
| | 4.82 | | 0.3 | 3 | 3.39 | 3.2 | 7 | 60 | 6 |
| | 4.7 | | 0.5 | 3 | 3.39 | 3.2 | 7 | 60 | 6 |
| | 5 | 20° | – | 3 | 2.82 | 2.6 | 7 | 60 | 6 |
| | 4.74 | | 0.3 | 3 | 2.82 | 2.6 | 7 | 60 | 6 |
| | 4.57 | | 0.5 | 3 | 2.82 | 2.6 | 7 | 60 | 6 |
| | 5 | 25° | – | 3 | 2.2 | 1.95 | 7 | 60 | 6 |
| | 4.66 | | 0.3 | 3 | 2.2 | 1.95 | 7 | 60 | 6 |
| | 4.43 | | 0.5 | 3 | 2.2 | 1.95 | 7 | 60 | 6 |
| 6 | 6 | 5° | – | 4 | 5.3 | 5.1 | 7 | 60 | 6 |
| | 5.95 | | 0.3 | 4 | 5.3 | 5.1 | 7 | 60 | 6 |
| | 5.91 | | 0.5 | 4 | 5.3 | 5.1 | 7 | 60 | 6 |
| | 6 | 10° | – | 4 | 4.59 | 4.3 | 7 | 60 | 6 |
| | 5.88 | | 0.3 | 4 | 4.59 | 4.3 | 7 | 60 | 6 |
| | 5.81 | | 0.5 | 4 | 4.59 | 4.3 | 7 | 60 | 6 |
| | 6 | 15° | – | 4 | 3.86 | 3.5 | 7 | 60 | 6 |
| | 5.82 | | 0.3 | 4 | 3.86 | 3.5 | 7 | 60 | 6 |
| | 5.7 | | 0.5 | 4 | 3.86 | 3.5 | 7 | 60 | 6 |
| | 6 | 20° | – | 4 | 3.09 | 2.9 | 7 | 60 | 6 |
| | 5.74 | | 0.3 | 4 | 3.09 | 2.9 | 7 | 60 | 6 |
| | 5.57 | | 0.5 | 4 | 3.09 | 2.9 | 7 | 60 | 6 |
| | 6 | 25° | – | 3.5 | 2.74 | 2.5 | 7 | 60 | 6 |
| | 5.66 | | 0.3 | 3.5 | 2.74 | 2.5 | 7 | 60 | 6 |
| | 5.43 | | 0.5 | 3.5 | 2.74 | 2.5 | 7 | 60 | 6 |
| 8 | 8 | 5° | – | 5 | 7.13 | 6.9 | 7 | 60 | 8 |
| | 7.95 | | 0.3 | 5 | 7.13 | 6.9 | 7 | 60 | 8 |
| | 7.91 | | 0.5 | 5 | 7.13 | 6.9 | 7 | 60 | 8 |
| | 8 | 10° | – | 5 | 6.24 | 6 | 7 | 60 | 8 |
| | 7.88 | | 0.3 | 5 | 6.24 | 6 | 7 | 60 | 8 |
| | 7.81 | | 0.5 | 5 | 6.24 | 6 | 7 | 60 | 8 |
| | 8 | 15° | – | 5 | 5.32 | 5 | 7 | 60 | 8 |
| | 7.82 | | 0.3 | 5 | 5.32 | 5 | 7 | 60 | 8 |
| | 7.7 | | 0.5 | 5 | 5.32 | 5 | 7 | 60 | 8 |
| | 8 | 20° | – | 5 | 4.36 | 4.1 | 7 | 60 | 8 |
| | 7.74 | | 0.3 | 5 | 4.36 | 4.1 | 7 | 60 | 8 |
| | 7.57 | | 0.5 | 5 | 4.36 | 4.1 | 7 | 60 | 8 |
| | 8 | 25° | – | 5 | 3.34 | 3.1 | 7 | 60 | 8 |
| | 7.66 | | 0.3 | 5 | 3.34 | 3.1 | 7 | 60 | 8 |
| | 7.43 | | 0.5 | 5 | 3.34 | 3.1 | 7 | 60 | 8 |

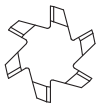
| 呼び寸法 (ΦD) Size | 刃径 (ΦD1) Dia. | 角度 (θ) Cut Angle | R | 刃長 (ℓ1) Length of Cut | 基準径 (ΦD2) Std. Dia. | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|---|---|---|
| 10 | 10 | 5° | – | 6 | 8.95 | 8.7 | 7 | 70 | 10 |
| | 9.95 | | 0.3 | 6 | 8.95 | 8.7 | 7 | 70 | 10 |
| | 9.91 | | 0.5 | 6 | 8.95 | 8.7 | 7 | 70 | 10 |
| | 10 | 10° | – | 6 | 7.88 | 7.6 | 7 | 70 | 10 |
| | 9.88 | | 0.3 | 6 | 7.88 | 7.6 | 7 | 70 | 10 |
| | 9.81 | | 0.5 | 6 | 7.88 | 7.6 | 7 | 70 | 10 |
| | 10 | 15° | – | 6 | 6.78 | 6.5 | 7 | 70 | 10 |
| | 9.82 | | 0.3 | 6 | 6.78 | 6.5 | 7 | 70 | 10 |
| | 9.7 | | 0.5 | 6 | 6.78 | 6.5 | 7 | 70 | 10 |
| | 10 | 20° | – | 6 | 5.63 | 5.4 | 7 | 70 | 10 |
| | 9.74 | | 0.3 | 6 | 5.63 | 5.4 | 7 | 70 | 10 |
| | 9.57 | | 0.5 | 6 | 5.63 | 5.4 | 7 | 70 | 10 |
| | 10 | 25° | – | 6 | 4.4 | 4.1 | 7 | 70 | 10 |
| | 9.66 | | 0.3 | 6 | 4.4 | 4.1 | 7 | 70 | 10 |
| | 9.43 | | 0.5 | 6 | 4.4 | 4.1 | 7 | 70 | 10 |
| 12 | 12 | 5° | – | 7 | 10.78 | 10.5 | 7 | 70 | 12 |
| | 11.95 | | 0.3 | 7 | 10.78 | 10.5 | 7 | 70 | 12 |
| | 11.91 | | 0.5 | 7 | 10.78 | 10.5 | 7 | 70 | 12 |
| | 12 | 10° | – | 7 | 9.53 | 9.3 | 7 | 70 | 12 |
| | 11.88 | | 0.3 | 7 | 9.53 | 9.3 | 7 | 70 | 12 |
| | 11.81 | | 0.5 | 7 | 9.53 | 9.3 | 7 | 70 | 12 |
| | 12 | 15° | – | 7 | 8.25 | 8 | 7 | 70 | 12 |
| | 11.82 | | 0.3 | 7 | 8.25 | 8 | 7 | 70 | 12 |
| | 11.7 | | 0.5 | 7 | 8.25 | 8 | 7 | 70 | 12 |
| | 12 | 20° | – | 7 | 6.9 | 6.6 | 7 | 70 | 12 |
| | 11.74 | | 0.3 | 7 | 6.9 | 6.6 | 7 | 70 | 12 |
| | 11.57 | | 0.5 | 7 | 6.9 | 6.6 | 7 | 70 | 12 |
| | 12 | 25° | – | 7 | 5.47 | 5.2 | 7 | 70 | 12 |
| | 11.66 | | 0.3 | 7 | 5.47 | 5.2 | 7 | 70 | 12 |
| | 11.43 | | 0.5 | 7 | 5.47 | 5.2 | 7 | 70 | 12 |

超硬

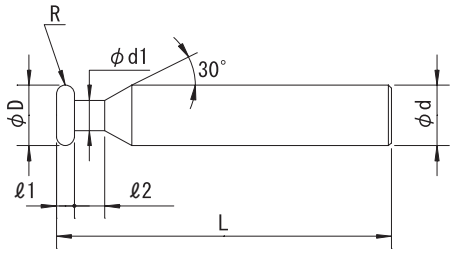
# CSMU

## 超硬スーパーミニコンベックス　*Solid Carbide Super Mini Convex Cutter*

切削条件表 P247　R 加 工　右直刃　超微粒子


センター穴ナシ






| 公差(Tolerance) | D：$^{0}_{-0.05}$ | ℓ1：$^{0}_{-0.035}$ | R：±0.01 | d：$^{0}_{-0.01}$ |
|---|---|---|---|---|

右刃ストレート　超微粒子
Straight Flute　Ultra Micro Grain Carbide

| 刃径 (ΦD) *Dia.* | R | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| 4 | 0.25 | 0.5 | 2 | 3.5 | 50 | 6 | 4 |
| | 0.3 | 0.6 | 2 | 3.5 | 50 | 6 | 4 |
| | 0.5 | 1 | 2 | 3.5 | 50 | 6 | 4 |
| | 0.75 | 1.5 | 2 | 3.5 | 50 | 6 | 4 |
| | 1 | 2 | 1.8 | 3.5 | 50 | 6 | 4 |
| 5 | 0.25 | 0.5 | 2.2 | 3.5 | 50 | 6 | 4 |
| | 0.3 | 0.6 | 2.2 | 3.5 | 50 | 6 | 4 |
| | 0.5 | 1 | 2.2 | 3.5 | 50 | 6 | 4 |
| | 0.75 | 1.5 | 2.2 | 3.5 | 50 | 6 | 4 |
| | 1 | 2 | 2.2 | 3.5 | 50 | 6 | 4 |
| 6 | 0.25 | 0.5 | 2.7 | 4 | 50 | 6 | 4 |
| | 0.3 | 0.6 | 2.7 | 4 | 50 | 6 | 4 |
| | 0.5 | 1 | 2.7 | 4 | 50 | 6 | 4 |
| | 0.75 | 1.5 | 2.7 | 4 | 50 | 6 | 4 |
| | 1 | 2 | 2.7 | 4 | 50 | 6 | 4 |
| 8 | 0.25 | 0.5 | 3.6 | 5 | 60 | 8 | 6 |
| | 0.3 | 0.6 | 3.6 | 5 | 60 | 8 | 6 |
| | 0.5 | 1 | 3.6 | 5 | 60 | 8 | 6 |
| | 0.75 | 1.5 | 3.6 | 5 | 60 | 8 | 6 |
| | 1 | 2 | 3.6 | 5 | 60 | 8 | 6 |
| | 1.25 | 2.5 | 3.6 | 5 | 60 | 8 | 6 |

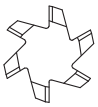
| 刃径 (ΦD) *Dia.* | R | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| 10 | 0.25 | 0.5 | 4.5 | 6 | 70 | 10 | 6 |
| | 0.3 | 0.6 | 4.5 | 6 | 70 | 10 | 6 |
| | 0.5 | 1 | 4.5 | 6 | 70 | 10 | 6 |
| | 0.75 | 1.5 | 4.5 | 6 | 70 | 10 | 6 |
| | 1 | 2 | 4.5 | 6 | 70 | 10 | 6 |
| | 1.25 | 2.5 | 4.5 | 6 | 70 | 10 | 6 |
| | 1.5 | 3 | 4.5 | 6 | 70 | 10 | 6 |
| | 2 | 4 | 4.5 | 6 | 70 | 10 | 6 |
| 12 | 0.25 | 0.5 | 5.5 | 6 | 70 | 12 | 6 |
| | 0.3 | 0.6 | 5.5 | 6 | 70 | 12 | 6 |
| | 0.5 | 1 | 5.5 | 6 | 70 | 12 | 6 |
| | 0.75 | 1.5 | 5.5 | 6 | 70 | 12 | 6 |
| | 1 | 2 | 5.5 | 6 | 70 | 12 | 6 |
| | 1.25 | 2.5 | 5.5 | 6 | 70 | 12 | 6 |
| | 1.5 | 3 | 5.5 | 6 | 70 | 12 | 6 |
| | 2 | 4 | 5.5 | 6 | 70 | 12 | 6 |
| | 2.5 | 5 | 5.5 | 6 | 70 | 12 | 6 |

超硬

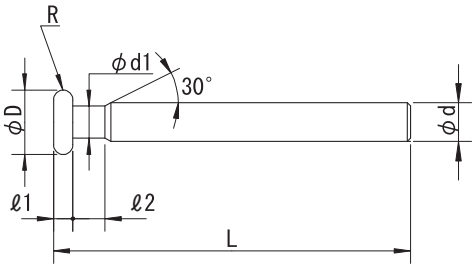
# CSMUL-A

## 超硬スーパーミニコンベックスロング　*Solid Carbide Super Mini Convex Cutter Long*

切削条件表 P248　R 加 工　右直刃　TiAlN　超微粒子


センター穴ナシ






| 公差(Tolerance) | D：$^{0}_{-0.05}$ | ℓ1：$^{0}_{-0.035}$ | R：±0.01 | d：$^{0}_{-0.01}$ |
|---|---|---|---|---|

右刃ストレート　TiAlNコーティング　超微粒子
Straight Flute　TiAlN Coating　Ultra Micro Grain Carbide

| 刃径 (ΦD) *Dia.* | R | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| 4 | 0.25 | 0.5 | 2 | 5 | 80 | 3 | 4 |
| | 0.3 | 0.6 | 2 | 5 | 80 | 3 | 4 |
| | 0.5 | 1 | 2 | 5 | 80 | 3 | 4 |
| | 0.75 | 1.5 | 2 | 5 | 80 | 3 | 4 |
| | 1 | 2 | 1.8 | 5 | 80 | 3 | 4 |
| 5 | 0.25 | 0.5 | 2.6 | 5 | 80 | 3 | 4 |
| | 0.3 | 0.6 | 2.6 | 5 | 80 | 3 | 4 |
| | 0.5 | 1 | 2.6 | 5 | 80 | 3 | 4 |
| | 0.75 | 1.5 | 2.6 | 5 | 80 | 3 | 4 |
| | 1 | 2 | 2.6 | 5 | 80 | 3 | 4 |
| 6 | 0.25 | 0.5 | 2.9 | 5 | 80 | 3 | 4 |
| | 0.3 | 0.6 | 2.9 | 5 | 80 | 3 | 4 |
| | 0.5 | 1 | 2.9 | 5 | 80 | 3 | 4 |
| | 0.75 | 1.5 | 2.9 | 5 | 80 | 3 | 4 |
| | 1 | 2 | 2.9 | 5 | 80 | 3 | 4 |
| 8 | 0.25 | 0.5 | 3.9 | 5 | 80 | 4 | 6 |
| | 0.3 | 0.6 | 3.9 | 5 | 80 | 4 | 6 |
| | 0.5 | 1 | 3.9 | 5 | 80 | 4 | 6 |
| | 0.75 | 1.5 | 3.9 | 5 | 80 | 4 | 6 |

| 刃径 (ΦD) *Dia.* | R | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| 8 | 1 | 2 | 3.9 | 5 | 80 | 4 | 6 |
| | 1.25 | 2.5 | 3.9 | 5 | 80 | 4 | 6 |
| 10 | 0.25 | 0.5 | 5 | 6 | 100 | 6 | 6 |
| | 0.3 | 0.6 | 5 | 6 | 100 | 6 | 6 |
| | 0.5 | 1 | 5 | 6 | 100 | 6 | 6 |
| | 0.75 | 1.5 | 5 | 6 | 100 | 6 | 6 |
| | 1 | 2 | 5 | 6 | 100 | 6 | 6 |
| | 1.25 | 2.5 | 5 | 6 | 100 | 6 | 6 |
| | 1.5 | 3 | 5 | 6 | 100 | 6 | 6 |
| | 2 | 4 | 5 | 6 | 100 | 6 | 6 |
| 12 | 0.25 | 0.5 | 5.9 | 6 | 100 | 6 | 6 |
| | 0.3 | 0.6 | 5.9 | 6 | 100 | 6 | 6 |
| | 0.5 | 1 | 5.9 | 6 | 100 | 6 | 6 |
| | 0.75 | 1.5 | 5.9 | 6 | 100 | 6 | 6 |
| | 1 | 2 | 5.9 | 6 | 100 | 6 | 6 |
| | 1.25 | 2.5 | 5.9 | 6 | 100 | 6 | 6 |
| | 1.5 | 3 | 5.9 | 6 | 100 | 6 | 6 |
| | 2 | 4 | 5.9 | 6 | 100 | 6 | 6 |
| | 2.5 | 5 | 5.9 | 6 | 100 | 6 | 6 |

超硬

# CSMV

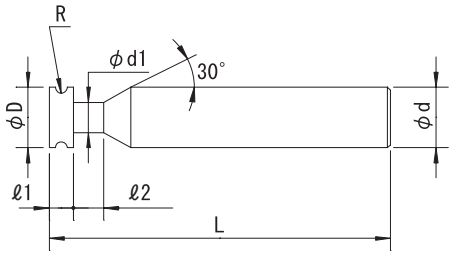
## 超硬スーパーミニコンケーブ *Solid Carbide Super Mini Concave Cutter*

切削条件表 P248 | R 加 工 | 右直刃 | 超微粒子



センター穴ナシ






| 公差(Tolerance) | D：$^{0}_{-0.05}$ | ℓ1：$^{0}_{-0.035}$ | R：±0.01 | d：$^{0}_{-0.009}$ |
|---|---|---|---|---|

右刃ストレート　超微粒子
Straight Flute　Ultra Micro Grain Carbide

| 刃径 (ΦD) *Dia.* | R | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| 4 | 0.25 | 2.5 | 2 | 3.5 | 50 | 6 | 4 |
| | 0.3 | 2.6 | 2 | 3.5 | 50 | 6 | 4 |
| | 0.5 | 3 | 2 | 3.5 | 50 | 6 | 4 |
| 5 | 0.25 | 2.5 | 2.2 | 3.5 | 50 | 6 | 4 |
| | 0.3 | 2.6 | 2.2 | 3.5 | 50 | 6 | 4 |
| | 0.5 | 3 | 2.2 | 3.5 | 50 | 6 | 4 |
| 6 | 0.25 | 2.5 | 2.7 | 4 | 50 | 6 | 4 |
| | 0.3 | 2.6 | 2.7 | 4 | 50 | 6 | 4 |
| | 0.5 | 3 | 2.7 | 4 | 50 | 6 | 4 |
| 8 | 0.25 | 2.5 | 3.6 | 4 | 60 | 8 | 6 |
| | 0.3 | 2.6 | 3.6 | 4 | 60 | 8 | 6 |
| | 0.5 | 3 | 3.6 | 4 | 60 | 8 | 6 |
| | 0.75 | 3.5 | 3.6 | 4 | 60 | 8 | 6 |
| | 1 | 4 | 3.6 | 4 | 60 | 8 | 6 |

| 刃径 (ΦD) *Dia.* | R | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| 10 | 0.25 | 2.5 | 4.5 | 6 | 70 | 10 | 6 |
| | 0.3 | 2.6 | 4.5 | 6 | 70 | 10 | 6 |
| | 0.5 | 3 | 4.5 | 6 | 70 | 10 | 6 |
| | 0.75 | 3.5 | 4.5 | 6 | 70 | 10 | 6 |
| | 1 | 4 | 4.5 | 6 | 70 | 10 | 6 |
| | 1.5 | 5 | 4.5 | 6 | 70 | 10 | 6 |
| 12 | 0.25 | 2.5 | 5.5 | 6 | 70 | 12 | 6 |
| | 0.3 | 2.6 | 5.5 | 6 | 70 | 12 | 6 |
| | 0.5 | 3 | 5.5 | 6 | 70 | 12 | 6 |
| | 0.75 | 3.5 | 5.5 | 6 | 70 | 12 | 6 |
| | 1 | 4 | 5.5 | 6 | 70 | 12 | 6 |
| | 1.5 | 5 | 5.5 | 6 | 70 | 12 | 6 |
| | 2 | 6 | 5.5 | 6 | 70 | 12 | 6 |

超硬

# CSWRC-A/CSWRCL-A

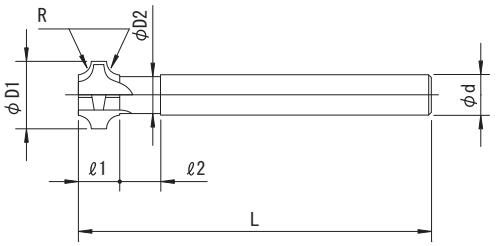
## 超硬ミニWR面取カッター/ロング　*Solid Carbide Mini Double R Cutter / Long*

切削条件表 P249

R 加 工


センター穴ナシ






| 公差(Tolerance) | R：±0.02 | D1：$^{+0.1}_{0}$ | d：$^{0}_{-0.01}$ |
|---|---|---|---|

## 《CSWRC-A》 右刃ストレート　TiAINコーティング　刃数:4　超微粒子

Straight Flute　TiAIN Coating　4 Flutes　Ultra Micro Grain Carbide

R 加 工　右直刃　TiAIN　刃数 4　超微粒子

| 寸法 R | 外径 (ΦD1) *Dia.* | 首下 (ℓ1) ※ | 首径 (ΦD2) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | θ |
|---|---|---|---|---|---|---|---|
| **0.2** | 3.8 | 2.6 | 2.8 | 4 | 60 | 3 | 15° |
| **0.3** | 4 | 2.8 | 2.8 | 4 | 60 | 3 | 15° |
| **0.4** | 4.2 | 3 | 2.8 | 4 | 60 | 3 | 15° |
| **0.5** | 4.4 | 3.2 | 2.8 | 4 | 60 | 3 | 15° |
| **0.6** | 4.6 | 3.4 | 2.8 | 4 | 60 | 3 | 15° |
| **0.7** | 5.8 | 3.6 | 3.8 | 4 | 60 | 4 | 15° |
| **0.8** | 6 | 3.8 | 3.8 | 4 | 60 | 4 | 15° |

| 寸法 R | 外径 (ΦD1) *Dia.* | 首下 (ℓ1) ※ | 首径 (ΦD2) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | θ |
|---|---|---|---|---|---|---|---|
| **0.9** | 6.2 | 4 | 3.8 | 4 | 60 | 4 | 10° |
| **1** | 8.4 | 4.2 | 5.6 | 6 | 70 | 6 | 10° |
| **1.2** | 8.8 | 4.6 | 5.6 | 6 | 70 | 6 | 10° |
| **1.5** | 9.4 | 5.7 | 5.6 | 6 | 70 | 6 | 10° |
| **2** | 12.4 | 6.7 | 7.4 | 8 | 70 | 8 | 10° |
| **2.5** | 13.4 | 8.2 | 7.4 | 8 | 70 | 8 | 10° |

※Cut Length Including Neck

| 公差(Tolerance) | R：±0.02 | D1：$^{+0.1}_{0}$ | d：$^{0}_{-0.01}$ |
|---|---|---|---|

## 《CSWRCL-A》 右刃ストレート　TiAINコーティング　刃数:4　超微粒子

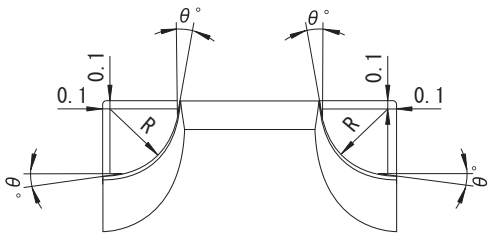
Straight Flute　TiAIN Coating　4 Flutes　Ultra Micro Grain Carbide

R 加 工　右直刃　TiAIN　刃数 4　超微粒子

| 寸法 R | 外径 (ΦD1) *Dia.* | 首下 (ℓ1) ※ | 首径 (ΦD2) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | θ |
|---|---|---|---|---|---|---|---|
| **0.2** | 6.8 | 2.6 | 5.6 | 8 | 100 | 6 | 15° |
| **0.3** | 7 | 2.8 | 5.6 | 8 | 100 | 6 | 15° |
| **0.4** | 7.2 | 3 | 5.6 | 8 | 100 | 6 | 15° |
| **0.5** | 7.4 | 3.2 | 5.6 | 8 | 100 | 6 | 15° |
| **0.6** | 7.6 | 3.4 | 5.6 | 8 | 100 | 6 | 15° |
| **0.7** | 7.8 | 3.6 | 5.6 | 8 | 100 | 6 | 15° |
| **0.8** | 8 | 3.8 | 5.6 | 8 | 100 | 6 | 15° |

| 寸法 R | 外径 (ΦD1) *Dia.* | 首下 (ℓ1) ※ | 首径 (ΦD2) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | θ |
|---|---|---|---|---|---|---|---|
| **0.9** | 8.2 | 4 | 5.6 | 8 | 100 | 6 | 10° |
| **1** | 10.4 | 4.2 | 7.4 | 10 | 100 | 8 | 10° |
| **1.2** | 10.8 | 4.6 | 7.4 | 10 | 100 | 8 | 10° |
| **1.5** | 11.4 | 5.7 | 7.4 | 10 | 100 | 8 | 10° |
| **2** | 14.4 | 6.7 | 9.4 | 10 | 100 | 10 | 10° |
| **2.5** | 15.4 | 8.2 | 9.4 | 10 | 100 | 10 | 10° |

※Cut Length Including Neck



超硬

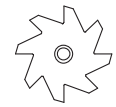
# CSMK

## 超硬スーパーミニキーシードカッター　*Solid Carbide Super Mini Keyseat Cutter*

切削条件表 P249

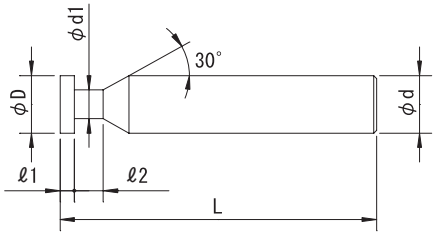
## スクエア溝加工（キーシードカッター）

右直刃　超微粒子



Φ8≦Dセンター穴付






| 公差(Tolerance) | D：$^{0}_{-0.05}$ | ℓ1：$^{0}_{-0.035}$ | d：$^{0}_{-0.009}$ |
|---|---|---|---|

右刃ストレート　超微粒子
Straight Flute　Ultra Micro Grain Carbide

| 刃径（ΦD） *Dia.* | 刃厚（ℓ1） *Cut Width* | 首径（Φd1） *Neck Dia.* | 首長（ℓ2） *Neck Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 刃数（N） *Number of Flutes* |
|---|---|---|---|---|---|---|
| 2 | 0.3 | 1.2 | 3.5 | 40 | 3 | 4 |
| | 0.4 | 1.2 | 3.5 | 40 | 3 | 4 |
| | 0.5 | 1.2 | 3.5 | 40 | 3 | 4 |
| | 0.6 | 1.2 | 3.5 | 40 | 3 | 4 |
| | 0.7 | 1.2 | 3.5 | 40 | 3 | 4 |
| | 0.8 | 1.2 | 3.5 | 40 | 3 | 4 |
| | 0.9 | 1.2 | 3.5 | 40 | 3 | 4 |
| | 1 | 1.2 | 3.5 | 40 | 3 | 4 |
| | 1.1 | 1.2 | 3.5 | 40 | 3 | 4 |
| | 1.2 | 1.2 | 3.5 | 40 | 3 | 4 |
| 2.5 | 0.3 | 1.25 | 3.5 | 40 | 3 | 4 |
| | 0.4 | 1.25 | 3.5 | 40 | 3 | 4 |
| | 0.5 | 1.25 | 3.5 | 40 | 3 | 4 |
| | 0.6 | 1.25 | 3.5 | 40 | 3 | 4 |
| | 0.7 | 1.25 | 3.5 | 40 | 3 | 4 |
| | 0.8 | 1.25 | 3.5 | 40 | 3 | 4 |
| | 0.9 | 1.25 | 3.5 | 40 | 3 | 4 |
| | 1 | 1.25 | 3.5 | 40 | 3 | 4 |
| | 1.1 | 1.25 | 3.5 | 40 | 3 | 4 |
| | 1.2 | 1.25 | 3.5 | 40 | 3 | 4 |
| 3 | 0.3 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 0.4 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 0.5 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 0.6 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 0.7 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 0.8 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 0.9 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 1 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 1.1 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 1.2 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 1.3 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 1.4 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 1.5 | 1.5 | 3.5 | 50 | 3 | 4 |
| 4 | 0.3 | 2 | 3.5 | 50 | 3 | 6 |
| | 0.4 | 2 | 3.5 | 50 | 3 | 6 |
| | 0.5 | 2 | 3.5 | 50 | 3 | 6 |
| | 0.6 | 2 | 3.5 | 50 | 3 | 6 |
| | 0.7 | 2 | 3.5 | 50 | 3 | 6 |
| | 0.8 | 2 | 3.5 | 50 | 3 | 6 |
| | 0.9 | 2 | 3.5 | 50 | 3 | 6 |
| | 1 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.1 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.2 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.3 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.4 | 2 | 3.5 | 50 | 3 | 6 |

| 刃径（ΦD） *Dia.* | 刃厚（ℓ1） *Cut Width* | 首径（Φd1） *Neck Dia.* | 首長（ℓ2） *Neck Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 刃数（N） *Number of Flutes* |
|---|---|---|---|---|---|---|
| 4 | 1.5 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.6 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.7 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.8 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.9 | 2 | 3.5 | 50 | 3 | 6 |
| | 2 | 2 | 3.5 | 50 | 3 | 6 |
| 5 | 0.3 | 2.5 | 4 | 50 | 6 | 6 |
| | 0.4 | 2.5 | 4 | 50 | 6 | 6 |
| | 0.5 | 2.5 | 4 | 50 | 6 | 6 |
| | 0.6 | 2.5 | 4 | 50 | 6 | 6 |
| | 0.7 | 2.5 | 4 | 50 | 6 | 6 |
| | 0.8 | 2.5 | 4 | 50 | 6 | 6 |
| | 0.9 | 2.5 | 4 | 50 | 6 | 6 |
| | 1 | 2.5 | 4 | 50 | 6 | 6 |
| | 1.1 | 2.5 | 4 | 50 | 6 | 6 |
| | 1.2 | 2.5 | 4 | 50 | 6 | 6 |
| | 1.3 | 2.5 | 4 | 50 | 6 | 6 |
| | 1.4 | 2.5 | 4 | 50 | 6 | 6 |
| | 1.5 | 2.5 | 4 | 50 | 6 | 6 |
| | 1.6 | 2.5 | 4 | 50 | 6 | 6 |
| | 1.7 | 2.5 | 4 | 50 | 6 | 6 |
| | 1.8 | 2.5 | 4 | 50 | 6 | 6 |
| | 1.9 | 2.5 | 4 | 50 | 6 | 6 |
| | 2 | 2.5 | 4 | 50 | 6 | 6 |
| | 2.5 | 2.5 | 4 | 50 | 6 | 6 |
| 6 | 0.3 | 3 | 4 | 50 | 6 | 8 |
| | 0.4 | 3 | 4 | 50 | 6 | 8 |
| | 0.5 | 3 | 4 | 50 | 6 | 8 |
| | 0.6 | 3 | 4 | 50 | 6 | 8 |
| | 0.7 | 3 | 4 | 50 | 6 | 8 |
| | 0.8 | 3 | 4 | 50 | 6 | 8 |
| | 0.9 | 3 | 4 | 50 | 6 | 8 |
| | 1 | 3 | 4 | 50 | 6 | 8 |
| | 1.1 | 3 | 4 | 50 | 6 | 8 |
| | 1.2 | 3 | 4 | 50 | 6 | 8 |
| | 1.3 | 3 | 4 | 50 | 6 | 8 |
| | 1.4 | 3 | 4 | 50 | 6 | 8 |
| | 1.5 | 3 | 4 | 50 | 6 | 8 |
| | 1.6 | 3 | 4 | 50 | 6 | 8 |
| | 1.7 | 3 | 4 | 50 | 6 | 8 |
| | 1.8 | 3 | 4 | 50 | 6 | 8 |
| | 1.9 | 3 | 4 | 50 | 6 | 8 |
| | 2 | 3 | 4 | 50 | 6 | 8 |
| | 2.5 | 3 | 4 | 50 | 6 | 8 |
| | 3 | 3 | 4 | 50 | 6 | 8 |

# CSMK 超硬スーパーミニキーシードカッター

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 7 | 0.3 | 3.5 | 4 | 60 | 8 | 8 |
| | 0.4 | 3.5 | 4 | 60 | 8 | 8 |
| | 0.5 | 3.5 | 4 | 60 | 8 | 8 |
| | 0.6 | 3.5 | 4 | 60 | 8 | 8 |
| | 0.7 | 3.5 | 4 | 60 | 8 | 8 |
| | 0.8 | 3.5 | 4 | 60 | 8 | 8 |
| | 0.9 | 3.5 | 4 | 60 | 8 | 8 |
| | 1 | 3.5 | 4 | 60 | 8 | 8 |
| | 1.1 | 3.5 | 4 | 60 | 8 | 8 |
| | 1.2 | 3.5 | 4 | 60 | 8 | 8 |
| | 1.3 | 3.5 | 4 | 60 | 8 | 8 |
| | 1.4 | 3.5 | 4 | 60 | 8 | 8 |
| | 1.5 | 3.5 | 4 | 60 | 8 | 8 |
| | 1.6 | 3.5 | 4 | 60 | 8 | 8 |
| | 1.7 | 3.5 | 4 | 60 | 8 | 8 |
| | 1.8 | 3.5 | 4 | 60 | 8 | 8 |
| | 1.9 | 3.5 | 4 | 60 | 8 | 8 |
| | 2 | 3.5 | 4 | 60 | 8 | 8 |
| | 2.5 | 3.5 | 4 | 60 | 8 | 8 |
| | 3 | 3.5 | 4 | 60 | 8 | 8 |
| | 3.5 | 3.5 | 4 | 60 | 8 | 8 |
| 8 | 0.3 | 4 | 4 | 60 | 8 | 8 |
| | 0.4 | 4 | 4 | 60 | 8 | 8 |
| | 0.5 | 4 | 4 | 60 | 8 | 8 |
| | 0.6 | 4 | 4 | 60 | 8 | 8 |
| | 0.7 | 4 | 4 | 60 | 8 | 8 |
| | 0.8 | 4 | 4 | 60 | 8 | 8 |
| | 0.9 | 4 | 4 | 60 | 8 | 8 |
| | 1 | 4 | 4 | 60 | 8 | 8 |
| | 1.1 | 4 | 4 | 60 | 8 | 8 |
| | 1.2 | 4 | 4 | 60 | 8 | 8 |
| | 1.3 | 4 | 4 | 60 | 8 | 8 |
| | 1.4 | 4 | 4 | 60 | 8 | 8 |
| | 1.5 | 4 | 4 | 60 | 8 | 8 |
| | 1.6 | 4 | 4 | 60 | 8 | 8 |
| | 1.7 | 4 | 4 | 60 | 8 | 8 |
| | 1.8 | 4 | 4 | 60 | 8 | 8 |
| | 1.9 | 4 | 4 | 60 | 8 | 8 |
| | 2 | 4 | 4 | 60 | 8 | 8 |
| | 2.5 | 4 | 4 | 60 | 8 | 8 |
| | 3 | 4 | 4 | 60 | 8 | 8 |
| | 3.5 | 4 | 4 | 60 | 8 | 8 |
| | 4 | 4 | 4 | 60 | 8 | 8 |
| 10 | 0.3 | 5 | 6 | 70 | 10 | 8 |
| | 0.4 | 5 | 6 | 70 | 10 | 8 |
| | 0.5 | 5 | 6 | 70 | 10 | 8 |
| | 0.6 | 5 | 6 | 70 | 10 | 8 |
| | 0.7 | 5 | 6 | 70 | 10 | 8 |
| | 0.8 | 5 | 6 | 70 | 10 | 8 |
| | 0.9 | 5 | 6 | 70 | 10 | 8 |
| | 1 | 5 | 6 | 70 | 10 | 8 |
| | 1.1 | 5 | 6 | 70 | 10 | 8 |
| | 1.2 | 5 | 6 | 70 | 10 | 8 |
| | 1.3 | 5 | 6 | 70 | 10 | 8 |
| | 1.4 | 5 | 6 | 70 | 10 | 8 |
| | 1.5 | 5 | 6 | 70 | 10 | 8 |
| | 1.6 | 5 | 6 | 70 | 10 | 8 |
| | 1.7 | 5 | 6 | 70 | 10 | 8 |
| | 1.8 | 5 | 6 | 70 | 10 | 8 |
| | 1.9 | 5 | 6 | 70 | 10 | 8 |
| | 2 | 5 | 6 | 70 | 10 | 8 |

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 10 | 2.5 | 5 | 6 | 70 | 10 | 8 |
| | 3 | 5 | 6 | 70 | 10 | 8 |
| | 3.5 | 5 | 6 | 70 | 10 | 8 |
| | 4 | 5 | 6 | 70 | 10 | 8 |
| | 4.5 | 5 | 6 | 70 | 10 | 8 |
| | 5 | 5 | 6 | 70 | 10 | 8 |
| 12 | 0.3 | 6 | 7 | 70 | 12 | 8 |
| | 0.4 | 6 | 7 | 70 | 12 | 8 |
| | 0.5 | 6 | 7 | 70 | 12 | 8 |
| | 0.6 | 6 | 7 | 70 | 12 | 8 |
| | 0.7 | 6 | 7 | 70 | 12 | 8 |
| | 0.8 | 6 | 7 | 70 | 12 | 8 |
| | 0.9 | 6 | 7 | 70 | 12 | 8 |
| | 1 | 6 | 7 | 70 | 12 | 8 |
| | 1.1 | 6 | 7 | 70 | 12 | 8 |
| | 1.2 | 6 | 7 | 70 | 12 | 8 |
| | 1.3 | 6 | 7 | 70 | 12 | 8 |
| | 1.4 | 6 | 7 | 70 | 12 | 8 |
| | 1.5 | 6 | 7 | 70 | 12 | 8 |
| | 1.6 | 6 | 7 | 70 | 12 | 8 |
| | 1.7 | 6 | 7 | 70 | 12 | 8 |
| | 1.8 | 6 | 7 | 70 | 12 | 8 |
| | 1.9 | 6 | 7 | 70 | 12 | 8 |
| | 2 | 6 | 7 | 70 | 12 | 8 |
| | 2.5 | 6 | 7 | 70 | 12 | 8 |
| | 3 | 6 | 7 | 70 | 12 | 8 |
| | 3.5 | 6 | 7 | 70 | 12 | 8 |
| | 4 | 6 | 7 | 70 | 12 | 8 |
| | 4.5 | 6 | 7 | 70 | 12 | 8 |
| | 5 | 6 | 7 | 70 | 12 | 8 |
| | 5.5 | 6 | 7 | 70 | 12 | 8 |
| | 6 | 6 | 7 | 70 | 12 | 8 |

超硬

# CSMTKC

## 超硬スーパーミニ千鳥刃キーシードカッター　*Solid Carbide Super Mini Staggered Tooth Keyseat Cutter*

切削条件表 P250

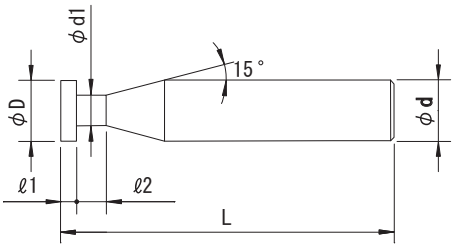
**スクエア溝加工（キーシードカッター）**

交互ネジレ10°　超微粒子



Φ7≦Dセンター穴付






| 公差(Tolerance) | D： $^{0}_{-0.05}$ | ℓ1： $^{0}_{-0.035}$ | d： $^{0}_{-0.009}$ |
|---|---|---|---|

右刃交互ネジレ10°　超微粒子
Right Hand Cut With Staggered Helical10°　Ultra Micro Grain Carbide

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 4 | 0.5 | 2 | 3.5 | 50 | 3 | 6 |
| | 0.6 | 2 | 3.5 | 50 | 3 | 6 |
| | 0.7 | 2 | 3.5 | 50 | 3 | 6 |
| | 0.8 | 2 | 3.5 | 50 | 3 | 6 |
| | 0.9 | 2 | 3.5 | 50 | 3 | 6 |
| | 1 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.1 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.2 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.3 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.4 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.5 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.6 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.7 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.8 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.9 | 2 | 3.5 | 50 | 3 | 6 |
| | 2 | 2 | 3.5 | 50 | 3 | 6 |
| 5 | 0.5 | 2.5 | 5 | 50 | 6 | 6 |
| | 0.6 | 2.5 | 4.9 | 50 | 6 | 6 |
| | 0.7 | 2.5 | 4.8 | 50 | 6 | 6 |
| | 0.8 | 2.5 | 4.7 | 50 | 6 | 6 |
| | 0.9 | 2.5 | 4.6 | 50 | 6 | 6 |
| | 1 | 2.5 | 4.5 | 50 | 6 | 6 |
| | 1.1 | 2.5 | 4.4 | 50 | 6 | 6 |
| | 1.2 | 2.5 | 4.3 | 50 | 6 | 6 |
| | 1.3 | 2.5 | 4.2 | 50 | 6 | 6 |
| | 1.4 | 2.5 | 4.1 | 50 | 6 | 6 |
| | 1.5 | 2.5 | 4 | 50 | 6 | 6 |
| | 1.6 | 2.5 | 4 | 50 | 6 | 6 |
| | 1.7 | 2.5 | 4 | 50 | 6 | 6 |
| | 1.8 | 2.5 | 4 | 50 | 6 | 6 |
| | 1.9 | 2.5 | 4 | 50 | 6 | 6 |
| | 2 | 2.5 | 4 | 50 | 6 | 6 |
| | 2.5 | 2.5 | 4 | 50 | 6 | 6 |
| 6 | 0.5 | 3 | 5 | 50 | 6 | 6 |
| | 0.6 | 3 | 4.9 | 50 | 6 | 6 |
| | 0.7 | 3 | 4.8 | 50 | 6 | 6 |
| | 0.8 | 3 | 4.7 | 50 | 6 | 6 |
| | 0.9 | 3 | 4.6 | 50 | 6 | 6 |
| | 1 | 3 | 4.5 | 50 | 6 | 6 |
| | 1.1 | 3 | 4.4 | 50 | 6 | 6 |
| | 1.2 | 3 | 4.3 | 50 | 6 | 6 |
| | 1.3 | 3 | 4.2 | 50 | 6 | 6 |
| | 1.4 | 3 | 4.1 | 50 | 6 | 6 |

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 6 | 1.5 | 3 | 4 | 50 | 6 | 6 |
| | 1.6 | 3 | 4 | 50 | 6 | 6 |
| | 1.7 | 3 | 4 | 50 | 6 | 6 |
| | 1.8 | 3 | 4 | 50 | 6 | 6 |
| | 1.9 | 3 | 4 | 50 | 6 | 6 |
| | 2 | 3 | 4 | 50 | 6 | 6 |
| | 2.5 | 3 | 4 | 50 | 6 | 6 |
| | 3 | 3 | 4 | 50 | 6 | 6 |
| 7 | 0.5 | 3.5 | 5 | 60 | 8 | 6 |
| | 0.6 | 3.5 | 4.9 | 60 | 8 | 6 |
| | 0.7 | 3.5 | 4.8 | 60 | 8 | 6 |
| | 0.8 | 3.5 | 4.7 | 60 | 8 | 6 |
| | 0.9 | 3.5 | 4.6 | 60 | 8 | 6 |
| | 1 | 3.5 | 4.5 | 60 | 8 | 6 |
| | 1.1 | 3.5 | 4.4 | 60 | 8 | 6 |
| | 1.2 | 3.5 | 4.3 | 60 | 8 | 6 |
| | 1.3 | 3.5 | 4.2 | 60 | 8 | 6 |
| | 1.4 | 3.5 | 4.1 | 60 | 8 | 6 |
| | 1.5 | 3.5 | 4 | 60 | 8 | 6 |
| | 1.6 | 3.5 | 4 | 60 | 8 | 6 |
| | 1.7 | 3.5 | 4 | 60 | 8 | 6 |
| | 1.8 | 3.5 | 4 | 60 | 8 | 6 |
| | 1.9 | 3.5 | 4 | 60 | 8 | 6 |
| | 2 | 3.5 | 4 | 60 | 8 | 6 |
| | 2.5 | 3.5 | 4 | 60 | 8 | 6 |
| | 3 | 3.5 | 4 | 60 | 8 | 6 |
| | 3.5 | 3.5 | 4 | 60 | 8 | 6 |
| 8 | 0.5 | 4 | 5 | 60 | 8 | 6 |
| | 0.6 | 4 | 4.9 | 60 | 8 | 6 |
| | 0.7 | 4 | 4.8 | 60 | 8 | 6 |
| | 0.8 | 4 | 4.7 | 60 | 8 | 6 |
| | 0.9 | 4 | 4.6 | 60 | 8 | 6 |
| | 1 | 4 | 4.5 | 60 | 8 | 6 |
| | 1.1 | 4 | 4.4 | 60 | 8 | 6 |
| | 1.2 | 4 | 4.3 | 60 | 8 | 6 |
| | 1.3 | 4 | 4.2 | 60 | 8 | 6 |
| | 1.4 | 4 | 4.1 | 60 | 8 | 6 |
| | 1.5 | 4 | 4 | 60 | 8 | 6 |
| | 1.6 | 4 | 4 | 60 | 8 | 6 |
| | 1.7 | 4 | 4 | 60 | 8 | 6 |
| | 1.8 | 4 | 4 | 60 | 8 | 6 |
| | 1.9 | 4 | 4 | 60 | 8 | 6 |
| | 2 | 4 | 4 | 60 | 8 | 6 |

# CSMTKC 超硬スーパーミニ千鳥刃キーシードカッター

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 8 | 2.5 | 4 | 4 | 60 | 8 | 6 |
| | 3 | 4 | 4 | 60 | 8 | 6 |
| | 3.5 | 4 | 4 | 60 | 8 | 6 |
| | 4 | 4 | 4 | 60 | 8 | 6 |
| 10 | 0.5 | 5 | 7 | 70 | 10 | 6 |
| | 0.6 | 5 | 6.9 | 70 | 10 | 6 |
| | 0.7 | 5 | 6.8 | 70 | 10 | 6 |
| | 0.8 | 5 | 6.7 | 70 | 10 | 6 |
| | 0.9 | 5 | 6.6 | 70 | 10 | 6 |
| | 1 | 5 | 6.5 | 70 | 10 | 6 |
| | 1.1 | 5 | 6.4 | 70 | 10 | 6 |
| | 1.2 | 5 | 6.3 | 70 | 10 | 6 |
| | 1.3 | 5 | 6.2 | 70 | 10 | 6 |
| | 1.4 | 5 | 6.1 | 70 | 10 | 6 |
| | 1.5 | 5 | 6 | 70 | 10 | 6 |
| | 1.6 | 5 | 6 | 70 | 10 | 6 |
| | 1.7 | 5 | 6 | 70 | 10 | 6 |
| | 1.8 | 5 | 6 | 70 | 10 | 6 |
| | 1.9 | 5 | 6 | 70 | 10 | 6 |
| | 2 | 5 | 6 | 70 | 10 | 6 |
| | 2.5 | 5 | 6 | 70 | 10 | 6 |
| | 3 | 5 | 6 | 70 | 10 | 6 |
| | 3.5 | 5 | 6 | 70 | 10 | 6 |
| | 4 | 5 | 6 | 70 | 10 | 6 |
| | 4.5 | 5 | 6 | 70 | 10 | 6 |
| | 5 | 5 | 6 | 70 | 10 | 6 |

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 12 | 0.5 | 6 | 8 | 70 | 12 | 6 |
| | 0.6 | 6 | 7.9 | 70 | 12 | 6 |
| | 0.7 | 6 | 7.8 | 70 | 12 | 6 |
| | 0.8 | 6 | 7.7 | 70 | 12 | 6 |
| | 0.9 | 6 | 7.6 | 70 | 12 | 6 |
| | 1 | 6 | 7.5 | 70 | 12 | 6 |
| | 1.1 | 6 | 7.4 | 70 | 12 | 6 |
| | 1.2 | 6 | 7.3 | 70 | 12 | 6 |
| | 1.3 | 6 | 7.2 | 70 | 12 | 6 |
| | 1.4 | 6 | 7.1 | 70 | 12 | 6 |
| | 1.5 | 6 | 7 | 70 | 12 | 6 |
| | 1.6 | 6 | 7 | 70 | 12 | 6 |
| | 1.7 | 6 | 7 | 70 | 12 | 6 |
| | 1.8 | 6 | 7 | 70 | 12 | 6 |
| | 1.9 | 6 | 7 | 70 | 12 | 6 |
| | 2 | 6 | 7 | 70 | 12 | 6 |
| | 2.5 | 6 | 7 | 70 | 12 | 6 |
| | 3 | 6 | 7 | 70 | 12 | 6 |
| | 3.5 | 6 | 7 | 70 | 12 | 6 |
| | 4 | 6 | 7 | 70 | 12 | 6 |
| | 4.5 | 6 | 7 | 70 | 12 | 6 |
| | 5 | 6 | 7 | 70 | 12 | 6 |
| | 5.5 | 6 | 7 | 70 | 12 | 6 |
| | 6 | 6 | 7 | 70 | 12 | 6 |

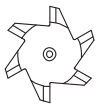
超硬

# CSACS

## 超硬ソリッドアンギュラカッター　*Solid Carbide Angular Cutter With Straight Shank*

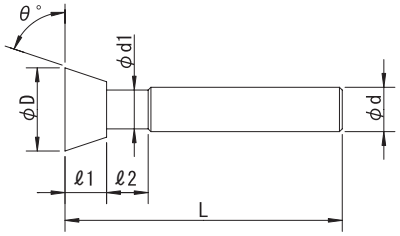
切削条件表 P250

アリ溝・角度付溝・面取り加工　右直刃　超微粒子



センター穴付






| 公差(Tolerance) | D：$^{+0.1}_{0}$ | θ：±10′ | d：h6 |
|---|---|---|---|

右刃ストレート　超微粒子
Straight Flute　Ultra Micro Grain Carbide

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| **15** | 45° | 4 | 5 | 7 | 80 | 6 | 6 |
| **20** | | 5 | 7.5 | 10 | 80 | 10 | 6 |
| **25** | | 7 | 8 | 10 | 80 | 12 | 6 |
| **30** | | 8 | 9 | 12 | 80 | 12 | 6 |

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| **15** | 60° | 6 | 5.5 | 7 | 80 | 6 | 6 |
| **20** | | 7 | 8.5 | 8 | 80 | 10 | 6 |
| **25** | | 9 | 10.5 | 10 | 80 | 12 | 6 |
| **30** | | 11 | 11.5 | 12 | 80 | 12 | 6 |

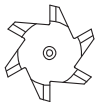
超硬

# CSACLS

## 超硬ソリッドアンギュラカッターロング　*Solid Carbide Angular Cutter With Long Straight Shank*

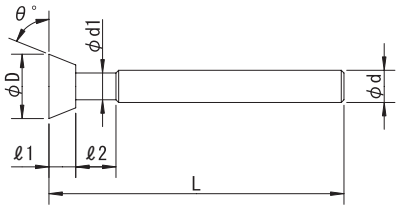
切削条件表 P250

アリ溝・角度付溝・面取り加工　右直刃　超微粒子



センター穴付






| 公差(Tolerance) | D：$^{+0.1}_{0}$ | θ：±10′ | d：h6 |
|---|---|---|---|

右刃ストレート　超微粒子
Straight Flute　Ultra Micro Grain Carbide

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| **15** | 45° | 4 | 5 | 7 | 130 | 6 | 6 |
| **20** | | 5 | 7.5 | 10 | 130 | 10 | 6 |
| **25** | | 7 | 8 | 10 | 130 | 12 | 6 |
| **30** | | 8 | 9 | 12 | 130 | 12 | 6 |

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| **15** | 60° | 6 | 5.5 | 7 | 130 | 6 | 6 |
| **20** | | 7 | 8.5 | 8 | 130 | 10 | 6 |
| **25** | | 9 | 10.5 | 10 | 130 | 12 | 6 |
| **30** | | 11 | 11.5 | 12 | 130 | 12 | 6 |

超硬

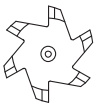
# CSTC

## 超硬ソリッドTスロットカッター　*Solid Carbide T-Slot Cutter*

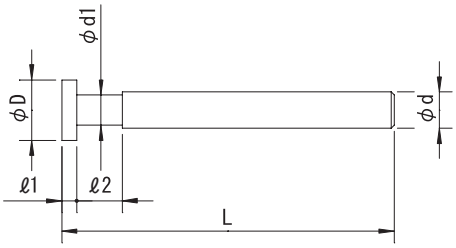
切削条件表 P244

**スクエア溝加工（Tスロットカッター）**

右直刃　超微粒子


センター穴付






| 公差(Tolerance) | D： $^{0}_{-0.03}$ | ℓ1： $^{0}_{-0.02}$ | d： $^{0}_{-0.009}$ |
|---|---|---|---|

右刃ストレート　超微粒子
Straight Flute　Ultra Micro Grain Carbide

| 刃径（ΦD） *Dia.* | 刃厚（ℓ1） *Cut Width* | 首径（Φd1） *Neck Dia.* | 首長（ℓ2） *Neck Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 刃数（N） *Number of Flutes* |
|---|---|---|---|---|---|---|
| 15 | 3 | 5.5 | 7 | 65 | 6 | 6 |
| | 4 | 5.5 | 7 | 65 | 6 | 6 |
| | 5 | 5.5 | 7 | 65 | 6 | 6 |
| | 6 | 5.5 | 7 | 65 | 6 | 6 |
| 16 | 3 | 5.5 | 7 | 65 | 6 | 6 |
| | 4 | 5.5 | 7 | 65 | 6 | 6 |
| | 5 | 5.5 | 7 | 65 | 6 | 6 |
| | 6 | 5.5 | 7 | 65 | 6 | 6 |
| 18 | 3 | 7.5 | 7 | 65 | 8 | 8 |
| | 4 | 7.5 | 7 | 65 | 8 | 8 |
| | 5 | 7.5 | 7 | 65 | 8 | 8 |
| | 6 | 7.5 | 7 | 65 | 8 | 8 |
| 20 | 3 | 9.5 | 7 | 75 | 10 | 8 |
| | 4 | 9.5 | 7 | 75 | 10 | 8 |
| | 5 | 9.5 | 7 | 75 | 10 | 8 |
| | 6 | 9.5 | 7 | 75 | 10 | 8 |
| | 8 | 9.5 | 7 | 75 | 10 | 8 |

| 刃径（ΦD） *Dia.* | 刃厚（ℓ1） *Cut Width* | 首径（Φd1） *Neck Dia.* | 首長（ℓ2） *Neck Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 刃数（N） *Number of Flutes* |
|---|---|---|---|---|---|---|
| 22 | 3 | 11.5 | 7 | 75 | 12 | 8 |
| | 4 | 11.5 | 7 | 75 | 12 | 8 |
| | 5 | 11.5 | 7 | 75 | 12 | 8 |
| | 6 | 11.5 | 7 | 75 | 12 | 8 |
| | 8 | 11.5 | 7 | 75 | 12 | 8 |
| 25 | 3 | 11.5 | 7 | 75 | 12 | 10 |
| | 4 | 11.5 | 7 | 75 | 12 | 10 |
| | 5 | 11.5 | 7 | 75 | 12 | 10 |
| | 6 | 11.5 | 7 | 75 | 12 | 10 |
| | 8 | 11.5 | 7 | 75 | 12 | 10 |
| | 10 | 11.5 | 7 | 75 | 12 | 10 |
| 30 | 3 | 11.5 | 7 | 80 | 12 | 10 |
| | 4 | 11.5 | 7 | 80 | 12 | 10 |
| | 5 | 11.5 | 7 | 80 | 12 | 10 |
| | 6 | 11.5 | 7 | 80 | 12 | 10 |
| | 8 | 11.5 | 7 | 80 | 12 | 10 |
| | 10 | 11.5 | 7 | 80 | 12 | 10 |

超硬

# CSTTC/CSTTCL

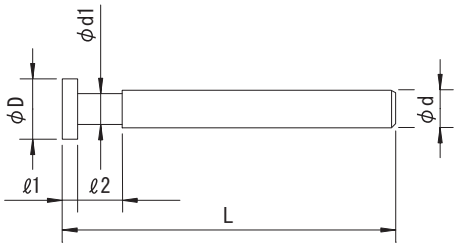
## 超硬ソリッド千鳥刃Tスロットカッター/ロング　*Solid Carbide Staggered Tooth T-Slot Cutter/Long*

切削条件表 P250

**スクエア溝加工（Tスロットカッター）**


センター穴付






| 公差(Tolerance) | D：$^{0}_{-0.05}$ | ℓ1：$^{0}_{-0.05}$ | d：$^{0}_{-0.01}$ |
|---|---|---|---|

## 《CSTTC》 右刃交互ネジレ15°　超微粒子
Right Hand Cut With Staggered Helix15°　Ultra Micro Grain Carbide

交互ネジレ15° 超微粒子

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 15 | 3 | 5.5 | 7 | 65 | 6 | 6 |
| | 4 | 5.5 | 7 | 65 | 6 | 6 |
| | 5 | 5.5 | 7 | 65 | 6 | 6 |
| | 6 | 5.5 | 7 | 65 | 6 | 6 |
| 16 | 3 | 5.5 | 7 | 65 | 6 | 6 |
| | 4 | 5.5 | 7 | 65 | 6 | 6 |
| | 5 | 5.5 | 7 | 65 | 6 | 6 |
| | 6 | 5.5 | 7 | 65 | 6 | 6 |
| 18 | 3 | 7.5 | 7 | 65 | 8 | 6 |
| | 4 | 7.5 | 7 | 65 | 8 | 6 |
| | 5 | 7.5 | 7 | 65 | 8 | 6 |
| | 6 | 7.5 | 7 | 65 | 8 | 6 |
| 20 | 3 | 9.5 | 7 | 75 | 10 | 6 |
| | 4 | 9.5 | 7 | 75 | 10 | 6 |
| | 5 | 9.5 | 7 | 75 | 10 | 6 |
| | 6 | 9.5 | 7 | 75 | 10 | 6 |
| | 8 | 9.5 | 7 | 75 | 10 | 6 |

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 22 | 3 | 11.5 | 7 | 75 | 12 | 6 |
| | 4 | 11.5 | 7 | 75 | 12 | 6 |
| | 5 | 11.5 | 7 | 75 | 12 | 6 |
| | 6 | 11.5 | 7 | 75 | 12 | 6 |
| | 8 | 11.5 | 7 | 75 | 12 | 6 |
| 25 | 3 | 11.5 | 7 | 75 | 12 | 8 |
| | 4 | 11.5 | 7 | 75 | 12 | 8 |
| | 5 | 11.5 | 7 | 75 | 12 | 8 |
| | 6 | 11.5 | 7 | 75 | 12 | 8 |
| | 8 | 11.5 | 7 | 75 | 12 | 8 |
| | 10 | 11.5 | 7 | 75 | 12 | 8 |
| 30 | 3 | 11.5 | 7 | 80 | 12 | 8 |
| | 4 | 11.5 | 7 | 80 | 12 | 8 |
| | 5 | 11.5 | 7 | 80 | 12 | 8 |
| | 6 | 11.5 | 7 | 80 | 12 | 8 |
| | 8 | 11.5 | 7 | 80 | 12 | 8 |
| | 10 | 11.5 | 7 | 80 | 12 | 8 |

| 公差(Tolerance) | D：$^{0}_{-0.05}$ | ℓ1：$^{0}_{-0.05}$ | d：$^{0}_{-0.011}$ |
|---|---|---|---|

## 《CSTTCL》 右刃交互ネジレ15°　超微粒子
Right Hand Cut With Staggered Helix15°　Ultra Micro Grain Carbide

交互ネジレ15° 超微粒子

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 15 | 3 | 7 | 7 | 150 | 8 | 6 |
| | 4 | 7 | 7 | 150 | 8 | 6 |
| | 5 | 7 | 7 | 150 | 8 | 6 |
| | 6 | 7 | 7 | 150 | 8 | 6 |
| 16 | 3 | 7 | 7 | 150 | 8 | 6 |
| | 4 | 7 | 7 | 150 | 8 | 6 |
| | 5 | 7 | 7 | 150 | 8 | 6 |
| | 6 | 7 | 7 | 150 | 8 | 6 |
| 18 | 3 | 9 | 7 | 150 | 10 | 6 |
| | 4 | 9 | 7 | 150 | 10 | 6 |
| | 5 | 9 | 7 | 150 | 10 | 6 |
| | 6 | 9 | 7 | 150 | 10 | 6 |
| 20 | 3 | 11 | 7 | 150 | 12 | 6 |
| | 4 | 11 | 7 | 150 | 12 | 6 |
| | 5 | 11 | 7 | 150 | 12 | 6 |
| | 6 | 11 | 7 | 150 | 12 | 6 |
| | 8 | 11 | 7 | 150 | 12 | 6 |

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 22 | 3 | 11 | 7 | 150 | 12 | 6 |
| | 4 | 11 | 7 | 150 | 12 | 6 |
| | 5 | 11 | 7 | 150 | 12 | 6 |
| | 6 | 11 | 7 | 150 | 12 | 6 |
| | 8 | 11 | 7 | 150 | 12 | 6 |
| 25 | 3 | 15 | 7 | 150 | 16 | 8 |
| | 4 | 15 | 7 | 150 | 16 | 8 |
| | 5 | 15 | 7 | 150 | 16 | 8 |
| | 6 | 15 | 7 | 150 | 16 | 8 |
| | 8 | 15 | 7 | 150 | 16 | 8 |
| | 10 | 15 | 7 | 150 | 16 | 8 |
| 30 | 3 | 15 | 7 | 150 | 16 | 8 |
| | 4 | 15 | 7 | 150 | 16 | 8 |
| | 5 | 15 | 7 | 150 | 16 | 8 |
| | 6 | 15 | 7 | 150 | 16 | 8 |
| | 8 | 15 | 7 | 150 | 16 | 8 |
| | 10 | 15 | 7 | 150 | 16 | 8 |

超硬

# CSKC

## 超硬ソリッドキーシードカッター　*Solid Carbide Keyseat Cutter*

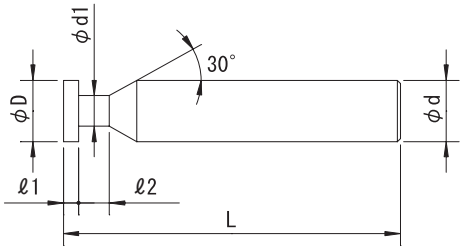
切削条件表 P251

**スクエア溝加工（キーシードカッター）** 右直刃 K10



Φ8≦Dセンター穴付






| 公差(Tolerance) | D： $^{0}_{-0.05}$ | ℓ1： $^{0}_{-0.035}$ | d： $^{0}_{-0.01}$ |
|---|---|---|---|

右刃ストレート　K10
Straight Flute　Micro Grain Carbide(K10)

| 刃径（ΦD） *Dia.* | 刃厚（ℓ1） *Cut Width* | 首径（Φd1） *Neck Dia.* | 首長（ℓ2） *Neck Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 刃数（N） *Number of Flutes* |
|---|---|---|---|---|---|---|
| 2 | 0.3 | 1.2 | 3.5 | 40 | 3 | 4 |
| | 0.4 | 1.2 | 3.5 | 40 | 3 | 4 |
| | 0.5 | 1.2 | 3.5 | 40 | 3 | 4 |
| | 0.6 | 1.2 | 3.5 | 40 | 3 | 4 |
| | 0.7 | 1.2 | 3.5 | 40 | 3 | 4 |
| | 0.8 | 1.2 | 3.5 | 40 | 3 | 4 |
| | 0.9 | 1.2 | 3.5 | 40 | 3 | 4 |
| | 1 | 1.2 | 3.5 | 40 | 3 | 4 |
| | 1.1 | 1.2 | 3.5 | 40 | 3 | 4 |
| | 1.2 | 1.2 | 3.5 | 40 | 3 | 4 |
| 2.5 | 0.3 | 1.25 | 3.5 | 40 | 3 | 4 |
| | 0.4 | 1.25 | 3.5 | 40 | 3 | 4 |
| | 0.5 | 1.25 | 3.5 | 40 | 3 | 4 |
| | 0.6 | 1.25 | 3.5 | 40 | 3 | 4 |
| | 0.7 | 1.25 | 3.5 | 40 | 3 | 4 |
| | 0.8 | 1.25 | 3.5 | 40 | 3 | 4 |
| | 0.9 | 1.25 | 3.5 | 40 | 3 | 4 |
| | 1 | 1.25 | 3.5 | 40 | 3 | 4 |
| | 1.1 | 1.25 | 3.5 | 40 | 3 | 4 |
| | 1.2 | 1.25 | 3.5 | 40 | 3 | 4 |
| 3 | 0.3 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 0.4 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 0.5 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 0.6 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 0.7 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 0.8 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 0.9 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 1 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 1.1 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 1.2 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 1.3 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 1.4 | 1.5 | 3.5 | 50 | 3 | 4 |
| | 1.5 | 1.5 | 3.5 | 50 | 3 | 4 |
| 4 | 0.3 | 2 | 3.5 | 50 | 3 | 6 |
| | 0.4 | 2 | 3.5 | 50 | 3 | 6 |
| | 0.5 | 2 | 3.5 | 50 | 3 | 6 |
| | 0.6 | 2 | 3.5 | 50 | 3 | 6 |
| | 0.7 | 2 | 3.5 | 50 | 3 | 6 |
| | 0.8 | 2 | 3.5 | 50 | 3 | 6 |
| | 0.9 | 2 | 3.5 | 50 | 3 | 6 |
| | 1 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.1 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.2 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.3 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.4 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.5 | 2 | 3.5 | 50 | 3 | 6 |

| 刃径（ΦD） *Dia.* | 刃厚（ℓ1） *Cut Width* | 首径（Φd1） *Neck Dia.* | 首長（ℓ2） *Neck Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 刃数（N） *Number of Flutes* |
|---|---|---|---|---|---|---|
| 4 | 1.6 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.7 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.8 | 2 | 3.5 | 50 | 3 | 6 |
| | 1.9 | 2 | 3.5 | 50 | 3 | 6 |
| | 2 | 2 | 3.5 | 50 | 3 | 6 |
| 5 | 0.3 | 2.5 | 5.2 | 50 | 6 | 8 |
| | 0.4 | 2.5 | 5.1 | 50 | 6 | 8 |
| | 0.5 | 2.5 | 5 | 50 | 6 | 8 |
| | 0.6 | 2.5 | 4.9 | 50 | 6 | 8 |
| | 0.7 | 2.5 | 4.8 | 50 | 6 | 8 |
| | 0.8 | 2.5 | 4.7 | 50 | 6 | 8 |
| | 0.9 | 2.5 | 4.6 | 50 | 6 | 8 |
| | 1 | 2.5 | 4.5 | 50 | 6 | 8 |
| | 1.1 | 2.5 | 4.4 | 50 | 6 | 8 |
| | 1.2 | 2.5 | 4.3 | 50 | 6 | 8 |
| | 1.3 | 2.5 | 4.2 | 50 | 6 | 8 |
| | 1.4 | 2.5 | 4.1 | 50 | 6 | 8 |
| | 1.5 | 2.5 | 4 | 50 | 6 | 8 |
| | 1.6 | 2.5 | 4 | 50 | 6 | 8 |
| | 1.7 | 2.5 | 4 | 50 | 6 | 8 |
| | 1.8 | 2.5 | 4 | 50 | 6 | 8 |
| | 1.9 | 2.5 | 4 | 50 | 6 | 8 |
| | 2 | 2.5 | 4 | 50 | 6 | 8 |
| | 2.5 | 2.5 | 4 | 50 | 6 | 8 |
| 6 | 0.3 | 3 | 5.2 | 50 | 6 | 8 |
| | 0.4 | 3 | 5.1 | 50 | 6 | 8 |
| | 0.5 | 3 | 5 | 50 | 6 | 8 |
| | 0.6 | 3 | 4.9 | 50 | 6 | 8 |
| | 0.7 | 3 | 4.8 | 50 | 6 | 8 |
| | 0.8 | 3 | 4.7 | 50 | 6 | 8 |
| | 0.9 | 3 | 4.6 | 50 | 6 | 8 |
| | 1 | 3 | 4.5 | 50 | 6 | 8 |
| | 1.1 | 3 | 4.4 | 50 | 6 | 8 |
| | 1.2 | 3 | 4.3 | 50 | 6 | 8 |
| | 1.3 | 3 | 4.2 | 50 | 6 | 8 |
| | 1.4 | 3 | 4.1 | 50 | 6 | 8 |
| | 1.5 | 3 | 4 | 50 | 6 | 8 |
| | 1.6 | 3 | 4 | 50 | 6 | 8 |
| | 1.7 | 3 | 4 | 50 | 6 | 8 |
| | 1.8 | 3 | 4 | 50 | 6 | 8 |
| | 1.9 | 3 | 4 | 50 | 6 | 8 |
| | 2 | 3 | 4 | 50 | 6 | 8 |
| | 2.5 | 3 | 4 | 50 | 6 | 8 |
| | 3 | 3 | 4 | 50 | 6 | 8 |

# CSKC 超硬ソリッドキーシードカッター

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 8 | 0.3 | 4 | 5.2 | 60 | 6 | 10 |
| | 0.4 | 4 | 5.1 | 60 | 6 | 10 |
| | 0.5 | 4 | 5 | 60 | 6 | 10 |
| | 0.6 | 4 | 4.9 | 60 | 6 | 10 |
| | 0.7 | 4 | 4.8 | 60 | 6 | 10 |
| | 0.8 | 4 | 4.7 | 60 | 6 | 10 |
| | 0.9 | 4 | 4.6 | 60 | 6 | 10 |
| | 1 | 4 | 4.5 | 60 | 6 | 10 |
| | 1.1 | 4 | 4.4 | 60 | 6 | 10 |
| | 1.2 | 4 | 4.3 | 60 | 6 | 10 |
| | 1.3 | 4 | 4.2 | 60 | 6 | 10 |
| | 1.4 | 4 | 4.1 | 60 | 6 | 10 |
| | 1.5 | 4 | 4 | 60 | 6 | 10 |
| | 1.6 | 4 | 4 | 60 | 6 | 10 |
| | 1.7 | 4 | 4 | 60 | 6 | 10 |
| | 1.8 | 4 | 4 | 60 | 6 | 10 |
| | 1.9 | 4 | 4 | 60 | 6 | 10 |
| | 2 | 4 | 4 | 60 | 6 | 10 |
| | 2.5 | 4 | 4 | 60 | 6 | 10 |
| | 3 | 4 | 4 | 60 | 6 | 10 |
| | 3.5 | 4 | 4 | 60 | 6 | 10 |
| | 4 | 4 | 4 | 60 | 6 | 10 |
| 10 | 0.3 | 5 | 6.2 | 60 | 8 | 10 |
| | 0.4 | 5 | 6.1 | 60 | 8 | 10 |
| | 0.5 | 5 | 6 | 60 | 8 | 10 |
| | 0.6 | 5 | 5.9 | 60 | 8 | 10 |
| | 0.7 | 5 | 5.8 | 60 | 8 | 10 |
| | 0.8 | 5 | 5.7 | 60 | 8 | 10 |
| | 0.9 | 5 | 5.6 | 60 | 8 | 10 |
| | 1 | 5 | 5.5 | 60 | 8 | 10 |
| | 1.1 | 5 | 5.4 | 60 | 8 | 10 |
| | 1.2 | 5 | 5.3 | 60 | 8 | 10 |
| | 1.3 | 5 | 5.2 | 60 | 8 | 10 |
| | 1.4 | 5 | 5.1 | 60 | 8 | 10 |
| | 1.5 | 5 | 5 | 60 | 8 | 10 |
| | 1.6 | 5 | 5 | 60 | 8 | 10 |
| | 1.7 | 5 | 5 | 60 | 8 | 10 |
| | 1.8 | 5 | 5 | 60 | 8 | 10 |
| | 1.9 | 5 | 5 | 60 | 8 | 10 |
| | 2 | 5 | 5 | 60 | 8 | 10 |
| | 2.5 | 5 | 5 | 60 | 8 | 10 |
| | 3 | 5 | 5 | 60 | 8 | 10 |
| | 3.5 | 5 | 5 | 60 | 8 | 10 |
| | 4 | 5 | 5 | 60 | 8 | 10 |
| | 4.5 | 5 | 5 | 60 | 8 | 10 |
| | 5 | 5 | 5 | 60 | 8 | 10 |
| 12 | 0.3 | 6 | 6.2 | 60 | 8 | 10 |
| | 0.4 | 6 | 6.1 | 60 | 8 | 10 |
| | 0.5 | 6 | 6 | 60 | 8 | 10 |
| | 0.6 | 6 | 5.9 | 60 | 8 | 10 |
| | 0.7 | 6 | 5.8 | 60 | 8 | 10 |
| | 0.8 | 6 | 5.7 | 60 | 8 | 10 |
| | 0.9 | 6 | 5.6 | 60 | 8 | 10 |
| | 1 | 6 | 5.5 | 60 | 8 | 10 |
| | 1.1 | 6 | 5.4 | 60 | 8 | 10 |
| | 1.2 | 6 | 5.3 | 60 | 8 | 10 |
| | 1.3 | 6 | 5.2 | 60 | 8 | 10 |
| | 1.4 | 6 | 5.1 | 60 | 8 | 10 |
| | 1.5 | 6 | 5 | 60 | 8 | 10 |
| | 1.6 | 6 | 5 | 60 | 8 | 10 |
| | 1.7 | 6 | 5 | 60 | 8 | 10 |
| | 1.8 | 6 | 5 | 60 | 8 | 10 |
| | 1.9 | 6 | 5 | 60 | 8 | 10 |
| | 2 | 6 | 5 | 60 | 8 | 10 |
| | 2.5 | 6 | 5 | 60 | 8 | 10 |
| | 3 | 6 | 5 | 60 | 8 | 10 |
| | 3.5 | 6 | 5 | 60 | 8 | 10 |
| | 4 | 6 | 5 | 60 | 8 | 10 |
| | 4.5 | 6 | 5 | 60 | 8 | 10 |

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 12 | 5 | 6 | 5 | 60 | 8 | 10 |
| | 5.5 | 6 | 5 | 60 | 8 | 10 |
| | 6 | 6 | 5 | 60 | 8 | 10 |
| 15 | 1 | 7 | 24 | 70 | 8 | 10 |
| | 1.5 | 7 | 23.5 | 70 | 8 | 10 |
| | 2 | 7 | 23 | 70 | 8 | 10 |
| | 2.5 | 7 | 22.5 | 70 | 8 | 10 |
| | 3 | 7 | 22 | 70 | 8 | 10 |
| | 3.5 | 7 | 21.5 | 70 | 8 | 10 |
| | 4 | 7 | 21 | 70 | 8 | 10 |
| | 4.5 | 7 | 20.5 | 70 | 8 | 10 |
| | 5 | 7 | 20 | 70 | 8 | 10 |
| | 5.5 | 7 | 19.5 | 70 | 8 | 10 |
| | 6 | 7 | 19 | 70 | 8 | 10 |
| 16 | 1 | 7 | 24 | 70 | 8 | 10 |
| | 1.5 | 7 | 23.5 | 70 | 8 | 10 |
| | 2 | 7 | 23 | 70 | 8 | 10 |
| | 2.5 | 7 | 22.5 | 70 | 8 | 10 |
| | 3 | 7 | 22 | 70 | 8 | 10 |
| | 3.5 | 7 | 21.5 | 70 | 8 | 10 |
| | 4 | 7 | 21 | 70 | 8 | 10 |
| | 4.5 | 7 | 20.5 | 70 | 8 | 10 |
| | 5 | 7 | 20 | 70 | 8 | 10 |
| | 5.5 | 7 | 19.5 | 70 | 8 | 10 |
| | 6 | 7 | 19 | 70 | 8 | 10 |
| 18 | 1 | 9 | 24 | 70 | 10 | 12 |
| | 1.5 | 9 | 23.5 | 70 | 10 | 12 |
| | 2 | 9 | 23 | 70 | 10 | 12 |
| | 2.5 | 9 | 22.5 | 70 | 10 | 12 |
| | 3 | 9 | 22 | 70 | 10 | 12 |
| | 3.5 | 9 | 21.5 | 70 | 10 | 12 |
| | 4 | 9 | 21 | 70 | 10 | 12 |
| | 4.5 | 9 | 20.5 | 70 | 10 | 12 |
| | 5 | 9 | 20 | 70 | 10 | 12 |
| | 5.5 | 9 | 19.5 | 70 | 10 | 12 |
| | 6 | 9 | 19 | 70 | 10 | 12 |
| 20 | 1 | 9 | 24 | 80 | 10 | 12 |
| | 1.5 | 9 | 23.5 | 80 | 10 | 12 |
| | 2 | 9 | 23 | 80 | 10 | 12 |
| | 2.5 | 9 | 22.5 | 80 | 10 | 12 |
| | 3 | 9 | 22 | 80 | 10 | 12 |
| | 3.5 | 9 | 21.5 | 80 | 10 | 12 |
| | 4 | 9 | 21 | 80 | 10 | 12 |
| | 4.5 | 9 | 20.5 | 80 | 10 | 12 |
| | 5 | 9 | 20 | 80 | 10 | 12 |
| | 5.5 | 9 | 19.5 | 80 | 10 | 12 |
| | 6 | 9 | 19 | 80 | 10 | 12 |
| 25 | 1 | 9 | 24 | 80 | 10 | 14 |
| | 1.5 | 9 | 23.5 | 80 | 10 | 14 |
| | 2 | 9 | 23 | 80 | 10 | 14 |
| | 2.5 | 9 | 22.5 | 80 | 10 | 14 |
| | 3 | 9 | 22 | 80 | 10 | 14 |
| | 3.5 | 9 | 21.5 | 80 | 10 | 14 |
| | 4 | 9 | 21 | 80 | 10 | 14 |
| | 4.5 | 9 | 20.5 | 80 | 10 | 14 |
| | 5 | 9 | 20 | 80 | 10 | 14 |
| | 5.5 | 9 | 19.5 | 80 | 10 | 14 |
| | 6 | 9 | 19 | 80 | 10 | 14 |
| 30 | 1 | 11 | 24 | 85 | 12 | 14 |
| | 1.5 | 11 | 23.5 | 85 | 12 | 14 |
| | 2 | 11 | 23 | 85 | 12 | 14 |
| | 2.5 | 11 | 22.5 | 85 | 12 | 14 |
| | 3 | 11 | 22 | 85 | 12 | 14 |
| | 3.5 | 11 | 21.5 | 85 | 12 | 14 |
| | 4 | 11 | 21 | 85 | 12 | 14 |
| | 4.5 | 11 | 20.5 | 85 | 12 | 14 |
| | 5 | 11 | 20 | 85 | 12 | 14 |
| | 5.5 | 11 | 19.5 | 85 | 12 | 14 |
| | 6 | 11 | 19 | 85 | 12 | 14 |

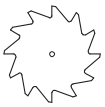
超硬

# CKC

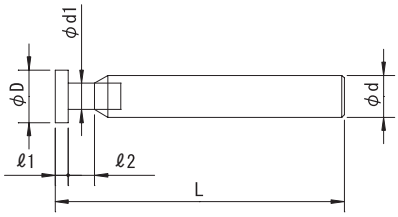
## 超硬キーシードカッター　*Solid Carbide Head Keyseat Cutter*

切削条件表 P251

**スクエア溝加工（キーシードカッター）** 右直刃 K10






| 公差 (Tolerance) | D | | | | ℓ1 | | d |
|---|---|---|---|---|---|---|---|
| | 10～16 | +0.3 +0.18 | 18～28 | +0.35 +0.21 | 0.8～3 | −0.014 −0.028 | h8 |
| | 30～45 | +0.43 +0.26 | 50～60 | +0.5 +0.3 | 3.5～6 | −0.02 −0.038 | |

右刃ストレート　K10　先ムクタイプ
Straight Flute　Micro Grain Carbide(K10)　Solid-Head Carbide

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 10 | 0.8 | 4.2 | 5 | 70 | 8 | 8 |
| | 1 | 4.2 | 5 | 70 | 8 | 8 |
| | 1.2 | 4.2 | 5 | 70 | 8 | 8 |
| | 1.5 | 4.2 | 5 | 70 | 8 | 8 |
| | 2 | 4.2 | 5 | 70 | 8 | 8 |
| | 2.5 | 4.2 | 5 | 70 | 8 | 8 |
| | 3 | 4.2 | 5 | 70 | 8 | 8 |
| | 3.5 | 4.2 | 5 | 70 | 8 | 8 |
| | 4 | 4.2 | 5 | 70 | 8 | 8 |
| | 5 | 4.2 | 5 | 70 | 8 | 8 |
| 12 | 0.8 | 4.8 | 5 | 70 | 10 | 8 |
| | 1 | 4.8 | 5 | 70 | 10 | 8 |
| | 1.2 | 4.8 | 5 | 70 | 10 | 8 |
| | 1.5 | 4.8 | 5 | 70 | 10 | 8 |
| | 2 | 4.8 | 5 | 70 | 10 | 8 |
| | 2.5 | 4.8 | 5 | 70 | 10 | 8 |
| | 3 | 4.8 | 5 | 70 | 10 | 8 |
| | 3.5 | 4.8 | 5 | 70 | 10 | 8 |
| | 4 | 4.8 | 5 | 70 | 10 | 8 |
| | 5 | 4.8 | 5 | 70 | 10 | 8 |
| 13 | 0.8 | 4.8 | 5 | 70 | 10 | 8 |
| | 1 | 4.8 | 5 | 70 | 10 | 8 |
| | 1.2 | 4.8 | 5 | 70 | 10 | 8 |
| | 1.5 | 4.8 | 5 | 70 | 10 | 8 |
| | 2 | 4.8 | 5 | 70 | 10 | 8 |
| | 2.5 | 4.8 | 5 | 70 | 10 | 8 |
| | 3 | 4.8 | 5 | 70 | 10 | 8 |
| | 3.5 | 4.8 | 5 | 70 | 10 | 8 |
| | 4 | 4.8 | 5 | 70 | 10 | 8 |
| | 5 | 4.8 | 5 | 70 | 10 | 10 |
| 15 | 0.8 | 5.5 | 5 | 75 | 10 | 10 |
| | 1 | 5.5 | 5 | 75 | 10 | 10 |
| | 1.2 | 5.5 | 5 | 75 | 10 | 10 |
| | 1.5 | 5.5 | 5 | 75 | 10 | 10 |
| | 2 | 5.5 | 5 | 75 | 10 | 10 |
| | 2.5 | 5.5 | 5 | 75 | 10 | 10 |
| | 3 | 5.5 | 5 | 75 | 10 | 10 |
| | 3.5 | 5.5 | 5 | 75 | 10 | 10 |
| | 4 | 5.5 | 5 | 75 | 10 | 10 |
| | 5 | 5.5 | 5 | 75 | 10 | 10 |

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 16 | 0.8 | 5.5 | 5 | 75 | 10 | 10 |
| | 1 | 5.5 | 5 | 75 | 10 | 10 |
| | 1.2 | 5.5 | 5 | 75 | 10 | 10 |
| | 1.5 | 5.5 | 5 | 75 | 10 | 10 |
| | 2 | 5.5 | 5 | 75 | 10 | 10 |
| | 2.5 | 5.5 | 5 | 75 | 10 | 10 |
| | 3 | 5.5 | 5 | 75 | 10 | 10 |
| | 3.5 | 5.5 | 5 | 75 | 10 | 10 |
| | 4 | 5.5 | 5 | 75 | 10 | 10 |
| | 5 | 5.5 | 5 | 75 | 10 | 10 |
| 18 | 0.8 | 6.5 | 5 | 75 | 12 | 12 |
| | 1 | 6.5 | 5 | 75 | 12 | 12 |
| | 1.2 | 6.5 | 5 | 75 | 12 | 12 |
| | 1.5 | 6.5 | 5 | 75 | 12 | 12 |
| | 2 | 6.5 | 5 | 75 | 12 | 12 |
| | 2.5 | 6.5 | 5 | 75 | 12 | 12 |
| | 3 | 6.5 | 5 | 75 | 12 | 12 |
| | 3.5 | 6.5 | 5 | 75 | 12 | 12 |
| | 4 | 6.5 | 5 | 75 | 12 | 12 |
| | 5 | 6.5 | 5 | 75 | 12 | 12 |
| 19 | 0.8 | 6.5 | 5 | 80 | 12 | 12 |
| | 1 | 6.5 | 5 | 80 | 12 | 12 |
| | 1.2 | 6.5 | 5 | 80 | 12 | 12 |
| | 1.5 | 6.5 | 5 | 80 | 12 | 12 |
| | 2 | 6.5 | 5 | 80 | 12 | 12 |
| | 2.5 | 6.5 | 5 | 80 | 12 | 12 |
| | 3 | 6.5 | 5 | 80 | 12 | 12 |
| | 3.5 | 6.5 | 5 | 80 | 12 | 12 |
| | 4 | 6.5 | 5 | 80 | 12 | 12 |
| | 5 | 6.5 | 5 | 80 | 12 | 12 |
| 20 | 0.8 | 6.5 | 5 | 80 | 12 | 12 |
| | 1 | 6.5 | 5 | 80 | 12 | 12 |
| | 1.2 | 6.5 | 5 | 80 | 12 | 12 |
| | 1.5 | 6.5 | 5 | 80 | 12 | 12 |
| | 2 | 6.5 | 5 | 80 | 12 | 12 |
| | 2.5 | 6.5 | 5 | 80 | 12 | 12 |
| | 3 | 6.5 | 5 | 80 | 12 | 12 |
| | 3.5 | 6.5 | 5 | 80 | 12 | 12 |
| | 4 | 6.5 | 5 | 80 | 12 | 12 |
| | 5 | 6.5 | 5 | 80 | 12 | 12 |

# CKC 超硬キーシードカッター

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 22 | 1 | 6.5 | 5 | 80 | 12 | 12 |
| | 1.2 | 6.5 | 5 | 80 | 12 | 12 |
| | 1.5 | 6.5 | 5 | 80 | 12 | 12 |
| | 2 | 6.5 | 5 | 80 | 12 | 12 |
| | 2.5 | 6.5 | 5 | 80 | 12 | 12 |
| | 3 | 6.5 | 5 | 80 | 12 | 12 |
| | 3.5 | 6.5 | 5 | 80 | 12 | 12 |
| | 4 | 6.5 | 5 | 80 | 12 | 12 |
| | 5 | 6.5 | 5 | 80 | 12 | 12 |
| | 6 | 6.5 | 5 | 80 | 12 | 12 |
| 25 | 1 | 7.5 | 5 | 80 | 12 | 14 |
| | 1.2 | 7.5 | 5 | 80 | 12 | 14 |
| | 1.5 | 7.5 | 5 | 80 | 12 | 14 |
| | 2 | 7.5 | 5 | 80 | 12 | 14 |
| | 2.5 | 7.5 | 5 | 80 | 12 | 14 |
| | 3 | 7.5 | 5 | 80 | 12 | 14 |
| | 3.5 | 7.5 | 5 | 80 | 12 | 14 |
| | 4 | 7.5 | 5 | 80 | 12 | 14 |
| | 5 | 7.5 | 5 | 80 | 12 | 14 |
| | 6 | 7.5 | 5 | 80 | 12 | 14 |
| 28 | 1 | 8.5 | 5 | 80 | 12 | 14 |
| | 1.2 | 8.5 | 5 | 80 | 12 | 14 |
| | 1.5 | 8.5 | 5 | 80 | 12 | 14 |
| | 2 | 8.5 | 5 | 80 | 12 | 14 |
| | 2.5 | 8.5 | 5 | 80 | 12 | 14 |
| | 3 | 8.5 | 5 | 80 | 12 | 14 |
| | 3.5 | 8.5 | 5 | 80 | 12 | 14 |
| | 4 | 8.5 | 5 | 80 | 12 | 14 |
| | 5 | 8.5 | 5 | 80 | 12 | 14 |
| | 6 | 8.5 | 5 | 80 | 12 | 14 |
| 30 | 1 | 8.5 | 5 | 85 | 16 | 14 |
| | 1.2 | 8.5 | 5 | 85 | 16 | 14 |
| | 1.5 | 8.5 | 5 | 85 | 16 | 14 |
| | 2 | 8.5 | 5 | 85 | 16 | 14 |
| | 2.5 | 8.5 | 5 | 85 | 16 | 14 |
| | 3 | 8.5 | 5 | 85 | 16 | 14 |
| | 3.5 | 8.5 | 5 | 85 | 16 | 14 |
| | 4 | 8.5 | 5 | 85 | 16 | 14 |
| | 5 | 8.5 | 5 | 85 | 16 | 14 |
| | 6 | 8.5 | 5 | 85 | 16 | 14 |
| 35 | 1 | 9.5 | 3 | 85 | 16 | 16 |
| | 1.2 | 9.5 | 3 | 85 | 16 | 16 |
| | 1.5 | 9.5 | 3 | 85 | 16 | 16 |
| | 2 | 9.5 | 3 | 85 | 16 | 16 |
| | 2.5 | 9.5 | 3 | 85 | 16 | 16 |
| | 3 | 9.5 | 3 | 85 | 16 | 16 |
| | 3.5 | 9.5 | 3 | 85 | 16 | 16 |
| | 4 | 9.5 | 3 | 85 | 16 | 16 |
| | 5 | 9.5 | 3 | 85 | 16 | 16 |
| | 6 | 9.5 | 3 | 85 | 16 | 16 |

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 40 | 1 | 10.5 | 3 | 90 | 16 | 16 |
| | 1.2 | 10.5 | 3 | 90 | 16 | 16 |
| | 1.5 | 10.5 | 3 | 90 | 16 | 16 |
| | 2 | 10.5 | 3 | 90 | 16 | 16 |
| | 2.5 | 10.5 | 3 | 90 | 16 | 16 |
| | 3 | 10.5 | 3 | 90 | 16 | 16 |
| | 3.5 | 10.5 | 3 | 90 | 16 | 16 |
| | 4 | 10.5 | 3 | 90 | 16 | 16 |
| | 5 | 10.5 | 3 | 90 | 16 | 16 |
| | 6 | 10.5 | 3 | 90 | 16 | 16 |
| 45 | 1 | 11.5 | 3 | 95 | 16 | 16 |
| | 1.2 | 11.5 | 3 | 95 | 16 | 16 |
| | 1.5 | 11.5 | 3 | 95 | 16 | 16 |
| | 2 | 11.5 | 3 | 95 | 16 | 16 |
| | 2.5 | 11.5 | 3 | 95 | 16 | 16 |
| | 3 | 11.5 | 3 | 95 | 16 | 16 |
| | 3.5 | 11.5 | 3 | 95 | 16 | 16 |
| | 4 | 11.5 | 3 | 95 | 16 | 16 |
| | 5 | 11.5 | 3 | 95 | 16 | 16 |
| | 6 | 11.5 | 3 | 95 | 16 | 16 |
| 50 | 1 | 12.5 | 3 | 100 | 20 | 18 |
| | 1.2 | 12.5 | 3 | 100 | 20 | 18 |
| | 1.5 | 12.5 | 3 | 100 | 20 | 18 |
| | 2 | 12.5 | 3 | 100 | 20 | 18 |
| | 2.5 | 12.5 | 3 | 100 | 20 | 18 |
| | 3 | 12.5 | 3 | 100 | 20 | 18 |
| | 3.5 | 12.5 | 3 | 100 | 20 | 18 |
| | 4 | 12.5 | 3 | 100 | 20 | 18 |
| | 5 | 12.5 | 3 | 100 | 20 | 18 |
| | 6 | 12.5 | 3 | 100 | 20 | 18 |
| 55 | 1 | 14 | 3 | 105 | 20 | 18 |
| | 1.2 | 14 | 3 | 105 | 20 | 18 |
| | 1.5 | 14 | 3 | 105 | 20 | 18 |
| | 2 | 14 | 3 | 105 | 20 | 18 |
| | 2.5 | 14 | 3 | 105 | 20 | 18 |
| | 3 | 14 | 3 | 105 | 20 | 18 |
| | 3.5 | 14 | 3 | 105 | 20 | 18 |
| | 4 | 14 | 3 | 105 | 20 | 18 |
| | 5 | 14 | 3 | 105 | 20 | 18 |
| | 6 | 14 | 3 | 105 | 20 | 18 |
| 60 | 1 | 15 | 3 | 110 | 20 | 18 |
| | 1.2 | 15 | 3 | 110 | 20 | 18 |
| | 1.5 | 15 | 3 | 110 | 20 | 18 |
| | 2 | 15 | 3 | 110 | 20 | 18 |
| | 2.5 | 15 | 3 | 110 | 20 | 18 |
| | 3 | 15 | 3 | 110 | 20 | 18 |
| | 3.5 | 15 | 3 | 110 | 20 | 18 |
| | 4 | 15 | 3 | 110 | 20 | 18 |
| | 5 | 15 | 3 | 110 | 20 | 18 |
| | 6 | 15 | 3 | 110 | 20 | 18 |

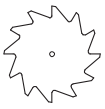
超硬

# CKC-AS

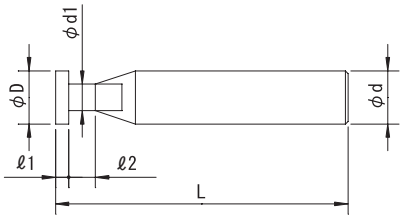
## 超硬キーシードカッター ASタイプ *Solid Carbide Head Keyseat Cutter AS-Type*

切削条件表 P251

**スクエア溝加工（キーシードカッター）** 右直刃 G2


センター穴ナシ






| 公差 (Tolerance) | D | | | | ℓ1 | | d |
|---|---|---|---|---|---|---|---|
| | 10～16 | +0.3 +0.18 | 18～28 | +0.35 +0.21 | 0.8～3 | −0.014 −0.028 | h8 |
| | 30～45 | +0.43 +0.26 | 50～60 | +0.5 +0.3 | 3.5～4 | −0.02 −0.038 | |

右刃ストレート G2 先ムクタイプ
Straight Flute Micro Grain Carbide(G2) Solid-Head Carbide

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 10 | 0.8 | 4.2 | 5 | 50 | 10 | 8 |
| | 1 | 4.2 | 5 | 50 | 10 | 8 |
| | 1.2 | 4.2 | 5 | 50 | 10 | 8 |
| | 1.5 | 4.2 | 5 | 50 | 10 | 8 |
| | 2 | 4.2 | 5 | 50 | 10 | 8 |
| | 2.5 | 4.2 | 5 | 50 | 10 | 8 |
| | 3 | 4.2 | 5 | 50 | 10 | 8 |
| | 4 | 4.2 | 5 | 50 | 10 | 8 |
| 12 | 0.8 | 4.8 | 5 | 50 | 10 | 8 |
| | 1 | 4.8 | 5 | 50 | 10 | 8 |
| | 1.2 | 4.8 | 5 | 50 | 10 | 8 |
| | 1.5 | 4.8 | 5 | 50 | 10 | 8 |
| | 2 | 4.8 | 5 | 50 | 10 | 8 |
| | 2.5 | 4.8 | 5 | 50 | 10 | 8 |
| | 3 | 4.8 | 5 | 50 | 10 | 8 |
| | 3.5 | 4.8 | 5 | 50 | 10 | 8 |
| | 4 | 4.8 | 5 | 50 | 10 | 8 |
| 15 | 0.8 | 5.5 | 5 | 55 | 12 | 10 |
| | 1 | 5.5 | 5 | 55 | 12 | 10 |
| | 1.2 | 5.5 | 5 | 55 | 12 | 10 |
| | 1.5 | 5.5 | 5 | 55 | 12 | 10 |
| | 2 | 5.5 | 5 | 55 | 12 | 10 |
| | 2.5 | 5.5 | 5 | 55 | 12 | 10 |
| | 3 | 5.5 | 5 | 55 | 12 | 10 |
| | 3.5 | 5.5 | 5 | 55 | 12 | 10 |
| | 4 | 5.5 | 5 | 55 | 12 | 10 |
| 16 | 0.8 | 5.5 | 5 | 55 | 12 | 10 |
| | 1 | 5.5 | 5 | 55 | 12 | 10 |
| | 1.2 | 5.5 | 5 | 55 | 12 | 10 |
| | 1.5 | 5.5 | 5 | 55 | 12 | 10 |
| | 2 | 5.5 | 5 | 55 | 12 | 10 |
| | 2.5 | 5.5 | 5 | 55 | 12 | 10 |
| | 3 | 5.5 | 5 | 55 | 12 | 10 |
| | 3.5 | 5.5 | 5 | 55 | 12 | 10 |
| | 4 | 5.5 | 5 | 55 | 12 | 10 |
| 18 | 0.8 | 6.5 | 5 | 55 | 12 | 12 |
| | 1 | 6.5 | 5 | 55 | 12 | 12 |
| | 1.2 | 6.5 | 5 | 55 | 12 | 12 |
| | 1.5 | 6.5 | 5 | 55 | 12 | 12 |
| | 2 | 6.5 | 5 | 55 | 12 | 12 |
| | 2.5 | 6.5 | 5 | 55 | 12 | 12 |
| | 3 | 6.5 | 5 | 55 | 12 | 12 |
| | 3.5 | 6.5 | 5 | 55 | 12 | 12 |
| | 4 | 6.5 | 5 | 55 | 12 | 12 |

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 20 | 0.8 | 6.5 | 5 | 60 | 12 | 12 |
| | 1 | 6.5 | 5 | 60 | 12 | 12 |
| | 1.2 | 6.5 | 5 | 60 | 12 | 12 |
| | 1.5 | 6.5 | 5 | 60 | 12 | 12 |
| | 2 | 6.5 | 5 | 60 | 12 | 12 |
| | 2.5 | 6.5 | 5 | 60 | 12 | 12 |
| | 3 | 6.5 | 5 | 60 | 12 | 12 |
| | 3.5 | 6.5 | 5 | 60 | 12 | 12 |
| | 4 | 6.5 | 5 | 60 | 12 | 12 |
| 22 | 1 | 6.5 | 5 | 60 | 16 | 12 |
| | 1.2 | 6.5 | 5 | 60 | 16 | 12 |
| | 1.5 | 6.5 | 5 | 60 | 16 | 12 |
| | 2 | 6.5 | 5 | 60 | 16 | 12 |
| | 2.5 | 6.5 | 5 | 60 | 16 | 12 |
| | 3 | 6.5 | 5 | 60 | 16 | 12 |
| | 3.5 | 6.5 | 5 | 60 | 16 | 12 |
| | 4 | 6.5 | 5 | 60 | 16 | 12 |
| 25 | 1 | 7.5 | 5 | 60 | 16 | 14 |
| | 1.2 | 7.5 | 5 | 60 | 16 | 14 |
| | 1.5 | 7.5 | 5 | 60 | 16 | 14 |
| | 2 | 7.5 | 5 | 60 | 16 | 14 |
| | 2.5 | 7.5 | 5 | 60 | 16 | 14 |
| | 3 | 7.5 | 5 | 60 | 16 | 14 |
| | 3.5 | 7.5 | 5 | 60 | 16 | 14 |
| | 4 | 7.5 | 5 | 60 | 16 | 14 |
| 28 | 1 | 8.5 | 5 | 60 | 16 | 14 |
| | 1.2 | 8.5 | 5 | 60 | 16 | 14 |
| | 1.5 | 8.5 | 5 | 60 | 16 | 14 |
| | 2 | 8.5 | 5 | 60 | 16 | 14 |
| | 2.5 | 8.5 | 5 | 60 | 16 | 14 |
| | 3 | 8.5 | 5 | 60 | 16 | 14 |
| | 3.5 | 8.5 | 5 | 60 | 16 | 14 |
| | 4 | 8.5 | 5 | 60 | 16 | 14 |
| 30 | 1 | 8.5 | 5 | 65 | 20 | 14 |
| | 1.2 | 8.5 | 5 | 65 | 20 | 14 |
| | 1.5 | 8.5 | 5 | 65 | 20 | 14 |
| | 2 | 8.5 | 5 | 65 | 20 | 14 |
| | 2.5 | 8.5 | 5 | 65 | 20 | 14 |
| | 3 | 8.5 | 5 | 65 | 20 | 14 |
| | 3.5 | 8.5 | 5 | 65 | 20 | 14 |
| | 4 | 8.5 | 5 | 65 | 20 | 14 |

# CKC-AS 超硬キーシードカッター ASタイプ

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 35 | 1 | 9.5 | 3 | 65 | 20 | 16 |
| | 1.2 | 9.5 | 3 | 65 | 20 | 16 |
| | 1.5 | 9.5 | 3 | 65 | 20 | 16 |
| | 2 | 9.5 | 3 | 65 | 20 | 16 |
| | 2.5 | 9.5 | 3 | 65 | 20 | 16 |
| | 3 | 9.5 | 3 | 65 | 20 | 16 |
| | 3.5 | 9.5 | 3 | 65 | 20 | 16 |
| | 4 | 9.5 | 3 | 65 | 20 | 16 |
| 40 | 1 | 10.5 | 3 | 70 | 20 | 16 |
| | 1.2 | 10.5 | 3 | 70 | 20 | 16 |
| | 1.5 | 10.5 | 3 | 70 | 20 | 16 |
| | 2 | 10.5 | 3 | 70 | 20 | 16 |
| | 2.5 | 10.5 | 3 | 70 | 20 | 16 |
| | 3 | 10.5 | 3 | 70 | 20 | 16 |
| | 3.5 | 10.5 | 3 | 70 | 20 | 16 |
| | 4 | 10.5 | 3 | 70 | 20 | 16 |
| 45 | 1 | 11.5 | 3 | 75 | 20 | 16 |
| | 1.2 | 11.5 | 3 | 75 | 20 | 16 |
| | 1.5 | 11.5 | 3 | 75 | 20 | 16 |
| | 2 | 11.5 | 3 | 75 | 20 | 16 |
| | 2.5 | 11.5 | 3 | 75 | 20 | 16 |
| | 3 | 11.5 | 3 | 75 | 20 | 16 |
| | 3.5 | 11.5 | 3 | 75 | 20 | 16 |
| | 4 | 11.5 | 3 | 75 | 20 | 16 |

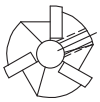
| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 50 | 1 | 12.5 | 3 | 80 | 25 | 18 |
| | 1.2 | 12.5 | 3 | 80 | 25 | 18 |
| | 1.5 | 12.5 | 3 | 80 | 25 | 18 |
| | 2 | 12.5 | 3 | 80 | 25 | 18 |
| | 2.5 | 12.5 | 3 | 80 | 25 | 18 |
| | 3 | 12.5 | 3 | 80 | 25 | 18 |
| | 3.5 | 12.5 | 3 | 80 | 25 | 18 |
| | 4 | 12.5 | 3 | 80 | 25 | 18 |
| 55 | 1 | 14 | 3 | 85 | 25 | 18 |
| | 1.2 | 14 | 3 | 85 | 25 | 18 |
| | 1.5 | 14 | 3 | 85 | 25 | 18 |
| | 2 | 14 | 3 | 85 | 25 | 18 |
| | 2.5 | 14 | 3 | 85 | 25 | 18 |
| | 3 | 14 | 3 | 85 | 25 | 18 |
| | 3.5 | 14 | 3 | 85 | 25 | 18 |
| | 4 | 14 | 3 | 85 | 25 | 18 |
| 60 | 1 | 15 | 3 | 90 | 25 | 18 |
| | 1.2 | 15 | 3 | 90 | 25 | 18 |
| | 1.5 | 15 | 3 | 90 | 25 | 18 |
| | 2 | 15 | 3 | 90 | 25 | 18 |
| | 2.5 | 15 | 3 | 90 | 25 | 18 |
| | 3 | 15 | 3 | 90 | 25 | 18 |
| | 3.5 | 15 | 3 | 90 | 25 | 18 |
| | 4 | 15 | 3 | 90 | 25 | 18 |

超硬

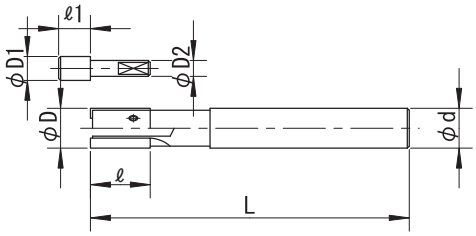
# CZCS

## 超硬パイロット付ザグリカッター ストレートシャンク *Carbide Tipped Counterbore With Straight Shank*

切削条件表 P252 | ザグリ加工 | 右直刃 | 刃数 3 | K10








| 公差(Tolerance) | D : $^{+0.2}_{0}$ | D1 : $^{0}_{-0.05}$ | d : h7 |
|---|---|---|---|

右刃ストレート　刃数:3　K10
Straight Flute　3 Flutes　Micro Grain Carbide(K10)

| 刃径 (ΦD) *Dia.* | 案内径 (ΦD1) *Guide Dia.* | 案内軸 (ΦD2) *Shank Dia. of Guide* | 案内長 (ℓ1) *Length of Guide* | 刃長 (ℓ) *Length of Cut* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|---|---|
| **10** | 6 | 4 | 8 | 15 | 80 | 10 |
| **11** | 6.8 | 4 | 8 | 15 | 80 | 10 |
| **12** | 7.7 | 5 | 10 | 15 | 90 | 10 |
| **13** | 8.3 | 5 | 10 | 15 | 90 | 12 |
| **14** | 8.8 | 5 | 10 | 15 | 105 | 12 |
| **15** | 10.2 | 5 | 10 | 15 | 105 | 12 |
| **16** | 10.5 | 6 | 10 | 15 | 105 | 12 |
| **17** | 12 | 6 | 10 | 15 | 110 | 12 |
| **18** | 13 | 6 | 10 | 15 | 110 | 12 |

| 刃径 (ΦD) *Dia.* | 案内径 (ΦD1) *Guide Dia.* | 案内軸 (ΦD2) *Shank Dia. of Guide* | 案内長 (ℓ1) *Length of Guide* | 刃長 (ℓ) *Length of Cut* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|---|---|
| **19** | 13.7 | 6 | 10 | 15 | 115 | 12 |
| **20** | 14 | 6 | 10 | 20 | 120 | 12 |
| **21** | 14 | 6 | 10 | 20 | 120 | 12 |
| **22** | 14 | 6 | 10 | 20 | 120 | 12 |
| **23** | 15 | 8 | 12 | 20 | 135 | 12 |
| **24** | 16 | 8 | 12 | 20 | 135 | 12 |
| **25** | 17 | 8 | 12 | 20 | 135 | 12 |
| **26** | 18 | 8 | 12 | 20 | 135 | 12 |
| **27** | 19 | 8 | 12 | 20 | 135 | 12 |
| **28** | 21 | 8 | 12 | 20 | 150 | 12 |

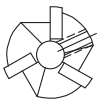
※別売り　パイロットのみ有り（P226）

超硬

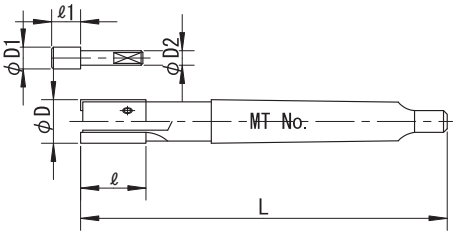
# CZCT

## 超硬パイロット付ザグリカッター テーパーシャンク *Carbide Tipped Counterbore With Taper Shank*

切削条件表 P252 | ザグリ加工 | 右直刃 | 刃数 3 | K10








| 公差(Tolerance) | D : $^{+0.2}_{0}$ | D1 : $^{0}_{-0.05}$ |
|---|---|---|

右刃ストレート　刃数:3　K10
Straight Flute　3 Flutes　Micro Grain Carbide(K10)

| 刃径 (ΦD) *Dia.* | 案内径 (ΦD1) *Guide Dia.* | 案内軸 (ΦD2) *Shank Dia. of Guide* | 案内長 (ℓ1) *Length of Guide* | 刃長 (ℓ) *Length of Cut* | 全長 (L) *Overall Length* | MT No. *Shank MTNo.* |
|---|---|---|---|---|---|---|
| **12** | 7.7 | 5 | 10 | 15 | 105.5 | MT1 |
| **13** | 8.3 | 5 | 10 | 15 | 105.5 | MT1 |
| **14** | 8.8 | 5 | 10 | 15 | 115.5 | MT1 |
| **15** | 10.2 | 5 | 10 | 15 | 115.5 | MT1 |
| **16** | 10.5 | 6 | 10 | 15 | 138.5 | MT2 |
| **17** | 12 | 6 | 10 | 15 | 138.5 | MT2 |
| **18** | 13 | 6 | 10 | 15 | 138.5 | MT2 |
| **19** | 13.7 | 6 | 10 | 15 | 143.5 | MT2 |
| **20** | 14 | 6 | 10 | 15 | 143.5 | MT2 |
| **21** | 14 | 6 | 12 | 20 | 148.5 | MT2 |
| **22** | 14 | 6 | 12 | 20 | 148.5 | MT2 |
| **23** | 15 | 8 | 12 | 20 | 153.5 | MT2 |
| **24** | 16 | 8 | 12 | 20 | 153.5 | MT2 |
| **25** | 17 | 8 | 12 | 20 | 153.5 | MT2 |

| 刃径 (ΦD) *Dia.* | 案内径 (ΦD1) *Guide Dia.* | 案内軸 (ΦD2) *Shank Dia. of Guide* | 案内長 (ℓ1) *Length of Guide* | 刃長 (ℓ) *Length of Cut* | 全長 (L) *Overall Length* | MT No. *Shank MTNo.* |
|---|---|---|---|---|---|---|
| **26** | 18 | 8 | 12 | 20 | 153.5 | MT2 |
| **27** | 19 | 8 | 12 | 20 | 153.5 | MT2 |
| **28** | 21 | 8 | 12 | 20 | 158.5 | MT2 |
| **29** | 22 | 8 | 12 | 20 | 158.5 | MT2 |
| **30** | 22 | 8 | 15 | 20 | 158.5 | MT2 |
| **31** | 23.5 | 8 | 15 | 20 | 158.5 | MT2 |
| **32** | 24 | 8 | 15 | 20 | 163.5 | MT2 |
| **33** | 18 | 8 | 15 | 20 | 163.5 | MT2 |
| **34** | 18 | 8 | 15 | 20 | 163.5 | MT2 |
| **35** | 19 | 8 | 15 | 20 | 163.5 | MT2 |
| **36** | 20 | 10 | 20 | 20 | 198 | MT3 |
| **37** | 20 | 10 | 20 | 20 | 198 | MT3 |
| **38** | 20 | 10 | 20 | 20 | 198 | MT3 |
| **39** | 22 | 10 | 20 | 20 | 198 | MT3 |
| **40** | 25 | 10 | 20 | 20 | 198 | MT3 |

※別売り　パイロットのみ有り（P226）

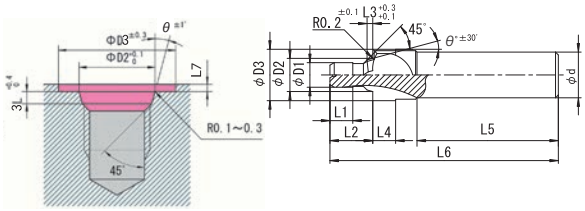
超硬

# CSSC

## 超硬シート面カッター（PF規格／UNF規格） *Carbide Tipped Seat Surface Cutter (PF Standard / UNF Standard)*

切削条件表 P253 | ザグリ加工 | 右直刃 | K10






右刃ストレート　K10
Straight Flute　Micro Grain Carbide(K10)

| 公差(Tolerance) | D1：$^{0}_{-0.05}$ | D3：±0.1 | d：h7 |
|---|---|---|---|

| 呼び寸法 Size | 案内径（ΦD1） Guide Dia. | 案内長（L1） Length of Guide | 面取径（ΦD2） Chamferring Dia. | (L2) | (L3) Chamferring Length | 角度（θ） Cut Angle | 刃径（ΦD3） Dia. | ザグリ刃長（L4） Length of Cut | シャンク長（L5） Shank Length | 全長（L6） Overall Length | シャンク径（ΦD4） Shank Dia. | 刃数（N） Number of Flutes | (L7) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PF1/8 | 8.6 | 8 | 11.6 | 15 | 2 | 15° | 18 | 8 | 50 | 80 | 16 | 3 | 1 |
| PF1/4 | 11.4 | 10 | 15.6 | 18 | 2.5 | 15° | 24 | 11 | 95 | 130 | 20 | 3 | 1.5 |
| PF3/8 | 15 | 12 | 18.6 | 20 | 2.5 | 15° | 28 | 11 | 100 | 137.5 | 25 | 4 | 2 |
| PF1/2 | 18.7 | 12 | 22.6 | 20 | 2.5 | 15° | 34 | 11 | 100 | 137.5 | 25 | 4 | 2.5 |
| PF3/4 | 24.1 | 15 | 29.8 | 25 | 3.5 | 15° | 45 | 15 | 100 | 150 | 32 | 4 | 2.5 |
| PF1" | 30.3 | 20 | 35.8 | 30 | 3.5 | 15° | 51 | 15 | 105 | 160 | 32 | 4 | 2.5 |
| UNF3/ 8-24 | 8.39 | 5 | 10.75 | 10 | 1.9 | 12° | 19 | 11 | 50 | 80 | 16 | 3 | 1.6 |
| UNF7/16-20 | 9.73 | 6 | 12.45 | 11.5 | 2.4 | 12° | 21 | 11 | 80 | 120 | 20 | 3 | 1.6 |
| UNF1/ 2-20 | 11.33 | 6 | 14.05 | 11.5 | 2.4 | 12° | 23 | 11 | 80 | 120 | 20 | 3 | 1.6 |
| UNF9/16-18 | 12.8 | 7 | 15.7 | 12.7 | 2.5 | 12° | 25 | 11 | 80 | 120 | 20 | 3 | 1.6 |
| UNF3/ 4-16 | 17.4 | 9 | 20.65 | 14.3 | 2.5 | 15° | 30 | 11 | 90 | 130 | 25 | 4 | 2.4 |
| UNF7/ 8-14 | 20.3 | 9 | 24 | 16.7 | 2.5 | 15° | 34 | 11 | 90 | 130 | 25 | 4 | 2.4 |

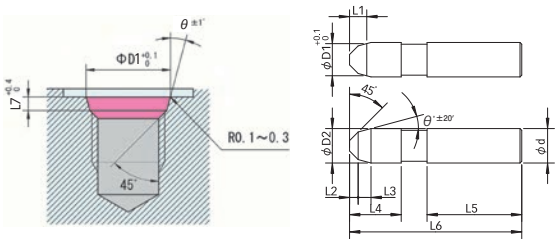
超硬

# CSSZC

## 超硬シート面ザグリカッター（PF規格／UNF規格） *Carbide Counterbore With Seat Surface (PF Standard / UNF Standard)*

切削条件表 P253 | ザグリ加工 | 右ネジレ20° | 超微粒子






右刃右ネジレ20°　超微粒子
Helix Angle-Right20°　Ultra Micro Grain Carbide

| 公差(Tolerance) | D2：$^{+0.01}_{0}$ | d：h7 |
|---|---|---|

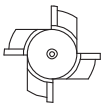
| 呼び寸法 Size | 基準径（ΦD1） Std Dia. | 基準長（L1） Std Length | (L2) Chamferring Length | (L3) Chamferring Length | 角度（θ） Cut Angle | 刃径（ΦD2） Dia. | 刃長（L4） Length of Cut | シャンク長（L5） Shank Length | 全長（L6） Overall Length | シャンク径（Φd） Shank Dia. | 刃数（N） Number of Flutes | (L7) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PF1/8 | 11.6 | 4.35 | 2 | 3 | 15° | 12 | 14 | 45 | 85 | 12 | 2 | 2 |
| PF1/4 | 15.6 | 5.25 | 2.5 | 4 | 15° | 16.3 | 19 | 70 | 95 | 16 | 2 | 2.5 |
| PF3/8 | 18.6 | 5.25 | 2.5 | 4 | 15° | 19.3 | 19 | 80 | 105 | 20 | 2 | 2.5 |
| PF1/2 | 22.6 | 5.25 | 2.5 | 4 | 15° | 23.3 | 19 | 90 | 115 | 25 | 2 | 2.5 |
| PF3/4 | 29.6 | 7.3 | 2.5 | 5.4 | 15° | 30.7 | 26 | 100 | 130 | 32 | 2 | 3.5 |
| PF1" | 35.8 | 7.3 | 2.5 | 5.4 | 15° | 36.7 | 26 | 100 | 130 | 32 | 2 | 3.5 |
| UNF3/ 8-24 | 10.75 | 3.8 | 1.9 | 3 | 12° | 11.22 | 15 | 60 | 85 | 12 | 2 | 1.9 |
| UNF7/16-20 | 12.45 | 4.8 | 2.4 | 4 | 12° | 13.13 | 19 | 70 | 100 | 12 | 2 | 2.4 |
| UNF1/ 2-20 | 14.05 | 4.8 | 2.4 | 4 | 12° | 14.73 | 19 | 70 | 100 | 12 | 2 | 2.4 |
| UNF9/16-18 | 15.7 | 5 | 2.5 | 4 | 12° | 16.34 | 19 | 70 | 100 | 16 | 2 | 2.5 |
| UNF3/ 4-16 | 20.65 | 5 | 2.5 | 4 | 15° | 21.45 | 19 | 70 | 100 | 20 | 2 | 2.5 |
| UNF7/ 8-14 | 24.0 | 5 | 2.5 | 4 | 15° | 24.8 | 19 | 70 | 100 | 25 | 2 | 2.5 |

超硬

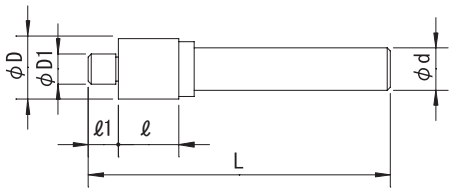
# CCB

## 超硬沈めフライス　*Carbide Tipped Counterbore*

切削条件表 P253　ザグリ加工　右ネジレ 12°　刃数 4　K10








| 公差(Tolerance) | D1：$^{-0.02}_{-0.04}$ | D：$^{+0.15}_{0}$ | d：h8 |
|---|---|---|---|

Sタイプ 右刃右ネジレ12°　刃数:4 K10
Helix Right 12° S Type　4 Flutes
Micro Grain Carbide(K10)

| 呼び寸法 Size | 案内径 (D1) Guide Dia. | 案内長 (ℓ1) Length of Guide | 刃径 (ΦD) Dia. | 刃長 (ℓ) Length of Cut | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|
| **5** | 5.2 | 5 | 8.9 | 13 | 51 | 6 |
| **6** | 6.2 | 6 | 10.4 | 15 | 58 | 8 |
| **8** | 8.2 | 8 | 13.4 | 16 | 67 | 10 |
| **10** | 10.3 | 10 | 16.8 | 16 | 74 | 12 |
| **12** | 12.4 | 12 | 18.8 | 20 | 83 | 12 |
| **14** | 14.4 | 14 | 24 | 20 | 90 | 12 |
| **16** | 16.5 | 16 | 26 | 20 | 100 | 16 |
| **18** | 18.5 | 18 | 28 | 20 | 104 | 16 |
| **20** | 21 | 21 | 30 | 20 | 109 | 16 |

| 公差(Tolerance) | D1：$^{-0.02}_{-0.04}$ | D：$^{+0.15}_{0}$ | d：h8 |
|---|---|---|---|

Yタイプ 右刃右ネジレ12°　刃数:4 K10
Helix Right 12° Y Type　4 Flutes
Micro Grain Carbide(K10)

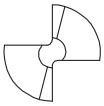
| 呼び寸法 Size | 案内径 (D1) Guide Dia. | 案内長 (ℓ1) Length of Guide | 刃径 (ΦD) Dia. | 刃長 (ℓ) Length of Cut | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|
| **5** | 5.3 | 5 | 9.5 | 13 | 51 | 6 |
| **6** | 6.4 | 6 | 11 | 15 | 58 | 8 |
| **8** | 8.4 | 8 | 14 | 16 | 67 | 10 |
| **10** | 10.5 | 10 | 17.5 | 16 | 74 | 12 |
| **12** | 13 | 12 | 20 | 20 | 83 | 12 |

超硬

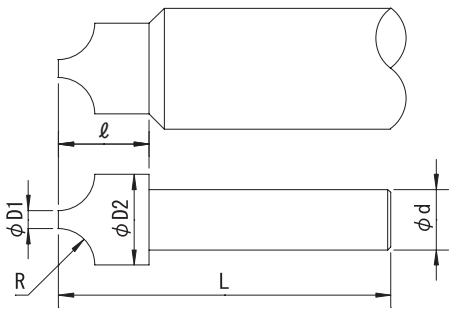
# CMCRC

## 超硬ミニコーナー Rカッター　*Carbide Mini Corner R Cutter*

切削条件表 P254　R 加 工　右直刃　超微粒子








| 公差(Tolerance) | R：±0.05 | D2：±0.01 | D1：$^{0}_{-0.03}$ | d：$^{0}_{-0.009}$ |
|---|---|---|---|---|

右刃ストレート　超微粒子
Straight Flute　Ultra Micro Grain Carbide

| 寸法 R | 小径 (ΦD1) First Dia. | 首下 (ℓ) ※ | 大径 (D2) Dia at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| **0.5** | 1.5 | 4 | 2.7 | 50 | 4 | 2 |
| **0.75** | 1.5 | 4 | 3.2 | 50 | 4 | 2 |
| **1** | 1.5 | 4 | 3.7 | 50 | 4 | 2 |
| **1.25** | 1.5 | 4 | 4.2 | 50 | 4 | 2 |
| **1.5** | 1.5 | 4 | 4.7 | 50 | 6 | 2 |
| **1.75** | 1.5 | 4 | 5.2 | 50 | 6 | 2 |
| **2** | 1.5 | 4 | 5.7 | 50 | 6 | 2 |
| **2.25** | 1.5 | 6 | 6.2 | 60 | 6 | 2 |
| **2.5** | 1.5 | 6 | 6.7 | 60 | 6 | 2 |

| 寸法 R | 小径 (ΦD1) First Dia. | 首下 (ℓ) ※ | 大径 (D2) Dia at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| **2.75** | 1.5 | 6 | 7.2 | 60 | 6 | 2 |
| **3** | 1.5 | 6 | 7.7 | 60 | 8 | 2 |
| **3.5** | 2 | 10 | 10 | 70 | 8 | 2 |
| **4** | 2 | 10 | 11 | 70 | 8 | 2 |
| **4.5** | 2 | 12 | 12 | 70 | 8 | 2 |
| **5** | 2 | 12 | 13 | 80 | 10 | 2 |
| **6** | 2 | 16 | 15 | 80 | 10 | 2 |
| **7** | 2 | 16 | 17 | 80 | 10 | 2 |
| **8** | 2 | 16 | 19 | 80 | 10 | 2 |

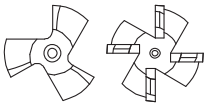
※Cut Length Including Neck

超硬

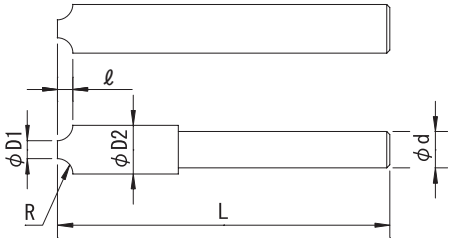
# CCRC

## 超硬コーナーRカッター *Carbide Tipped Corner R Cutter*

切削条件表 P254 | R 加 工 | 右直刃 | K10






| 公差(Tolerance) | R：±0.05 | D2：±0.1 | d：h6 |
|---|---|---|---|

右刃ストレート　K10 R2.5までソリッド
Straight Flute　Micro Grain Carbide(K10) ※Carbide Solid for up to R2.5

| 寸法 R | 小径 (ΦD1) First Dia. | 刃長 (ℓ) Length of Cut | 大径 (ΦD2) Dia at Lrage End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| **0.5** | 5 | 0.5 | 8 | 60 | 8 | 3 |
| **0.75** | 5 | 0.75 | 8 | 60 | 8 | 3 |
| **1** | 5 | 1 | 8 | 60 | 8 | 3 |
| **1.25** | 5 | 1.25 | 8 | 60 | 8 | 3 |
| **1.5** | 5 | 1.5 | 10 | 70 | 10 | 3 |
| **1.75** | 5 | 1.75 | 10 | 70 | 10 | 3 |
| **2** | 5 | 2 | 10 | 70 | 10 | 3 |
| **2.5** | 5 | 2.5 | 12 | 75 | 12 | 3 |
| **3** | 10 | 3 | 18 | 100 | 16* | 4 |
| **3.5** | 11 | 3.5 | 20 | 100 | 16* | 4 |
| **4** | 12 | 4 | 22 | 100 | 16* | 4 |
| **4.5** | 12 | 4.5 | 24 | 120 | 20* | 4 |
| **5** | 13 | 5 | 25 | 120 | 20* | 4 |

| 寸法 R | 小径 (ΦD1) First Dia. | 刃長 (ℓ) Length of Cut | 大径 (ΦD2) Dia at Lrage End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| **6** | 14 | 6 | 28 | 120 | 25* | 4 |
| **7** | 15 | 7 | 31 | 120 | 25* | 4 |
| **8** | 15 | 8 | 33 | 130 | 25* | 4 |
| **9** | 17 | 9 | 37 | 130 | 32* | 4 |
| **10** | 20 | 10 | 42 | 130 | 32* | 4 |
| **11** | 20 | 11 | 44 | 130 | 32* | 4 |
| **12** | 22 | 12 | 48 | 150 | 32* | 4 |
| **13** | 22 | 13 | 50 | 150 | 32* | 4 |
| **14** | 22 | 14 | 52 | 150 | 42* | 4 |
| **15** | 22 | 15 | 54 | 150 | 42* | 4 |
| **16** | 22 | 16 | 56 | 170 | 42* | 4 |
| **18** | 22 | 18 | 60 | 170 | 42* | 4 |
| **20** | 22 | 20 | 64 | 170 | 42* | 4 |

*シャンク径φ16以上はフラット付ストレートシャンク(TypeⅠ～Ⅱ)P373参照

超硬

# OAC4

## 超硬Oリング用アリ溝カッター　*Solid Carbide Angular Cutter For O Ring*

### 4枚刃 ステン用仕上げ　*4Flutes For Finishing Stainless*

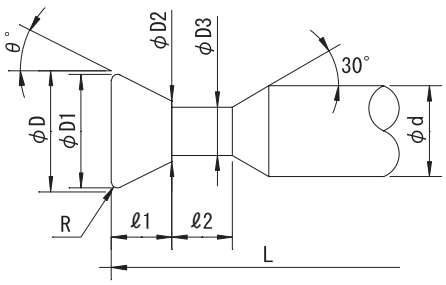
切削条件表 P254

**Oリングアリ溝加工**　右ネジレ15°　超微粒子



センターカット



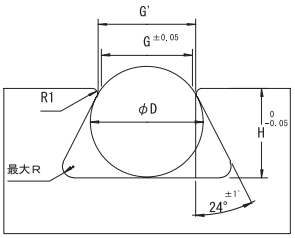


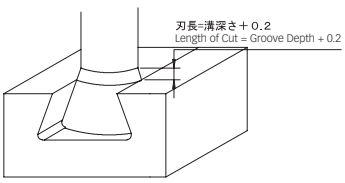

| 公差(Tolerance) | θ° : ±30′ | R : $^{0}_{-0.05}$ | d : h6 |
|---|---|---|---|

アリ溝角 θ=24°　右刃右ネジレ15°　超微粒子
Cut Angle θ=24°　Helix Angle-Right15°　Ultra Micro Grain Carbide

| 呼び型番 Tool No. | 外径 (ΦD1) Dia. at Large End | 延長交点 (ΦD) Intersection point | R Corner Radius | 刃長 (ℓ1) Cut Length | 小径 (ΦD2) Minor Dia. | 首径 (ΦD3) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 適応Oリング規格 Applicable O Ring Std. 規格 Standard | | 呼び番号 Model |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P-1 | 2.58 | 2.8 | 0.2 | 1.6 | 1.37 | 1.3 | 4 | 50 | 3 | 加圧用 For Pressure | JIS B2401 | P3 ～ P10 |
| P-2 | 3.39 | 3.6 | 0.2 | 2 | 1.82 | 1.75 | 4 | 50 | 3 | | | P10A ～ P22 |
| P-3 | 5.01 | 5.44 | 0.4 | 3 | 2.77 | 2.7 | 6 | 60 | 6 | | | P22A ～ P50 |
| P-4 | 8.5 | 8.94 | 0.4 | 4.9 | 4.57 | 4.5 | 7 | 60 | 10 | | | P48A ～ P150 |
| P-5 | 12.47 | 13.33 | 0.8 | 7.2 | 6.92 | 6.85 | 7 | 80 | 12 | | | P150A ～ P400 |
| G-1 | 4.31 | 4.74 | 0.4 | 2.6 | 2.42 | 2.35 | 6 | 60 | 6 | | | G25 ～ G145 |
| G-2 | 8.5 | 8.94 | 0.4 | 4.9 | 4.57 | 4.5 | 7 | 60 | 10 | | | G150 ～ G300 |
| A-1 | 2.41 | 2.63 | 0.2 | 1.5 | 1.29 | 1.2 | 4 | 50 | 3 | | AS568A | 004 ～ 050 |
| A-2 | 3.73 | 3.95 | 0.2 | 2.2 | 1.98 | 1.9 | 4 | 50 | 3 | | | 102 ～ 178 |
| A-3 | 5.01 | 5.44 | 0.4 | 3 | 2.77 | 2.7 | 6 | 60 | 6 | | | 201 ～ 284 |
| A-4 | 7.88 | 8.31 | 0.4 | 4.5 | 4.27 | 4.2 | 6 | 60 | 8 | | | 309 ～ 395 |
| A-5 | 10.22 | 11.08 | 0.8 | 6 | 5.76 | 5.7 | 7 | 80 | 12 | | | 425 ～ 475 |
| P-6 | 4.84 | 5.28 | 0.4 | 2.7 | 2.87 | 2.8 | 6 | 60 | 6 | 真空用 For Vacuum | JIS B2401 | P22A ～ P50 |
| P-7 | 8.26 | 8.69 | 0.4 | 4.4 | 4.77 | 4.7 | 7 | 60 | 10 | | | P48A ～ P150 |
| P-8 | 12.09 | 12.96 | 0.8 | 6.5 | 7.17 | 7.1 | 7 | 80 | 12 | | | P150A ～ P400 |
| V-1 | 5.6 | 6.03 | 0.4 | 3.1 | 3.27 | 3.2 | 6 | 60 | 6 | | | V15 ～ V175 |
| V-2 | 8.74 | 9.17 | 0.4 | 4.6 | 5.07 | 5 | 7 | 60 | 10 | | | V225 ～ V430 |
| V-3 | 14.6 | 15.47 | 0.8 | 7.8 | 8.52 | 8.45 | 7 | 80 | 12 | | | V480 ～ V1055 |
| A-6 | 4.87 | 5.31 | 0.4 | 2.7 | 2.89 | 2.8 | 6 | 60 | 6 | | AS568A | 201 ～ 284 |
| A-7 | 7.67 | 8.1 | 0.4 | 4.1 | 4.44 | 4.4 | 6 | 60 | 8 | | | 309 ～ 395 |
| A-8 | 9.9 | 10.76 | 0.8 | 5.4 | 5.94 | 5.9 | 7 | 80 | 12 | | | 425 ～ 475 |

【参考】Oリング溝規格　Standard of O Ring Groove




| 規格 | | 呼び番号 | 太さ (ΦD) | | G 取り前 | G' 取り後 | H 深さ | R1 | R |
|---|---|---|---|---|---|---|---|---|---|
| 加圧用 For Pressure | JIS B2401 | P3 ～ P10 | 1.9 | ±0.08 | 1.55 | 1.71 | 1.4 | 0.15 | 0.4 |
| | | P10A ～ P22 | 2.4 | ±0.09 | 2 | 2.22 | 1.8 | 0.2 | 0.4 |
| | | P22A ～ P50 | 3.5 | ±0.1 | 2.95 | 3.17 | 2.8 | 0.2 | 0.8 |
| | | P48A ～ P150 | 5.7 | ±0.13 | 4.75 | 5.18 | 4.7 | 0.4 | 0.8 |
| | | P150A ～ P400 | 8.4 | ±0.15 | 7.1 | 7.64 | 7 | 0.5 | 1.6 |
| | | G25 ～ G145 | 3.1 | ±0.1 | 2.6 | 2.82 | 2.4 | 0.2 | 0.8 |
| | | G150 ～ G300 | 5.7 | ±0.13 | 4.75 | 5.18 | 4.7 | 0.4 | 0.8 |
| | AS568A | 004 ～ 050 | 1.78 | ±0.07 | 1.47 | 1.61 | 1.3 | 0.13 | 0.4 |
| | | 102 ～ 178 | 2.62 | ±0.07 | 2.16 | 2.43 | 2.01 | 0.25 | 0.4 |
| | | 201 ～ 284 | 3.53 | ±0.1 | 2.95 | 3.22 | 2.79 | 0.25 | 0.79 |
| | | 309 ～ 395 | 5.33 | ±0.12 | 4.45 | 4.86 | 4.34 | 0.38 | 0.79 |
| | | 425 ～ 475 | 6.98 | ±0.15 | 5.94 | 6.35 | 5.77 | 0.38 | 1.59 |
| 真空用 For Vacuum | JIS B2401 | P22A ～ P50 | 3.5 | ±0.1 | 3.05 | 3.27 | 2.5 | 0.2 | 0.8 |
| | | P48A ～ P150 | 5.7 | ±0.13 | 4.95 | 5.38 | 4.2 | 0.4 | 0.8 |
| | | P150A ～ P400 | 8.4 | ±0.15 | 7.35 | 7.89 | 6.3 | 0.5 | 1.6 |
| | | V15 ～ V175 | 4 | ±0.1 | 3.45 | 3.77 | 2.9 | 0.3 | 0.8 |
| | | V225 ～ V430 | 6 | ±0.15 | 5.25 | 5.68 | 4.4 | 0.4 | 0.8 |
| | | V480 ～ V1055 | 10 | ±0.3 | 8.7 | 9.24 | 7.6 | 0.5 | 1.6 |
| | AS568A | 201 ～ 284 | 3.53 | ±0.1 | 3.07 | 3.34 | 2.51 | 0.25 | 0.79 |
| | | 309 ～ 395 | 5.33 | ±0.12 | 4.62 | 5.03 | 3.91 | 0.38 | 0.79 |
| | | 425 ～ 475 | 6.98 | ±0.15 | 6.12 | 6.53 | 5.21 | 0.38 | 1.59 |

超硬

# OAC4-R

## 超硬Oリング用アリ溝カッター　*Solid Carbide Angular Cutter For O Ring*

### 4枚刃 ステン用荒　*4Flutes For Roughing Stainless*

切削条件表 P255

Oリングアリ溝加工

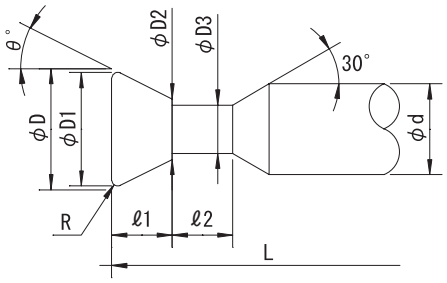
右ネジレ 15°

超微粒子



センターカット






| 公差(Tolerance) | θ° ：±30′ | R：$^{0}_{-0.05}$ | d：h6 |
|---|---|---|---|

アリ溝角 θ=15°　右刃右ネジレ15°　超微粒子
Cut Angle θ=15°　Helix Angle-Right15°　Ultra Micro Grain Carbide

| 呼び型番 *Tool No.* | 外径（ΦD1） *Dia. at Large End* | 延長交点（ΦD） *Intersection point* | R *Corner Radius* | 刃長（ℓ1） *Cut Length* | 小径（ΦD2） *Minor Dia.* | 首径（ΦD3） *Neck Dia.* | 首長（ℓ2） *Neck Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 適応Oリング規格 *Applicable O Ring Std.* 規格 *Standard* | | 呼び番号 *Model* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **P-1** | 1.91 | 2.02 | 0.2 | 1.6 | 1.17 | 1.1 | 4 | 50 | 3 | 加圧用 For Pressure | JIS B2401 | P3 ～ P10 |
| **P-2** | 2.57 | 2.69 | 0.2 | 2 | 1.62 | 1.55 | 4 | 50 | 3 | | | P10A ～ P22 |
| **P-3** | 3.94 | 4.18 | 0.4 | 3 | 2.57 | 2.5 | 4 | 60 | 3 | | | P22A ～ P50 |
| **P-4** | 6.75 | 7 | 0.4 | 4.9 | 4.37 | 4.3 | 6 | 60 | 8 | | | P48A ～ P150 |
| **P-5** | 10.09 | 10.58 | 0.8 | 7.2 | 6.72 | 6.65 | 7 | 80 | 12 | | | P150A ～ P400 |
| **G-1** | 3.37 | 3.61 | 0.4 | 2.6 | 2.22 | 2.15 | 4 | 60 | 3 | | | G25 ～ G145 |
| **G-2** | 6.75 | 7 | 0.4 | 4.9 | 4.37 | 4.3 | 6 | 60 | 8 | | | G150 ～ G300 |
| **A-1** | 1.77 | 1.89 | 0.2 | 1.5 | 1.09 | 1 | 4 | 50 | 3 | | AS568A | 004 ～ 050 |
| **A-2** | 2.84 | 2.96 | 0.2 | 2.2 | 1.78 | 1.7 | 4 | 50 | 3 | | | 102 ～ 178 |
| **A-3** | 3.94 | 4.18 | 0.4 | 3 | 2.57 | 2.5 | 4 | 60 | 3 | | | 201 ～ 284 |
| **A-4** | 6.24 | 6.48 | 0.4 | 4.5 | 4.07 | 4 | 6 | 60 | 6 | | | 309 ～ 395 |
| **A-5** | 8.29 | 8.78 | 0.8 | 6 | 5.56 | 5.5 | 7 | 80 | 10 | | | 425 ～ 475 |
| **P-6** | 3.87 | 4.12 | 0.4 | 2.7 | 2.67 | 2.6 | 4 | 60 | 3 | 真空用 For Vacuum | JIS B2401 | P22A ～ P50 |
| **P-7** | 6.69 | 6.93 | 0.4 | 4.4 | 4.57 | 4.5 | 6 | 60 | 8 | | | P48A ～ P150 |
| **P-8** | 9.97 | 10.45 | 0.8 | 6.5 | 6.97 | 6.9 | 7 | 80 | 12 | | | P150A ～ P400 |
| **V-1** | 4.49 | 4.73 | 0.4 | 3.1 | 3.07 | 3 | 6 | 60 | 6 | | | V15 ～ V175 |
| **V-2** | 7.09 | 7.34 | 0.4 | 4.6 | 4.87 | 4.8 | 6 | 60 | 8 | | | V225 ～ V430 |
| **V-3** | 12.01 | 12.5 | 0.8 | 7.8 | 8.32 | 8.25 | 7 | 80 | 12 | | | V480 ～ V1055 |
| **A-6** | 3.89 | 4.14 | 0.4 | 2.7 | 2.69 | 2.6 | 4 | 60 | 3 | | AS568A | 201 ～ 284 |
| **A-7** | 6.22 | 6.47 | 0.4 | 4.1 | 4.27 | 4.2 | 6 | 60 | 6 | | | 309 ～ 395 |
| **A-8** | 8.15 | 8.63 | 0.8 | 5.4 | 5.74 | 5.7 | 7 | 80 | 10 | | | 425 ～ 475 |

超硬

# OAC2

## 超硬Oリング用アリ溝カッター *Solid Carbide Angular Cutter For O Ring*

### 2枚刃 アルミ用 *2Flutes For Aluminum*

切削条件表 P255

Oリングアリ溝加工

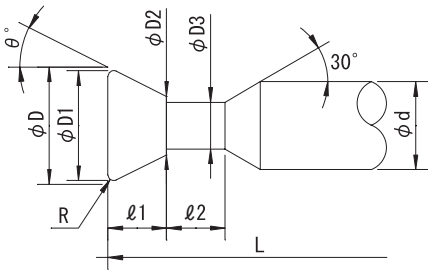
右ネジレ 15°

超微粒子



センターカット






| 公差(Tolerance) | θ° : ±30′ | R : $^{0}_{-0.05}$ | d : h6 |
|---|---|---|---|

アリ溝角 θ=24° 右刃右ネジレ15° 超微粒子
Cut Angle θ=24° Helix Angle-Right15° Ultra Micro Grain Carbide

| 呼び型番 Tool No. | 外径 (ΦD1) Dia. at Large End | 延長交点 (ΦD) Intersection point | R Corner Radius | 刃長 (ℓ1) Cut Length | 小径 (ΦD2) Minor Dia. | 首径 (ΦD3) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 適応Oリング規格 Applicable O Ring Std. 規格 Standard | | 呼び番号 Model |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P-1 | 2.58 | 2.8 | 0.2 | 1.6 | 1.37 | 1.3 | 4 | 50 | 3 | 加圧用 For Pressure | JIS B2401 | P3 ～ P10 |
| P-2 | 3.39 | 3.6 | 0.2 | 2 | 1.82 | 1.75 | 4 | 50 | 3 | | | P10A ～ P22 |
| P-3 | 5.01 | 5.44 | 0.4 | 3 | 2.77 | 2.7 | 6 | 60 | 6 | | | P22A ～ P50 |
| P-4 | 8.5 | 8.94 | 0.4 | 4.9 | 4.57 | 4.5 | 7 | 60 | 10 | | | P48A ～ P150 |
| P-5 | 12.47 | 13.33 | 0.8 | 7.2 | 6.92 | 6.85 | 7 | 80 | 12 | | | P150A ～ P400 |
| G-1 | 4.31 | 4.74 | 0.4 | 2.6 | 2.42 | 2.35 | 6 | 60 | 6 | | | G25 ～ G145 |
| G-2 | 8.5 | 8.94 | 0.4 | 4.9 | 4.57 | 4.5 | 7 | 60 | 10 | | | G150 ～ G300 |
| A-1 | 2.41 | 2.63 | 0.2 | 1.5 | 1.29 | 1.2 | 4 | 50 | 3 | | AS568A | 004 ～ 050 |
| A-2 | 3.73 | 3.95 | 0.2 | 2.2 | 1.98 | 1.9 | 4 | 50 | 3 | | | 102 ～ 178 |
| A-3 | 5.01 | 5.44 | 0.4 | 3 | 2.77 | 2.7 | 6 | 60 | 6 | | | 201 ～ 284 |
| A-4 | 7.88 | 8.31 | 0.4 | 4.5 | 4.27 | 4.2 | 6 | 60 | 8 | | | 309 ～ 395 |
| A-5 | 10.22 | 11.08 | 0.8 | 6 | 5.76 | 5.7 | 7 | 80 | 12 | | | 425 ～ 475 |
| P-6 | 4.84 | 5.28 | 0.4 | 2.7 | 2.87 | 2.8 | 6 | 60 | 6 | 真空用 For Vacuum | JIS B2401 | P22A ～ P50 |
| P-7 | 8.26 | 8.69 | 0.4 | 4.4 | 4.77 | 4.7 | 7 | 60 | 10 | | | P48A ～ P150 |
| P-8 | 12.09 | 12.96 | 0.8 | 6.5 | 7.17 | 7.1 | 7 | 80 | 12 | | | P150A ～ P400 |
| V-1 | 5.6 | 6.03 | 0.4 | 3.1 | 3.27 | 3.2 | 6 | 60 | 6 | | | V15 ～ V175 |
| V-2 | 8.74 | 9.17 | 0.4 | 4.6 | 5.07 | 5 | 7 | 60 | 10 | | | V225 ～ V430 |
| V-3 | 14.6 | 15.47 | 0.8 | 7.8 | 8.52 | 8.45 | 7 | 80 | 12 | | | V480 ～ V1055 |
| A-6 | 4.87 | 5.31 | 0.4 | 2.7 | 2.89 | 2.8 | 6 | 60 | 6 | | AS568A | 201 ～ 284 |
| A-7 | 7.67 | 8.1 | 0.4 | 4.1 | 4.44 | 4.4 | 6 | 60 | 8 | | | 309 ～ 395 |
| A-8 | 9.9 | 10.76 | 0.8 | 5.4 | 5.94 | 5.9 | 7 | 80 | 12 | | | 425 ～ 475 |

超硬

# OACR2

## 超硬R面取付Oリング用アリ溝カッター　*Solid Carbide Angular Cutter With Chamfering R For O Ring*

切削条件表 P255

Oリングアリ溝加工

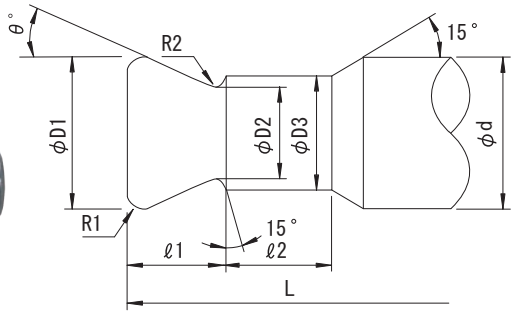
右ネジレ 15°

超微粒子



センターカット






| 公差(Tolerance) | θ° ：±20′ | R1 ：±0.1 | R2 ：$^{+0.05}_{0}$ | d ：h6 |
|---|---|---|---|---|

アリ溝角 θ=24°　右刃右ネジレ15°　超微粒子

Cut Angle θ=24°　Helix Angle-Right15°　Ultra Micro Grain Carbide

| 呼び型番 *Tool No.* | 外径（ΦD1） *Dia. at Large End* | R1 *Corner Radius* | R2 *Chamfering R* | 刃長（ℓ1） *Cut Length* | 小径（ΦD2） *Minor Dia.* | 首径（ΦD3） *Neck Dia.* | 首長（ℓ2） *Neck Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 適応Oリング規格 *Applicable O Ring Std.* 規格 *Standard* | | 呼び番号 *Model* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **P-3** | 5.01 | 0.4 | 0.2 | 2.8 | 3.17 | 4.26 | 6 | 60 | 6 | 加圧用 For Pressure | JIS B2401 | P22A ～ P50 |
| **P-4** | 8.5 | 0.4 | 0.4 | 4.7 | 5.18 | 6.62 | 7 | 60 | 10 | | | P48A ～ P150 |
| **P-5** | 12.47 | 0.8 | 0.5 | 7 | 7.64 | 9.25 | 7 | 80 | 12 | | | P150A ～ P400 |
| **G-1** | 4.31 | 0.4 | 0.2 | 2.4 | 2.82 | 3.91 | 6 | 60 | 6 | | | G25 ～ G145 |
| **G-2** | 8.5 | 0.4 | 0.4 | 4.7 | 5.18 | 6.62 | 7 | 60 | 10 | | | G150 ～ G300 |
| **A-3** | 5.01 | 0.4 | 0.25 | 2.79 | 3.22 | 4.4 | 6 | 60 | 6 | | AS568A | 201 ～ 284 |
| **A-4** | 7.89 | 0.4 | 0.38 | 4.34 | 4.86 | 6.27 | 6 | 60 | 8 | | | 309 ～ 395 |
| **A-5** | 10.22 | 0.8 | 0.38 | 5.77 | 6.35 | 7.76 | 7 | 80 | 12 | | | 425 ～ 475 |
| **P-6** | 4.84 | 0.4 | 0.2 | 2.5 | 3.27 | 4.36 | 6 | 60 | 6 | 真空用 For Vacuum | JIS B2401 | P22A ～ P50 |
| **P-7** | 8.26 | 0.4 | 0.4 | 4.2 | 5.38 | 6.82 | 7 | 60 | 10 | | | P48A ～ P150 |
| **P-8** | 12.09 | 0.8 | 0.5 | 6.3 | 7.89 | 9.5 | 7 | 80 | 12 | | | P150A ～ P400 |
| **V-1** | 5.6 | 0.4 | 0.3 | 2.9 | 3.77 | 5.04 | 6 | 60 | 6 | | | V15 ～ V175 |
| **V-2** | 8.74 | 0.4 | 0.4 | 4.4 | 5.68 | 7.12 | 7 | 60 | 10 | | | V225 ～ V430 |
| **V-3** | 14.6 | 0.8 | 0.5 | 7.6 | 9.24 | 10.85 | 7 | 80 | 12 | | | V480 ～ V1055 |
| **A-6** | 4.87 | 0.4 | 0.25 | 2.51 | 3.34 | 4.52 | 6 | 60 | 6 | | AS568A | 201 ～ 284 |
| **A-7** | 7.67 | 0.4 | 0.38 | 3.91 | 5.03 | 6.44 | 6 | 60 | 8 | | | 309 ～ 395 |
| **A-8** | 9.9 | 0.8 | 0.38 | 5.21 | 6.53 | 7.94 | 7 | 80 | 12 | | | 425 ～ 475 |

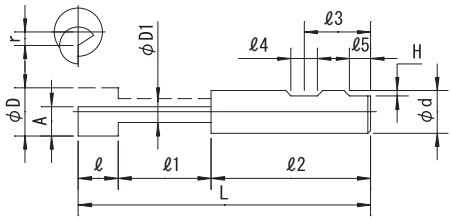
超硬

# CUKC

## 超硬裏ザグリカッター（K10タイプ／P20タイプ） *Carbide Tipped Back Counterboring Cutter (K10-Type / P20-Type)*

切削条件表 P256 | ザグリ加工 | K10 | P20






| 公差(Tolerance) | D：$^{+0.2}_{0}$ | d：$^{0}_{-0.02}$ |
|---|---|---|

(K10・P20)
Micro Grain Carbide(K10・P20)

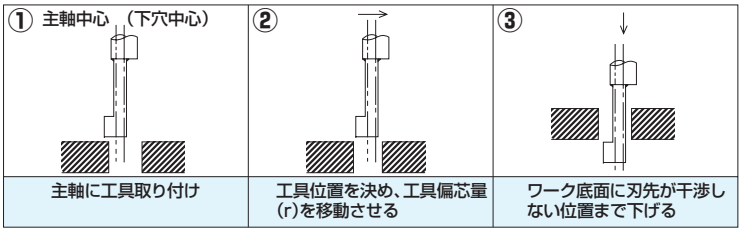
| 呼び寸法 *Size* | 座ぐり加工径（ΦD） *※1* | A | 下穴最小径 *※2* | 偏心量（r） *Eccentricity amount* | 首回転径（ΦD1） *Diameter of Gyration* | （ℓ） | （ℓ1） | シャンク長（ℓ2） *Shank Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|---|---|---|---|---|
| **M 8** | 14 | 8 | 9 | 3 | 8 | 13 | 35 | 50 | 98 | 12 |
| **M10** | 17.5 | 10 | 11 | 3.75 | 9.5 | 15 | 40 | 55 | 110 | 16 |
| **M12** | 20 | 12 | 14 | 4 | 11 | 20 | 45 | 55 | 120 | 16 |
| **M14** | 23 | 15 | 16 | 4 | 14 | 23 | 50 | 65 | 138 | 20 |
| **M16** | 26 | 16 | 18 | 5 | 16 | 26 | 55 | 75 | 156 | 25 |
| **M18** | 29 | 19 | 20 | 5 | 18 | 28 | 60 | 75 | 163 | 25 |
| **M20** | 32 | 20 | 22 | 6 | 20 | 32 | 65 | 75 | 172 | 25 |

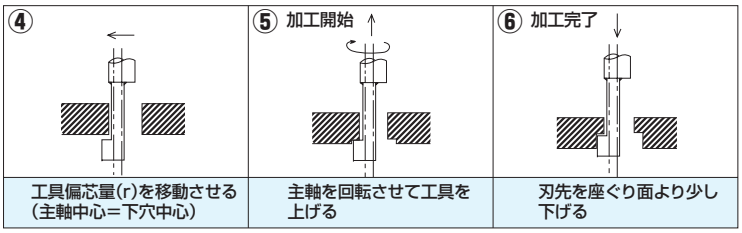
※1 Diameter of work piece after counterboring
※2 Minimum Diameter of drilled hole
•Difference of Gyration Diameter and Drilled Hole Diameter should be 1.0 to 2.0.

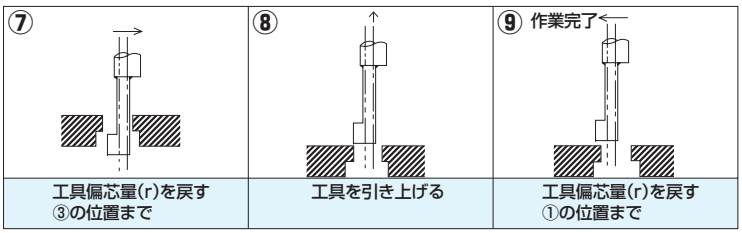
切欠部寸法
Shank Size

| （Φd） | （ℓ3） | （ℓ4） | （ℓ5） | （H） |
|---|---|---|---|---|
| **12** | 22.5 | 8 | – | 1.6 |
| **16** | 24 | 10 | – | 1.8 |
| **20** | 25 | 11 | – | 1.8 |
| **25** | 32 | 12 | 17 | 2 |

## 加工手順




注意 1．工具位置決め移動と戻しの時は、主軸回転を停止して行うこと
2．刃先の向きを確認して、工具偏芯量（r）を戻すこと

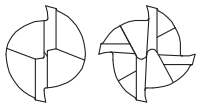
ハイス

# HOAC2-A/HOAC4-A

## Oリング用アリ溝カッター　*Angular Cutter For O Ring*

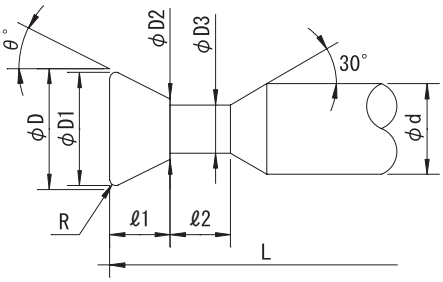
切削条件表 P256

**Oリングアリ溝加工**



センターカット　センターカット






| 公差(Tolerance) | θ° ：±30′ | R：$^{0}_{-0.05}$ | d：h6 |
|---|---|---|---|

## 《HOAC2-A》 アリ溝角 θ=24° 右刃右ネジレ15° 2枚刃 TiAINコーティング 粉末ハイス

Cut Angle θ=24° Helix Angle-Right15° 2 Flutes TiAIN Coating Powder Metallurgy

右ネジレ15° 刃数2 TiAIN 粉末ハイス

| 呼び型番 Tool No. | 外径(ΦD1) Dia. at Large End | 延長交点(ΦD) Intersection point | R Corner Radius | 刃長(ℓ1) Cut Length | 小径(ΦD2) Minor Dia. | 首径(ΦD3) Neck Dia. | 首長(ℓ2) Neck Length | 全長(L) Overall Length | シャンク径(Φd) Shank Dia. | 適応Oリング規格 Applicable O Ring Std. 規格 Standard | | 呼び番号 Model |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P-3 | 5.01 | 5.44 | 0.4 | 3 | 2.77 | 2.7 | 6 | 60 | 6 | 加圧用 For Pressure | JIS B2401 | P22A～P50 |
| P-4 | 8.5 | 8.94 | 0.4 | 4.9 | 4.57 | 4.5 | 7 | 60 | 10 | | | P48A～P150 |
| P-5 | 12.47 | 13.33 | 0.8 | 7.2 | 6.92 | 6.85 | 7 | 80 | 12 | | | P150A～P400 |
| G-1 | 4.31 | 4.74 | 0.4 | 2.6 | 2.42 | 2.35 | 6 | 60 | 6 | | | G25～G145 |
| G-2 | 8.5 | 8.94 | 0.4 | 4.9 | 4.57 | 4.5 | 7 | 60 | 10 | | | G150～G300 |
| A-3 | 5.01 | 5.44 | 0.4 | 3 | 2.77 | 2.7 | 6 | 60 | 6 | | AS568A | 201～284 |
| A-4 | 7.88 | 8.31 | 0.4 | 4.5 | 4.27 | 4.2 | 6 | 60 | 8 | | | 309～395 |
| A-5 | 10.22 | 11.08 | 0.8 | 6 | 5.76 | 5.7 | 7 | 80 | 12 | | | 425～475 |
| P-6 | 4.84 | 5.28 | 0.4 | 2.7 | 2.87 | 2.8 | 6 | 60 | 6 | 真空用 For Vacuum | JIS B2401 | P22A～P50 |
| P-7 | 8.26 | 8.69 | 0.4 | 4.4 | 4.77 | 4.7 | 7 | 60 | 10 | | | P48A～P150 |
| P-8 | 12.09 | 12.96 | 0.8 | 6.5 | 7.17 | 7.1 | 7 | 80 | 12 | | | P150A～P400 |
| V-1 | 5.6 | 6.03 | 0.4 | 3.1 | 3.27 | 3.2 | 6 | 60 | 6 | | | V15～V175 |
| V-2 | 8.74 | 9.17 | 0.4 | 4.6 | 5.07 | 5 | 7 | 60 | 10 | | | V225～V430 |
| V-3 | 14.6 | 15.47 | 0.8 | 7.8 | 8.52 | 8.45 | 7 | 80 | 12 | | | V480～V1055 |
| A-6 | 4.87 | 5.31 | 0.4 | 2.7 | 2.89 | 2.8 | 6 | 60 | 6 | | AS568A | 201～284 |
| A-7 | 7.67 | 8.1 | 0.4 | 4.1 | 4.44 | 4.4 | 6 | 60 | 8 | | | 309～395 |
| A-8 | 9.9 | 10.76 | 0.8 | 5.4 | 5.94 | 5.9 | 7 | 80 | 12 | | | 425～475 |

| 公差(Tolerance) | θ° ：±30′ | R：$^{0}_{-0.05}$ | d：h6 |
|---|---|---|---|

## 《HOAC4-A》 アリ溝角 θ=24° 右刃右ネジレ15° 4枚刃 TiAINコーティング 粉末ハイス

Cut Angle θ=24° Helix Angle-Right15° 4 Flutes TiAIN Coating Powder Metallurgy

右ネジレ15° 刃数4 TiAIN 粉末ハイス

| 呼び型番 Tool No. | 外径(ΦD1) Dia. at Large End | 延長交点(ΦD) Intersection point | R Corner Radius | 刃長(ℓ1) Cut Length | 小径(ΦD2) Minor Dia. | 首径(ΦD3) Neck Dia. | 首長(ℓ2) Neck Length | 全長(L) Overall Length | シャンク径(Φd) Shank Dia. | 適応Oリング規格 Applicable O Ring Std. 規格 Standard | | 呼び番号 Model |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P-3 | 5.01 | 5.44 | 0.4 | 3 | 2.77 | 2.7 | 6 | 60 | 6 | 加圧用 For Pressure | JIS B2401 | P22A～P50 |
| P-4 | 8.5 | 8.94 | 0.4 | 4.9 | 4.57 | 4.5 | 7 | 60 | 10 | | | P48A～P150 |
| P-5 | 12.47 | 13.33 | 0.8 | 7.2 | 6.92 | 6.85 | 7 | 80 | 12 | | | P150A～P400 |
| G-1 | 4.31 | 4.74 | 0.4 | 2.6 | 2.42 | 2.35 | 6 | 60 | 6 | | | G25～G145 |
| G-2 | 8.5 | 8.94 | 0.4 | 4.9 | 4.57 | 4.5 | 7 | 60 | 10 | | | G150～G300 |
| A-3 | 5.01 | 5.44 | 0.4 | 3 | 2.77 | 2.7 | 6 | 60 | 6 | | AS568A | 201～284 |
| A-4 | 7.88 | 8.31 | 0.4 | 4.5 | 4.27 | 4.2 | 6 | 60 | 8 | | | 309～395 |
| A-5 | 10.22 | 11.08 | 0.8 | 6 | 5.76 | 5.7 | 7 | 80 | 12 | | | 425～475 |
| P-6 | 4.84 | 5.28 | 0.4 | 2.7 | 2.87 | 2.8 | 6 | 60 | 6 | 真空用 For Vacuum | JIS B2401 | P22A～P50 |
| P-7 | 8.26 | 8.69 | 0.4 | 4.4 | 4.77 | 4.7 | 7 | 60 | 10 | | | P48A～P150 |
| P-8 | 12.09 | 12.96 | 0.8 | 6.5 | 7.17 | 7.1 | 7 | 80 | 12 | | | P150A～P400 |
| V-1 | 5.6 | 6.03 | 0.4 | 3.1 | 3.27 | 3.2 | 6 | 60 | 6 | | | V15～V175 |
| V-2 | 8.74 | 9.17 | 0.4 | 4.6 | 5.07 | 5 | 7 | 60 | 10 | | | V225～V430 |
| V-3 | 14.6 | 15.47 | 0.8 | 7.8 | 8.52 | 8.45 | 7 | 80 | 12 | | | V480～V1055 |
| A-6 | 4.87 | 5.31 | 0.4 | 2.7 | 2.89 | 2.8 | 6 | 60 | 6 | | AS568A | 201～284 |
| A-7 | 7.67 | 8.1 | 0.4 | 4.1 | 4.44 | 4.4 | 6 | 60 | 8 | | | 309～395 |
| A-8 | 9.9 | 10.76 | 0.8 | 5.4 | 5.94 | 5.9 | 7 | 80 | 12 | | | 425～475 |

ハイス

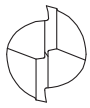
# HOACR2-A

## R面取付Oリング用アリ溝カッター　*Angular Cutter With Chamfering R For O Ring*

切削条件表 P256

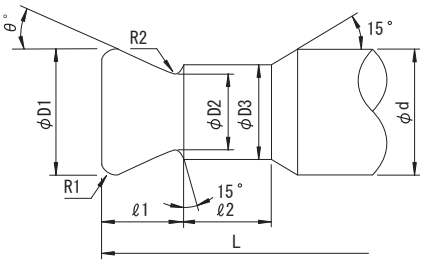
Oリングアリ溝加工

右ネジレ 15°　刃数 2　TiAlN　粉末ハイス



センターカット






| 公差(Tolerance) | θ° : ±20′ | R1 : ±0.1 | R2 : $^{+0.05}_{0}$ | d : h6 |
|---|---|---|---|---|

アリ溝角 θ=24°　右刃右ネジレ15°　2枚刃　TiAlNコーティング　粉末ハイス
Cut Angle θ=24°　Helix Angle-Right15°　2 Flutes　TiAlN Coating　Powder Metallurgy

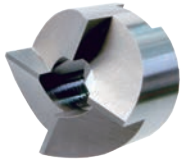
| 呼び型番 *Tool No.* | 外径（ΦD1） *Dia. at Large End* | R1 *Corner Radius* | R2 *Chamfering R* | 刃長（ℓ1） *Cut Length* | 小径（ΦD2） *Minor Dia.* | 首径（ΦD3） *Neck Dia.* | 首長（ℓ2） *Neck Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* | 適応Oリング規格 *Applicable O Ring Std.* | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 規格 *Standard* | | 呼び番号 *Model* |
| P-3 | 5.01 | 0.4 | 0.2 | 2.8 | 3.17 | 4.26 | 6 | 60 | 6 | 加圧用 For Pressure | JIS B2401 | P22A～P50 |
| P-4 | 8.5 | 0.4 | 0.4 | 4.7 | 5.18 | 6.62 | 7 | 60 | 10 | | | P48A～P150 |
| P-5 | 12.47 | 0.8 | 0.5 | 7 | 7.64 | 9.25 | 7 | 80 | 12 | | | P150A～P400 |
| G-1 | 4.31 | 0.4 | 0.2 | 2.4 | 2.82 | 3.91 | 6 | 60 | 6 | | | G25～G145 |
| G-2 | 8.5 | 0.4 | 0.4 | 4.7 | 5.18 | 6.62 | 7 | 60 | 10 | | | G150～G300 |
| A-3 | 5.01 | 0.4 | 0.25 | 2.79 | 3.22 | 4.4 | 6 | 60 | 6 | | AS568A | 201～284 |
| A-4 | 7.89 | 0.4 | 0.38 | 4.34 | 4.86 | 6.27 | 6 | 60 | 8 | | | 309～395 |
| A-5 | 10.22 | 0.8 | 0.38 | 5.77 | 6.35 | 7.76 | 7 | 80 | 12 | | | 425～475 |
| P-6 | 4.84 | 0.4 | 0.2 | 2.5 | 3.27 | 4.36 | 6 | 60 | 6 | 真空用 For Vacuum | JIS B2401 | P22A～P50 |
| P-7 | 8.26 | 0.4 | 0.4 | 4.2 | 5.38 | 6.82 | 7 | 60 | 10 | | | P48A～P150 |
| P-8 | 12.09 | 0.8 | 0.5 | 6.3 | 7.89 | 9.5 | 7 | 80 | 12 | | | P150A～P400 |
| V-1 | 5.6 | 0.4 | 0.3 | 2.9 | 3.77 | 5.04 | 6 | 60 | 6 | | | V15～V175 |
| V-2 | 8.74 | 0.4 | 0.4 | 4.4 | 5.68 | 7.12 | 7 | 60 | 10 | | | V225～V430 |
| V-3 | 14.6 | 0.8 | 0.5 | 7.6 | 9.24 | 10.85 | 7 | 80 | 12 | | | V480～V1055 |
| A-6 | 4.87 | 0.4 | 0.25 | 2.51 | 3.34 | 4.52 | 6 | 60 | 6 | | AS568A | 201～284 |
| A-7 | 7.67 | 0.4 | 0.38 | 3.91 | 5.03 | 6.44 | 6 | 60 | 8 | | | 309～395 |
| A-8 | 9.9 | 0.8 | 0.38 | 5.21 | 6.53 | 7.94 | 7 | 80 | 12 | | | 425～475 |

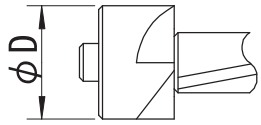
# BZC/BDC/BMC/BZH

## 裏ザグリカッター *Back Counterboring cutter*

切削条件表 P257

ザグリ加工





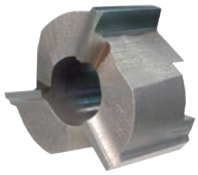

| 公差(Tolerance) | D : $^{+0.05}_{0}$ |
|---|---|

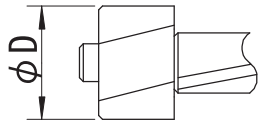
正回転 直刃 | 刃数 4 | HSS Co

### 《BZC》スタンダード裏ザグリカッター

正回転用ストレート　刃数:4　SKH56
Straight Flute　4 Flutes　HSS-Co.

*Standard Back Counterboring Cutter*





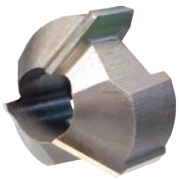

| 公差(Tolerance) | D : $^{+0.05}_{0}$ |
|---|---|

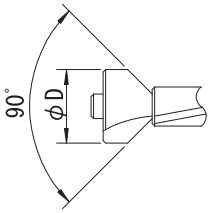
正回転 5° | 刃数 3 | HSS Co

### 《BDC》深穴用裏ザグリカッター

正回転用ネジレ5°　刃数:3　SKH56
Helix Angle:5°　3 Flutes　HSS-Co.

*Back Counterboring Cutter For Deep Hole*





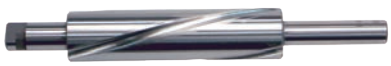

| 公差(Tolerance) | D : $^{+0.05}_{0}$ |
|---|---|

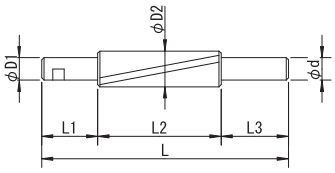
正回転 5° | 刃数 3 | HSS Co

### 《BMC》裏面取カッター

正回転用ネジレ5°　刃数:3　SKH56
Helix Angle:5°　3 Flutes　HSS-Co.

*Back Countersink*






### 《BZH》ガイドホルダー

*Guide Holder*

| 公差 (Tolerance) | D1 | | | | D2 | d |
|---|---|---|---|---|---|---|
| | 2.9 | $^{-0.02}_{-0.03}$ | 4.9～ 5.9 | $^{-0.02}_{-0.035}$ | d8 | h7 |
| | 7.9～9.9 | $^{-0.023}_{-0.058}$ | 11.9～13.9 | $^{-0.028}_{-0.04}$ | | |

# BZC/BDC/BMC/BZH 裏ザグリカッター

| BZC スタンダード | BDC 深穴用 | BMC 面取り用 | BZH ガイドホルダー | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 刃径 (ΦD) *Dia.* | 刃径 (ΦD) *Dia.* | 刃径 (ΦD) *Dia.* | 案内径 (ΦD2) *Guide Dia.* | 軸径 (ΦD1) | 軸長 (L1) | 案内長 (L2) *Guide Length* | 全長 (L) *Overall Length* | シャンク長 (L3) *Shank Length* | シャンク径 (Φd) *Shank Dia.* |
| **8** | **8** | **8** | 3 | 3 ( 2.9) | 11.5 | 48.5 | 90 | 30 | 8 |
| **9** | **9** | **10** | 4 | | | | | | |
| **9.5** | **9.5** | | 5 | | | | | | |
| **10** | **10** | | 6 | | | | | | |
| **11** | **11** | **11** | 5 | 5 ( 4.9) | 14 | 66 | 120 | 40 | 10 |
| **12** | **12** | **13** | 6 | | | | | | |
| **13** | **13** | | 7 | | | | | | |
| | | | 8 | | | | | | |
| | | | 9 | | | | | | |
| | | | 10 | | | | | | |
| **14** | **14** | **14** | 6 | 6 ( 5.9) | 16.5 | 83.5 | 140 | 40 | 12 |
| **15** | **15** | **16** | 7 | | | | | | |
| **16** | **16** | | 8 | | | | | | |
| | | | 9 | | | | | | |
| | | | 10 | | | | | | |
| | | | 11 | | | | | | |
| **17** | **17** | **17** | 8 | 8 ( 7.9) | 20 | 90 | 150 | 40 | 12 |
| **17.5** | **17.5** | **18** | 9 | | | | | | |
| **18** | **18** | **20** | 10 | | | | | | |
| **19** | **19** | | 11 | | | | | | |
| **20** | **20** | | 12 | | | | | | |
| | | | 13 | | | | | | |
| | | | 14 | | | | | | |
| | | | 15 | | | | | | |
| | | | 16 | | | | | | |
| | | | 17 | | | | | | |
| | | | 18 | | | | | | |
| **21** | **21** | **21** | 10 | 10 ( 9.9) | 22 | 88 | 160 | 50 | 12 |
| **22** | **22** | **23** | 11 | | | | | | |
| **23** | **23** | **24** | 12 | | | | | | |
| **24** | **24** | | 13 | | | | | | |
| | | | 14 | | | | | | |
| | | | 15 | | | | | | |
| | | | 16 | | | | | | |
| | | | 17 | | | | | | |
| | | | 18 | | | | | | |
| **25** | **25** | **25** | 12 | 12 (11.9) | 26 | 94 | 170 | 50 | 12 |
| **26** | **26** | **27** | 13 | | | | | | |
| **27** | **27** | **29** | 14 | | | | | | |
| **28** | **28** | | 15 | | | | | | |
| **29** | **29** | | 16 | | | | | | |
| | | | 17 | | | | | | |
| | | | 18 | | | | | | |
| | | | 19 | | | | | | |
| | | | 20 | | | | | | |
| **30** | **30** | **30** | 14 | 14 (13.9) | 29 | 104 | 183 | 50 | 12 |
| **31** | **31** | **33** | 15 | | | | | | |
| **32** | **32** | **35** | 16 | | | | | | |
| **33** | **33** | | 17 | | | | | | |
| **34** | **34** | | 18 | | | | | | |
| **35** | **35** | | 19 | | | | | | |
| | | | 20 | | | | | | |
| | | | 21 | | | | | | |
| | | | 22 | | | | | | |
| | | | 23 | | | | | | |
| | | | 24 | | | | | | |
| | | | 25 | | | | | | |
| | | | 26 | | | | | | |

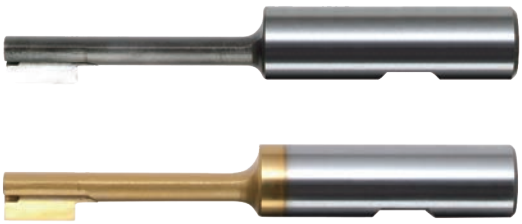
ハイス

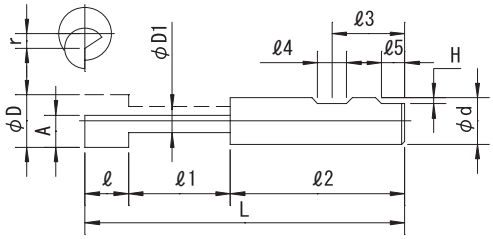
# UKC/UKCC

## 裏ザグリカッター　*Back Counterboring Cutter*

切削条件表 P257

ザグリ加工






## 《UKC》 SKH51 HSS

| 公差(Tolerance) | D：$^{+0.2}_{0}$ | d：$^{0}_{-0.02}$ |
|---|---|---|

HSS

| 呼び寸法 Size | 座ぐり加工径 (ΦD) ※1 | A | 下穴最小径 ※2 | 偏心量 (r) Eccentricity amount | 首回転径 (ΦD1) Diameter of Gyration | (ℓ) | (ℓ1) | シャンク長 (ℓ2) Shank Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|---|---|---|---|
| **M 8** | 14 | 8 | 9 | 3 | 8 | 13 | 35 | 50 | 98 | 12 |
| **M10** | 17.5 | 10 | 11 | 3.75 | 9.5 | 15 | 40 | 55 | 110 | 16 |
| **M12** | 20 | 12 | 14 | 4 | 11 | 20 | 45 | 55 | 120 | 16 |
| **M14** | 23 | 15 | 16 | 4 | 14 | 23 | 50 | 65 | 138 | 20 |
| **M16** | 26 | 16 | 18 | 5 | 16 | 26 | 55 | 75 | 156 | 25 |
| **M18** | 29 | 19 | 20 | 5 | 18 | 28 | 60 | 75 | 163 | 25 |
| **M20** | 32 | 20 | 22 | 6 | 20 | 32 | 65 | 75 | 172 | 25 |

※1 Diameter of work piece after counterboring
※2 Minimum Diameter of drilled hole
•Difference of Gyration Diameter and Drilled Hole Diameter should be 1.0 to 2.0.

切欠部寸法
Shank Size

| (Φd) | (ℓ3) | (ℓ4) | (ℓ5) | (H) |
|---|---|---|---|---|
| **12** | 22.5 | 8 | – | 1.6 |
| **16** | 24 | 10 | – | 1.8 |
| **20** | 25 | 11 | – | 1.8 |
| **25** | 32 | 12 | 17 | 2 |

## 《UKCC》 TiNコーティング　SKH51 TiN Coating　HSS

| 公差(Tolerance) | D：$^{+0.2}_{0}$ | d：$^{0}_{-0.02}$ |
|---|---|---|

TiN HSS

| 呼び寸法 Size | 座ぐり加工径 (ΦD) ※1 | A | 下穴最小径 ※2 | 偏心量 (r) Eccentricity amount | 首回転径 (ΦD1) Diameter of Gyration | (ℓ) | (ℓ1) | シャンク長 (ℓ2) Shank Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|---|---|---|---|
| **M 8** | 14 | 8 | 9 | 3 | 8 | 13 | 35 | 50 | 98 | 12 |
| **M10** | 17.5 | 10 | 11 | 3.75 | 9.5 | 15 | 40 | 55 | 110 | 16 |
| **M12** | 20 | 12 | 14 | 4 | 11 | 20 | 45 | 55 | 120 | 16 |
| **M14** | 23 | 15 | 16 | 4 | 14 | 23 | 50 | 65 | 138 | 20 |
| **M16** | 26 | 16 | 18 | 5 | 16 | 26 | 55 | 75 | 156 | 25 |
| **M18** | 29 | 19 | 20 | 5 | 18 | 28 | 60 | 75 | 163 | 25 |
| **M20** | 32 | 20 | 22 | 6 | 20 | 32 | 65 | 75 | 172 | 25 |

※1 Diameter of work piece after counterboring
※2 Minimum Diameter of drilled hole
•Difference of Gyration Diameter and Drilled Hole Diameter should be 1.0 to 2.0.

切欠部寸法
Shank Size

| (Φd) | (ℓ3) | (ℓ4) | (ℓ5) | (H) |
|---|---|---|---|---|
| **12** | 22.5 | 8 | – | 1.6 |
| **16** | 24 | 10 | – | 1.8 |
| **20** | 25 | 11 | – | 1.8 |
| **25** | 32 | 12 | 17 | 2 |

※加工手順 P192をご覧ください

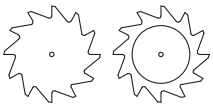
ハイス

# KCNC-C

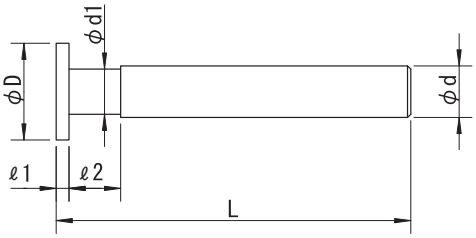
## 自動旋盤用カッター TiCNコーティング *Cutter For NC Lathe Machine TiCN Coated*

切削条件表 P258

**スクエア溝加工（キーシードカッター）** 右直刃 TiCN HSS Co






| 公差 (Tolerance) | D | | | | ℓ1 | | d |
|---|---|---|---|---|---|---|---|
| | 15 | +0.3 +0.18 | 20 | +0.35 +0.21 | 0.8～3 | −0.014 −0.028 | h8 |
| | 30 | +0.43 +0.26 | | | 3.5～5 | −0.02 −0.038 | |

右刃ストレート TiCNコーティング SKH56
Straight Flute TiCN Coating HSS-Co.

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 15 | 0.8 | 5.5 | 5 | 60 | 6 | 10 |
| | 0.9 | 5.5 | 5 | 60 | 6 | 10 |
| | 1 | 5.5 | 5 | 60 | 6 | 10 |
| | 1.1 | 5.5 | 5 | 60 | 6 | 10 |
| | 1.2 | 5.5 | 5 | 60 | 6 | 10 |
| | 1.3 | 5.5 | 5 | 60 | 6 | 10 |
| | 1.4 | 5.5 | 5 | 60 | 6 | 10 |
| | 1.5 | 5.5 | 5 | 60 | 6 | 10 |
| | 1.6 | 5.5 | 5 | 60 | 6 | 10 |
| | 1.7 | 5.5 | 5 | 60 | 6 | 10 |
| | 1.8 | 5.5 | 5 | 60 | 6 | 10 |
| | 1.9 | 5.5 | 5 | 60 | 6 | 10 |
| | 2 | 5.5 | 5 | 60 | 6 | 10 |
| | 2.1 | 5.5 | 5 | 60 | 6 | 10 |
| | 2.2 | 5.5 | 5 | 60 | 6 | 10 |
| | 2.3 | 5.5 | 5 | 60 | 6 | 10 |
| | 2.4 | 5.5 | 5 | 60 | 6 | 10 |
| | 2.5 | 5.5 | 5 | 60 | 6 | 10 |
| | 2.6 | 5.5 | 5 | 60 | 6 | 10 |
| | 2.7 | 5.5 | 5 | 60 | 6 | 10 |
| | 2.8 | 5.5 | 5 | 60 | 6 | 10 |
| | 2.9 | 5.5 | 5 | 60 | 6 | 10 |
| | 3 | 5.5 | 5 | 60 | 6 | 10 |
| | 3.5 | 5.5 | 5 | 60 | 6 | 10 |
| | 4 | 5.5 | 5 | 60 | 6 | 10 |
| | 4.5 | 5.5 | 5 | 60 | 6 | 10 |
| | 5 | 5.5 | 5 | 60 | 6 | 10 |
| 20 | 0.8 | 9.5 | 5 | 60 | 10 | 12 |
| | 0.9 | 9.5 | 5 | 60 | 10 | 12 |
| | 1 | 9.5 | 5 | 60 | 10 | 12 |
| | 1.1 | 9.5 | 5 | 60 | 10 | 12 |
| | 1.2 | 9.5 | 5 | 60 | 10 | 12 |
| | 1.3 | 9.5 | 5 | 60 | 10 | 12 |
| | 1.4 | 9.5 | 5 | 60 | 10 | 12 |
| | 1.5 | 9.5 | 5 | 60 | 10 | 12 |
| | 1.6 | 9.5 | 5 | 60 | 10 | 12 |
| | 1.7 | 9.5 | 5 | 60 | 10 | 12 |
| | 1.8 | 9.5 | 5 | 60 | 10 | 12 |
| | 1.9 | 9.5 | 5 | 60 | 10 | 12 |
| | 2 | 9.5 | 5 | 60 | 10 | 12 |
| | 2.1 | 9.5 | 5 | 60 | 10 | 12 |

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 20 | 2.2 | 9.5 | 5 | 60 | 10 | 12 |
| | 2.3 | 9.5 | 5 | 60 | 10 | 12 |
| | 2.4 | 9.5 | 5 | 60 | 10 | 12 |
| | 2.5 | 9.5 | 5 | 60 | 10 | 12 |
| | 2.6 | 9.5 | 5 | 60 | 10 | 12 |
| | 2.7 | 9.5 | 5 | 60 | 10 | 12 |
| | 2.8 | 9.5 | 5 | 60 | 10 | 12 |
| | 2.9 | 9.5 | 5 | 60 | 10 | 12 |
| | 3 | 9.5 | 5 | 60 | 10 | 12 |
| | 3.5 | 9.5 | 5 | 60 | 10 | 12 |
| | 4 | 9.5 | 5 | 60 | 10 | 12 |
| | 4.5 | 9.5 | 5 | 60 | 10 | 12 |
| | 5 | 9.5 | 5 | 60 | 10 | 12 |
| 30 | 0.8 | 9.5 | 5 | 60 | 10 | 14 |
| | 0.9 | 9.5 | 5 | 60 | 10 | 14 |
| | 1 | 9.5 | 5 | 60 | 10 | 14 |
| | 1.1 | 9.5 | 5 | 60 | 10 | 14 |
| | 1.2 | 9.5 | 5 | 60 | 10 | 14 |
| | 1.3 | 9.5 | 5 | 60 | 10 | 14 |
| | 1.4 | 9.5 | 5 | 60 | 10 | 14 |
| | 1.5 | 9.5 | 5 | 60 | 10 | 14 |
| | 1.6 | 9.5 | 5 | 60 | 10 | 14 |
| | 1.7 | 9.5 | 5 | 60 | 10 | 14 |
| | 1.8 | 9.5 | 5 | 60 | 10 | 14 |
| | 1.9 | 9.5 | 5 | 60 | 10 | 14 |
| | 2 | 9.5 | 5 | 60 | 10 | 14 |
| | 2.1 | 9.5 | 5 | 60 | 10 | 14 |
| | 2.2 | 9.5 | 5 | 60 | 10 | 14 |
| | 2.3 | 9.5 | 5 | 60 | 10 | 14 |
| | 2.4 | 9.5 | 5 | 60 | 10 | 14 |
| | 2.5 | 9.5 | 5 | 60 | 10 | 14 |
| | 2.6 | 9.5 | 5 | 60 | 10 | 14 |
| | 2.7 | 9.5 | 5 | 60 | 10 | 14 |
| | 2.8 | 9.5 | 5 | 60 | 10 | 14 |
| | 2.9 | 9.5 | 5 | 60 | 10 | 14 |
| | 3 | 9.5 | 5 | 60 | 10 | 14 |
| | 3.5 | 9.5 | 5 | 60 | 10 | 14 |
| | 4 | 9.5 | 5 | 60 | 10 | 14 |
| | 4.5 | 9.5 | 5 | 60 | 10 | 14 |
| | 5 | 9.5 | 5 | 60 | 10 | 14 |

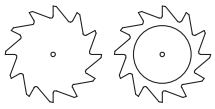
# KCNC

## 自動旋盤用カッター　*Cutter For NC Lathe Machine*

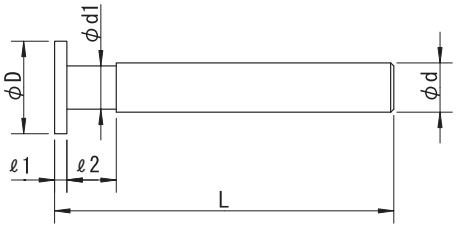
切削条件表 P258

## スクエア溝加工（キーシードカッター）

右直刃　HSS Co






| 公差 (Tolerance) | D | | | | ℓ1 | | d |
|---|---|---|---|---|---|---|---|
| | 15 | +0.3 +0.18 | 20 | +0.35 +0.21 | 0.5～3 | −0.014 −0.028 | h8 |
| | 30 | +0.43 +0.26 | | | 3.5～5 | −0.02 −0.038 | |

右刃ストレート　SKH56
Straight Flute　HSS-Co.

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 15 | 0.5 | 5.5 | 5 | 60 | 6 | 10 |
| | 0.6 | 5.5 | 5 | 60 | 6 | 10 |
| | 0.7 | 5.5 | 5 | 60 | 6 | 10 |
| | 0.8 | 5.5 | 5 | 60 | 6 | 10 |
| | 0.9 | 5.5 | 5 | 60 | 6 | 10 |
| | 1 | 5.5 | 5 | 60 | 6 | 10 |
| | 1.1 | 5.5 | 5 | 60 | 6 | 10 |
| | 1.2 | 5.5 | 5 | 60 | 6 | 10 |
| | 1.3 | 5.5 | 5 | 60 | 6 | 10 |
| | 1.4 | 5.5 | 5 | 60 | 6 | 10 |
| | 1.5 | 5.5 | 5 | 60 | 6 | 10 |
| | 1.6 | 5.5 | 5 | 60 | 6 | 10 |
| | 1.7 | 5.5 | 5 | 60 | 6 | 10 |
| | 1.8 | 5.5 | 5 | 60 | 6 | 10 |
| | 1.9 | 5.5 | 5 | 60 | 6 | 10 |
| | 2 | 5.5 | 5 | 60 | 6 | 10 |
| | 2.1 | 5.5 | 5 | 60 | 6 | 10 |
| | 2.2 | 5.5 | 5 | 60 | 6 | 10 |
| | 2.3 | 5.5 | 5 | 60 | 6 | 10 |
| | 2.4 | 5.5 | 5 | 60 | 6 | 10 |
| | 2.5 | 5.5 | 5 | 60 | 6 | 10 |
| | 2.6 | 5.5 | 5 | 60 | 6 | 10 |
| | 2.7 | 5.5 | 5 | 60 | 6 | 10 |
| | 2.8 | 5.5 | 5 | 60 | 6 | 10 |
| | 2.9 | 5.5 | 5 | 60 | 6 | 10 |
| | 3 | 5.5 | 5 | 60 | 6 | 10 |
| | 3.5 | 5.5 | 5 | 60 | 6 | 10 |
| | 4 | 5.5 | 5 | 60 | 6 | 10 |
| | 4.5 | 5.5 | 5 | 60 | 6 | 10 |
| | 5 | 5.5 | 5 | 60 | 6 | 10 |
| 20 | 0.5 | 9.5 | 5 | 60 | 10 | 12 |
| | 0.6 | 9.5 | 5 | 60 | 10 | 12 |
| | 0.7 | 9.5 | 5 | 60 | 10 | 12 |
| | 0.8 | 9.5 | 5 | 60 | 10 | 12 |
| | 0.9 | 9.5 | 5 | 60 | 10 | 12 |
| | 1 | 9.5 | 5 | 60 | 10 | 12 |
| | 1.1 | 9.5 | 5 | 60 | 10 | 12 |
| | 1.2 | 9.5 | 5 | 60 | 10 | 12 |
| | 1.3 | 9.5 | 5 | 60 | 10 | 12 |
| | 1.4 | 9.5 | 5 | 60 | 10 | 12 |
| | 1.5 | 9.5 | 5 | 60 | 10 | 12 |
| | 1.6 | 9.5 | 5 | 60 | 10 | 12 |
| | 1.7 | 9.5 | 5 | 60 | 10 | 12 |
| | 1.8 | 9.5 | 5 | 60 | 10 | 12 |
| | 1.9 | 9.5 | 5 | 60 | 10 | 12 |

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 20 | 2 | 9.5 | 5 | 60 | 10 | 12 |
| | 2.1 | 9.5 | 5 | 60 | 10 | 12 |
| | 2.2 | 9.5 | 5 | 60 | 10 | 12 |
| | 2.3 | 9.5 | 5 | 60 | 10 | 12 |
| | 2.4 | 9.5 | 5 | 60 | 10 | 12 |
| | 2.5 | 9.5 | 5 | 60 | 10 | 12 |
| | 2.6 | 9.5 | 5 | 60 | 10 | 12 |
| | 2.7 | 9.5 | 5 | 60 | 10 | 12 |
| | 2.8 | 9.5 | 5 | 60 | 10 | 12 |
| | 2.9 | 9.5 | 5 | 60 | 10 | 12 |
| | 3 | 9.5 | 5 | 60 | 10 | 12 |
| | 3.5 | 9.5 | 5 | 60 | 10 | 12 |
| | 4 | 9.5 | 5 | 60 | 10 | 12 |
| | 4.5 | 9.5 | 5 | 60 | 10 | 12 |
| | 5 | 9.5 | 5 | 60 | 10 | 12 |
| 30 | 0.5 | 9.5 | 5 | 60 | 10 | 14 |
| | 0.6 | 9.5 | 5 | 60 | 10 | 14 |
| | 0.7 | 9.5 | 5 | 60 | 10 | 14 |
| | 0.8 | 9.5 | 5 | 60 | 10 | 14 |
| | 0.9 | 9.5 | 5 | 60 | 10 | 14 |
| | 1 | 9.5 | 5 | 60 | 10 | 14 |
| | 1.1 | 9.5 | 5 | 60 | 10 | 14 |
| | 1.2 | 9.5 | 5 | 60 | 10 | 14 |
| | 1.3 | 9.5 | 5 | 60 | 10 | 14 |
| | 1.4 | 9.5 | 5 | 60 | 10 | 14 |
| | 1.5 | 9.5 | 5 | 60 | 10 | 14 |
| | 1.6 | 9.5 | 5 | 60 | 10 | 14 |
| | 1.7 | 9.5 | 5 | 60 | 10 | 14 |
| | 1.8 | 9.5 | 5 | 60 | 10 | 14 |
| | 1.9 | 9.5 | 5 | 60 | 10 | 14 |
| | 2 | 9.5 | 5 | 60 | 10 | 14 |
| | 2.1 | 9.5 | 5 | 60 | 10 | 14 |
| | 2.2 | 9.5 | 5 | 60 | 10 | 14 |
| | 2.3 | 9.5 | 5 | 60 | 10 | 14 |
| | 2.4 | 9.5 | 5 | 60 | 10 | 14 |
| | 2.5 | 9.5 | 5 | 60 | 10 | 14 |
| | 2.6 | 9.5 | 5 | 60 | 10 | 14 |
| | 2.7 | 9.5 | 5 | 60 | 10 | 14 |
| | 2.8 | 9.5 | 5 | 60 | 10 | 14 |
| | 2.9 | 9.5 | 5 | 60 | 10 | 14 |
| | 3 | 9.5 | 5 | 60 | 10 | 14 |
| | 3.5 | 9.5 | 5 | 60 | 10 | 14 |
| | 4 | 9.5 | 5 | 60 | 10 | 14 |
| | 4.5 | 9.5 | 5 | 60 | 10 | 14 |
| | 5 | 9.5 | 5 | 60 | 10 | 14 |

ハイス

# KC

## キーシードカッター *Keyseat Cutter*

切削条件表 P258

### スクエア溝加工（キーシードカッター）

右直刃 HSS

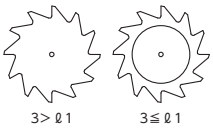





図1

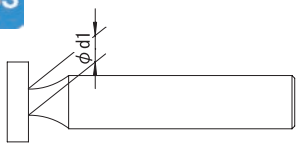
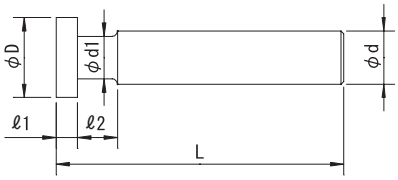



図2




| 公差 (Tolerance) | D | | | | ℓ1 | | | | d |
|---|---|---|---|---|---|---|---|---|---|
| | 8～16 | +0.3 +0.18 | 18～28 | +0.35 +0.21 | 0.5～ 3 | −0.014 −0.028 | 3.5～ 6 | −0.02 −0.038 | h8 |
| | 30～45 | +0.43 +0.26 | 48～80 | +0.5 +0.3 | 7 ～10 | −0.025 −0.047 | 11 ～16 | −0.032 −0.059 | |

右刃ストレート　SKH51
Straight Flute　HSS

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | 形状 *Shape* |
|---|---|---|---|---|---|---|---|
| 8 | 0.5 | 3.7 | 6 | 50 | 8 | 8 | 図1 |
| | 0.6 | 3.7 | 6 | 50 | 8 | 8 | |
| | 0.7 | 3.7 | 6 | 50 | 8 | 8 | |
| | 0.8 | 3.7 | 6 | 50 | 8 | 8 | |
| | 0.9 | 3.7 | 6 | 50 | 8 | 8 | |
| | 1 | 3.7 | 6 | 50 | 8 | 8 | |
| | 1.1 | 3.7 | 6 | 50 | 8 | 8 | |
| | 1.2 | 3.7 | 6 | 50 | 8 | 8 | |
| | 1.3 | 3.7 | 6 | 50 | 8 | 8 | |
| | 1.4 | 3.7 | 6 | 50 | 8 | 8 | |
| | 1.5 | 3.7 | 6 | 50 | 8 | 8 | |
| | 1.6 | 3.7 | 6 | 50 | 8 | 8 | |
| | 1.7 | 3.7 | 6 | 50 | 8 | 8 | |
| | 1.8 | 3.7 | 6 | 50 | 8 | 8 | |
| | 1.9 | 3.7 | 6 | 50 | 8 | 8 | |
| | 2 | 3.7 | 6 | 50 | 8 | 8 | |
| | 2.1 | 3.7 | 6 | 50 | 8 | 8 | |
| | 2.2 | 3.7 | 6 | 50 | 8 | 8 | |
| | 2.3 | 3.7 | 6 | 50 | 8 | 8 | |
| | 2.4 | 3.7 | 6 | 50 | 8 | 8 | |
| | 2.5 | 3.7 | 6 | 50 | 8 | 8 | |
| | 2.6 | 3.7 | 6 | 50 | 8 | 8 | |
| | 2.7 | 3.7 | 6 | 50 | 8 | 8 | |
| | 2.8 | 3.7 | 6 | 50 | 8 | 8 | |
| | 2.9 | 3.7 | 6 | 50 | 8 | 8 | |
| | 3 | 3.7 | 6 | 50 | 8 | 8 | |
| | 3.5 | 3.7 | 6 | 50 | 8 | 8 | |
| | 4 | 3.7 | 6 | 50 | 8 | 8 | |
| | 4.5 | 3.7 | 6 | 50 | 8 | 8 | |
| | 5 | 3.7 | 6 | 50 | 8 | 8 | |
| | 6 | 3.7 | 6 | 50 | 8 | 8 | |
| 10 | 0.5 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 0.6 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 0.7 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 0.8 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 0.9 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 1 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 1.1 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 1.2 | 4.2 | 5.8 | 50 | 8 | 8 | |

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | 形状 *Shape* |
|---|---|---|---|---|---|---|---|
| 10 | 1.3 | 4.2 | 5.8 | 50 | 8 | 8 | 図1 |
| | 1.4 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 1.5 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 1.6 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 1.7 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 1.8 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 1.9 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 2 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 2.1 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 2.2 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 2.3 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 2.4 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 2.5 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 2.6 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 2.7 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 2.8 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 2.9 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 3 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 3.5 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 4 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 4.5 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 5 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 6 | 4.2 | 5.8 | 50 | 8 | 8 | |
| 12 | 0.5 | 4.4 | 7 | 50 | 10 | 8 | |
| | 0.6 | 4.4 | 7 | 50 | 10 | 8 | |
| | 0.7 | 4.4 | 7 | 50 | 10 | 8 | |
| | 0.8 | 4.4 | 7 | 50 | 10 | 8 | |
| | 0.9 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.1 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.2 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.3 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.4 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.5 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.6 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.7 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.8 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.9 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2 | 4.4 | 7 | 50 | 10 | 8 | |

# KC キーシードカッター

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | 形状 Shape |
|---|---|---|---|---|---|---|---|
| 12 | 2.1 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2.2 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2.3 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2.4 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2.5 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2.6 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2.7 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2.8 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2.9 | 4.4 | 7 | 50 | 10 | 8 | |
| | 3 | 4.4 | 7 | 50 | 10 | 8 | |
| | 3.5 | 4.4 | 7 | 50 | 10 | 8 | |
| | 4 | 4.4 | 7 | 50 | 10 | 8 | |
| | 4.5 | 4.4 | 7 | 50 | 10 | 8 | |
| | 5 | 4.4 | 7 | 50 | 10 | 8 | |
| | 6 | 4.4 | 7 | 50 | 10 | 8 | |
| | 7 | 4.4 | 7 | 50 | 10 | 8 | |
| 13 | 0.5 | 4.4 | 7 | 50 | 10 | 8 | 図1 |
| | 0.6 | 4.4 | 7 | 50 | 10 | 8 | |
| | 0.7 | 4.4 | 7 | 50 | 10 | 8 | |
| | 0.8 | 4.4 | 7 | 50 | 10 | 8 | |
| | 0.9 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.1 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.2 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.3 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.4 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.5 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.6 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.7 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.8 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.9 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2.1 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2.2 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2.3 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2.4 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2.5 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2.6 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2.7 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2.8 | 4.4 | 7 | 50 | 10 | 8 | |
| | 2.9 | 4.4 | 7 | 50 | 10 | 8 | |
| | 3 | 4.4 | 7 | 50 | 10 | 8 | |
| | 3.5 | 4.4 | 7 | 50 | 10 | 8 | |
| | 4 | 4.4 | 7 | 50 | 10 | 8 | |
| | 4.5 | 4.4 | 7 | 50 | 10 | 8 | |
| | 5 | 4.4 | 7 | 50 | 10 | 8 | |
| | 6 | 4.4 | 7 | 50 | 10 | 8 | |
| | 7 | 4.4 | 7 | 50 | 10 | 8 | |
| | 8 | 4.4 | 7 | 50 | 10 | 8 | |
| 14 | 0.5 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 0.6 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 0.7 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 0.8 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 0.9 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 1 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 1.1 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 1.2 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 1.3 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 1.4 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 1.5 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 1.6 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 1.7 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 1.8 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 1.9 | 4.7 | 7.8 | 50 | 10 | 8 | |

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | 形状 Shape |
|---|---|---|---|---|---|---|---|
| 14 | 2 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 2.1 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 2.2 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 2.3 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 2.4 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 2.5 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 2.6 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 2.7 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 2.8 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 2.9 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 3 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 3.5 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 4 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 4.5 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 5 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 6 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 7 | 4.7 | 7.8 | 50 | 10 | 8 | |
| | 8 | 4.7 | 7.8 | 50 | 10 | 8 | |
| 15 | 0.5 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 0.6 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 0.7 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 0.8 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 0.9 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 1 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 1.1 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 1.2 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 1.3 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 1.4 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 1.5 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 1.6 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 1.7 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 1.8 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 1.9 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 2 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 2.1 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 2.2 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 2.3 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 2.4 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 2.5 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 2.6 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 2.7 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 2.8 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 2.9 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 3 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 3.5 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 4 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 4.5 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 5 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 6 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 7 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 8 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 9 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 10 | 4.7 | 7.8 | 50 | 10 | 10 | |
| 16 | 0.5 | 5 | 8.8 | 60 | 12 | 10 | |
| | 0.6 | 5 | 8.8 | 60 | 12 | 10 | |
| | 0.7 | 5 | 8.8 | 60 | 12 | 10 | |
| | 0.8 | 5 | 8.8 | 60 | 12 | 10 | |
| | 0.9 | 5 | 8.8 | 60 | 12 | 10 | |
| | 1 | 5 | 8.8 | 60 | 12 | 10 | |
| | 1.1 | 5 | 8.8 | 60 | 12 | 10 | |
| | 1.2 | 5 | 8.8 | 60 | 12 | 10 | |
| | 1.3 | 5 | 8.8 | 60 | 12 | 10 | |
| | 1.4 | 5 | 8.8 | 60 | 12 | 10 | |
| | 1.5 | 5 | 8.8 | 60 | 12 | 10 | |

# KC キーシードカッター

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | 形状 Shape |
|---|---|---|---|---|---|---|---|
| 16 | 1.6 | 5 | 8.8 | 60 | 12 | 10 | |
| | 1.7 | 5 | 8.8 | 60 | 12 | 10 | |
| | 1.8 | 5 | 8.8 | 60 | 12 | 10 | |
| | 1.9 | 5 | 8.8 | 60 | 12 | 10 | |
| | 2 | 5 | 8.8 | 60 | 12 | 10 | |
| | 2.1 | 5 | 8.8 | 60 | 12 | 10 | |
| | 2.2 | 5 | 8.8 | 60 | 12 | 10 | |
| | 2.3 | 5 | 8.8 | 60 | 12 | 10 | |
| | 2.4 | 5 | 8.8 | 60 | 12 | 10 | |
| | 2.5 | 5 | 8.8 | 60 | 12 | 10 | |
| | 2.6 | 5 | 8.8 | 60 | 12 | 10 | |
| | 2.7 | 5 | 8.8 | 60 | 12 | 10 | |
| | 2.8 | 5 | 8.8 | 60 | 12 | 10 | |
| | 2.9 | 5 | 8.8 | 60 | 12 | 10 | |
| | 3 | 5 | 8.8 | 60 | 12 | 10 | |
| | 3.5 | 5 | 8.8 | 60 | 12 | 10 | |
| | 4 | 5 | 8.8 | 60 | 12 | 10 | |
| | 4.5 | 5 | 8.8 | 60 | 12 | 10 | |
| | 5 | 5 | 8.8 | 60 | 12 | 10 | |
| | 6 | 5 | 8.8 | 60 | 12 | 10 | |
| | 7 | 5 | 8.8 | 60 | 12 | 10 | |
| | 8 | 5 | 8.8 | 60 | 12 | 10 | |
| | 9 | 5 | 8.8 | 60 | 12 | 10 | |
| | 10 | 5 | 8.8 | 60 | 12 | 10 | |
| | 11 | 5 | 8.8 | 60 | 12 | 10 | |
| | 12 | 5 | 8.8 | 60 | 12 | 10 | |
| 18 | 0.5 | 7 | 9.6 | 60 | 12 | 12 | |
| | 0.6 | 7 | 9.6 | 60 | 12 | 12 | |
| | 0.7 | 7 | 9.6 | 60 | 12 | 12 | |
| | 0.8 | 7 | 9.6 | 60 | 12 | 12 | |
| | 0.9 | 7 | 9.6 | 60 | 12 | 12 | |
| | 1 | 7 | 9.6 | 60 | 12 | 12 | |
| | 1.1 | 7 | 9.6 | 60 | 12 | 12 | 図1 |
| | 1.2 | 7 | 9.6 | 60 | 12 | 12 | |
| | 1.3 | 7 | 9.6 | 60 | 12 | 12 | |
| | 1.4 | 7 | 9.6 | 60 | 12 | 12 | |
| | 1.5 | 7 | 9.6 | 60 | 12 | 12 | |
| | 1.6 | 7 | 9.6 | 60 | 12 | 12 | |
| | 1.7 | 7 | 9.6 | 60 | 12 | 12 | |
| | 1.8 | 7 | 9.6 | 60 | 12 | 12 | |
| | 1.9 | 7 | 9.6 | 60 | 12 | 12 | |
| | 2 | 7 | 9.6 | 60 | 12 | 12 | |
| | 2.1 | 7 | 9.6 | 60 | 12 | 12 | |
| | 2.2 | 7 | 9.6 | 60 | 12 | 12 | |
| | 2.3 | 7 | 9.6 | 60 | 12 | 12 | |
| | 2.4 | 7 | 9.6 | 60 | 12 | 12 | |
| | 2.5 | 7 | 9.6 | 60 | 12 | 12 | |
| | 2.6 | 7 | 9.6 | 60 | 12 | 12 | |
| | 2.7 | 7 | 9.6 | 60 | 12 | 12 | |
| | 2.8 | 7 | 9.6 | 60 | 12 | 12 | |
| | 2.9 | 7 | 9.6 | 60 | 12 | 12 | |
| | 3 | 7 | 9.6 | 60 | 12 | 12 | |
| | 3.5 | 7 | 9.6 | 60 | 12 | 12 | |
| | 4 | 7 | 9.6 | 60 | 12 | 12 | |
| | 4.5 | 7 | 9.6 | 60 | 12 | 12 | |
| | 5 | 7 | 9.6 | 60 | 12 | 12 | |
| | 6 | 7 | 9.6 | 60 | 12 | 12 | |
| | 7 | 7 | 9.6 | 60 | 12 | 12 | |
| | 8 | 7 | 9.6 | 60 | 12 | 12 | |
| | 9 | 7 | 9.6 | 60 | 12 | 12 | |
| | 10 | 7 | 9.6 | 60 | 12 | 12 | |
| | 11 | 7 | 9.6 | 60 | 12 | 12 | |
| | 12 | 7 | 9.6 | 60 | 12 | 12 | |
| 19 | 0.5 | 8 | 8.7 | 60 | 12 | 12 | |

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | 形状 Shape |
|---|---|---|---|---|---|---|---|
| 19 | 0.6 | 8 | 8.7 | 60 | 12 | 12 | |
| | 0.7 | 8 | 8.7 | 60 | 12 | 12 | |
| | 0.8 | 8 | 8.7 | 60 | 12 | 12 | |
| | 0.9 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.1 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.2 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.3 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.4 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.5 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.6 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.7 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.8 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.9 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2.1 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2.2 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2.3 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2.4 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2.5 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2.6 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2.7 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2.8 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2.9 | 8 | 8.7 | 60 | 12 | 12 | |
| | 3 | 8 | 8.7 | 60 | 12 | 12 | |
| | 3.5 | 8 | 8.7 | 60 | 12 | 12 | |
| | 4 | 8 | 8.7 | 60 | 12 | 12 | |
| | 4.5 | 8 | 8.7 | 60 | 12 | 12 | |
| | 5 | 8 | 8.7 | 60 | 12 | 12 | |
| | 6 | 8 | 8.7 | 60 | 12 | 12 | |
| | 7 | 8 | 8.7 | 60 | 12 | 12 | |
| | 8 | 8 | 8.7 | 60 | 12 | 12 | |
| | 9 | 8 | 8.7 | 60 | 12 | 12 | |
| | 10 | 8 | 8.7 | 60 | 12 | 12 | |
| | 11 | 8 | 8.7 | 60 | 12 | 12 | |
| | 12 | 8 | 8.7 | 60 | 12 | 12 | |
| 20 | 0.5 | 8 | 8.7 | 60 | 12 | 12 | |
| | 0.6 | 8 | 8.7 | 60 | 12 | 12 | |
| | 0.7 | 8 | 8.7 | 60 | 12 | 12 | |
| | 0.8 | 8 | 8.7 | 60 | 12 | 12 | |
| | 0.9 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.1 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.2 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.3 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.4 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.5 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.6 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.7 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.8 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.9 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2.1 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2.2 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2.3 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2.4 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2.5 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2.6 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2.7 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2.8 | 8 | 8.7 | 60 | 12 | 12 | |
| | 2.9 | 8 | 8.7 | 60 | 12 | 12 | |
| | 3 | 8 | 8.7 | 60 | 12 | 12 | |
| | 3.5 | 8 | 8.7 | 60 | 12 | 12 | |
| | 4 | 8 | 8.7 | 60 | 12 | 12 | |

# KC キーシードカッター

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | 形状 Shape |
|---|---|---|---|---|---|---|---|
| 20 | 4.5 | 8 | 8.7 | 60 | 12 | 12 | 図1 |
| | 5 | 8 | 8.7 | 60 | 12 | 12 | |
| | 6 | 8 | 8.7 | 60 | 12 | 12 | |
| | 7 | 8 | 8.7 | 60 | 12 | 12 | |
| | 8 | 8 | 8.7 | 60 | 12 | 12 | |
| | 9 | 8 | 8.7 | 60 | 12 | 12 | |
| | 10 | 8 | 8.7 | 60 | 12 | 12 | |
| | 11 | 8 | 8.7 | 60 | 12 | 12 | |
| | 12 | 8 | 8.7 | 60 | 12 | 12 | |
| 22 | 0.5 | 9 | 8.5 | 60 | 12 | 12 | |
| | 0.6 | 9 | 8.5 | 60 | 12 | 12 | |
| | 0.7 | 9 | 8.5 | 60 | 12 | 12 | |
| | 0.8 | 9 | 8.5 | 60 | 12 | 12 | |
| | 0.9 | 9 | 8.5 | 60 | 12 | 12 | |
| | 1 | 9 | 8.5 | 60 | 12 | 12 | |
| | 1.1 | 9 | 8.5 | 60 | 12 | 12 | |
| | 1.2 | 9 | 8.5 | 60 | 12 | 12 | |
| | 1.3 | 9 | 8.5 | 60 | 12 | 12 | |
| | 1.4 | 9 | 8.5 | 60 | 12 | 12 | |
| | 1.5 | 9 | 8.5 | 60 | 12 | 12 | |
| | 1.6 | 9 | 8.5 | 60 | 12 | 12 | |
| | 1.7 | 9 | 8.5 | 60 | 12 | 12 | |
| | 1.8 | 9 | 8.5 | 60 | 12 | 12 | |
| | 1.9 | 9 | 8.5 | 60 | 12 | 12 | |
| | 2 | 9 | 8.5 | 60 | 12 | 12 | |
| | 2.1 | 9 | 8.5 | 60 | 12 | 12 | |
| | 2.2 | 9 | 8.5 | 60 | 12 | 12 | |
| | 2.3 | 9 | 8.5 | 60 | 12 | 12 | |
| | 2.4 | 9 | 8.5 | 60 | 12 | 12 | |
| | 2.5 | 9 | 8.5 | 60 | 12 | 12 | |
| | 2.6 | 9 | 8.5 | 60 | 12 | 12 | |
| | 2.7 | 9 | 8.5 | 60 | 12 | 12 | |
| | 2.8 | 9 | 8.5 | 60 | 12 | 12 | |
| | 2.9 | 9 | 8.5 | 60 | 12 | 12 | |
| | 3 | 9 | 8.5 | 60 | 12 | 12 | |
| | 3.5 | 9 | 8.5 | 60 | 12 | 12 | |
| | 4 | 9 | 8.5 | 60 | 12 | 12 | |
| | 4.5 | 9 | 8.5 | 60 | 12 | 12 | |
| | 5 | 9 | 8.5 | 60 | 12 | 12 | |
| | 6 | 9 | 8.5 | 60 | 12 | 12 | |
| | 7 | 9 | 8.5 | 60 | 12 | 12 | |
| | 8 | 9 | 8.5 | 60 | 12 | 12 | |
| | 9 | 9 | 8.5 | 60 | 12 | 12 | |
| | 10 | 9 | 8.5 | 60 | 12 | 12 | |
| | 11 | 9 | 8.5 | 60 | 12 | 12 | |
| | 12 | 9 | 8.5 | 60 | 12 | 12 | |
| 24 | 0.5 | 10 | 12 | 65 | 12 | 14 | 図2 |
| | 0.6 | 10 | 12 | 65 | 12 | 14 | |
| | 0.7 | 10 | 12 | 65 | 12 | 14 | |
| | 0.8 | 10 | 12 | 65 | 12 | 14 | |
| | 0.9 | 10 | 12 | 65 | 12 | 14 | |
| | 1 | 10 | 12 | 65 | 12 | 14 | |
| | 1.1 | 10 | 12 | 65 | 12 | 14 | |
| | 1.2 | 10 | 12 | 65 | 12 | 14 | |
| | 1.3 | 10 | 12 | 65 | 12 | 14 | |
| | 1.4 | 10 | 12 | 65 | 12 | 14 | |
| | 1.5 | 10 | 12 | 65 | 12 | 14 | |
| | 1.6 | 10 | 12 | 65 | 12 | 14 | |
| | 1.7 | 10 | 12 | 65 | 12 | 14 | |
| | 1.8 | 10 | 12 | 65 | 12 | 14 | |
| | 1.9 | 10 | 12 | 65 | 12 | 14 | |
| | 2 | 10 | 12 | 65 | 12 | 14 | |
| | 2.1 | 10 | 12 | 65 | 12 | 14 | |
| | 2.2 | 10 | 12 | 65 | 12 | 14 | |

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | 形状 Shape |
|---|---|---|---|---|---|---|---|
| 24 | 2.3 | 10 | 12 | 65 | 12 | 14 | 図2 |
| | 2.4 | 10 | 12 | 65 | 12 | 14 | |
| | 2.5 | 10 | 12 | 65 | 12 | 14 | |
| | 2.6 | 10 | 12 | 65 | 12 | 14 | |
| | 2.7 | 10 | 12 | 65 | 12 | 14 | |
| | 2.8 | 10 | 12 | 65 | 12 | 14 | |
| | 2.9 | 10 | 12 | 65 | 12 | 14 | |
| | 3 | 10 | 12 | 65 | 12 | 14 | |
| | 3.5 | 10 | 12 | 65 | 12 | 14 | |
| | 4 | 10 | 12 | 65 | 12 | 14 | |
| | 4.5 | 10 | 12 | 65 | 12 | 14 | |
| | 5 | 10 | 12 | 65 | 12 | 14 | |
| | 5.5 | 10 | 12 | 65 | 12 | 14 | |
| | 6 | 10 | 12 | 65 | 12 | 14 | |
| | 7 | 10 | 12 | 65 | 12 | 14 | |
| | 8 | 10 | 12 | 65 | 12 | 14 | |
| | 9 | 10 | 12 | 65 | 12 | 14 | |
| | 10 | 10 | 12 | 65 | 12 | 14 | |
| | 11 | 10 | 12 | 65 | 12 | 14 | |
| | 12 | 10 | 12 | 65 | 12 | 14 | |
| 25 | 0.5 | 10 | 12 | 65 | 12 | 14 | |
| | 0.6 | 10 | 12 | 65 | 12 | 14 | |
| | 0.7 | 10 | 12 | 65 | 12 | 14 | |
| | 0.8 | 10 | 12 | 65 | 12 | 14 | |
| | 0.9 | 10 | 12 | 65 | 12 | 14 | |
| | 1 | 10 | 12 | 65 | 12 | 14 | |
| | 1.1 | 10 | 12 | 65 | 12 | 14 | |
| | 1.2 | 10 | 12 | 65 | 12 | 14 | |
| | 1.3 | 10 | 12 | 65 | 12 | 14 | |
| | 1.4 | 10 | 12 | 65 | 12 | 14 | |
| | 1.5 | 10 | 12 | 65 | 12 | 14 | |
| | 1.6 | 10 | 12 | 65 | 12 | 14 | |
| | 1.7 | 10 | 12 | 65 | 12 | 14 | |
| | 1.8 | 10 | 12 | 65 | 12 | 14 | |
| | 1.9 | 10 | 12 | 65 | 12 | 14 | |
| | 2 | 10 | 12 | 65 | 12 | 14 | |
| | 2.1 | 10 | 12 | 65 | 12 | 14 | |
| | 2.2 | 10 | 12 | 65 | 12 | 14 | |
| | 2.3 | 10 | 12 | 65 | 12 | 14 | |
| | 2.4 | 10 | 12 | 65 | 12 | 14 | |
| | 2.5 | 10 | 12 | 65 | 12 | 14 | |
| | 2.6 | 10 | 12 | 65 | 12 | 14 | |
| | 2.7 | 10 | 12 | 65 | 12 | 14 | |
| | 2.8 | 10 | 12 | 65 | 12 | 14 | |
| | 2.9 | 10 | 12 | 65 | 12 | 14 | |
| | 3 | 10 | 12 | 65 | 12 | 14 | |
| | 3.5 | 10 | 12 | 65 | 12 | 14 | |
| | 4 | 10 | 12 | 65 | 12 | 14 | |
| | 4.5 | 10 | 12 | 65 | 12 | 14 | |
| | 5 | 10 | 12 | 65 | 12 | 14 | |
| | 6 | 10 | 12 | 65 | 12 | 14 | |
| | 7 | 10 | 12 | 65 | 12 | 14 | |
| | 8 | 10 | 12 | 65 | 12 | 14 | |
| | 9 | 10 | 12 | 65 | 12 | 14 | |
| | 10 | 10 | 12 | 65 | 12 | 14 | |
| | 11 | 10 | 12 | 65 | 12 | 14 | |
| | 12 | 10 | 12 | 65 | 12 | 14 | |
| 26 | 0.5 | 10 | 12 | 65 | 12 | 14 | |
| | 0.6 | 10 | 12 | 65 | 12 | 14 | |
| | 0.7 | 10 | 12 | 65 | 12 | 14 | |
| | 0.8 | 10 | 12 | 65 | 12 | 14 | |
| | 0.9 | 10 | 12 | 65 | 12 | 14 | |
| | 1 | 10 | 12 | 65 | 12 | 14 | |
| | 1.1 | 10 | 12 | 65 | 12 | 14 | |

# KC キーシードカッター

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | 形状 Shape |
|---|---|---|---|---|---|---|---|
| 26 | 1.2 | 10 | 12 | 65 | 12 | 14 | |
| | 1.3 | 10 | 12 | 65 | 12 | 14 | |
| | 1.4 | 10 | 12 | 65 | 12 | 14 | |
| | 1.5 | 10 | 12 | 65 | 12 | 14 | |
| | 1.6 | 10 | 12 | 65 | 12 | 14 | |
| | 1.7 | 10 | 12 | 65 | 12 | 14 | |
| | 1.8 | 10 | 12 | 65 | 12 | 14 | |
| | 1.9 | 10 | 12 | 65 | 12 | 14 | |
| | 2 | 10 | 12 | 65 | 12 | 14 | |
| | 2.1 | 10 | 12 | 65 | 12 | 14 | |
| | 2.2 | 10 | 12 | 65 | 12 | 14 | |
| | 2.3 | 10 | 12 | 65 | 12 | 14 | |
| | 2.4 | 10 | 12 | 65 | 12 | 14 | |
| | 2.5 | 10 | 12 | 65 | 12 | 14 | |
| | 2.6 | 10 | 12 | 65 | 12 | 14 | |
| | 2.7 | 10 | 12 | 65 | 12 | 14 | |
| | 2.8 | 10 | 12 | 65 | 12 | 14 | |
| | 2.9 | 10 | 12 | 65 | 12 | 14 | |
| | 3 | 10 | 12 | 65 | 12 | 14 | |
| | 3.5 | 10 | 12 | 65 | 12 | 14 | |
| | 4 | 10 | 12 | 65 | 12 | 14 | |
| | 4.5 | 10 | 12 | 65 | 12 | 14 | |
| | 5 | 10 | 12 | 65 | 12 | 14 | |
| | 6 | 10 | 12 | 65 | 12 | 14 | |
| | 7 | 10 | 12 | 65 | 12 | 14 | |
| | 8 | 10 | 12 | 65 | 12 | 14 | |
| | 9 | 10 | 12 | 65 | 12 | 14 | |
| | 10 | 10 | 12 | 65 | 12 | 14 | |
| | 11 | 10 | 12 | 65 | 12 | 14 | |
| | 12 | 10 | 12 | 65 | 12 | 14 | |
| 28 | 0.5 | 10 | 24.5 | 65 | 12 | 14 | 図2 |
| | 0.6 | 10 | 24.4 | 65 | 12 | 14 | |
| | 0.7 | 10 | 24.3 | 65 | 12 | 14 | |
| | 0.8 | 10 | 24.2 | 65 | 12 | 14 | |
| | 0.9 | 10 | 24.1 | 65 | 12 | 14 | |
| | 1 | 10 | 24 | 65 | 12 | 14 | |
| | 1.1 | 10 | 23.9 | 65 | 12 | 14 | |
| | 1.2 | 10 | 23.8 | 65 | 12 | 14 | |
| | 1.3 | 10 | 23.7 | 65 | 12 | 14 | |
| | 1.4 | 10 | 23.6 | 65 | 12 | 14 | |
| | 1.5 | 10 | 23.5 | 65 | 12 | 14 | |
| | 1.6 | 10 | 23.4 | 65 | 12 | 14 | |
| | 1.7 | 10 | 23.3 | 65 | 12 | 14 | |
| | 1.8 | 10 | 23.2 | 65 | 12 | 14 | |
| | 1.9 | 10 | 23.1 | 65 | 12 | 14 | |
| | 2 | 10 | 23 | 65 | 12 | 14 | |
| | 2.1 | 10 | 22.9 | 65 | 12 | 14 | |
| | 2.2 | 10 | 22.8 | 65 | 12 | 14 | |
| | 2.3 | 10 | 22.7 | 65 | 12 | 14 | |
| | 2.4 | 10 | 22.6 | 65 | 12 | 14 | |
| | 2.5 | 10 | 22.5 | 65 | 12 | 14 | |
| | 2.6 | 10 | 22.4 | 65 | 12 | 14 | |
| | 2.7 | 10 | 22.3 | 65 | 12 | 14 | |
| | 2.8 | 10 | 22.2 | 65 | 12 | 14 | |
| | 2.9 | 10 | 22.1 | 65 | 12 | 14 | |
| | 3 | 10 | 22 | 65 | 12 | 14 | |
| | 3.5 | 10 | 21.5 | 65 | 12 | 14 | |
| | 4 | 10 | 21 | 65 | 12 | 14 | |
| | 4.5 | 10 | 20.5 | 65 | 12 | 14 | |
| | 5 | 10 | 20 | 65 | 12 | 14 | |
| | 6 | 10 | 19 | 65 | 12 | 14 | |
| | 7 | 10 | 18 | 65 | 12 | 14 | |
| | 8 | 10 | 17 | 65 | 12 | 14 | |
| | 9 | 10 | 16 | 65 | 12 | 14 | |

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | 形状 Shape |
|---|---|---|---|---|---|---|---|
| 28 | 10 | 10 | 15 | 65 | 12 | 14 | |
| | 11 | 10 | 14 | 65 | 12 | 14 | |
| | 12 | 10 | 13 | 65 | 12 | 14 | |
| 30 | 0.5 | 10 | 24.5 | 70 | 12 | 14 | |
| | 0.6 | 10 | 24.4 | 70 | 12 | 14 | |
| | 0.7 | 10 | 24.3 | 70 | 12 | 14 | |
| | 0.8 | 10 | 24.2 | 70 | 12 | 14 | |
| | 0.9 | 10 | 24.1 | 70 | 12 | 14 | |
| | 1 | 10 | 24 | 70 | 12 | 14 | |
| | 1.1 | 10 | 23.9 | 70 | 12 | 14 | |
| | 1.2 | 10 | 23.8 | 70 | 12 | 14 | |
| | 1.3 | 10 | 23.7 | 70 | 12 | 14 | |
| | 1.4 | 10 | 23.6 | 70 | 12 | 14 | |
| | 1.5 | 10 | 23.5 | 70 | 12 | 14 | |
| | 1.6 | 10 | 23.4 | 70 | 12 | 14 | |
| | 1.7 | 10 | 23.3 | 70 | 12 | 14 | |
| | 1.8 | 10 | 23.2 | 70 | 12 | 14 | |
| | 1.9 | 10 | 23.1 | 70 | 12 | 14 | |
| | 2 | 10 | 23 | 70 | 12 | 14 | |
| | 2.1 | 10 | 22.9 | 70 | 12 | 14 | |
| | 2.2 | 10 | 22.8 | 70 | 12 | 14 | |
| | 2.3 | 10 | 22.7 | 70 | 12 | 14 | |
| | 2.4 | 10 | 22.6 | 70 | 12 | 14 | |
| | 2.5 | 10 | 22.5 | 70 | 12 | 14 | |
| | 2.6 | 10 | 22.4 | 70 | 12 | 14 | |
| | 2.7 | 10 | 22.3 | 70 | 12 | 14 | |
| | 2.8 | 10 | 22.2 | 70 | 12 | 14 | |
| | 2.9 | 10 | 22.1 | 70 | 12 | 14 | |
| | 3 | 10 | 22 | 70 | 12 | 14 | |
| | 3.5 | 10 | 21.5 | 70 | 12 | 14 | |
| | 4 | 10 | 21 | 70 | 12 | 14 | |
| | 4.5 | 10 | 20.5 | 70 | 12 | 14 | |
| | 5 | 10 | 20 | 70 | 12 | 14 | 図2 |
| | 6 | 10 | 19 | 70 | 12 | 14 | |
| | 7 | 10 | 18 | 70 | 12 | 14 | |
| | 8 | 10 | 17 | 70 | 12 | 14 | |
| | 9 | 10 | 16 | 70 | 12 | 14 | |
| | 10 | 10 | 15 | 70 | 12 | 14 | |
| | 11 | 10 | 14 | 70 | 12 | 14 | |
| | 12 | 10 | 13 | 70 | 12 | 14 | |
| 32 | 1 | 10 | 24 | 70 | 12 | 14 | |
| | 1.1 | 10 | 23.9 | 70 | 12 | 14 | |
| | 1.2 | 10 | 23.8 | 70 | 12 | 14 | |
| | 1.3 | 10 | 23.7 | 70 | 12 | 14 | |
| | 1.4 | 10 | 23.6 | 70 | 12 | 14 | |
| | 1.5 | 10 | 23.5 | 70 | 12 | 14 | |
| | 1.6 | 10 | 23.4 | 70 | 12 | 14 | |
| | 1.7 | 10 | 23.3 | 70 | 12 | 14 | |
| | 1.8 | 10 | 23.2 | 70 | 12 | 14 | |
| | 1.9 | 10 | 23.1 | 70 | 12 | 14 | |
| | 2 | 10 | 23 | 70 | 12 | 14 | |
| | 2.1 | 10 | 22.9 | 70 | 12 | 14 | |
| | 2.2 | 10 | 22.8 | 70 | 12 | 14 | |
| | 2.3 | 10 | 22.7 | 70 | 12 | 14 | |
| | 2.4 | 10 | 22.6 | 70 | 12 | 14 | |
| | 2.5 | 10 | 22.5 | 70 | 12 | 14 | |
| | 2.6 | 10 | 22.4 | 70 | 12 | 14 | |
| | 2.7 | 10 | 22.3 | 70 | 12 | 14 | |
| | 2.8 | 10 | 22.2 | 70 | 12 | 14 | |
| | 2.9 | 10 | 22.1 | 70 | 12 | 14 | |
| | 3 | 10 | 22 | 70 | 12 | 14 | |
| | 3.5 | 10 | 21.5 | 70 | 12 | 14 | |
| | 4 | 10 | 21 | 70 | 12 | 14 | |
| | 4.5 | 10 | 20.5 | 70 | 12 | 14 | |

# KC キーシードカッター

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | 形状 Shape |
|---|---|---|---|---|---|---|---|
| 32 | 5 | 10 | 20 | 70 | 12 | 14 | |
| | 6 | 10 | 19 | 70 | 12 | 14 | |
| | 7 | 10 | 18 | 70 | 12 | 14 | |
| | 8 | 10 | 17 | 70 | 12 | 14 | |
| | 9 | 10 | 16 | 70 | 12 | 14 | |
| | 10 | 10 | 15 | 70 | 12 | 14 | |
| | 11 | 10 | 14 | 70 | 12 | 14 | |
| | 12 | 10 | 13 | 70 | 12 | 14 | |
| | 13 | 10 | 12 | 70 | 12 | 14 | |
| | 14 | 10 | 11 | 70 | 12 | 14 | |
| | 15 | 10 | 10 | 70 | 12 | 14 | |
| 35 | 1 | 10 | 24 | 75 | 12 | 16 | |
| | 1.1 | 10 | 23.9 | 75 | 12 | 16 | |
| | 1.2 | 10 | 23.8 | 75 | 12 | 16 | |
| | 1.3 | 10 | 23.7 | 75 | 12 | 16 | |
| | 1.4 | 10 | 23.6 | 75 | 12 | 16 | |
| | 1.5 | 10 | 23.5 | 75 | 12 | 16 | |
| | 1.6 | 10 | 23.4 | 75 | 12 | 16 | |
| | 1.7 | 10 | 23.3 | 75 | 12 | 16 | |
| | 1.8 | 10 | 23.2 | 75 | 12 | 16 | |
| | 1.9 | 10 | 23.1 | 75 | 12 | 16 | |
| | 2 | 10 | 23 | 75 | 12 | 16 | |
| | 2.1 | 10 | 22.9 | 75 | 12 | 16 | |
| | 2.2 | 10 | 22.8 | 75 | 12 | 16 | |
| | 2.3 | 10 | 22.7 | 75 | 12 | 16 | |
| | 2.4 | 10 | 22.6 | 75 | 12 | 16 | |
| | 2.5 | 10 | 22.5 | 75 | 12 | 16 | |
| | 2.6 | 10 | 22.4 | 75 | 12 | 16 | |
| | 2.7 | 10 | 22.3 | 75 | 12 | 16 | |
| | 2.8 | 10 | 22.2 | 75 | 12 | 16 | |
| | 2.9 | 10 | 22.1 | 75 | 12 | 16 | |
| | 3 | 10 | 22 | 75 | 12 | 16 | |
| | 3.5 | 10 | 21.5 | 75 | 12 | 16 | |
| | 4 | 10 | 21 | 75 | 12 | 16 | |
| | 4.5 | 10 | 20.5 | 75 | 12 | 16 | |
| | 5 | 10 | 20 | 75 | 12 | 16 | |
| | 6 | 10 | 19 | 75 | 12 | 16 | |
| | 7 | 10 | 18 | 75 | 12 | 16 | |
| | 8 | 10 | 17 | 75 | 12 | 16 | |
| | 9 | 10 | 16 | 75 | 12 | 16 | |
| | 10 | 10 | 15 | 75 | 12 | 16 | |
| | 11 | 10 | 14 | 75 | 12 | 16 | |
| | 12 | 10 | 13 | 75 | 12 | 16 | |
| | 13 | 10 | 12 | 75 | 12 | 16 | |
| | 14 | 10 | 11 | 75 | 12 | 16 | |
| | 15 | 10 | 10 | 75 | 12 | 16 | |
| 38 | 1 | 10 | 24 | 75 | 12 | 16 | |
| | 1.1 | 10 | 23.9 | 75 | 12 | 16 | |
| | 1.2 | 10 | 23.8 | 75 | 12 | 16 | |
| | 1.3 | 10 | 23.7 | 75 | 12 | 16 | |
| | 1.4 | 10 | 23.6 | 75 | 12 | 16 | |
| | 1.5 | 10 | 23.5 | 75 | 12 | 16 | |
| | 1.6 | 10 | 23.4 | 75 | 12 | 16 | |
| | 1.7 | 10 | 23.3 | 75 | 12 | 16 | |
| | 1.8 | 10 | 23.2 | 75 | 12 | 16 | |
| | 1.9 | 10 | 23.1 | 75 | 12 | 16 | |
| | 2 | 10 | 23 | 75 | 12 | 16 | |
| | 2.1 | 10 | 22.9 | 75 | 12 | 16 | |
| | 2.2 | 10 | 22.8 | 75 | 12 | 16 | |
| | 2.3 | 10 | 22.7 | 75 | 12 | 16 | |
| | 2.4 | 10 | 22.6 | 75 | 12 | 16 | |
| | 2.5 | 10 | 22.5 | 75 | 12 | 16 | |
| | 2.6 | 10 | 22.4 | 75 | 12 | 16 | |
| | 2.7 | 10 | 22.3 | 75 | 12 | 16 | |

図2

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | 形状 Shape |
|---|---|---|---|---|---|---|---|
| 38 | 2.8 | 10 | 22.2 | 75 | 12 | 16 | |
| | 2.9 | 10 | 22.1 | 75 | 12 | 16 | |
| | 3 | 10 | 22 | 75 | 12 | 16 | |
| | 3.5 | 10 | 21.5 | 75 | 12 | 16 | |
| | 4 | 10 | 21 | 75 | 12 | 16 | |
| | 4.5 | 10 | 20.5 | 75 | 12 | 16 | |
| | 5 | 10 | 20 | 75 | 12 | 16 | |
| | 6 | 10 | 19 | 75 | 12 | 16 | |
| | 7 | 10 | 18 | 75 | 12 | 16 | |
| | 8 | 10 | 17 | 75 | 12 | 16 | |
| | 9 | 10 | 16 | 75 | 12 | 16 | |
| | 10 | 10 | 15 | 75 | 12 | 16 | |
| | 11 | 10 | 14 | 75 | 12 | 16 | |
| | 12 | 10 | 13 | 75 | 12 | 16 | |
| | 13 | 10 | 12 | 75 | 12 | 16 | |
| | 14 | 10 | 11 | 75 | 12 | 16 | |
| | 15 | 10 | 10 | 75 | 12 | 16 | |
| 40 | 1 | 10 | 24 | 75 | 12 | 16 | |
| | 1.1 | 10 | 23.9 | 75 | 12 | 16 | |
| | 1.2 | 10 | 23.8 | 75 | 12 | 16 | |
| | 1.3 | 10 | 23.7 | 75 | 12 | 16 | |
| | 1.4 | 10 | 23.6 | 75 | 12 | 16 | |
| | 1.5 | 10 | 23.5 | 75 | 12 | 16 | |
| | 1.6 | 10 | 23.4 | 75 | 12 | 16 | |
| | 1.7 | 10 | 23.3 | 75 | 12 | 16 | |
| | 1.8 | 10 | 23.2 | 75 | 12 | 16 | |
| | 1.9 | 10 | 23.1 | 75 | 12 | 16 | |
| | 2 | 10 | 23 | 75 | 12 | 16 | |
| | 2.1 | 10 | 22.9 | 75 | 12 | 16 | |
| | 2.2 | 10 | 22.8 | 75 | 12 | 16 | |
| | 2.3 | 10 | 22.7 | 75 | 12 | 16 | |
| | 2.4 | 10 | 22.6 | 75 | 12 | 16 | |
| | 2.5 | 10 | 22.5 | 75 | 12 | 16 | |
| | 2.6 | 10 | 22.4 | 75 | 12 | 16 | |
| | 2.7 | 10 | 22.3 | 75 | 12 | 16 | |
| | 2.8 | 10 | 22.2 | 75 | 12 | 16 | |
| | 2.9 | 10 | 22.1 | 75 | 12 | 16 | |
| | 3 | 10 | 22 | 75 | 12 | 16 | |
| | 3.5 | 10 | 21.5 | 75 | 12 | 16 | |
| | 4 | 10 | 21 | 75 | 12 | 16 | |
| | 4.5 | 10 | 20.5 | 75 | 12 | 16 | |
| | 5 | 10 | 20 | 75 | 12 | 16 | |
| | 6 | 10 | 19 | 75 | 12 | 16 | |
| | 7 | 10 | 18 | 75 | 12 | 16 | |
| | 8 | 10 | 17 | 75 | 12 | 16 | |
| | 9 | 10 | 16 | 75 | 12 | 16 | |
| | 10 | 10 | 15 | 75 | 12 | 16 | |
| | 11 | 10 | 14 | 75 | 12 | 16 | |
| | 12 | 10 | 13 | 75 | 12 | 16 | |
| | 13 | 10 | 12 | 75 | 12 | 16 | |
| | 14 | 10 | 11 | 75 | 12 | 16 | |
| | 15 | 10 | 10 | 75 | 12 | 16 | |
| 42 | 1 | 10 | 24 | 75 | 12 | 16 | |
| | 1.1 | 10 | 23.9 | 75 | 12 | 16 | |
| | 1.2 | 10 | 23.8 | 75 | 12 | 16 | |
| | 1.3 | 10 | 23.7 | 75 | 12 | 16 | |
| | 1.4 | 10 | 23.6 | 75 | 12 | 16 | |
| | 1.5 | 10 | 23.5 | 75 | 12 | 16 | |
| | 1.6 | 10 | 23.4 | 75 | 12 | 16 | |
| | 1.7 | 10 | 23.3 | 75 | 12 | 16 | |
| | 1.8 | 10 | 23.2 | 75 | 12 | 16 | |
| | 1.9 | 10 | 23.1 | 75 | 12 | 16 | |
| | 2 | 10 | 23 | 75 | 12 | 16 | |
| | 2.1 | 10 | 22.9 | 75 | 12 | 16 | |

図2

# KC キーシードカッター

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | 形状 Shape |
|---|---|---|---|---|---|---|---|
| 42 | 2.2 | 10 | 22.8 | 75 | 12 | 16 | |
| | 2.3 | 10 | 22.7 | 75 | 12 | 16 | |
| | 2.4 | 10 | 22.6 | 75 | 12 | 16 | |
| | 2.5 | 10 | 22.5 | 75 | 12 | 16 | |
| | 2.6 | 10 | 22.4 | 75 | 12 | 16 | |
| | 2.7 | 10 | 22.3 | 75 | 12 | 16 | |
| | 2.8 | 10 | 22.2 | 75 | 12 | 16 | |
| | 2.9 | 10 | 22.1 | 75 | 12 | 16 | |
| | 3 | 10 | 22 | 75 | 12 | 16 | |
| | 3.5 | 10 | 21.5 | 75 | 12 | 16 | |
| | 4 | 10 | 21 | 75 | 12 | 16 | |
| | 4.5 | 10 | 20.5 | 75 | 12 | 16 | |
| | 5 | 10 | 20 | 75 | 12 | 16 | |
| | 6 | 10 | 19 | 75 | 12 | 16 | |
| | 7 | 10 | 18 | 75 | 12 | 16 | |
| | 8 | 10 | 17 | 75 | 12 | 16 | |
| | 9 | 10 | 16 | 75 | 12 | 16 | |
| | 10 | 10 | 15 | 75 | 12 | 16 | |
| | 11 | 10 | 14 | 75 | 12 | 16 | |
| | 12 | 10 | 13 | 75 | 12 | 16 | |
| | 13 | 10 | 12 | 75 | 12 | 16 | |
| 45 | 1 | 10 | 24 | 80 | 12 | 16 | 図2 |
| | 1.1 | 10 | 23.9 | 80 | 12 | 16 | |
| | 1.2 | 10 | 23.8 | 80 | 12 | 16 | |
| | 1.3 | 10 | 23.7 | 80 | 12 | 16 | |
| | 1.4 | 10 | 23.6 | 80 | 12 | 16 | |
| | 1.5 | 10 | 23.5 | 80 | 12 | 16 | |
| | 1.6 | 10 | 23.4 | 80 | 12 | 16 | |
| | 1.7 | 10 | 23.3 | 80 | 12 | 16 | |
| | 1.8 | 10 | 23.2 | 80 | 12 | 16 | |
| | 1.9 | 10 | 23.1 | 80 | 12 | 16 | |
| | 2 | 10 | 23 | 80 | 12 | 16 | |
| | 2.1 | 10 | 22.9 | 80 | 12 | 16 | |
| | 2.2 | 10 | 22.8 | 80 | 12 | 16 | |
| | 2.3 | 10 | 22.7 | 80 | 12 | 16 | |
| | 2.4 | 10 | 22.6 | 80 | 12 | 16 | |
| | 2.5 | 10 | 22.5 | 80 | 12 | 16 | |
| | 2.6 | 10 | 22.4 | 80 | 12 | 16 | |
| | 2.7 | 10 | 22.3 | 80 | 12 | 16 | |
| | 2.8 | 10 | 22.2 | 80 | 12 | 16 | |
| | 2.9 | 10 | 22.1 | 80 | 12 | 16 | |
| | 3 | 10 | 22 | 80 | 12 | 16 | |
| | 3.5 | 10 | 21.5 | 80 | 12 | 16 | |
| | 4 | 10 | 21 | 80 | 12 | 16 | |
| | 4.5 | 10 | 20.5 | 80 | 12 | 16 | |
| | 5 | 10 | 20 | 80 | 12 | 16 | |
| | 6 | 10 | 19 | 80 | 12 | 16 | |
| | 7 | 10 | 18 | 80 | 12 | 16 | |
| | 8 | 10 | 17 | 80 | 12 | 16 | |
| | 9 | 10 | 16 | 80 | 12 | 16 | |
| | 10 | 10 | 15 | 80 | 12 | 16 | |
| | 11 | 10 | 14 | 80 | 12 | 16 | |
| | 12 | 10 | 13 | 80 | 12 | 16 | |
| | 13 | 10 | 12 | 80 | 12 | 16 | |
| | 14 | 10 | 11 | 80 | 12 | 16 | |
| | 15 | 10 | 10 | 80 | 12 | 16 | |
| | 16 | 10 | 9 | 80 | 12 | 16 | |
| 48 | 1 | 14 | 24 | 80 | 16 | 16 | |
| | 1.1 | 14 | 23.9 | 80 | 16 | 16 | |
| | 1.2 | 14 | 23.8 | 80 | 16 | 16 | |
| | 1.3 | 14 | 23.7 | 80 | 16 | 16 | |
| | 1.4 | 14 | 23.6 | 80 | 16 | 16 | |
| | 1.5 | 14 | 23.5 | 80 | 16 | 16 | |
| | 1.6 | 14 | 23.4 | 80 | 16 | 16 | |

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | 形状 Shape |
|---|---|---|---|---|---|---|---|
| 48 | 1.7 | 14 | 23.3 | 80 | 16 | 16 | |
| | 1.8 | 14 | 23.2 | 80 | 16 | 16 | |
| | 1.9 | 14 | 23.1 | 80 | 16 | 16 | |
| | 2 | 14 | 23 | 80 | 16 | 16 | |
| | 2.1 | 14 | 22.9 | 80 | 16 | 16 | |
| | 2.2 | 14 | 22.8 | 80 | 16 | 16 | |
| | 2.3 | 14 | 22.7 | 80 | 16 | 16 | |
| | 2.4 | 14 | 22.6 | 80 | 16 | 16 | |
| | 2.5 | 14 | 22.5 | 80 | 16 | 16 | |
| | 2.6 | 14 | 22.4 | 80 | 16 | 16 | |
| | 2.7 | 14 | 22.3 | 80 | 16 | 16 | |
| | 2.8 | 14 | 22.2 | 80 | 16 | 16 | |
| | 2.9 | 14 | 22.1 | 80 | 16 | 16 | |
| | 3 | 14 | 22 | 80 | 16 | 16 | |
| | 3.5 | 14 | 21.5 | 80 | 16 | 16 | |
| | 4 | 14 | 21 | 80 | 16 | 16 | |
| | 4.5 | 14 | 20.5 | 80 | 16 | 16 | |
| | 5 | 14 | 20 | 80 | 16 | 16 | |
| | 6 | 14 | 19 | 80 | 16 | 16 | |
| | 7 | 14 | 18 | 80 | 16 | 16 | |
| | 8 | 14 | 17 | 80 | 16 | 16 | |
| | 9 | 14 | 16 | 80 | 16 | 16 | |
| | 10 | 14 | 15 | 80 | 16 | 16 | |
| | 11 | 14 | 14 | 80 | 16 | 16 | |
| | 12 | 14 | 13 | 80 | 16 | 16 | |
| | 13 | 14 | 12 | 80 | 16 | 16 | |
| | 14 | 14 | 11 | 80 | 16 | 16 | |
| | 15 | 14 | 10 | 80 | 16 | 16 | |
| 50 | 1 | 14 | 24 | 80 | 16 | 16 | 図2 |
| | 1.1 | 14 | 23.9 | 80 | 16 | 16 | |
| | 1.2 | 14 | 23.8 | 80 | 16 | 16 | |
| | 1.3 | 14 | 23.7 | 80 | 16 | 16 | |
| | 1.4 | 14 | 23.6 | 80 | 16 | 16 | |
| | 1.5 | 14 | 23.5 | 80 | 16 | 16 | |
| | 1.6 | 14 | 23.4 | 80 | 16 | 16 | |
| | 1.7 | 14 | 23.3 | 80 | 16 | 16 | |
| | 1.8 | 14 | 23.2 | 80 | 16 | 16 | |
| | 1.9 | 14 | 23.1 | 80 | 16 | 16 | |
| | 2 | 14 | 23 | 80 | 16 | 16 | |
| | 2.1 | 14 | 22.9 | 80 | 16 | 16 | |
| | 2.2 | 14 | 22.8 | 80 | 16 | 16 | |
| | 2.3 | 14 | 22.7 | 80 | 16 | 16 | |
| | 2.4 | 14 | 22.6 | 80 | 16 | 16 | |
| | 2.5 | 14 | 22.5 | 80 | 16 | 16 | |
| | 2.6 | 14 | 22.4 | 80 | 16 | 16 | |
| | 2.7 | 14 | 22.3 | 80 | 16 | 16 | |
| | 2.8 | 14 | 22.2 | 80 | 16 | 16 | |
| | 2.9 | 14 | 22.1 | 80 | 16 | 16 | |
| | 3 | 14 | 22 | 80 | 16 | 16 | |
| | 3.5 | 14 | 21.5 | 80 | 16 | 16 | |
| | 4 | 14 | 21 | 80 | 16 | 16 | |
| | 4.5 | 14 | 20.5 | 80 | 16 | 16 | |
| | 5 | 14 | 20 | 80 | 16 | 16 | |
| | 6 | 14 | 19 | 80 | 16 | 16 | |
| | 7 | 14 | 18 | 80 | 16 | 16 | |
| | 8 | 14 | 17 | 80 | 16 | 16 | |
| | 9 | 14 | 16 | 80 | 16 | 16 | |
| | 10 | 14 | 15 | 80 | 16 | 16 | |
| | 11 | 14 | 14 | 80 | 16 | 16 | |
| | 12 | 14 | 13 | 80 | 16 | 16 | |
| | 13 | 14 | 12 | 80 | 16 | 16 | |
| | 14 | 14 | 11 | 80 | 16 | 16 | |
| | 15 | 14 | 10 | 80 | 16 | 16 | |
| | 16 | 14 | 9 | 80 | 16 | 16 | |

# KC キーシードカッター

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | 形状 Shape |
|---|---|---|---|---|---|---|---|
| 55 | 1 | 14 | 24 | 80 | 16 | 16 | 図2 |
| | 1.2 | 14 | 23.8 | 80 | 16 | 16 | |
| | 1.5 | 14 | 23.5 | 80 | 16 | 16 | |
| | 2 | 14 | 23 | 80 | 16 | 16 | |
| | 2.5 | 14 | 22.5 | 80 | 16 | 16 | |
| | 3 | 14 | 22 | 80 | 16 | 16 | |
| | 3.5 | 14 | 21.5 | 80 | 16 | 16 | |
| | 4 | 14 | 21 | 80 | 16 | 16 | |
| | 4.5 | 14 | 20.5 | 80 | 16 | 16 | |
| | 5 | 14 | 20 | 80 | 16 | 16 | |
| | 6 | 14 | 19 | 80 | 16 | 16 | |
| | 7 | 14 | 18 | 80 | 16 | 16 | |
| | 8 | 14 | 17 | 80 | 16 | 16 | |
| | 9 | 14 | 16 | 80 | 16 | 16 | |
| | 10 | 14 | 15 | 80 | 16 | 16 | |
| | 11 | 14 | 14 | 80 | 16 | 16 | |
| | 12 | 14 | 13 | 80 | 16 | 16 | |
| | 13 | 14 | 12 | 80 | 16 | 16 | |
| | 14 | 14 | 11 | 80 | 16 | 16 | |
| 60 | 1 | 18 | 24 | 85 | 20 | 18 | |
| | 1.2 | 18 | 23.8 | 85 | 20 | 18 | |
| | 1.5 | 18 | 23.5 | 85 | 20 | 18 | |
| | 2 | 18 | 23 | 85 | 20 | 18 | |
| | 2.5 | 18 | 22.5 | 85 | 20 | 18 | |
| | 3 | 18 | 22 | 85 | 20 | 18 | |
| | 3.5 | 18 | 21.5 | 85 | 20 | 18 | |
| | 4 | 18 | 21 | 85 | 20 | 18 | |
| | 4.5 | 18 | 20.5 | 85 | 20 | 18 | |
| | 5 | 18 | 20 | 85 | 20 | 18 | |
| | 6 | 18 | 19 | 85 | 20 | 18 | |
| | 7 | 18 | 18 | 85 | 20 | 18 | |
| | 8 | 18 | 17 | 85 | 20 | 18 | |
| | 9 | 18 | 16 | 85 | 20 | 18 | |
| | 10 | 18 | 15 | 85 | 20 | 18 | |
| | 11 | 18 | 14 | 85 | 20 | 18 | |
| | 12 | 18 | 13 | 85 | 20 | 18 | |
| | 13 | 18 | 12 | 85 | 20 | 18 | |
| | 14 | 18 | 11 | 85 | 20 | 18 | |
| | 15 | 18 | 10 | 85 | 20 | 18 | |
| | 16 | 18 | 9 | 85 | 20 | 18 | |
| 65 | 1.5 | 18 | 28.5 | 90 | 20 | 18 | |
| | 2 | 18 | 28 | 90 | 20 | 18 | |
| | 2.5 | 18 | 27.5 | 90 | 20 | 18 | |
| | 3 | 18 | 27 | 90 | 20 | 18 | |
| | 3.5 | 18 | 26.5 | 90 | 20 | 18 | |
| | 4 | 18 | 26 | 90 | 20 | 18 | |
| | 4.5 | 18 | 25.5 | 90 | 20 | 18 | |
| | 5 | 18 | 25 | 90 | 20 | 18 | |

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | 形状 Shape |
|---|---|---|---|---|---|---|---|
| 65 | 6 | 18 | 24 | 90 | 20 | 18 | 図2 |
| | 7 | 18 | 23 | 90 | 20 | 18 | |
| | 8 | 18 | 22 | 90 | 20 | 18 | |
| | 9 | 18 | 21 | 90 | 20 | 18 | |
| | 10 | 18 | 20 | 90 | 20 | 18 | |
| | 12 | 18 | 18 | 90 | 20 | 18 | |
| 70 | 1.5 | 18 | 33.5 | 100 | 20 | 20 | |
| | 2 | 18 | 33 | 100 | 20 | 20 | |
| | 2.5 | 18 | 32.5 | 100 | 20 | 20 | |
| | 3 | 18 | 32 | 100 | 20 | 20 | |
| | 3.5 | 18 | 31.5 | 100 | 20 | 20 | |
| | 4 | 18 | 31 | 100 | 20 | 20 | |
| | 4.5 | 18 | 30.5 | 100 | 20 | 20 | |
| | 5 | 18 | 30 | 100 | 20 | 20 | |
| | 6 | 18 | 29 | 100 | 20 | 20 | |
| | 7 | 18 | 28 | 100 | 20 | 20 | |
| | 8 | 18 | 27 | 100 | 20 | 20 | |
| | 9 | 18 | 26 | 100 | 20 | 20 | |
| | 10 | 18 | 25 | 100 | 20 | 20 | |
| | 12 | 18 | 23 | 100 | 20 | 20 | |
| 75 | 1.5 | 18 | 38.5 | 105 | 20 | 20 | |
| | 2 | 18 | 38 | 105 | 20 | 20 | |
| | 2.5 | 18 | 37.5 | 105 | 20 | 20 | |
| | 3 | 18 | 37 | 105 | 20 | 20 | |
| | 3.5 | 18 | 36.5 | 105 | 20 | 20 | |
| | 4 | 18 | 36 | 105 | 20 | 20 | |
| | 4.5 | 18 | 35.5 | 105 | 20 | 20 | |
| | 5 | 18 | 35 | 105 | 20 | 20 | |
| | 6 | 18 | 34 | 105 | 20 | 20 | |
| | 7 | 18 | 33 | 105 | 20 | 20 | |
| | 8 | 18 | 32 | 105 | 20 | 20 | |
| | 9 | 18 | 31 | 105 | 20 | 20 | |
| | 10 | 18 | 30 | 105 | 20 | 20 | |
| | 12 | 18 | 28 | 105 | 20 | 20 | |
| 80 | 1.5 | 23 | 38.5 | 115 | 25 | 22 | |
| | 2 | 23 | 38 | 115 | 25 | 22 | |
| | 2.5 | 23 | 37.5 | 115 | 25 | 22 | |
| | 3 | 23 | 37 | 115 | 25 | 22 | |
| | 3.5 | 23 | 36.5 | 115 | 25 | 22 | |
| | 4 | 23 | 36 | 115 | 25 | 22 | |
| | 4.5 | 23 | 35.5 | 115 | 25 | 22 | |
| | 5 | 23 | 35 | 115 | 25 | 22 | |
| | 6 | 23 | 34 | 115 | 25 | 22 | |
| | 7 | 23 | 33 | 115 | 25 | 22 | |
| | 8 | 23 | 32 | 115 | 25 | 22 | |
| | 9 | 23 | 31 | 115 | 25 | 22 | |
| | 10 | 23 | 30 | 115 | 25 | 22 | |
| | 12 | 23 | 28 | 115 | 25 | 22 | |

ハイス

# KCS

## 側刃付キーシードカッター　*Keyseat Cutter With Side Cutting Edge*

切削条件表 P258

**スクエア溝加工（キーシードカッター）** 右直刃 HSS

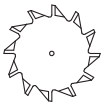




図1

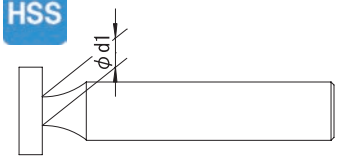
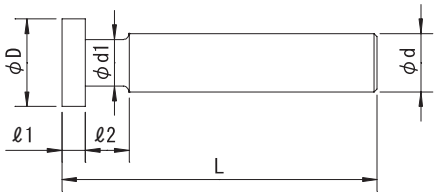



図2




| 公差 (Tolerance) | D | | | | ℓ1 | | d |
|---|---|---|---|---|---|---|---|
| | 8～16 | +0.3 +0.18 | 19～25 | +0.35 +0.21 | 1～1.8 | −0.014 −0.028 | h8 |
| | 30～40 | +0.43 +0.26 | | | | | |

右刃ストレート　SKH51
Straight Flute　HSS

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | 形状 *Shape* |
|---|---|---|---|---|---|---|---|
| 8 | 1 | 3.7 | 6 | 50 | 8 | 8 | 図1 |
| | 1.2 | 3.7 | 6 | 50 | 8 | 8 | |
| | 1.5 | 3.7 | 6 | 50 | 8 | 8 | |
| | 1.6 | 3.7 | 6 | 50 | 8 | 8 | |
| | 1.8 | 3.7 | 6 | 50 | 8 | 8 | |
| 10 | 1 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 1.2 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 1.5 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 1.6 | 4.2 | 5.8 | 50 | 8 | 8 | |
| | 1.8 | 4.2 | 5.8 | 50 | 8 | 8 | |
| 12 | 1 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.2 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.5 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.6 | 4.4 | 7 | 50 | 10 | 8 | |
| | 1.8 | 4.4 | 7 | 50 | 10 | 8 | |
| 15 | 1 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 1.2 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 1.5 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 1.6 | 4.7 | 7.8 | 50 | 10 | 10 | |
| | 1.8 | 4.7 | 7.8 | 50 | 10 | 10 | |
| 16 | 1 | 5 | 8.8 | 60 | 12 | 10 | |
| | 1.2 | 5 | 8.8 | 60 | 12 | 10 | |
| | 1.5 | 5 | 8.8 | 60 | 12 | 10 | |
| | 1.6 | 5 | 8.8 | 60 | 12 | 10 | |
| | 1.8 | 5 | 8.8 | 60 | 12 | 10 | |
| 19 | 1 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.2 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.5 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.6 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.8 | 8 | 8.7 | 60 | 12 | 12 | |

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | 形状 *Shape* |
|---|---|---|---|---|---|---|---|
| 20 | 1 | 8 | 8.7 | 60 | 12 | 12 | 図1 |
| | 1.2 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.5 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.6 | 8 | 8.7 | 60 | 12 | 12 | |
| | 1.8 | 8 | 8.7 | 60 | 12 | 12 | |
| 22 | 1 | 9 | 8.5 | 60 | 12 | 12 | |
| | 1.2 | 9 | 8.5 | 60 | 12 | 12 | |
| | 1.5 | 9 | 8.5 | 60 | 12 | 12 | |
| | 1.6 | 9 | 8.5 | 60 | 12 | 12 | |
| | 1.8 | 9 | 8.5 | 60 | 12 | 12 | |
| 25 | 1 | 10 | 12 | 65 | 12 | 14 | 図2 |
| | 1.2 | 10 | 12 | 65 | 12 | 14 | |
| | 1.5 | 10 | 12 | 65 | 12 | 14 | |
| | 1.6 | 10 | 12 | 65 | 12 | 14 | |
| | 1.8 | 10 | 12 | 65 | 12 | 14 | |
| 30 | 1 | 10 | 24 | 70 | 12 | 14 | |
| | 1.2 | 10 | 23.8 | 70 | 12 | 14 | |
| | 1.5 | 10 | 23.5 | 70 | 12 | 14 | |
| | 1.6 | 10 | 23.4 | 70 | 12 | 14 | |
| | 1.8 | 10 | 23.2 | 70 | 12 | 14 | |
| 35 | 1 | 10 | 24 | 75 | 12 | 16 | |
| | 1.2 | 10 | 23.8 | 75 | 12 | 16 | |
| | 1.5 | 10 | 23.5 | 75 | 12 | 16 | |
| | 1.6 | 10 | 23.4 | 75 | 12 | 16 | |
| | 1.8 | 10 | 23.2 | 75 | 12 | 16 | |
| 40 | 1 | 10 | 24 | 75 | 12 | 16 | |
| | 1.2 | 10 | 23.8 | 75 | 12 | 16 | |
| | 1.5 | 10 | 23.5 | 75 | 12 | 16 | |
| | 1.6 | 10 | 23.4 | 75 | 12 | 16 | |
| | 1.8 | 10 | 23.2 | 75 | 12 | 16 | |

ハイス

# KCLS

## ロングシャンクキーシードカッター　*Long Shank Keyseat Cutter*

切削条件表 P259

**スクエア溝加工（キーシードカッター）** 右直刃 HSS Co

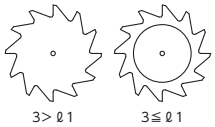





図1

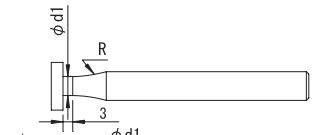
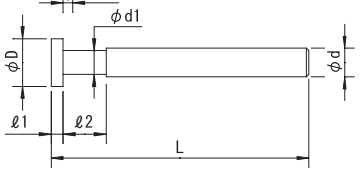



図2




| 公差 (Tolerance) | D | | | | ℓ1 | | d |
|---|---|---|---|---|---|---|---|
| | 10～16 | +0.3 +0.18 | 18～25 | +0.35 +0.21 | 0.5～3 | −0.014 −0.028 | h8 |
| | 30～40 | +0.43 +0.26 | | | 3.5～6 | −0.02 −0.038 | |

右刃ストレート　SKH56
Straight Flute　HSS-Co.

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | R | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | 形状 *Shape* |
|---|---|---|---|---|---|---|---|---|
| 10 | 0.5 | 4.2 | 8.8 | 10 | 80 | 8 | 8 | 図1 |
| | 0.8 | 4.2 | 8.8 | 10 | 80 | 8 | 8 | |
| | 1 | 4.2 | 8.8 | 10 | 80 | 8 | 8 | |
| | 1.2 | 4.2 | 8.8 | 10 | 80 | 8 | 8 | |
| | 1.5 | 4.2 | 8.8 | 10 | 80 | 8 | 8 | |
| | 2 | 4.2 | 8.8 | 10 | 80 | 8 | 8 | |
| | 2.5 | 4.2 | 8.8 | 10 | 80 | 8 | 8 | |
| | 3 | 4.2 | 8.8 | 10 | 80 | 8 | 8 | |
| | 3.5 | 4.2 | 8.8 | 10 | 80 | 8 | 8 | |
| | 4 | 4.2 | 8.8 | 10 | 80 | 8 | 8 | |
| | 5 | 4.2 | 8.8 | 10 | 80 | 8 | 8 | |
| 12 | 0.5 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 0.8 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 1 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 1.2 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 1.5 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 2 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 2.5 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 3 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 3.5 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 4 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 5 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| 13 | 0.5 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 0.8 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 1 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 1.2 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 1.5 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 2 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 2.5 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 3 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 3.5 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 4 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| | 5 | 4.4 | 10 | 10 | 80 | 10 | 8 | |
| 14 | 0.5 | 4.7 | 10.8 | 13 | 80 | 10 | 8 | |
| | 0.8 | 4.7 | 10.8 | 13 | 80 | 10 | 8 | |
| | 1 | 4.7 | 10.8 | 13 | 80 | 10 | 8 | |
| | 1.2 | 4.7 | 10.8 | 13 | 80 | 10 | 8 | |
| | 1.5 | 4.7 | 10.8 | 13 | 80 | 10 | 8 | |
| | 2 | 4.7 | 10.8 | 13 | 80 | 10 | 8 | |
| | 2.5 | 4.7 | 10.8 | 13 | 80 | 10 | 8 | |

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | R | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | 形状 *Shape* |
|---|---|---|---|---|---|---|---|---|
| 14 | 3 | 4.7 | 10.8 | 13 | 80 | 10 | 8 | 図1 |
| | 3.5 | 4.7 | 10.8 | 13 | 80 | 10 | 8 | |
| | 4 | 4.7 | 10.8 | 13 | 80 | 10 | 8 | |
| | 5 | 4.7 | 10.8 | 13 | 80 | 10 | 8 | |
| 15 | 0.5 | 4.7 | 10.8 | 13 | 80 | 10 | 10 | |
| | 0.8 | 4.7 | 10.8 | 13 | 80 | 10 | 10 | |
| | 1 | 4.7 | 10.8 | 13 | 80 | 10 | 10 | |
| | 1.2 | 4.7 | 10.8 | 13 | 80 | 10 | 10 | |
| | 1.5 | 4.7 | 10.8 | 13 | 80 | 10 | 10 | |
| | 2 | 4.7 | 10.8 | 13 | 80 | 10 | 10 | |
| | 2.5 | 4.7 | 10.8 | 13 | 80 | 10 | 10 | |
| | 3 | 4.7 | 10.8 | 13 | 80 | 10 | 10 | |
| | 3.5 | 4.7 | 10.8 | 13 | 80 | 10 | 10 | |
| | 4 | 4.7 | 10.8 | 13 | 80 | 10 | 10 | |
| | 5 | 4.7 | 10.8 | 13 | 80 | 10 | 10 | |
| | 6 | 4.7 | 10.8 | 13 | 80 | 10 | 10 | |
| 16 | 0.5 | 5 | 11.8 | 13 | 100 | 12 | 10 | |
| | 0.8 | 5 | 11.8 | 13 | 100 | 12 | 10 | |
| | 1 | 5 | 11.8 | 13 | 100 | 12 | 10 | |
| | 1.2 | 5 | 11.8 | 13 | 100 | 12 | 10 | |
| | 1.5 | 5 | 11.8 | 13 | 100 | 12 | 10 | |
| | 2 | 5 | 11.8 | 13 | 100 | 12 | 10 | |
| | 2.5 | 5 | 11.8 | 13 | 100 | 12 | 10 | |
| | 3 | 5 | 11.8 | 13 | 100 | 12 | 10 | |
| | 3.5 | 5 | 11.8 | 13 | 100 | 12 | 10 | |
| | 4 | 5 | 11.8 | 13 | 100 | 12 | 10 | |
| | 5 | 5 | 11.8 | 13 | 100 | 12 | 10 | |
| 18 | 0.5 | 7 | 12.6 | 20 | 100 | 12 | 12 | |
| | 0.8 | 7 | 12.6 | 20 | 100 | 12 | 12 | |
| | 1 | 7 | 12.6 | 20 | 100 | 12 | 12 | |
| | 1.2 | 7 | 12.6 | 20 | 100 | 12 | 12 | |
| | 1.5 | 7 | 12.6 | 20 | 100 | 12 | 12 | |
| | 2 | 7 | 12.6 | 20 | 100 | 12 | 12 | |
| | 2.5 | 7 | 12.6 | 20 | 100 | 12 | 12 | |
| | 3 | 7 | 12.6 | 20 | 100 | 12 | 12 | |
| | 3.5 | 7 | 12.6 | 20 | 100 | 12 | 12 | |
| | 4 | 7 | 12.6 | 20 | 100 | 12 | 12 | |
| | 5 | 7 | 12.6 | 20 | 100 | 12 | 12 | |
| 19 | 0.5 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 0.8 | 8 | 11.7 | 20 | 120 | 12 | 12 | |

# KCLS ロングシャンクキーシードカッター

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | R | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | 形状 Shape |
|---|---|---|---|---|---|---|---|---|
| 19 | 1 | 8 | 11.7 | 20 | 120 | 12 | 12 | 図1 |
| | 1.2 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 1.5 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 2 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 2.5 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 3 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 3.5 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 4 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 5 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| 20 | 0.5 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 0.8 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 1 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 1.2 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 1.5 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 2 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 2.5 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 3 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 3.5 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 4 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 5 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| | 6 | 8 | 11.7 | 20 | 120 | 12 | 12 | |
| 25 | 0.5 | 10 | 12 | 25 | 120 | 12 | 14 | |
| | 0.8 | 10 | 12 | 25 | 120 | 12 | 14 | |
| | 1 | 10 | 12 | 25 | 120 | 12 | 14 | |
| | 1.2 | 10 | 12 | 25 | 120 | 12 | 14 | |
| | 1.5 | 10 | 12 | 25 | 120 | 12 | 14 | |
| | 2 | 10 | 12 | 25 | 120 | 12 | 14 | |
| | 2.5 | 10 | 12 | 25 | 120 | 12 | 14 | |
| | 3 | 10 | 12 | 25 | 120 | 12 | 14 | |
| | 3.5 | 10 | 12 | 25 | 120 | 12 | 14 | |
| | 4 | 10 | 12 | 25 | 120 | 12 | 14 | |
| | 5 | 10 | 12 | 25 | 120 | 12 | 14 | |
| | 6 | 10 | 12 | 25 | 120 | 12 | 14 | |

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | R | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes | 形状 Shape |
|---|---|---|---|---|---|---|---|---|
| 30 | 0.5 | 12 | 24.5 | – | 150 | 16 | 14 | 図2 |
| | 0.8 | 12 | 24.2 | – | 150 | 16 | 14 | |
| | 1 | 12 | 24 | – | 150 | 16 | 14 | |
| | 1.2 | 12 | 23.8 | – | 150 | 16 | 14 | |
| | 1.5 | 12 | 23.5 | – | 150 | 16 | 14 | |
| | 2 | 12 | 23 | – | 150 | 16 | 14 | |
| | 2.5 | 12 | 22.5 | – | 150 | 16 | 14 | |
| | 3 | 12 | 22 | – | 150 | 16 | 14 | |
| | 3.5 | 12 | 21.5 | – | 150 | 16 | 14 | |
| | 4 | 12 | 21 | – | 150 | 16 | 14 | |
| | 5 | 12 | 20 | – | 150 | 16 | 14 | |
| | 6 | 12 | 19 | – | 150 | 16 | 14 | |
| 35 | 1 | 14 | 24 | – | 150 | 16 | 16 | |
| | 1.5 | 14 | 23.5 | – | 150 | 16 | 16 | |
| | 2 | 14 | 23 | – | 150 | 16 | 16 | |
| | 2.5 | 14 | 22.5 | – | 150 | 16 | 16 | |
| | 3 | 14 | 22 | – | 150 | 16 | 16 | |
| | 3.5 | 14 | 21.5 | – | 150 | 16 | 16 | |
| | 4 | 14 | 21 | – | 150 | 16 | 16 | |
| | 5 | 14 | 20 | – | 150 | 16 | 16 | |
| | 6 | 14 | 19 | – | 150 | 16 | 16 | |
| 40 | 1 | 14 | 24 | – | 150 | 16 | 16 | |
| | 1.5 | 14 | 23.5 | – | 150 | 16 | 16 | |
| | 2 | 14 | 23 | – | 150 | 16 | 16 | |
| | 2.5 | 14 | 22.5 | – | 150 | 16 | 16 | |
| | 3 | 14 | 22 | – | 150 | 16 | 16 | |
| | 3.5 | 14 | 21.5 | – | 150 | 16 | 16 | |
| | 4 | 14 | 21 | – | 150 | 16 | 16 | |
| | 5 | 14 | 20 | – | 150 | 16 | 16 | |
| | 6 | 14 | 19 | – | 150 | 16 | 16 | |

# TKCLS

## ロングシャンク千鳥刃キーシードカッター　*Long Shank Staggered Tooth Keyseat Cutter*

切削条件表 P259

## スクエア溝加工（キーシードカッター）

交互ネジレ15° HSS Co

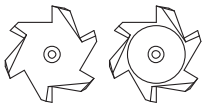





図1

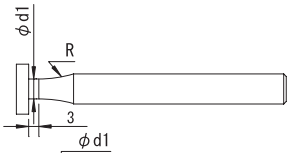
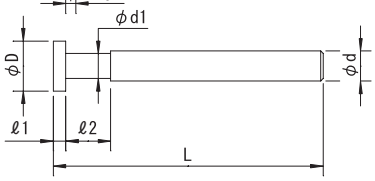



図2




| 公差 (Tolerance) | D | | | | ℓ1 | | d |
|---|---|---|---|---|---|---|---|
| | 10～16 | +0.3 +0.18 | 18～25 | +0.35 +0.21 | 1～ 3 | −0.014 −0.028 | h8 |
| | 30～40 | +0.43 +0.26 | 50 | +0.5 +0.3 | 4～ 5 | −0.02 −0.038 | |

右刃交互ネジレ15°　SKH56
Right Hand Cut With Staggered Helix15°　HSS-Co.

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | R | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | 形状 *Shape* |
|---|---|---|---|---|---|---|---|---|
| 10 | 1 | 4.2 | 8.8 | 10 | 80 | 8 | 6 | 図1 |
| | 1.5 | 4.2 | 8.8 | 10 | 80 | 8 | 6 | |
| | 2 | 4.2 | 8.8 | 10 | 80 | 8 | 6 | |
| | 2.5 | 4.2 | 8.8 | 10 | 80 | 8 | 6 | |
| | 3 | 4.2 | 8.8 | 10 | 80 | 8 | 6 | |
| 12 | 1 | 4.4 | 10 | 10 | 80 | 10 | 6 | |
| | 1.5 | 4.4 | 10 | 10 | 80 | 10 | 6 | |
| | 2 | 4.4 | 10 | 10 | 80 | 10 | 6 | |
| | 2.5 | 4.4 | 10 | 10 | 80 | 10 | 6 | |
| | 3 | 4.4 | 10 | 10 | 80 | 10 | 6 | |
| | 4 | 4.4 | 10 | 10 | 80 | 10 | 6 | |
| 13 | 1 | 4.4 | 10 | 10 | 80 | 10 | 6 | |
| | 1.5 | 4.4 | 10 | 10 | 80 | 10 | 6 | |
| | 2 | 4.4 | 10 | 10 | 80 | 10 | 6 | |
| | 2.5 | 4.4 | 10 | 10 | 80 | 10 | 6 | |
| | 3 | 4.4 | 10 | 10 | 80 | 10 | 6 | |
| | 4 | 4.4 | 10 | 10 | 80 | 10 | 6 | |
| 15 | 1 | 4.7 | 10.8 | 13 | 80 | 10 | 6 | |
| | 1.5 | 4.7 | 10.8 | 13 | 80 | 10 | 6 | |
| | 2 | 4.7 | 10.8 | 13 | 80 | 10 | 6 | |
| | 2.5 | 4.7 | 10.8 | 13 | 80 | 10 | 6 | |
| | 3 | 4.7 | 10.8 | 13 | 80 | 10 | 6 | |
| | 4 | 4.7 | 10.8 | 13 | 80 | 10 | 6 | |
| | 5 | 4.7 | 10.8 | 13 | 80 | 10 | 6 | |
| 16 | 1 | 5 | 11.8 | 13 | 100 | 12 | 6 | |
| | 1.5 | 5 | 11.8 | 13 | 100 | 12 | 6 | |
| | 2 | 5 | 11.8 | 13 | 100 | 12 | 6 | |
| | 2.5 | 5 | 11.8 | 13 | 100 | 12 | 6 | |
| | 3 | 5 | 11.8 | 13 | 100 | 12 | 6 | |
| | 4 | 5 | 11.8 | 13 | 100 | 12 | 6 | |
| | 5 | 5 | 11.8 | 13 | 100 | 12 | 6 | |
| 18 | 1 | 7 | 12.6 | 20 | 100 | 12 | 8 | |
| | 1.5 | 7 | 12.6 | 20 | 100 | 12 | 8 | |
| | 2 | 7 | 12.6 | 20 | 100 | 12 | 8 | |
| | 2.5 | 7 | 12.6 | 20 | 100 | 12 | 8 | |
| | 3 | 7 | 12.6 | 20 | 100 | 12 | 8 | |
| | 4 | 7 | 12.6 | 20 | 100 | 12 | 8 | |
| | 5 | 7 | 12.6 | 20 | 100 | 12 | 8 | |
| 20 | 1 | 8 | 11.7 | 20 | 120 | 12 | 8 | |
| | 1.5 | 8 | 11.7 | 20 | 120 | 12 | 8 | |

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | R | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* | 形状 *Shape* |
|---|---|---|---|---|---|---|---|---|
| 20 | 2 | 8 | 11.7 | 20 | 120 | 12 | 8 | 図1 |
| | 2.5 | 8 | 11.7 | 20 | 120 | 12 | 8 | |
| | 3 | 8 | 11.7 | 20 | 120 | 12 | 8 | |
| | 4 | 8 | 11.7 | 20 | 120 | 12 | 8 | |
| | 5 | 8 | 11.7 | 20 | 120 | 12 | 8 | |
| 25 | 1 | 10 | 12 | 25 | 120 | 12 | 8 | |
| | 1.5 | 10 | 12 | 25 | 120 | 12 | 8 | |
| | 2 | 10 | 12 | 25 | 120 | 12 | 8 | |
| | 2.5 | 10 | 12 | 25 | 120 | 12 | 8 | |
| | 3 | 10 | 12 | 25 | 120 | 12 | 8 | |
| | 4 | 10 | 12 | 25 | 120 | 12 | 8 | |
| | 5 | 10 | 12 | 25 | 120 | 12 | 8 | |
| 30 | 1 | 12 | 29 | – | 150 | 16 | 10 | 図2 |
| | 1.5 | 12 | 28.5 | – | 150 | 16 | 10 | |
| | 2 | 12 | 28 | – | 150 | 16 | 10 | |
| | 2.5 | 12 | 27.5 | – | 150 | 16 | 10 | |
| | 3 | 12 | 27 | – | 150 | 16 | 10 | |
| | 4 | 12 | 26 | – | 150 | 16 | 10 | |
| | 5 | 12 | 25 | – | 150 | 16 | 10 | |
| 35 | 1 | 14 | 29 | – | 150 | 16 | 10 | |
| | 1.5 | 14 | 28.5 | – | 150 | 16 | 10 | |
| | 2 | 14 | 28 | – | 150 | 16 | 10 | |
| | 2.5 | 14 | 27.5 | – | 150 | 16 | 10 | |
| | 3 | 14 | 27 | – | 150 | 16 | 10 | |
| | 4 | 14 | 26 | – | 150 | 16 | 10 | |
| | 5 | 14 | 25 | – | 150 | 16 | 10 | |
| 40 | 1.5 | 14 | 28.5 | – | 150 | 16 | 12 | |
| | 2 | 14 | 28 | – | 150 | 16 | 12 | |
| | 2.5 | 14 | 27.5 | – | 150 | 16 | 12 | |
| | 3 | 14 | 27 | – | 150 | 16 | 12 | |
| | 4 | 14 | 26 | – | 150 | 16 | 12 | |
| | 5 | 14 | 25 | – | 150 | 16 | 12 | |
| 50 | 1.5 | 14 | 28.5 | – | 150 | 16 | 12 | |
| | 2 | 14 | 28 | – | 150 | 16 | 12 | |
| | 2.5 | 14 | 27.5 | – | 150 | 16 | 12 | |
| | 3 | 14 | 27 | – | 150 | 16 | 12 | |
| | 4 | 14 | 26 | – | 150 | 16 | 12 | |
| | 5 | 14 | 25 | – | 150 | 16 | 12 | |

ハイス

# MSS-TiN

## 柄付メタルソー　*Metal Saw With Straight Shank (TiN Coated)*

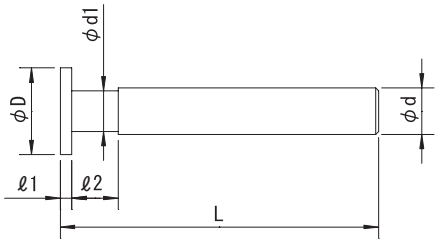
切削条件表 P259

スクエア溝加工（キーシードカッター）

右直刃　TiN　粉末ハイス








| 公差(Tolerance) | D：$^{+0.25}_{0}$ | ℓ1：$^{0}_{-0.03}$ | d：h7 |
|---|---|---|---|

右刃ストレート　TiNコーティング　粉末ハイス
Straight Flute　TiN Coating　Powder Metallurgy

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 16 | 0.8 | 7.5 | 14.2 | 75 | 8 | 16 |
| | 0.9 | 7.5 | 14.1 | 75 | 8 | 16 |
| | 1 | 7.5 | 14 | 75 | 8 | 16 |
| | 1.1 | 7.5 | 13.9 | 75 | 8 | 16 |
| | 1.2 | 7.5 | 13.8 | 75 | 8 | 16 |
| | 1.3 | 7.5 | 13.7 | 75 | 8 | 16 |
| | 1.4 | 7.5 | 13.6 | 75 | 8 | 16 |
| | 1.5 | 7.5 | 13.5 | 75 | 8 | 16 |
| | 1.6 | 7.5 | 13.4 | 75 | 8 | 16 |
| | 1.7 | 7.5 | 13.3 | 75 | 8 | 16 |
| | 1.8 | 7.5 | 13.2 | 75 | 8 | 16 |
| | 1.9 | 7.5 | 13.1 | 75 | 8 | 16 |
| | 2 | 7.5 | 13 | 75 | 8 | 16 |
| | 2.1 | 7.5 | 12.9 | 75 | 8 | 16 |
| | 2.2 | 7.5 | 12.8 | 75 | 8 | 16 |
| | 2.3 | 7.5 | 12.7 | 75 | 8 | 16 |
| | 2.4 | 7.5 | 12.6 | 75 | 8 | 16 |
| | 2.5 | 7.5 | 12.5 | 75 | 8 | 16 |
| | 2.6 | 7.5 | 12.4 | 75 | 8 | 16 |
| | 2.7 | 7.5 | 12.3 | 75 | 8 | 16 |
| | 2.8 | 7.5 | 12.2 | 75 | 8 | 16 |
| | 2.9 | 7.5 | 12.1 | 75 | 8 | 16 |
| | 3 | 7.5 | 12 | 75 | 8 | 16 |
| 18 | 0.8 | 7.5 | 14.2 | 75 | 8 | 18 |
| | 0.9 | 7.5 | 14.1 | 75 | 8 | 18 |
| | 1 | 7.5 | 14 | 75 | 8 | 18 |
| | 1.1 | 7.5 | 13.9 | 75 | 8 | 18 |
| | 1.2 | 7.5 | 13.8 | 75 | 8 | 18 |
| | 1.3 | 7.5 | 13.7 | 75 | 8 | 18 |
| | 1.4 | 7.5 | 13.6 | 75 | 8 | 18 |
| | 1.5 | 7.5 | 13.5 | 75 | 8 | 18 |
| | 1.6 | 7.5 | 13.4 | 75 | 8 | 18 |
| | 1.7 | 7.5 | 13.3 | 75 | 8 | 18 |
| | 1.8 | 7.5 | 13.2 | 75 | 8 | 18 |
| | 1.9 | 7.5 | 13.1 | 75 | 8 | 18 |
| | 2 | 7.5 | 13 | 75 | 8 | 18 |
| | 2.1 | 7.5 | 12.9 | 75 | 8 | 18 |
| | 2.2 | 7.5 | 12.8 | 75 | 8 | 18 |
| | 2.3 | 7.5 | 12.7 | 75 | 8 | 18 |
| | 2.4 | 7.5 | 12.6 | 75 | 8 | 18 |
| | 2.5 | 7.5 | 12.5 | 75 | 8 | 18 |
| | 2.6 | 7.5 | 12.4 | 75 | 8 | 18 |
| | 2.7 | 7.5 | 12.3 | 75 | 8 | 18 |
| | 2.8 | 7.5 | 12.2 | 75 | 8 | 18 |
| | 2.9 | 7.5 | 12.1 | 75 | 8 | 18 |
| | 3 | 7.5 | 12 | 75 | 8 | 18 |

| 刃径 (ΦD) *Dia.* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| 20 | 0.8 | 9.5 | 14.2 | 80 | 10 | 18 |
| | 0.9 | 9.5 | 14.1 | 80 | 10 | 18 |
| | 1 | 9.5 | 14 | 80 | 10 | 18 |
| | 1.1 | 9.5 | 13.9 | 80 | 10 | 18 |
| | 1.2 | 9.5 | 13.8 | 80 | 10 | 18 |
| | 1.3 | 9.5 | 13.7 | 80 | 10 | 18 |
| | 1.4 | 9.5 | 13.6 | 80 | 10 | 18 |
| | 1.5 | 9.5 | 13.5 | 80 | 10 | 18 |
| | 1.6 | 9.5 | 13.4 | 80 | 10 | 18 |
| | 1.7 | 9.5 | 13.3 | 80 | 10 | 18 |
| | 1.8 | 9.5 | 13.2 | 80 | 10 | 18 |
| | 1.9 | 9.5 | 13.1 | 80 | 10 | 18 |
| | 2 | 9.5 | 13 | 80 | 10 | 18 |
| | 2.1 | 9.5 | 12.9 | 80 | 10 | 18 |
| | 2.2 | 9.5 | 12.8 | 80 | 10 | 18 |
| | 2.3 | 9.5 | 12.7 | 80 | 10 | 18 |
| | 2.4 | 9.5 | 12.6 | 80 | 10 | 18 |
| | 2.5 | 9.5 | 12.5 | 80 | 10 | 18 |
| | 2.6 | 9.5 | 12.4 | 80 | 10 | 18 |
| | 2.7 | 9.5 | 12.3 | 80 | 10 | 18 |
| | 2.8 | 9.5 | 12.2 | 80 | 10 | 18 |
| | 2.9 | 9.5 | 12.1 | 80 | 10 | 18 |
| | 3 | 9.5 | 12 | 80 | 10 | 18 |
| 25 | 0.8 | 11.5 | 14.2 | 80 | 12 | 22 |
| | 0.9 | 11.5 | 14.1 | 80 | 12 | 22 |
| | 1 | 11.5 | 14 | 80 | 12 | 22 |
| | 1.1 | 11.5 | 13.9 | 80 | 12 | 22 |
| | 1.2 | 11.5 | 13.8 | 80 | 12 | 22 |
| | 1.3 | 11.5 | 13.7 | 80 | 12 | 22 |
| | 1.4 | 11.5 | 13.6 | 80 | 12 | 22 |
| | 1.5 | 11.5 | 13.5 | 80 | 12 | 22 |
| | 1.6 | 11.5 | 13.4 | 80 | 12 | 22 |
| | 1.7 | 11.5 | 13.3 | 80 | 12 | 22 |
| | 1.8 | 11.5 | 13.2 | 80 | 12 | 22 |
| | 1.9 | 11.5 | 13.1 | 80 | 12 | 22 |
| | 2 | 11.5 | 13 | 80 | 12 | 22 |
| | 2.1 | 11.5 | 12.9 | 80 | 12 | 22 |
| | 2.2 | 11.5 | 12.8 | 80 | 12 | 22 |
| | 2.3 | 11.5 | 12.7 | 80 | 12 | 22 |
| | 2.4 | 11.5 | 12.6 | 80 | 12 | 22 |
| | 2.5 | 11.5 | 12.5 | 80 | 12 | 22 |
| | 2.6 | 11.5 | 12.4 | 80 | 12 | 22 |
| | 2.7 | 11.5 | 12.3 | 80 | 12 | 22 |
| | 2.8 | 11.5 | 12.2 | 80 | 12 | 22 |
| | 2.9 | 11.5 | 12.1 | 80 | 12 | 22 |
| | 3 | 11.5 | 12 | 80 | 12 | 22 |

# MSS-TiN 柄付メタルソー

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 30 | 0.8 | 11.5 | 14.2 | 85 | 12 | 22 |
| | 0.9 | 11.5 | 14.1 | 85 | 12 | 22 |
| | 1 | 11.5 | 14 | 85 | 12 | 22 |
| | 1.1 | 11.5 | 13.9 | 85 | 12 | 22 |
| | 1.2 | 11.5 | 13.8 | 85 | 12 | 22 |
| | 1.3 | 11.5 | 13.7 | 85 | 12 | 22 |
| | 1.4 | 11.5 | 13.6 | 85 | 12 | 22 |
| | 1.5 | 11.5 | 13.5 | 85 | 12 | 22 |
| | 1.6 | 11.5 | 13.4 | 85 | 12 | 22 |
| | 1.7 | 11.5 | 13.3 | 85 | 12 | 22 |
| | 1.8 | 11.5 | 13.2 | 85 | 12 | 22 |
| | 1.9 | 11.5 | 13.1 | 85 | 12 | 22 |
| | 2 | 11.5 | 13 | 85 | 12 | 22 |
| | 2.1 | 11.5 | 12.9 | 85 | 12 | 22 |
| | 2.2 | 11.5 | 12.8 | 85 | 12 | 22 |
| | 2.3 | 11.5 | 12.7 | 85 | 12 | 22 |
| | 2.4 | 11.5 | 12.6 | 85 | 12 | 22 |
| | 2.5 | 11.5 | 12.5 | 85 | 12 | 22 |
| | 2.6 | 11.5 | 12.4 | 85 | 12 | 22 |
| | 2.7 | 11.5 | 12.3 | 85 | 12 | 22 |
| | 2.8 | 11.5 | 12.2 | 85 | 12 | 22 |
| | 2.9 | 11.5 | 12.1 | 85 | 12 | 22 |
| | 3 | 11.5 | 12 | 85 | 12 | 22 |
| 35 | 1 | 15.5 | 14 | 85 | 16 | 24 |
| | 1.1 | 15.5 | 13.9 | 85 | 16 | 24 |
| | 1.2 | 15.5 | 13.8 | 85 | 16 | 24 |
| | 1.3 | 15.5 | 13.7 | 85 | 16 | 24 |
| | 1.4 | 15.5 | 13.6 | 85 | 16 | 24 |
| | 1.5 | 15.5 | 13.5 | 85 | 16 | 24 |
| | 1.6 | 15.5 | 13.4 | 85 | 16 | 24 |
| | 1.7 | 15.5 | 13.3 | 85 | 16 | 24 |
| | 1.8 | 15.5 | 13.2 | 85 | 16 | 24 |
| | 1.9 | 15.5 | 13.1 | 85 | 16 | 24 |
| | 2 | 15.5 | 13 | 85 | 16 | 24 |
| | 2.1 | 15.5 | 12.9 | 85 | 16 | 24 |
| | 2.2 | 15.5 | 12.8 | 85 | 16 | 24 |
| | 2.3 | 15.5 | 12.7 | 85 | 16 | 24 |
| | 2.4 | 15.5 | 12.6 | 85 | 16 | 24 |
| | 2.5 | 15.5 | 12.5 | 85 | 16 | 24 |
| | 2.6 | 15.5 | 12.4 | 85 | 16 | 24 |
| | 2.7 | 15.5 | 12.3 | 85 | 16 | 24 |
| | 2.8 | 15.5 | 12.2 | 85 | 16 | 24 |
| | 2.9 | 15.5 | 12.1 | 85 | 16 | 24 |
| | 3 | 15.5 | 12 | 85 | 16 | 24 |
| 40 | 1 | 15.5 | 14 | 90 | 16 | 28 |
| | 1.1 | 15.5 | 13.9 | 90 | 16 | 28 |
| | 1.2 | 15.5 | 13.8 | 90 | 16 | 28 |
| | 1.3 | 15.5 | 13.7 | 90 | 16 | 28 |
| | 1.4 | 15.5 | 13.6 | 90 | 16 | 28 |
| | 1.5 | 15.5 | 13.5 | 90 | 16 | 28 |
| | 1.6 | 15.5 | 13.4 | 90 | 16 | 28 |
| | 1.7 | 15.5 | 13.3 | 90 | 16 | 28 |
| | 1.8 | 15.5 | 13.2 | 90 | 16 | 28 |
| | 1.9 | 15.5 | 13.1 | 90 | 16 | 28 |
| | 2 | 15.5 | 13 | 90 | 16 | 28 |
| | 2.1 | 15.5 | 12.9 | 90 | 16 | 28 |
| | 2.2 | 15.5 | 12.8 | 90 | 16 | 28 |
| | 2.3 | 15.5 | 12.7 | 90 | 16 | 28 |
| | 2.4 | 15.5 | 12.6 | 90 | 16 | 28 |
| | 2.5 | 15.5 | 12.5 | 90 | 16 | 28 |
| | 2.6 | 15.5 | 12.4 | 90 | 16 | 28 |
| | 2.7 | 15.5 | 12.3 | 90 | 16 | 28 |
| | 2.8 | 15.5 | 12.2 | 90 | 16 | 28 |
| | 2.9 | 15.5 | 12.1 | 90 | 16 | 28 |
| | 3 | 15.5 | 12 | 90 | 16 | 28 |

| 刃径 (ΦD) Dia. | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| 45 | 1 | 19.5 | 14 | 95 | 20 | 28 |
| | 1.1 | 19.5 | 13.9 | 95 | 20 | 28 |
| | 1.2 | 19.5 | 13.8 | 95 | 20 | 28 |
| | 1.3 | 19.5 | 13.7 | 95 | 20 | 28 |
| | 1.4 | 19.5 | 13.6 | 95 | 20 | 28 |
| | 1.5 | 19.5 | 13.5 | 95 | 20 | 28 |
| | 1.6 | 19.5 | 13.4 | 95 | 20 | 28 |
| | 1.7 | 19.5 | 13.3 | 95 | 20 | 28 |
| | 1.8 | 19.5 | 13.2 | 95 | 20 | 28 |
| | 1.9 | 19.5 | 13.1 | 95 | 20 | 28 |
| | 2 | 19.5 | 13 | 95 | 20 | 28 |
| | 2.1 | 19.5 | 12.9 | 95 | 20 | 28 |
| | 2.2 | 19.5 | 12.8 | 95 | 20 | 28 |
| | 2.3 | 19.5 | 12.7 | 95 | 20 | 28 |
| | 2.4 | 19.5 | 12.6 | 95 | 20 | 28 |
| | 2.5 | 19.5 | 12.5 | 95 | 20 | 28 |
| | 2.6 | 19.5 | 12.4 | 95 | 20 | 28 |
| | 2.7 | 19.5 | 12.3 | 95 | 20 | 28 |
| | 2.8 | 19.5 | 12.2 | 95 | 20 | 28 |
| | 2.9 | 19.5 | 12.1 | 95 | 20 | 28 |
| | 3 | 19.5 | 12 | 95 | 20 | 28 |
| 50 | 1 | 19.5 | 14 | 100 | 20 | 30 |
| | 1.1 | 19.5 | 13.9 | 100 | 20 | 30 |
| | 1.2 | 19.5 | 13.8 | 100 | 20 | 30 |
| | 1.3 | 19.5 | 13.7 | 100 | 20 | 30 |
| | 1.4 | 19.5 | 13.6 | 100 | 20 | 30 |
| | 1.5 | 19.5 | 13.5 | 100 | 20 | 30 |
| | 1.6 | 19.5 | 13.4 | 100 | 20 | 30 |
| | 1.7 | 19.5 | 13.3 | 100 | 20 | 30 |
| | 1.8 | 19.5 | 13.2 | 100 | 20 | 30 |
| | 1.9 | 19.5 | 13.1 | 100 | 20 | 30 |
| | 2 | 19.5 | 13 | 100 | 20 | 30 |
| | 2.1 | 19.5 | 12.9 | 100 | 20 | 30 |
| | 2.2 | 19.5 | 12.8 | 100 | 20 | 30 |
| | 2.3 | 19.5 | 12.7 | 100 | 20 | 30 |
| | 2.4 | 19.5 | 12.6 | 100 | 20 | 30 |
| | 2.5 | 19.5 | 12.5 | 100 | 20 | 30 |
| | 2.6 | 19.5 | 12.4 | 100 | 20 | 30 |
| | 2.7 | 19.5 | 12.3 | 100 | 20 | 30 |
| | 2.8 | 19.5 | 12.2 | 100 | 20 | 30 |
| | 2.9 | 19.5 | 12.1 | 100 | 20 | 30 |
| | 3 | 19.5 | 12 | 100 | 20 | 30 |

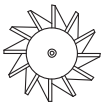
ハイス

# ACS

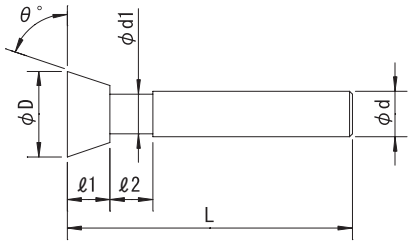
## 柄付アンギュラカッター　*Angular Cutter With Straight Shank*

切削条件表 P260

アリ溝・角度付溝・面取り加工　右直刃　HSS　HSS Co








| 公差(Tolerance) | D：$^{+1}_{0}$ | θ：±15′ | d：h8 |
|---|---|---|---|

右刃ストレート　SKH51 φ65以上　SKH56
Straight Flute　HSS-Co for φ65 and Over.　HSS for Other Dia.

※はオリジナル品（Original Size）

| 刃径 (ΦD) Dia. | 角度 (θ) Cut Angle | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|---|
| 15 | 30° | 2.5 | 4 | 10 | 54 | 10 | 8 |
| 20 | | 3 | 5 | 12 | 62 | 10 | 10 |
| 25 | | 4 | 6 | 15 | 67 | 12 | 10 |
| 30 | | 5 | 8 | 18 | 76 | 16 | 12 |
| 35 | | 6 | 8 | 18 | 79 | 16 | 12 |
| 40 | | 7 | 10 | 20 | 88 | 20 | 14 |
| 45 | | 7 | 10 | 20 | 90 | 20 | 14 |
| 50 | | 8 | 12 | 25 | 98 | 25 | 16 |
| 55 | | 9 | 12 | 25 | 98 | 25 | 18 |
| 60 | | 10 | 14 | 25 | 103 | 25 | 18 |
| 15 | 40° | 3.5 | 4 | 10 | 54 | 10 | 8 |
| 20 | | 5 | 5 | 12 | 62 | 10 | 10 |
| 25 | | 7 | 6 | 15 | 67 | 12 | 10 |
| 30 | | 8 | 8 | 18 | 76 | 16 | 12 |
| 35 | | 10 | 8 | 18 | 79 | 16 | 12 |
| 40 | | 11 | 10 | 20 | 88 | 20 | 14 |
| 45 | | 13 | 10 | 20 | 90 | 20 | 14 |
| 50 | | 14 | 12 | 25 | 98 | 25 | 16 |
| 55 | | 15 | 12 | 25 | 98 | 25 | 18 |
| 60 | | 16 | 14 | 25 | 103 | 25 | 18 |
| 10 | 45° | 3 | 3 | 8 | 45 | 8 | 8 |
| 12 | | 3.5 | 4 | 10 | 50 | 8 | 8 |
| 15 | | 4 | 5 | 10 | 54 | 10 | 8 |
| 20 | | 5 | 6 | 12 | 62 | 10 | 10 |
| 25 | | 7 | 7 | 15 | 67 | 12 | 10 |
| 30 | | 8 | 9 | 18 | 76 | 16 | 12 |
| 35 | | 11 | 9 | 18 | 79 | 16 | 12 |
| 40 | | 13 | 11 | 20 | 88 | 20 | 14 |
| 45 | | 15 | 11 | 20 | 90 | 20 | 14 |
| 50 | | 16 | 13 | 25 | 98 | 25 | 16 |
| 55 | | 16 | 13 | 25 | 98 | 25 | 18 |
| 60 | | 18 | 15 | 25 | 103 | 25 | 18 |
| ※ 65 | | 18 | 25 | 25 | 123 | 32 | 18 |
| | | 18 | 25 | 25 | 120 | 32 | 18 |
| | | 18 | 25 | 25 | 123 | 42 | 18 |
| ※ | | 18 | 25 | 32 | 123 | 42 | 18 |
| 70 | | 18 | 25 | 25 | 123 | 32 | 20 |
| | | 18 | 25 | 25 | 123 | 42 | 20 |
| ※ | | 18 | 25 | 37 | 135 | 42 | 20 |
| 75 | | 20 | 25 | 25 | 125 | 32 | 20 |
| | | 20 | 25 | 25 | 125 | 42 | 20 |
| ※ | | 20 | 25 | 35 | 135 | 42 | 20 |
| 80 | | 22 | 25 | 25 | 127 | 32 | 22 |
| | | 22 | 25 | 25 | 127 | 42 | 22 |
| ※ | | 22 | 25 | 33 | 135 | 42 | 22 |

| 刃径 (ΦD) Dia. | 角度 (θ) Cut Angle | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|---|
| 90 | 45° | 25 | 30 | 25 | 130 | 32 | 22 |
| | | 25 | 30 | 25 | 130 | 42 | 22 |
| ※ | | 25 | 30 | 40 | 145 | 42 | 22 |
| 100 | | 25 | 30 | 25 | 130 | 32 | 22 |
| | | 25 | 30 | 25 | 130 | 42 | 22 |
| ※ | | 25 | 30 | 40 | 145 | 42 | 22 |
| 10 | 50° | 3 | 4 | 8 | 45 | 8 | 8 |
| 15 | | 4 | 6 | 10 | 54 | 10 | 8 |
| 20 | | 5 | 8 | 12 | 62 | 10 | 10 |
| 25 | | 7 | 9 | 15 | 67 | 12 | 10 |
| 30 | | 8 | 11 | 18 | 76 | 16 | 12 |
| 35 | | 11 | 11 | 18 | 79 | 16 | 12 |
| 40 | | 13 | 13 | 20 | 88 | 20 | 14 |
| 45 | | 15 | 13 | 20 | 90 | 20 | 14 |
| 50 | | 16 | 15 | 25 | 98 | 25 | 16 |
| 55 | | 16 | 15 | 25 | 98 | 25 | 18 |
| 60 | | 18 | 17 | 25 | 103 | 25 | 18 |
| 65 | | 18 | 25 | 25 | 123 | 32 | 18 |
| 70 | | 18 | 25 | 25 | 123 | 32 | 20 |
| 75 | | 20 | 25 | 25 | 125 | 32 | 20 |
| 80 | | 22 | 25 | 25 | 127 | 32 | 22 |
| 90 | | 25 | 30 | 25 | 130 | 32 | 22 |
| 100 | | 25 | 30 | 25 | 130 | 32 | 22 |
| 10 | 55° | 3 | 4 | 8 | 45 | 8 | 8 |
| 12 | | 3.5 | 5 | 10 | 50 | 8 | 8 |
| 15 | | 4 | 6 | 10 | 54 | 10 | 8 |
| 20 | | 5 | 8 | 12 | 62 | 10 | 10 |
| 25 | | 7 | 10 | 15 | 67 | 12 | 10 |
| 30 | | 8 | 12 | 18 | 76 | 16 | 12 |
| 35 | | 11 | 12 | 18 | 79 | 16 | 12 |
| 40 | | 13 | 13 | 20 | 88 | 20 | 14 |
| 45 | | 15 | 15 | 20 | 90 | 20 | 14 |
| 50 | | 16 | 18 | 25 | 98 | 25 | 16 |
| 55 | | 16 | 18 | 25 | 98 | 25 | 18 |
| 60 | | 18 | 20 | 25 | 103 | 25 | 18 |
| 65 | | 18 | 25 | 25 | 123 | 32 | 18 |
| 70 | | 18 | 25 | 25 | 123 | 32 | 20 |
| 75 | | 20 | 25 | 25 | 125 | 32 | 20 |
| 80 | | 22 | 25 | 25 | 127 | 32 | 22 |
| 90 | | 25 | 30 | 25 | 130 | 32 | 22 |
| 100 | | 25 | 30 | 25 | 130 | 32 | 22 |

# ACS 柄付アンギュラカッター

| 刃径 (ΦD) Dia. | 角度 (θ) Cut Angle | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|---|
| 10 | 60° | 4 | 4 | 8 | 45 | 8 | 8 |
| 12 | | 5 | 5 | 10 | 50 | 8 | 8 |
| 15 | | 6 | 6 | 12 | 54 | 10 | 8 |
| 20 | | 7 | 8 | 12 | 64 | 10 | 10 |
| 25 | | 9 | 10 | 15 | 69 | 12 | 10 |
| 30 | | 11 | 12 | 18 | 79 | 16 | 12 |
| 35 | | 13 | 14 | 18 | 81 | 16 | 12 |
| 40 | | 17 | 16 | 20 | 92 | 20 | 14 |
| 45 | | 19 | 18 | 20 | 94 | 20 | 14 |
| 50 | | 22 | 20 | 22 | 104 | 25 | 16 |
| 55 | | 22 | 20 | 22 | 104 | 25 | 18 |
| 60 | | 25 | 22 | 22 | 110 | 25 | 18 |
| 65 | | 25 | 26 | 25 | 130 | 32 | 18 |
| ※ 70 | | 25 | 34 | 25 | 130 | 32 | 20 |
| | | 25 | 30 | 25 | 130 | 32 | 20 |
| | | 30 | 34 | 25 | 130 | 42 | 20 |
| ※ | | 30 | 30 | 25 | 135 | 42 | 20 |
| 75 | | 25 | 36 | 25 | 130 | 32 | 20 |
| | | 30 | 36 | 25 | 130 | 42 | 20 |
| ※ | | 30 | 36 | 25 | 135 | 42 | 20 |
| 80 | | 25 | 38 | 25 | 130 | 32 | 22 |
| | | 30 | 38 | 25 | 135 | 42 | 22 |
| ※ 90 | | 30 | 42 | 25 | 135 | 32 | 22 |
| | | 30 | 40 | 25 | 135 | 32 | 22 |
| ※ | | 35 | 42 | 25 | 135 | 42 | 22 |
| | | 35 | 40 | 30 | 145 | 42 | 22 |
| ※ 100 | | 30 | 42 | 25 | 135 | 32 | 22 |
| | | 30 | 48 | 25 | 135 | 32 | 22 |
| | | 35 | 42 | 25 | 135 | 42 | 22 |
| ※ | | 35 | 48 | 30 | 145 | 42 | 22 |
| 10 | 65° | 4 | 4 | 8 | 45 | 8 | 8 |
| 15 | | 6 | 6 | 12 | 54 | 10 | 8 |
| 20 | | 7 | 8 | 12 | 64 | 10 | 10 |
| 25 | | 9 | 10 | 15 | 69 | 12 | 10 |
| 30 | | 11 | 12 | 18 | 79 | 16 | 12 |
| 35 | | 13 | 14 | 18 | 81 | 16 | 12 |
| 40 | | 17 | 16 | 20 | 92 | 20 | 14 |
| 45 | | 19 | 18 | 20 | 94 | 20 | 14 |
| 50 | | 22 | 20 | 22 | 104 | 25 | 16 |
| 55 | | 22 | 20 | 22 | 104 | 25 | 18 |
| 60 | | 25 | 22 | 22 | 110 | 25 | 18 |
| 65 | | 25 | 26 | 25 | 130 | 32 | 18 |
| 70 | | 25 | 34 | 25 | 130 | 32 | 20 |
| 75 | | 25 | 36 | 25 | 130 | 32 | 20 |
| 80 | | 25 | 38 | 25 | 130 | 32 | 22 |
| 90 | | 30 | 42 | 25 | 135 | 32 | 22 |
| 100 | | 30 | 42 | 25 | 135 | 32 | 22 |
| 10 | 70° | 4 | 4 | 8 | 45 | 8 | 8 |
| 12 | | 5 | 5 | 10 | 50 | 8 | 8 |
| 15 | | 6 | 6 | 12 | 54 | 10 | 8 |
| 20 | | 7 | 8 | 12 | 64 | 10 | 10 |
| 25 | | 9 | 10 | 15 | 69 | 12 | 10 |
| 30 | | 11 | 12 | 18 | 79 | 16 | 12 |
| 35 | | 13 | 14 | 18 | 81 | 16 | 12 |
| 40 | | 17 | 16 | 20 | 92 | 20 | 14 |
| 45 | | 19 | 18 | 20 | 94 | 20 | 14 |
| 50 | | 22 | 20 | 22 | 104 | 25 | 16 |
| 55 | | 22 | 20 | 22 | 104 | 25 | 18 |
| 60 | | 25 | 22 | 22 | 110 | 25 | 18 |
| 65 | | 25 | 26 | 25 | 130 | 32 | 18 |
| 70 | | 25 | 34 | 25 | 130 | 32 | 20 |
| 75 | | 25 | 36 | 25 | 130 | 32 | 20 |
| 80 | | 25 | 38 | 25 | 130 | 32 | 22 |
| 90 | | 30 | 42 | 25 | 135 | 32 | 22 |
| 100 | | 30 | 42 | 25 | 135 | 32 | 22 |

| 刃径 (ΦD) Dia. | 角度 (θ) Cut Angle | 刃厚 (ℓ1) Cut Width | 首径 (Φd1) Neck Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|---|
| 10 | 75° | 4 | 4 | 8 | 45 | 8 | 8 |
| 12 | | 5 | 5 | 10 | 50 | 8 | 8 |
| 15 | | 6 | 6 | 12 | 54 | 10 | 8 |
| 20 | | 7 | 8 | 12 | 64 | 10 | 10 |
| 25 | | 9 | 10 | 15 | 69 | 12 | 10 |
| 30 | | 11 | 12 | 18 | 79 | 16 | 12 |
| 35 | | 13 | 14 | 18 | 81 | 16 | 12 |
| 40 | | 17 | 16 | 20 | 92 | 20 | 14 |
| 45 | | 19 | 18 | 20 | 94 | 20 | 14 |
| 50 | | 22 | 20 | 22 | 104 | 25 | 16 |
| 55 | | 22 | 20 | 22 | 104 | 25 | 18 |
| 60 | | 25 | 22 | 22 | 110 | 25 | 18 |
| 65 | | 25 | 26 | 25 | 130 | 32 | 18 |
| 70 | | 25 | 34 | 25 | 130 | 32 | 20 |
| 75 | | 25 | 36 | 25 | 130 | 32 | 20 |
| 80 | | 25 | 38 | 25 | 130 | 32 | 20 |
| 90 | | 30 | 42 | 25 | 135 | 32 | 22 |
| 100 | | 30 | 42 | 25 | 135 | 32 | 22 |
| 10 | 80° | 4 | 4 | 8 | 45 | 8 | 8 |
| 12 | | 5 | 5 | 10 | 50 | 8 | 8 |
| 15 | | 6 | 6 | 12 | 54 | 10 | 8 |
| 20 | | 7 | 8 | 12 | 64 | 10 | 10 |
| 25 | | 9 | 10 | 15 | 69 | 12 | 10 |
| 30 | | 11 | 12 | 18 | 79 | 16 | 12 |
| 35 | | 13 | 14 | 18 | 81 | 16 | 12 |
| 40 | | 17 | 16 | 20 | 92 | 20 | 14 |
| 45 | | 19 | 18 | 20 | 94 | 20 | 14 |
| 50 | | 22 | 20 | 22 | 104 | 25 | 16 |
| 55 | | 22 | 20 | 22 | 104 | 25 | 18 |
| 60 | | 25 | 22 | 22 | 110 | 25 | 18 |
| 70 | | 25 | 34 | 25 | 130 | 32 | 20 |
| 75 | | 25 | 36 | 25 | 130 | 32 | 20 |
| 80 | | 25 | 38 | 25 | 130 | 32 | 22 |
| 90 | | 30 | 42 | 25 | 135 | 32 | 22 |
| 100 | | 30 | 42 | 25 | 135 | 32 | 22 |

ハイス

# ACSW

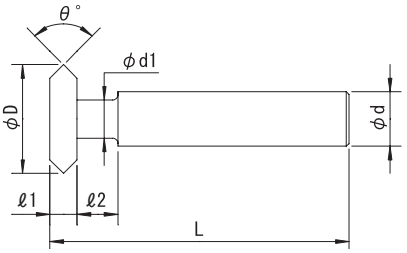
## 柄付Wアンギュラカッター　*W Angular Cutter With Straight Shank*

切削条件表 P261

アリ溝・角度付溝・面取り加工　右直刃　HSS　HSS Co








| 公差(Tolerance) | D：$^{+1}_{0}$ | θ：±15′ | d：h8 |
|---|---|---|---|

右刃ストレート　SKH51 φ65以上　SKH56
Straight Flute　HSS-Co for φ65 and Over.　HSS for Other Dia.

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| **10** | W60° | 3.1 | 4.3 | 8.9 | 45 | 8 | 8 |
| **12** | | 3.7 | 5 | 11.3 | 50 | 8 | 8 |
| **15** | | 4 | 5 | 12 | 60 | 10 | 8 |
| **20** | | 5 | 6 | 12 | 63 | 10 | 10 |
| **25** | | 6 | 7 | 15 | 75 | 12 | 10 |
| **30** | | 8 | 8 | 18 | 78 | 16 | 12 |
| **35** | | 8 | 10 | 18 | 82 | 16 | 12 |
| **40** | | 9 | 12 | 20 | 93 | 20 | 14 |
| **45** | | 11 | 14 | 20 | 95 | 20 | 14 |
| **50** | | 12 | 16 | 22 | 104 | 25 | 16 |
| **55** | | 13 | 18 | 24 | 110 | 25 | 18 |
| **60** | | 14 | 20 | 24 | 110 | 25 | 18 |
| **65** | | 15 | 25 | 25 | 130 | 32 | 18 |
| **70** | | 15 | 25 | 25 | 130 | 32 | 20 |
| **75** | | 20 | 25 | 25 | 130 | 32 | 20 |
| **80** | | 20 | 25 | 25 | 130 | 32 | 22 |
| **90** | | 25 | 30 | 25 | 135 | 32 | 22 |
| **100** | | 25 | 30 | 25 | 135 | 32 | 22 |
| **10** | W90° | 4 | 5 | 8 | 45 | 8 | 8 |
| **12** | | 5 | 5 | 10 | 50 | 8 | 8 |
| **15** | | 5 | 6 | 12 | 60 | 10 | 8 |
| **20** | | 6 | 8 | 12 | 63 | 10 | 10 |
| **25** | | 7 | 10 | 15 | 75 | 12 | 10 |
| **30** | | 8 | 12 | 18 | 78 | 16 | 12 |
| **35** | | 10 | 14 | 18 | 82 | 16 | 12 |
| **40** | | 12 | 16 | 20 | 93 | 20 | 14 |
| **45** | | 16 | 16 | 20 | 95 | 20 | 14 |
| **50** | | 18 | 18 | 22 | 104 | 25 | 16 |
| **55** | | 20 | 20 | 24 | 110 | 25 | 18 |
| **60** | | 20 | 22 | 24 | 110 | 25 | 18 |
| **65** | | 22 | 25 | 25 | 130 | 32 | 18 |
| **70** | | 22 | 25 | 25 | 130 | 32 | 20 |
| **75** | | 25 | 28 | 25 | 130 | 32 | 20 |
| **80** | | 25 | 28 | 25 | 130 | 32 | 22 |
| **90** | | 30 | 30 | 25 | 135 | 32 | 22 |
| **100** | | 30 | 30 | 25 | 135 | 32 | 22 |

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| **10** | W120° | 4 | 5 | 8 | 45 | 8 | 8 |
| **12** | | 5 | 5 | 10 | 50 | 8 | 8 |
| **15** | | 5 | 6 | 12 | 60 | 10 | 8 |
| **20** | | 6 | 8 | 12 | 63 | 10 | 10 |
| **25** | | 7 | 10 | 15 | 75 | 12 | 10 |
| **30** | | 8 | 12 | 18 | 78 | 16 | 12 |
| **35** | | 10 | 14 | 18 | 82 | 16 | 12 |
| **40** | | 12 | 16 | 20 | 93 | 20 | 14 |
| **45** | | 16 | 16 | 20 | 95 | 20 | 14 |
| **50** | | 18 | 18 | 22 | 104 | 25 | 16 |
| **55** | | 20 | 20 | 24 | 110 | 25 | 18 |
| **60** | | 20 | 22 | 24 | 110 | 25 | 18 |
| **65** | | 22 | 25 | 25 | 130 | 32 | 18 |
| **70** | | 22 | 25 | 25 | 130 | 32 | 20 |
| **75** | | 25 | 28 | 25 | 130 | 32 | 20 |
| **80** | | 25 | 28 | 25 | 130 | 32 | 22 |
| **90** | | 30 | 30 | 25 | 135 | 32 | 22 |
| **100** | | 30 | 30 | 25 | 135 | 32 | 22 |

ハイス

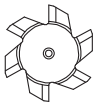
# ACST

## 強力型柄付アンギュラカッター　*Long Shank Strong Angular Cutter With Straight Shank*

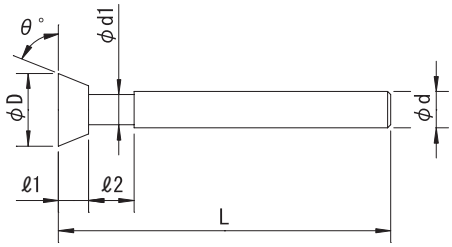
切削条件表 P262

アリ溝・角度付溝・面取り加工

右ネジレ 15°　右ネジレ 20°　HSS Co








| 公差(Tolerance) | D：$^{+1}_{0}$ | θ：45°±1° | θ：60°±15′ | d：h8 |
|---|---|---|---|---|

角度45°:右刃右ネジレ15°　60°:右刃右ネジレ20°　SKH56

θ=45°:Helix Angle-Right15°　θ=60°:Helix Angle-Right20°　HSS-Co.

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| **12** | 45° | 3.5 | 3.5 | 10 | 70 | 8 | 4 |
| **15** | | 5 | 3.5 | 10 | 75 | 8 | 4 |
| **16** | | 5 | 4.5 | 12 | 80 | 8 | 4 |
| **18** | | 5 | 5.5 | 12 | 90 | 10 | 4 |
| **20** | | 5 | 8.5 | 12 | 109 | 10 | 4 |
| **25** | | 7 | 8.5 | 15 | 124 | 12 | 6 |
| **30** | | 8 | 8.5 | 18 | 144 | 16 | 6 |
| **35** | | 11 | 8.5 | 18 | 146 | 16 | 6 |
| **40** | | 13 | 10.5 | 20 | 162 | 20 | 6 |
| **45** | | 15 | 10.5 | 20 | 164 | 20 | 6 |
| **50** | | 16 | 12.5 | 25 | 177 | 25 | 6 |
| **55** | | 16 | 12.5 | 25 | 177 | 25 | 8 |
| **60** | | 18 | 14.5 | 25 | 185 | 25 | 8 |

| 刃径 (ΦD) *Dia.* | 角度 (θ) *Cut Angle* | 刃厚 (ℓ1) *Cut Width* | 首径 (Φd1) *Neck Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|---|
| **12** | 60° | 5 | 6 | 10 | 70 | 8 | 4 |
| **15** | | 6 | 7 | 12 | 75 | 8 | 4 |
| **16** | | 7 | 7 | 12 | 80 | 8 | 4 |
| **18** | | 7 | 9 | 12 | 90 | 10 | 4 |
| **20** | | 7 | 9 | 12 | 109 | 10 | 4 |
| **25** | | 9 | 11 | 15 | 124 | 12 | 6 |
| **30** | | 11 | 13 | 18 | 144 | 16 | 6 |
| **35** | | 13 | 15 | 18 | 146 | 16 | 6 |
| **40** | | 17 | 17 | 25 | 162 | 20 | 6 |
| **45** | | 19 | 19 | 25 | 164 | 20 | 6 |
| **50** | | 22 | 21 | 30 | 177 | 25 | 6 |
| **55** | | 22 | 21 | 30 | 177 | 25 | 8 |
| **60** | | 25 | 23 | 30 | 185 | 25 | 8 |
| **65** | | 25 | 28 | 30 | 185 | 32 | 8 |
| **70** | | 25 | 34 | 30 | 195 | 32 | 8 |
| | | 25 | 34 | 30 | 195 | 42 | 8 |
| **75** | | 25 | 36 | 30 | 195 | 32 | 8 |
| | | 25 | 36 | 30 | 195 | 42 | 8 |
| **80** | | 25 | 38 | 30 | 195 | 32 | 10 |
| | | 25 | 38 | 30 | 195 | 42 | 10 |
| **90** | | 30 | 42 | 25 | 195 | 32 | 10 |
| | | 30 | 42 | 25 | 195 | 42 | 10 |
| **100** | | 30 | 42 | 25 | 195 | 32 | 10 |
| | | 30 | 42 | 25 | 195 | 42 | 10 |

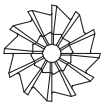
ハイス

# PCS

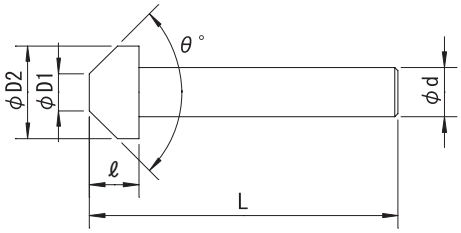
## 柄付傘型カッター　*Parasol Cutter With Straight Shank*

切削条件表 P263

アリ溝・角度付溝・面取り加工　右直刃　HSS　HSS Co








| 公差(Tolerance) | D2：$^{+1}_{0}$ | θ：$^{0}_{-30'}$ | d：h8 |
|---|---|---|---|

右刃ストレート　φ60までSKH51 φ65以上　SKH56
Straight Flute　HSS-Co for φ65 and over.　HSS for other Size.

| 呼び寸法 (D2×θ) *Size (Taper Angle)* | 小径 (ΦD1) *First Dia.* | 首下 (ℓ) ※ | 大径 (ΦD2) *Dai at Large End* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| **15x60°** | 6 | 11 | 15 | 51 | 8 | 8 |
| **20x60°** | 8 | 13.5 | 20 | 58.5 | 10 | 8 |
| **25x60°** | 10 | 16 | 25 | 61 | 12 | 8 |
| **30x60°** | 12 | 18.5 | 30 | 63.5 | 16 | 10 |
| **35x60°** | 14 | 23 | 35 | 68 | 16 | 10 |
| **40x60°** | 16 | 26 | 40 | 76 | 25 | 10 |
| **45x60°** | 18 | 28 | 45 | 78 | 25 | 12 |
| **50x60°** | 20 | 31 | 50 | 86 | 32 | 12 |
| **55x60°** | 22 | 36 | 55 | 91 | 32 | 12 |
| **60x60°** | 24 | 36 | 60 | 91 | 32 | 12 |
| **65x60°** | 26 | 40 | 65 | 100 | 32 | 14 |
| **70x60°** | 28 | 42 | 70 | 102 | 32 | 14 |
| **75x60°** | 30 | 45 | 75 | 105 | 32 | 14 |
| **80x60°** | 32 | 48 | 80 | 108 | 32 | 14 |
| **90x60°** | 36 | 53 | 90 | 113 | 32 | 14 |
| **100x60°** | 40 | 58 | 100 | 118 | 32 | 14 |

※Cut Length Including Neck

| 呼び寸法 (D2×θ) *Size (Taper Angle)* | 小径 (ΦD1) *First Dia.* | 首下 (ℓ) ※ | 大径 (ΦD2) *Dai at Large End* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| **15x90°** | 6 | 8 | 15 | 48 | 8 | 8 |
| **20x90°** | 8 | 9 | 20 | 54 | 10 | 8 |
| **25x90°** | 10 | 10.5 | 25 | 55.5 | 12 | 8 |
| **30x90°** | 12 | 12 | 30 | 57 | 16 | 10 |
| **35x90°** | 14 | 15 | 35 | 60 | 16 | 10 |
| **40x90°** | 16 | 17 | 40 | 67 | 25 | 10 |
| **45x90°** | 18 | 19 | 45 | 69 | 25 | 12 |
| **50x90°** | 20 | 20 | 50 | 75 | 32 | 12 |
| **55x90°** | 22 | 23 | 55 | 78 | 32 | 12 |
| **60x90°** | 24 | 23 | 60 | 78 | 32 | 12 |
| **65x90°** | 26 | 26 | 65 | 86 | 32 | 14 |
| **70x90°** | 28 | 27 | 70 | 87 | 32 | 14 |
| **75x90°** | 30 | 29 | 75 | 89 | 32 | 14 |
| **80x90°** | 32 | 30 | 80 | 90 | 32 | 14 |
| **90x90°** | 36 | 33 | 90 | 93 | 32 | 14 |
| **100x90°** | 40 | 36 | 100 | 96 | 32 | 14 |

※Cut Length Including Neck

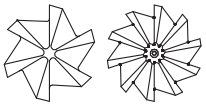
ハイス

# CF

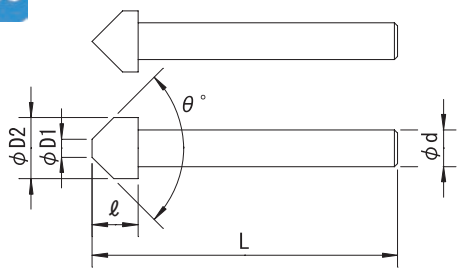
## センターフライス　*Countersink With Straight Shank*

切削条件表 P263

アリ溝・角度付溝・面取り加工　右直刃　HSS






| 公差(Tolerance) | θ：$^{0}_{-30'}$ | d：h8 |
|---|---|---|

右刃ストレート　SKH51
Straight Flute　HSS

| 呼び寸法 (D2×θ) *Size (Taper Angle)* | 小径 (ΦD1) *First Dia.* | 首下 (ℓ) ※ | 大径 (ΦD2) *Dai at Large End* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| **6x 60°** | – | – | 6 | 35 | 6 | 6 |
| **8x 60°** | – | 12 | 8 | 40 | 6 | 6 |
| **10x 60°** | – | 14 | 10 | 52 | 6 | 6 |
| **12x 60°** | – | 15 | 12 | 52 | 8 | 6 |
| **15x 60°** | – | 18 | 15 | 55 | 10 | 6 |
| **16x 60°** | – | 19 | 16 | 58 | 10 | 6 |
| **20x 60°** | – | 22 | 20 | 62 | 10 | 8 |
| **22x 60°** | – | 24 | 22 | 64 | 12 | 8 |
| **25x 60°** | 5 | 24 | 25 | 64 | 12 | 8 |
| **30x 60°** | 5 | 29 | 30 | 69 | 12 | 10 |
| **35x 60°** | 8 | 31 | 35 | 79 | 12 | 10 |
| **40x 60°** | 8 | 38 | 40 | 88 | 12 | 12 |
| **45x 60°** | 12 | 39 | 45 | 93 | 12 | 12 |
| **50x 60°** | 12 | 43 | 50 | 98 | 16 | 12 |
| **55x 60°** | 12 | 46 | 55 | 100 | 16 | 12 |
| **60x 60°** | 15 | 49 | 60 | 103 | 16 | 14 |
| **65x 60°** | 17 | 52 | 65 | 106 | 16 | 14 |
| **70x 60°** | 20 | 54 | 70 | 114 | 20 | 14 |
| **75x 60°** | 20 | 61 | 75 | 121 | 20 | 14 |
| **80x 60°** | 25 | 58 | 80 | 128 | 20 | 14 |
| **90x 60°** | 25 | 66 | 90 | 136 | 25 | 14 |
| **100x 60°** | 25 | 72 | 100 | 145 | 25 | 14 |

※Cut Length Including Neck

| 呼び寸法 (D2×θ) *Size (Taper Angle)* | 小径 (ΦD1) *First Dia.* | 首下 (ℓ) ※ | 大径 (ΦD2) *Dai at Large End* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| **6x 90°** | – | – | 6 | 35 | 6 | 6 |
| **8x 90°** | – | 9 | 8 | 40 | 6 | 6 |
| **10x 90°** | – | 10 | 10 | 45 | 6 | 6 |
| **12x 90°** | – | 11 | 12 | 48 | 8 | 6 |
| **15x 90°** | – | 12 | 15 | 50 | 10 | 6 |
| **16x 90°** | – | 13 | 16 | 50 | 10 | 6 |
| **20x 90°** | – | 17 | 20 | 55 | 10 | 8 |
| **22x 90°** | – | 17 | 22 | 58 | 12 | 8 |
| **25x 90°** | 5 | 17 | 25 | 58 | 12 | 8 |
| **30x 90°** | 5 | 19 | 30 | 60 | 12 | 10 |
| **35x 90°** | 8 | 20 | 35 | 64 | 12 | 10 |
| **40x 90°** | 8 | 26 | 40 | 71 | 12 | 12 |
| **45x 90°** | 12 | 26 | 45 | 73 | 12 | 12 |
| **50x 90°** | 12 | 29 | 50 | 76 | 16 | 12 |
| **55x 90°** | 12 | 31 | 55 | 78 | 16 | 12 |
| **60x 90°** | 15 | 33 | 60 | 80 | 16 | 14 |
| **65x 90°** | 17 | 34 | 65 | 84 | 16 | 14 |
| **70x 90°** | 20 | 40 | 70 | 100 | 20 | 14 |
| **75x 90°** | 20 | 45 | 75 | 105 | 20 | 14 |
| **80x 90°** | 25 | 40 | 80 | 110 | 20 | 14 |
| **90x 90°** | 25 | 45 | 90 | 115 | 25 | 14 |
| **100x 90°** | 25 | 50 | 100 | 120 | 25 | 14 |

※Cut Length Including Neck

| 呼び寸法 (D2×θ) *Size (Taper Angle)* | 小径 (ΦD1) *First Dia.* | 首下 (ℓ) ※ | 大径 (ΦD2) *Dai at Large End* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| **6x120°** | – | – | 6 | 35 | 6 | 6 |
| **8x120°** | – | 8 | 8 | 39 | 6 | 6 |
| **10x120°** | – | 8 | 10 | 43 | 6 | 6 |
| **12x120°** | – | 9 | 12 | 46 | 8 | 6 |
| **15x120°** | – | 10 | 15 | 48 | 10 | 6 |
| **16x120°** | – | 10 | 16 | 48 | 10 | 6 |
| **20x120°** | – | 13 | 20 | 51 | 10 | 6 |
| **25x120°** | 5 | 13 | 25 | 54 | 12 | 8 |
| **30x120°** | 5 | 15 | 30 | 56 | 12 | 10 |
| **35x120°** | 8 | 15 | 35 | 59 | 12 | 10 |
| **40x120°** | 8 | 20 | 40 | 65 | 12 | 12 |
| **45x120°** | 12 | 20 | 45 | 67 | 12 | 12 |
| **50x120°** | 12 | 21 | 50 | 68 | 16 | 12 |
| **55x120°** | 12 | 23 | 55 | 70 | 16 | 12 |
| **60x120°** | 15 | 23 | 60 | 70 | 16 | 14 |

※Cut Length Including Neck

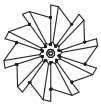
ハイス

# CFT

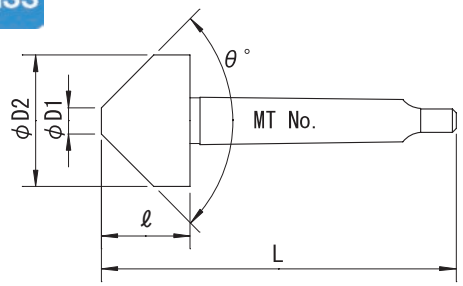
## センターフライス（テーパーシャンク） *Countersink With Taper Shank*

切削条件表 P263

アリ溝・角度付溝・面取り加工　右直刃　HSS








| 公差(Tolerance) | θ ： $^{0}_{-30'}$ |
|---|---|

右刃ストレート　SKH51
Straight Flute　HSS

| 呼び寸法 (D2xθ) *Size (Taper Angle)* | 小径 (ΦD1) *First Dia.* | 首下 (ℓ) ※ | 大径 (ΦD2) *Dai at Large End* | 全長 (L) *Overall Length* | MT No. *Shank MTNo.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| **40x60° xMT2** | 8 | 38 | 40 | 124 | 2 | 12 |
| **40x60° xMT3** | 8 | 38 | 40 | 143 | 3 | 12 |
| **45x60° xMT2** | 12 | 39 | 45 | 125 | 2 | 12 |
| **45x60° xMT3** | 12 | 39 | 45 | 144 | 3 | 12 |
| **50x60° xMT2** | 12 | 43 | 50 | 129 | 2 | 12 |
| **50x60° xMT3** | 12 | 43 | 50 | 148 | 3 | 12 |
| **55x60° xMT2** | 12 | 46 | 55 | 132 | 2 | 12 |
| **55x60° xMT3** | 12 | 46 | 55 | 151 | 3 | 12 |
| **60x60° xMT2** | 15 | 49 | 60 | 135 | 2 | 14 |
| **60x60° xMT3** | 15 | 49 | 60 | 154 | 3 | 14 |
| **60x60° xMT4** | 15 | 49 | 60 | 179 | 4 | 14 |
| **65x60° xMT3** | 17 | 52 | 65 | 157 | 3 | 14 |
| **65x60° xMT4** | 17 | 52 | 65 | 182 | 4 | 14 |
| **70x60° xMT3** | 20 | 54 | 70 | 159 | 3 | 14 |
| **70x60° xMT4** | 20 | 54 | 70 | 184 | 4 | 14 |
| **80x60° xMT3** | 25 | 58 | 80 | 163 | 3 | 14 |
| **80x60° xMT4** | 25 | 58 | 80 | 188 | 4 | 14 |
| **90x60° xMT3** | 25 | 66 | 90 | 171 | 3 | 14 |
| **90x60° xMT4** | 25 | 66 | 90 | 196 | 4 | 14 |
| **95x60° xMT4** | 25 | 75 | 95 | 205 | 4 | 14 |
| **100x60° xMT3** | 25 | 75 | 100 | 180 | 3 | 14 |
| **100x60° xMT4** | 25 | 75 | 100 | 205 | 4 | 14 |

※Cut Length Including Neck

| 呼び寸法 (D2xθ) *Size (Taper Angle)* | 小径 (ΦD1) *First Dia.* | 首下 (ℓ) ※ | 大径 (ΦD2) *Dai at Large End* | 全長 (L) *Overall Length* | MT No. *Shank MTNo.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|---|---|
| **40x90° xMT2** | 8 | 26 | 40 | 112 | 2 | 12 |
| **40x90° xMT3** | 8 | 26 | 40 | 131 | 3 | 12 |
| **45x90° xMT2** | 12 | 26 | 45 | 112 | 2 | 12 |
| **45x90° xMT3** | 12 | 26 | 45 | 131 | 3 | 12 |
| **50x90° xMT2** | 12 | 29 | 50 | 115 | 2 | 12 |
| **50x90° xMT3** | 12 | 29 | 50 | 134 | 3 | 12 |
| **55x90° xMT2** | 12 | 31 | 55 | 117 | 2 | 12 |
| **55x90° xMT3** | 12 | 31 | 55 | 136 | 3 | 12 |
| **60x90° xMT2** | 15 | 33 | 60 | 119 | 2 | 14 |
| **60x90° xMT3** | 15 | 33 | 60 | 138 | 3 | 14 |
| **60x90° xMT4** | 15 | 33 | 60 | 163 | 4 | 14 |
| **65x90° xMT3** | 17 | 34 | 65 | 139 | 3 | 14 |
| **65x90° xMT4** | 17 | 34 | 65 | 164 | 4 | 14 |
| **70x90° xMT3** | 20 | 40 | 70 | 145 | 3 | 14 |
| **70x90° xMT4** | 20 | 40 | 70 | 170 | 4 | 14 |
| **80x90° xMT3** | 25 | 40 | 80 | 145 | 3 | 14 |
| **80x90° xMT4** | 25 | 40 | 80 | 170 | 4 | 14 |
| **90x90° xMT3** | 25 | 45 | 90 | 150 | 3 | 14 |
| **90x90° xMT4** | 25 | 45 | 90 | 175 | 4 | 14 |
| **95x90° xMT4** | 25 | 50 | 95 | 180 | 4 | 14 |
| **100x90° xMT3** | 25 | 50 | 100 | 155 | 3 | 14 |
| **100x90° xMT4** | 25 | 50 | 100 | 180 | 4 | 14 |

※Cut Length Including Neck

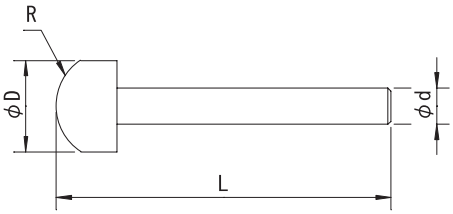
# RC

## R面取カッター（スプールブッシュ用） *R Cutter (For Sprue Bushes)*

切削条件表 P263 | R 加 工 | 右直刃 | HSS Co








| 公差(Tolerance) | d：h8 |
|---|---|

右刃ストレート　SKH56
Straight Flute　HSS-Co.

| 呼び寸法 (R) *Size* | 外径 (ΦD) *Dai at Large End* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* | 刃数 (N) *Number of Flutes* |
|---|---|---|---|---|
| **10.5** | 18 | 80 | 12 | 2 |
| **15.5** | 25 | 85 | 12 | 2 |
| **20.5** | 35 | 90 | 12 | 2 |

ハイス

# CC

## センター面取カッター　*Center Chamfering Cutter*

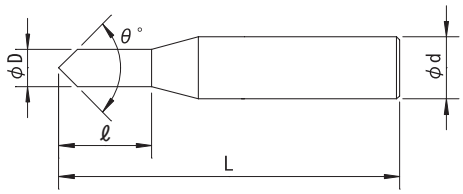
切削条件表 P264

アリ溝・角度付溝・面取り加工

右ネジレ 25°　右ネジレ 30°　刃数 2　HSS Co








| 公差(Tolerance) | D： $^{0}_{-0.02}$ | θ： $^{0}_{-30'}$ | d：h6 |
|---|---|---|---|

右刃右ネジレ30°（先端角30°は右刃右ネジレ25°）　刃数:2　SKH56

Helix Angle-Right30°(Helix Angle Right25° for θ 30°)　2 Flutes　HSS-Co.

| 刃径（ΦD） *Dia.* | 先端角（θ） *Point Angle* | 刃長（ℓ） *Length of Flutes* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|
| 4 | 30° | 15 | 75 | 8 |
| | 45° | 12 | 75 | 8 |
| | 60° | 11 | 75 | 8 |
| | 80° | 11 | 75 | 8 |
| | 90° | 11 | 75 | 8 |
| | 120° | 11 | 75 | 8 |
| 6 | 30° | 19 | 85 | 10 |
| | 45° | 14 | 85 | 10 |
| | 60° | 13 | 85 | 10 |
| | 80° | 13 | 85 | 10 |
| | 90° | 13 | 85 | 10 |
| | 120° | 13 | 85 | 10 |
| 8 | 30° | 25 | 100 | 12 |
| | 45° | 21 | 100 | 12 |
| | 60° | 19 | 100 | 12 |
| | 80° | 19 | 100 | 12 |
| | 90° | 19 | 100 | 12 |
| | 120° | 19 | 100 | 12 |
| 10 | 30° | 31 | 120 | 16 |
| | 45° | 24 | 120 | 16 |
| | 60° | 22 | 120 | 16 |
| | 80° | 22 | 120 | 16 |
| | 90° | 22 | 120 | 16 |
| | 120° | 22 | 120 | 16 |
| 12 | 30° | 38 | 125 | 16 |
| | 45° | 28 | 125 | 16 |
| | 60° | 26 | 125 | 16 |
| | 80° | 26 | 125 | 16 |
| | 90° | 26 | 125 | 16 |
| | 120° | 26 | 125 | 16 |

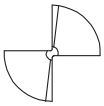
| 刃径（ΦD） *Dia.* | 先端角（θ） *Point Angle* | 刃長（ℓ） *Length of Flutes* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|
| 16 | 30° | 47 | 145 | 20 |
| | 45° | 34 | 145 | 20 |
| | 60° | 32 | 145 | 20 |
| | 80° | 32 | 145 | 20 |
| | 90° | 32 | 145 | 20 |
| | 120° | 32 | 145 | 20 |
| 20 | 30° | 57 | 165 | 25 |
| | 45° | 41 | 165 | 25 |
| | 60° | 38 | 165 | 25 |
| | 80° | 38 | 165 | 25 |
| | 90° | 38 | 165 | 25 |
| | 120° | 38 | 165 | 25 |
| 25 | 30° | 68 | 170 | 32 |
| | 45° | 48 | 170 | 32 |
| | 60° | 45 | 170 | 32 |
| | 90° | 45 | 170 | 32 |
| | 120° | 45 | 170 | 32 |
| 30 | 60° | 50 | 180 | 32 |
| | 90° | 50 | 180 | 32 |
| | 120° | 50 | 180 | 32 |
| 35 | 60° | 60 | 190 | 32 |
| | 90° | 60 | 190 | 32 |
| | 120° | 60 | 190 | 32 |

ハイス

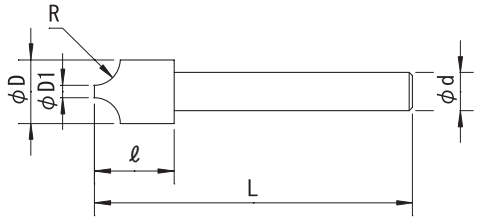
# MCRC

## ミニコーナーRカッター（ハーフ） *Mini Corner R Cutter*

切削条件表 P265 | R 加 工 | 右直刃 | HSS Co








| 公差(Tolerance) | R：±0.05 | D1：±0.01 | D1：$^{0}_{-0.03}$ | d：$^{0}_{-0.009}$ |
|---|---|---|---|---|

右刃ストレート　SKH56
Straight Flute　HSS-Co.

| 寸法 R | 小径 (ΦD1) First Dia. | 首下 (ℓ) ※ | 外径 (ΦD) Outside Dia. | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| **0.5** | 2 | 5.7 | 3 | 60 | 6 | 2 |
| **0.75** | 2 | 6.3 | 3.5 | 60 | 6 | 2 |
| **1** | 2 | 7.3 | 4 | 60 | 6 | 2 |
| **1.25** | 2 | 8.2 | 4.5 | 60 | 6 | 2 |
| **1.5** | 2 | 9.1 | 5 | 60 | 6 | 2 |
| **1.75** | 2 | 10 | 5.5 | 60 | 6 | 2 |
| **2** | 2 | – | 6 | 60 | 6 | 2 |
| **2.25** | 2 | 12.2 | 6.5 | 60 | 8 | 2 |
| **2.5** | 2 | 13.1 | 7 | 60 | 8 | 2 |

※Cut Length Including Neck

| 寸法 R | 小径 (ΦD1) First Dia. | 首下 (ℓ) ※ | 外径 (ΦD) Outside Dia. | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| **2.75** | 2 | 14 | 7.5 | 60 | 8 | 2 |
| **3** | 2 | – | 8 | 60 | 8 | 2 |
| **3.5** | 2 | 10 | 10 | 70 | 8 | 2 |
| **4** | 2 | 10 | 11 | 70 | 8 | 2 |
| **4.5** | 2 | 12 | 12 | 70 | 8 | 2 |
| **5** | 2 | 12 | 13 | 80 | 10 | 2 |
| **6** | 2 | 16 | 15 | 80 | 10 | 2 |
| **7** | 2 | 16 | 17 | 80 | 10 | 2 |
| **8** | 2 | 16 | 19 | 80 | 10 | 2 |

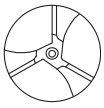
※Cut Length Including Neck

ハイス

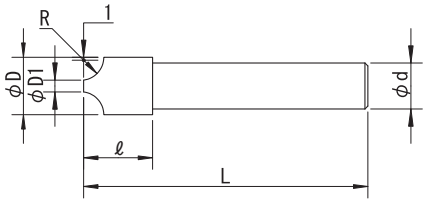
# CRC

## コーナーRカッター *Corner R Cutter*

切削条件表 P265 | R 加 工 | 右直刃 | HSS Co








| 公差(Tolerance) | R：±0.03 | d：h7 |
|---|---|---|

右刃ストレート　SKH56
Straight Flute　HSS-Co.

| 寸法 R | 小径 (ΦD1) First Dia. | 首下 (ℓ) ※ | 外径 (ΦD) Outside Dia. | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| **0.5** | 6 | 25 | 9 | 60 | 10 | 3 |
| **0.75** | 6 | 25 | 9.5 | 60 | 10 | 3 |
| **1** | 6 | 25 | 10 | 60 | 10 | 3 |
| **1.25** | 6 | 25 | 10.5 | 60 | 10 | 3 |
| **1.5** | 6 | 25 | 11 | 60 | 10 | 3 |
| **2** | 6 | 25 | 12 | 65 | 12 | 3 |
| **2.5** | 6 | 25 | 13 | 65 | 12 | 3 |
| **3** | 6 | 25 | 14 | 65 | 12 | 3 |
| **3.5** | 6 | 30 | 15 | 70 | 12 | 3 |
| **4** | 6 | 30 | 16 | 70 | 12 | 3 |

※Cut Length Including Neck

| 寸法 R | 小径 (ΦD1) First Dia. | 首下 (ℓ) ※ | 外径 (ΦD) Outside Dia. | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 (N) Number of Flutes |
|---|---|---|---|---|---|---|
| **4.5** | 7 | 30 | 18 | 75 | 16 | 4 |
| **5** | 7 | 30 | 19 | 75 | 16 | 4 |
| **6** | 8 | 30 | 22 | 75 | 16 | 4 |
| **7** | 8 | 30 | 24 | 75 | 16 | 4 |
| **8** | 9 | 40 | 27 | 90 | 20 | 4 |
| **9** | 9 | 40 | 29 | 90 | 20 | 4 |
| **10** | 10 | 40 | 32 | 90 | 25 | 4 |
| **12** | 12 | 50 | 38 | 110 | 32 | 4 |
| **12.5** | 12 | 50 | 39 | 110 | 32 | 4 |
| **15** | 13 | 50 | 45 | 110 | 32 | 4 |
| **16** | 14 | 50 | 48 | 110 | 32 | 4 |

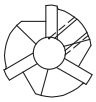
※Cut Length Including Neck

ハイス

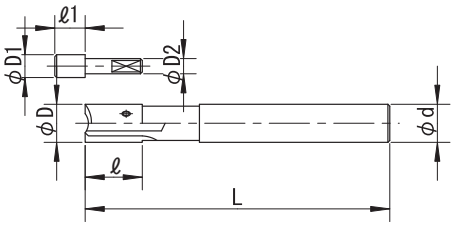
# ZCS

## パイロット付ザグリカッター ストレートシャンク *Counterbore With Straight Shank*

切削条件表 P266 | ザグリ加工 | 右ネジレ 12° | 刃数 3 | HSS








| 公差(Tolerance) | D : $^{+0.2}_{0}$ | D1 : $^{0}_{-0.05}$ | d : h7 |
|---|---|---|---|

右刃右ネジレ12° 刃数:3 SKH51
Helix Angle-Right12° 3 Flutes HSS

| 刃径 (ΦD) *Dia.* | 案内径 (ΦD1) *Guide Dia.* | 案内軸 (ΦD2) *Shank Dia. of Guide* | 案内長 (ℓ1) *Length of Guide* | 刃長 (ℓ) *Length of Cut* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|---|---|
| **6** | 3 | 2.5 | 5 | 15 | 70 | 6 |
| **7** | 4 | 3 | 5 | 15 | 70 | 6 |
| **8** | 4.5 | 3 | 5 | 15 | 80 | 8 |
| **9** | 4.5 | 3 | 5 | 15 | 80 | 8 |
| | 5.5 | 3 | 5 | 15 | 80 | 8 |
| **10** | 5.5 | 4 | 8 | 15 | 80 | 10 |
| | 6 | 4 | 8 | 15 | 80 | 10 |
| **11** | 6.8 | 4 | 8 | 15 | 80 | 10 |
| **12** | 6.8 | 5 | 10 | 20 | 90 | 10 |
| | 7.7 | 5 | 10 | 20 | 90 | 10 |
| **13** | 8.3 | 5 | 10 | 20 | 90 | 12 |
| **14** | 8.8 | 5 | 10 | 25 | 105 | 12 |
| **15** | 10.2 | 5 | 10 | 25 | 105 | 12 |
| **16** | 10.5 | 6 | 10 | 25 | 105 | 12 |
| **17** | 8.8 | 6 | 10 | 25 | 110 | 12 |
| | 10.5 | 6 | 10 | 25 | 110 | 12 |
| | 12 | 6 | 10 | 25 | 110 | 12 |
| **18** | 6.8 | 6 | 10 | 25 | 110 | 12 |
| | 8.8 | 6 | 10 | 25 | 110 | 12 |
| | 13 | 6 | 10 | 25 | 110 | 12 |

| 刃径 (ΦD) *Dia.* | 案内径 (ΦD1) *Guide Dia.* | 案内軸 (ΦD2) *Shank Dia. of Guide* | 案内長 (ℓ1) *Length of Guide* | 刃長 (ℓ) *Length of Cut* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|---|---|
| **19** | 13 | 6 | 10 | 30 | 115 | 12 |
| | 13.7 | 6 | 10 | 30 | 115 | 12 |
| **20** | 8.8 | 6 | 10 | 30 | 120 | 12 |
| | 10.2 | 6 | 10 | 30 | 120 | 12 |
| | 10.5 | 6 | 10 | 30 | 120 | 12 |
| | 14 | 6 | 10 | 30 | 120 | 12 |
| **21** | 14 | 6 | 10 | 30 | 120 | 12 |
| **22** | 10.2 | 6 | 10 | 30 | 120 | 12 |
| | 14 | 6 | 10 | 30 | 120 | 12 |
| **23** | 12 | 8 | 12 | 35 | 135 | 12 |
| | 15 | 8 | 12 | 35 | 135 | 12 |
| **24** | 16 | 8 | 12 | 35 | 135 | 12 |
| **25** | 10.2 | 8 | 12 | 35 | 135 | 12 |
| | 13 | 8 | 12 | 35 | 135 | 12 |
| | 13.7 | 8 | 12 | 35 | 135 | 12 |
| | 17 | 8 | 12 | 35 | 135 | 12 |
| **26** | 18 | 8 | 12 | 35 | 135 | 12 |
| **27** | 19 | 8 | 12 | 35 | 135 | 12 |
| **28** | 15 | 8 | 12 | 40 | 150 | 12 |
| | 21 | 8 | 12 | 40 | 150 | 12 |

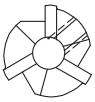
※別売り パイロットのみ有り（P226）

ハイス

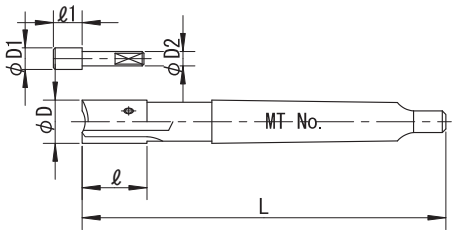
# ZCT

## パイロット付ザグリカッター テーパーシャンク *Counterbore With Taper Shank*

切削条件表 P266 | ザグリ加工 | 右ネジレ 12° | 刃数 3 | HSS








| 公差(Tolerance) | D : $^{+0.2}_{0}$ | D1 : $^{0}_{-0.05}$ |
|---|---|---|

右刃右ネジレ12° 刃数:3 SKH51
Helix Angle-Right12° 3 Flutes HSS

| 刃径 (ΦD) *Dia.* | 案内径 (ΦD1) *Guide Dia.* | 案内軸 (ΦD2) *Shank Dia. of Guide* | 案内長 (ℓ1) *Length of Guide* | 刃長 (ℓ) *Length of Cut* | 全長 (L) *Overall Length* | MT No. *Shank MTNo.* |
|---|---|---|---|---|---|---|
| **11** | 6.8 | 4 | 8 | 15 | 95.5 | MT1 |
| **12** | 7.7 | 5 | 10 | 20 | 105.5 | MT1 |
| **13** | 8.3 | 5 | 10 | 25 | 105.5 | MT1 |
| **14** | 8.8 | 5 | 10 | 25 | 115.5 | MT1 |
| **15** | 10.2 | 5 | 10 | 25 | 115.5 | MT1 |
| **16** | 10.5 | 6 | 10 | 25 | 138.5 | MT2 |
| **17** | 12 | 6 | 10 | 25 | 138.5 | MT2 |
| **18** | 13 | 6 | 10 | 25 | 138.5 | MT2 |
| **19** | 13.7 | 6 | 10 | 30 | 143.5 | MT2 |
| **20** | 14 | 6 | 10 | 30 | 143.5 | MT2 |
| **21** | 14 | 6 | 12 | 30 | 148.5 | MT2 |
| **22** | 14 | 6 | 12 | 30 | 148.5 | MT2 |
| **23** | 15 | 8 | 12 | 35 | 153.5 | MT2 |
| **24** | 16 | 8 | 12 | 35 | 153.5 | MT2 |
| **25** | 17 | 8 | 12 | 35 | 153.5 | MT2 |
| **26** | 18 | 8 | 12 | 35 | 153.5 | MT2 |
| **27** | 19 | 8 | 12 | 35 | 153.5 | MT2 |
| **28** | 21 | 8 | 12 | 40 | 158.5 | MT2 |
| **29** | 22 | 8 | 12 | 40 | 158.5 | MT2 |
| **30** | 22 | 8 | 15 | 40 | 158.5 | MT2 |
| **31** | 23.5 | 8 | 15 | 40 | 158.5 | MT2 |
| **32** | 24 | 8 | 15 | 45 | 163.5 | MT2 |
| **33** | 18 | 8 | 15 | 45 | 163.5 | MT2 |
| **34** | 18 | 8 | 15 | 45 | 163.5 | MT2 |
| **35** | 19 | 8 | 15 | 45 | 163.5 | MT2 |
| **36** | 20 | 10 | 20 | 50 | 198 | MT3 |
| **37** | 20 | 10 | 20 | 50 | 198 | MT3 |

| 刃径 (ΦD) *Dia.* | 案内径 (ΦD1) *Guide Dia.* | 案内軸 (ΦD2) *Shank Dia. of Guide* | 案内長 (ℓ1) *Length of Guide* | 刃長 (ℓ) *Length of Cut* | 全長 (L) *Overall Length* | MT No. *Shank MTNo.* |
|---|---|---|---|---|---|---|
| **38** | 20 | 10 | 20 | 50 | 198 | MT3 |
| **39** | 22 | 10 | 20 | 50 | 198 | MT3 |
| **40** | 25 | 10 | 20 | 50 | 198 | MT3 |
| **41** | 25 | 10 | 20 | 50 | 198 | MT3 |
| **42** | 25 | 10 | 20 | 50 | 198 | MT3 |
| **43** | 25 | 10 | 20 | 50 | 198 | MT3 |
| **44** | 25 | 10 | 20 | 50 | 198 | MT3 |
| **45** | 25 | 10 | 20 | 50 | 198 | MT3 |
| **46** | 25 | 10 | 20 | 50 | 198 | MT3 |
| **47** | 25 | 10 | 20 | 50 | 198 | MT3 |
| **48** | 25 | 10 | 20 | 50 | 198 | MT3 |
| **49** | 25 | 10 | 20 | 50 | 198 | MT3 |
| **50** | 25 | 10 | 20 | 50 | 198 | MT3 |
| **51** | 25 | 10 | 20 | 50 | 198 | MT3 |
| **52** | 25 | 10 | 20 | 50 | 198 | MT3 |
| **53** | 25 | 10 | 20 | 50 | 198 | MT3 |
| **54** | 25 | 10 | 20 | 50 | 198 | MT3 |
| **55** | 25 | 12 | 20 | 50 | 198 | MT3 |
| **56** | 25 | 12 | 20 | 50 | 198 | MT3 |
| **57** | 25 | 12 | 20 | 50 | 198 | MT3 |
| **58** | 25 | 12 | 20 | 50 | 198 | MT3 |
| **59** | 25 | 12 | 20 | 50 | 198 | MT3 |
| **60** | 25 | 12 | 20 | 50 | 198 | MT3 |
| **64** | 25 | 12 | 20 | 50 | 198 | MT3 |
| **65** | 25 | 12 | 20 | 50 | 198 | MT3 |
| **70** | 25 | 12 | 20 | 50 | 198 | MT3 |
| **75** | 25 | 12 | 20 | 50 | 198 | MT3 |

※別売り パイロットのみ有り（P226）

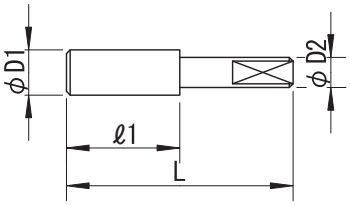
ハイス

# ZCP

## ザグリカッター用パイロット *Guide For Counterbore*

ザグリ加工 SK4






| 公差(Tolerance) | D1：$^{0}_{-0.05}$ | D2：h7 |
|---|---|---|

材質：SK4

| 適応ザグリ径 *Cutter Dia.* | 案内径（ΦD1） *Guide Dia.* | 案内長（ℓ1） *Length of Guide* | 全長（L） *Overall Length* | 案内軸（ΦD2） *Shank Dia. of Guide* |
|---|---|---|---|---|
| **6** | 3 | 5 | 20 | 2.5 |
| **7～9** | 4 | 5 | 20 | 3 |
| | 4.5 | | | |
| | 5.5 | | | |
| **10** | 5.5 | 8 | 23 | 4 |
| | 6 | | | |
| **11** | 6.8 | 8 | 30 | 4 |
| **12～15** | 6.8 | 10 | 35 | 5 |
| | 7.7 | | | |
| | 8.3 | | | |
| | 8.8 | | | |
| | 10.2 | | | |
| **16～18** | 6.8 | 10 | 35 | 6 |
| | 8.8 | | | |
| | 10.5 | | | |
| | 12 | | | |
| | 13 | | | |
| **19～22** | 8.8 | 10 | 40 | 6 |
| | 10.2 | | | |
| | 10.5 | | | |
| | 13 | | | |
| | 13.7 | | | |
| | 14 | | | |

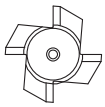
| 適応ザグリ径 *Cutter Dia.* | 案内径（ΦD1） *Guide Dia.* | 案内長（ℓ1） *Length of Guide* | 全長（L） *Overall Length* | 案内軸（ΦD2） *Shank Dia. of Guide* |
|---|---|---|---|---|
| **23～27** | 10.2 | 12 | 47 | 8 |
| | 12 | | | |
| | 13 | | | |
| | 13.7 | | | |
| | 15 | | | |
| | 16 | | | |
| | 17 | | | |
| | 18 | | | |
| | 19 | | | |
| **28～29** | 15 | 12 | 55 | 8 |
| | 21 | | | |
| | 22 | | | |
| **30～31** | 22 | 15 | 55 | 8 |
| | 23.5 | | | |
| **32～35** | 18 | 15 | 60 | 8 |
| | 19 | | | |
| | 24 | | | |
| **36～54** | 20 | 20 | 70 | 10 |
| | 22 | | | |
| | 25 | | | |
| **55～75** | 25 | 20 | 70 | 12 |

ハイス

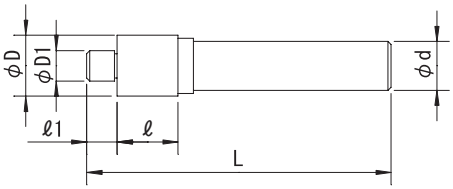
# CB

## 六角穴付ボルト用沈めフライス ストレートシャンク *Counterbore With Straight Shank*

切削条件表 P267 | ザグリ加工 | 右ネジレ 12° | 刃数 4 | HSS








| 公差(Tolerance) | D1：$^{0}_{-0.05}$ | D：$^{+0.2}_{0}$ | d：h8 |
|---|---|---|---|

右刃右ネジレ12° 刃数:4 SKH51
Helix Angle-Right12° 4 Flutes HSS

| 呼び寸法 Size. | 案内径 (ΦD1) Guide Dia. | 案内長 (ℓ1) Length of Guide | 刃径 (ΦD) Dia. | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|
| **3** | 3.2 | 3 | 5.9 | 7 | 37 | 6 |
| **4** | 4.2 | 4 | 7.4 | 10 | 44 | 6 |
| **5** | 5.2 | 5 | 8.9 | 13 | 51 | 6 |
| **6** | 6.2 | 6 | 10.4 | 15 | 58 | 8 |
| **8** | 8.2 | 8 | 13.4 | 16 | 67 | 10 |
| **10** | 10.3 | 10 | 16.8 | 16 | 74 | 12 |
| **12** | 12.4 | 12 | 18.8 | 20 | 83 | 12 |
| **14** | 14.4 | 14 | 24 | 20 | 90 | 12 |

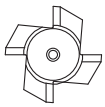
| 呼び寸法 Size. | 案内径 (ΦD1) Guide Dia. | 案内長 (ℓ1) Length of Guide | 刃径 (ΦD) Dia. | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|
| **16** | 16.5 | 16 | 26 | 22 | 100 | 16 |
| **18** | 18.5 | 18 | 28 | 24 | 104 | 16 |
| **20** | 21 | 21 | 30 | 26 | 109 | 16 |
| **1/4** | 6.55 | 6 | 11 | 14 | 58 | 8 |
| **5/16** | 8.25 | 8 | 14 | 16 | 67 | 10 |
| **3/8** | 9.8 | 9 | 15 | 16 | 73 | 12 |
| **1/2** | 13.2 | 13 | 20 | 20 | 83 | 12 |

ハイス

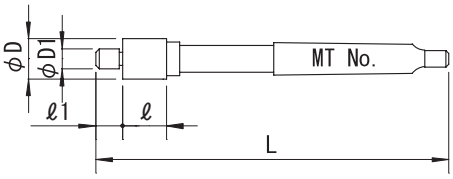
# CBT

## 六角穴付ボルト用沈めフライス テーパーシャンク *Counterbore With Taper Shank*

切削条件表 P267 | ザグリ加工 | 右ネジレ 12° | 刃数 4 | HSS








| 公差(Tolerance) | D1：$^{0}_{-0.05}$ | D：$^{+0.2}_{0}$ |
|---|---|---|

右刃右ネジレ12° 刃数:4 SKH51
Helix Angle-Right12° 4 Flutes HSS

| 呼び寸法 Size. | 案内径 (ΦD1) Guide Dia. | 案内長 (ℓ1) Length of Guide | 刃径 (ΦD) Dia. | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | MT No. Shank MTNo. |
|---|---|---|---|---|---|---|
| **10** | 10.3 | 10 | 16.8 | 16 | 101.5 | 1 |
| **12** | 12.4 | 12 | 18.8 | 18 | 106.5 | 1 |
| **14** | 14.4 | 14 | 24 | 20 | 110.5 | 1 |
| **16** | 16.5 | 16 | 26 | 22 | 130.5 | 2 |
| **18** | 18.5 | 18 | 28 | 24 | 134.5 | 2 |
| **20** | 21 | 21 | 30 | 26 | 138.5 | 2 |
| **22** | 23 | 23 | 32 | 28 | 142.5 | 2 |
| **24** | 25 | 25 | 36 | 32 | 170 | 3 |
| **30** | 31.5 | 31 | 45 | 38 | 182 | 3 |
| **36** | 37.5 | 37 | 53 | 44 | 196 | 3 |

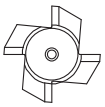
| 呼び寸法 Size. | 案内径 (ΦD1) Guide Dia. | 案内長 (ℓ1) Length of Guide | 刃径 (ΦD) Dia. | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | MT No. Shank MTNo. |
|---|---|---|---|---|---|---|
| **42** | 44 | 44 | 59 | 52 | 210 | 3 |
| **45** | 47 | 47 | 64 | 55 | 243 | 4 |
| **48** | 50 | 50 | 67 | 58 | 249 | 4 |
| **3/8** | 9.8 | 10 | 15 | 16 | 102.5 | 1 |
| **1/2** | 13.2 | 13 | 20 | 18 | 106.5 | 1 |
| **5/8** | 16.5 | 16 | 26 | 22 | 128.5 | 2 |
| **3/4** | 20 | 20 | 29 | 26 | 135.5 | 2 |
| **7/8** | 23 | 23 | 32 | 28 | 140.5 | 2 |
| **1"** | 26.5 | 26 | 37 | 32 | 169 | 3 |

ハイス

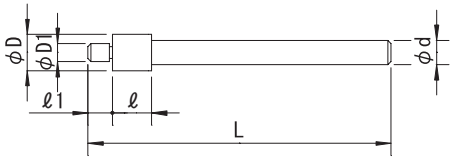
# CBLS

## 六角穴付ボルト用ロングシャンク沈めフライス　*Long Shank Counterbore*

切削条件表 P267 | ザグリ加工 | 右ネジレ 12° | 刃数 4 | HSS








| 公差(Tolerance) | D1：$^{0}_{-0.05}$ | D：$^{+0.2}_{0}$ | d：h8 |
|---|---|---|---|

右刃右ネジレ12°　刃数:4　SKH51
Helix Angle-Right12°　4 Flutes　HSS

| 呼び寸法 Size. | 案内径（ΦD1） Guide Dia. | 案内長（ℓ1） Length of Guide | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| **3** | 3.2 | 3 | 5.9 | 7 | 120 | 6 |
| **4** | 4.2 | 4 | 7.4 | 10 | 120 | 6 |
| **5** | 5.2 | 5 | 8.9 | 13 | 120 | 6 |
| **6** | 6.2 | 6 | 10.4 | 15 | 120 | 8 |
| **8** | 8.2 | 8 | 13.4 | 16 | 120 | 10 |
| **10** | 10.3 | 10 | 16.8 | 16 | 140 | 12 |
| **12** | 12.4 | 12 | 18.8 | 20 | 160 | 12 |
| **14** | 14.4 | 14 | 24 | 20 | 180 | 12 |

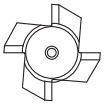
| 呼び寸法 Size. | 案内径（ΦD1） Guide Dia. | 案内長（ℓ1） Length of Guide | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| **16** | 16.5 | 16 | 26 | 22 | 180 | 16 |
| **18** | 18.5 | 18 | 28 | 24 | 200 | 16 |
| **20** | 21 | 21 | 30 | 26 | 200 | 16 |
| **1/4** | 6.55 | 6 | 11 | 14 | 120 | 8 |
| **5/16** | 8.25 | 8 | 14 | 16 | 120 | 10 |
| **3/8** | 9.8 | 9 | 15 | 16 | 140 | 12 |
| **1/2** | 13.2 | 13 | 20 | 20 | 160 | 12 |

ハイス

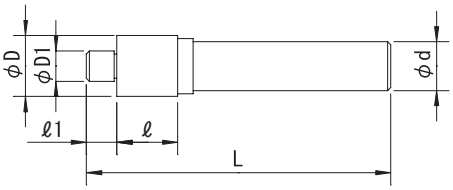
# CBH

## 平小ネジ用沈めフライス　*Screw Counterbore*

切削条件表 P267 | ザグリ加工 | 右ネジレ 12° | 刃数 4 | HSS








| 公差(Tolerance) | D1：$^{0}_{-0.05}$ | D：$^{+0.2}_{0}$ | d：h8 |
|---|---|---|---|

右刃右ネジレ12°　刃数:4　SKH51
Helix Angle-Right12°　4 Flutes　HSS

| 呼び寸法 Size. | 案内径（ΦD1） Guide Dia. | 案内長（ℓ1） Length of Guide | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| **2.5** | 2.7 | 2.5 | 4.9 | 6 | 35 | 4 |
| **3** | 3.2 | 2.5 | 5.9 | 6 | 37 | 6 |
| **4** | 4.2 | 3.5 | 7.4 | 8 | 44 | 6 |

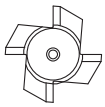
| 呼び寸法 Size. | 案内径（ΦD1） Guide Dia. | 案内長（ℓ1） Length of Guide | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| **5** | 5.2 | 4 | 9.4 | 10 | 51 | 6 |
| **6** | 6.2 | 5 | 11 | 11 | 57 | 8 |
| **8** | 8.2 | 7 | 14.5 | 12 | 64 | 8 |

ハイス

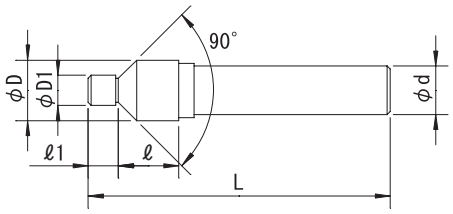
# CBS

## 皿小ネジ用沈めフライス　*Screw Countersink*

切削条件表 P267 | ザグリ加工 | 右ネジレ 12° | 刃数 4 | HSS








| 公差(Tolerance) | D1：$^{0}_{-0.05}$ | D：$^{+0.2}_{0}$ | d：h8 |
|---|---|---|---|

右刃右ネジレ12°　刃数:4　SKH51
Helix Angle-Right12°　4 Flutes　HSS

| 呼び寸法 Size | 案内径 (ΦD1) Guide Dia. | 案内長 (ℓ1) Length of Guide | 刃径 (ΦD) Dia. | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|
| **3** | 3.2 | 2.5 | 7.5 | 6 | 37 | 6 |
| **4** | 4.2 | 3.5 | 9.5 | 8 | 44 | 6 |
| **5** | 5.2 | 4 | 12 | 10 | 51 | 8 |
| **6** | 6.2 | 5 | 14 | 11 | 57 | 10 |

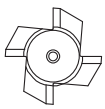
| 呼び寸法 Size | 案内径 (ΦD1) Guide Dia. | 案内長 (ℓ1) Length of Guide | 刃径 (ΦD) Dia. | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|
| **8** | 8.2 | 7 | 18.5 | 15 | 64 | 10 |
| **10** | 10.3 | 9 | 23 | 24.4 | 74 | 12 |
| **12** | 12.4 | 11 | 27 | 28.3 | 83 | 12 |

ハイス

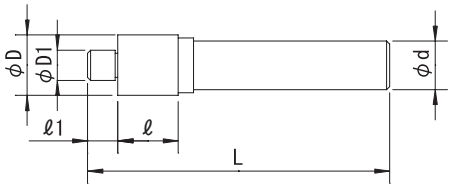
# CBO

## 押出ピン用沈めフライス　*Push Pin Counterbore*

切削条件表 P268 | ザグリ加工 | 右ネジレ 12° | 刃数 4 | HSS Co








| 公差(Tolerance) | D1：$^{-0.03}_{-0.05}$ | D：$^{+0.3}_{0}$ | d：h8 |
|---|---|---|---|

右刃右ネジレ12°　刃数:4　SKH56
Helix Angle-Right12°　4 Flutes　HSS-Co.

| 呼び寸法 Size | 案内径 (ΦD1) Guide Dia. | 案内長 (ℓ1) Length of Guide | 刃径 (ΦD) Dia. | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|
| **1** | 1 | 3 | 6 | 7 | 36.5 | 5 |
| **1.5** | 1.5 | 3 | 6 | 7 | 36.5 | 5 |
| **2** | 2 | 3 | 6 | 7 | 36.5 | 5 |
| **2.5** | 2.5 | 3 | 6 | 7 | 36.5 | 5 |
| **3** | 3 | 3 | 6 | 7 | 37 | 5 |
| **3.5** | 3.5 | 3 | 8 | 8 | 42 | 6 |
| **4** | 4 | 4 | 8 | 8 | 43 | 6 |
| **4.5** | 4.5 | 4 | 9 | 8 | 45 | 6 |
| **5** | 5 | 5 | 9 | 10 | 51 | 6 |

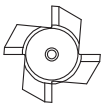
| 呼び寸法 Size | 案内径 (ΦD1) Guide Dia. | 案内長 (ℓ1) Length of Guide | 刃径 (ΦD) Dia. | 刃長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|
| **6** | 6 | 5 | 10 | 10 | 55 | 8 |
| **7** | 7 | 6 | 11 | 10 | 55 | 8 |
| **8** | 8 | 8 | 13 | 12 | 64 | 8 |
| **9** | 9 | 8 | 14 | 12 | 64 | 10 |
| **10** | 10 | 10 | 15 | 12 | 66 | 10 |
| **12** | 12 | 10 | 17 | 14 | 69 | 10 |
| **14** | 14 | 12 | 19 | 14 | 76 | 12 |
| **16** | 16 | 13 | 21 | 16 | 79 | 12 |
| **20** | 20 | 20 | 25.5 | 19 | 100 | 16 |

ハイス

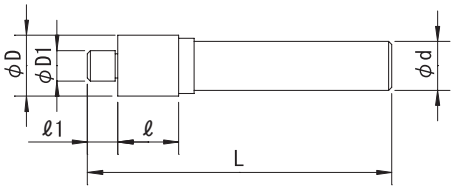
# CB-JM

## JIS沈めフライス　*Counterbore With JIS*

切削条件表 P268　ザグリ加工　右ネジレ 12°　刃数 4　HSS Co








| 公差(Tolerance) | D1：$^{0}_{-0.05}$ | D：$^{+0.2}_{0}$ | d：h8 |
|---|---|---|---|

右刃右ネジレ12°　刃数:4　SKH56
Helix Angle-Right12°　4 Flutes　HSS-Co.

| 呼び寸法 Size. | 案内径（ΦD1） Guide Dia. | 案内長（ℓ1） Length of Guide | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| JM 3 | 3.2 | 3 | 6.5 | 7 | 47 | 6 |
| JM 4 | 4.3 | 4 | 8 | 10 | 54 | 6 |
| JM 5 | 5.3 | 5 | 9.5 | 13 | 61 | 6 |

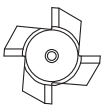
| 呼び寸法 Size. | 案内径（ΦD1） Guide Dia. | 案内長（ℓ1） Length of Guide | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| JM 6 | 6.4 | 6 | 11 | 15 | 68 | 8 |
| JM 8 | 8.4 | 8 | 14 | 16 | 77 | 10 |
| JM10 | 10.5 | 10 | 17.5 | 16 | 84 | 12 |
| JM12 | 13 | 12 | 20 | 20 | 93 | 12 |

ハイス

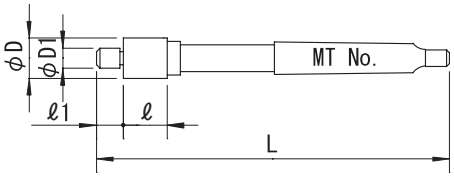
# CB-TSM

## TSM沈めフライス　*Counterbore With TSM*

切削条件表 P268　ザグリ加工　右ネジレ 12°　刃数 4　HSS Co








| 公差(Tolerance) | D1：$^{0}_{-0.05}$ | D：$^{+0.2}_{0}$ |
|---|---|---|

右刃右ネジレ12°　刃数:4　SKH56
Helix Angle-Right12°　4 Flutes　HSS-Co.

| 呼び寸法 Size. | 案内径（ΦD1） Guide Dia. | 案内長（ℓ1） Length of Guide | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | MT No. Shank MTNo |
|---|---|---|---|---|---|---|
| TSM18 | 18.5 | 18 | 29 | 24 | 134.5 | 2 |
| TSM20 | 21 | 21 | 32 | 26 | 138.5 | 2 |
| TSM22 | 23 | 23 | 35 | 28 | 142.5 | 2 |
| TSM24 | 25 | 25 | 39 | 32 | 170 | 3 |

| 呼び寸法 Size. | 案内径（ΦD1） Guide Dia. | 案内長（ℓ1） Length of Guide | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | MT No. Shank MTNo |
|---|---|---|---|---|---|---|
| TSM30 | 31.5 | 31 | 48 | 38 | 182 | 3 |
| TSM36 | 37.5 | 37 | 57 | 44 | 196 | 3 |
| TSM42 | 44 | 44 | 66 | 52 | 210 | 3 |
| TSM45 | 47 | 47 | 71 | 55 | 243 | 4 |
| TSM48 | 50 | 50 | 75 | 58 | 249 | 4 |

ハイス

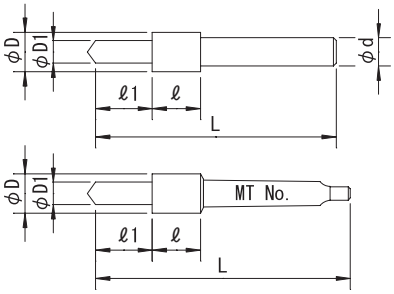
# DCB

## 六角穴付ボルト用ドリル付沈めフライス　*Counterbore With Drill*

切削条件表 P269　ザグリ加工　右ネジレ 25°　刃数 2　HSS








| 公差(Tolerance) | D1：h8 | D：$^{+0.1}_{0}$ | d：h8 |
|---|---|---|---|

右刃右ネジレ25°（D1）　刃数:2　SKH51
Helix Angle-Right25°(D1)　2 Flutes　HSS

| 呼び寸法 Size | ドリル径（ΦD1） Drill Dia. | ドリル長（ℓ1） Length of Drill | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| **M 3** | 3.5 | 10 | 5.9 | 7 | 48 | 6 |
| **M 4** | 4.5 | 15 | 7.4 | 9 | 55 | 6 |
| **M 5** | 5.5 | 20 | 8.9 | 12 | 64 | 6 |
| **M 6** | 6.5 | 25 | 10.4 | 13 | 70 | 8 |
| **M 8** | 8.5 | 30 | 13.4 | 16 | 78 | 10 |
| **M10** | 10.6 | 35 | 16.8 | 20 | 87 | 12 |
| **M12** | 12.7 | 35 | 18.8 | 23 | 90 | 12 |

| 呼び寸法 Size | ドリル径（ΦD1） Drill Dia. | ドリル長（ℓ1） Length of Drill | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| **M14** | 16 | 35 | 23 | 35 | 110 | 12 |
| **M16** | 18 | 40 | 26 | 40 | 120 | 12 |
| **M18** | 20 | 45 | 29 | 45 | 130 | 12 |
| **1/4** | 6.85 | 25 | 11 | 13 | 69 | 8 |
| **5/16** | 8.55 | 30 | 14 | 17 | 81 | 10 |
| **3/8** | 10.1 | 35 | 15 | 18 | 87 | 12 |
| **1/2** | 13.5 | 35 | 20 | 23 | 92 | 12 |

※テーパーシャンク（Taper Shank）

| 呼び寸法 Size | ドリル径（ΦD1） Drill Dia. | ドリル長（ℓ1） Length of Drill | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | MT No. Shank MTNo. |
|---|---|---|---|---|---|---|
| **M16** | 18 | 40 | 26 | 40 | 179 | 3 |

| 呼び寸法 Size | ドリル径（ΦD1） Drill Dia. | ドリル長（ℓ1） Length of Drill | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | MT No. Shank MTNo. |
|---|---|---|---|---|---|---|
| **M18** | 20 | 45 | 29 | 45 | 189 | 3 |

ハイス

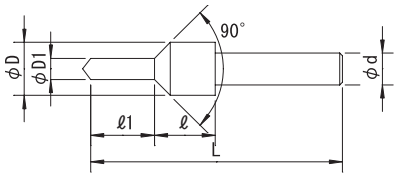
# DCBS

## 皿小ネジ用ドリル付沈めフライス　*Screw Countersink With Drill*

切削条件表 P269 | ザグリ加工 | 右ネジレ 25° | 刃数 2 | HSS








| 公差(Tolerance) | D1：h8 | D：$^{+0.1}_{0}$ | d：h8 |
|---|---|---|---|

右刃右ネジレ25°（D1） 刃数:2 SKH51
Helix Angle-Right25°(D1) 2 Flutes HSS

| 呼び寸法 Size | ドリル径（ΦD1） Drill Dia. | ドリル長（ℓ1） Length of Drill | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| **M3** | 3.5 | 10 | 7.5 | 11 | 44 | 6 |
| **M4** | 4.5 | 15 | 9.5 | 14 | 55 | 6 |

| 呼び寸法 Size | ドリル径（ΦD1） Drill Dia. | ドリル長（ℓ1） Length of Drill | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| **M5** | 5.5 | 15 | 12 | 18 | 61 | 6 |
| **M6** | 6.5 | 20 | 14 | 20 | 71 | 8 |
| **M8** | 8.5 | 20 | 18.5 | 25 | 76 | 8 |

ハイス

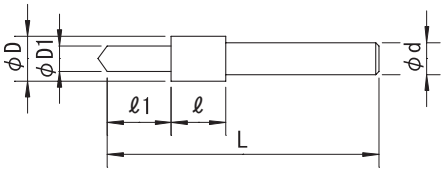
# DCBTA

## TAS六角穴付ボルト用ドリル付沈めフライス　*TAS Counterbore With Drill*

切削条件表 P269 | ザグリ加工 | 右ネジレ 25° | 刃数 2 | HSS








| 公差(Tolerance) | D1：h8 | D：h8 | d：h8 |
|---|---|---|---|

右刃右ネジレ25°（D1） 刃数:2 SKH51
Helix Angle-Right25°(D1) 2 Flutes HSS

| 呼び寸法 Size | ドリル径（ΦD1） Drill Dia. | ドリル長（ℓ1） Length of Drill | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| **M 3** | 3.4 | 13 | 6.5 | 9 | 60 | 6 |
| **M 4** | 4.5 | 18 | 8 | 10 | 66 | 6 |
| **M 5** | 5.5 | 22 | 9.5 | 11 | 76 | 8 |
| **M 6** | 6.6 | 25 | 11 | 12 | 80 | 8 |
| **M 8** | 9 | 28 | 14 | 14 | 85 | 12 |
| **M10** | 11 | 30 | 17.5 | 17 | 95 | 12 |
| **M12** | 14 | 32 | 20 | 22 | 102 | 12 |
| **M14** | 16 | 35 | 23 | 27 | 110 | 12 |

| 呼び寸法 Size | ドリル径（ΦD1） Drill Dia. | ドリル長（ℓ1） Length of Drill | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| **M16** | 18 | 40 | 26 | 32 | 120 | 12 |
| **M18** | 20 | 45 | 29 | 37 | 130 | 12 |
| | | | | | | |
| **1/4** | 6.9 | 25 | 11 | 12 | 80 | 8 |
| **5/16** | 8.9 | 28 | 14 | 14 | 85 | 8 |
| **3/8** | 10.5 | 30 | 15 | 17 | 90 | 8 |
| **1/2** | 14.7 | 32 | 20 | 22 | 102 | 12 |
| **5/8** | 17.9 | 40 | 26 | 32 | 120 | 12 |

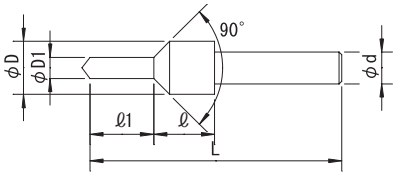
# DCBSTA

## TAS皿小ネジ用ドリル付沈めフライス　*TAS Screw Countersink With Drill*

切削条件表 P270 | ザグリ加工 | 右ネジレ 25° | 刃数 2 | HSS








| 公差(Tolerance) | D1：h8 | D：h8 | d：h8 |
|---|---|---|---|

右刃右ネジレ25°（D1）　刃数:2　SKH51
Helix Angle-Right25°(D1)　2 Flutes　HSS

| 呼び寸法 Size | ドリル径（ΦD1） Drill Dia. | ドリル長（ℓ1） Length of Drill | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| **M 3** | 3.4 | 11.5 | 6.4 | 10.5 | 60 | 6 |
| **M 4** | 4.5 | 16.1 | 8.4 | 11.9 | 66 | 6 |
| **M 5** | 5.5 | 19.6 | 10.4 | 13.4 | 76 | 8 |

| 呼び寸法 Size | ドリル径（ΦD1） Drill Dia. | ドリル長（ℓ1） Length of Drill | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| **M 6** | 6.6 | 22.1 | 12.5 | 14.9 | 80 | 10 |
| **M 8** | 9 | 24.3 | 16.5 | 17.7 | 85 | 12 |
| **M10** | 11 | 30 | 21 | 22 | 95 | 12 |
| **M12** | 14 | 32 | 25 | 27.5 | 102 | 12 |

ハイス

# DCB-TRM/DCB-TZM

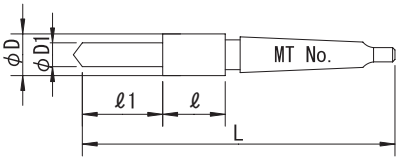
## 六角ボルト沈め用段付ドリル *Counterbore With Drill (Taper Shank)*

切削条件表 P270

ザグリ加工








| 公差(Tolerance) | D1：h8 | D：h8 |
|---|---|---|

## 《DCB-TRM》R型

右刃右ネジレ35°(D)　窒化処理　刃数:2　SKH51
R-Type Helix Angle-Right35°(D)　Nitridization　2 Flutes　HSS

右ネジレ 35°　NH　刃数 2　HSS

| 呼び寸法 Size | ドリル径(ΦD1) Drill Dia. | ドリル長(ℓ1) Length of Drill | 刃径(ΦD) Dia. | 刃長(ℓ) Length of Flutes | 全長(L) Overall Length | MT No. Shank MTNo. |
|---|---|---|---|---|---|---|
| M 5 | 5.3 | 22 | 9.5 | 20 | 120 | 1 |
| M 6 | 6.4 | 25 | 11 | 22 | 125 | 1 |
| M 8 | 8.4 | 30 | 14 | 27 | 135 | 1 |
| M10 | 10.5 | 35 | 17.5 | 32 | 160 | 2 |
| M12 | 13 | 40 | 20 | 37 | 170 | 2 |

| 呼び寸法 Size | ドリル径(ΦD1) Drill Dia. | ドリル長(ℓ1) Length of Drill | 刃径(ΦD) Dia. | 刃長(ℓ) Length of Flutes | 全長(L) Overall Length | MT No. Shank MTNo. |
|---|---|---|---|---|---|---|
| M14 | 15 | 45 | 23 | 42 | 180 | 2 |
| M16 | 17 | 50 | 26 | 48 | 210 | 3 |
| M18 | 19 | 55 | 29 | 53 | 220 | 3 |
| M20 | 21 | 60 | 32 | 58 | 230 | 3 |
| M22 | 23 | 65 | 35 | 63 | 265 | 4 |
| M24 | 25 | 70 | 39 | 68 | 275 | 4 |

| 公差(Tolerance) | D1：h8 | D：h8 |
|---|---|---|

## 《DCB-TZM》Z型

右刃右ネジレ35°(D)　窒化処理　刃数:2　SKH51
Z-Type Helix Angle-Right35°(D)　Nitridization　2 Flutes　HSS

右ネジレ 35°　NH　刃数 2　HSS

| 呼び寸法 Size | ドリル径(ΦD1) Drill Dia. | ドリル長(ℓ1) Length of Drill | 刃径(ΦD) Dia. | 刃長(ℓ) Length of Flutes | 全長(L) Overall Length | MT No. Shank MTNo. |
|---|---|---|---|---|---|---|
| M 3 | 3.4 | 13 | 9 | 19 | 110 | 1 |
| M 4 | 4.5 | 18 | 11 | 19 | 115 | 1 |
| M 5 | 5.5 | 23 | 13 | 19 | 120 | 1 |
| M 6 | 6.6 | 27 | 15 | 30 | 150 | 2 |
| M 8 | 9 | 37 | 20 | 30 | 160 | 2 |
| M10 | 11 | 40 | 24 | 43 | 195 | 3 |
| M12 | 14 | 45 | 28 | 43 | 200 | 3 |

| 呼び寸法 Size | ドリル径(ΦD1) Drill Dia. | ドリル長(ℓ1) Length of Drill | 刃径(ΦD) Dia. | 刃長(ℓ) Length of Flutes | 全長(L) Overall Length | MT No. Shank MTNo. |
|---|---|---|---|---|---|---|
| M14 | 16 | 50 | 32 | 43 | 205 | 3 |
| M16 | 18 | 55 | 35 | 53 | 245 | 4 |
| M18 | 20 | 60 | 39 | 53 | 250 | 4 |
| M20 | 22 | 65 | 43 | 53 | 255 | 4 |
| M22 | 24 | 70 | 46 | 53 | 260 | 4 |
| M24 | 26 | 80 | 50 | 53 | 270 | 4 |
| M27 | 30 | 90 | 55 | 66 | 325 | 5 |
| M30 | 33 | 100 | 62 | 66 | 335 | 5 |

ハイス

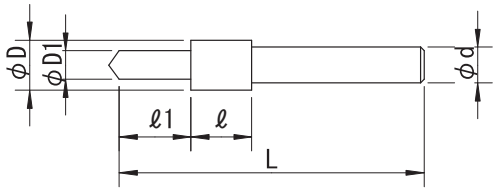
# DCB-SRM

## 六角ボルト沈め用段付ドリル（ストレートシャンク）R型 *Counterbore With Drill (Straight Shank) R-Type*

切削条件表 P269 | ザグリ加工 | 右ネジレ 35° | NH | 刃数 2 | HSS








| 公差(Tolerance) | D1：$^{0}_{-0.04}$ | D：$^{0}_{-0.04}$ | d：h7 |
|---|---|---|---|

右刃右ネジレ35°（D） 窒化処理 刃数:2 SKH51
Helix Angle-Right35°(D) Nitridization 2 Flutes HSS

| 呼び寸法 Size | ドリル径（ΦD1） Drill Dia. | ドリル長（ℓ1） Length of Drill | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| M 3 | 3.4 | 13 | 6.5 | 12 | 65 | 6 |
| M 4 | 4.5 | 18 | 8 | 17 | 75 | 6 |
| M 5 | 5.5 | 22 | 9.5 | 18 | 85 | 8 |
| M 6 | 6.6 | 25 | 11 | 20 | 90 | 8 |
| M 8 | 9 | 28 | 14 | 27 | 100 | 12 |
| M10 | 11 | 30 | 17.5 | 30 | 110 | 12 |
| M12 | 14 | 32 | 20 | 33 | 115 | 12 |
| M14 | 16 | 35 | 23 | 40 | 125 | 12 |

| 呼び寸法 Size | ドリル径（ΦD1） Drill Dia. | ドリル長（ℓ1） Length of Drill | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| M16 | 18 | 40 | 26 | 45 | 135 | 12 |
| M18 | 20 | 45 | 29 | 50 | 145 | 12 |
| 1/4 | 6.9 | 25 | 11 | 20 | 90 | 8 |
| 5/16 | 8.9 | 28 | 14 | 27 | 100 | 12 |
| 3/8 | 10.5 | 30 | 15 | 30 | 110 | 12 |
| 1/2 | 14.7 | 32 | 20 | 33 | 115 | 12 |
| 5/8 | 17.9 | 40 | 26 | 45 | 135 | 12 |

ハイス

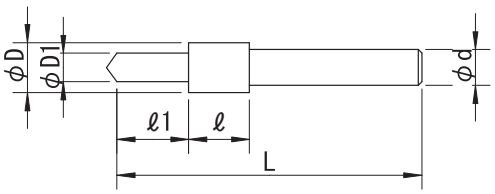
# DCB-SHM

## 平小ネジ沈め用段付ドリル（ストレートシャンク）H型 *Screw Counterbore With Drill (Straight Shank) H-Type*

切削条件表 P269 | ザグリ加工 | 右ネジレ 35° | NH | 刃数 2 | HSS








| 公差(Tolerance) | D1：$^{0}_{-0.04}$ | D：$^{0}_{-0.04}$ | d：h7 |
|---|---|---|---|

右刃右ネジレ35°（D） 窒化処理 刃数:2 SKH51
Helix Angle-Right35°(D) Nitridization 2 Flutes HSS

| 呼び寸法 Size | ドリル径（ΦD1） Drill Dia. | ドリル長（ℓ1） Length of Drill | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| M3 | 3.4 | 13 | 5.9 | 12 | 65 | 6 |
| M4 | 4.5 | 18 | 7.4 | 17 | 75 | 6 |

| 呼び寸法 Size | ドリル径（ΦD1） Drill Dia. | ドリル長（ℓ1） Length of Drill | 刃径（ΦD） Dia. | 刃長（ℓ） Length of Flutes | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. |
|---|---|---|---|---|---|---|
| M5 | 5.5 | 22 | 9.4 | 18 | 85 | 8 |
| M6 | 6.6 | 25 | 11 | 20 | 90 | 8 |
| M8 | 9 | 28 | 14.5 | 27 | 100 | 12 |

ハイス

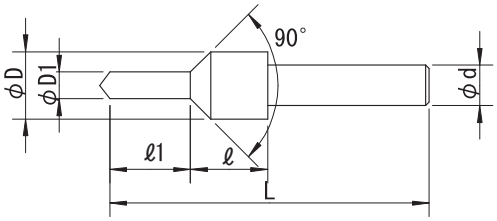
# DCB-SSM

## 皿小ネジ沈め用段付ドリル（ストレートシャンク）S型　*Screw Counterbore With Drill (Straight Shank) S-Type*

切削条件表 P270 | ザグリ加工 | 右ネジレ 35° | NH | 刃数 2 | HSS








| 公差(Tolerance) | D1：$^{0}_{-0.04}$ | D：$^{0}_{-0.04}$ | d：h7 |
|---|---|---|---|

右刃右ネジレ35°（D）　窒化処理　刃数:2　SKH51
Helix Angle-Right35°(D)　Nitridization　2 Flutes　HSS

| 呼び寸法 *Size* | ドリル径（ΦD1） *Drill Dia.* | ドリル長（ℓ1） *Length of Drill* | 刃径（ΦD） *Dia.* | 刃長（ℓ） *Length of Flutes* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|---|
| **M3** | 3.4 | 11.5 | 6.4 | 13.5 | 65 | 6 |
| **M4** | 4.5 | 16.05 | 8.4 | 13.95 | 70 | 6 |

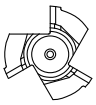
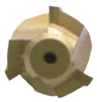
| 呼び寸法 *Size* | ドリル径（ΦD1） *Drill Dia.* | ドリル長（ℓ1） *Length of Drill* | 刃径（ΦD） *Dia.* | 刃長（ℓ） *Length of Flutes* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|---|
| **M5** | 5.5 | 19.55 | 10.4 | 15.45 | 80 | 8 |
| **M6** | 6.6 | 22.05 | 12.5 | 17.95 | 85 | 10 |
| **M8** | 9 | 24.25 | 16.5 | 20.75 | 90 | 12 |

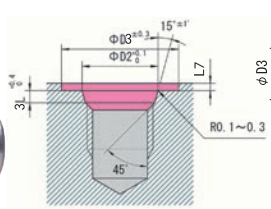
ハイス

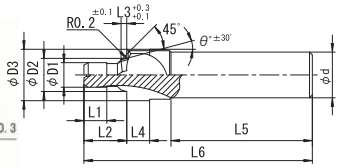
# SSC-TiN

## シート面カッター（PF規格／UNF規格） *Seat Surface Cutter (PF Standard / UNF Standard)*

切削条件表 P271 | ザグリ加工 | 斜刃 5° | TiN | HSS Co






右斜刃5° TiNコーティング SKH56
Helix Angle-Right5° TiN Coating HSS-Co.

| 公差(Tolerance) | D1：$^{0}_{-0.05}$ | D3：±0.1 | d：h7 |
|---|---|---|---|

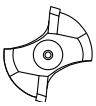
| 呼び寸法 Size | 案内径（ΦD1） Guide Dia. | 案内長（L1） Length of Guide | 面取径（ΦD2） Chamferring Dia. | (L2) | (L3) Chamferring Length | 角度（θ） Cut Angle | 刃径（ΦD3） Dia. | ザグリ刃長（L4） Length of Cut | シャンク長（L5） Shank Length | 全長（L6） Overall Length | シャンク径（ΦD4） Shank Dia. | 刃数（N） Number of Flutes | (L7) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PF1/8 | 8.6 | 8 | 11.6 | 15 | 2 | 15° | 18 | 8 | 50 | 80 | 16 | 3 | 1 |
| PF1/4 | 11.4 | 10 | 15.6 | 18 | 2.5 | 15° | 24 | 11 | 95 | 130 | 20 | 3 | 1.5 |
| PF3/8 | 15 | 12 | 18.6 | 20 | 2.5 | 15° | 28 | 11 | 100 | 137.5 | 25 | 4 | 2 |
| PF1/2 | 18.7 | 12 | 22.6 | 20 | 2.5 | 15° | 34 | 11 | 100 | 137.5 | 25 | 4 | 2.5 |
| PF3/4 | 24.1 | 15 | 29.8 | 25 | 3.5 | 15° | 45 | 15 | 100 | 150 | 32 | 4 | 2.5 |
| PF1" | 30.3 | 20 | 35.8 | 30 | 3.5 | 15° | 51 | 15 | 105 | 160 | 32 | 4 | 2.5 |
| UNF3/ 8-24 | 8.39 | 5 | 10.75 | 10 | 1.9 | 12° | 19 | 11 | 50 | 80 | 16 | 3 | 1.6 |
| UNF7/16-20 | 9.73 | 6 | 12.45 | 11.5 | 2.4 | 12° | 21 | 11 | 80 | 120 | 20 | 3 | 1.6 |
| UNF1/ 2-20 | 11.33 | 6 | 14.05 | 11.5 | 2.4 | 12° | 23 | 11 | 80 | 120 | 20 | 3 | 1.6 |
| UNF9/16-18 | 12.8 | 7 | 15.7 | 12.7 | 2.5 | 12° | 25 | 11 | 80 | 120 | 20 | 3 | 1.6 |
| UNF3/ 4-16 | 17.4 | 9 | 20.65 | 14.3 | 2.5 | 15° | 30 | 11 | 90 | 130 | 25 | 4 | 2.4 |
| UNF7/ 8-14 | 20.3 | 9 | 24 | 16.7 | 2.5 | 15° | 34 | 11 | 90 | 130 | 25 | 4 | 2.4 |

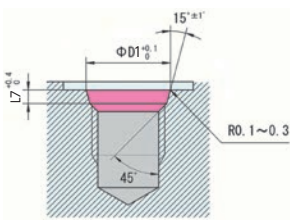
ハイス

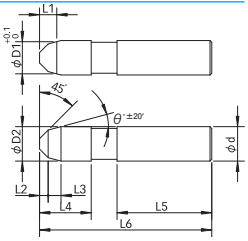
# SSZC-TiN

## シート面ザグリカッター（PF規格／UNF規格） *Counterbore With Seat Surface (PF Standard / UNF Standard)*

切削条件表 P271 | ザグリ加工 | 右ネジレ 20° | TiN | HSS Co








右刃右ネジレ20° TiNコーティング SKH56
Helix Angle-Right20° TiN Coating HSS-Co.

| 公差(Tolerance) | D2：$^{+0.01}_{0}$ | d：h7 |
|---|---|---|

| 呼び寸法 Size | 基準径（ΦD1） Std Dia. | 基準長（L1） Std Length | (L2) Chamferring Length | (L3) Chamferring Length | 角度（θ） Cut Angle | 刃径（ΦD2） Dia. | 刃長（L4） Length of Cut | シャンク長（L5） Shank Length | 全長（L6） Overall Length | シャンク径（Φd） Shank Dia. | 刃数（N） Number of Flutes | (L7) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PF1/8 | 11.6 | 4.35 | 2 | 3 | 15° | 12 | 14 | 45 | 85 | 12 | 2 | 2 |
| PF1/4 | 15.6 | 5.25 | 2.5 | 4 | 15° | 16.3 | 19 | 70 | 95 | 16 | 2 | 2.5 |
| PF3/8 | 18.6 | 5.25 | 2.5 | 4 | 15° | 19.3 | 19 | 80 | 105 | 20 | 2 | 2.5 |
| PF1/2 | 22.6 | 5.25 | 2.5 | 4 | 15° | 23.3 | 19 | 90 | 115 | 25 | 2 | 2.5 |
| PF3/4 | 29.6 | 7.3 | 2.5 | 5.4 | 15° | 30.7 | 26 | 100 | 130 | 32 | 2 | 3.5 |
| PF1" | 35.8 | 7.3 | 2.5 | 5.4 | 15° | 36.7 | 26 | 100 | 130 | 32 | 2 | 3.5 |
| UNF3/ 8-24 | 10.75 | 3.8 | 1.9 | 3 | 12° | 11.22 | 15 | 60 | 85 | 12 | 2 | 1.9 |
| UNF7/16-20 | 12.45 | 4.8 | 2.4 | 4 | 12° | 13.13 | 19 | 70 | 100 | 12 | 2 | 2.4 |
| UNF1/ 2-20 | 14.05 | 4.8 | 2.4 | 4 | 12° | 14.73 | 19 | 70 | 100 | 12 | 2 | 2.4 |
| UNF9/16-18 | 15.7 | 5 | 2.5 | 4 | 12° | 16.34 | 19 | 70 | 100 | 16 | 2 | 2.5 |
| UNF3/ 4-16 | 20.65 | 5 | 2.5 | 4 | 15° | 21.45 | 19 | 70 | 100 | 20 | 2 | 2.5 |
| UNF7/ 8-14 | 24.0 | 5 | 2.5 | 4 | 15° | 24.8 | 19 | 70 | 100 | 25 | 2 | 2.5 |

Cutter Cutting Condition Talbe

# カッター
# 切削条件参考表

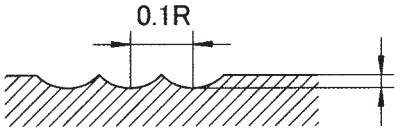
安全上の注意：切削条件は、被削材の硬さ、
切り込み量、ツーリング、機械の状態により
条件を増減してください。
切削油を使用してください。
Adjust cutting conditions according to
rigidity of work material, tooling, machine
and depth of cut.
Use cutting fluid.

## ●CSQCS2-A/CSQCL2-A/CSQCS4-A/CSQCL4-A　超硬ソリッド球面カッター

| 寸法 R | 非鉄金属 Al. Cu 切削速度 Cutting Speed 100~150m/min | | | 炭素鋼 FC. FCD. S50C 切削速度 Cutting Speed 45~75m/min | | | 合金鋼 SCM. SKD. SUS304 切削速度 Cutting Speed 35~50m/min | | |
|---|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | | 回転数 Spindle speed rpm | 送り feed mm/min | | 回転数 Spindle speed rpm | 送り feed mm/min | |
| | | 2 枚刃 | 4 枚刃 | | 2 枚刃 | 4 枚刃 | | 2 枚刃 | 4 枚刃 |
| **0.5** | 31,831 ~ 47,748 | 1,910 ~ 6,685 | | 14,324 ~ 23,873 | 716 ~ 2,387 | | 11,141 ~ 15,915 | 334 ~ 637 | |
| **1** | 15,915 ~ 23,874 | 955 ~ 3,342 | | 7,162 ~ 11,937 | 358 ~ 1,194 | | 5,570 ~ 7,958 | 167 ~ 318 | |
| **1.5** | 10,610 ~ 15,916 | 637 ~ 2,228 | | 4,775 ~ 7,958 | 239 ~ 796 | | 3,714 ~ 5,305 | 111 ~ 212 | |
| **2** | 7,958 ~ 11,937 | 477 ~ 1,671 | | 3,581 ~ 5,968 | 179 ~ 597 | | 2,785 ~ 3,979 | 84 ~ 159 | |
| **2.5** | 6,366 ~ 9,550 | 382 ~ 1,337 | | 2,865 ~ 4,775 | 143 ~ 477 | | 2,228 ~ 3,183 | 67 ~ 127 | |
| **3** | 5,305 ~ 7,958 | 318 ~ 1,114 | 424 ~ 1,432 | 2,387 ~ 3,979 | 119 ~ 398 | 172 ~ 477 | 1,857 ~ 2,653 | 56 ~ 106 | 111 ~ 159 |
| **3.5** | 4,547 ~ 6,821 | 273 ~ 955 | 364 ~ 1,228 | 2,046 ~ 3,410 | 102 ~ 341 | 147 ~ 409 | 1,592 ~ 2,274 | 48 ~ 91 | 95 ~ 136 |
| **4** | 3,979 ~ 5,968 | 239 ~ 836 | 318 ~ 1,074 | 1,790 ~ 2,984 | 90 ~ 298 | 129 ~ 358 | 1,393 ~ 1,989 | 42 ~ 80 | 84 ~ 119 |
| **4.5** | 3,537 ~ 5,305 | 212 ~ 743 | 283 ~ 955 | 1,592 ~ 2,653 | 80 ~ 265 | 115 ~ 318 | 1,238 ~ 1,768 | 37 ~ 71 | 74 ~ 106 |
| **5** | 3,183 ~ 4,775 | 191 ~ 668 | 255 ~ 859 | 1,432 ~ 2,387 | 72 ~ 239 | 103 ~ 286 | 1,114 ~ 1,592 | 33 ~ 64 | 67 ~ 95 |
| **5.5** | 2,894 ~ 4,341 | 174 ~ 608 | 231 ~ 781 | 1,302 ~ 2,170 | 65 ~ 217 | 94 ~ 260 | 1,013 ~ 1,447 | 30 ~ 58 | 61 ~ 87 |
| **6** | 2,653 ~ 3,979 | 159 ~ 557 | 212 ~ 716 | 1,194 ~ 1,989 | 60 ~ 199 | 86 ~ 239 | 928 ~ 1,326 | 28 ~ 53 | 56 ~ 80 |
| **8** | 1,989 ~ 2,984 | 119 ~ 418 | 159 ~ 537 | 895 ~ 1,492 | 45 ~ 149 | 64 ~ 179 | 696 ~ 995 | 21 ~ 40 | 42 ~ 60 |
| **10** | 1,592 ~ 2,387 | 95 ~ 334 | 127 ~ 430 | 716 ~ 1,194 | 36 ~ 119 | 52 ~ 143 | 557 ~ 796 | 17 ~ 32 | 33 ~ 48 |

切込量基準

R : ボール半径
D : 刃外径
L1: 首下長




切込量 ap
L1≦Dx3=0.07R
L1≦Dx6=0.05R
L1≦Dx8=0.02R

1. 傾斜角が大きい、コーナー等負荷が大きくなる加工では、回転数、送りを下げてご使用ください。
2. 加工による首部のワークへの干渉にご注意ください。
3. 切削油の使用を推奨いたします。

## ●CSMT-H　高硬度用 超硬スーパーミニスロット

| 刃径 Dia. | 高硬度材 SKD. NAK (HRC ~ 62) 切削速度 Cutting speed 12~20m/min | | 加工深さ milling depth. |
|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | |
| **5** | 764 ~ 1,273 | 23 ~ 51 | 0.25 |
| **6** | 637 ~ 1,061 | 19 ~ 42 | 0.3 |
| **8** | 477 ~ 796 | 14 ~ 32 | 0.4 |
| **10** | 382 ~ 637 | 11 ~ 25 | 0.5 |
| **12** | 318 ~ 531 | 10 ~ 21 | 0.6 |

※刃厚1mm以下の製品は送りを20%下げて御使用ください。
In case that cut width is less than 1mm,reduce feed by 20%.

## ●CSMT-Re　樹脂用 超硬スーパーミニスロット

| 刃径 Dia. | 樹脂 MC ナイロン POM 切削速度 Cutting speed 75~113m/min | |
|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min |
| **5** | 4,775 ~ 7,194 | 382 ~ 1,007 |
| **6** | 3,979 ~ 5,995 | 477 ~ 1,199 |
| **8** | 2,984 ~ 4,496 | 358 ~ 899 |
| **10** | 2,387 ~ 3,597 | 286 ~ 719 |
| **12** | 1,990 ~ 2,998 | 239 ~ 600 |

## アルミ用
## ●CSMT-Al 超硬スーパーミニスロット

| 刃径 Dia. | 非鉄金属 Al. Cu<br>切削速度 Cutting speed 63~96m/min | |
|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min |
| 5 | 4,011 ～ 6,112 | 321 ～ 733 |
| 6 | 3,342 ～ 5,093 | 334 ～ 917 |
| 8 | 2,507 ～ 3,820 | 251 ～ 688 |
| 10 | 2,005 ～ 3,056 | 201 ～ 550 |
| 12 | 1,671 ～ 2,547 | 167 ～ 458 |

※刃厚1mm以下の製品は送りを20%下げて御使用ください。
In case that cut width is less than 1mm,reduce feed by 20%.

## 高硬度用
## ●CSMS-H 超硬スーパーミニアンギュラ

| 刃径 Dia. | 高硬度材 SKD. NAK (HRC ～ 62)<br>切削速度 Cutting speed 12~20m/min | |
|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min |
| 5x45° | 764 ～ 1,273 | 23 ～ 51 |
| 6x45° | 637 ～ 1,061 | 19 ～ 42 |
| 8x45° | 477 ～ 796 | 14 ～ 32 |
| 10x45° | 382 ～ 637 | 11 ～ 25 |
| 12x45° | 318 ～ 531 | 10 ～ 21 |
| 5x60° | 764 ～ 1,273 | 23 ～ 51 |
| 6x60° | 637 ～ 1,061 | 19 ～ 42 |
| 8x60° | 477 ～ 796 | 14 ～ 32 |
| 10x60° | 382 ～ 637 | 11 ～ 25 |
| 12x60° | 318 ～ 531 | 10 ～ 21 |

※1度の加工取代は0.5として
standard depth of cut during one cutting operation is 0.5mm.

## 樹脂用
## ●CSMS-Re 超硬スーパーミニアンギュラ

| 刃径 Dia. | 樹脂 MC ナイロン POM<br>切削速度 Cutting speed 75~113m/min | |
|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min |
| 5x45° | 4,775 ～ 7,194 | 382 ～ 1,007 |
| 6x45° | 3,979 ～ 5,995 | 477 ～ 1,199 |
| 8x45° | 2,984 ～ 4,496 | 358 ～ 899 |
| 10x45° | 2,387 ～ 3,597 | 286 ～ 719 |
| 12x45° | 1,990 ～ 2,998 | 239 ～ 600 |
| 5x60° | 4,775 ～ 7,194 | 382 ～ 1,007 |
| 6x60° | 3,979 ～ 5,995 | 477 ～ 1,199 |
| 8x60° | 2,984 ～ 4,496 | 358 ～ 899 |
| 10x60° | 2,387 ～ 3,597 | 286 ～ 719 |
| 12x60° | 1,990 ～ 2,998 | 239 ～ 600 |

## アルミ用
## ●CSMS-Al 超硬スーパーミニアンギュラ

| 刃径 Dia. | 非鉄金属 Al. Cu<br>切削速度 Cutting speed 63~96m/min | |
|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min |
| 5x45° | 4,011 ～ 6,112 | 321 ～ 733 |
| 6x45° | 3,342 ～ 5,093 | 334 ～ 917 |
| 8x45° | 2,507 ～ 3,820 | 251 ～ 688 |
| 10x45° | 2,005 ～ 3,056 | 201 ～ 550 |
| 12x45° | 1,671 ～ 2,547 | 167 ～ 458 |
| 5x60° | 4,011 ～ 6,112 | 321 ～ 733 |
| 6x60° | 3,342 ～ 5,093 | 334 ～ 917 |
| 8x60° | 2,507 ～ 3,820 | 251 ～ 688 |
| 10x60° | 2,005 ～ 3,056 | 201 ～ 550 |
| 12x60° | 1,671 ～ 2,547 | 167 ～ 458 |

※1度の加工取代は0.5として
standard depth of cut during one cutting operation is 0.5mm.

## 高硬度用
## ●CSMW-H 超硬スーパーミニWアンギュラ

| 刃径 Dia. | 高硬度材 SKD. NAK (HRC ～ 62)<br>切削速度 Cutting speed 12~20m/min | |
|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min |
| 5xW 60° | 764 ～ 1,273 | 23 ～ 51 |
| 6xW 60° | 637 ～ 1,061 | 19 ～ 42 |
| 8xW 60° | 477 ～ 796 | 14 ～ 32 |
| 10xW 60° | 382 ～ 637 | 11 ～ 25 |
| 12xW 60° | 318 ～ 531 | 10 ～ 21 |
| 5xW 90° | 764 ～ 1,273 | 23 ～ 51 |
| 6xW 90° | 637 ～ 1,061 | 19 ～ 42 |
| 8xW 90° | 477 ～ 796 | 14 ～ 32 |
| 10xW 90° | 382 ～ 637 | 11 ～ 25 |
| 12xW 90° | 318 ～ 531 | 10 ～ 21 |
| 5xW120° | 764 ～ 1,273 | 23 ～ 51 |
| 6xW120° | 637 ～ 1,061 | 19 ～ 42 |
| 8xW120° | 477 ～ 796 | 14 ～ 32 |
| 10xW120° | 382 ～ 637 | 11 ～ 25 |
| 12xW120° | 318 ～ 531 | 10 ～ 21 |

※1度の加工取代は0.5として
standard depth of cut during one cutting operation is 0.5mm.

## 樹脂用
## ●CSMW-Re 超硬スーパーミニWアンギュラ

| 刃径 Dia. | 樹脂 MC ナイロン POM<br>切削速度 Cutting speed 75~113m/min | |
|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min |
| 5xW 60° | 4,775 ～ 7,194 | 382 ～ 1,007 |
| 6xW 60° | 3,979 ～ 5,995 | 477 ～ 1,199 |
| 8xW 60° | 2,984 ～ 4,496 | 358 ～ 899 |
| 10xW 60° | 2,387 ～ 3,597 | 286 ～ 719 |
| 12xW 60° | 1,990 ～ 2,998 | 239 ～ 600 |
| 5xW 90° | 4,775 ～ 7,194 | 382 ～ 1,007 |
| 6xW 90° | 3,979 ～ 5,995 | 477 ～ 1,199 |
| 8xW 90° | 2,984 ～ 4,496 | 358 ～ 899 |
| 10xW 90° | 2,387 ～ 3,597 | 286 ～ 719 |
| 12xW 90° | 1,990 ～ 2,998 | 239 ～ 600 |
| 5xW120° | 4,775 ～ 7,194 | 382 ～ 1,007 |
| 6xW120° | 3,979 ～ 5,995 | 477 ～ 1,199 |
| 8xW120° | 2,984 ～ 4,496 | 358 ～ 899 |
| 10xW120° | 2,387 ～ 3,597 | 286 ～ 719 |
| 12xW120° | 1,990 ～ 2,998 | 239 ～ 600 |

## アルミ用
## ●CSMW-Al　超硬スーパーミニWアンギュラ

| 刃径 Dia. | 非鉄金属 Al. Cu<br>切削速度 Cutting speed 63~96m/min | |
|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min |
| 5xW 60° | 4,011 ～ 6,112 | 321 ～ 733 |
| 6xW 60° | 3,342 ～ 5,093 | 334 ～ 917 |
| 8xW 60° | 2,507 ～ 3,820 | 251 ～ 688 |
| 10xW 60° | 2,005 ～ 3,056 | 201 ～ 550 |
| 12xW 60° | 1,671 ～ 2,547 | 167 ～ 458 |
| 5xW 90° | 4,011 ～ 6,112 | 321 ～ 733 |
| 6xW 90° | 3,342 ～ 5,093 | 334 ～ 917 |
| 8xW 90° | 2,507 ～ 3,820 | 251 ～ 688 |
| 10xW 90° | 2,005 ～ 3,056 | 201 ～ 550 |
| 12xW 90° | 1,671 ～ 2,547 | 167 ～ 458 |
| 5xW120° | 4,011 ～ 6,112 | 321 ～ 73 |
| 6xW120° | 3,342 ～ 5,093 | 334 ～ 917 |
| 8xW120° | 2,507 ～ 3,820 | 251 ～ 688 |
| 10xW120° | 2,005 ～ 3,056 | 201 ～ 550 |
| 12xW120° | 1,671 ～ 2,547 | 167 ～ 458 |

※1度の加工取代は0.5として
standard depth of cut during one cutting operation is 0.5mm.

## 樹脂用
## ●CSMK-Re　超硬スーパーミニキーシードカッター

| 刃径 Dia. | 樹脂 MC ナイロン POM<br>切削速度 Cutting speed 75~113m/min | |
|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min |
| 5 | 4,775 ～ 7,194 | 382 ～ 1,007 |
| 6 | 3,979 ～ 5,995 | 477 ～ 1,199 |
| 8 | 2,984 ～ 4,496 | 358 ～ 899 |
| 10 | 2,387 ～ 3,597 | 286 ～ 719 |
| 12 | 1,990 ～ 2,998 | 239 ～ 600 |

## アルミ用
## ●CSMK-Al　超硬スーパーミニキーシードカッター

| 刃径 Dia. | 非鉄金属 Al. Cu<br>切削速度 Cutting speed 63~96m/min | |
|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min |
| 5 | 4,011 ～ 6,112 | 321 ～ 733 |
| 6 | 3,342 ～ 5,093 | 334 ～ 917 |
| 8 | 2,507 ～ 3,820 | 251 ～ 688 |
| 10 | 2,005 ～ 3,056 | 201 ～ 550 |
| 12 | 1,671 ～ 2,547 | 167 ～ 458 |

※刃厚1mm以下の製品は送りを20%下げて御使用ください。
In case that cut width is less than 1mm,reduce feed by 20%.

## ●CSMT-S　超硬スーパーミニスロット スリムシャンク

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | | 加工深さ milling depth. |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| **5** | 955 ～ 1,910 | 40 ～ 135 | 764 ～ 1,273 | 21 ～ 72 | 637 ～ 1,019 | 18 ～ 57 | 509 ～ 891 | 11 ～ 25 | 0.5 |
| **6** | 796 ～ 1,592 | 54 ～ 181 | 637 ～ 1,061 | 29 ～ 96 | 531 ～ 849 | 23 ～ 76 | 424 ～ 743 | 15 ～ 34 | 0.6 |
| **8** | 597 ～ 1,194 | 45 ～ 152 | 477 ～ 796 | 24 ～ 81 | 398 ～ 637 | 19 ～ 65 | 318 ～ 557 | 13 ～ 28 | 0.8 |
| **10** | 477 ～ 955 | 40 ～ 135 | 382 ～ 637 | 21 ～ 72 | 318 ～ 509 | 18 ～ 57 | 255 ～ 446 | 11 ～ 25 | 1 |
| **12** | 398 ～ 796 | 37 ～ 124 | 318 ～ 531 | 19 ～ 66 | 265 ～ 424 | 17 ～ 53 | 212 ～ 371 | 10 ～ 23 | 1.2 |

※刃厚 1 mm以下の製品は送りを20%下げて御使用ください
In case that cut width is less than 1mm,reduce feed by 20%.

## ●CSMS-S　超硬スーパーミニアンギュラ スリムシャンク

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| **5x45°** | 955 ～ 1,910 | 28 ～ 95 | 764 ～ 1,273 | 15 ～ 50 | 637 ～ 1,019 | 12 ～ 40 | 509 ～ 891 | 8 ～ 18 |
| **6x45°** | 796 ～ 1,592 | 25 ～ 84 | 637 ～ 1,061 | 13 ～ 45 | 531 ～ 849 | 11 ～ 36 | 424 ～ 743 | 7 ～ 16 |
| **8x45°** | 597 ～ 1,194 | 32 ～ 107 | 477 ～ 796 | 17 ～ 57 | 398 ～ 637 | 14 ～ 45 | 318 ～ 557 | 9 ～ 19 |
| **10x45°** | 477 ～ 955 | 28 ～ 95 | 382 ～ 637 | 15 ～ 50 | 318 ～ 509 | 12 ～ 40 | 255 ～ 446 | 8 ～ 18 |
| **12x45°** | 398 ～ 796 | 26 ～ 87 | 318 ～ 531 | 14 ～ 46 | 265 ～ 424 | 11 ～ 37 | 212 ～ 371 | 7 ～ 16 |
| **5x50°** | 955 ～ 1,910 | 32 ～ 109 | 764 ～ 1,273 | 17 ～ 57 | 637 ～ 1,019 | 14 ～ 46 | 509 ～ 891 | 9 ～ 19 |
| **6x50°** | 796 ～ 1,592 | 29 ～ 96 | 637 ～ 1,061 | 15 ～ 51 | 531 ～ 849 | 13 ～ 40 | 424 ～ 743 | 8 ～ 18 |
| **8x50°** | 597 ～ 1,194 | 37 ～ 122 | 477 ～ 796 | 19 ～ 65 | 398 ～ 637 | 16 ～ 52 | 318 ～ 557 | 10 ～ 22 |
| **10x50°** | 477 ～ 955 | 32 ～ 109 | 382 ～ 637 | 17 ～ 57 | 318 ～ 509 | 14 ～ 46 | 255 ～ 446 | 9 ～ 19 |
| **12x50°** | 398 ～ 796 | 30 ～ 99 | 318 ～ 531 | 16 ～ 53 | 265 ～ 424 | 13 ～ 42 | 212 ～ 371 | 8 ～ 19 |
| **5x55°** | 955 ～ 1,910 | 28 ～ 95 | 764 ～ 1,273 | 15 ～ 50 | 637 ～ 1,019 | 12 ～ 40 | 509 ～ 891 | 8 ～ 18 |
| **6x55°** | 796 ～ 1,592 | 25 ～ 84 | 637 ～ 1,061 | 13 ～ 45 | 531 ～ 849 | 11 ～ 36 | 424 ～ 743 | 7 ～ 16 |
| **8x55°** | 597 ～ 1,194 | 32 ～ 107 | 477 ～ 796 | 17 ～ 57 | 398 ～ 637 | 14 ～ 45 | 318 ～ 557 | 9 ～ 19 |
| **10x55°** | 477 ～ 955 | 28 ～ 95 | 382 ～ 637 | 15 ～ 50 | 318 ～ 509 | 12 ～ 40 | 255 ～ 446 | 8 ～ 18 |
| **12x55°** | 398 ～ 796 | 26 ～ 87 | 318 ～ 531 | 14 ～ 46 | 265 ～ 424 | 11 ～ 37 | 212 ～ 371 | 7 ～ 16 |
| **5x60°** | 955 ～ 1,910 | 32 ～ 109 | 764 ～ 1,273 | 17 ～ 57 | 637 ～ 1,019 | 14 ～ 46 | 509 ～ 891 | 9 ～ 19 |
| **6x60°** | 796 ～ 1,592 | 29 ～ 96 | 637 ～ 1,061 | 15 ～ 51 | 531 ～ 849 | 13 ～ 40 | 424 ～ 743 | 8 ～ 18 |
| **8x60°** | 597 ～ 1,194 | 37 ～ 122 | 477 ～ 796 | 19 ～ 65 | 398 ～ 637 | 16 ～ 52 | 318 ～ 557 | 10 ～ 22 |
| **10x60°** | 477 ～ 955 | 32 ～ 109 | 382 ～ 637 | 17 ～ 57 | 318 ～ 509 | 14 ～ 46 | 255 ～ 446 | 9 ～ 19 |
| **12x60°** | 398 ～ 796 | 30 ～ 99 | 318 ～ 531 | 16 ～ 53 | 265 ～ 424 | 13 ～ 42 | 212 ～ 371 | 8 ～ 19 |
| **5x70°** | 955 ～ 1,910 | 28 ～ 95 | 764 ～ 1,273 | 15 ～ 50 | 637 ～ 1,019 | 12 ～ 40 | 509 ～ 891 | 8 ～ 18 |
| **6x70°** | 796 ～ 1,592 | 25 ～ 84 | 637 ～ 1,061 | 13 ～ 45 | 531 ～ 849 | 11 ～ 36 | 424 ～ 743 | 7 ～ 16 |
| **8x70°** | 597 ～ 1,194 | 32 ～ 107 | 477 ～ 796 | 17 ～ 57 | 398 ～ 637 | 14 ～ 45 | 318 ～ 557 | 9 ～ 19 |
| **10x70°** | 477 ～ 955 | 28 ～ 95 | 382 ～ 637 | 15 ～ 50 | 318 ～ 509 | 12 ～ 40 | 255 ～ 446 | 8 ～ 18 |
| **12x70°** | 398 ～ 796 | 26 ～ 87 | 318 ～ 531 | 14 ～ 46 | 265 ～ 424 | 11 ～ 37 | 212 ～ 371 | 7 ～ 16 |
| **5x75°** | 955 ～ 1,910 | 32 ～ 109 | 764 ～ 1,273 | 17 ～ 57 | 637 ～ 1,019 | 14 ～ 46 | 509 ～ 891 | 9 ～ 19 |
| **6x75°** | 796 ～ 1,592 | 29 ～ 96 | 637 ～ 1,061 | 15 ～ 51 | 531 ～ 849 | 13 ～ 40 | 424 ～ 743 | 8 ～ 18 |
| **8x75°** | 597 ～ 1,194 | 37 ～ 122 | 477 ～ 796 | 19 ～ 65 | 398 ～ 637 | 16 ～ 52 | 318 ～ 557 | 10 ～ 22 |
| **10x75°** | 477 ～ 955 | 32 ～ 109 | 382 ～ 637 | 17 ～ 57 | 318 ～ 509 | 14 ～ 46 | 255 ～ 446 | 9 ～ 19 |
| **12x75°** | 398 ～ 796 | 30 ～ 99 | 318 ～ 531 | 16 ～ 53 | 265 ～ 424 | 13 ～ 42 | 212 ～ 371 | 8 ～ 19 |

※1度の加工取代は0.5として
Standard depth of cut during one cutting operation is 0.5mm.

## ●CSMW-S　超硬スーパーミニWアンギュラ スリムシャンク

| 呼び寸法 Size. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 10~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 5xW 60° | 955 ～ 1,910 | 30 ～ 101 | 637 ～ 1,273 | 13 ～ 54 | 637 ～ 1,019 | 13 ～ 43 | 509 ～ 891 | 8 ～ 19 |
| 6xW 60° | 796 ～ 1,592 | 27 ～ 90 | 531 ～ 1,061 | 12 ～ 48 | 531 ～ 849 | 12 ～ 38 | 424 ～ 743 | 7 ～ 17 |
| 8xW 60° | 597 ～ 1,194 | 34 ～ 114 | 398 ～ 796 | 15 ～ 60 | 398 ～ 637 | 15 ～ 49 | 318 ～ 557 | 9 ～ 21 |
| 10xW 60° | 477 ～ 955 | 40 ～ 135 | 318 ～ 637 | 18 ～ 72 | 318 ～ 509 | 18 ～ 57 | 255 ～ 446 | 11 ～ 25 |
| 12xW 60° | 398 ～ 796 | 37 ～ 124 | 265 ～ 531 | 17 ～ 66 | 265 ～ 424 | 17 ～ 53 | 212 ～ 371 | 10 ～ 23 |
| 5xW 90° | 955 ～ 1,910 | 32 ～ 109 | 637 ～ 1,273 | 14 ～ 57 | 637 ～ 1,019 | 14 ～ 46 | 509 ～ 891 | 9 ～ 19 |
| 6xW 90° | 796 ～ 1,592 | 29 ～ 96 | 531 ～ 1,061 | 13 ～ 51 | 531 ～ 849 | 13 ～ 40 | 424 ～ 743 | 8 ～ 18 |
| 8xW 90° | 597 ～ 1,194 | 37 ～ 122 | 398 ～ 796 | 16 ～ 65 | 398 ～ 637 | 16 ～ 52 | 318 ～ 557 | 10 ～ 22 |
| 10xW 90° | 477 ～ 955 | 43 ～ 145 | 318 ～ 637 | 19 ～ 76 | 318 ～ 509 | 19 ～ 61 | 255 ～ 446 | 12 ～ 27 |
| 12xW 90° | 398 ～ 796 | 39 ～ 133 | 265 ～ 531 | 18 ～ 71 | 265 ～ 424 | 18 ～ 57 | 212 ～ 371 | 11 ～ 24 |
| 5xW120° | 955 ～ 1,910 | 35 ～ 115 | 637 ～ 1,273 | 15 ～ 61 | 637 ～ 1,019 | 15 ～ 49 | 509 ～ 891 | 9 ～ 21 |
| 6xW120° | 796 ～ 1,592 | 30 ～ 102 | 531 ～ 1,061 | 13 ～ 55 | 531 ～ 849 | 13 ～ 43 | 424 ～ 743 | 8 ～ 19 |
| 8xW120° | 597 ～ 1,194 | 38 ～ 130 | 398 ～ 796 | 17 ～ 69 | 398 ～ 637 | 17 ～ 55 | 318 ～ 557 | 11 ～ 24 |
| 10xW120° | 477 ～ 955 | 46 ～ 153 | 318 ～ 637 | 20 ～ 82 | 318 ～ 509 | 20 ～ 65 | 255 ～ 446 | 13 ～ 28 |
| 12xW120° | 398 ～ 796 | 42 ～ 141 | 265 ～ 531 | 19 ～ 75 | 265 ～ 424 | 19 ～ 59 | 212 ～ 371 | 12 ～ 26 |

※1度の加工取代は0.5として
Standard depth of cut during one cutting operation is 0.5mm.

## ●CSMU-S　超硬スーパーミニコンベックス スリムシャンク

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 5 | 955 ～ 1,910 | 30 ～ 101 | 764 ～ 1,273 | 16 ～ 54 | 637 ～ 1,019 | 13 ～ 43 | 509 ～ 891 | 8 ～ 19 |
| 6 | 796 ～ 1,592 | 40 ～ 135 | 637 ～ 1,061 | 21 ～ 72 | 531 ～ 849 | 18 ～ 57 | 424 ～ 743 | 11 ～ 25 |
| 8 | 597 ～ 1,194 | 34 ～ 114 | 477 ～ 796 | 18 ～ 60 | 398 ～ 637 | 15 ～ 49 | 318 ～ 557 | 9 ～ 21 |
| 10 | 477 ～ 955 | 30 ～ 101 | 382 ～ 637 | 16 ～ 54 | 318 ～ 509 | 13 ～ 43 | 255 ～ 446 | 8 ～ 19 |
| 12 | 398 ～ 796 | 28 ～ 93 | 318 ～ 531 | 15 ～ 50 | 265 ～ 424 | 12 ～ 39 | 212 ～ 371 | 7 ～ 17 |

※R0.3mm以下の製品は送りを10%下げてご使用ください。
※R0.75mm以下の製品は送りを5%下げてご使用ください。
In case that R is 0.3mm and less,reduce feed by 10%.
In case that R is 0.75mm and less,reduce feed by 5%.

## ●CSMK-S　超硬スーパーミニキーシードカッター スリムシャンク

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | | 加工深さ milling depth. |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 5 | 955 ～ 1,910 | 49 ～ 163 | 764 ～ 1,273 | 26 ～ 87 | 637 ～ 1,019 | 21 ～ 69 | 509 ～ 891 | 14 ～ 30 | 0.5 |
| 6 | 796 ～ 1,592 | 57 ～ 193 | 637 ～ 1,061 | 31 ～ 103 | 531 ～ 849 | 25 ～ 82 | 424 ～ 743 | 16 ～ 36 | 0.6 |
| 8 | 597 ～ 1,194 | 49 ～ 163 | 477 ～ 796 | 26 ～ 87 | 398 ～ 637 | 21 ～ 69 | 318 ～ 557 | 14 ～ 30 | 0.8 |
| 10 | 477 ～ 955 | 43 ～ 145 | 382 ～ 637 | 22 ～ 76 | 318 ～ 509 | 19 ～ 61 | 255 ～ 446 | 12 ～ 27 | 1 |
| 12 | 398 ～ 796 | 39 ～ 133 | 318 ～ 531 | 20 ～ 71 | 265 ～ 424 | 18 ～ 57 | 212 ～ 371 | 11 ～ 24 | 1.2 |

※刃厚 1 mm以下の製品は送りを10%下げて御使用ください
In case that cut width is less than 1mm, reduce feed by 10%.

## ●CSMT　超硬スーパーミニスロット
## ●CSTC　超硬ソリッドTスロットカッター

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | | 加工深さ milling depth. |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 2 | 2,387 ～ 4,775 | 86 ～ 286 | 1,910 ～ 3,183 | 46 ～ 153 | 1,592 ～ 2,546 | 38 ～ 122 | 1,273 ～ 2,228 | 24 ～ 53 | 0.2 |
| 3 | 1,592 ～ 3,183 | 62 ～ 207 | 1,273 ～ 2,122 | 33 ～ 110 | 1,061 ～ 1,698 | 28 ～ 88 | 849 ～ 1,485 | 18 ～ 39 | 0.3 |
| 4 | 1,194 ～ 2,387 | 50 ～ 167 | 955 ～ 1,592 | 27 ～ 89 | 796 ～ 1,273 | 22 ～ 71 | 637 ～ 1,114 | 14 ～ 31 | 0.4 |
| 5 | 955 ～ 1,910 | 43 ～ 143 | 764 ～ 1,273 | 23 ～ 76 | 637 ～ 1,019 | 19 ～ 61 | 509 ～ 891 | 12 ～ 27 | 0.5 |
| 6 | 796 ～ 1,592 | 57 ～ 191 | 637 ～ 1,061 | 31 ～ 102 | 531 ～ 849 | 25 ～ 81 | 424 ～ 743 | 16 ～ 36 | 0.6 |
| 7 | 682 ～ 1,364 | 52 ～ 174 | 546 ～ 909 | 28 ～ 93 | 455 ～ 728 | 23 ～ 74 | 364 ～ 637 | 15 ～ 32 | 0.7 |
| 8 | 597 ～ 1,194 | 48 ～ 161 | 477 ～ 796 | 26 ～ 86 | 398 ～ 637 | 21 ～ 69 | 318 ～ 557 | 14 ～ 30 | 0.8 |
| 10 | 477 ～ 955 | 43 ～ 143 | 382 ～ 637 | 23 ～ 76 | 318 ～ 509 | 19 ～ 61 | 255 ～ 446 | 12 ～ 27 | 1 |
| 12 | 398 ～ 796 | 39 ～ 131 | 318 ～ 531 | 21 ～ 70 | 265 ～ 424 | 18 ～ 56 | 212 ～ 371 | 11 ～ 25 | 1.2 |
| 15 | 318 ～ 637 | 48 ～ 143 | 255 ～ 424 | 29 ～ 80 | 212 ～ 340 | 24 ～ 64 | 170 ～ 297 | 17 ～ 33 | 1.5 |
| 20 | 239 ～ 477 | 57 ～ 172 | 191 ～ 318 | 34 ～ 95 | 159 ～ 255 | 29 ～ 76 | 127 ～ 223 | 20 ～ 40 | 2 |
| 25 | 191 ～ 382 | 67 ～ 201 | 153 ～ 255 | 40 ～ 111 | 127 ～ 204 | 33 ～ 89 | 102 ～ 178 | 23 ～ 47 | 2.5 |
| 30 | 159 ～ 318 | 64 ～ 191 | 127 ～ 212 | 38 ～ 106 | 106 ～ 170 | 32 ～ 85 | 85 ～ 149 | 22 ～ 45 | 3 |

Φ12迄刃厚1mm、Φ15からは刃厚3mmを基準として算出（送り量÷回転数＝回転当り切込み量）
※刃厚 1 mm以下の製品は送りを20%下げて御使用ください。
Feed(mm/min)÷Spindle speed(rpm)=Feed rate(mm/rev)
Calculation basis:Cut width is 1mm for up to $\phi$12.
Cut width is 3mm for$\phi$15 and over.
In case that cut width is 1mm and less, reduce feed by 20%.

## ●CSMTL-A　超硬スーパーミニスロットロング

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | | 加工深さ milling depth. |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 5 | 955 ～ 1,910 | 37 ～ 122 | 764 ～ 1,273 | 19 ～ 65 | 637 ～ 1,019 | 16 ～ 52 | 509 ～ 891 | 10 ～ 23 | 0.5 |
| 6 | 796 ～ 1,592 | 49 ～ 162 | 637 ～ 1,061 | 26 ～ 87 | 531 ～ 849 | 22 ～ 69 | 424 ～ 743 | 14 ～ 30 | 0.6 |
| 7 | 682 ～ 1,364 | 44 ～ 148 | 546 ～ 909 | 24 ～ 79 | 455 ～ 728 | 20 ～ 63 | 364 ～ 637 | 13 ～ 28 | 0.7 |
| 8 | 597 ～ 1,194 | 41 ～ 137 | 477 ～ 796 | 22 ～ 73 | 398 ～ 637 | 18 ～ 58 | 318 ～ 557 | 12 ～ 26 | 0.8 |
| 10 | 477 ～ 955 | 37 ～ 122 | 382 ～ 637 | 19 ～ 65 | 318 ～ 509 | 16 ～ 52 | 255 ～ 446 | 10 ～ 23 | 1 |
| 12 | 398 ～ 796 | 33 ～ 112 | 318 ～ 531 | 18 ～ 60 | 265 ～ 424 | 15 ～ 48 | 212 ～ 371 | 10 ～ 21 | 1.2 |

※刃厚 1 mm以下の製品は送りを20%下げて御使用ください
In case that cut width is 1mm and less, reduce feed by 20%.

## ●CSMS　超硬スーパーミニアンギュラ

| 呼び寸法 size. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 5x45° | 955 ～ 1,910 | 30 ～ 100 | 764 ～ 1,273 | 16 ～ 53 | 637 ～ 1,019 | 13 ～ 43 | 509 ～ 891 | 9 ～ 19 |
| 6x45° | 796 ～ 1,592 | 27 ～ 89 | 637 ～ 1,061 | 14 ～ 48 | 531 ～ 849 | 12 ～ 38 | 424 ～ 743 | 8 ～ 17 |
| 8x45° | 597 ～ 1,194 | 34 ～ 113 | 477 ～ 796 | 18 ～ 60 | 398 ～ 637 | 15 ～ 48 | 318 ～ 557 | 10 ～ 21 |
| 10x45° | 477 ～ 955 | 30 ～ 100 | 382 ～ 637 | 16 ～ 53 | 318 ～ 509 | 13 ～ 43 | 255 ～ 446 | 9 ～ 19 |
| 12x45° | 398 ～ 796 | 28 ～ 92 | 318 ～ 531 | 15 ～ 49 | 265 ～ 424 | 12 ～ 39 | 212 ～ 371 | 8 ～ 17 |
| 5x60° | 955 ～ 1,910 | 34 ～ 115 | 764 ～ 1,273 | 18 ～ 61 | 637 ～ 1,019 | 15 ～ 49 | 509 ～ 891 | 10 ～ 21 |
| 6x60° | 796 ～ 1,592 | 31 ～ 102 | 637 ～ 1,061 | 16 ～ 54 | 531 ～ 849 | 14 ～ 43 | 424 ～ 743 | 9 ～ 19 |
| 8x60° | 597 ～ 1,194 | 39 ～ 129 | 477 ～ 796 | 21 ～ 69 | 398 ～ 637 | 17 ～ 55 | 318 ～ 557 | 11 ～ 24 |
| 10x60° | 477 ～ 955 | 34 ～ 115 | 382 ～ 637 | 18 ～ 61 | 318 ～ 509 | 15 ～ 49 | 255 ～ 446 | 10 ～ 21 |
| 12x60° | 398 ～ 796 | 32 ～ 105 | 318 ～ 531 | 17 ～ 56 | 265 ～ 424 | 14 ～ 45 | 212 ～ 371 | 9 ～ 20 |

※1度の加工取代は0.5として
Standard depth of cut during one cutting operation is 0.5mm.

## ●CSMSL-A　超硬スーパーミニアンギュラロング

| 呼び寸法 size. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| **5x45°** | 955 ～ 1,910 | 28 ～ 93 | 764 ～ 1,273 | 15 ～ 50 | 637 ～ 1,019 | 12 ～ 40 | 509 ～ 891 | 8 ～ 17 |
| **6x45°** | 796 ～ 1,592 | 25 ～ 83 | 637 ～ 1,061 | 13 ～ 44 | 531 ～ 849 | 11 ～ 35 | 424 ～ 743 | 7 ～ 15 |
| **8x45°** | 597 ～ 1,194 | 31 ～ 105 | 477 ～ 796 | 17 ～ 56 | 398 ～ 637 | 14 ～ 45 | 318 ～ 557 | 9 ～ 20 |
| **10x45°** | 477 ～ 955 | 28 ～ 93 | 382 ～ 637 | 15 ～ 50 | 318 ～ 509 | 12 ～ 40 | 255 ～ 446 | 8 ～ 17 |
| **12x45°** | 398 ～ 796 | 26 ～ 85 | 318 ～ 531 | 14 ～ 46 | 265 ～ 424 | 11 ～ 36 | 212 ～ 371 | 7 ～ 16 |
| **5x60°** | 955 ～ 1,910 | 32 ～ 107 | 764 ～ 1,273 | 17 ～ 57 | 637 ～ 1,019 | 14 ～ 46 | 509 ～ 891 | 9 ～ 20 |
| **6x60°** | 796 ～ 1,592 | 29 ～ 95 | 637 ～ 1,061 | 15 ～ 51 | 531 ～ 849 | 13 ～ 41 | 424 ～ 743 | 8 ～ 18 |
| **8x60°** | 597 ～ 1,194 | 36 ～ 121 | 477 ～ 796 | 19 ～ 64 | 398 ～ 637 | 16 ～ 52 | 318 ～ 557 | 10 ～ 23 |
| **10x60°** | 477 ～ 955 | 32 ～ 107 | 382 ～ 637 | 17 ～ 57 | 318 ～ 509 | 14 ～ 46 | 255 ～ 446 | 9 ～ 20 |
| **12x60°** | 398 ～ 796 | 30 ～ 98 | 318 ～ 531 | 16 ～ 53 | 265 ～ 424 | 13 ～ 42 | 212 ～ 371 | 8 ～ 18 |

※1度の加工取代は0.5として
Standard depth of cut during one cutting operation is 0.5mm.

## ●CSMW　超硬スーパーミニWアンギュラ

| 呼び寸法 size. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 10~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| **5xW 60°** | 955 ～ 1,910 | 32 ～ 107 | 637 ～ 1,273 | 14 ～ 57 | 637 ～ 1,019 | 14 ～ 46 | 509 ～ 891 | 9 ～ 20 |
| **6xW 60°** | 796 ～ 1,592 | 29 ～ 95 | 531 ～ 1,061 | 13 ～ 51 | 531 ～ 849 | 13 ～ 41 | 424 ～ 743 | 8 ～ 18 |
| **8xW 60°** | 597 ～ 1,194 | 36 ～ 121 | 398 ～ 796 | 16 ～ 64 | 398 ～ 637 | 16 ～ 52 | 318 ～ 557 | 10 ～ 23 |
| **10xW 60°** | 477 ～ 955 | 43 ～ 143 | 318 ～ 637 | 19 ～ 76 | 318 ～ 509 | 19 ～ 61 | 255 ～ 446 | 12 ～ 27 |
| **12xW 60°** | 398 ～ 796 | 39 ～ 131 | 265 ～ 531 | 18 ～ 70 | 265 ～ 424 | 18 ～ 56 | 212 ～ 371 | 11 ～ 25 |
| **5xW 90°** | 955 ～ 1,910 | 34 ～ 115 | 637 ～ 1,273 | 15 ～ 61 | 637 ～ 1,019 | 15 ～ 49 | 509 ～ 891 | 10 ～ 21 |
| **6xW 90°** | 796 ～ 1,592 | 31 ～ 102 | 531 ～ 1,061 | 14 ～ 54 | 531 ～ 849 | 14 ～ 43 | 424 ～ 743 | 9 ～ 19 |
| **8xW 90°** | 597 ～ 1,194 | 39 ～ 129 | 398 ～ 796 | 17 ～ 69 | 398 ～ 637 | 17 ～ 55 | 318 ～ 557 | 11 ～ 24 |
| **10xW 90°** | 477 ～ 955 | 46 ～ 153 | 318 ～ 637 | 20 ～ 81 | 318 ～ 509 | 20 ～ 65 | 255 ～ 446 | 13 ～ 29 |
| **12xW 90°** | 398 ～ 796 | 42 ～ 140 | 265 ～ 531 | 19 ～ 75 | 265 ～ 424 | 19 ～ 60 | 212 ～ 371 | 12 ～ 26 |
| **5xW120°** | 955 ～ 1,910 | 37 ～ 122 | 637 ～ 1,273 | 16 ～ 65 | 637 ～ 1,019 | 16 ～ 52 | 509 ～ 891 | 10 ～ 23 |
| **6xW120°** | 796 ～ 1,592 | 32 ～ 108 | 531 ～ 1,061 | 14 ～ 58 | 531 ～ 849 | 14 ～ 46 | 424 ～ 743 | 9 ～ 20 |
| **8xW120°** | 597 ～ 1,194 | 41 ～ 137 | 398 ～ 796 | 18 ～ 73 | 398 ～ 637 | 18 ～ 58 | 318 ～ 557 | 12 ～ 26 |
| **10xW120°** | 477 ～ 955 | 49 ～ 162 | 318 ～ 637 | 22 ～ 87 | 318 ～ 509 | 22 ～ 69 | 255 ～ 446 | 14 ～ 30 |
| **12xW120°** | 398 ～ 796 | 45 ～ 149 | 265 ～ 531 | 20 ～ 79 | 265 ～ 424 | 20 ～ 63 | 212 ～ 371 | 13 ～ 28 |

※1度の加工取代は0.5として
Standard depth of cut during one cutting operation is 0.5mm.

## ●CSMWL-A　超硬スーパーミニWアンギュラロング

| 呼び寸法 size. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 10~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| **5xW 60°** | 955 ~ 1,910 | 28 ~ 93 | 637 ~ 1,273 | 12 ~ 50 | 637 ~ 1,019 | 12 ~ 40 | 509 ~ 891 | 8 ~ 17 |
| **6xW 60°** | 796 ~ 1,592 | 25 ~ 83 | 531 ~ 1,061 | 11 ~ 44 | 531 ~ 849 | 11 ~ 35 | 424 ~ 743 | 7 ~ 15 |
| **8xW 60°** | 597 ~ 1,194 | 31 ~ 105 | 398 ~ 796 | 14 ~ 56 | 398 ~ 637 | 14 ~ 45 | 318 ~ 557 | 9 ~ 20 |
| **10xW 60°** | 477 ~ 955 | 37 ~ 124 | 318 ~ 637 | 17 ~ 66 | 318 ~ 509 | 17 ~ 53 | 255 ~ 446 | 11 ~ 23 |
| **12xW 60°** | 398 ~ 796 | 34 ~ 114 | 265 ~ 531 | 15 ~ 61 | 265 ~ 424 | 15 ~ 49 | 212 ~ 371 | 10 ~ 21 |
| **5xW 90°** | 955 ~ 1,910 | 30 ~ 100 | 637 ~ 1,273 | 13 ~ 53 | 637 ~ 1,019 | 13 ~ 43 | 509 ~ 891 | 9 ~ 19 |
| **6xW 90°** | 796 ~ 1,592 | 27 ~ 89 | 531 ~ 1,061 | 12 ~ 48 | 531 ~ 849 | 12 ~ 38 | 424 ~ 743 | 8 ~ 17 |
| **8xW 90°** | 597 ~ 1,194 | 34 ~ 113 | 398 ~ 796 | 15 ~ 60 | 398 ~ 637 | 15 ~ 48 | 318 ~ 557 | 10 ~ 21 |
| **10xW 90°** | 477 ~ 955 | 40 ~ 134 | 318 ~ 637 | 18 ~ 71 | 318 ~ 509 | 18 ~ 57 | 255 ~ 446 | 11 ~ 25 |
| **12xW 90°** | 398 ~ 796 | 37 ~ 123 | 265 ~ 531 | 16 ~ 65 | 265 ~ 424 | 16 ~ 52 | 212 ~ 371 | 10 ~ 23 |
| **5xW120°** | 955 ~ 1,910 | 32 ~ 107 | 637 ~ 1,273 | 14 ~ 57 | 637 ~ 1,019 | 14 ~ 46 | 509 ~ 891 | 9 ~ 20 |
| **6xW120°** | 796 ~ 1,592 | 29 ~ 95 | 531 ~ 1,061 | 13 ~ 51 | 531 ~ 849 | 13 ~ 41 | 424 ~ 743 | 8 ~ 18 |
| **8xW120°** | 597 ~ 1,194 | 36 ~ 121 | 398 ~ 796 | 16 ~ 64 | 398 ~ 637 | 16 ~ 52 | 318 ~ 557 | 10 ~ 23 |
| **10xW120°** | 477 ~ 955 | 43 ~ 143 | 318 ~ 637 | 19 ~ 76 | 318 ~ 509 | 19 ~ 61 | 255 ~ 446 | 12 ~ 27 |
| **12xW120°** | 398 ~ 796 | 39 ~ 131 | 265 ~ 531 | 18 ~ 70 | 265 ~ 424 | 18 ~ 56 | 212 ~ 371 | 11 ~ 25 |

※1度の加工取代は0.5として
Standard depth of cut during one cutting operation is 0.5mm.

## ●CSMST2-P　超硬ソリッドミニストロングアンギュラ 2枚刃

| 呼び寸法 size. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 20~30m/min | | 切削速度 Cutting Speed 15~20m/min | | 切削速度 Cutting Speed 12~18m/min | | 切削速度 Cutting Speed 10~16m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| **3x 5°** | 2,122 ~ 3,183 | 94 ~ 281 | 1,592 ~ 2,122 | 53 ~ 141 | 1,273 ~ 1,910 | 28 ~ 84 | 1,061 ~ 1,698 | 19 ~ 60 |
| **4x 5°** | 1,592 ~ 2,387 | 76 ~ 227 | 1,194 ~ 1,592 | 43 ~ 114 | 955 ~ 1,432 | 23 ~ 68 | 796 ~ 1,273 | 15 ~ 48 |
| **6x 5°** | 1,061 ~ 1,592 | 58 ~ 173 | 796 ~ 1,061 | 32 ~ 87 | 637 ~ 955 | 17 ~ 52 | 531 ~ 849 | 12 ~ 37 |
| **8x 5°** | 796 ~ 1,194 | 49 ~ 146 | 597 ~ 796 | 27 ~ 73 | 477 ~ 716 | 15 ~ 44 | 398 ~ 637 | 10 ~ 31 |
| **10x 5°** | 637 ~ 955 | 43 ~ 130 | 477 ~ 637 | 24 ~ 65 | 382 ~ 573 | 13 ~ 39 | 318 ~ 509 | 9 ~ 28 |
| **12x 5°** | 531 ~ 796 | 40 ~ 119 | 398 ~ 531 | 22 ~ 60 | 318 ~ 477 | 12 ~ 36 | 265 ~ 424 | 8 ~ 25 |
| **3x10°** | 2,122 ~ 3,183 | 82 ~ 246 | 1,592 ~ 2,122 | 46 ~ 123 | 1,273 ~ 1,910 | 25 ~ 74 | 1,061 ~ 1,698 | 16 ~ 53 |
| **4x10°** | 1,592 ~ 2,387 | 66 ~ 199 | 1,194 ~ 1,592 | 37 ~ 99 | 955 ~ 1,432 | 20 ~ 60 | 796 ~ 1,273 | 13 ~ 42 |
| **6x10°** | 1,061 ~ 1,592 | 51 ~ 152 | 796 ~ 1,061 | 28 ~ 76 | 637 ~ 955 | 15 ~ 45 | 531 ~ 849 | 10 ~ 32 |
| **8x10°** | 796 ~ 1,194 | 43 ~ 128 | 597 ~ 796 | 24 ~ 64 | 477 ~ 716 | 13 ~ 38 | 398 ~ 637 | 9 ~ 27 |
| **10x10°** | 637 ~ 955 | 38 ~ 114 | 477 ~ 637 | 21 ~ 57 | 382 ~ 573 | 11 ~ 34 | 318 ~ 509 | 8 ~ 24 |
| **12x10°** | 531 ~ 796 | 35 ~ 104 | 398 ~ 531 | 20 ~ 52 | 318 ~ 477 | 10 ~ 31 | 265 ~ 424 | 7 ~ 22 |
| **3x15°** | 2,122 ~ 3,183 | 70 ~ 211 | 1,592 ~ 2,122 | 40 ~ 106 | 1,273 ~ 1,910 | 21 ~ 63 | 1,061 ~ 1,698 | 14 ~ 45 |
| **4x15°** | 1,592 ~ 2,387 | 57 ~ 170 | 1,194 ~ 1,592 | 32 ~ 85 | 955 ~ 1,432 | 17 ~ 51 | 796 ~ 1,273 | 11 ~ 36 |
| **6x15°** | 1,061 ~ 1,592 | 43 ~ 130 | 796 ~ 1,061 | 24 ~ 65 | 637 ~ 955 | 13 ~ 39 | 531 ~ 849 | 9 ~ 28 |
| **8x15°** | 796 ~ 1,194 | 37 ~ 110 | 597 ~ 796 | 21 ~ 55 | 477 ~ 716 | 11 ~ 33 | 398 ~ 637 | 7 ~ 23 |
| **10x15°** | 637 ~ 955 | 32 ~ 97 | 477 ~ 637 | 18 ~ 49 | 382 ~ 573 | 10 ~ 29 | 318 ~ 509 | 6 ~ 21 |
| **12x15°** | 531 ~ 796 | 30 ~ 89 | 398 ~ 531 | 17 ~ 45 | 318 ~ 477 | 9 ~ 27 | 265 ~ 424 | 6 ~ 19 |
| **3x20°** | 2,122 ~ 3,183 | 58 ~ 173 | 1,592 ~ 2,122 | 32 ~ 86 | 1,273 ~ 1,910 | 17 ~ 52 | 1,061 ~ 1,698 | 12 ~ 37 |
| **4x20°** | 1,592 ~ 2,387 | 46 ~ 139 | 1,194 ~ 1,592 | 26 ~ 70 | 955 ~ 1,432 | 14 ~ 42 | 796 ~ 1,273 | 9 ~ 30 |
| **6x20°** | 1,061 ~ 1,592 | 35 ~ 106 | 796 ~ 1,061 | 20 ~ 53 | 637 ~ 955 | 11 ~ 32 | 531 ~ 849 | 7 ~ 23 |
| **8x20°** | 796 ~ 1,194 | 30 ~ 90 | 597 ~ 796 | 17 ~ 45 | 477 ~ 716 | 9 ~ 27 | 398 ~ 637 | 6 ~ 19 |
| **10x20°** | 637 ~ 955 | 27 ~ 80 | 477 ~ 637 | 15 ~ 40 | 382 ~ 573 | 8 ~ 24 | 318 ~ 509 | 5 ~ 17 |
| **12x20°** | 531 ~ 796 | 24 ~ 73 | 398 ~ 531 | 14 ~ 36 | 318 ~ 477 | 7 ~ 22 | 265 ~ 424 | 5 ~ 16 |
| **3x25°** | 2,122 ~ 3,183 | 47 ~ 141 | 1,592 ~ 2,122 | 26 ~ 70 | 1,273 ~ 1,910 | 14 ~ 42 | 1,061 ~ 1,698 | 9 ~ 30 |
| **4x25°** | 1,592 ~ 2,387 | 38 ~ 114 | 1,194 ~ 1,592 | 21 ~ 57 | 955 ~ 1,432 | 11 ~ 34 | 796 ~ 1,273 | 8 ~ 24 |
| **6x25°** | 1,061 ~ 1,592 | 29 ~ 87 | 796 ~ 1,061 | 16 ~ 43 | 637 ~ 955 | 9 ~ 26 | 531 ~ 849 | 6 ~ 18 |
| **8x25°** | 796 ~ 1,194 | 24 ~ 73 | 597 ~ 796 | 14 ~ 37 | 477 ~ 716 | 7 ~ 22 | 398 ~ 637 | 5 ~ 16 |
| **10x25°** | 637 ~ 955 | 22 ~ 65 | 477 ~ 637 | 12 ~ 32 | 382 ~ 573 | 6 ~ 19 | 318 ~ 509 | 4 ~ 14 |
| **12x25°** | 531 ~ 796 | 20 ~ 60 | 398 ~ 531 | 11 ~ 30 | 318 ~ 477 | 6 ~ 18 | 265 ~ 424 | 4 ~ 13 |

## ●CSMST4-P　超硬ソリッドミニストロングアンギュラ 4枚刃

| 呼び寸法 size. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 20~30m/min | | 切削速度 Cutting Speed 15~20m/min | | 切削速度 Cutting Speed 12~18m/min | | 切削速度 Cutting Speed 10~16m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 3x 5° | 2,122 ~ 3,183 | 110 ~ 331 | 1,592 ~ 2,334 | 62 ~ 182 | 1,273 ~ 1,910 | 33 ~ 99 | 1,061 ~ 1,698 | 22 ~ 71 |
| 4x 5° | 1,592 ~ 2,387 | 89 ~ 267 | 1,194 ~ 1,751 | 50 ~ 147 | 955 ~ 1,432 | 27 ~ 80 | 796 ~ 1,273 | 18 ~ 57 |
| 6x 5° | 1,061 ~ 1,592 | 68 ~ 204 | 796 ~ 1,167 | 38 ~ 112 | 637 ~ 955 | 20 ~ 61 | 531 ~ 849 | 14 ~ 43 |
| 8x 5° | 796 ~ 1,194 | 57 ~ 172 | 597 ~ 875 | 32 ~ 95 | 477 ~ 716 | 17 ~ 52 | 398 ~ 637 | 11 ~ 37 |
| 10x 5° | 637 ~ 955 | 51 ~ 153 | 477 ~ 700 | 29 ~ 84 | 382 ~ 573 | 15 ~ 46 | 318 ~ 509 | 10 ~ 33 |
| 12x 5° | 531 ~ 796 | 47 ~ 140 | 398 ~ 584 | 26 ~ 77 | 318 ~ 477 | 14 ~ 42 | 265 ~ 424 | 9 ~ 30 |
| 3x10° | 2,122 ~ 3,183 | 97 ~ 290 | 1,592 ~ 2,334 | 54 ~ 159 | 1,273 ~ 1,910 | 29 ~ 87 | 1,061 ~ 1,698 | 19 ~ 62 |
| 4x10° | 1,592 ~ 2,387 | 78 ~ 234 | 1,194 ~ 1,751 | 44 ~ 129 | 955 ~ 1,432 | 23 ~ 70 | 796 ~ 1,273 | 16 ~ 50 |
| 6x10° | 1,061 ~ 1,592 | 59 ~ 178 | 796 ~ 1,167 | 33 ~ 98 | 637 ~ 955 | 18 ~ 53 | 531 ~ 849 | 12 ~ 38 |
| 8x10° | 796 ~ 1,194 | 50 ~ 150 | 597 ~ 875 | 28 ~ 83 | 477 ~ 716 | 15 ~ 45 | 398 ~ 637 | 10 ~ 32 |
| 10x10° | 637 ~ 955 | 45 ~ 134 | 477 ~ 700 | 25 ~ 74 | 382 ~ 573 | 13 ~ 40 | 318 ~ 509 | 9 ~ 29 |
| 12x10° | 531 ~ 796 | 41 ~ 123 | 398 ~ 584 | 23 ~ 67 | 318 ~ 477 | 12 ~ 37 | 265 ~ 424 | 8 ~ 26 |
| 3x15° | 2,122 ~ 3,183 | 83 ~ 248 | 1,592 ~ 2,334 | 47 ~ 137 | 1,273 ~ 1,910 | 25 ~ 74 | 1,061 ~ 1,698 | 17 ~ 53 |
| 4x15° | 1,592 ~ 2,387 | 67 ~ 201 | 1,194 ~ 1,751 | 38 ~ 110 | 955 ~ 1,432 | 20 ~ 60 | 796 ~ 1,273 | 13 ~ 43 |
| 6x15° | 1,061 ~ 1,592 | 51 ~ 153 | 796 ~ 1,167 | 29 ~ 84 | 637 ~ 955 | 15 ~ 46 | 531 ~ 849 | 10 ~ 33 |
| 8x15° | 796 ~ 1,194 | 43 ~ 129 | 597 ~ 875 | 24 ~ 71 | 477 ~ 716 | 13 ~ 39 | 398 ~ 637 | 9 ~ 28 |
| 10x15° | 637 ~ 955 | 38 ~ 115 | 477 ~ 700 | 21 ~ 63 | 382 ~ 573 | 11 ~ 34 | 318 ~ 509 | 8 ~ 24 |
| 12x15° | 531 ~ 796 | 35 ~ 105 | 398 ~ 584 | 20 ~ 58 | 318 ~ 477 | 11 ~ 32 | 265 ~ 424 | 7 ~ 22 |
| 3x20° | 2,122 ~ 3,183 | 69 ~ 207 | 1,592 ~ 2,334 | 39 ~ 114 | 1,273 ~ 1,910 | 21 ~ 62 | 1,061 ~ 1,698 | 14 ~ 44 |
| 4x20° | 1,592 ~ 2,387 | 56 ~ 167 | 1,194 ~ 1,751 | 31 ~ 92 | 955 ~ 1,432 | 17 ~ 50 | 796 ~ 1,273 | 11 ~ 36 |
| 6x20° | 1,061 ~ 1,592 | 42 ~ 127 | 796 ~ 1,167 | 24 ~ 70 | 637 ~ 955 | 13 ~ 38 | 531 ~ 849 | 8 ~ 27 |
| 8x20° | 796 ~ 1,194 | 36 ~ 107 | 597 ~ 875 | 20 ~ 59 | 477 ~ 716 | 11 ~ 32 | 398 ~ 637 | 7 ~ 23 |
| 10x20° | 637 ~ 955 | 32 ~ 95 | 477 ~ 700 | 18 ~ 53 | 382 ~ 573 | 10 ~ 29 | 318 ~ 509 | 6 ~ 20 |
| 12x20° | 531 ~ 796 | 29 ~ 88 | 398 ~ 584 | 16 ~ 48 | 318 ~ 477 | 9 ~ 26 | 265 ~ 424 | 6 ~ 19 |
| 3x25° | 2,122 ~ 3,183 | 55 ~ 166 | 1,592 ~ 2,334 | 31 ~ 91 | 1,273 ~ 1,910 | 17 ~ 50 | 1,061 ~ 1,698 | 11 ~ 35 |
| 4x25° | 1,592 ~ 2,387 | 45 ~ 134 | 1,194 ~ 1,751 | 25 ~ 74 | 955 ~ 1,432 | 13 ~ 40 | 796 ~ 1,273 | 9 ~ 29 |
| 6x25° | 1,061 ~ 1,592 | 34 ~ 102 | 796 ~ 1,167 | 19 ~ 56 | 637 ~ 955 | 10 ~ 31 | 531 ~ 849 | 7 ~ 22 |
| 8x25° | 796 ~ 1,194 | 29 ~ 86 | 597 ~ 875 | 16 ~ 47 | 477 ~ 716 | 9 ~ 26 | 398 ~ 637 | 6 ~ 18 |
| 10x25° | 637 ~ 955 | 25 ~ 76 | 477 ~ 700 | 14 ~ 42 | 382 ~ 573 | 8 ~ 23 | 318 ~ 509 | 5 ~ 16 |
| 12x25° | 531 ~ 796 | 23 ~ 70 | 398 ~ 584 | 13 ~ 39 | 318 ~ 477 | 7 ~ 21 | 265 ~ 424 | 5 ~ 15 |

## ●CSMU　超硬スーパーミニコンベックス

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 4 | 1,194 ~ 2,387 | 38 ~ 125 | 955 ~ 1,592 | 20 ~ 67 | 796 ~ 1,273 | 17 ~ 53 | 637 ~ 1,114 | 11 ~ 23 |
| 5 | 955 ~ 1,910 | 32 ~ 107 | 764 ~ 1,273 | 17 ~ 57 | 637 ~ 1,019 | 14 ~ 46 | 509 ~ 891 | 9 ~ 20 |
| 6 | 796 ~ 1,592 | 43 ~ 143 | 637 ~ 1,061 | 23 ~ 76 | 531 ~ 849 | 19 ~ 61 | 424 ~ 743 | 12 ~ 27 |
| 7 | 682 ~ 1,364 | 39 ~ 130 | 546 ~ 909 | 21 ~ 70 | 455 ~ 728 | 17 ~ 56 | 364 ~ 637 | 11 ~ 24 |
| 8 | 597 ~ 1,194 | 36 ~ 121 | 477 ~ 796 | 19 ~ 64 | 398 ~ 637 | 16 ~ 52 | 318 ~ 557 | 10 ~ 23 |
| 10 | 477 ~ 955 | 32 ~ 107 | 382 ~ 637 | 17 ~ 57 | 318 ~ 509 | 14 ~ 46 | 255 ~ 446 | 9 ~ 20 |
| 12 | 398 ~ 796 | 30 ~ 98 | 318 ~ 531 | 16 ~ 53 | 265 ~ 424 | 13 ~ 42 | 212 ~ 371 | 8 ~ 18 |

※R0.3mm以下の製品は送りを10%下げて御使用ください。
※R0.75mm以下の製品は送りを5%下げて御使用ください。
In case that R is 0.3mm and less, reduce feed by 10%.
In case that R is 0.75mm and less, reduce feed by 5%.

## ●CSMUL-A　超硬スーパーミニコンベックスロング

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 4 | 1,194 ～ 2,387 | 35 ～ 116 | 955 ～ 1,592 | 18 ～ 62 | 796 ～ 1,273 | 15 ～ 49 | 637 ～ 1,114 | 10 ～ 21 |
| 5 | 955 ～ 1,910 | 29 ～ 99 | 764 ～ 1,273 | 15 ～ 53 | 637 ～ 1,019 | 13 ～ 42 | 509 ～ 891 | 8 ～ 18 |
| 6 | 796 ～ 1,592 | 39 ～ 132 | 637 ～ 1,061 | 21 ～ 70 | 531 ～ 849 | 17 ～ 56 | 424 ～ 743 | 11 ～ 25 |
| 8 | 597 ～ 1,194 | 33 ～ 112 | 477 ～ 796 | 17 ～ 59 | 398 ～ 637 | 14 ～ 48 | 318 ～ 557 | 9 ～ 21 |
| 10 | 477 ～ 955 | 29 ～ 99 | 382 ～ 637 | 15 ～ 53 | 318 ～ 509 | 13 ～ 42 | 255 ～ 446 | 8 ～ 18 |
| 12 | 398 ～ 796 | 27 ～ 91 | 318 ～ 531 | 14 ～ 49 | 265 ～ 424 | 12 ～ 39 | 212 ～ 371 | 7 ～ 16 |

※R0.3mm以下の製品は送りを10%下げてご使用ください。
※R0.75mm以下の製品は送りを5%下げてご使用ください。
in case that R is 0.3mm and less,reduce feed by 10%.
in case that R is 0.75mm and less,reduce feed by 5%.

## ●CSMV　超硬スーパーミニコンケーブ

| 刃径 Dia. | R | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|---|
| | | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | |
| | | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 4 | R 0.25 | 1,194 ～ 2,387 | 134 ～ 267 | 955 ～ 1,592 | 107 ～ 178 | 796 ～ 1,273 | 89 ～ 143 | 637 ～ 1,114 | 71 ～ 125 |
| 5 | | 955 ～ 1,910 | 115 ～ 229 | 764 ～ 1,273 | 92 ～ 153 | 637 ～ 1,019 | 76 ～ 122 | 509 ～ 891 | 61 ～ 107 |
| 6 | | 796 ～ 1,592 | 102 ～ 204 | 637 ～ 1,061 | 81 ～ 136 | 531 ～ 849 | 68 ～ 109 | 424 ～ 743 | 54 ～ 95 |
| 8 | | 597 ～ 1,194 | 129 ～ 258 | 477 ～ 796 | 103 ～ 172 | 398 ～ 637 | 86 ～ 138 | 318 ～ 557 | 69 ～ 120 |
| 10 | | 477 ～ 955 | 115 ～ 229 | 382 ～ 637 | 92 ～ 153 | 318 ～ 509 | 76 ～ 122 | 255 ～ 446 | 61 ～ 107 |
| 12 | | 398 ～ 796 | 105 ～ 210 | 318 ～ 531 | 84 ～ 140 | 265 ～ 424 | 70 ～ 112 | 212 ～ 371 | 56 ～ 98 |
| 4 | R 0.3 | 1,194 ～ 2,387 | 134 ～ 267 | 955 ～ 1,592 | 107 ～ 178 | 796 ～ 1,273 | 89 ～ 143 | 637 ～ 1,114 | 71 ～ 125 |
| 5 | | 955 ～ 1,910 | 115 ～ 229 | 764 ～ 1,273 | 92 ～ 153 | 637 ～ 1,019 | 76 ～ 122 | 509 ～ 891 | 61 ～ 107 |
| 6 | | 796 ～ 1,592 | 102 ～ 204 | 637 ～ 1,061 | 81 ～ 136 | 531 ～ 849 | 68 ～ 109 | 424 ～ 743 | 54 ～ 95 |
| 8 | | 597 ～ 1,194 | 129 ～ 258 | 477 ～ 796 | 103 ～ 172 | 398 ～ 637 | 86 ～ 138 | 318 ～ 557 | 69 ～ 120 |
| 10 | | 477 ～ 955 | 115 ～ 229 | 382 ～ 637 | 92 ～ 153 | 318 ～ 509 | 76 ～ 122 | 255 ～ 446 | 61 ～ 107 |
| 12 | | 398 ～ 796 | 105 ～ 210 | 318 ～ 531 | 84 ～ 140 | 265 ～ 424 | 70 ～ 112 | 212 ～ 371 | 56 ～ 98 |
| 4 | R 0.5 | 1,194 ～ 2,387 | 134 ～ 267 | 955 ～ 1,592 | 107 ～ 178 | 796 ～ 1,273 | 89 ～ 143 | 637 ～ 1,114 | 71 ～ 125 |
| 5 | | 955 ～ 1,910 | 115 ～ 229 | 764 ～ 1,273 | 92 ～ 153 | 637 ～ 1,019 | 76 ～ 122 | 509 ～ 891 | 61 ～ 107 |
| 6 | | 796 ～ 1,592 | 102 ～ 204 | 637 ～ 1,061 | 81 ～ 136 | 531 ～ 849 | 68 ～ 109 | 424 ～ 743 | 54 ～ 95 |
| 8 | | 597 ～ 1,194 | 129 ～ 258 | 477 ～ 796 | 103 ～ 172 | 398 ～ 637 | 86 ～ 138 | 318 ～ 557 | 69 ～ 120 |
| 10 | | 477 ～ 955 | 115 ～ 229 | 382 ～ 637 | 92 ～ 153 | 318 ～ 509 | 76 ～ 122 | 255 ～ 446 | 61 ～ 107 |
| 12 | | 398 ～ 796 | 105 ～ 210 | 318 ～ 531 | 84 ～ 140 | 265 ～ 424 | 70 ～ 112 | 212 ～ 371 | 56 ～ 98 |
| 8 | R 0.75 | 597 ～ 1,194 | 97 ～ 193 | 477 ～ 796 | 77 ～ 129 | 398 ～ 637 | 64 ～ 103 | 318 ～ 557 | 52 ～ 90 |
| 10 | | 477 ～ 955 | 86 ～ 172 | 382 ～ 637 | 69 ～ 115 | 318 ～ 509 | 57 ～ 92 | 255 ～ 446 | 46 ～ 80 |
| 12 | | 398 ～ 796 | 79 ～ 158 | 318 ～ 531 | 63 ～ 105 | 265 ～ 424 | 53 ～ 84 | 212 ～ 371 | 42 ～ 74 |
| 8 | R 1 | 597 ～ 1,194 | 97 ～ 193 | 477 ～ 796 | 77 ～ 129 | 398 ～ 637 | 64 ～ 103 | 318 ～ 557 | 52 ～ 90 |
| 10 | | 477 ～ 955 | 86 ～ 172 | 382 ～ 637 | 69 ～ 115 | 318 ～ 509 | 57 ～ 92 | 255 ～ 446 | 46 ～ 80 |
| 12 | | 398 ～ 796 | 53 ～ 105 | 318 ～ 531 | 42 ～ 70 | 265 ～ 424 | 35 ～ 56 | 212 ～ 371 | 28 ～ 49 |
| 10 | R 1.5 | 477 ～ 955 | 57 ～ 115 | 382 ～ 637 | 46 ～ 76 | 318 ～ 509 | 38 ～ 61 | 255 ～ 446 | 31 ～ 53 |
| 12 | | 398 ～ 796 | 53 ～ 105 | 318 ～ 531 | 42 ～ 70 | 265 ～ 424 | 35 ～ 56 | 212 ～ 371 | 28 ～ 49 |
| 12 | R 2 | 398 ～ 796 | 26 ～ 53 | 318 ～ 531 | 21 ～ 35 | 265 ～ 424 | 18 ～ 28 | 212 ～ 371 | 14 ～ 25 |

※R刃加工を基準に設定してます
Cutting conditions in the above table are set on the basis of the radius of the tools.

## ●CSWRC-A　超硬ミニWR面取カッター

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 0.2 | 1,326 ～ 2,653 | 53 ～ 212 | 1,061 ～ 1,768 | 42 ～ 124 | 884 ～ 1,415 | 31 ～ 85 | 707 ～ 1,238 | 21 ～ 62 |
| 0.3 | 1,256 ～ 2,513 | 50 ～ 201 | 1,005 ～ 1,675 | 40 ～ 117 | 838 ～ 1,340 | 29 ～ 80 | 670 ～ 1,173 | 20 ～ 59 |
| 0.4 | 1,194 ～ 2,387 | 48 ～ 191 | 955 ～ 1,592 | 38 ～ 111 | 796 ～ 1,273 | 28 ～ 76 | 637 ～ 1,114 | 19 ～ 56 |
| 0.5 | 1,137 ～ 2,274 | 45 ～ 182 | 909 ～ 1,516 | 36 ～ 106 | 758 ～ 1,213 | 27 ～ 73 | 606 ～ 1,061 | 18 ～ 53 |
| 0.6 | 1,085 ～ 2,170 | 43 ～ 174 | 868 ～ 1,447 | 35 ～ 101 | 723 ～ 1,157 | 25 ～ 69 | 579 ～ 1,013 | 17 ～ 51 |
| 0.7 | 853 ～ 1,705 | 34 ～ 136 | 682 ～ 1,137 | 27 ～ 80 | 568 ～ 909 | 20 ～ 55 | 455 ～ 796 | 14 ～ 40 |
| 0.8 | 823 ～ 1,646 | 33 ～ 132 | 659 ～ 1,098 | 26 ～ 77 | 549 ～ 878 | 19 ～ 53 | 439 ～ 768 | 13 ～ 38 |
| 0.9 | 796 ～ 1,592 | 32 ～ 127 | 637 ～ 1,061 | 25 ～ 74 | 531 ～ 849 | 19 ～ 51 | 424 ～ 743 | 13 ～ 37 |
| 1 | 582 ～ 1,165 | 23 ～ 93 | 466 ～ 776 | 19 ～ 54 | 388 ～ 621 | 14 ～ 37 | 311 ～ 543 | 9 ～ 27 |
| 1.2 | 555 ～ 1,110 | 22 ～ 89 | 444 ～ 740 | 18 ～ 52 | 370 ～ 592 | 13 ～ 36 | 296 ～ 518 | 9 ～ 26 |
| 1.5 | 519 ～ 1,038 | 21 ～ 83 | 415 ～ 692 | 17 ～ 48 | 346 ～ 554 | 12 ～ 33 | 277 ～ 484 | 8 ～ 24 |
| 2 | 391 ～ 783 | 16 ～ 63 | 313 ～ 522 | 13 ～ 37 | 261 ～ 417 | 9 ～ 25 | 209 ～ 365 | 6 ～ 18 |
| 2.5 | 362 ～ 723 | 14 ～ 58 | 289 ～ 482 | 12 ～ 34 | 241 ～ 386 | 8 ～ 23 | 193 ～ 338 | 6 ～ 17 |

## ●CSWRCL-A　超硬ミニWR面取カッターロング

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 0.2 | 723 ～ 1,447 | 29 ～ 116 | 579 ～ 965 | 23 ～ 68 | 482 ～ 772 | 17 ～ 46 | 386 ～ 675 | 12 ～ 34 |
| 0.3 | 702 ～ 1,404 | 28 ～ 112 | 562 ～ 936 | 22 ～ 66 | 468 ～ 749 | 16 ～ 45 | 374 ～ 655 | 11 ～ 33 |
| 0.4 | 682 ～ 1,364 | 27 ～ 109 | 546 ～ 909 | 22 ～ 64 | 455 ～ 728 | 16 ～ 44 | 364 ～ 637 | 11 ～ 32 |
| 0.5 | 663 ～ 1,326 | 27 ～ 106 | 531 ～ 884 | 21 ～ 62 | 442 ～ 707 | 15 ～ 42 | 354 ～ 619 | 11 ～ 31 |
| 0.6 | 645 ～ 1,290 | 26 ～ 103 | 516 ～ 860 | 21 ～ 60 | 430 ～ 688 | 15 ～ 41 | 344 ～ 602 | 10 ～ 30 |
| 0.7 | 628 ～ 1,256 | 25 ～ 101 | 503 ～ 838 | 20 ～ 59 | 419 ～ 670 | 15 ～ 40 | 335 ～ 586 | 10 ～ 29 |
| 0.8 | 612 ～ 1,224 | 24 ～ 98 | 490 ～ 816 | 20 ～ 57 | 408 ～ 653 | 14 ～ 39 | 326 ～ 571 | 10 ～ 29 |
| 0.9 | 597 ～ 1,194 | 24 ～ 95 | 477 ～ 796 | 19 ～ 56 | 398 ～ 637 | 14 ～ 38 | 318 ～ 557 | 10 ～ 28 |
| 1 | 468 ～ 936 | 19 ～ 75 | 374 ～ 624 | 15 ～ 44 | 312 ～ 499 | 11 ～ 30 | 250 ～ 437 | 7 ～ 22 |
| 1.2 | 450 ～ 901 | 18 ～ 72 | 360 ～ 601 | 14 ～ 42 | 300 ～ 480 | 11 ～ 29 | 240 ～ 420 | 7 ～ 21 |
| 1.5 | 426 ～ 853 | 17 ～ 68 | 341 ～ 568 | 14 ～ 40 | 284 ～ 455 | 10 ～ 27 | 227 ～ 398 | 7 ～ 20 |
| 2 | 336 ～ 672 | 13 ～ 54 | 269 ～ 448 | 11 ～ 31 | 224 ～ 359 | 8 ～ 22 | 179 ～ 314 | 5 ～ 16 |
| 2.5 | 314 ～ 628 | 13 ～ 50 | 251 ～ 419 | 10 ～ 29 | 209 ～ 335 | 7 ～ 20 | 168 ～ 293 | 5 ～ 15 |

## ●CSMK　超硬スーパーミニキーシードカッター

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | | 加工深さ milling depth. |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 2 | 2,387 ～ 4,775 | 69 ～ 229 | 1,910 ～ 3,183 | 37 ～ 122 | 1,592 ～ 2,546 | 31 ～ 98 | 1,273 ～ 2,228 | 20 ～ 43 | 0.2 |
| 2.5 | 1,910 ～ 3,820 | 57 ～ 191 | 1,528 ～ 2,546 | 31 ～ 102 | 1,273 ～ 2,037 | 25 ～ 81 | 1,019 ～ 1,783 | 16 ～ 36 | 0.25 |
| 3 | 1,592 ～ 3,183 | 50 ～ 166 | 1,273 ～ 2,122 | 26 ～ 88 | 1,061 ～ 1,698 | 22 ～ 71 | 849 ～ 1,485 | 14 ～ 31 | 0.3 |
| 4 | 1,194 ～ 2,387 | 60 ～ 201 | 955 ～ 1,592 | 32 ～ 107 | 796 ～ 1,273 | 27 ～ 86 | 637 ～ 1,114 | 17 ～ 37 | 0.4 |
| 5 | 955 ～ 1,910 | 52 ～ 172 | 764 ～ 1,273 | 28 ～ 92 | 637 ～ 1,019 | 23 ～ 73 | 509 ～ 891 | 15 ～ 32 | 0.5 |
| 6 | 796 ～ 1,592 | 61 ～ 204 | 637 ～ 1,061 | 33 ～ 109 | 531 ～ 849 | 27 ～ 87 | 424 ～ 743 | 17 ～ 38 | 0.6 |
| 7 | 682 ～ 1,364 | 56 ～ 186 | 546 ～ 909 | 30 ～ 99 | 455 ～ 728 | 25 ～ 79 | 364 ～ 637 | 16 ～ 35 | 0.7 |
| 8 | 597 ～ 1,194 | 52 ～ 172 | 477 ～ 796 | 28 ～ 92 | 398 ～ 637 | 23 ～ 73 | 318 ～ 557 | 15 ～ 32 | 0.8 |
| 10 | 477 ～ 955 | 46 ～ 153 | 382 ～ 637 | 24 ～ 81 | 318 ～ 509 | 20 ～ 65 | 255 ～ 446 | 13 ～ 29 | 1 |
| 12 | 398 ～ 796 | 42 ～ 140 | 318 ～ 531 | 22 ～ 75 | 265 ～ 424 | 19 ～ 60 | 212 ～ 371 | 12 ～ 26 | 1.2 |

※刃厚 1 mm以下の製品は送りを10%下げて御使用ください。
In case that cut width is 1mm and less, reduce feed by 10%.

## ●CSMTKC　超硬スーパーミニ千鳥刃キーシードカッター

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | | 加工深さ milling depth. |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 4 | 1,194 ～ 2,387 | 66 ～ 221 | 955 ～ 1,592 | 35 ～ 118 | 796 ～ 1,273 | 29 ～ 94 | 637 ～ 1,114 | 19 ～ 41 | 0.4 |
| 5 | 955 ～ 1,910 | 57 ～ 189 | 764 ～ 1,273 | 30 ～ 101 | 637 ～ 1,019 | 25 ～ 81 | 509 ～ 891 | 16 ～ 35 | 0.5 |
| 6 | 796 ～ 1,592 | 50 ～ 168 | 637 ～ 1,061 | 27 ～ 90 | 531 ～ 849 | 22 ～ 72 | 424 ～ 743 | 14 ～ 31 | 0.6 |
| 7 | 682 ～ 1,364 | 46 ～ 153 | 546 ～ 909 | 24 ～ 82 | 455 ～ 728 | 20 ～ 65 | 364 ～ 637 | 13 ～ 29 | 0.7 |
| 8 | 597 ～ 1,194 | 43 ～ 142 | 477 ～ 796 | 23 ～ 76 | 398 ～ 637 | 19 ～ 61 | 318 ～ 557 | 12 ～ 26 | 0.8 |
| 10 | 477 ～ 955 | 38 ～ 126 | 382 ～ 637 | 20 ～ 67 | 318 ～ 509 | 17 ～ 54 | 255 ～ 446 | 11 ～ 24 | 1 |
| 12 | 398 ～ 796 | 35 ～ 116 | 318 ～ 531 | 18 ～ 62 | 265 ～ 424 | 15 ～ 49 | 212 ～ 371 | 10 ～ 22 | 1.2 |

※刃厚1mm以下の製品は送りを10%下げて御使用ください。
In case that cut width is 1mm and less, reduce feed by 10%.

## ●CSACS　超硬ソリッドアンギュラカッター
## ●CSACLS　超硬ソリッドアンギュラカッターロング

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 15x45° | 318 ～ 637 | 32 ～ 101 | 255 ～ 424 | 17 ～ 58 | 212 ～ 340 | 14 ～ 46 | 170 ～ 297 | 10 ～ 20 |
| 20x45° | 239 ～ 477 | 29 ～ 90 | 191 ～ 318 | 15 ～ 51 | 159 ～ 255 | 13 ～ 41 | 127 ～ 223 | 9 ～ 18 |
| 25x45° | 191 ～ 382 | 27 ～ 83 | 153 ～ 255 | 14 ～ 47 | 127 ～ 204 | 12 ～ 38 | 102 ～ 178 | 8 ～ 17 |
| 30x45° | 159 ～ 318 | 25 ～ 79 | 127 ～ 212 | 13 ～ 45 | 106 ～ 170 | 11 ～ 36 | 85 ～ 149 | 7 ～ 16 |
| 15x60° | 318 ～ 637 | 37 ～ 116 | 255 ～ 424 | 20 ～ 66 | 212 ～ 340 | 17 ～ 53 | 170 ～ 297 | 11 ～ 23 |
| 20x60° | 239 ～ 477 | 33 ～ 103 | 191 ～ 318 | 18 ～ 59 | 159 ～ 255 | 15 ～ 47 | 127 ～ 223 | 10 ～ 21 |
| 25x60° | 191 ～ 382 | 31 ～ 95 | 153 ～ 255 | 16 ～ 54 | 127 ～ 204 | 14 ～ 43 | 102 ～ 178 | 9 ～ 19 |
| 30x60° | 159 ～ 318 | 29 ～ 90 | 127 ～ 212 | 15 ～ 51 | 106 ～ 170 | 13 ～ 41 | 85 ～ 149 | 9 ～ 18 |

※1度の加工取代は1として
Standard depth of cut during one cutting operation is 1mm.

## ●CSTTC　超硬ソリッド千鳥刃Tスロットカッター
## ●CSTTCL　超硬ソリッド千鳥刃Tスロットカッターロング

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | | 加工深さ milling depth. |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 15 | 318 ～ 637 | 115 ～ 191 | 255 ～ 424 | 46 ～ 127 | 212 ～ 340 | 38 ～ 102 | 170 ～ 297 | 25 ～ 54 | 1.5 |
| 16 | 299 ～ 597 | 107 ～ 179 | 239 ～ 398 | 43 ～ 119 | 199 ～ 318 | 36 ～ 96 | 159 ～ 279 | 24 ～ 50 | 1.5 |
| 18 | 265 ～ 531 | 96 ～ 159 | 212 ～ 354 | 38 ～ 106 | 177 ～ 283 | 32 ～ 85 | 142 ～ 248 | 21 ～ 45 | 1.5 |
| 20 | 239 ～ 477 | 86 ～ 143 | 191 ～ 318 | 34 ～ 96 | 159 ～ 255 | 29 ～ 76 | 127 ～ 223 | 19 ～ 40 | 2 |
| 22 | 217 ～ 434 | 78 ～ 130 | 173 ～ 290 | 31 ～ 87 | 145 ～ 232 | 26 ～ 69 | 116 ～ 203 | 17 ～ 36 | 2.5 |
| 25 | 191 ～ 382 | 92 ～ 153 | 153 ～ 255 | 37 ～ 102 | 127 ～ 204 | 31 ～ 82 | 102 ～ 178 | 20 ～ 43 | 2.5 |
| 30 | 159 ～ 318 | 76 ～ 127 | 127 ～ 212 | 31 ～ 85 | 106 ～ 170 | 25 ～ 68 | 85 ～ 149 | 17 ～ 36 | 3 |

刃厚3mmを基準として算出（送り量÷回転数＝回転当り切込み量）
Feed (mm/min)÷Spindle speed(rpm)=Feed rate(mm/rev)
Calculation basis：Cut width is 3mm

## ●CSKC　超硬ソリッドキーシードカッター

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | | 加工深さ milling depth. |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 2 | 2,387 ～ 4,775 | 69 ～ 229 | 1,910 ～ 3,183 | 37 ～ 122 | 1,592 ～ 2,546 | 31 ～ 98 | 1,273 ～ 2,228 | 20 ～ 43 | 0.2 |
| 2.5 | 1,910 ～ 3,820 | 57 ～ 191 | 1,528 ～ 2,546 | 31 ～ 102 | 1,273 ～ 2,037 | 25 ～ 81 | 1,019 ～ 1,783 | 16 ～ 36 | 0.25 |
| 3 | 1,592 ～ 3,183 | 50 ～ 166 | 1,273 ～ 2,122 | 26 ～ 88 | 1,061 ～ 1,698 | 22 ～ 71 | 849 ～ 1,485 | 14 ～ 31 | 0.3 |
| 4 | 1,194 ～ 2,387 | 60 ～ 201 | 955 ～ 1,592 | 32 ～ 107 | 796 ～ 1,273 | 27 ～ 86 | 637 ～ 1,114 | 17 ～ 37 | 0.4 |
| 5 | 955 ～ 1,910 | 69 ～ 229 | 764 ～ 1,273 | 37 ～ 122 | 637 ～ 1,019 | 31 ～ 98 | 509 ～ 891 | 20 ～ 43 | 0.5 |
| 6 | 796 ～ 1,592 | 61 ～ 204 | 637 ～ 1,061 | 33 ～ 109 | 531 ～ 849 | 27 ～ 87 | 424 ～ 743 | 17 ～ 38 | 0.6 |
| 7 | 682 ～ 1,364 | 56 ～ 186 | 546 ～ 909 | 30 ～ 99 | 455 ～ 728 | 25 ～ 79 | 364 ～ 637 | 16 ～ 35 | 0.7 |
| 8 | 597 ～ 1,194 | 52 ～ 172 | 477 ～ 796 | 28 ～ 92 | 398 ～ 637 | 23 ～ 73 | 318 ～ 557 | 15 ～ 32 | 0.8 |
| 10 | 477 ～ 955 | 46 ～ 153 | 382 ～ 637 | 24 ～ 81 | 318 ～ 509 | 20 ～ 65 | 255 ～ 446 | 13 ～ 29 | 1 |
| 12 | 398 ～ 796 | 42 ～ 140 | 318 ～ 531 | 22 ～ 75 | 265 ～ 424 | 19 ～ 60 | 212 ～ 371 | 12 ～ 26 | 1.2 |
| 15 | 318 ～ 637 | 48 ～ 159 | 255 ～ 424 | 25 ～ 85 | 212 ～ 340 | 21 ～ 68 | 170 ～ 297 | 14 ～ 30 | 2.2 |
| 16 | 298 ～ 597 | 47 ～ 155 | 239 ～ 398 | 25 ～ 83 | 199 ～ 318 | 21 ～ 66 | 159 ～ 279 | 13 ～ 29 | 3.2 |
| 18 | 265 ～ 531 | 53 ～ 178 | 212 ～ 354 | 29 ～ 95 | 177 ～ 283 | 24 ～ 76 | 141 ～ 248 | 15 ～ 33 | 4.2 |
| 20 | 239 ～ 477 | 52 ～ 172 | 191 ～ 318 | 28 ～ 92 | 159 ～ 255 | 23 ～ 73 | 127 ～ 223 | 15 ～ 32 | 5.2 |
| 25 | 191 ～ 382 | 56 ～ 187 | 153 ～ 255 | 30 ～ 100 | 127 ～ 204 | 25 ～ 80 | 102 ～ 178 | 16 ～ 35 | 6.2 |
| 30 | 159 ～ 318 | 53 ～ 178 | 127 ～ 212 | 29 ～ 95 | 106 ～ 170 | 24 ～ 76 | 85 ～ 149 | 15 ～ 33 | 7.2 |

※刃厚 1 mm以下の製品は送りを10%下げて御使用ください。
In case that cut width is 1mm and less, reduce feed by 10%.

## ●CKC　超硬キーシードカッター
## ●CKC-AS　超硬キーシードカッター ASタイプ

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | | 加工深さ milling depth. |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 10 | 477 ～ 955 | 29 ～ 95 | 382 ～ 637 | 15 ～ 51 | 318 ～ 509 | 13 ～ 41 | 255 ～ 446 | 8 ～ 18 | 1 |
| 12 | 398 ～ 796 | 29 ～ 95 | 318 ～ 531 | 15 ～ 51 | 265 ～ 424 | 13 ～ 41 | 212 ～ 371 | 8 ～ 18 | 1.2 |
| 13 | 367 ～ 735 | 29 ～ 95 | 294 ～ 490 | 15 ～ 51 | 245 ～ 392 | 13 ～ 41 | 196 ～ 343 | 8 ～ 18 | 1.3 |
| 15 | 318 ～ 637 | 36 ～ 119 | 255 ～ 424 | 19 ～ 64 | 212 ～ 340 | 16 ～ 51 | 170 ～ 297 | 10 ～ 22 | 1.5 |
| 16 | 298 ～ 597 | 36 ～ 119 | 239 ～ 398 | 19 ～ 64 | 199 ～ 318 | 16 ～ 51 | 159 ～ 279 | 10 ～ 22 | 1.6 |
| 18 | 265 ～ 531 | 43 ～ 143 | 212 ～ 354 | 23 ～ 76 | 177 ～ 283 | 19 ～ 61 | 141 ～ 248 | 12 ～ 27 | 1.8 |
| 19 | 251 ～ 503 | 43 ～ 143 | 201 ～ 335 | 23 ～ 76 | 168 ～ 268 | 19 ～ 61 | 134 ～ 235 | 12 ～ 27 | 1.9 |
| 20 | 239 ～ 477 | 43 ～ 143 | 191 ～ 318 | 23 ～ 76 | 159 ～ 255 | 19 ～ 61 | 127 ～ 223 | 12 ～ 27 | 2 |
| 22 | 217 ～ 434 | 43 ～ 143 | 174 ～ 289 | 23 ～ 76 | 145 ～ 231 | 19 ～ 61 | 116 ～ 203 | 12 ～ 27 | 2.2 |
| 25 | 191 ～ 382 | 50 ～ 167 | 153 ～ 255 | 27 ～ 89 | 127 ～ 204 | 22 ～ 71 | 102 ～ 178 | 14 ～ 31 | 2.5 |
| 28 | 171 ～ 341 | 50 ～ 167 | 136 ～ 227 | 27 ～ 89 | 114 ～ 182 | 22 ～ 71 | 91 ～ 159 | 14 ～ 31 | 2.8 |
| 30 | 159 ～ 318 | 50 ～ 167 | 127 ～ 212 | 27 ～ 89 | 106 ～ 170 | 22 ～ 71 | 85 ～ 149 | 14 ～ 31 | 3 |
| 35 | 136 ～ 273 | 57 ～ 191 | 109 ～ 182 | 31 ～ 102 | 91 ～ 146 | 25 ～ 81 | 73 ～ 127 | 16 ～ 36 | 3.5 |
| 40 | 119 ～ 239 | 57 ～ 191 | 95 ～ 159 | 31 ～ 102 | 80 ～ 127 | 25 ～ 81 | 64 ～ 111 | 16 ～ 36 | 4 |
| 45 | 106 ～ 212 | 57 ～ 191 | 85 ～ 141 | 31 ～ 102 | 71 ～ 113 | 25 ～ 81 | 57 ～ 99 | 16 ～ 36 | 4.5 |
| 50 | 95 ～ 191 | 64 ～ 215 | 76 ～ 127 | 34 ～ 115 | 64 ～ 102 | 29 ～ 92 | 51 ～ 89 | 18 ～ 40 | 5 |
| 55 | 87 ～ 174 | 64 ～ 215 | 69 ～ 116 | 34 ～ 115 | 58 ～ 93 | 29 ～ 92 | 46 ～ 81 | 18 ～ 40 | 5.5 |
| 60 | 80 ～ 159 | 64 ～ 215 | 64 ～ 106 | 34 ～ 115 | 53 ～ 85 | 29 ～ 92 | 42 ～ 74 | 18 ～ 40 | 6 |

※Φ10～Φ20迄刃厚 1 mm以下の製品は送りを10%下げて御使用ください。
※Φ22～Φ40迄刃厚 1.5 mm以下の製品は送りを15%下げて御使用ください。
※Φ45～Φ60迄刃厚 2 mm以下の製品は送りを20%下げて御使用ください。
As for the cutter of $\phi$10～$\phi$20 with cut width of 1mm and less, reduce feed by 10%.
As for the cutter of $\phi$22～$\phi$40 with cut width of 1.5mm and less, reduce feed by 15%.
As for the cutter of $\phi$45～$\phi$60 with cut width of 2mm and less, reduce feed by 20%.

## ●CZCS　超硬パイロット付ザグリカッター ストレートシャンク
## ●CZCT　超硬パイロット付ザグリカッター テーパーシャンク

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 18~35m/min | | 切削速度 Cutting Speed 15~25m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 8~16m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| **10** | 573 ~ 1,114 | 26 ~ 50 | 477 ~ 796 | 21 ~ 36 | 382 ~ 637 | 17 ~ 29 | 255 ~ 509 | 11 ~ 23 |
| **11** | 521 ~ 1,013 | 23 ~ 46 | 434 ~ 723 | 20 ~ 33 | 347 ~ 579 | 16 ~ 26 | 231 ~ 463 | 10 ~ 21 |
| **12** | 477 ~ 928 | 21 ~ 42 | 398 ~ 663 | 18 ~ 30 | 318 ~ 531 | 14 ~ 24 | 212 ~ 424 | 10 ~ 19 |
| **13** | 441 ~ 857 | 20 ~ 39 | 367 ~ 612 | 17 ~ 28 | 294 ~ 490 | 13 ~ 22 | 196 ~ 392 | 9 ~ 18 |
| **14** | 409 ~ 796 | 18 ~ 36 | 341 ~ 568 | 15 ~ 26 | 273 ~ 455 | 12 ~ 20 | 182 ~ 364 | 8 ~ 16 |
| **15** | 382 ~ 743 | 17 ~ 33 | 318 ~ 531 | 14 ~ 24 | 255 ~ 424 | 11 ~ 19 | 170 ~ 340 | 8 ~ 15 |
| **16** | 358 ~ 696 | 16 ~ 31 | 298 ~ 497 | 13 ~ 22 | 239 ~ 398 | 11 ~ 18 | 159 ~ 318 | 7 ~ 14 |
| **17** | 337 ~ 655 | 15 ~ 29 | 281 ~ 468 | 13 ~ 21 | 225 ~ 374 | 10 ~ 17 | 150 ~ 300 | 7 ~ 14 |
| **18** | 318 ~ 619 | 14 ~ 28 | 265 ~ 442 | 12 ~ 20 | 212 ~ 354 | 10 ~ 16 | 141 ~ 283 | 6 ~ 13 |
| **19** | 302 ~ 586 | 14 ~ 26 | 251 ~ 419 | 11 ~ 19 | 201 ~ 335 | 9 ~ 15 | 134 ~ 268 | 6 ~ 12 |
| **20** | 286 ~ 557 | 13 ~ 25 | 239 ~ 398 | 11 ~ 18 | 191 ~ 318 | 9 ~ 14 | 127 ~ 255 | 6 ~ 11 |
| **21** | 273 ~ 531 | 12 ~ 24 | 227 ~ 379 | 10 ~ 17 | 182 ~ 303 | 8 ~ 14 | 121 ~ 243 | 5 ~ 11 |
| **22** | 260 ~ 506 | 12 ~ 23 | 217 ~ 362 | 10 ~ 16 | 174 ~ 289 | 8 ~ 13 | 116 ~ 231 | 5 ~ 10 |
| **23** | 249 ~ 484 | 11 ~ 22 | 208 ~ 346 | 9 ~ 16 | 166 ~ 277 | 7 ~ 12 | 111 ~ 221 | 5 ~ 10 |
| **24** | 239 ~ 464 | 11 ~ 21 | 199 ~ 332 | 9 ~ 15 | 159 ~ 265 | 7 ~ 12 | 106 ~ 212 | 5 ~ 10 |
| **25** | 229 ~ 446 | 10 ~ 20 | 191 ~ 318 | 9 ~ 14 | 153 ~ 255 | 7 ~ 11 | 102 ~ 204 | 5 ~ 9 |
| **26** | 220 ~ 428 | 10 ~ 19 | 184 ~ 306 | 8 ~ 14 | 147 ~ 245 | 7 ~ 11 | 98 ~ 196 | 4 ~ 9 |
| **27** | 212 ~ 413 | 10 ~ 19 | 177 ~ 295 | 8 ~ 13 | 141 ~ 236 | 6 ~ 11 | 94 ~ 189 | 4 ~ 9 |
| **28** | 205 ~ 398 | 9 ~ 18 | 171 ~ 284 | 8 ~ 13 | 136 ~ 227 | 6 ~ 10 | 91 ~ 182 | 4 ~ 8 |
| **29** | 198 ~ 384 | 9 ~ 17 | 165 ~ 274 | 7 ~ 12 | 132 ~ 220 | 6 ~ 10 | 88 ~ 176 | 4 ~ 8 |
| **30** | 191 ~ 371 | 9 ~ 17 | 159 ~ 265 | 7 ~ 12 | 127 ~ 212 | 6 ~ 10 | 85 ~ 170 | 4 ~ 8 |
| **31** | 185 ~ 359 | 8 ~ 16 | 154 ~ 257 | 7 ~ 12 | 123 ~ 205 | 6 ~ 9 | 82 ~ 164 | 4 ~ 7 |
| **32** | 179 ~ 348 | 8 ~ 16 | 149 ~ 249 | 7 ~ 11 | 119 ~ 199 | 5 ~ 9 | 80 ~ 159 | 4 ~ 7 |
| **33** | 174 ~ 338 | 8 ~ 15 | 145 ~ 241 | 7 ~ 11 | 116 ~ 193 | 5 ~ 9 | 77 ~ 154 | 3 ~ 7 |
| **34** | 169 ~ 328 | 8 ~ 15 | 140 ~ 234 | 6 ~ 11 | 112 ~ 187 | 5 ~ 8 | 75 ~ 150 | 3 ~ 7 |
| **35** | 164 ~ 318 | 7 ~ 14 | 136 ~ 227 | 6 ~ 10 | 109 ~ 182 | 5 ~ 8 | 73 ~ 146 | 3 ~ 7 |
| **36** | 159 ~ 309 | 7 ~ 14 | 133 ~ 221 | 6 ~ 10 | 106 ~ 177 | 5 ~ 8 | 71 ~ 141 | 3 ~ 6 |
| **37** | 155 ~ 301 | 7 ~ 14 | 129 ~ 215 | 6 ~ 10 | 103 ~ 172 | 5 ~ 8 | 69 ~ 138 | 3 ~ 6 |
| **38** | 151 ~ 293 | 7 ~ 13 | 126 ~ 209 | 6 ~ 9 | 101 ~ 168 | 5 ~ 8 | 67 ~ 134 | 3 ~ 6 |
| **39** | 147 ~ 286 | 7 ~ 13 | 122 ~ 204 | 5 ~ 9 | 98 ~ 163 | 4 ~ 7 | 65 ~ 131 | 3 ~ 6 |
| **40** | 143 ~ 279 | 6 ~ 13 | 119 ~ 199 | 5 ~ 9 | 95 ~ 159 | 4 ~ 7 | 64 ~ 127 | 3 ~ 6 |

## ●CSSC　超硬シート面カッター（PF規格／UNF規格）

| 呼び寸法 Size | 非鉄金属 Al. Cu<br>切削速度 Cutting Speed 20~50m/min | | 炭素鋼 FC. FCD. S50C<br>切削速度 Cutting Speed 25~35m/min | | 合金鋼 SCM. SKD. SUS304<br>切削速度 Cutting Speed 18~28m/min | | 調質鋼 HPM. NAK<br>切削速度 Cutting Speed 20~35m/min | |
|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| **PF1/8** | 513 ~ 1,284 | 54 ~ 135 | 513 ~ 898 | 46 ~ 81 | 462 ~ 719 | 35 ~ 54 | 513 ~ 898 | 23 ~ 40 |
| **PF1/4** | 384 ~ 959 | 40 ~ 101 | 384 ~ 671 | 35 ~ 60 | 345 ~ 537 | 26 ~ 40 | 384 ~ 671 | 17 ~ 30 |
| **PF3/8** | 318 ~ 796 | 45 ~ 111 | 318 ~ 557 | 38 ~ 67 | 286 ~ 446 | 29 ~ 45 | 318 ~ 557 | 19 ~ 33 |
| **PF1/2** | 260 ~ 650 | 36 ~ 91 | 260 ~ 455 | 31 ~ 55 | 234 ~ 364 | 23 ~ 36 | 260 ~ 455 | 16 ~ 27 |
| **PF3/4** | 199 ~ 497 | 28 ~ 70 | 199 ~ 348 | 24 ~ 42 | 179 ~ 279 | 18 ~ 28 | 199 ~ 348 | 12 ~ 21 |
| **PF1"** | 168 ~ 419 | 23 ~ 59 | 168 ~ 293 | 20 ~ 35 | 151 ~ 235 | 15 ~ 23 | 168 ~ 293 | 10 ~ 18 |
| **UNF3/ 8-24** | 549 ~ 1,372 | 58 ~ 206 | 549 ~ 686 | 49 ~ 62 | 494 ~ 768 | 37 ~ 58 | 549 ~ 960 | 25 ~ 43 |
| **UNF7/16-20** | 472 ~ 1,179 | 50 ~ 177 | 472 ~ 589 | 42 ~ 53 | 424 ~ 660 | 32 ~ 50 | 472 ~ 825 | 21 ~ 37 |
| **UNF1/ 2-20** | 419 ~ 1,047 | 44 ~ 157 | 419 ~ 524 | 38 ~ 47 | 377 ~ 586 | 28 ~ 44 | 419 ~ 733 | 19 ~ 33 |
| **UNF9/16-18** | 374 ~ 936 | 39 ~ 140 | 374 ~ 468 | 34 ~ 42 | 337 ~ 524 | 25 ~ 39 | 374 ~ 655 | 17 ~ 29 |
| **UNF3/ 4-16** | 285 ~ 714 | 40 ~ 143 | 285 ~ 357 | 34 ~ 43 | 257 ~ 400 | 26 ~ 40 | 285 ~ 500 | 17 ~ 30 |
| **UNF7/ 8-14** | 246 ~ 614 | 34 ~ 123 | 246 ~ 307 | 30 ~ 37 | 221 ~ 344 | 22 ~ 34 | 246 ~ 430 | 15 ~ 26 |

## ●CSSZC　超硬シート面ザグリカッター（PF規格／UNF規格）

| 呼び寸法 Size | 非鉄金属 Al. Cu<br>切削速度 Cutting Speed 25~60m/min | | 炭素鋼 FC. FCD. S50C<br>切削速度 Cutting Speed 25~35m/min | | 合金鋼 SCM. SKD. SUS304<br>切削速度 Cutting Speed 18~30m/min | | 調質鋼 HPM. NAK<br>切削速度 Cutting Speed 20~32m/min | |
|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| **PF1/8** | 686 ~ 1,646 | 21 ~ 99 | 686 ~ 960 | 21 ~ 48 | 494 ~ 823 | 15 ~ 37 | 549 ~ 878 | 16 ~ 22 |
| **PF1/4** | 510 ~ 1,224 | 15 ~ 73 | 510 ~ 714 | 15 ~ 36 | 367 ~ 612 | 11 ~ 28 | 408 ~ 653 | 12 ~ 16 |
| **PF3/8** | 428 ~ 1,027 | 13 ~ 62 | 428 ~ 599 | 13 ~ 30 | 308 ~ 513 | 9 ~ 23 | 342 ~ 548 | 10 ~ 14 |
| **PF1/2** | 352 ~ 845 | 11 ~ 51 | 352 ~ 493 | 11 ~ 25 | 254 ~ 423 | 8 ~ 19 | 282 ~ 451 | 8 ~ 11 |
| **PF3/4** | 267 ~ 641 | 8 ~ 38 | 267 ~ 374 | 8 ~ 19 | 192 ~ 320 | 6 ~ 14 | 214 ~ 342 | 6 ~ 9 |
| **PF1"** | 222 ~ 533 | 7 ~ 32 | 222 ~ 311 | 7 ~ 16 | 160 ~ 267 | 5 ~ 12 | 178 ~ 285 | 5 ~ 7 |
| **UNF3/ 8-24** | 740 ~ 1,777 | 22 ~ 107 | 740 ~ 1,036 | 22 ~ 52 | 533 ~ 888 | 16 ~ 40 | 592 ~ 948 | 18 ~ 24 |
| **UNF7/16-20** | 639 ~ 1,534 | 19 ~ 92 | 639 ~ 895 | 19 ~ 45 | 460 ~ 767 | 14 ~ 35 | 511 ~ 818 | 15 ~ 20 |
| **UNF1/ 2-20** | 566 ~ 1,359 | 17 ~ 82 | 566 ~ 793 | 17 ~ 40 | 408 ~ 680 | 12 ~ 31 | 453 ~ 725 | 14 ~ 18 |
| **UNF9/16-18** | 507 ~ 1,216 | 15 ~ 73 | 507 ~ 710 | 15 ~ 36 | 365 ~ 608 | 11 ~ 27 | 405 ~ 649 | 12 ~ 16 |
| **UNF3/ 4-16** | 385 ~ 925 | 12 ~ 56 | 385 ~ 540 | 12 ~ 27 | 277 ~ 462 | 8 ~ 21 | 308 ~ 493 | 9 ~ 12 |
| **UNF7/ 8-14** | 332 ~ 796 | 10 ~ 48 | 332 ~ 464 | 10 ~ 23 | 239 ~ 398 | 7 ~ 18 | 265 ~ 424 | 8 ~ 11 |

## ●CCB　超硬沈めフライス Sタイプ

| 呼び寸法 Size | 非鉄金属 Al. Cu<br>切削速度 Cutting Speed 18~35m/min | | 炭素鋼 FC. FCD. S50C<br>切削速度 Cutting Speed 15~25m/min | | 合金鋼 SCM. SKD. SUS304<br>切削速度 Cutting Speed 12~20m/min | | 調質鋼 HPM. NAK<br>切削速度 Cutting Speed 8~16m/min | |
|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| **5** | 644 ~ 1,252 | 26 ~ 150 | 536 ~ 894 | 21 ~ 107 | 429 ~ 715 | 17 ~ 86 | 286 ~ 572 | 11 ~ 69 |
| **6** | 551 ~ 1,071 | 22 ~ 129 | 459 ~ 765 | 18 ~ 92 | 367 ~ 612 | 15 ~ 73 | 245 ~ 490 | 10 ~ 59 |
| **8** | 428 ~ 831 | 17 ~ 100 | 356 ~ 594 | 14 ~ 71 | 285 ~ 475 | 11 ~ 57 | 190 ~ 380 | 8 ~ 46 |
| **10** | 341 ~ 663 | 14 ~ 80 | 284 ~ 474 | 11 ~ 57 | 227 ~ 379 | 9 ~ 45 | 152 ~ 303 | 6 ~ 36 |
| **12** | 305 ~ 593 | 12 ~ 71 | 254 ~ 423 | 10 ~ 51 | 203 ~ 339 | 8 ~ 41 | 135 ~ 271 | 5 ~ 33 |
| **14** | 239 ~ 464 | 10 ~ 56 | 199 ~ 332 | 8 ~ 40 | 159 ~ 265 | 6 ~ 32 | 106 ~ 212 | 4 ~ 25 |
| **16** | 220 ~ 428 | 9 ~ 51 | 184 ~ 306 | 7 ~ 37 | 147 ~ 245 | 6 ~ 29 | 98 ~ 196 | 4 ~ 24 |
| **18** | 205 ~ 398 | 8 ~ 48 | 171 ~ 284 | 7 ~ 34 | 136 ~ 227 | 5 ~ 27 | 91 ~ 182 | 4 ~ 22 |
| **20** | 191 ~ 371 | 8 ~ 45 | 159 ~ 265 | 6 ~ 32 | 127 ~ 212 | 5 ~ 25 | 85 ~ 170 | 3 ~ 20 |

## ●CCB　超硬沈めフライス Yタイプ

| 呼び寸法 Size | 非鉄金属 Al. Cu<br>切削速度 Cutting Speed 18~35m/min | | 炭素鋼 FC. FCD. S50C<br>切削速度 Cutting Speed 15~25m/min | | 合金鋼 SCM. SKD. SUS304<br>切削速度 Cutting Speed 12~20m/min | | 調質鋼 HPM. NAK<br>切削速度 Cutting Speed 8~16m/min | |
|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| **5** | 603 ~ 1,173 | 24 ~ 141 | 503 ~ 838 | 20 ~ 101 | 402 ~ 670 | 16 ~ 80 | 268 ~ 536 | 11 ~ 64 |
| **6** | 521 ~ 1,013 | 21 ~ 122 | 434 ~ 723 | 17 ~ 87 | 347 ~ 579 | 14 ~ 69 | 231 ~ 463 | 9 ~ 56 |
| **8** | 409 ~ 796 | 16 ~ 95 | 341 ~ 568 | 14 ~ 68 | 273 ~ 455 | 11 ~ 55 | 182 ~ 364 | 7 ~ 44 |
| **10** | 327 ~ 637 | 13 ~ 76 | 273 ~ 455 | 11 ~ 55 | 218 ~ 364 | 9 ~ 44 | 146 ~ 291 | 6 ~ 35 |
| **12** | 286 ~ 557 | 11 ~ 67 | 239 ~ 398 | 10 ~ 48 | 191 ~ 318 | 8 ~ 38 | 127 ~ 255 | 5 ~ 31 |

## ●CMCRC　超硬ミニコーナーRカッター

| 寸法 R | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| R0.5 | 1,768 ～ 3,537 | 32 ～ 128 | 1,415 ～ 2,358 | 19 ～ 64 | 1,179 ～ 1,886 | 16 ～ 51 | 943 ～ 1,650 | 9 ～ 30 |
| R1 | 1,290 ～ 2,581 | 27 ～ 109 | 1,032 ～ 1,721 | 16 ～ 54 | 860 ～ 1,376 | 14 ～ 44 | 688 ～ 1,204 | 7 ～ 25 |
| R2 | 838 ～ 1,675 | 23 ～ 91 | 670 ～ 1,117 | 14 ～ 45 | 558 ～ 894 | 11 ～ 36 | 447 ～ 782 | 6 ～ 21 |
| R3 | 620 ～ 1,240 | 21 ～ 82 | 496 ～ 827 | 12 ～ 41 | 413 ～ 661 | 10 ～ 33 | 331 ～ 579 | 5 ～ 19 |
| R4 | 434 ～ 868 | 19 ～ 75 | 347 ～ 579 | 11 ～ 37 | 289 ～ 463 | 9 ～ 30 | 231 ～ 405 | 5 ～ 17 |
| R5 | 367 ～ 735 | 18 ～ 72 | 294 ～ 490 | 11 ～ 36 | 245 ～ 392 | 9 ～ 29 | 196 ～ 343 | 5 ～ 17 |
| R6 | 318 ～ 637 | 18 ～ 70 | 255 ～ 424 | 11 ～ 35 | 212 ～ 340 | 9 ～ 28 | 170 ～ 297 | 5 ～ 16 |
| R7 | 281 ～ 562 | 17 ～ 69 | 225 ～ 374 | 10 ～ 34 | 187 ～ 300 | 9 ～ 27 | 150 ～ 262 | 5 ～ 16 |
| R8 | 251 ～ 503 | 17 ～ 67 | 201 ～ 335 | 10 ～ 34 | 168 ～ 268 | 8 ～ 27 | 134 ～ 235 | 4 ～ 16 |

## ●CCRC　超硬コーナーRカッター

| 寸法 R | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| R 0.5 | 597 ～ 1,194 | 30 ～ 122 | 477 ～ 796 | 18 ～ 61 | 398 ～ 637 | 15 ～ 49 | 318 ～ 557 | 8 ～ 28 |
| R 1 | 597 ～ 1,194 | 30 ～ 122 | 477 ～ 796 | 18 ～ 61 | 398 ～ 637 | 15 ～ 49 | 318 ～ 557 | 8 ～ 28 |
| R 2 | 477 ～ 955 | 29 ～ 115 | 382 ～ 637 | 17 ～ 57 | 318 ～ 509 | 14 ～ 46 | 255 ～ 446 | 8 ～ 27 |
| R 3 | 265 ～ 531 | 24 ～ 97 | 212 ～ 354 | 15 ～ 49 | 177 ～ 283 | 12 ～ 39 | 141 ～ 248 | 6 ～ 23 |
| R 4 | 217 ～ 434 | 24 ～ 94 | 174 ～ 289 | 14 ～ 47 | 145 ～ 231 | 12 ～ 38 | 116 ～ 203 | 6 ～ 22 |
| R 5 | 191 ～ 382 | 23 ～ 93 | 153 ～ 255 | 14 ～ 46 | 127 ～ 204 | 12 ～ 37 | 102 ～ 178 | 6 ～ 22 |
| R 6 | 171 ～ 341 | 23 ～ 92 | 136 ～ 227 | 14 ～ 46 | 114 ～ 182 | 11 ～ 37 | 91 ～ 159 | 6 ～ 21 |
| R 7 | 154 ～ 308 | 23 ～ 91 | 123 ～ 205 | 14 ～ 45 | 103 ～ 164 | 11 ～ 36 | 82 ～ 144 | 6 ～ 21 |
| R 8 | 145 ～ 289 | 23 ～ 90 | 116 ～ 193 | 14 ～ 45 | 96 ～ 154 | 11 ～ 36 | 77 ～ 135 | 6 ～ 21 |
| R10 | 114 ～ 227 | 22 ～ 88 | 91 ～ 152 | 13 ～ 44 | 76 ～ 121 | 11 ～ 35 | 61 ～ 106 | 6 ～ 21 |
| R12 | 99 ～ 199 | 22 ～ 88 | 80 ～ 133 | 13 ～ 44 | 66 ～ 106 | 11 ～ 35 | 53 ～ 93 | 6 ～ 20 |
| R14 | 92 ～ 184 | 22 ～ 87 | 73 ～ 122 | 13 ～ 44 | 61 ～ 98 | 11 ～ 35 | 49 ～ 86 | 6 ～ 20 |
| R16 | 85 ～ 171 | 22 ～ 87 | 68 ～ 114 | 13 ～ 43 | 57 ～ 91 | 11 ～ 35 | 45 ～ 80 | 6 ～ 20 |
| R18 | 80 ～ 159 | 22 ～ 86 | 64 ～ 106 | 13 ～ 43 | 53 ～ 85 | 11 ～ 35 | 42 ～ 74 | 6 ～ 20 |
| R20 | 75 ～ 149 | 22 ～ 86 | 60 ～ 99 | 13 ～ 43 | 50 ～ 80 | 11 ～ 34 | 40 ～ 70 | 6 ～ 20 |

## ●OAC4　超硬Oリング用アリ溝カッター

| 呼び型番 Tool No. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 20~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 6~12m/min | | 切削速度 Cutting Speed 4~8m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| A-1 | 2,642 ～ 3,962 | 158 ～ 634 | 1,585 ～ 2,642 | 63 ～ 211 | 792 ～ 1,585 | 32 ～ 127 | 528 ～ 1,057 | 17 ～ 63 |
| A-2 | 1,707 ～ 2,560 | 102 ～ 410 | 1,024 ～ 1,707 | 41 ～ 137 | 512 ～ 1,024 | 20 ～ 82 | 341 ～ 683 | 11 ～ 41 |
| A-3 | 1,271 ～ 1,906 | 76 ～ 305 | 762 ～ 1,271 | 30 ～ 102 | 381 ～ 762 | 15 ～ 61 | 254 ～ 508 | 8 ～ 30 |
| A-4 | 807 ～ 1,210 | 48 ～ 194 | 484 ～ 807 | 19 ～ 65 | 242 ～ 484 | 10 ～ 39 | 161 ～ 323 | 5 ～ 19 |
| A-5 | 623 ～ 934 | 37 ～ 149 | 374 ～ 623 | 15 ～ 50 | 187 ～ 374 | 7 ～ 30 | 125 ～ 249 | 4 ～ 15 |
| A-6 | 1,307 ～ 1,961 | 78 ～ 314 | 784 ～ 1,307 | 31 ～ 105 | 392 ～ 784 | 16 ～ 63 | 261 ～ 523 | 8 ～ 31 |
| A-7 | 830 ～ 1,245 | 50 ～ 199 | 498 ～ 830 | 20 ～ 66 | 249 ～ 498 | 10 ～ 40 | 166 ～ 332 | 5 ～ 20 |
| A-8 | 643 ～ 965 | 39 ～ 154 | 386 ～ 643 | 15 ～ 51 | 193 ～ 386 | 8 ～ 31 | 129 ～ 257 | 4 ～ 15 |
| P-1 | 2,468 ～ 3,701 | 148 ～ 592 | 1,481 ～ 2,468 | 59 ～ 197 | 740 ～ 1,481 | 30 ～ 118 | 494 ～ 987 | 16 ～ 59 |
| P-2 | 1,878 ～ 2,817 | 113 ～ 451 | 1,127 ～ 1,878 | 45 ～ 150 | 563 ～ 1,127 | 23 ～ 90 | 376 ～ 751 | 12 ～ 45 |
| P-3 | 1,271 ～ 1,906 | 76 ～ 305 | 762 ～ 1,271 | 30 ～ 102 | 381 ～ 762 | 15 ～ 61 | 254 ～ 508 | 8 ～ 30 |
| P-4 | 749 ～ 1,123 | 45 ～ 180 | 449 ～ 749 | 18 ～ 60 | 225 ～ 449 | 9 ～ 36 | 150 ～ 300 | 5 ～ 18 |
| P-5 | 511 ～ 766 | 31 ～ 123 | 306 ～ 511 | 12 ～ 41 | 153 ～ 306 | 6 ～ 25 | 102 ～ 204 | 3 ～ 12 |
| P-6 | 1,315 ～ 1,973 | 79 ～ 316 | 789 ～ 1,315 | 32 ～ 105 | 395 ～ 789 | 16 ～ 63 | 263 ～ 526 | 8 ～ 32 |
| P-7 | 771 ～ 1,156 | 46 ～ 185 | 462 ～ 771 | 18 ～ 62 | 231 ～ 462 | 9 ～ 37 | 154 ～ 308 | 5 ～ 18 |
| P-8 | 527 ～ 791 | 32 ～ 126 | 316 ～ 527 | 13 ～ 42 | 158 ～ 316 | 6 ～ 25 | 105 ～ 211 | 3 ～ 13 |
| G-1 | 1,477 ～ 2,216 | 89 ～ 354 | 886 ～ 1,477 | 35 ～ 118 | 443 ～ 886 | 18 ～ 71 | 295 ～ 591 | 9 ～ 35 |
| G-2 | 749 ～ 1,123 | 45 ～ 180 | 449 ～ 749 | 18 ～ 60 | 225 ～ 449 | 9 ～ 36 | 150 ～ 300 | 5 ～ 18 |
| V-1 | 1,137 ～ 1,705 | 68 ～ 273 | 682 ～ 1,137 | 27 ～ 91 | 341 ～ 682 | 14 ～ 55 | 227 ～ 455 | 7 ～ 27 |
| V-2 | 728 ～ 1,093 | 44 ～ 175 | 437 ～ 728 | 17 ～ 58 | 219 ～ 437 | 9 ～ 35 | 146 ～ 291 | 5 ～ 17 |
| V-3 | 436 ～ 654 | 26 ～ 105 | 262 ～ 436 | 10 ～ 35 | 131 ～ 262 | 5 ～ 21 | 87 ～ 174 | 3 ～ 10 |

## ●OAC4-R　超硬Oリング用アリ溝カッター

| 呼び型番 Tool No. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 20~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 6~12m/min | | 切削速度 Cutting Speed 4~8m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| A-1 | 3,597 ~ 5,395 | 216 ~ 863 | 2,158 ~ 3,597 | 86 ~ 288 | 1,079 ~ 2,158 | 43 ~ 173 | 719 ~ 1,439 | 23 ~ 86 |
| A-2 | 2,242 ~ 3,362 | 134 ~ 538 | 1,345 ~ 2,242 | 54 ~ 179 | 672 ~ 1,345 | 27 ~ 108 | 448 ~ 897 | 14 ~ 54 |
| A-3 | 1,616 ~ 2,424 | 97 ~ 388 | 969 ~ 1,616 | 39 ~ 129 | 485 ~ 969 | 19 ~ 78 | 323 ~ 646 | 10 ~ 39 |
| A-4 | 1,020 ~ 1,530 | 61 ~ 245 | 612 ~ 1,020 | 24 ~ 82 | 306 ~ 612 | 12 ~ 49 | 204 ~ 408 | 7 ~ 24 |
| A-5 | 768 ~ 1,152 | 46 ~ 184 | 461 ~ 768 | 18 ~ 61 | 230 ~ 461 | 9 ~ 37 | 154 ~ 307 | 5 ~ 18 |
| A-6 | 1,637 ~ 2,455 | 98 ~ 393 | 982 ~ 1,637 | 39 ~ 131 | 491 ~ 982 | 20 ~ 79 | 327 ~ 655 | 10 ~ 39 |
| A-7 | 1,024 ~ 1,535 | 61 ~ 246 | 614 ~ 1,024 | 25 ~ 82 | 307 ~ 614 | 12 ~ 49 | 205 ~ 409 | 7 ~ 25 |
| A-8 | 781 ~ 1,172 | 47 ~ 187 | 469 ~ 781 | 19 ~ 62 | 234 ~ 469 | 9 ~ 37 | 156 ~ 312 | 5 ~ 19 |
| P-1 | 3,333 ~ 5,000 | 200 ~ 800 | 2,000 ~ 3,333 | 80 ~ 267 | 1,000 ~ 2,000 | 40 ~ 160 | 667 ~ 1,333 | 21 ~ 80 |
| P-2 | 2,477 ~ 3,716 | 149 ~ 595 | 1,486 ~ 2,477 | 59 ~ 198 | 743 ~ 1,486 | 30 ~ 119 | 495 ~ 991 | 16 ~ 59 |
| P-3 | 1,616 ~ 2,424 | 97 ~ 388 | 969 ~ 1,616 | 39 ~ 129 | 485 ~ 969 | 19 ~ 78 | 323 ~ 646 | 10 ~ 39 |
| P-4 | 943 ~ 1,415 | 57 ~ 226 | 566 ~ 943 | 23 ~ 75 | 283 ~ 566 | 11 ~ 45 | 189 ~ 377 | 6 ~ 23 |
| P-5 | 631 ~ 946 | 38 ~ 151 | 379 ~ 631 | 15 ~ 50 | 189 ~ 379 | 8 ~ 30 | 126 ~ 252 | 4 ~ 15 |
| P-6 | 1,645 ~ 2,468 | 99 ~ 395 | 987 ~ 1,645 | 39 ~ 132 | 494 ~ 987 | 20 ~ 79 | 329 ~ 658 | 11 ~ 39 |
| P-7 | 952 ~ 1,427 | 57 ~ 228 | 571 ~ 952 | 23 ~ 76 | 285 ~ 571 | 11 ~ 46 | 190 ~ 381 | 6 ~ 23 |
| P-8 | 639 ~ 958 | 38 ~ 153 | 383 ~ 639 | 15 ~ 51 | 192 ~ 383 | 8 ~ 31 | 128 ~ 255 | 4 ~ 15 |
| G-1 | 1,889 ~ 2,834 | 113 ~ 453 | 1,133 ~ 1,889 | 45 ~ 151 | 567 ~ 1,133 | 23 ~ 91 | 378 ~ 756 | 12 ~ 45 |
| G-2 | 943 ~ 1,415 | 57 ~ 226 | 566 ~ 943 | 23 ~ 75 | 283 ~ 566 | 11 ~ 45 | 189 ~ 377 | 6 ~ 23 |
| V-1 | 1,418 ~ 2,127 | 85 ~ 340 | 851 ~ 1,418 | 34 ~ 113 | 425 ~ 851 | 17 ~ 68 | 284 ~ 567 | 9 ~ 34 |
| V-2 | 898 ~ 1,347 | 54 ~ 215 | 539 ~ 898 | 22 ~ 72 | 269 ~ 539 | 11 ~ 43 | 180 ~ 359 | 6 ~ 22 |
| V-3 | 530 ~ 795 | 32 ~ 127 | 318 ~ 530 | 13 ~ 42 | 159 ~ 318 | 6 ~ 25 | 106 ~ 212 | 3 ~ 13 |

## ●OAC2　超硬Oリング用アリ溝カッター
## ●OACR2　超硬R面取付Oリング用アリ溝カッター

| 呼び型番 Tool No. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 20~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 6~12m/min | | 切削速度 Cutting Speed 4~8m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| A-1 | 2,642 ~ 3,962 | 103 ~ 412 | 1,585 ~ 2,642 | 41 ~ 137 | 792 ~ 1,585 | 21 ~ 82 | 528 ~ 1,057 | 11 ~ 41 |
| A-2 | 1,707 ~ 2,560 | 67 ~ 266 | 1,024 ~ 1,707 | 27 ~ 89 | 512 ~ 1,024 | 13 ~ 53 | 341 ~ 683 | 7 ~ 27 |
| A-3 | 1,271 ~ 1,906 | 50 ~ 198 | 762 ~ 1,271 | 20 ~ 66 | 381 ~ 762 | 10 ~ 40 | 254 ~ 508 | 5 ~ 20 |
| A-4 | 807 ~ 1,210 | 31 ~ 126 | 484 ~ 807 | 13 ~ 42 | 242 ~ 484 | 6 ~ 25 | 161 ~ 323 | 3 ~ 13 |
| A-5 | 623 ~ 934 | 24 ~ 97 | 374 ~ 623 | 10 ~ 32 | 187 ~ 374 | 5 ~ 19 | 125 ~ 249 | 3 ~ 10 |
| A-6 | 1,307 ~ 1,961 | 51 ~ 204 | 784 ~ 1,307 | 20 ~ 68 | 392 ~ 784 | 10 ~ 41 | 261 ~ 523 | 5 ~ 20 |
| A-7 | 830 ~ 1,245 | 32 ~ 129 | 498 ~ 830 | 13 ~ 43 | 249 ~ 498 | 6 ~ 26 | 166 ~ 332 | 3 ~ 13 |
| A-8 | 643 ~ 965 | 25 ~ 100 | 386 ~ 643 | 10 ~ 33 | 193 ~ 386 | 5 ~ 20 | 129 ~ 257 | 3 ~ 10 |
| P-1 | 2,468 ~ 3,701 | 96 ~ 385 | 1,481 ~ 2,468 | 38 ~ 128 | 740 ~ 1,481 | 19 ~ 77 | 494 ~ 987 | 10 ~ 38 |
| P-2 | 1,878 ~ 2,817 | 73 ~ 293 | 1,127 ~ 1,878 | 29 ~ 98 | 563 ~ 1,127 | 15 ~ 59 | 376 ~ 751 | 8 ~ 29 |
| P-3 | 1,271 ~ 1,906 | 50 ~ 198 | 762 ~ 1,271 | 20 ~ 66 | 381 ~ 762 | 10 ~ 40 | 254 ~ 508 | 5 ~ 20 |
| P-4 | 749 ~ 1,123 | 29 ~ 117 | 449 ~ 749 | 12 ~ 39 | 225 ~ 449 | 6 ~ 23 | 150 ~ 300 | 3 ~ 12 |
| P-5 | 511 ~ 766 | 20 ~ 80 | 306 ~ 511 | 8 ~ 27 | 153 ~ 306 | 4 ~ 16 | 102 ~ 204 | 2 ~ 8 |
| P-6 | 1,315 ~ 1,973 | 51 ~ 205 | 789 ~ 1,315 | 21 ~ 68 | 395 ~ 789 | 10 ~ 41 | 263 ~ 526 | 5 ~ 21 |
| P-7 | 771 ~ 1,156 | 30 ~ 120 | 462 ~ 771 | 12 ~ 40 | 231 ~ 462 | 6 ~ 24 | 154 ~ 308 | 3 ~ 12 |
| P-8 | 527 ~ 791 | 21 ~ 82 | 316 ~ 527 | 8 ~ 27 | 158 ~ 316 | 4 ~ 16 | 105 ~ 211 | 2 ~ 8 |
| G-1 | 1,477 ~ 2,216 | 58 ~ 230 | 886 ~ 1,477 | 23 ~ 77 | 443 ~ 886 | 12 ~ 46 | 295 ~ 591 | 6 ~ 23 |
| G-2 | 749 ~ 1,123 | 29 ~ 117 | 449 ~ 749 | 12 ~ 39 | 225 ~ 449 | 6 ~ 23 | 150 ~ 300 | 3 ~ 12 |
| V-1 | 1,137 ~ 1,705 | 44 ~ 177 | 682 ~ 1,137 | 18 ~ 59 | 341 ~ 682 | 9 ~ 35 | 227 ~ 455 | 5 ~ 18 |
| V-2 | 728 ~ 1,093 | 28 ~ 114 | 437 ~ 728 | 11 ~ 38 | 219 ~ 437 | 6 ~ 23 | 146 ~ 291 | 3 ~ 11 |
| V-3 | 436 ~ 654 | 17 ~ 68 | 262 ~ 436 | 7 ~ 23 | 131 ~ 262 | 3 ~ 14 | 87 ~ 174 | 2 ~ 7 |

## ●CUKC　超硬裏ザグリカッター　K10タイプ・P20タイプ

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～38HRC HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~15m/min | | 切削速度 Cutting Speed 8~12m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| M 8 | 341 ～ 682 | 34 ～ 136 | 273 ～ 455 | 14 ～ 45 | 227 ～ 341 | 11 ～ 34 | 182 ～ 273 | 5 ～ 22 |
| M10 | 273 ～ 546 | 27 ～ 109 | 218 ～ 364 | 11 ～ 36 | 182 ～ 273 | 9 ～ 27 | 146 ～ 218 | 4 ～ 17 |
| M12 | 239 ～ 477 | 24 ～ 95 | 191 ～ 318 | 10 ～ 32 | 159 ～ 239 | 8 ～ 24 | 127 ～ 191 | 4 ～ 15 |
| M14 | 208 ～ 415 | 21 ～ 83 | 166 ～ 277 | 8 ～ 28 | 138 ～ 208 | 7 ～ 21 | 111 ～ 166 | 3 ～ 13 |
| M16 | 184 ～ 367 | 18 ～ 73 | 147 ～ 245 | 7 ～ 24 | 122 ～ 184 | 6 ～ 18 | 98 ～ 147 | 3 ～ 12 |
| M18 | 165 ～ 329 | 16 ～ 66 | 132 ～ 220 | 7 ～ 22 | 110 ～ 165 | 5 ～ 16 | 88 ～ 132 | 3 ～ 11 |
| M20 | 149 ～ 298 | 15 ～ 60 | 119 ～ 199 | 6 ～ 20 | 99 ～ 149 | 5 ～ 15 | 80 ～ 119 | 2 ～ 10 |

## ●HOAC2-A　Oリング用アリ溝カッター
## ●HOACR2-A　R面取付Oリング用アリ溝カッター

| 呼び型番 Tool No. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~25m/min | | 切削速度 Cutting Speed 10~15m/min | | 切削速度 Cutting Speed 5~8m/min | | 切削速度 Cutting Speed 3~6m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| A-3 | 953 ～ 1,588 | 37 ～ 165 | 635 ～ 953 | 17 ～ 50 | 318 ～ 508 | 8 ～ 26 | 191 ～ 381 | 4 ～ 15 |
| A-4 | 605 ～ 1,009 | 24 ～ 105 | 403 ～ 605 | 10 ～ 31 | 202 ～ 323 | 5 ～ 17 | 121 ～ 242 | 3 ～ 9 |
| A-5 | 467 ～ 779 | 18 ～ 81 | 311 ～ 467 | 8 ～ 24 | 156 ～ 249 | 4 ～ 13 | 93 ～ 187 | 2 ～ 7 |
| A-6 | 980 ～ 1,634 | 38 ～ 170 | 654 ～ 980 | 17 ～ 51 | 327 ～ 523 | 8 ～ 27 | 196 ～ 392 | 4 ～ 15 |
| A-7 | 623 ～ 1,038 | 24 ～ 108 | 415 ～ 623 | 11 ～ 32 | 208 ～ 332 | 5 ～ 17 | 125 ～ 249 | 3 ～ 10 |
| A-8 | 482 ～ 804 | 19 ～ 84 | 322 ～ 482 | 8 ～ 25 | 161 ～ 257 | 4 ～ 13 | 96 ～ 193 | 2 ～ 8 |
| P-3 | 953 ～ 1,588 | 37 ～ 165 | 635 ～ 953 | 17 ～ 50 | 318 ～ 508 | 8 ～ 26 | 191 ～ 381 | 4 ～ 15 |
| P-4 | 562 ～ 936 | 22 ～ 97 | 374 ～ 562 | 10 ～ 29 | 187 ～ 300 | 5 ～ 16 | 112 ～ 225 | 2 ～ 9 |
| P-5 | 383 ～ 638 | 15 ～ 66 | 255 ～ 383 | 7 ～ 20 | 128 ～ 204 | 3 ～ 11 | 77 ～ 153 | 2 ～ 6 |
| P-6 | 986 ～ 1,644 | 38 ～ 171 | 658 ～ 986 | 17 ～ 51 | 329 ～ 526 | 9 ～ 27 | 197 ～ 395 | 4 ～ 15 |
| P-7 | 578 ～ 963 | 23 ～ 100 | 385 ～ 578 | 10 ～ 30 | 193 ～ 308 | 5 ～ 16 | 116 ～ 231 | 2 ～ 9 |
| P-8 | 395 ～ 659 | 15 ～ 69 | 264 ～ 395 | 7 ～ 21 | 132 ～ 211 | 3 ～ 11 | 79 ～ 158 | 2 ～ 6 |
| G-1 | 1,108 ～ 1,846 | 43 ～ 192 | 739 ～ 1,108 | 19 ～ 58 | 369 ～ 591 | 10 ～ 31 | 222 ～ 443 | 5 ～ 17 |
| G-2 | 562 ～ 936 | 22 ～ 97 | 374 ～ 562 | 10 ～ 29 | 187 ～ 300 | 5 ～ 16 | 112 ～ 225 | 2 ～ 9 |
| V-1 | 853 ～ 1,421 | 33 ～ 148 | 568 ～ 853 | 15 ～ 44 | 284 ～ 455 | 7 ～ 24 | 171 ～ 341 | 4 ～ 13 |
| V-2 | 546 ～ 910 | 21 ～ 95 | 364 ～ 546 | 9 ～ 28 | 182 ～ 291 | 5 ～ 15 | 109 ～ 219 | 2 ～ 9 |
| V-3 | 327 ～ 545 | 13 ～ 57 | 218 ～ 327 | 6 ～ 17 | 109 ～ 174 | 3 ～ 9 | 65 ～ 131 | 1 ～ 5 |

## ●HOAC4-A　Oリング用アリ溝カッター

| 呼び型番 Tool No. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~25m/min | | 切削速度 Cutting Speed 10~15m/min | | 切削速度 Cutting Speed 5~8m/min | | 切削速度 Cutting Speed 3~6m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| A-3 | 953 ～ 1,588 | 57 ～ 254 | 635 ～ 953 | 25 ～ 76 | 318 ～ 508 | 13 ～ 41 | 191 ～ 381 | 6 ～ 23 |
| A-4 | 605 ～ 1,009 | 36 ～ 161 | 403 ～ 605 | 16 ～ 48 | 202 ～ 323 | 8 ～ 26 | 121 ～ 242 | 4 ～ 15 |
| A-5 | 467 ～ 779 | 28 ～ 125 | 311 ～ 467 | 12 ～ 37 | 156 ～ 249 | 6 ～ 20 | 93 ～ 187 | 3 ～ 11 |
| A-6 | 980 ～ 1,634 | 59 ～ 261 | 654 ～ 980 | 26 ～ 78 | 327 ～ 523 | 13 ～ 42 | 196 ～ 392 | 6 ～ 24 |
| A-7 | 623 ～ 1,038 | 37 ～ 166 | 415 ～ 623 | 17 ～ 50 | 208 ～ 332 | 8 ～ 27 | 125 ～ 249 | 4 ～ 15 |
| A-8 | 482 ～ 804 | 29 ～ 129 | 322 ～ 482 | 13 ～ 39 | 161 ～ 257 | 6 ～ 21 | 96 ～ 193 | 3 ～ 12 |
| P-3 | 953 ～ 1,588 | 57 ～ 254 | 635 ～ 953 | 25 ～ 76 | 318 ～ 508 | 13 ～ 41 | 191 ～ 381 | 6 ～ 23 |
| P-4 | 562 ～ 936 | 34 ～ 150 | 374 ～ 562 | 15 ～ 45 | 187 ～ 300 | 7 ～ 24 | 112 ～ 225 | 4 ～ 13 |
| P-5 | 383 ～ 638 | 23 ～ 102 | 255 ～ 383 | 10 ～ 31 | 128 ～ 204 | 5 ～ 16 | 77 ～ 153 | 2 ～ 9 |
| P-6 | 986 ～ 1,644 | 59 ～ 263 | 658 ～ 986 | 26 ～ 79 | 329 ～ 526 | 13 ～ 42 | 197 ～ 395 | 6 ～ 24 |
| P-7 | 578 ～ 963 | 35 ～ 154 | 385 ～ 578 | 15 ～ 46 | 193 ～ 308 | 8 ～ 25 | 116 ～ 231 | 4 ～ 14 |
| P-8 | 395 ～ 659 | 24 ～ 105 | 264 ～ 395 | 11 ～ 32 | 132 ～ 211 | 5 ～ 17 | 79 ～ 158 | 3 ～ 9 |
| G-1 | 1,108 ～ 1,846 | 66 ～ 295 | 739 ～ 1,108 | 30 ～ 89 | 369 ～ 591 | 15 ～ 47 | 222 ～ 443 | 7 ～ 27 |
| G-2 | 562 ～ 936 | 34 ～ 150 | 374 ～ 562 | 15 ～ 45 | 187 ～ 300 | 7 ～ 24 | 112 ～ 225 | 4 ～ 13 |
| V-1 | 853 ～ 1,421 | 51 ～ 227 | 568 ～ 853 | 23 ～ 68 | 284 ～ 455 | 11 ～ 36 | 171 ～ 341 | 5 ～ 20 |
| V-2 | 546 ～ 910 | 33 ～ 146 | 364 ～ 546 | 15 ～ 44 | 182 ～ 291 | 7 ～ 23 | 109 ～ 219 | 3 ～ 13 |
| V-3 | 327 ～ 545 | 20 ～ 87 | 218 ～ 327 | 9 ～ 26 | 109 ～ 174 | 4 ～ 14 | 65 ～ 131 | 2 ～ 8 |

## ●UKC　裏ザグリカッター

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～ 38HRC HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 10~20m/min | | 切削速度 Cutting Speed 8~15m/min | | 切削速度 Cutting Speed 7~12m/min | | 切削速度 Cutting Speed 6~10m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| M 8 | 227 ～ 455 | 23 ～ 91 | 182 ～ 341 | 9 ～ 34 | 159 ～ 273 | 8 ～ 27 | 136 ～ 227 | 4 ～ 18 |
| M10 | 182 ～ 364 | 18 ～ 73 | 146 ～ 273 | 7 ～ 27 | 127 ～ 218 | 6 ～ 22 | 109 ～ 182 | 3 ～ 15 |
| M12 | 159 ～ 318 | 16 ～ 64 | 127 ～ 239 | 6 ～ 24 | 111 ～ 191 | 6 ～ 19 | 95 ～ 159 | 3 ～ 13 |
| M14 | 138 ～ 277 | 14 ～ 55 | 111 ～ 208 | 6 ～ 21 | 97 ～ 166 | 5 ～ 17 | 83 ～ 138 | 2 ～ 11 |
| M16 | 122 ～ 245 | 12 ～ 49 | 98 ～ 184 | 5 ～ 18 | 86 ～ 147 | 4 ～ 15 | 73 ～ 122 | 2 ～ 10 |
| M18 | 110 ～ 220 | 11 ～ 44 | 88 ～ 165 | 4 ～ 16 | 77 ～ 132 | 4 ～ 13 | 66 ～ 110 | 2 ～ 9 |
| M20 | 99 ～ 199 | 10 ～ 40 | 80 ～ 149 | 4 ～ 15 | 70 ～ 119 | 3 ～ 12 | 60 ～ 99 | 2 ～ 8 |

## ●UKCC　裏ザグリカッター TiNコーティング

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～ 38HRC HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 12~25m/min | | 切削速度 Cutting Speed 10~18m/min | | 切削速度 Cutting Speed 8~14m/min | | 切削速度 Cutting Speed 7~10m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| M 8 | 273 ～ 568 | 27 ～ 114 | 227 ～ 409 | 11 ～ 41 | 182 ～ 318 | 9 ～ 32 | 159 ～ 227 | 5 ～ 18 |
| M10 | 218 ～ 455 | 22 ～ 91 | 182 ～ 327 | 9 ～ 33 | 146 ～ 255 | 7 ～ 25 | 127 ～ 182 | 4 ～ 15 |
| M12 | 191 ～ 398 | 19 ～ 80 | 159 ～ 286 | 8 ～ 29 | 127 ～ 223 | 6 ～ 22 | 111 ～ 159 | 3 ～ 13 |
| M14 | 166 ～ 346 | 17 ～ 69 | 138 ～ 249 | 7 ～ 25 | 111 ～ 194 | 6 ～ 19 | 97 ～ 138 | 3 ～ 11 |
| M16 | 147 ～ 306 | 15 ～ 61 | 122 ～ 220 | 6 ～ 22 | 98 ～ 171 | 5 ～ 17 | 86 ～ 122 | 3 ～ 10 |
| M18 | 132 ～ 274 | 13 ～ 55 | 110 ～ 198 | 5 ～ 20 | 88 ～ 154 | 4 ～ 15 | 77 ～ 110 | 2 ～ 9 |
| M20 | 119 ～ 249 | 12 ～ 50 | 99 ～ 179 | 5 ～ 18 | 80 ～ 139 | 4 ～ 14 | 70 ～ 99 | 2 ～ 8 |

## ●BZC/BDC/BMC　裏ザグリカッター

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | |
|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 14~25m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~12m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 8 | 557 ～ 796 | 33 ～ 60 | 398 ～ 637 | 12 ～ 19 | 318 ～ 477 | 7 ～ 10 |
| 9 | 495 ～ 707 | 30 ～ 54 | 354 ～ 566 | 11 ～ 17 | 283 ～ 424 | 6 ～ 9 |
| 9.5 | 469 ～ 670 | 30 ～ 53 | 335 ～ 536 | 11 ～ 17 | 268 ～ 402 | 6 ～ 9 |
| 10 | 446 ～ 637 | 29 ～ 51 | 318 ～ 509 | 10 ～ 17 | 255 ～ 382 | 6 ～ 9 |
| 11 | 405 ～ 579 | 27 ～ 48 | 289 ～ 463 | 10 ～ 16 | 231 ～ 347 | 6 ～ 9 |
| 12 | 371 ～ 531 | 25 ～ 45 | 265 ～ 424 | 9 ～ 15 | 212 ～ 318 | 5 ～ 8 |
| 13 | 343 ～ 490 | 24 ～ 42 | 245 ～ 392 | 9 ～ 14 | 196 ～ 294 | 5 ～ 8 |
| 14 | 318 ～ 455 | 22 ～ 40 | 227 ～ 364 | 8 ～ 13 | 182 ～ 273 | 5 ～ 7 |
| 15 | 297 ～ 424 | 21 ～ 38 | 212 ～ 340 | 8 ～ 13 | 170 ～ 255 | 5 ～ 7 |
| 16 | 279 ～ 398 | 20 ～ 37 | 199 ～ 318 | 8 ～ 12 | 159 ～ 239 | 5 ～ 7 |
| 17 | 262 ～ 374 | 20 ～ 35 | 187 ～ 300 | 7 ～ 12 | 150 ～ 225 | 4 ～ 7 |
| 17.5 | 255 ～ 364 | 19 ～ 35 | 182 ～ 291 | 7 ～ 12 | 146 ～ 218 | 4 ～ 7 |
| 18 | 248 ～ 354 | 19 ～ 34 | 177 ～ 283 | 7 ～ 12 | 141 ～ 212 | 4 ～ 7 |
| 19 | 235 ～ 335 | 19 ～ 33 | 168 ～ 268 | 7 ～ 11 | 134 ～ 201 | 4 ～ 7 |
| 20 | 223 ～ 318 | 18 ～ 32 | 159 ～ 255 | 7 ～ 11 | 127 ～ 191 | 4 ～ 6 |
| 21 | 212 ～ 303 | 18 ～ 31 | 152 ～ 243 | 7 ～ 11 | 121 ～ 182 | 4 ～ 6 |
| 22 | 203 ～ 289 | 17 ～ 30 | 145 ～ 231 | 6 ～ 10 | 116 ～ 174 | 4 ～ 6 |
| 23 | 194 ～ 277 | 17 ～ 30 | 138 ～ 221 | 6 ～ 10 | 111 ～ 166 | 4 ～ 6 |
| 24 | 186 ～ 265 | 16 ～ 29 | 133 ～ 212 | 6 ～ 10 | 106 ～ 159 | 4 ～ 6 |
| 25 | 178 ～ 255 | 16 ～ 28 | 127 ～ 204 | 6 ～ 10 | 102 ～ 153 | 4 ～ 6 |
| 26 | 171 ～ 245 | 15 ～ 28 | 122 ～ 196 | 6 ～ 9 | 98 ～ 147 | 4 ～ 6 |
| 27 | 165 ～ 236 | 15 ～ 27 | 118 ～ 189 | 6 ～ 9 | 94 ～ 141 | 4 ～ 6 |
| 28 | 159 ～ 227 | 15 ～ 26 | 114 ～ 182 | 6 ～ 9 | 91 ～ 136 | 4 ～ 6 |
| 29 | 154 ～ 220 | 15 ～ 26 | 110 ～ 176 | 6 ～ 9 | 88 ～ 132 | 4 ～ 5 |
| 30 | 149 ～ 212 | 14 ～ 25 | 106 ～ 170 | 5 ～ 9 | 85 ～ 127 | 4 ～ 5 |
| 31 | 144 ～ 205 | 14 ～ 25 | 103 ～ 164 | 5 ～ 9 | 82 ～ 123 | 4 ～ 5 |
| 32 | 139 ～ 199 | 14 ～ 25 | 99 ～ 159 | 5 ～ 8 | 80 ～ 119 | 4 ～ 5 |
| 33 | 135 ～ 193 | 14 ～ 24 | 96 ～ 154 | 5 ～ 8 | 77 ～ 116 | 3 ～ 5 |
| 34 | 131 ～ 187 | 13 ～ 24 | 94 ～ 150 | 5 ～ 8 | 75 ～ 112 | 3 ～ 5 |
| 35 | 127 ～ 182 | 13 ～ 24 | 91 ～ 146 | 5 ～ 8 | 73 ～ 109 | 3 ～ 5 |

## ●KCNC-C　自動旋盤用カッター TiCNコーティング

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～38HRC HPM. NAK | | 加工深さ milling depth. |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 17~29m/min | | 切削速度 Cutting Speed 12~21m/min | | 切削速度 Cutting Speed 10~17m/min | | 切削速度 Cutting Speed 7~14m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| **15** | 361 ～ 616 | 43 ～ 74 | 255 ～ 446 | 31 ～ 54 | 212 ～ 361 | 25 ～ 43 | 149 ～ 297 | 18 ～ 36 | 1.5 |
| **20** | 271 ～ 462 | 39 ～ 67 | 191 ～ 334 | 28 ～ 48 | 159 ～ 271 | 23 ～ 39 | 111 ～ 223 | 16 ～ 32 | 2 |
| **30** | 180 ～ 308 | 30 ～ 52 | 127 ～ 223 | 21 ～ 37 | 106 ～ 180 | 18 ～ 30 | 74 ～ 149 | 12 ～ 25 | 3 |

## ●KCNC　自動旋盤用カッター

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～38HRC HPM. NAK | | 加工深さ milling depth. |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~25m/min | | 切削速度 Cutting Speed 10~18m/min | | 切削速度 Cutting Speed 9~15m/min | | 切削速度 Cutting Speed 6~12m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| **15** | 318 ～ 531 | 38 ～ 64 | 212 ～ 382 | 25 ～ 46 | 191 ～ 318 | 23 ～ 38 | 127 ～ 255 | 15 ～ 31 | 1.5 |
| **20** | 239 ～ 398 | 34 ～ 57 | 159 ～ 287 | 23 ～ 41 | 143 ～ 239 | 21 ～ 34 | 96 ～ 191 | 14 ～ 28 | 2 |
| **30** | 159 ～ 265 | 27 ～ 45 | 106 ～ 191 | 18 ～ 32 | 96 ～ 159 | 16 ～ 27 | 64 ～ 127 | 11 ～ 21 | 3 |

## ●KC　キーシードカッター
## ●KCS　側刃付キーシードカッター

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～38HRC HPM. NAK | | 加工深さ milling depth. |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 9~16m/min | | 切削速度 Cutting Speed 7~14m/min | | 切削速度 Cutting Speed 6~12m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| **8** | 477 ～ 796 | 17 ～ 48 | 358 ～ 637 | 9 ～ 31 | 279 ～ 557 | 7 ～ 27 | 239 ～ 477 | 5 ～ 11 | 0.8 |
| **10** | 382 ～ 637 | 18 ～ 51 | 286 ～ 509 | 9 ～ 33 | 223 ～ 446 | 7 ～ 29 | 191 ～ 382 | 5 ～ 12 | 1 |
| **12** | 318 ～ 531 | 24 ～ 66 | 239 ～ 424 | 12 ～ 42 | 186 ～ 371 | 9 ～ 37 | 159 ～ 318 | 6 ～ 16 | 1.2 |
| **14** | 273 ～ 455 | 25 ～ 68 | 205 ～ 364 | 12 ～ 44 | 159 ～ 318 | 10 ～ 38 | 136 ～ 273 | 7 ～ 16 | 1.4 |
| **16** | 239 ～ 398 | 30 ～ 84 | 179 ～ 318 | 15 ～ 53 | 139 ～ 279 | 12 ～ 47 | 119 ～ 239 | 8 ～ 20 | 1.6 |
| **18** | 212 ～ 354 | 31 ～ 85 | 159 ～ 283 | 15 ～ 54 | 124 ～ 248 | 12 ～ 48 | 106 ～ 212 | 8 ～ 20 | 1.8 |
| **20** | 191 ～ 318 | 31 ～ 86 | 143 ～ 255 | 15 ～ 55 | 111 ～ 223 | 12 ～ 48 | 95 ～ 191 | 8 ～ 21 | 2 |
| **25** | 153 ～ 255 | 37 ～ 102 | 115 ～ 204 | 18 ～ 66 | 89 ～ 178 | 14 ～ 57 | 76 ～ 153 | 10 ～ 25 | 2.5 |
| **30** | 127 ～ 212 | 37 ～ 104 | 95 ～ 170 | 19 ～ 67 | 74 ～ 149 | 15 ～ 58 | 64 ～ 127 | 10 ～ 25 | 3 |
| **40** | 95 ～ 159 | 44 ～ 121 | 72 ～ 127 | 22 ～ 77 | 56 ～ 111 | 17 ～ 68 | 48 ～ 95 | 12 ～ 29 | 4 |
| **50** | 76 ～ 127 | 44 ～ 122 | 57 ～ 102 | 22 ～ 78 | 45 ～ 89 | 17 ～ 68 | 38 ～ 76 | 12 ～ 29 | 5 |
| **60** | 64 ～ 106 | 50 ～ 138 | 48 ～ 85 | 25 ～ 89 | 37 ～ 74 | 19 ～ 78 | 32 ～ 64 | 13 ～ 33 | 6 |
| **70** | 55 ～ 91 | 56 ～ 155 | 41 ～ 73 | 28 ～ 99 | 32 ～ 64 | 22 ～ 87 | 27 ～ 55 | 15 ～ 37 | 7 |
| **80** | 48 ～ 80 | 61 ～ 171 | 36 ～ 64 | 31 ～ 109 | 28 ～ 56 | 24 ～ 96 | 24 ～ 48 | 16 ～ 41 | 8 |

## ●KCLS　ロングシャンクキーシードカッター
## ●TKCLS　ロングシャンク千鳥刃キーシードカッター

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～ 38HRC HPM. NAK | | 加工深さ milling depth. |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~25m/min | | 切削速度 Cutting Speed 10~18m/min | | 切削速度 Cutting Speed 9~15m/min | | 切削速度 Cutting Speed 6~12m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| **10** | 477 ～ 796 | 23 ～ 64 | 318 ～ 573 | 10 ～ 37 | 286 ～ 477 | 9 ～ 31 | 191 ～ 382 | 5 ～ 12 | 1 |
| **12** | 398 ～ 663 | 30 ～ 83 | 265 ～ 477 | 13 ～ 48 | 239 ～ 398 | 12 ～ 40 | 159 ～ 318 | 6 ～ 16 | 1.2 |
| **14** | 341 ～ 568 | 31 ～ 85 | 227 ～ 409 | 14 ～ 49 | 205 ～ 341 | 12 ～ 41 | 136 ～ 273 | 7 ～ 16 | 1.4 |
| **16** | 298 ～ 497 | 38 ～ 104 | 199 ～ 358 | 17 ～ 60 | 179 ～ 298 | 15 ～ 50 | 119 ～ 239 | 8 ～ 20 | 1.6 |
| **18** | 265 ～ 442 | 38 ～ 106 | 177 ～ 318 | 17 ～ 61 | 159 ～ 265 | 15 ～ 51 | 106 ～ 212 | 8 ～ 20 | 1.8 |
| **20** | 239 ～ 398 | 39 ～ 107 | 159 ～ 286 | 17 ～ 62 | 143 ～ 239 | 15 ～ 52 | 95 ～ 191 | 8 ～ 21 | 2 |
| **25** | 191 ～ 318 | 46 ～ 128 | 127 ～ 229 | 20 ～ 74 | 115 ～ 191 | 18 ～ 61 | 76 ～ 153 | 10 ～ 25 | 2.5 |
| **30** | 159 ～ 265 | 47 ～ 130 | 106 ～ 191 | 21 ～ 75 | 95 ～ 159 | 19 ～ 62 | 64 ～ 127 | 10 ～ 25 | 3 |
| **40** | 119 ～ 199 | 54 ～ 151 | 80 ～ 143 | 24 ～ 87 | 72 ～ 119 | 22 ～ 73 | 48 ～ 95 | 12 ～ 29 | 4 |
| **50** | 95 ～ 159 | 55 ～ 153 | 64 ～ 115 | 24 ～ 88 | 57 ～ 95 | 22 ～ 73 | 38 ～ 76 | 12 ～ 29 | 5 |

## ●MSS-TiN　柄付メタルソー

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～ 38HRC HPM. NAK | | 加工深さ milling depth. |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 9~16m/min | | 切削速度 Cutting Speed 7~14m/min | | 切削速度 Cutting Speed 6~12m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| **16** | 239 ～ 398 | 34 ～ 95 | 179 ～ 318 | 17 ～ 61 | 139 ～ 279 | 13 ～ 53 | 119 ～ 239 | 9 ～ 23 | 1.6 |
| **18** | 212 ～ 354 | 35 ～ 98 | 159 ～ 283 | 18 ～ 62 | 124 ～ 248 | 14 ～ 55 | 106 ～ 212 | 9 ～ 23 | 1.8 |
| **20** | 191 ～ 318 | 36 ～ 99 | 143 ～ 255 | 18 ～ 63 | 111 ～ 223 | 14 ～ 55 | 95 ～ 191 | 9 ～ 24 | 2 |
| **30** | 127 ～ 212 | 43 ～ 119 | 95 ～ 170 | 21 ～ 76 | 74 ～ 149 | 17 ～ 67 | 64 ～ 127 | 11 ～ 29 | 3 |
| **40** | 95 ～ 159 | 50 ～ 139 | 72 ～ 127 | 25 ～ 89 | 56 ～ 111 | 20 ～ 78 | 48 ～ 95 | 13 ～ 33 | 4 |
| **50** | 76 ～ 127 | 51 ～ 141 | 57 ～ 102 | 25 ～ 90 | 45 ～ 89 | 20 ～ 79 | 38 ～ 76 | 13 ～ 34 | 5 |

## ●ACS　柄付アンギュラカッター

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | |
|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 9~16m/min | | 切削速度 Cutting Speed 5~10m/min | | 切削速度 Cutting Speed 4~8m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 角度 Taper Angle | 30° | | | | | |
| 15 | 191 ～ 340 | 24 ～ 64 | 106 ～ 212 | 7 ～ 27 | 85 ～ 170 | 4 ～ 17 |
| 20 | 143 ～ 255 | 24 ～ 63 | 80 ～ 159 | 7 ～ 26 | 64 ～ 127 | 4 ～ 17 |
| 30 | 95 ～ 170 | 21 ～ 56 | 53 ～ 106 | 6 ～ 23 | 42 ～ 85 | 4 ～ 15 |
| 40 | 72 ～ 127 | 20 ～ 54 | 40 ～ 80 | 6 ～ 22 | 32 ～ 64 | 4 ～ 14 |
| 50 | 57 ～ 102 | 20 ～ 53 | 32 ～ 64 | 6 ～ 22 | 25 ～ 51 | 4 ～ 14 |
| 60 | 48 ～ 85 | 20 ～ 54 | 27 ～ 53 | 6 ～ 22 | 21 ～ 42 | 4 ～ 14 |
| 角度 Taper Angle | 40° ～ 50° | | | | | |
| 15 | 191 ～ 340 | 26 ～ 70 | 106 ～ 212 | 7 ～ 29 | 85 ～ 170 | 5 ～ 19 |
| 20 | 143 ～ 255 | 26 ～ 69 | 80 ～ 159 | 7 ～ 29 | 64 ～ 127 | 5 ～ 18 |
| 30 | 95 ～ 170 | 23 ～ 61 | 53 ～ 106 | 6 ～ 25 | 42 ～ 85 | 4 ～ 16 |
| 40 | 72 ～ 127 | 22 ～ 58 | 40 ～ 80 | 6 ～ 24 | 32 ～ 64 | 4 ～ 16 |
| 50 | 57 ～ 102 | 22 ～ 58 | 32 ～ 64 | 6 ～ 24 | 25 ～ 51 | 4 ～ 15 |
| 60 | 48 ～ 85 | 22 ～ 59 | 27 ～ 53 | 6 ～ 24 | 21 ～ 42 | 4 ～ 16 |
| 70 | 41 ～ 73 | 23 ～ 60 | 23 ～ 45 | 6 ～ 25 | 18 ～ 36 | 4 ～ 16 |
| 80 | 36 ～ 64 | 21 ～ 56 | 20 ～ 40 | 6 ～ 23 | 16 ～ 32 | 4 ～ 15 |
| 90 | 32 ～ 57 | 21 ～ 57 | 18 ～ 35 | 6 ～ 24 | 14 ～ 28 | 4 ～ 15 |
| 100 | 29 ～ 51 | 20 ～ 53 | 16 ～ 32 | 5 ～ 22 | 13 ～ 25 | 4 ～ 14 |
| 刃径 Dia. | 切削速度 Cutting Speed 10~18m/min | | 切削速度 Cutting Speed 6~12m/min | | 切削速度 Cutting Speed 5~10m/min | |
| 角度 Taper Angle | 55° ～ 65° | | | | | |
| 10 | 318 ～ 573 | 38 ～ 102 | 191 ～ 382 | 11 ～ 45 | 159 ～ 318 | 8 ～ 30 |
| 12 | 265 ～ 477 | 34 ～ 91 | 159 ～ 318 | 10 ～ 40 | 133 ～ 265 | 7 ～ 27 |
| 15 | 212 ～ 382 | 28 ～ 77 | 127 ～ 255 | 9 ～ 34 | 106 ～ 212 | 6 ～ 23 |
| 20 | 159 ～ 286 | 28 ～ 76 | 95 ～ 191 | 8 ～ 34 | 80 ～ 159 | 6 ～ 22 |
| 30 | 106 ～ 191 | 25 ～ 67 | 64 ～ 127 | 7 ～ 30 | 53 ～ 106 | 5 ～ 20 |
| 40 | 80 ～ 143 | 24 ～ 64 | 48 ～ 95 | 7 ～ 29 | 40 ～ 80 | 5 ～ 19 |
| 50 | 64 ～ 115 | 24 ～ 64 | 38 ～ 76 | 7 ～ 28 | 32 ～ 64 | 5 ～ 19 |
| 60 | 53 ～ 95 | 24 ～ 65 | 32 ～ 64 | 7 ～ 29 | 27 ～ 53 | 5 ～ 19 |
| 70 | 45 ～ 82 | 25 ～ 66 | 27 ～ 55 | 7 ～ 29 | 23 ～ 45 | 5 ～ 20 |
| 80 | 40 ～ 72 | 23 ～ 62 | 24 ～ 48 | 7 ～ 28 | 20 ～ 40 | 5 ～ 18 |
| 90 | 35 ～ 64 | 23 ～ 63 | 21 ～ 42 | 7 ～ 28 | 18 ～ 35 | 5 ～ 19 |
| 100 | 32 ～ 57 | 21 ～ 58 | 19 ～ 38 | 6 ～ 26 | 16 ～ 32 | 4 ～ 17 |
| 角度 Taper Angle | 70° ～ 80° | | | | | |
| 10 | 318 ～ 573 | 41 ～ 110 | 191 ～ 382 | 12 ～ 49 | 159 ～ 318 | 8 ～ 33 |
| 12 | 265 ～ 477 | 36 ～ 97 | 159 ～ 318 | 11 ～ 43 | 133 ～ 265 | 7 ～ 29 |
| 15 | 212 ～ 382 | 31 ～ 83 | 127 ～ 255 | 9 ～ 37 | 106 ～ 212 | 6 ～ 24 |
| 20 | 159 ～ 286 | 30 ～ 82 | 95 ～ 191 | 9 ～ 36 | 80 ～ 159 | 6 ～ 24 |
| 30 | 106 ～ 191 | 27 ～ 72 | 64 ～ 127 | 8 ～ 32 | 53 ～ 106 | 5 ～ 21 |
| 40 | 80 ～ 143 | 26 ～ 69 | 48 ～ 95 | 8 ～ 31 | 40 ～ 80 | 5 ～ 20 |
| 50 | 64 ～ 115 | 25 ～ 69 | 38 ～ 76 | 8 ～ 31 | 32 ～ 64 | 5 ～ 20 |
| 60 | 53 ～ 95 | 26 ～ 70 | 32 ～ 64 | 8 ～ 31 | 27 ～ 53 | 5 ～ 21 |
| 70 | 45 ～ 82 | 26 ～ 71 | 27 ～ 55 | 8 ～ 32 | 23 ～ 45 | 5 ～ 21 |
| 80 | 40 ～ 72 | 25 ～ 67 | 24 ～ 48 | 7 ～ 30 | 20 ～ 40 | 5 ～ 20 |
| 90 | 35 ～ 64 | 25 ～ 67 | 21 ～ 42 | 7 ～ 30 | 18 ～ 35 | 5 ～ 20 |
| 100 | 32 ～ 57 | 23 ～ 62 | 19 ～ 38 | 7 ～ 28 | 16 ～ 32 | 5 ～ 18 |

## ●ACSW　柄付Wアンギュラカッター

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | |
|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 9~16m/min | | 切削速度 Cutting Speed 5~10m/min | | 切削速度 Cutting Speed 4~8m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 角度 Taper Angle | W60° | | | | | |
| 10 | 286 ~ 509 | 35 ~ 93 | 159 ~ 318 | 9 ~ 39 | 127 ~ 255 | 6 ~ 25 |
| 12 | 239 ~ 424 | 31 ~ 82 | 133 ~ 265 | 8 ~ 34 | 106 ~ 212 | 5 ~ 22 |
| 15 | 191 ~ 340 | 26 ~ 70 | 106 ~ 212 | 7 ~ 29 | 85 ~ 170 | 5 ~ 19 |
| 20 | 143 ~ 255 | 26 ~ 69 | 80 ~ 159 | 7 ~ 29 | 64 ~ 127 | 5 ~ 18 |
| 30 | 95 ~ 170 | 23 ~ 61 | 53 ~ 106 | 6 ~ 25 | 42 ~ 85 | 4 ~ 16 |
| 40 | 72 ~ 127 | 22 ~ 58 | 40 ~ 80 | 6 ~ 24 | 32 ~ 64 | 4 ~ 16 |
| 50 | 57 ~ 102 | 22 ~ 58 | 32 ~ 64 | 6 ~ 24 | 25 ~ 51 | 4 ~ 15 |
| 60 | 48 ~ 85 | 22 ~ 59 | 27 ~ 53 | 6 ~ 24 | 21 ~ 42 | 4 ~ 16 |
| 70 | 41 ~ 73 | 23 ~ 60 | 23 ~ 45 | 6 ~ 25 | 18 ~ 36 | 4 ~ 16 |
| 80 | 36 ~ 64 | 21 ~ 56 | 20 ~ 40 | 6 ~ 23 | 16 ~ 32 | 4 ~ 15 |
| 90 | 32 ~ 57 | 21 ~ 57 | 18 ~ 35 | 6 ~ 24 | 14 ~ 28 | 4 ~ 15 |
| 100 | 29 ~ 51 | 20 ~ 53 | 16 ~ 32 | 5 ~ 22 | 13 ~ 25 | 4 ~ 14 |
| 刃径 Dia. | 切削速度 Cutting Speed 10~18m/min | | 切削速度 Cutting Speed 6~12m/min | | 切削速度 Cutting Speed 5~10m/min | |
| 角度 Taper Angle | W90° | | | | | |
| 10 | 318 ~ 573 | 38 ~ 102 | 191 ~ 382 | 11 ~ 45 | 159 ~ 318 | 8 ~ 30 |
| 12 | 265 ~ 477 | 34 ~ 91 | 159 ~ 318 | 10 ~ 40 | 133 ~ 265 | 7 ~ 27 |
| 15 | 212 ~ 382 | 28 ~ 77 | 127 ~ 255 | 9 ~ 34 | 106 ~ 212 | 6 ~ 23 |
| 20 | 159 ~ 286 | 28 ~ 76 | 95 ~ 191 | 8 ~ 34 | 80 ~ 159 | 6 ~ 22 |
| 30 | 106 ~ 191 | 25 ~ 67 | 64 ~ 127 | 7 ~ 30 | 53 ~ 106 | 5 ~ 20 |
| 40 | 80 ~ 143 | 24 ~ 64 | 48 ~ 95 | 7 ~ 29 | 40 ~ 80 | 5 ~ 19 |
| 50 | 64 ~ 115 | 24 ~ 64 | 38 ~ 76 | 7 ~ 28 | 32 ~ 64 | 5 ~ 19 |
| 60 | 53 ~ 95 | 24 ~ 65 | 32 ~ 64 | 7 ~ 29 | 27 ~ 53 | 5 ~ 19 |
| 70 | 45 ~ 82 | 25 ~ 66 | 27 ~ 55 | 7 ~ 29 | 23 ~ 45 | 5 ~ 20 |
| 80 | 40 ~ 72 | 23 ~ 62 | 24 ~ 48 | 7 ~ 28 | 20 ~ 40 | 5 ~ 18 |
| 90 | 35 ~ 64 | 23 ~ 63 | 21 ~ 42 | 7 ~ 28 | 18 ~ 35 | 5 ~ 19 |
| 100 | 32 ~ 57 | 21 ~ 58 | 19 ~ 38 | 6 ~ 26 | 16 ~ 32 | 4 ~ 17 |
| 角度 Taper Angle | W120° | | | | | |
| 10 | 318 ~ 573 | 41 ~ 110 | 191 ~ 382 | 12 ~ 49 | 159 ~ 318 | 8 ~ 33 |
| 12 | 265 ~ 477 | 36 ~ 97 | 159 ~ 318 | 11 ~ 43 | 133 ~ 265 | 7 ~ 29 |
| 15 | 212 ~ 382 | 31 ~ 83 | 127 ~ 255 | 9 ~ 37 | 106 ~ 212 | 6 ~ 24 |
| 20 | 159 ~ 286 | 30 ~ 82 | 95 ~ 191 | 9 ~ 36 | 80 ~ 159 | 6 ~ 24 |
| 30 | 106 ~ 191 | 27 ~ 72 | 64 ~ 127 | 8 ~ 32 | 53 ~ 106 | 5 ~ 21 |
| 40 | 80 ~ 143 | 26 ~ 69 | 48 ~ 95 | 8 ~ 31 | 40 ~ 80 | 5 ~ 20 |
| 50 | 64 ~ 115 | 25 ~ 69 | 38 ~ 76 | 8 ~ 31 | 32 ~ 64 | 5 ~ 20 |
| 60 | 53 ~ 95 | 26 ~ 70 | 32 ~ 64 | 8 ~ 31 | 27 ~ 53 | 5 ~ 21 |
| 70 | 45 ~ 82 | 26 ~ 71 | 27 ~ 55 | 8 ~ 32 | 23 ~ 45 | 5 ~ 21 |
| 80 | 40 ~ 72 | 25 ~ 67 | 24 ~ 48 | 7 ~ 30 | 20 ~ 40 | 5 ~ 20 |
| 90 | 35 ~ 64 | 25 ~ 67 | 21 ~ 42 | 7 ~ 30 | 18 ~ 35 | 5 ~ 20 |
| 100 | 32 ~ 57 | 23 ~ 62 | 19 ~ 38 | 7 ~ 28 | 16 ~ 32 | 5 ~ 18 |

## ●ACST　強力型柄付アンギュラカッター

| 刃径 Dia. | 非鉄金属 Al. Cu 切削速度 Cutting Speed 9~16m/min | | 炭素鋼 FC. FCD. S50C 切削速度 Cutting Speed 5~10m/min | | 合金鋼 SCM. SKD. SUS304 切削速度 Cutting Speed 4~8m/min | |
|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 角度 Taper Angle | 45° | | | | | |
| 15 | 191 ~ 340 | 39 ~ 105 | 106 ~ 212 | 11 ~ 44 | 85 ~ 170 | 7 ~ 28 |
| 16 | 179 ~ 318 | 37 ~ 100 | 99 ~ 199 | 10 ~ 42 | 80 ~ 159 | 7 ~ 27 |
| 18 | 159 ~ 283 | 34 ~ 91 | 88 ~ 177 | 9 ~ 38 | 71 ~ 141 | 6 ~ 24 |
| 20 | 143 ~ 255 | 31 ~ 83 | 80 ~ 159 | 8 ~ 34 | 64 ~ 127 | 6 ~ 22 |
| 25 | 115 ~ 204 | 39 ~ 105 | 64 ~ 127 | 11 ~ 44 | 51 ~ 102 | 7 ~ 28 |
| 30 | 95 ~ 170 | 34 ~ 91 | 53 ~ 106 | 9 ~ 38 | 42 ~ 85 | 6 ~ 24 |
| 35 | 82 ~ 146 | 31 ~ 82 | 45 ~ 91 | 8 ~ 34 | 36 ~ 73 | 5 ~ 22 |
| 40 | 72 ~ 127 | 28 ~ 75 | 40 ~ 80 | 8 ~ 31 | 32 ~ 64 | 5 ~ 20 |
| 45 | 64 ~ 113 | 26 ~ 70 | 35 ~ 71 | 7 ~ 29 | 28 ~ 57 | 5 ~ 19 |
| 50 | 57 ~ 102 | 24 ~ 65 | 32 ~ 64 | 7 ~ 27 | 25 ~ 51 | 4 ~ 17 |
| 55 | 52 ~ 93 | 31 ~ 82 | 29 ~ 58 | 8 ~ 34 | 23 ~ 46 | 5 ~ 22 |
| 60 | 48 ~ 85 | 29 ~ 78 | 27 ~ 53 | 8 ~ 33 | 21 ~ 42 | 5 ~ 21 |

| 刃径 Dia. | 非鉄金属 Al. Cu 切削速度 Cutting Speed 10~18m/min | | 炭素鋼 FC. FCD. S50C 切削速度 Cutting Speed 6~12m/min | | 合金鋼 SCM. SKD. SUS304 切削速度 Cutting Speed 5~10m/min | | 調質鋼~38HRC HPM. NAK 切削速度 Cutting Speed 4~8m/min | |
|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 角度 Taper Angle | 60° | | | | | | | |
| 12 | 265 ~ 477 | 54 ~ 146 | 159 ~ 318 | 16 ~ 65 | 133 ~ 265 | 11 ~ 43 | 106 ~ 212 | 7 ~ 14 |
| 15 | 212 ~ 382 | 46 ~ 124 | 127 ~ 255 | 14 ~ 55 | 106 ~ 212 | 9 ~ 37 | 85 ~ 170 | 6 ~ 12 |
| 16 | 199 ~ 358 | 44 ~ 118 | 119 ~ 239 | 13 ~ 53 | 99 ~ 199 | 9 ~ 35 | 80 ~ 159 | 6 ~ 12 |
| 18 | 177 ~ 318 | 40 ~ 107 | 106 ~ 212 | 12 ~ 48 | 88 ~ 177 | 8 ~ 32 | 71 ~ 141 | 5 ~ 11 |
| 20 | 159 ~ 286 | 36 ~ 98 | 95 ~ 191 | 11 ~ 44 | 80 ~ 159 | 7 ~ 29 | 64 ~ 127 | 5 ~ 10 |
| 25 | 127 ~ 229 | 46 ~ 124 | 76 ~ 153 | 14 ~ 55 | 64 ~ 127 | 9 ~ 37 | 51 ~ 102 | 6 ~ 12 |
| 30 | 106 ~ 191 | 40 ~ 108 | 64 ~ 127 | 12 ~ 48 | 53 ~ 106 | 8 ~ 32 | 42 ~ 85 | 5 ~ 11 |
| 35 | 91 ~ 164 | 36 ~ 97 | 55 ~ 109 | 11 ~ 43 | 45 ~ 91 | 7 ~ 29 | 36 ~ 73 | 5 ~ 10 |
| 40 | 80 ~ 143 | 33 ~ 89 | 48 ~ 95 | 10 ~ 40 | 40 ~ 80 | 7 ~ 26 | 32 ~ 64 | 4 ~ 9 |
| 45 | 71 ~ 127 | 31 ~ 83 | 42 ~ 85 | 9 ~ 37 | 35 ~ 71 | 6 ~ 24 | 28 ~ 57 | 4 ~ 8 |
| 50 | 64 ~ 115 | 29 ~ 77 | 38 ~ 76 | 9 ~ 34 | 32 ~ 64 | 6 ~ 23 | 25 ~ 51 | 4 ~ 8 |
| 55 | 58 ~ 104 | 36 ~ 98 | 35 ~ 69 | 11 ~ 43 | 29 ~ 58 | 7 ~ 29 | 23 ~ 46 | 5 ~ 10 |
| 60 | 53 ~ 95 | 34 ~ 93 | 32 ~ 64 | 10 ~ 41 | 27 ~ 53 | 7 ~ 28 | 21 ~ 42 | 5 ~ 9 |
| 65 | 49 ~ 88 | 33 ~ 89 | 29 ~ 59 | 10 ~ 39 | 24 ~ 49 | 7 ~ 26 | 20 ~ 39 | 4 ~ 9 |
| 70 | 45 ~ 82 | 32 ~ 85 | 27 ~ 55 | 9 ~ 38 | 23 ~ 45 | 6 ~ 25 | 18 ~ 36 | 4 ~ 8 |
| 75 | 42 ~ 76 | 31 ~ 83 | 25 ~ 51 | 9 ~ 37 | 21 ~ 42 | 6 ~ 24 | 17 ~ 34 | 4 ~ 8 |
| 80 | 40 ~ 72 | 37 ~ 100 | 24 ~ 48 | 11 ~ 44 | 20 ~ 40 | 7 ~ 30 | 16 ~ 32 | 5 ~ 10 |
| 90 | 35 ~ 64 | 34 ~ 92 | 21 ~ 42 | 10 ~ 41 | 18 ~ 35 | 7 ~ 27 | 14 ~ 28 | 5 ~ 9 |
| 100 | 32 ~ 57 | 32 ~ 85 | 19 ~ 38 | 9 ~ 38 | 16 ~ 32 | 6 ~ 25 | 13 ~ 25 | 4 ~ 8 |

## ●PCS　柄付傘型カッター
## ●CF　センターフライス
## ●CFT　センターフライス（テーパーシャンク）

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | |
|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 9~16m/min | | 切削速度 Cutting Speed 5~10m/min | | 切削速度 Cutting Speed 4~8m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 6x 60° | 477 ~ 849 | 45 ~ 119 | 265 ~ 531 | 12 ~ 50 | 212 ~ 424 | 8 ~ 32 |
| 8x 60° | 358 ~ 637 | 34 ~ 91 | 199 ~ 398 | 9 ~ 38 | 159 ~ 318 | 6 ~ 24 |
| 10x 60° | 286 ~ 509 | 28 ~ 74 | 159 ~ 318 | 7 ~ 31 | 127 ~ 255 | 5 ~ 20 |
| 15x 60° | 191 ~ 340 | 19 ~ 52 | 106 ~ 212 | 5 ~ 21 | 85 ~ 170 | 3 ~ 14 |
| 20x 60° | 143 ~ 255 | 20 ~ 54 | 80 ~ 159 | 5 ~ 22 | 64 ~ 127 | 4 ~ 14 |
| 30x 60° | 95 ~ 170 | 18 ~ 48 | 53 ~ 106 | 5 ~ 20 | 42 ~ 85 | 3 ~ 13 |
| 40x 60° | 72 ~ 127 | 18 ~ 47 | 40 ~ 80 | 5 ~ 20 | 32 ~ 64 | 3 ~ 12 |
| 50x 60° | 57 ~ 102 | 15 ~ 40 | 32 ~ 64 | 4 ~ 17 | 25 ~ 51 | 3 ~ 11 |
| 60x 60° | 48 ~ 85 | 16 ~ 41 | 27 ~ 53 | 4 ~ 17 | 21 ~ 42 | 3 ~ 11 |
| 70x 60° | 41 ~ 73 | 14 ~ 38 | 23 ~ 45 | 4 ~ 16 | 18 ~ 36 | 3 ~ 10 |
| 80x 60° | 36 ~ 64 | 13 ~ 35 | 20 ~ 40 | 4 ~ 15 | 16 ~ 32 | 2 ~ 9 |
| 90x 60° | 32 ~ 57 | 12 ~ 33 | 18 ~ 35 | 3 ~ 14 | 14 ~ 28 | 2 ~ 9 |
| 100x 60° | 29 ~ 51 | 12 ~ 31 | 16 ~ 32 | 3 ~ 13 | 13 ~ 25 | 2 ~ 8 |
| 呼び寸法 Size | 切削速度 Cutting Speed 10~18m/min | | 切削速度 Cutting Speed 6~12m/min | | 切削速度 Cutting Speed 5~10m/min | |
| 6x 90° | 531 ~ 955 | 49 ~ 131 | 318 ~ 637 | 15 ~ 58 | 265 ~ 531 | 10 ~ 39 |
| 8x 90° | 398 ~ 716 | 37 ~ 100 | 239 ~ 477 | 11 ~ 44 | 199 ~ 398 | 7 ~ 30 |
| 10x 90° | 318 ~ 573 | 30 ~ 82 | 191 ~ 382 | 9 ~ 36 | 159 ~ 318 | 6 ~ 24 |
| 15x 90° | 212 ~ 382 | 21 ~ 57 | 127 ~ 255 | 6 ~ 25 | 106 ~ 212 | 4 ~ 17 |
| 20x 90° | 159 ~ 286 | 22 ~ 59 | 95 ~ 191 | 7 ~ 26 | 80 ~ 159 | 4 ~ 18 |
| 30x 90° | 106 ~ 191 | 20 ~ 53 | 64 ~ 127 | 6 ~ 24 | 53 ~ 106 | 4 ~ 16 |
| 40x 90° | 80 ~ 143 | 19 ~ 52 | 48 ~ 95 | 6 ~ 23 | 40 ~ 80 | 4 ~ 15 |
| 50x 90° | 64 ~ 115 | 16 ~ 44 | 38 ~ 76 | 5 ~ 20 | 32 ~ 64 | 3 ~ 13 |
| 60x 90° | 53 ~ 95 | 17 ~ 46 | 32 ~ 64 | 5 ~ 20 | 27 ~ 53 | 3 ~ 14 |
| 70x 90° | 45 ~ 82 | 15 ~ 42 | 27 ~ 55 | 5 ~ 18 | 23 ~ 45 | 3 ~ 12 |
| 80x 90° | 40 ~ 72 | 14 ~ 38 | 24 ~ 48 | 4 ~ 17 | 20 ~ 40 | 3 ~ 11 |
| 90x 90° | 35 ~ 64 | 13 ~ 36 | 21 ~ 42 | 4 ~ 16 | 18 ~ 35 | 3 ~ 11 |
| 100x 90° | 32 ~ 57 | 13 ~ 34 | 19 ~ 38 | 4 ~ 15 | 16 ~ 32 | 3 ~ 10 |
| 6x120° | 531 ~ 955 | 52 ~ 141 | 318 ~ 637 | 16 ~ 63 | 265 ~ 531 | 10 ~ 42 |
| 8x120° | 398 ~ 716 | 40 ~ 108 | 239 ~ 477 | 12 ~ 48 | 199 ~ 398 | 8 ~ 32 |
| 10x120° | 318 ~ 573 | 32 ~ 88 | 191 ~ 382 | 10 ~ 39 | 159 ~ 318 | 6 ~ 26 |
| 15x120° | 212 ~ 382 | 23 ~ 61 | 127 ~ 255 | 7 ~ 27 | 106 ~ 212 | 5 ~ 18 |
| 20x120° | 159 ~ 286 | 24 ~ 64 | 95 ~ 191 | 7 ~ 28 | 80 ~ 159 | 5 ~ 19 |
| 30x120° | 106 ~ 191 | 21 ~ 57 | 64 ~ 127 | 6 ~ 25 | 53 ~ 106 | 4 ~ 17 |
| 40x120° | 80 ~ 143 | 21 ~ 55 | 48 ~ 95 | 6 ~ 25 | 40 ~ 80 | 4 ~ 16 |
| 50x120° | 64 ~ 115 | 18 ~ 47 | 38 ~ 76 | 5 ~ 21 | 32 ~ 64 | 4 ~ 14 |
| 60x120° | 53 ~ 95 | 18 ~ 49 | 32 ~ 64 | 5 ~ 22 | 27 ~ 53 | 4 ~ 15 |

## ●RC R面取カッター（スプールブッシュ用）

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～ 38HRC HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~14m/min | | 切削速度 Cutting Speed 6~10m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| R10.5 | 212 ~ 354 | 11 ~ 35 | 177 ~ 283 | 5 ~ 17 | 141 ~ 248 | 4 ~ 14 | 106 ~ 177 | 2 ~ 5 |
| R15.5 | 153 ~ 255 | 8 ~ 25 | 127 ~ 204 | 4 ~ 12 | 102 ~ 178 | 3 ~ 10 | 76 ~ 127 | 2 ~ 4 |
| R20.5 | 109 ~ 182 | 5 ~ 18 | 91 ~ 146 | 3 ~ 9 | 73 ~ 127 | 2 ~ 7 | 55 ~ 91 | 1 ~ 3 |

## ●CC　センター面取カッター

| 呼び寸法 Size | 非鉄金属 Al. Cu 切削速度 Cutting Speed 15~25m/min | | 炭素鋼 FC. FCD. S50C 切削速度 Cutting Speed 12~16m/min | | 合金鋼 SCM. SKD. SUS304 切削速度 Cutting Speed 10~14m/min | | 調質鋼～38HRC HPM. NAK 切削速度 Cutting Speed 8~12m/min | |
|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 4x 30° | 1,194～1,989 | 23～38 | 955～1,273 | 18～24 | 796～1,114 | 15～21 | 637～955 | 12～18 |
| 6x 30° | 796～1,326 | 17～29 | 637～849 | 14～18 | 531～743 | 11～16 | 424～637 | 9～14 |
| 8x 30° | 597～995 | 15～24 | 477～637 | 12～15 | 398～557 | 10～14 | 318～477 | 8～12 |
| 10x 30° | 477～796 | 13～21 | 382～509 | 10～14 | 318～446 | 9～12 | 255～382 | 7～10 |
| 12x 30° | 398～663 | 12～20 | 318～424 | 9～13 | 265～371 | 8～11 | 212～318 | 6～9 |
| 16x 30° | 298～497 | 10～17 | 239～318 | 8～11 | 199～279 | 7～10 | 159～239 | 6～8 |
| 20x 30° | 239～398 | 10～16 | 191～255 | 8～10 | 159～223 | 6～9 | 127～191 | 5～8 |
| 25x 30° | 191～318 | 9～15 | 153～204 | 7～10 | 127～178 | 6～8 | 102～153 | 5～7 |
| 4x 45° | 1,194～1,989 | 23～38 | 955～1,273 | 18～24 | 796～1,114 | 15～21 | 637～955 | 12～18 |
| 6x 45° | 796～1,326 | 17～29 | 637～849 | 14～18 | 531～743 | 11～16 | 424～637 | 9～14 |
| 8x 45° | 597～995 | 15～24 | 477～637 | 12～15 | 398～557 | 10～14 | 318～477 | 8～12 |
| 10x 45° | 477～796 | 13～21 | 382～509 | 10～14 | 318～446 | 9～12 | 255～382 | 7～10 |
| 12x 45° | 398～663 | 12～20 | 318～424 | 9～13 | 265～371 | 8～11 | 212～318 | 6～9 |
| 16x 45° | 298～497 | 10～17 | 239～318 | 8～11 | 199～279 | 7～10 | 159～239 | 6～8 |
| 20x 45° | 239～398 | 10～16 | 191～255 | 8～10 | 159～223 | 6～9 | 127～191 | 5～8 |
| 25x 45° | 191～318 | 9～15 | 153～204 | 7～10 | 127～178 | 6～8 | 102～153 | 5～7 |
| 4x 60° | 1,194～1,989 | 50～83 | 955～1,273 | 40～53 | 796～1,114 | 33～46 | 637～955 | 26～40 |
| 6x 60° | 796～1,326 | 38～63 | 637～849 | 30～40 | 531～743 | 25～35 | 424～637 | 20～30 |
| 8x 60° | 597～995 | 32～53 | 477～637 | 26～34 | 398～557 | 21～30 | 318～477 | 17～26 |
| 10x 60° | 477～796 | 28～47 | 382～509 | 23～30 | 318～446 | 19～26 | 255～382 | 15～23 |
| 12x 60° | 398～663 | 26～43 | 318～424 | 21～28 | 265～371 | 17～24 | 212～318 | 14～21 |
| 16x 60° | 298～497 | 23～38 | 239～318 | 18～25 | 199～279 | 15～22 | 159～239 | 12～18 |
| 20x 60° | 239～398 | 21～35 | 191～255 | 17～23 | 159～223 | 14～20 | 127～191 | 11～17 |
| 25x 60° | 191～318 | 20～33 | 153～204 | 16～21 | 127～178 | 13～19 | 102～153 | 11～16 |
| 30x 60° | 159～265 | 19～32 | 127～170 | 15～20 | 106～149 | 13～18 | 85～127 | 10～15 |
| 35x 60° | 136～227 | 18～30 | 109～146 | 15～19 | 91～127 | 12～17 | 73～109 | 10～15 |
| 4x 80° | 1,194～1,989 | 61～102 | 955～1,273 | 49～65 | 796～1,114 | 41～57 | 637～955 | 32～49 |
| 6x 80° | 796～1,326 | 46～77 | 637～849 | 37～50 | 531～743 | 31～43 | 424～637 | 25～37 |
| 8x 80° | 597～995 | 39～65 | 477～637 | 31～42 | 398～557 | 26～37 | 318～477 | 21～31 |
| 10x 80° | 477～796 | 35～58 | 382～509 | 28～37 | 318～446 | 23～32 | 255～382 | 19～28 |
| 12x 80° | 398～663 | 32～53 | 318～424 | 26～34 | 265～371 | 21～30 | 212～318 | 17～26 |
| 16x 80° | 298～497 | 28～47 | 239～318 | 23～30 | 199～279 | 19～26 | 159～239 | 15～23 |
| 20x 80° | 239～398 | 26～44 | 191～255 | 21～28 | 159～223 | 17～24 | 127～191 | 14～21 |
| 25x 80° | 191～318 | 24～41 | 153～204 | 19～26 | 127～178 | 16～23 | 102～153 | 13～19 |
| 4x 90° | 1,194～1,989 | 61～102 | 955～1,273 | 49～65 | 796～1,114 | 41～57 | 637～955 | 32～49 |
| 6x 90° | 796～1,326 | 46～77 | 637～849 | 37～50 | 531～743 | 31～43 | 424～637 | 25～37 |
| 8x 90° | 597～995 | 39～65 | 477～637 | 31～42 | 398～557 | 26～37 | 318～477 | 21～31 |
| 10x 90° | 477～796 | 35～58 | 382～509 | 28～37 | 318～446 | 23～32 | 255～382 | 19～28 |
| 12x 90° | 398～663 | 32～53 | 318～424 | 26～34 | 265～371 | 21～30 | 212～318 | 17～26 |
| 16x 90° | 298～497 | 28～47 | 239～318 | 23～30 | 199～279 | 19～26 | 159～239 | 15～23 |
| 20x 90° | 239～398 | 26～44 | 191～255 | 21～28 | 159～223 | 17～24 | 127～191 | 14～21 |
| 25x 90° | 191～318 | 24～41 | 153～204 | 19～26 | 127～178 | 16～23 | 102～153 | 13～19 |
| 30x 90° | 159～265 | 23～39 | 127～170 | 19～25 | 106～149 | 15～22 | 85～127 | 12～19 |
| 35x 90° | 136～227 | 22～37 | 109～146 | 18～24 | 91～127 | 15～21 | 73～109 | 12～18 |
| 4x120° | 1,194～1,989 | 75～125 | 955～1,273 | 60～80 | 796～1,114 | 50～70 | 637～955 | 40～60 |
| 6x120° | 796～1,326 | 57～95 | 637～849 | 46～61 | 531～743 | 38～53 | 424～637 | 31～46 |
| 8x120° | 597～995 | 48～81 | 477～637 | 39～52 | 398～557 | 32～45 | 318～477 | 26～39 |
| 10x120° | 477～796 | 43～72 | 382～509 | 34～46 | 318～446 | 29～40 | 255～382 | 23～34 |
| 12x120° | 398～663 | 39～66 | 318～424 | 32～42 | 265～371 | 26～37 | 212～318 | 21～32 |
| 16x120° | 298～497 | 35～58 | 239～318 | 28～37 | 199～279 | 23～33 | 159～239 | 19～28 |
| 20x120° | 239～398 | 32～54 | 191～255 | 26～34 | 159～223 | 21～30 | 127～191 | 17～26 |
| 25x120° | 191～318 | 30～50 | 153～204 | 24～32 | 127～178 | 20～28 | 102～153 | 16～24 |
| 30x120° | 159～265 | 29～48 | 127～170 | 23～31 | 106～149 | 19～27 | 85～127 | 15～23 |
| 35x120° | 136～227 | 28～46 | 109～146 | 22～29 | 91～127 | 18～26 | 73～109 | 15～22 |

## ●MCRC　ミニコーナーRカッター（ハーフ）

| 寸法 R | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～ 38HRC HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 12~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~12m/min | | 切削速度 Cutting Speed 6~10m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| **0.5** | 1,273 ～ 2,122 | 21 ～ 69 | 1,061 ～ 1,698 | 13 ～ 40 | 849 ～ 1,273 | 10 ～ 30 | 637 ～ 1,061 | 5 ～ 17 |
| **0.75** | 1,091 ～ 1,819 | 19 ～ 63 | 909 ～ 1,455 | 12 ～ 37 | 728 ～ 1,091 | 10 ～ 28 | 546 ～ 909 | 5 ～ 16 |
| **1** | 955 ～ 1,592 | 18 ～ 60 | 796 ～ 1,273 | 11 ～ 35 | 637 ～ 955 | 9 ～ 26 | 477 ～ 796 | 4 ～ 15 |
| **1.25** | 849 ～ 1,415 | 17 ～ 57 | 707 ～ 1,132 | 11 ～ 33 | 566 ～ 849 | 9 ～ 25 | 424 ～ 707 | 4 ～ 14 |
| **1.5** | 764 ～ 1,273 | 16 ～ 54 | 637 ～ 1,019 | 10 ～ 32 | 509 ～ 764 | 8 ～ 24 | 382 ～ 637 | 4 ～ 14 |
| **1.75** | 694 ～ 1,157 | 16 ～ 52 | 579 ～ 926 | 10 ～ 31 | 463 ～ 694 | 8 ～ 23 | 347 ～ 579 | 4 ～ 13 |
| **2** | 637 ～ 1,061 | 15 ～ 51 | 531 ～ 849 | 10 ～ 30 | 424 ～ 637 | 8 ～ 22 | 318 ～ 531 | 4 ～ 13 |
| **2.25** | 588 ～ 979 | 15 ～ 49 | 490 ～ 784 | 9 ～ 29 | 392 ～ 588 | 8 ～ 22 | 294 ～ 490 | 4 ～ 12 |
| **2.5** | 546 ～ 909 | 14 ～ 48 | 455 ～ 728 | 9 ～ 28 | 364 ～ 546 | 7 ～ 21 | 273 ～ 455 | 4 ～ 12 |
| **2.75** | 509 ～ 849 | 14 ～ 47 | 424 ～ 679 | 9 ～ 28 | 340 ～ 509 | 7 ～ 21 | 255 ～ 424 | 4 ～ 12 |
| **3** | 477 ～ 796 | 14 ～ 46 | 398 ～ 637 | 9 ～ 27 | 318 ～ 477 | 7 ～ 20 | 239 ～ 398 | 3 ～ 11 |
| **3.5** | 382 ～ 637 | 13 ～ 43 | 318 ～ 509 | 8 ～ 25 | 255 ～ 382 | 7 ～ 19 | 191 ～ 318 | 3 ～ 11 |
| **4** | 347 ～ 579 | 13 ～ 42 | 289 ～ 463 | 8 ～ 25 | 231 ～ 347 | 6 ～ 19 | 174 ～ 289 | 3 ～ 11 |
| **4.5** | 318 ～ 531 | 12 ～ 41 | 265 ～ 424 | 8 ～ 24 | 212 ～ 318 | 6 ～ 18 | 159 ～ 265 | 3 ～ 10 |
| **5** | 294 ～ 490 | 12 ～ 41 | 245 ～ 392 | 8 ～ 24 | 196 ～ 294 | 6 ～ 18 | 147 ～ 245 | 3 ～ 10 |
| **6** | 255 ～ 424 | 12 ～ 40 | 212 ～ 340 | 8 ～ 23 | 170 ～ 255 | 6 ～ 18 | 127 ～ 212 | 3 ～ 10 |
| **7** | 225 ～ 374 | 12 ～ 39 | 187 ～ 300 | 7 ～ 23 | 150 ～ 225 | 6 ～ 17 | 112 ～ 187 | 3 ～ 10 |
| **8** | 201 ～ 335 | 11 ～ 38 | 168 ～ 268 | 7 ～ 22 | 134 ～ 201 | 6 ～ 17 | 101 ～ 168 | 3 ～ 10 |

## ●CRC　コーナーRカッター

| 寸法 R | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 25~40m/min | | 切削速度 Cutting Speed 20~25m/min | | 切削速度 Cutting Speed 15~18m/min | | 切削速度 Cutting Speed 10~12m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| **0.5** | 940 ～ 1,500 | 84 ～ 134 | 750 ～ 940 | 56 ～ 85 | 560 ～ 670 | 34 ～ 50 | 380 ～ 450 | 23 ～ 27 |
| **1** | 880 ～ 1,410 | 80 ～ 127 | 710 ～ 880 | 53 ～ 80 | 530 ～ 640 | 32 ～ 48 | 350 ～ 420 | 21 ～ 25 |
| **1.5** | 840 ～ 1,340 | 75 ～ 121 | 670 ～ 840 | 50 ～ 76 | 500 ～ 600 | 30 ～ 45 | 330 ～ 400 | 20 ～ 24 |
| **2** | 800 ～ 1,270 | 72 ～ 115 | 640 ～ 790 | 48 ～ 71 | 480 ～ 570 | 29 ～ 43 | 320 ～ 380 | 19 ～ 23 |
| **2.5** | 760 ～ 1,210 | 68 ～ 109 | 610 ～ 760 | 46 ～ 68 | 450 ～ 550 | 27 ～ 41 | 300 ～ 360 | 18 ～ 22 |
| **3** | 720 ～ 1,160 | 65 ～ 104 | 580 ～ 720 | 44 ～ 65 | 430 ～ 520 | 26 ～ 39 | 290 ～ 350 | 17 ～ 21 |
| **4** | 660 ～ 1,060 | 60 ～ 95 | 530 ～ 660 | 40 ～ 59 | 400 ～ 480 | 24 ～ 36 | 270 ～ 320 | 16 ～ 19 |
| **5** | 570 ～ 910 | 68 ～ 110 | 450 ～ 580 | 45 ～ 70 | 340 ～ 410 | 27 ～ 41 | 230 ～ 270 | 18 ～ 22 |
| **6** | 500 ～ 800 | 60 ～ 95 | 400 ～ 500 | 40 ～ 60 | 300 ～ 360 | 24 ～ 36 | 200 ～ 240 | 16 ～ 19 |
| **8** | 420 ～ 670 | 50 ～ 80 | 340 ～ 420 | 34 ～ 50 | 250 ～ 300 | 20 ～ 30 | 170 ～ 200 | 14 ～ 16 |
| **10** | 360 ～ 580 | 43 ～ 70 | 290 ～ 360 | 29 ～ 43 | 220 ～ 260 | 18 ～ 26 | 140 ～ 170 | 11 ～ 14 |
| **12** | 310 ～ 490 | 37 ～ 59 | 340 ～ 310 | 34 ～ 37 | 180 ～ 220 | 14 ～ 22 | 120 ～ 150 | 10 ～ 12 |
| **15** | 270 ～ 420 | 32 ～ 51 | 210 ～ 360 | 21 ～ 42 | 160 ～ 190 | 13 ～ 19 | 100 ～ 130 | 8 ～ 10 |
| **16** | 250 ～ 400 | 30 ～ 48 | 200 ～ 350 | 20 ～ 42 | 150 ～ 180 | 12 ～ 18 | 100 ～ 120 | 8 ～ 10 |

## ●ZCS　パイロット付ザグリカッター ストレートシャンク
## ●ZCT　パイロット付ザグリカッター テーパーシャンク

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | |
|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 14~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~12m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 6 | 743 ～ 1,062 | 45 ～ 64 | 531 ～ 849 | 32 ～ 51 | 425 ～ 637 | 26 ～ 38 |
| 7 | 637 ～ 910 | 38 ～ 55 | 455 ～ 728 | 27 ～ 44 | 364 ～ 546 | 22 ～ 33 |
| 8 | 557 ～ 796 | 33 ～ 48 | 398 ～ 637 | 24 ～ 38 | 318 ～ 478 | 19 ～ 29 |
| 9 | 495 ～ 708 | 30 ～ 42 | 354 ～ 566 | 21 ～ 34 | 283 ～ 425 | 17 ～ 26 |
| 10 | 446 ～ 637 | 27 ～ 38 | 318 ～ 510 | 19 ～ 31 | 255 ～ 382 | 15 ～ 23 |
| 11 | 405 ～ 579 | 24 ～ 35 | 290 ～ 463 | 17 ～ 28 | 232 ～ 347 | 14 ～ 21 |
| 12 | 372 ～ 531 | 22 ～ 32 | 265 ～ 425 | 16 ～ 26 | 212 ～ 318 | 13 ～ 19 |
| 13 | 343 ～ 490 | 21 ～ 29 | 245 ～ 392 | 15 ～ 24 | 196 ～ 294 | 12 ～ 18 |
| 14 | 318 ～ 455 | 19 ～ 27 | 227 ～ 364 | 14 ～ 22 | 182 ～ 273 | 11 ～ 16 |
| 15 | 297 ～ 425 | 18 ～ 26 | 212 ～ 340 | 13 ～ 20 | 170 ～ 255 | 10 ～ 15 |
| 16 | 279 ～ 398 | 17 ～ 24 | 199 ～ 318 | 12 ～ 19 | 159 ～ 239 | 10 ～ 14 |
| 17 | 262 ～ 375 | 16 ～ 23 | 187 ～ 300 | 11 ～ 18 | 150 ～ 225 | 9 ～ 14 |
| 18 | 248 ～ 354 | 15 ～ 21 | 177 ～ 283 | 11 ～ 17 | 142 ～ 212 | 9 ～ 13 |
| 19 | 235 ～ 335 | 14 ～ 20 | 168 ～ 268 | 10 ～ 16 | 134 ～ 201 | 8 ～ 12 |
| 20 | 223 ～ 318 | 13 ～ 19 | 159 ～ 255 | 10 ～ 15 | 127 ～ 191 | 8 ～ 11 |
| 22 | 203 ～ 290 | 12 ～ 17 | 145 ～ 232 | 9 ～ 14 | 116 ～ 174 | 7 ～ 10 |
| 24 | 186 ～ 265 | 11 ～ 16 | 133 ～ 212 | 8 ～ 13 | 106 ～ 159 | 6 ～ 10 |
| 26 | 171 ～ 245 | 10 ～ 15 | 122 ～ 196 | 7 ～ 12 | 98 ～ 147 | 6 ～ 9 |
| 28 | 159 ～ 227 | 10 ～ 14 | 114 ～ 182 | 7 ～ 11 | 91 ～ 136 | 5 ～ 8 |
| 30 | 149 ～ 212 | 9 ～ 13 | 106 ～ 170 | 6 ～ 10 | 85 ～ 127 | 5 ～ 8 |
| 32 | 139 ～ 199 | 8 ～ 12 | 100 ～ 159 | 6 ～ 10 | 80 ～ 119 | 5 ～ 7 |
| 34 | 131 ～ 187 | 8 ～ 11 | 94 ～ 150 | 6 ～ 9 | 75 ～ 112 | 5 ～ 7 |
| 36 | 124 ～ 177 | 7 ～ 11 | 88 ～ 142 | 5 ～ 9 | 71 ～ 106 | 4 ～ 6 |
| 38 | 117 ～ 168 | 7 ～ 10 | 84 ～ 134 | 5 ～ 8 | 67 ～ 101 | 4 ～ 6 |
| 40 | 111 ～ 159 | 7 ～ 10 | 80 ～ 127 | 5 ～ 8 | 64 ～ 96 | 4 ～ 6 |
| 42 | 106 ～ 152 | 6 ～ 9 | 76 ～ 121 | 5 ～ 7 | 61 ～ 91 | 4 ～ 5 |
| 44 | 101 ～ 145 | 6 ～ 9 | 72 ～ 116 | 4 ～ 7 | 58 ～ 87 | 3 ～ 5 |
| 46 | 97 ～ 138 | 6 ～ 8 | 69 ～ 111 | 4 ～ 7 | 55 ～ 83 | 3 ～ 5 |
| 48 | 93 ～ 133 | 6 ～ 8 | 66 ～ 106 | 4 ～ 6 | 53 ～ 80 | 3 ～ 5 |
| 50 | 89 ～ 127 | 5 ～ 8 | 64 ～ 102 | 4 ～ 6 | 51 ～ 76 | 3 ～ 5 |
| 52 | 86 ～ 122 | 5 ～ 7 | 61 ～ 98 | 4 ～ 6 | 49 ～ 73 | 3 ～ 4 |
| 54 | 83 ～ 118 | 5 ～ 7 | 59 ～ 94 | 4 ～ 6 | 47 ～ 71 | 3 ～ 4 |
| 56 | 80 ～ 114 | 5 ～ 7 | 57 ～ 91 | 3 ～ 5 | 45 ～ 68 | 3 ～ 4 |
| 58 | 77 ～ 110 | 5 ～ 7 | 55 ～ 88 | 3 ～ 5 | 44 ～ 66 | 3 ～ 4 |
| 60 | 74 ～ 106 | 4 ～ 6 | 53 ～ 85 | 3 ～ 5 | 42 ～ 64 | 3 ～ 4 |
| 64 | 70 ～ 100 | 4 ～ 6 | 50 ～ 80 | 3 ～ 5 | 40 ～ 60 | 2 ～ 4 |
| 65 | 69 ～ 98 | 4 ～ 6 | 49 ～ 78 | 3 ～ 5 | 39 ～ 59 | 2 ～ 4 |
| 70 | 64 ～ 91 | 4 ～ 5 | 45 ～ 73 | 3 ～ 4 | 36 ～ 55 | 2 ～ 3 |
| 75 | 59 ～ 85 | 4 ～ 5 | 42 ～ 68 | 3 ～ 4 | 34 ～ 51 | 2 ～ 3 |

## ●CB　六角穴付ボルト用沈めフライス ストレートシャンク
## ●CBT　六角穴付ボルト用沈めフライス テーパーシャンク
## ●CBLS　六角穴付ボルト用ロングシャンク沈めフライス

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | |
|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 14~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~12m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| M 3 | 755 ~ 1,079 | 59 ~ 168 | 540 ~ 863 | 28 ~ 89 | 432 ~ 647 | 17 ~ 50 |
| M 4 | 602 ~ 860 | 50 ~ 141 | 430 ~ 688 | 24 ~ 75 | 344 ~ 516 | 14 ~ 42 |
| M 5 | 501 ~ 715 | 43 ~ 124 | 358 ~ 572 | 21 ~ 66 | 286 ~ 429 | 12 ~ 37 |
| M 6 | 428 ~ 612 | 39 ~ 112 | 306 ~ 490 | 19 ~ 60 | 245 ~ 367 | 11 ~ 33 |
| M 8 | 333 ~ 475 | 33 ~ 95 | 238 ~ 380 | 16 ~ 51 | 190 ~ 285 | 10 ~ 29 |
| M10 | 265 ~ 379 | 29 ~ 84 | 189 ~ 303 | 14 ~ 45 | 152 ~ 227 | 8 ~ 25 |
| M12 | 237 ~ 339 | 28 ~ 79 | 169 ~ 271 | 13 ~ 42 | 135 ~ 203 | 8 ~ 24 |
| M14 | 186 ~ 265 | 25 ~ 70 | 133 ~ 212 | 12 ~ 37 | 106 ~ 159 | 7 ~ 21 |
| M16 | 171 ~ 245 | 24 ~ 68 | 122 ~ 196 | 11 ~ 36 | 98 ~ 147 | 7 ~ 20 |
| M18 | 159 ~ 227 | 23 ~ 65 | 114 ~ 182 | 11 ~ 35 | 91 ~ 136 | 7 ~ 20 |
| M20 | 149 ~ 212 | 22 ~ 64 | 106 ~ 170 | 11 ~ 34 | 85 ~ 127 | 6 ~ 19 |
| M22 | 139 ~ 199 | 22 ~ 62 | 99 ~ 159 | 10 ~ 33 | 80 ~ 119 | 6 ~ 19 |
| M24 | 124 ~ 177 | 21 ~ 59 | 88 ~ 141 | 10 ~ 32 | 71 ~ 106 | 6 ~ 18 |
| M30 | 99 ~ 141 | 19 ~ 55 | 71 ~ 113 | 9 ~ 29 | 57 ~ 85 | 6 ~ 17 |
| M36 | 84 ~ 120 | 18 ~ 53 | 60 ~ 96 | 9 ~ 28 | 48 ~ 72 | 5 ~ 16 |
| M42 | 76 ~ 108 | 18 ~ 51 | 54 ~ 86 | 9 ~ 27 | 43 ~ 65 | 5 ~ 15 |
| M45 | 70 ~ 99 | 18 ~ 50 | 50 ~ 80 | 8 ~ 27 | 40 ~ 60 | 5 ~ 15 |
| M48 | 67 ~ 95 | 17 ~ 50 | 48 ~ 76 | 8 ~ 26 | 38 ~ 57 | 5 ~ 15 |

## ●CBH　平小ネジ用沈めフライス

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | |
|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 14~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~12m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| M 2.5 | 909 ~ 1,299 | 68 ~ 194 | 650 ~ 1,039 | 32 ~ 104 | 520 ~ 780 | 19 ~ 58 |
| M 3 | 755 ~ 1,079 | 59 ~ 168 | 540 ~ 863 | 28 ~ 89 | 432 ~ 647 | 17 ~ 50 |
| M 4 | 602 ~ 860 | 50 ~ 141 | 430 ~ 688 | 24 ~ 75 | 344 ~ 516 | 14 ~ 42 |
| M 5 | 474 ~ 677 | 42 ~ 119 | 339 ~ 542 | 20 ~ 64 | 271 ~ 406 | 12 ~ 36 |
| M 6 | 405 ~ 579 | 38 ~ 108 | 289 ~ 463 | 18 ~ 57 | 231 ~ 347 | 11 ~ 32 |
| M 8 | 307 ~ 439 | 32 ~ 91 | 220 ~ 351 | 15 ~ 48 | 176 ~ 263 | 9 ~ 27 |

## ●CBS　皿小ネジ用沈めフライス

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | |
|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 14~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~12m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| M 3 | 594 ~ 849 | 49 ~ 140 | 424 ~ 679 | 23 ~ 75 | 340 ~ 509 | 14 ~ 42 |
| M 4 | 469 ~ 670 | 42 ~ 119 | 335 ~ 536 | 20 ~ 63 | 268 ~ 402 | 12 ~ 36 |
| M 5 | 371 ~ 531 | 36 ~ 102 | 265 ~ 424 | 17 ~ 54 | 212 ~ 318 | 10 ~ 31 |
| M 6 | 318 ~ 455 | 32 ~ 93 | 227 ~ 364 | 15 ~ 49 | 182 ~ 273 | 9 ~ 28 |
| M 8 | 241 ~ 344 | 28 ~ 79 | 172 ~ 275 | 13 ~ 42 | 138 ~ 206 | 8 ~ 24 |

## ●CBO　押出ピン用沈めフライス

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | |
|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 14~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~12m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| M 1 | 743 ~ 1,061 | 58 ~ 166 | 531 ~ 849 | 28 ~ 88 | 424 ~ 637 | 17 ~ 50 |
| M 1.5 | 743 ~ 1,061 | 58 ~ 166 | 531 ~ 849 | 28 ~ 88 | 424 ~ 637 | 17 ~ 50 |
| M 2 | 743 ~ 1,061 | 58 ~ 166 | 531 ~ 849 | 28 ~ 88 | 424 ~ 637 | 17 ~ 50 |
| M 2.5 | 743 ~ 1,061 | 58 ~ 166 | 531 ~ 849 | 28 ~ 88 | 424 ~ 637 | 17 ~ 50 |
| M 3 | 743 ~ 1,061 | 58 ~ 166 | 531 ~ 849 | 28 ~ 88 | 424 ~ 637 | 17 ~ 50 |
| M 3.5 | 557 ~ 796 | 47 ~ 134 | 398 ~ 637 | 22 ~ 71 | 318 ~ 477 | 13 ~ 40 |
| M 4 | 557 ~ 796 | 47 ~ 134 | 398 ~ 637 | 22 ~ 71 | 318 ~ 477 | 13 ~ 40 |
| M 4.5 | 495 ~ 707 | 43 ~ 123 | 354 ~ 566 | 21 ~ 66 | 283 ~ 424 | 12 ~ 37 |
| M 5 | 495 ~ 707 | 43 ~ 123 | 354 ~ 566 | 21 ~ 66 | 283 ~ 424 | 12 ~ 37 |
| M 6 | 446 ~ 637 | 40 ~ 115 | 318 ~ 509 | 19 ~ 61 | 255 ~ 382 | 11 ~ 34 |
| M 7 | 405 ~ 579 | 38 ~ 108 | 289 ~ 463 | 18 ~ 57 | 231 ~ 347 | 11 ~ 32 |
| M 8 | 343 ~ 490 | 34 ~ 97 | 245 ~ 392 | 16 ~ 52 | 196 ~ 294 | 10 ~ 29 |
| M10 | 297 ~ 424 | 31 ~ 89 | 212 ~ 340 | 15 ~ 48 | 170 ~ 255 | 9 ~ 27 |
| M12 | 262 ~ 374 | 29 ~ 83 | 187 ~ 300 | 14 ~ 44 | 150 ~ 225 | 8 ~ 25 |
| M14 | 235 ~ 335 | 27 ~ 78 | 168 ~ 268 | 13 ~ 42 | 134 ~ 201 | 8 ~ 24 |
| M16 | 212 ~ 303 | 26 ~ 75 | 152 ~ 243 | 12 ~ 40 | 121 ~ 182 | 7 ~ 22 |
| M20 | 175 ~ 250 | 24 ~ 68 | 125 ~ 200 | 11 ~ 36 | 100 ~ 150 | 7 ~ 20 |

## ●CB-JM　JIS沈めフライス

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | |
|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 14~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~12m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| JM 3 | 686 ~ 979 | 55 ~ 156 | 490 ~ 784 | 26 ~ 83 | 392 ~ 588 | 16 ~ 47 |
| JM 4 | 557 ~ 796 | 47 ~ 134 | 398 ~ 637 | 22 ~ 71 | 318 ~ 477 | 13 ~ 40 |
| JM 5 | 469 ~ 670 | 42 ~ 119 | 335 ~ 536 | 20 ~ 63 | 268 ~ 402 | 12 ~ 36 |
| JM 6 | 405 ~ 579 | 38 ~ 108 | 289 ~ 463 | 18 ~ 57 | 231 ~ 347 | 11 ~ 32 |
| JM 8 | 318 ~ 455 | 32 ~ 83 | 227 ~ 364 | 15 ~ 49 | 182 ~ 273 | 9 ~ 28 |
| JM10 | 255 ~ 364 | 29 ~ 82 | 182 ~ 291 | 14 ~ 44 | 146 ~ 218 | 8 ~ 25 |
| JM12 | 223 ~ 318 | 27 ~ 76 | 159 ~ 255 | 13 ~ 41 | 127 ~ 191 | 8 ~ 23 |

## ●CB-TSM　TSM沈めフライス

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | |
|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 14~20m/min | | 切削速度 Cutting Speed 10~16m/min | | 切削速度 Cutting Speed 8~12m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| TSM18 | 154 ~ 220 | 23 ~ 65 | 110 ~ 176 | 11 ~ 34 | 88 ~ 132 | 6 ~ 19 |
| TSM20 | 139 ~ 199 | 22 ~ 62 | 99 ~ 159 | 10 ~ 33 | 80 ~ 119 | 6 ~ 19 |
| TSM22 | 127 ~ 182 | 21 ~ 60 | 91 ~ 146 | 10 ~ 32 | 73 ~ 109 | 6 ~ 18 |
| TSM24 | 114 ~ 163 | 20 ~ 58 | 82 ~ 131 | 10 ~ 31 | 65 ~ 98 | 6 ~ 17 |
| TSM30 | 93 ~ 133 | 19 ~ 54 | 66 ~ 106 | 9 ~ 29 | 53 ~ 80 | 5 ~ 16 |
| TSM36 | 78 ~ 112 | 18 ~ 52 | 56 ~ 89 | 9 ~ 28 | 45 ~ 67 | 5 ~ 15 |
| TSM42 | 68 ~ 96 | 17 ~ 50 | 48 ~ 77 | 8 ~ 27 | 39 ~ 58 | 5 ~ 15 |
| TSM45 | 63 ~ 90 | 17 ~ 49 | 45 ~ 72 | 8 ~ 26 | 36 ~ 54 | 5 ~ 15 |
| TSM48 | 59 ~ 85 | 17 ~ 48 | 42 ~ 68 | 8 ~ 26 | 34 ~ 51 | 5 ~ 15 |

## ●DCB　六角穴付ボルト用ドリル付沈めフライス

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～ 38HRC HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 16~25m/min | | 切削速度 Cutting Speed 12~18m/min | | 切削速度 Cutting Speed 10~14m/min | | 切削速度 Cutting Speed 8~12m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| M 3 | 863 ～ 1,349 | 71 ～ 221 | 647 ～ 971 | 35 ～ 106 | 540 ～ 755 | 24 ～ 62 | 432 ～ 647 | 12 ～ 35 |
| M 4 | 688 ～ 1,075 | 64 ～ 200 | 516 ～ 774 | 32 ～ 96 | 430 ～ 602 | 21 ～ 56 | 344 ～ 516 | 11 ～ 32 |
| M 5 | 572 ～ 894 | 60 ～ 186 | 429 ～ 644 | 30 ～ 89 | 358 ～ 501 | 20 ～ 52 | 286 ～ 429 | 10 ～ 30 |
| M 6 | 490 ～ 765 | 57 ～ 177 | 367 ～ 551 | 28 ～ 85 | 306 ～ 429 | 19 ～ 49 | 245 ～ 367 | 9 ～ 28 |
| M 8 | 380 ～ 594 | 52 ～ 164 | 285 ～ 428 | 26 ～ 79 | 238 ～ 333 | 17 ～ 46 | 190 ～ 285 | 9 ～ 26 |
| M10 | 303 ～ 474 | 50 ～ 155 | 227 ～ 341 | 25 ～ 74 | 189 ～ 265 | 17 ～ 43 | 152 ～ 227 | 8 ～ 25 |
| M12 | 271 ～ 423 | 48 ～ 151 | 203 ～ 305 | 24 ～ 73 | 169 ～ 237 | 16 ～ 42 | 135 ～ 203 | 8 ～ 24 |
| M14 | 221 ～ 346 | 47 ～ 145 | 166 ～ 249 | 23 ～ 70 | 138 ～ 194 | 16 ～ 41 | 111 ～ 166 | 8 ～ 23 |
| M16 | 196 ～ 306 | 46 ～ 142 | 147 ～ 220 | 23 ～ 68 | 122 ～ 171 | 15 ～ 40 | 98 ～ 147 | 8 ～ 23 |
| M18 | 176 ～ 274 | 45 ～ 140 | 132 ～ 198 | 22 ～ 67 | 110 ～ 154 | 15 ～ 39 | 88 ～ 132 | 7 ～ 22 |

## ●DCBS　皿小ネジ用ドリル付沈めフライス

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～ 38HRC HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 16~25m/min | | 切削速度 Cutting Speed 12~18m/min | | 切削速度 Cutting Speed 10~14m/min | | 切削速度 Cutting Speed 8~12m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| M 3 | 679 ～ 1,061 | 64 ～ 199 | 509 ～ 764 | 32 ～ 95 | 424 ～ 594 | 21 ～ 56 | 340 ～ 509 | 11 ～ 32 |
| M 4 | 536 ～ 838 | 58 ～ 182 | 402 ～ 603 | 29 ～ 87 | 335 ～ 469 | 19 ～ 51 | 268 ～ 402 | 10 ～ 29 |
| M 5 | 424 ～ 663 | 54 ～ 169 | 318 ～ 477 | 27 ～ 81 | 265 ～ 371 | 18 ～ 47 | 212 ～ 318 | 9 ～ 27 |
| M 6 | 364 ～ 568 | 52 ～ 162 | 273 ～ 409 | 26 ～ 78 | 227 ～ 318 | 17 ～ 45 | 182 ～ 273 | 9 ～ 26 |
| M 8 | 275 ～ 430 | 49 ～ 152 | 206 ～ 310 | 24 ～ 73 | 172 ～ 241 | 16 ～ 42 | 138 ～ 206 | 8 ～ 24 |

## ●DCBTA　TAS六角穴付ボルト用ドリル付沈めフライス
## ●DCB-SRM　六角ボルト沈め用段付ドリル（ストレートシャンク）R型
## ●DCB-SHM　平小ネジ沈め用段付ドリル（ストレートシャンク）H型

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～ 38HRC HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 16~25m/min | | 切削速度 Cutting Speed 12~18m/min | | 切削速度 Cutting Speed 10~14m/min | | 切削速度 Cutting Speed 8~12m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| M 3 | 784 ～ 1,224 | 68 ～ 211 | 588 ～ 881 | 34 ～ 101 | 490 ～ 686 | 23 ～ 59 | 392 ～ 588 | 11 ～ 34 |
| M 4 | 637 ～ 995 | 62 ～ 194 | 477 ～ 716 | 31 ～ 93 | 398 ～ 557 | 21 ～ 54 | 318 ～ 477 | 10 ～ 31 |
| M 5 | 536 ～ 838 | 58 ～ 182 | 402 ～ 603 | 29 ～ 87 | 335 ～ 469 | 19 ～ 51 | 268 ～ 402 | 10 ～ 29 |
| M 6 | 463 ～ 723 | 56 ～ 174 | 347 ～ 521 | 28 ～ 83 | 289 ～ 405 | 19 ～ 49 | 232 ～ 347 | 9 ～ 28 |
| M 8 | 364 ～ 568 | 52 ～ 162 | 273 ～ 409 | 26 ～ 78 | 227 ～ 318 | 17 ～ 45 | 182 ～ 273 | 9 ～ 26 |
| M10 | 291 ～ 455 | 49 ～ 153 | 218 ～ 327 | 25 ～ 74 | 182 ～ 255 | 16 ～ 43 | 146 ～ 218 | 8 ～ 25 |
| M12 | 255 ～ 398 | 48 ～ 149 | 191 ～ 286 | 24 ～ 72 | 159 ～ 223 | 16 ～ 42 | 127 ～ 191 | 8 ～ 24 |
| M14 | 221 ～ 346 | 47 ～ 145 | 166 ～ 249 | 23 ～ 70 | 138 ～ 194 | 16 ～ 41 | 111 ～ 166 | 8 ～ 23 |
| M16 | 196 ～ 306 | 46 ～ 142 | 147 ～ 220 | 23 ～ 68 | 122 ～ 171 | 15 ～ 40 | 98 ～ 147 | 8 ～ 23 |
| M18 | 176 ～ 274 | 45 ～ 140 | 132 ～ 198 | 22 ～ 67 | 110 ～ 154 | 15 ～ 39 | 88 ～ 132 | 7 ～ 22 |

## ●DCBSTA　TAS皿小ネジ用ドリル付沈めフライス
## ●DCB-SSM　皿小ネジ沈め用段付ドリル（ストレートシャンク）S型

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～38HRC HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 16~25m/min | | 切削速度 Cutting Speed 12~18m/min | | 切削速度 Cutting Speed 10~14m/min | | 切削速度 Cutting Speed 8~12m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| M 3 | 796～1,243 | 68～213 | 597～895 | 34～102 | 497～696 | 23～60 | 398～597 | 11～34 |
| M 4 | 606～947 | 61～190 | 455～682 | 30～91 | 379～531 | 20～53 | 303～455 | 10～30 |
| M 5 | 490～765 | 57～177 | 367～551 | 28～85 | 306～429 | 19～49 | 245～367 | 9～28 |
| M 6 | 407～637 | 53～167 | 306～458 | 27～80 | 255～357 | 18～47 | 204～306 | 9～27 |
| M 8 | 309～482 | 50～156 | 232～347 | 25～75 | 193～270 | 17～44 | 154～232 | 8～25 |
| M10 | 243～379 | 47～148 | 182～273 | 24～71 | 152～212 | 16～41 | 121～182 | 8～24 |
| M12 | 204～318 | 46～143 | 153～229 | 23～69 | 127～178 | 15～40 | 102～153 | 8～23 |

## ●DCB-TRM　六角ボルト沈め用段付ドリル R型

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～38HRC HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 16~25m/min | | 切削速度 Cutting Speed 12~18m/min | | 切削速度 Cutting Speed 10~14m/min | | 切削速度 Cutting Speed 8~12m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| M 5 | 536～838 | 58～182 | 402～603 | 29～87 | 335～469 | 19～51 | 268～402 | 10～29 |
| M 6 | 463～723 | 56～174 | 347～521 | 28～83 | 289～405 | 19～49 | 232～347 | 9～28 |
| M 8 | 364～568 | 52～162 | 273～409 | 26～78 | 227～318 | 17～45 | 182～273 | 9～26 |
| M10 | 291～455 | 49～153 | 218～327 | 25～74 | 182～255 | 16～43 | 146～218 | 8～25 |
| M12 | 255～398 | 48～149 | 191～286 | 24～72 | 159～223 | 16～42 | 127～191 | 8～24 |
| M14 | 221～346 | 47～145 | 166～249 | 23～70 | 138～194 | 16～41 | 111～166 | 8～23 |
| M16 | 196～306 | 46～142 | 147～220 | 23～68 | 122～171 | 15～40 | 98～147 | 8～23 |
| M18 | 176～274 | 45～140 | 132～198 | 22～67 | 110～154 | 15～39 | 88～132 | 7～22 |
| M20 | 159～249 | 44～138 | 119～179 | 22～66 | 99～139 | 15～39 | 80～119 | 7～22 |
| M22 | 146～227 | 44～136 | 109～164 | 22～65 | 91～127 | 15～38 | 73～109 | 7～22 |
| M24 | 131～204 | 43～135 | 98～147 | 22～65 | 82～114 | 14～38 | 65～98 | 7～22 |

## ●DCB-TZM　六角ボルト沈め用段付ドリル Z型

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～38HRC HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 16~25m/min | | 切削速度 Cutting Speed 12~18m/min | | 切削速度 Cutting Speed 10~14m/min | | 切削速度 Cutting Speed 8~12m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| M 3 | 566～884 | 59～186 | 424～637 | 30～89 | 354～495 | 20～52 | 283～424 | 10～30 |
| M 4 | 463～723 | 56～174 | 347～521 | 28～83 | 289～405 | 19～49 | 232～347 | 9～28 |
| M 5 | 392～612 | 53～165 | 294～441 | 26～79 | 245～343 | 18～46 | 196～294 | 9～26 |
| M 6 | 340～531 | 51～159 | 255～382 | 25～76 | 212～297 | 17～45 | 170～255 | 8～25 |
| M 8 | 255～398 | 48～149 | 191～286 | 24～72 | 159～223 | 16～42 | 127～191 | 8～24 |
| M10 | 212～332 | 46～144 | 159～239 | 23～69 | 133～186 | 15～40 | 106～159 | 8～23 |
| M12 | 182～284 | 45～141 | 136～205 | 23～68 | 114～159 | 15～39 | 91～136 | 8～23 |
| M14 | 159～249 | 44～138 | 119～179 | 22～66 | 99～139 | 15～39 | 80～119 | 7～22 |
| M16 | 146～227 | 44～136 | 109～164 | 22～65 | 91～127 | 15～38 | 73～109 | 7～22 |
| M18 | 131～204 | 43～135 | 98～147 | 22～65 | 82～114 | 14～38 | 65～98 | 7～22 |
| M20 | 118～185 | 43～133 | 89～133 | 21～64 | 74～104 | 14～37 | 59～89 | 7～21 |
| M22 | 111～173 | 42～132 | 83～125 | 21～64 | 69～97 | 14～37 | 55～83 | 7～21 |
| M24 | 102～159 | 42～131 | 76～115 | 21～63 | 64～89 | 14～37 | 51～76 | 7～21 |
| M27 | 93～145 | 42～130 | 69～104 | 21～63 | 58～81 | 14～36 | 46～69 | 7～21 |
| M30 | 82～128 | 41～129 | 62～92 | 21～62 | 51～72 | 14～36 | 41～62 | 7～21 |

## ●SSC-TiN　シート面カッター（PF規格／UNF規格）

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | |
|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~35m/min | | 切削速度 Cutting Speed 15~25m/min | | 切削速度 Cutting Speed 12~20m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| **PF1/8** | 385 ～ 898 | 58 ～ 135 | 385 ～ 642 | 40 ～ 67 | 308 ～ 513 | 23 ～ 39 |
| **PF1/4** | 288 ～ 671 | 43 ～ 101 | 288 ～ 479 | 30 ～ 50 | 230 ～ 384 | 17 ～ 29 |
| **PF3/8** | 239 ～ 557 | 48 ～ 111 | 239 ～ 398 | 33 ～ 56 | 191 ～ 318 | 19 ～ 32 |
| **PF1/2** | 195 ～ 455 | 39 ～ 91 | 195 ～ 325 | 27 ～ 45 | 156 ～ 260 | 16 ～ 26 |
| **PF3/4** | 149 ～ 348 | 30 ～ 70 | 149 ～ 249 | 21 ～ 35 | 119 ～ 199 | 12 ～ 20 |
| **PF1"** | 126 ～ 293 | 25 ～ 59 | 126 ～ 209 | 18 ～ 29 | 101 ～ 168 | 10 ～ 17 |
| **UNF3/ 8-24** | 412 ～ 960 | 62 ～ 144 | 412 ～ 686 | 43 ～ 72 | 329 ～ 549 | 25 ～ 41 |
| **UNF7/16-20** | 354 ～ 825 | 53 ～ 124 | 354 ～ 589 | 37 ～ 62 | 283 ～ 472 | 21 ～ 35 |
| **UNF1/ 2-20** | 314 ～ 733 | 47 ～ 110 | 314 ～ 524 | 33 ～ 55 | 251 ～ 419 | 19 ～ 31 |
| **UNF9/16-18** | 281 ～ 655 | 42 ～ 98 | 281 ～ 468 | 30 ～ 49 | 225 ～ 374 | 17 ～ 28 |
| **UNF3/ 4-16** | 214 ～ 500 | 43 ～ 100 | 214 ～ 357 | 30 ～ 50 | 171 ～ 285 | 17 ～ 29 |
| **UNF7/ 8-14** | 184 ～ 430 | 37 ～ 86 | 184 ～ 307 | 26 ～ 43 | 147 ～ 246 | 15 ～ 25 |

## ●SSZC-TiN　シート面ザグリカッター（PF規格／UNF規格）

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | |
|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 18~35m/min | | 切削速度 Cutting Speed 15~25m/min | | 切削速度 Cutting Speed 12~20m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| **PF1/8** | 494 ～ 960 | 20 ～ 54 | 412 ～ 686 | 12 ～ 41 | 329 ～ 549 | 10 ～ 27 |
| **PF1/4** | 367 ～ 714 | 15 ～ 43 | 306 ～ 510 | 9 ～ 31 | 245 ～ 408 | 7 ～ 20 |
| **PF3/8** | 308 ～ 599 | 12 ～ 36 | 257 ～ 428 | 8 ～ 26 | 205 ～ 342 | 6 ～ 17 |
| **PF1/2** | 254 ～ 493 | 10 ～ 30 | 211 ～ 352 | 6 ～ 21 | 169 ～ 282 | 5 ～ 14 |
| **PF3/4** | 192 ～ 374 | 8 ～ 22 | 160 ～ 267 | 5 ～ 16 | 128 ～ 214 | 4 ～ 11 |
| **PF1"** | 160 ～ 311 | 6 ～ 19 | 133 ～ 222 | 4 ～ 13 | 107 ～ 178 | 3 ～ 9 |
| **UNF3/ 8-24** | 533 ～ 1,036 | 21 ～ 62 | 444 ～ 740 | 13 ～ 44 | 355 ～ 592 | 11 ～ 30 |
| **UNF7/16-20** | 460 ～ 895 | 18 ～ 54 | 384 ～ 639 | 12 ～ 38 | 307 ～ 511 | 9 ～ 26 |
| **UNF1/ 2-20** | 408 ～ 793 | 16 ～ 48 | 340 ～ 566 | 10 ～ 34 | 272 ～ 453 | 8 ～ 23 |
| **UNF9/16-18** | 365 ～ 710 | 15 ～ 43 | 304 ～ 507 | 9 ～ 30 | 243 ～ 405 | 7 ～ 20 |
| **UNF3/ 4-16** | 277 ～ 540 | 11 ～ 32 | 231 ～ 385 | 7 ～ 23 | 185 ～ 308 | 6 ～ 15 |
| **UNF7/ 8-14** | 239 ～ 464 | 10 ～ 28 | 199 ～ 332 | 6 ～ 20 | 159 ～ 265 | 5 ～ 13 |

# DRILL SERIES

超硬

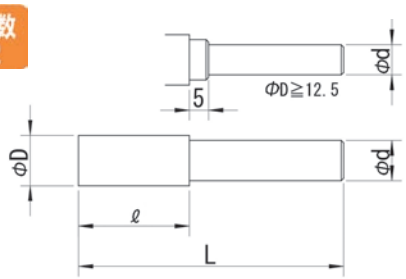
# CNCZ-C

## 超硬フラットザグリドリル（自動旋盤用） *Solid Carbide Flat Drill For Counterboring*

切削条件表 P287 | ドリル・ザグリ加工 | 右ネジレ 20° | TiCN | K10 | 刃数 2








| 公差 (Tolerance) | D | | | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|
| | 3 | $^{0}_{-0.014}$ | 3.1～6 | $^{0}_{-0.018}$ | 6.1～10 | $^{0}_{-0.022}$ | 10.1～16 | $^{0}_{-0.027}$ | h6 |

右刃右ネジレ20° TiCNコーティング 刃数:2 K10
Helix Angle-Right20° TiCN Coating 2 Flutes Micro Grain Carbide(K10)

| 刃径 (ΦD) Dia. | 溝長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|
| 3 | 12 | 40 | 4 |
| 3.1 | 12 | 40 | 4 |
| 3.2 | 12 | 40 | 4 |
| 3.3 | 12 | 40 | 4 |
| 3.4 | 12 | 40 | 4 |
| 3.5 | 12 | 40 | 4 |
| 3.6 | 12 | 40 | 4 |
| 3.7 | 12 | 40 | 4 |
| 3.8 | 12 | 40 | 4 |
| 3.9 | 12 | 40 | 4 |
| 4 | 12 | 40 | 4 |
| 4.1 | 12 | 40 | 5 |
| 4.2 | 16 | 45 | 5 |
| 4.3 | 16 | 45 | 5 |
| 4.4 | 16 | 45 | 5 |
| 4.5 | 16 | 45 | 5 |
| 4.6 | 16 | 45 | 5 |
| 4.7 | 16 | 45 | 5 |
| 4.8 | 16 | 45 | 5 |
| 4.9 | 16 | 45 | 5 |
| 5 | 16 | 45 | 5 |
| 5.1 | 16 | 45 | 6 |
| 5.2 | 16 | 45 | 6 |
| 5.3 | 16 | 45 | 6 |
| 5.4 | 16 | 45 | 6 |
| 5.5 | 16 | 45 | 6 |
| 5.6 | 16 | 45 | 6 |
| 5.7 | 16 | 45 | 6 |
| 5.8 | 16 | 45 | 6 |
| 5.9 | 16 | 45 | 6 |
| 6 | 20 | 50 | 6 |
| 6.1 | 20 | 50 | 6 |
| 6.2 | 20 | 50 | 6 |
| 6.3 | 20 | 50 | 6 |
| 6.4 | 20 | 50 | 6 |
| 6.5 | 20 | 50 | 6 |
| 6.6 | 20 | 50 | 6 |
| 6.7 | 25 | 55 | 7 |
| 6.8 | 25 | 55 | 7 |
| 6.9 | 25 | 55 | 7 |
| 7 | 25 | 55 | 7 |
| 7.1 | 25 | 60 | 7 |
| 7.2 | 25 | 60 | 7 |
| 7.3 | 25 | 60 | 7 |
| 7.4 | 25 | 60 | 7 |
| 7.5 | 25 | 60 | 7 |
| 7.6 | 25 | 60 | 7 |
| 7.7 | 25 | 60 | 7 |
| 7.8 | 25 | 60 | 7 |

| 刃径 (ΦD) Dia. | 溝長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|
| 7.9 | 25 | 60 | 7 |
| 8 | 25 | 60 | 7 |
| 8.1 | 25 | 60 | 7 |
| 8.2 | 25 | 60 | 7 |
| 8.3 | 25 | 60 | 7 |
| 8.4 | 25 | 60 | 7 |
| 8.5 | 25 | 60 | 7 |
| 8.6 | 25 | 60 | 7 |
| 8.7 | 25 | 60 | 7 |
| 8.8 | 25 | 60 | 7 |
| 8.9 | 25 | 60 | 7 |
| 9 | 25 | 60 | 7 |
| 9.1 | 25 | 60 | 7 |
| 9.2 | 25 | 60 | 7 |
| 9.3 | 25 | 60 | 7 |
| 9.4 | 25 | 60 | 7 |
| 9.5 | 25 | 60 | 7 |
| 9.6 | 25 | 60 | 7 |
| 9.7 | 25 | 60 | 7 |
| 9.8 | 25 | 60 | 7 |
| 9.9 | 25 | 60 | 7 |
| 10 | 25 | 60 | 7 |
| 10.1 | 25 | 60 | 7 |
| 10.2 | 25 | 60 | 7 |
| 10.3 | 25 | 60 | 7 |
| 10.4 | 25 | 60 | 7 |
| 10.5 | 25 | 60 | 7 |
| 10.6 | 25 | 60 | 7 |
| 10.7 | 25 | 60 | 7 |
| 10.8 | 25 | 60 | 7 |
| 10.9 | 25 | 60 | 7 |
| 11 | 25 | 60 | 10 |
| 11.1 | 25 | 60 | 10 |
| 11.2 | 25 | 60 | 10 |
| 11.3 | 25 | 60 | 10 |
| 11.4 | 25 | 60 | 10 |
| 11.5 | 25 | 60 | 10 |
| 11.6 | 25 | 60 | 10 |
| 11.7 | 25 | 60 | 10 |
| 11.8 | 25 | 60 | 10 |
| 11.9 | 25 | 60 | 10 |
| 12 | 25 | 60 | 10 |
| 12.5 | 25 | 60 | 10 |
| 13 | 25 | 60 | 10 |
| 13.5 | 25 | 60 | 10 |
| 14 | 25 | 60 | 10 |
| 14.5 | 25 | 60 | 10 |
| 15 | 25 | 60 | 10 |
| 15.5 | 25 | 60 | 10 |
| 16 | 25 | 60 | 10 |

超硬

# TR-P/TRL-P

## タップ リムーバーPlus *Tap Remover Plus*

切削条件表 P274

**折損タップ除去専用**

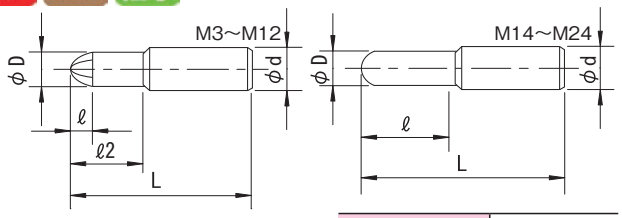
右直刃 | 右ネジレ30° | P Coating | 超微粒子



（M3～M12）



（M14～M24）




| 公差(Tolerance) | d：h7 |
|---|---|

右刃ストレート（M14用以上　刃数:4　右刃右ネジレ30°）Pコーティング　超微粒子
Straight Flute (For M14 and over:Helix Angle-Right30°)　PCoating　Ultra Micro Grain Carbide

| 型番 *Size* | タップサイズ *Tap Size* | 外径（ΦD） *Cut Diameter* | 刃長（ℓ） *Cut Length* | 有効長（ℓ2） *Effective Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|---|
| TR-P 3 | M 3 | 2.2 | 3.5 | 9 | 40 | 6 |
| TR-P 4 | M 4 | 3.1 | 4 | 12 | 40 | 6 |
| TR-P 5 | M 5 | 3.8 | 4 | 15 | 45 | 6 |
| TR-P 6 | M 6 | 4.6 | 4.5 | 18 | 50 | 6 |
| TR-P 8 | M 8 | 6.2 | 5.5 | 24 | 55 | 8 |
| TR-P 10 | M10 | 7.1 | 6 | 30 | 60 | 10 |
| TR-P 12 | M12 | 8.6 | 6.5 | 30 | 60 | 12 |
| TR-P 14 | M14 | 10.6 | 40 | | 90 | 16 |
| TR-P 16 | M16 | 12 | 45 | | 95 | 16 |
| TR-P 18 | M18 | 14 | 50 | | 100 | 16 |
| TR-P 20 | M20 | 15 | 50 | | 100 | 16 |
| TR-P 22 | M22 | 17 | 55 | | 110 | 20 |
| TR-P 24 | M24 | 19 | 60 | | 120 | 20 |

| 型番 *Size* | タップサイズ *Tap Size* | 外径（ΦD） *Cut Diameter* | 刃長（ℓ） *Cut Length* | 有効長（ℓ2） *Effective Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|---|
| TRL-P 3 | M 3 | 2.2 | 3.5 | 15 | 40 | 6 |
| TRL-P 4 | M 4 | 3.1 | 4 | 20 | 45 | 6 |
| TRL-P 5 | M 5 | 3.8 | 4 | 25 | 50 | 6 |
| TRL-P 6 | M 6 | 4.6 | 4.5 | 30 | 60 | 6 |
| TRL-P 8 | M 8 | 6.2 | 5.5 | 35 | 65 | 8 |
| TRL-P 10 | M10 | 7.1 | 6 | 40 | 75 | 10 |
| TRL-P 12 | M12 | 8.6 | 6.5 | 40 | 80 | 12 |

### ①切削前に
Before operation

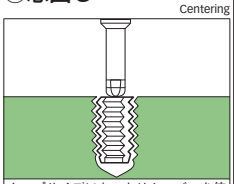
必ずフライス盤でコレットチャックをご使用ください（油圧チャック不可）
Make sure to use milling machine with collet chuck.
(Don't use Hydraulic chuck.)



タップ折れ口が、ワークより極端にはみ出している時は、平らにカットして下さい

それ以外の場合、前処理は一切不要です
When the broken part of the tap is protruding from work piece, grind it flat.

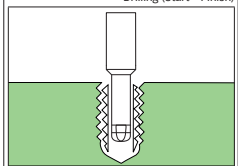
### ②芯出し
Centering



タップサイズにあったリムーバーを使用し、タップとリムーバーのセンター（芯出し）は、出来るだけ正確に出して下さい

Centering should be precisely done with Tap Remover Plus that is suitable for the broken tap size.

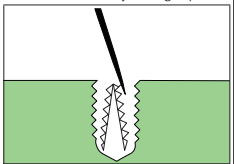
### ③切削開始→終了
Drilling (Start→Finish)



切削油はタップリとかけ、切削は湿式、主軸送りはハンドリングにて行って下さい
切削抵抗がなくなったら切削は終了です

When drilling, it is advised to use plenty of coolant. Feed should be done manually.
Once there is no cutting resistance on Tap Remover Puls, the drilling process is completed.

### ④最終切屑処理
Finally clearing chip waste

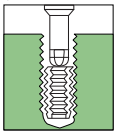


穴に残った切屑を、きれいに取除き、再度タップ通しを行って完了です

Remove chip waste including peripheral remnants of the tap.
Once the hole is cleared, tapping can be resumed.

### TRL-P ロングサイズ（セカンドカット専用）の使い方
How to use Tap Remover Long Size.

●最初からロングサイズはご使用になれません
Tap Remover Long Size can not be used at first process.

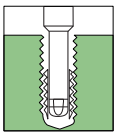


レギュラーサイズ
Regular Size

■ファーストカット
First process

まず、タップサイズに合ったレギュラータイプを使い、一定の深さ（有効長の50%）まで除去加工をして下さい

At first, the drilling is preformed untill certain depth (50% of the effective length) by using regular size Tap Remover Plus suitable for the tap size.



ロングサイズ
Long Size

■セカンドカット
Second process

ネジ山などに残った切屑を、ピンやエアーを使って完全に取除いてからロングサイズのタップリムーバーで除去をします。

Long size Tap Remover Plus can be used after getting rid of the chips left on the thread by using pin or air.

ファーストカット、セカンドカットとも、中間切屑処理を数回行うようにして下さい

It is recommended that the chip waste in the hole be removed occasionally during both processes.

### 使用条件と注意点
Work condition

（1）必ず、フライス盤（汎用、NC、MC）でご使用ください。
（2）チャックは剛性のあるものをご使用ください
（3）芯出しは正確に行ってください
（4）切削油をかけてください

(1) When processing, use milling machine (General use/NC/MC) Do not use drilling machine, radial drilling machine.
(2)Use chuck with rigidity.
(3)Centering should be done with accuracy.
(4)During the drilling process, use plenty of coolant.

### タップリムーバー切削条件表
Drilling condition for Tap Remover Plus

| 呼び寸法 *Size* | 回転数 *Spindle speed rpm* | 送り *feed mm/min* |
|---|---|---|
| TR-P/TRL-P 3 | 650～1,000 | 5～10mm |
| TR-P/TRL-P 4 | | |
| TR-P/TRL-P 5 | | |
| TR-P/TRL-P 6 | | |
| TR-P/TRL-P 8 | | |
| TR-P/TRL-P10 | | |
| TR-P/TRL-P12 | | |
| TR-P 14 | 300～ 700 | |
| TR-P 16 | | |
| TR-P 18 | | |
| TR-P 20 | | |
| TR-P 22 | | |
| TR-P 24 | | |

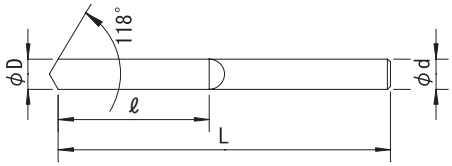
超硬

# CSHD

## 超硬半月ドリル　*Solid Carbide Half Drill*

切削条件表 P287　非鉄・樹脂加工　右直刃　K10






| 公差(Tolerance) | D：$^{0}_{-0.005}$ | d：h6 |
|---|---|---|

右刃ストレート　K10
Straight Flute　Micro Grain Carbide(K10)

| 刃径 (ΦD) *Dia.* | 溝長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **0.7** | 8 | 30 | 0.7 |
| **0.8** | 10 | 30 | 0.8 |
| **0.9** | 10 | 30 | 0.9 |
| **1** | 13 | 30 | 1 |
| **1.1** | 13 | 30 | 1.1 |
| **1.2** | 13 | 30 | 1.2 |
| **1.3** | 18 | 35 | 1.3 |
| **1.4** | 18 | 35 | 1.4 |
| **1.5** | 18 | 35 | 1.5 |
| **1.6** | 18 | 35 | 1.6 |
| **1.7** | 18 | 35 | 1.7 |
| **1.8** | 20 | 40 | 1.8 |
| **1.9** | 20 | 40 | 1.9 |
| **2** | 20 | 40 | 2 |
| **2.1** | 20 | 40 | 2.1 |
| **2.2** | 20 | 40 | 2.2 |
| **2.3** | 23 | 45 | 2.3 |
| **2.4** | 23 | 45 | 2.4 |
| **2.5** | 23 | 45 | 2.5 |
| **2.6** | 23 | 45 | 2.6 |
| **2.7** | 23 | 45 | 2.7 |
| **2.8** | 23 | 45 | 2.8 |
| **2.9** | 23 | 45 | 2.9 |
| **3** | 25 | 50 | 3 |
| **3.1** | 25 | 50 | 3.1 |
| **3.2** | 25 | 50 | 3.2 |
| **3.3** | 25 | 50 | 3.3 |

| 刃径 (ΦD) *Dia.* | 溝長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **3.4** | 25 | 50 | 3.4 |
| **3.5** | 25 | 50 | 3.5 |
| **3.6** | 30 | 55 | 3.6 |
| **3.7** | 30 | 55 | 3.7 |
| **3.8** | 30 | 55 | 3.8 |
| **3.9** | 30 | 55 | 3.9 |
| **4** | 30 | 55 | 4 |
| **4.1** | 30 | 55 | 4.1 |
| **4.2** | 30 | 55 | 4.2 |
| **4.3** | 30 | 55 | 4.3 |
| **4.4** | 30 | 55 | 4.4 |
| **4.5** | 35 | 60 | 4.5 |
| **4.6** | 35 | 60 | 4.6 |
| **4.7** | 35 | 60 | 4.7 |
| **4.8** | 35 | 60 | 4.8 |
| **4.9** | 35 | 60 | 4.9 |
| **5** | 40 | 65 | 5 |
| **5.1** | 40 | 65 | 5.1 |
| **5.2** | 40 | 65 | 5.2 |
| **5.3** | 40 | 65 | 5.3 |
| **5.4** | 40 | 65 | 5.4 |
| **5.5** | 40 | 65 | 5.5 |
| **5.6** | 40 | 65 | 5.6 |
| **5.7** | 45 | 70 | 5.7 |
| **5.8** | 45 | 70 | 5.8 |
| **5.9** | 45 | 70 | 5.9 |
| **6** | 45 | 70 | 6 |

超硬

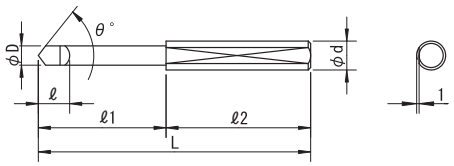
# CCTS/CCTL

## 超硬センタリングツール *Solid Carbide Head Centering Tool Point 90°·118°*

切削条件表 P287

**位置決め・面取り加工**






| 公差(Tolerance) | D：h8 | θ：$^{0}_{-30'}$ | d：h7 |
|---|---|---|---|

## 《CCTS》 ショートタイプ K10・G2
Micro Grain Carbide (K10・G2) Short Type

K10 G2

| 刃径 (ΦD) *Dia.* | 先端角 (θ) *Point Angle* | 溝長 (ℓ) *Length of Flutes* | 首下 (ℓ1) *Neck Length* | シャンク長 (ℓ2) *Length of Shank* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|---|---|
| 12 | 90° | 20 | 70 | 110 | 180 | 16 |
| | | 20 | 70 | 110 | 180 | 20 |
| | | 20 | 70 | 110 | 180 | 25 |
| 16 | 90° | 30 | 70 | 110 | 180 | 16 |
| | | 30 | 70 | 110 | 180 | 20 |
| | | 30 | 70 | 110 | 180 | 25 |
| 19 | 90° | 30 | 70 | 110 | 180 | 16 |
| | | 30 | 70 | 110 | 180 | 20 |
| | | 30 | 70 | 110 | 180 | 25 |
| 25 | 90° | 30 | 70 | 110 | 180 | 16 |
| | | 30 | 70 | 110 | 180 | 20 |
| | | 30 | 70 | 110 | 180 | 25 |
| 30 | 90° | 35 | 70 | 110 | 180 | 20 |
| | | 35 | 70 | 110 | 180 | 25 |
| | | 35 | 70 | 110 | 180 | 32 |
| 35 | 90° | 40 | 70 | 110 | 180 | 25 |
| | | 40 | 70 | 110 | 180 | 32 |
| | | 40 | 70 | 110 | 180 | 42 |
| 40 | 90° | 40 | 70 | 110 | 180 | 25 |
| | | 40 | 70 | 110 | 180 | 32 |
| | | 40 | 70 | 110 | 180 | 42 |
| 45 | 90° | 40 | 70 | 110 | 180 | 25 |
| | | 40 | 70 | 110 | 180 | 32 |
| | | 40 | 70 | 110 | 180 | 42 |
| 50 | 90° | 45 | 70 | 110 | 180 | 25 |
| | | 45 | 70 | 110 | 180 | 32 |
| | | 45 | 70 | 110 | 180 | 42 |

| 刃径 (ΦD) *Dia.* | 先端角 (θ) *Point Angle* | 溝長 (ℓ) *Length of Flutes* | 首下 (ℓ1) *Neck Length* | シャンク長 (ℓ2) *Length of Shank* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|---|---|
| 12 | 118° | 20 | 70 | 110 | 180 | 16 |
| | | 20 | 70 | 110 | 180 | 20 |
| | | 20 | 70 | 110 | 180 | 25 |
| 16 | 118° | 30 | 70 | 110 | 180 | 16 |
| | | 30 | 70 | 110 | 180 | 20 |
| | | 30 | 70 | 110 | 180 | 25 |
| 19 | 118° | 30 | 70 | 110 | 180 | 16 |
| | | 30 | 70 | 110 | 180 | 20 |
| | | 30 | 70 | 110 | 180 | 25 |
| 25 | 118° | 30 | 70 | 110 | 180 | 16 |
| | | 30 | 70 | 110 | 180 | 20 |
| | | 30 | 70 | 110 | 180 | 25 |
| 30 | 118° | 35 | 70 | 110 | 180 | 20 |
| | | 35 | 70 | 110 | 180 | 25 |
| | | 35 | 70 | 110 | 180 | 32 |
| 35 | 118° | 40 | 70 | 110 | 180 | 25 |
| | | 40 | 70 | 110 | 180 | 32 |
| | | 40 | 70 | 110 | 180 | 42 |
| 40 | 118° | 40 | 70 | 110 | 180 | 25 |
| | | 40 | 70 | 110 | 180 | 32 |
| | | 40 | 70 | 110 | 180 | 42 |
| 45 | 118° | 40 | 70 | 110 | 180 | 25 |
| | | 40 | 70 | 110 | 180 | 32 |
| | | 40 | 70 | 110 | 180 | 42 |
| 50 | 118° | 45 | 70 | 110 | 180 | 25 |
| | | 45 | 70 | 110 | 180 | 32 |
| | | 45 | 70 | 110 | 180 | 42 |

| 公差(Tolerance) | D：h8 | θ：$^{0}_{-30'}$ | d：h7 |
|---|---|---|---|

## 《CCTL》 ロングタイプ K10・G2
Micro Grain Carbide (K10・G2) Long Type

K10 G2

| 刃径 (ΦD) *Dia.* | 先端角 (θ) *Point Angle* | 溝長 (ℓ) *Length of Flutes* | 首下 (ℓ1) *Neck Length* | シャンク長 (ℓ2) *Length of Shank* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|---|---|
| 12 | 90° | 20 | 100 | 150 | 250 | 16 |
| | | 20 | 100 | 150 | 250 | 20 |
| | | 20 | 100 | 150 | 250 | 25 |
| 16 | 90° | 30 | 100 | 150 | 250 | 16 |
| | | 30 | 100 | 150 | 250 | 20 |
| | | 30 | 100 | 150 | 250 | 25 |

| 刃径 (ΦD) *Dia.* | 先端角 (θ) *Point Angle* | 溝長 (ℓ) *Length of Flutes* | 首下 (ℓ1) *Neck Length* | シャンク長 (ℓ2) *Length of Shank* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|---|---|
| 12 | 118° | 20 | 100 | 150 | 250 | 16 |
| | | 20 | 100 | 150 | 250 | 20 |
| | | 20 | 100 | 150 | 250 | 25 |
| 16 | 118° | 30 | 100 | 150 | 250 | 16 |
| | | 30 | 100 | 150 | 250 | 20 |
| | | 30 | 100 | 150 | 250 | 25 |

# CCTS/CCTL 超硬センタリングツール

## 《CCTL》

| 刃径 (ΦD) Dia. | 先端角 (θ) Point Angle | 溝長 (ℓ) Length of Flutes | 首下 (ℓ1) Neck Length | シャンク長 (ℓ2) Length of Shank | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|
| 19 | 90° | 30 | 100 | 200 | 300 | 16 |
| | | 30 | 100 | 200 | 300 | 20 |
| | | 30 | 100 | 200 | 300 | 25 |
| 25 | 90° | 30 | 100 | 200 | 300 | 16 |
| | | 30 | 100 | 200 | 300 | 20 |
| | | 30 | 100 | 200 | 300 | 25 |
| 30 | 90° | 35 | 100 | 200 | 300 | 20 |
| | | 35 | 100 | 200 | 300 | 25 |
| | | 35 | 100 | 200 | 300 | 32 |
| 35 | 90° | 40 | 100 | 200 | 300 | 25 |
| | | 40 | 100 | 200 | 300 | 32 |
| | | 40 | 100 | 200 | 300 | 42 |
| 40 | 90° | 40 | 100 | 200 | 300 | 25 |
| | | 40 | 100 | 200 | 300 | 32 |
| | | 40 | 100 | 200 | 300 | 42 |
| 45 | 90° | 40 | 100 | 200 | 300 | 25 |
| | | 40 | 100 | 200 | 300 | 32 |
| | | 40 | 100 | 200 | 300 | 42 |
| 50 | 90° | 45 | 100 | 200 | 300 | 25 |
| | | 45 | 100 | 200 | 300 | 32 |
| | | 45 | 100 | 200 | 300 | 42 |

| 刃径 (ΦD) Dia. | 先端角 (θ) Point Angle | 溝長 (ℓ) Length of Flutes | 首下 (ℓ1) Neck Length | シャンク長 (ℓ2) Length of Shank | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|
| 19 | 118° | 30 | 100 | 200 | 300 | 16 |
| | | 30 | 100 | 200 | 300 | 20 |
| | | 30 | 100 | 200 | 300 | 25 |
| 25 | 118° | 30 | 100 | 200 | 300 | 16 |
| | | 30 | 100 | 200 | 300 | 20 |
| | | 30 | 100 | 200 | 300 | 25 |
| 30 | 118° | 35 | 100 | 200 | 300 | 20 |
| | | 35 | 100 | 200 | 300 | 25 |
| | | 35 | 100 | 200 | 300 | 32 |
| 35 | 118° | 40 | 100 | 200 | 300 | 25 |
| | | 40 | 100 | 200 | 300 | 32 |
| | | 40 | 100 | 200 | 300 | 42 |
| 40 | 118° | 40 | 100 | 200 | 300 | 25 |
| | | 40 | 100 | 200 | 300 | 32 |
| | | 40 | 100 | 200 | 300 | 42 |
| 45 | 118° | 40 | 100 | 200 | 300 | 25 |
| | | 40 | 100 | 200 | 300 | 32 |
| | | 40 | 100 | 200 | 300 | 42 |
| 50 | 118° | 45 | 100 | 200 | 300 | 25 |
| | | 45 | 100 | 200 | 300 | 32 |
| | | 45 | 100 | 200 | 300 | 42 |

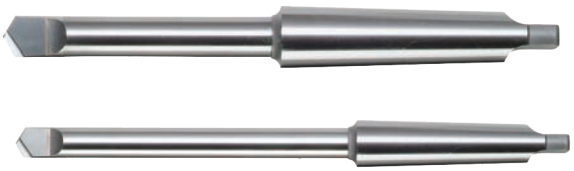
超硬

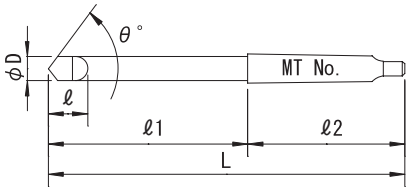
# CCTST/CCTLT

## 超硬センタリングツール（テーパーシャンク） *Solid Carbide Head Centering Tool Point 90°·118°*

切削条件表 P287

**位置決め・面取り加工**






| 公差(Tolerance) | D：h8 | θ：$^{0}_{-30'}$ |
|---|---|---|

| 公差(Tolerance) | D：h8 | θ：$^{0}_{-30'}$ |
|---|---|---|

## 《CCTST》 ショートタイプ K10・G2 Micro Grain Carbide(K10・G2) Short Type

K10 G2

| 刃径 (ΦD) Dia. | 先端角 (θ) Point Angle | 溝長 (ℓ) Length of Flutes | 首下 (ℓ1) Neck Length | シャンク長 (ℓ2) Length of Shank | 全長 (L) Overall Length | MT No. Shank MTNo. |
|---|---|---|---|---|---|---|
| 12 | 90° | 20 | 80 | 80 | 160 | 2 |
| 16 | | 30 | 100 | 80 | 180 | 2 |
| 19 | | 30 | 110 | 80 | 190 | 2 |
| 25 | | 30 | 140 | 99 | 239 | 3 |
| 30 | | 35 | 140 | 99 | 239 | 3 |
| 35 | | 40 | 141 | 124 | 265 | 4 |
| 40 | | 40 | 141 | 124 | 265 | 4 |
| 12 | 118° | 20 | 80 | 80 | 160 | 2 |
| 16 | | 30 | 100 | 80 | 180 | 2 |
| 19 | | 30 | 110 | 80 | 190 | 2 |
| 25 | | 30 | 140 | 99 | 239 | 3 |
| 30 | | 35 | 140 | 99 | 239 | 3 |
| 35 | | 40 | 141 | 124 | 265 | 4 |
| 40 | | 40 | 141 | 124 | 265 | 4 |

## 《CCTLT》 ロングタイプ K10・G2 Micro Grain Carbide(K10・G2) Long Type

K10 G2

| 刃径 (ΦD) Dia. | 先端角 (θ) Point Angle | 溝長 (ℓ) Length of Flutes | 首下 (ℓ1) Neck Length | シャンク長 (ℓ2) Length of Shank | 全長 (L) Overall Length | MT No. Shank MTNo. |
|---|---|---|---|---|---|---|
| 12 | 90° | 20 | 130 | 80 | 210 | 2 |
| 16 | | 30 | 150 | 80 | 230 | 2 |
| 19 | | 30 | 160 | 80 | 240 | 2 |
| 25 | | 30 | 190 | 99 | 289 | 3 |
| 30 | | 35 | 190 | 99 | 289 | 3 |
| 35 | | 40 | 216 | 124 | 340 | 4 |
| 40 | | 40 | 216 | 124 | 340 | 4 |
| 12 | 118° | 20 | 130 | 80 | 210 | 2 |
| 16 | | 30 | 150 | 80 | 230 | 2 |
| 19 | | 30 | 160 | 80 | 240 | 2 |
| 25 | | 30 | 190 | 99 | 289 | 3 |
| 30 | | 35 | 190 | 99 | 289 | 3 |
| 35 | | 40 | 216 | 124 | 340 | 4 |
| 40 | | 40 | 216 | 124 | 340 | 4 |

ハイス

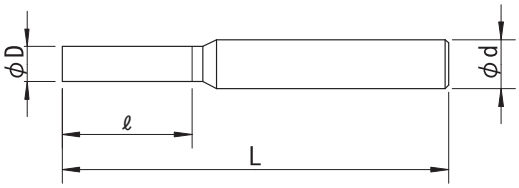
# FZD-A

## フラットザグリドリル *Flat Drill For Counterboring*

切削条件表 P288 | ドリル・ザグリ加工 | 右ネジレ 25° | TiAlN | 刃数 2 | 粉末ハイス








| 公差 (Tolerance) | D | | d |
|---|---|---|---|
| | 0.1トビ Increment 0.1 | 0.05トビ Increment 0.05 | h7 |
| | 0 −0.03 | 0 −0.009 | |

右刃右ネジレ25° TiAlNコーティング 刃数:2 粉末ハイス
Helix Angle-Right25° TiAlN Coating 2 Flutes Powder Metallurgy

| 刃径 (ΦD) *Dia.* | 溝長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **2** | 8 | 50 | 4 |
| **2.1** | 8 | 50 | 4 |
| **2.2** | 8 | 50 | 4 |
| **2.3** | 8 | 50 | 4 |
| **2.4** | 8 | 50 | 4 |
| **2.5** | 10 | 50 | 4 |
| **2.6** | 10 | 50 | 4 |
| **2.7** | 10 | 50 | 4 |
| **2.8** | 10 | 50 | 4 |
| **2.9** | 10 | 50 | 4 |
| **3** | 12 | 50 | 4 |
| **3.1** | 12 | 50 | 4 |
| **3.2** | 12 | 50 | 4 |
| **3.3** | 12 | 50 | 4 |
| **3.4** | 12 | 50 | 4 |
| **3.5** | 14 | 50 | 4 |
| **3.6** | 14 | 50 | 4 |
| **3.7** | 14 | 50 | 4 |
| **3.8** | 14 | 50 | 4 |
| **3.9** | 14 | 50 | 4 |
| **4** | 16 | 50 | 4 |
| **4.1** | 16 | 50 | 6 |
| **4.2** | 16 | 50 | 6 |
| **4.3** | 16 | 50 | 6 |
| **4.4** | 16 | 50 | 6 |
| **4.5** | 18 | 50 | 6 |
| **4.6** | 18 | 50 | 6 |
| **4.7** | 18 | 50 | 6 |
| **4.8** | 20 | 60 | 6 |
| **4.9** | 20 | 60 | 6 |
| **5** | 20 | 60 | 6 |
| **5.1** | 20 | 60 | 6 |
| **5.2** | 20 | 60 | 6 |
| **5.3** | 20 | 60 | 6 |
| **5.4** | 20 | 60 | 6 |
| **5.5** | 22 | 60 | 6 |
| **5.6** | 22 | 60 | 6 |
| **5.7** | 22 | 60 | 6 |
| **5.8** | 22 | 60 | 6 |
| **5.9** | 22 | 60 | 6 |
| **6** | 22 | 60 | 6 |
| **6.1** | 24 | 70 | 6 |
| **6.2** | 24 | 70 | 6 |
| **6.3** | 24 | 70 | 6 |
| **6.4** | 24 | 70 | 6 |
| **6.5** | 28 | 70 | 6 |
| **6.6** | 28 | 70 | 6 |

| 刃径 (ΦD) *Dia.* | 溝長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **6.7** | 28 | 70 | 6 |
| **6.8** | 28 | 70 | 6 |
| **6.9** | 28 | 70 | 6 |
| **7** | 28 | 70 | 6 |
| **7.1** | 28 | 70 | 6 |
| **7.2** | 28 | 70 | 6 |
| **7.3** | 28 | 70 | 6 |
| **7.4** | 28 | 70 | 6 |
| **7.5** | 28 | 70 | 6 |
| **7.6** | 28 | 70 | 6 |
| **7.7** | 28 | 70 | 6 |
| **7.8** | 28 | 70 | 6 |
| **7.9** | 28 | 70 | 6 |
| **8** | 28 | 70 | 8 |
| **8.1** | 28 | 80 | 8 |
| **8.2** | 28 | 80 | 8 |
| **8.3** | 28 | 80 | 8 |
| **8.4** | 28 | 80 | 8 |
| **8.5** | 28 | 80 | 8 |
| **8.6** | 28 | 80 | 8 |
| **8.7** | 28 | 80 | 8 |
| **8.8** | 28 | 80 | 8 |
| **8.9** | 28 | 80 | 8 |
| **9** | 30 | 80 | 8 |
| **9.1** | 30 | 80 | 8 |
| **9.2** | 30 | 80 | 8 |
| **9.3** | 30 | 80 | 8 |
| **9.4** | 30 | 80 | 8 |
| **9.5** | 32 | 80 | 8 |
| **9.6** | 32 | 80 | 8 |
| **9.7** | 32 | 80 | 8 |
| **9.8** | 32 | 80 | 8 |
| **9.9** | 32 | 80 | 8 |
| **10** | 32 | 80 | 10 |
| **10.1** | 33 | 90 | 10 |
| **10.2** | 33 | 90 | 10 |
| **10.3** | 33 | 90 | 10 |
| **10.4** | 33 | 90 | 10 |
| **10.5** | 33 | 90 | 10 |
| **10.6** | 33 | 90 | 10 |
| **10.7** | 33 | 90 | 10 |
| **10.8** | 33 | 90 | 10 |
| **10.9** | 33 | 90 | 10 |
| **11** | 35 | 90 | 10 |
| **11.1** | 35 | 90 | 10 |
| **11.2** | 35 | 90 | 10 |
| **11.3** | 35 | 90 | 10 |

# FZD-A フラットザグリドリル

| 刃径 (ΦD) Dia. | 溝長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|
| **11.4** | 35 | 90 | 10 |
| **11.5** | 38 | 90 | 10 |
| **11.6** | 38 | 90 | 10 |
| **11.7** | 38 | 90 | 10 |
| **11.8** | 38 | 90 | 10 |
| **11.9** | 38 | 90 | 10 |
| **12** | 38 | 90 | 12 |
| **12.5** | 40 | 100 | 12 |
| **13** | 40 | 100 | 12 |
| **13.5** | 40 | 100 | 12 |
| **14** | 40 | 100 | 12 |

| 刃径 (ΦD) Dia. | 溝長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|
| **14.5** | 40 | 105 | 12 |
| **15** | 40 | 105 | 12 |
| **15.5** | 42 | 110 | 12 |
| **16** | 42 | 110 | 16 |
| **16.5** | 42 | 115 | 16 |
| **17** | 42 | 115 | 16 |
| **17.5** | 42 | 115 | 16 |
| **18** | 42 | 115 | 16 |
| **18.5** | 42 | 115 | 16 |
| **19** | 42 | 115 | 16 |
| **19.5** | 42 | 125 | 16 |
| **20** | 42 | 125 | 20 |

| 刃径 (ΦD) Dia. | 溝長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|
| **2.05 ～ 2.45** | 8 | 50 | 4 |
| **2.55 ～ 2.95** | 10 | 50 | 4 |
| **3.05 ～ 3.45** | 12 | 50 | 4 |
| **3.55 ～ 3.95** | 14 | 50 | 4 |
| **4.05 ～ 4.45** | 16 | 50 | 6 |
| **4.55 ～ 4.75** | 18 | 50 | 6 |
| **4.85 ～ 4.95** | 20 | 60 | 6 |
| **5.05 ～ 5.45** | 20 | 60 | 6 |
| **5.55 ～ 5.95** | 22 | 60 | 6 |
| **6.05** | 22 | 60 | 6 |
| **6.15 ～ 6.45** | 24 | 70 | 6 |

| 刃径 (ΦD) Dia. | 溝長 (ℓ) Length of Flutes | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|
| **6.55 ～ 6.95** | 28 | 70 | 6 |
| **7.05 ～ 7.45** | 28 | 70 | 6 |
| **7.55 ～ 7.95** | 28 | 70 | 6 |
| **8.05 ～ 8.45** | 28 | 80 | 8 |
| **8.55 ～ 8.95** | 28 | 80 | 8 |
| **9.05 ～ 9.45** | 30 | 80 | 8 |
| **9.55 ～ 9.95** | 32 | 80 | 8 |
| **10.05 ～ 10.45** | 33 | 90 | 10 |
| **10.55 ～ 10.95** | 33 | 90 | 10 |
| **11.05 ～ 11.45** | 35 | 90 | 10 |
| **11.55 ～ 11.95** | 38 | 90 | 10 |

ハイス

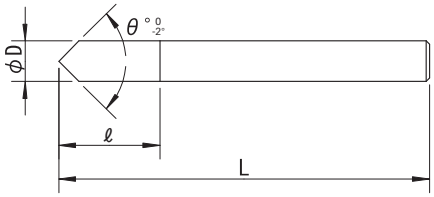
# GSS

## スターティングドリル *Starting Drill*

切削条件表 P288 | 位置決め・面取り加工 | 右ネジレ 15～20° | TiN | 刃数 2 | HSS Co








| 公差 (Tolerance) | D | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 0 −0.01 | 4～ 6 | 0 −0.012 | 8～10 | 0 −0.015 | 12～16 | 0 −0.018 | 20～25 | 0 −0.021 |

右刃右ネジレ15°～20° TiNコーティング 刃数:2 SKH56
Helix Angle-Right15°~20° TiN Coating 2 Flutes HSS-Co.

| 刃径 (ΦD) *Dia.* | 先端角 (θ) *Point Angle* | 溝長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* |
|---|---|---|---|
| **3** | 135° | 12 | 50 |
| **4** | | 15 | 55 |
| **5** | | 18 | 60 |
| **6** | | 20 | 65 |
| **8** | | 25 | 80 |
| **10** | | 30 | 90 |

| 刃径 (ΦD) *Dia.* | 先端角 (θ) *Point Angle* | 溝長 (ℓ) *Length of Flutes* | 全長 (L) *Overall Length* |
|---|---|---|---|
| **3** | 90° | 12 | 50 |
| **4** | | 15 | 55 |
| **5** | | 18 | 60 |
| **6** | | 20 | 65 |
| **8** | | 25 | 80 |
| **10** | | 30 | 90 |
| **12** | | 35 | 100 |
| **16** | | 40 | 115 |
| **20** | | 50 | 130 |
| **25** | | 60 | 150 |

ハイス

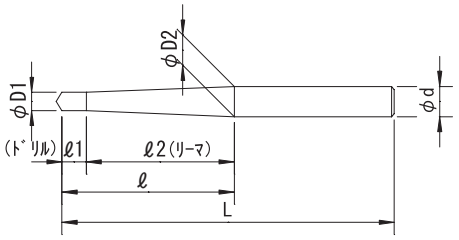
# TPD

## テーパーピンドリル（ストレートシャンク） *Taper Pin Drill With Straight Shank*

切削条件表 P289 | テーパー穴加工 | 右ネジレ | 刃数 2 | HSS Co








| 公差(Tolerance) | D1：h8 | d：h8 |
|---|---|---|

### 1/50テーパー　右刃右ネジレ　刃数:2　SKH56
1/50Taper　Helix Angle-Right　2 Flutes　HSS-Co.

| 呼び寸法 Size | 小径(ΦD1) First Dia. | 刃長(ℓ) Length of Flutes | 大径(ΦD2) Dia at Large End | ドリル長(ℓ1) Length of Drill | リーマ長(ℓ2) Length of reamer | 全長(L) Overall Length | シャンク径(Φd) Shank Dia. |
|---|---|---|---|---|---|---|---|
| 2 | 1.98 | 45 | 2.84 | 2 | 43 | 65 | 2.8 |
| 2.5 | 2.48 | 52 | 3.44 | 4 | 48 | 75 | 3.2 |
| 3 | 2.98 | 62 | 4.14 | 4 | 58 | 100 | 4 |
| 4 | 3.98 | 74 | 5.38 | 4 | 70 | 115 | 5 |
| 5 | 4.98 | 88 | 6.62 | 6 | 82 | 135 | 6.5 |
| 6 | 5.97 | 100 | 7.85 | 6 | 94 | 150 | 7.5 |
| 7 | 6.97 | 120 | 9.25 | 6 | 114 | 175 | 9 |
| 8 | 7.97 | 146 | 10.69 | 10 | 136 | 205 | 10 |

| 呼び寸法 Size | 小径(ΦD1) First Dia. | 刃長(ℓ) Length of Flutes | 大径(ΦD2) Dia at Large End | ドリル長(ℓ1) Length of Drill | リーマ長(ℓ2) Length of reamer | 全長(L) Overall Length | シャンク径(Φd) Shank Dia. |
|---|---|---|---|---|---|---|---|
| 9 | 8.96 | 168 | 12.12 | 10 | 158 | 230 | 12 |
| 10 | 9.96 | 168 | 13.12 | 10 | 158 | 230 | 13 |
| 11 | 10.96 | 178 | 14.32 | 10 | 168 | 245 | 14 |
| 12 | 11.96 | 192 | 15.5 | 15 | 177 | 260 | 15 |
| 13 | 12.96 | 202 | 16.7 | 15 | 187 | 275 | 16 |
| 14 | 13.95 | 241 | 18.47 | 15 | 226 | 320 | 16 |
| 15 | 14.95 | 241 | 19.47 | 15 | 226 | 320 | 20 |
| 16 | 15.95 | 241 | 20.47 | 15 | 226 | 320 | 20 |
| 20 | 19.95 | 282 | 25.15 | 22 | 260 | 370 | 25 |

ハイス

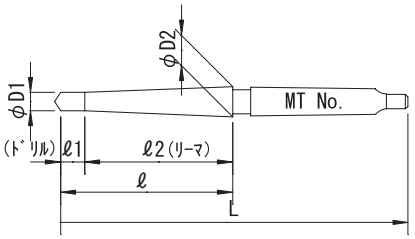
# TPDT

## テーパーピンドリル（テーパーシャンク） *Taper Pin Drill With Taper Shank*

切削条件表 P289 | テーパー穴加工 | 右ネジレ | 刃数 2 | HSS Co








| 公差(Tolerance) | D1：h8 |
|---|---|

### 1/50テーパー　右刃右ネジレ　刃数:2　SKH56
1/50Taper　Helix Angle-Right　2 Flutes　HSS-Co.

| 呼び寸法 Size | 小径(ΦD1) First Dia. | 刃長(ℓ) Length of Flutes | 大径(ΦD2) Dia at Large End | ドリル長(ℓ1) Length of Drill | リーマ長(ℓ2) Length of reamer | 全長(L) Overall Length | MT No. Shank MTNo. |
|---|---|---|---|---|---|---|---|
| 5 | 4.98 | 88 | 6.62 | 6 | 82 | 165 | 1 |
| 6 | 5.97 | 100 | 7.85 | 6 | 94 | 175 | 1 |
| 7 | 6.97 | 120 | 9.25 | 6 | 114 | 195 | 1 |
| 8 | 7.97 | 146 | 10.69 | 10 | 136 | 220 | 1 |
| 9 | 8.96 | 168 | 12.12 | 10 | 158 | 245 | 1 |
| 10 | 9.96 | 168 | 13.12 | 10 | 158 | 245 | 1 |
| 11 | 10.96 | 178 | 14.32 | 10 | 168 | 270 | 2 |

| 呼び寸法 Size | 小径(ΦD1) First Dia. | 刃長(ℓ) Length of Flutes | 大径(ΦD2) Dia at Large End | ドリル長(ℓ1) Length of Drill | リーマ長(ℓ2) Length of reamer | 全長(L) Overall Length | MT No. Shank MTNo. |
|---|---|---|---|---|---|---|---|
| 12 | 11.96 | 192 | 15.5 | 15 | 177 | 285 | 2 |
| 13 | 12.96 | 202 | 16.7 | 15 | 187 | 290 | 2 |
| 14 | 13.95 | 241 | 18.47 | 15 | 226 | 330 | 2 |
| 15 | 14.95 | 241 | 19.47 | 15 | 226 | 330 | 2 |
| 16 | 15.95 | 241 | 20.47 | 15 | 226 | 330 | 2 |
| 18 | 17.95 | 282 | 23.15 | 22 | 260 | 390 | 3 |
| 20 | 19.95 | 282 | 25.15 | 22 | 260 | 390 | 3 |
| 25 | 24.94 | 319 | 30.88 | 22 | 297 | 430 | 3 |

ハイス

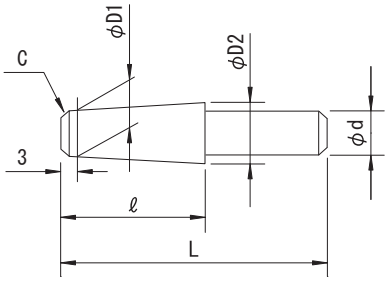
# SPTDN

## ニック付スパイラルテーパーコアドリル　*Spiral Taper Core Drill With Nick*

切削条件表 P289　テーパー穴加工　右ネジレ12°　右ネジレ20°　HSS Co








| 公差(Tolerance) | D1：±0.05 | d：h7 |
|---|---|---|

1/5, 1/6テーパー右刃右ネジレ12°　1/8, 1/10テーパー右刃右ネジレ20°　SKH56

1/5, 1/6 Taper Helix Angle-Right12°　1/8, 1/10 Taper Helix Angle-Right20°　HSS-Co.

| 呼び寸法 Size | 基準径(ΦD1) Std. Dia. | 刃長(ℓ) Length of Flutes | 大径(ΦD2) Dia at Large End | 全長(L) Overall Length | シャンク径(d) Shank Dia. | 刃数(N) Number of Flutes | C |
|---|---|---|---|---|---|---|---|
| **8-1/ 5** | 7.7 | 45 | 16.1 | 95 | 16 | 4 | 0.5 |
| **10-1/ 5** | 9.7 | 45 | 18.1 | 95 | 16 | 4 | 0.5 |
| **12-1/ 5** | 11.7 | 45 | 20.1 | 95 | 20 | 4 | 0.5 |
| **15-1/ 5** | 14.7 | 50 | 24.1 | 100 | 20 | 4 | 1 |
| **16-1/ 5** | 15.7 | 50 | 25.1 | 100 | 20 | 4 | 1 |
| **18-1/ 5** | 17.7 | 50 | 27.1 | 100 | 25 | 4 | 1 |
| **20-1/ 5** | 19.7 | 50 | 29.1 | 100 | 25 | 4 | 1 |
| **8-1/ 6** | 7.7 | 45 | 14.7 | 95 | 16 | 4 | 0.5 |
| **10-1/ 6** | 9.7 | 45 | 16.7 | 95 | 16 | 4 | 0.5 |
| **12-1/ 6** | 11.7 | 45 | 18.7 | 95 | 16 | 4 | 0.5 |
| **15-1/ 6** | 14.7 | 50 | 22.53 | 100 | 20 | 4 | 1 |
| **16-1/ 6** | 15.7 | 50 | 23.53 | 100 | 20 | 4 | 1 |
| **18-1/ 6** | 17.7 | 50 | 25.53 | 100 | 25 | 4 | 1 |
| **20-1/ 6** | 19.7 | 50 | 27.53 | 100 | 25 | 4 | 1 |

| 呼び寸法 Size | 基準径(ΦD1) Std. Dia. | 刃長(ℓ) Length of Flutes | 大径(ΦD2) Dia at Large End | 全長(L) Overall Length | シャンク径(d) Shank Dia. | 刃数(N) Number of Flutes | C |
|---|---|---|---|---|---|---|---|
| **8-1/ 8** | 7.7 | 50 | 13.58 | 100 | 12 | 4 | 0.5 |
| **10-1/ 8** | 9.7 | 50 | 15.58 | 100 | 16 | 4 | 0.5 |
| **12-1/ 8** | 11.7 | 50 | 17.58 | 100 | 16 | 4 | 0.5 |
| **15-1/ 8** | 14.7 | 55 | 21.2 | 105 | 20 | 4 | 1 |
| **16-1/ 8** | 15.7 | 55 | 22.2 | 105 | 20 | 4 | 1 |
| **18-1/ 8** | 17.7 | 55 | 24.2 | 105 | 20 | 4 | 1 |
| **20-1/ 8** | 19.7 | 55 | 26.2 | 105 | 25 | 4 | 1 |
| **8-1/10** | 7.7 | 50 | 12.4 | 100 | 12 | 4 | 0.5 |
| **10-1/10** | 9.7 | 50 | 14.4 | 100 | 16 | 4 | 0.5 |
| **12-1/10** | 11.7 | 50 | 16.4 | 100 | 16 | 4 | 0.5 |
| **15-1/10** | 14.7 | 55 | 19.9 | 105 | 20 | 4 | 1 |
| **16-1/10** | 15.7 | 55 | 20.9 | 105 | 20 | 4 | 1 |
| **18-1/10** | 17.7 | 55 | 22.9 | 105 | 20 | 4 | 1 |
| **20-1/10** | 19.7 | 55 | 24.9 | 105 | 25 | 4 | 1 |
| **22-1/10** | 21.7 | 60 | 27.4 | 115 | 25 | 4 | 1.5 |
| **25-1/10** | 24.7 | 60 | 30.4 | 115 | 25 | 4 | 1.5 |

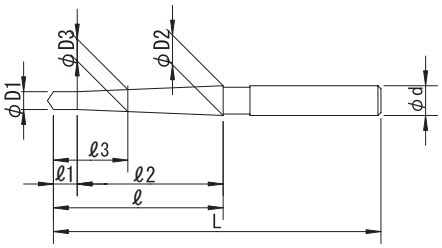
ハイス

# PTDS

## 管用ドリル（ストレートシャンク） *Drill With Straight Shank For Pipe*

切削条件表 P290 | 管用ドリル | 右ネジレ 35° | 刃数 2 | HSS Co






| 公差(Tolerance) | D1：h8 | d：h6 |
|---|---|---|

右刃右ネジレ35°　刃数:2　SKH56
Helix Angle-Right35°　2 Flutes　HSS-Co.

| 呼び寸法 Size | 小径（ΦD1） First Dia. | 刃長（ℓ） Length of Flutes | 大径（ΦD2） Dia at Large End | ドリル長（ℓ1） Length of Drill | テーパ長（ℓ2） Length of Taper | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. | （ΦD3） 基準径 Std. Dia. | （ΦD3） 許容差 Tolerance | 基準長（ℓ3） Length of Std. |
|---|---|---|---|---|---|---|---|---|---|---|
| **1/16** | 6 | 35 | 7.705 | 4 | 31 | 110 | 8 | 6.561 | ±0.05 | 14.2 |
| **1/8** | 7.8 | 40 | 9.725 | 5 | 35 | 120 | 10 | 8.564 | ±0.05 | 18.9 |
| **1/4** | 10.7 | 45 | 12.735 | 8 | 37 | 125 | 12 | 11.442 | ±0.05 | 21.5 |

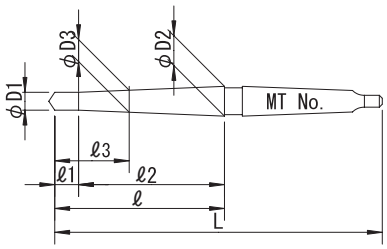
ハイス

# PTDT

## 管用ドリル（テーパーシャンク） *Drill With Taper Shank For Pipe*

切削条件表 P290 | 管用ドリル | 右ネジレ 35° | 刃数 2 | HSS Co






| 公差(Tolerance) | D1：h8 |
|---|---|

右刃右ネジレ35°　刃数:2　SKH56
Helix Angle-Right35°　2 Flutes　HSS-Co.

| 呼び寸法 Size | 小径（ΦD1） First Dia. | 刃長（ℓ） Length of Flutes | 大径（ΦD2） Dia at Large End | ドリル長（ℓ1） Length of Drill | テーパ長（ℓ2） Length of Taper | 全長（L） Overall Length | MT No. Shank MT NO. | （ΦD3） 基準径 Std. Dia. | （ΦD3） 許容差 Tolerance | 基準長（ℓ3） Length of Std. |
|---|---|---|---|---|---|---|---|---|---|---|
| **1/8** | 7.8 | 40 | 9.725 | 5 | 35 | 115 | 1 | 8.564 | ±0.05 | 18.9 |
| **1/4** | 10.7 | 45 | 12.735 | 8 | 37 | 120 | 1 | 11.442 | ±0.05 | 21.5 |
| **3/8** | 14.1 | 53 | 16.465 | 10 | 43 | 145 | 2 | 14.947 | ±0.05 | 25.4 |
| **1/2** | 17.6 | 60 | 20.24 | 12 | 48 | 152 | 2 | 18.628 | ±0.05 | 30.7 |
| **3/4** | 23.1 | 70 | 26.125 | 15 | 55 | 185 | 3 | 24.117 | ±0.05 | 33.5 |
| **1″** | 29.1 | 80 | 32.51 | 18 | 62 | 195 | 3 | 30.288 | ±0.05 | 39.6 |
| **1-1/4** | 37.7 | 90 | 41.55 | 20 | 70 | 230 | 4 | 38.948 | ±0.05 | 42.7 |
| **1-1/2** | 43.5 | 100 | 47.79 | 22 | 78 | 240 | 4 | 44.842 | ±0.05 | 46.4 |
| **2″** | 55.2 | 103 | 59.49 | 25 | 78 | 275 | 5 | 56.623 | ±0.05 | 51.4 |

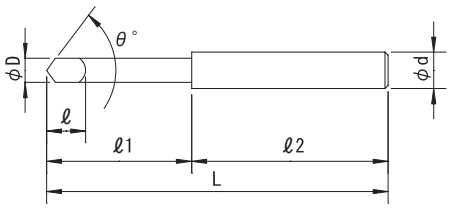
ハイス

# CT

## センタリングツール　*Centering Tool Point 90°·118°*

切削条件表 P290　位置決め・面取り加工　HSS Co






| 公差(Tolerance) | D：h8 | θ：$^{0}_{-30'}$ | d：h7 |
|---|---|---|---|

SKH57
HSS-Co.

| 刃径 (ΦD) *Dia.* | 先端角 (θ) *Point Angle* | 溝長 (ℓ) *Length of Flutes* | 首下 (ℓ1) ※ | シャンク長 (ℓ2) *Length of Shank* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|---|---|
| **10** | 90° | 13 | 45 | 135 | 180 | 12 |
| **13** | 90° | 19 | 55 | 145 | 200 | 16 |
| **15** | 90° | 19 | 55 | 145 | 200 | 16 |
| **18** | 90° | 25 | 65 | 155 | 220 | 25 |
| **20** | 90° | 25 | 65 | 155 | 220 | 25 |
| **22** | 90° | 30 | 65 | 155 | 220 | 25 |
| **25** | 90° | 35 | 80 | 140 | 220 | 25 |
| **27** | 90° | 38 | 80 | 140 | 220 | 32 |
| **30** | 90° | 42 | 90 | 150 | 240 | 32 |
| **32** | 90° | 42 | 90 | 150 | 240 | 32 |

※Cut Length Including Neck

| 刃径 (ΦD) *Dia.* | 先端角 (θ) *Point Angle* | 溝長 (ℓ) *Length of Flutes* | 首下 (ℓ1) ※ | シャンク長 (ℓ2) *Length of Shank* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|---|---|
| **10** | 118° | 13 | 45 | 135 | 180 | 12 |
| **13** | 118° | 19 | 55 | 145 | 200 | 16 |
| **15** | 118° | 19 | 55 | 145 | 200 | 16 |
| **18** | 118° | 25 | 65 | 155 | 220 | 25 |
| **20** | 118° | 25 | 65 | 155 | 220 | 25 |
| **22** | 118° | 30 | 65 | 155 | 220 | 25 |
| **25** | 118° | 35 | 80 | 140 | 220 | 25 |
| **27** | 118° | 38 | 80 | 140 | 220 | 32 |
| **30** | 118° | 42 | 90 | 150 | 240 | 32 |
| **32** | 118° | 42 | 90 | 150 | 240 | 32 |

※Cut Length Including Neck

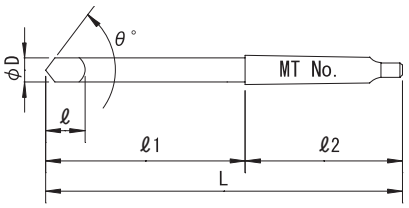
ハイス

# CTT

## センタリングツール（テーパーシャンク）　*Centering Tool With Taper Shank Point 90°·118°*

切削条件表 P290　位置決め・面取り加工　HSS Co






| 公差(Tolerance) | D：h8 | θ：$^{0}_{-30'}$ |
|---|---|---|

SKH57
HSS-Co.

| 刃径 (ΦD) *Dia.* | 先端角 (θ) *Point Angle* | 溝長 (ℓ) *Length of Flutes* | 首下 (ℓ1) ※ | シャンク長 (ℓ2) *Length of Shank* | 全長 (L) *Overall Length* | MT No. *Shank MTNo.* |
|---|---|---|---|---|---|---|
| **10** | 90° | 13 | 110 | 65.5 | 175.5 | 1 |
| **13** | 90° | 19 | 130 | 80 | 210 | 2 |
| **15** | 90° | 19 | 130 | 80 | 210 | 2 |
| **18** | 90° | 25 | 160 | 80 | 240 | 2 |
| **20** | 90° | 25 | 160 | 80 | 240 | 2 |
| **22** | 90° | 30 | 160 | 80 | 240 | 2 |
| **25** | 90° | 35 | 190 | 99 | 289 | 3 |
| **27** | 90° | 38 | 190 | 99 | 289 | 3 |
| **30** | 90° | 42 | 210 | 99 | 309 | 3 |
| **32** | 90° | 42 | 210 | 99 | 309 | 3 |

※Cut Length Including Neck

| 刃径 (ΦD) *Dia.* | 先端角 (θ) *Point Angle* | 溝長 (ℓ) *Length of Flutes* | 首下 (ℓ1) ※ | シャンク長 (ℓ2) *Length of Shank* | 全長 (L) *Overall Length* | MT No. *Shank MTNo.* |
|---|---|---|---|---|---|---|
| **10** | 118° | 13 | 110 | 65.5 | 175.5 | 1 |
| **13** | 118° | 19 | 130 | 80 | 210 | 2 |
| **15** | 118° | 19 | 130 | 80 | 210 | 2 |
| **18** | 118° | 25 | 160 | 80 | 240 | 2 |
| **20** | 118° | 25 | 160 | 80 | 240 | 2 |
| **22** | 118° | 30 | 160 | 80 | 240 | 2 |
| **25** | 118° | 35 | 190 | 99 | 289 | 3 |
| **27** | 118° | 38 | 190 | 99 | 289 | 3 |
| **30** | 118° | 42 | 210 | 99 | 309 | 3 |
| **32** | 118° | 42 | 210 | 99 | 309 | 3 |

※Cut Length Including Neck



魚沼市上原高原　コスモス

Drill Cutting Condition Talbe

# ドリル
# 切削条件参考表

安全上の注意：切削条件は、被削材の硬さ、
切り込み量、ツーリング、機械の状態により
条件を増減してください。
切削油を使用してください。
Adjust cutting conditions according to
rigidity of work material, tooling, machine
and depth of cut.
Use cutting fluid.

## ●CNCZ-C　超硬フラットザグリドリル（自動旋盤用）

| 刃径 Dia. | 非鉄金属 Al. Cu<br>切削速度 Cutting Speed 30~60m/min | | 炭素鋼 FC. FCD. S50C<br>切削速度 Cutting Speed 20~50m/min | | 合金鋼 SCM. SKD. SUS304<br>切削速度 Cutting Speed 15~50m/min | | 調質鋼 HPM. NAK<br>切削速度 Cutting Speed 10~50m/min | |
|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 3 | 3,183 ~ 6,366 | 95 ~ 382 | 2,122 ~ 5,305 | 61 ~ 318 | 1,592 ~ 5,305 | 32 ~ 297 | 1,061 ~ 5,305 | 32 ~ 106 |
| 4 | 2,387 ~ 4,775 | 72 ~ 286 | 1,592 ~ 3,979 | 48 ~ 239 | 1,194 ~ 3,979 | 24 ~ 223 | 796 ~ 3,979 | 24 ~ 80 |
| 5 | 1,910 ~ 3,820 | 57 ~ 229 | 1,273 ~ 3,183 | 38 ~ 191 | 955 ~ 3,183 | 19 ~ 178 | 637 ~ 3,183 | 19 ~ 64 |
| 6 | 1,592 ~ 3,183 | 48 ~ 191 | 1,061 ~ 2,653 | 32 ~ 159 | 796 ~ 2,653 | 16 ~ 149 | 531 ~ 2,653 | 16 ~ 53 |
| 7 | 1,364 ~ 2,728 | 41 ~ 164 | 909 ~ 2,274 | 27 ~ 136 | 682 ~ 2,274 | 14 ~ 127 | 455 ~ 2,274 | 14 ~ 45 |
| 8 | 1,194 ~ 2,387 | 36 ~ 143 | 796 ~ 1,989 | 24 ~ 119 | 597 ~ 1,989 | 12 ~ 111 | 398 ~ 1,989 | 12 ~ 40 |
| 9 | 1,061 ~ 2,122 | 32 ~ 127 | 707 ~ 1,768 | 21 ~ 106 | 531 ~ 1,768 | 11 ~ 99 | 354 ~ 1,768 | 11 ~ 35 |
| 10 | 955 ~ 1,910 | 29 ~ 115 | 637 ~ 1,592 | 19 ~ 95 | 477 ~ 1,592 | 10 ~ 89 | 318 ~ 1,592 | 10 ~ 32 |
| 11 | 868 ~ 1,736 | 26 ~ 104 | 579 ~ 1,447 | 17 ~ 87 | 434 ~ 1,447 | 9 ~ 81 | 289 ~ 1,447 | 9 ~ 29 |
| 12 | 796 ~ 1,592 | 24 ~ 95 | 531 ~ 1,326 | 16 ~ 80 | 398 ~ 1,326 | 8 ~ 74 | 265 ~ 1,326 | 8 ~ 27 |
| 13 | 735 ~ 1,469 | 22 ~ 88 | 490 ~ 1,224 | 15 ~ 73 | 367 ~ 1,224 | 7 ~ 69 | 245 ~ 1,224 | 7 ~ 24 |
| 14 | 682 ~ 1,364 | 20 ~ 82 | 455 ~ 1,137 | 14 ~ 68 | 341 ~ 1,137 | 7 ~ 64 | 227 ~ 1,137 | 7 ~ 23 |
| 15 | 637 ~ 1,273 | 19 ~ 76 | 424 ~ 1,061 | 13 ~ 64 | 318 ~ 1,061 | 6 ~ 59 | 212 ~ 1,061 | 6 ~ 21 |
| 16 | 597 ~ 1,194 | 18 ~ 72 | 398 ~ 995 | 12 ~ 60 | 298 ~ 995 | 6 ~ 56 | 199 ~ 995 | 6 ~ 20 |

## ●CSHD　超硬半月ドリル

| 刃径 Dia. | 非鉄金属 Al. Cu<br>切削速度 Cutting Speed 18~35m/min | | 炭素鋼 FC. FCD. S50C<br>切削速度 Cutting Speed 15~25m/min | | 合金鋼 SCM. SKD. SUS304<br>切削速度 Cutting Speed 12~20m/min | | 調質鋼 HPM. NAK<br>切削速度 Cutting Speed 8~16m/min | |
|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 0.7 | 8,185 ~ 15,915 | 55 ~ 426 | 6,821 ~ 11,368 | 46 ~ 304 | 5,457 ~ 9,095 | 36 ~ 243 | 3,638 ~ 7,276 | 24 ~ 195 |
| 1 | 5,730 ~ 11,141 | 39 ~ 306 | 4,775 ~ 7,958 | 33 ~ 219 | 3,820 ~ 6,366 | 26 ~ 175 | 2,546 ~ 5,093 | 18 ~ 140 |
| 1.5 | 3,820 ~ 7,427 | 27 ~ 214 | 3,183 ~ 5,305 | 23 ~ 153 | 2,546 ~ 4,244 | 18 ~ 122 | 1,698 ~ 3,395 | 12 ~ 98 |
| 2 | 2,865 ~ 5,570 | 21 ~ 167 | 2,387 ~ 3,979 | 18 ~ 119 | 1,910 ~ 3,183 | 14 ~ 95 | 1,273 ~ 2,546 | 10 ~ 76 |
| 2.5 | 2,292 ~ 4,456 | 18 ~ 139 | 1,910 ~ 3,183 | 15 ~ 99 | 1,528 ~ 2,546 | 12 ~ 80 | 1,019 ~ 2,037 | 8 ~ 64 |
| 3 | 1,910 ~ 3,714 | 16 ~ 121 | 1,592 ~ 2,653 | 13 ~ 86 | 1,273 ~ 2,122 | 10 ~ 69 | 849 ~ 1,698 | 7 ~ 55 |
| 3.5 | 1,637 ~ 3,183 | 14 ~ 107 | 1,364 ~ 2,274 | 12 ~ 77 | 1,091 ~ 1,819 | 9 ~ 61 | 728 ~ 1,455 | 6 ~ 49 |
| 4 | 1,432 ~ 2,785 | 13 ~ 97 | 1,194 ~ 1,989 | 10 ~ 70 | 955 ~ 1,592 | 8 ~ 56 | 637 ~ 1,273 | 6 ~ 45 |
| 4.5 | 1,273 ~ 2,476 | 12 ~ 90 | 1,061 ~ 1,768 | 10 ~ 64 | 849 ~ 1,415 | 8 ~ 51 | 566 ~ 1,132 | 5 ~ 41 |
| 5 | 1,146 ~ 2,228 | 11 ~ 84 | 955 ~ 1,592 | 9 ~ 60 | 764 ~ 1,273 | 7 ~ 48 | 509 ~ 1,019 | 5 ~ 38 |
| 5.5 | 1,042 ~ 2,026 | 10 ~ 78 | 868 ~ 1,447 | 8 ~ 56 | 694 ~ 1,157 | 7 ~ 45 | 463 ~ 926 | 4 ~ 36 |
| 6 | 955 ~ 1,857 | 10 ~ 74 | 796 ~ 1,326 | 8 ~ 53 | 637 ~ 1,061 | 6 ~ 42 | 424 ~ 849 | 4 ~ 34 |

## ●CCTS　超硬センタリングツール ショートタイプ
## ●CCTL　超硬センタリングツール ロングタイプ
## ●CCTST　超硬センタリングツール ショートタイプ（テーパーシャンク）
## ●CCTLT　超硬センタリングツール ロングタイプ（テーパーシャンク）

| 刃径 Dia. | 非鉄金属 Al. Cu<br>切削速度 Cutting Speed 18~35m/min | | 炭素鋼 FC. FCD. S50C<br>切削速度 Cutting Speed 15~25m/min | | 合金鋼 SCM. SKD. SUS304<br>切削速度 Cutting Speed 12~20m/min | | 調質鋼 HPM. NAK<br>切削速度 Cutting Speed 8~16m/min | |
|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 12 | 477 ~ 928 | 17 ~ 136 | 398 ~ 663 | 15 ~ 97 | 318 ~ 531 | 12 ~ 77 | 212 ~ 424 | 8 ~ 62 |
| 16 | 358 ~ 696 | 14 ~ 110 | 298 ~ 497 | 12 ~ 79 | 239 ~ 398 | 9 ~ 63 | 159 ~ 318 | 6 ~ 50 |
| 19 | 302 ~ 586 | 13 ~ 98 | 251 ~ 419 | 10 ~ 70 | 201 ~ 335 | 8 ~ 56 | 134 ~ 268 | 6 ~ 45 |
| 25 | 229 ~ 446 | 11 ~ 82 | 191 ~ 318 | 9 ~ 59 | 153 ~ 255 | 7 ~ 47 | 102 ~ 204 | 5 ~ 38 |
| 30 | 191 ~ 371 | 10 ~ 74 | 159 ~ 265 | 8 ~ 53 | 127 ~ 212 | 6 ~ 42 | 85 ~ 170 | 4 ~ 34 |
| 35 | 164 ~ 318 | 9 ~ 68 | 136 ~ 227 | 7 ~ 49 | 109 ~ 182 | 6 ~ 39 | 73 ~ 146 | 4 ~ 31 |
| 40 | 143 ~ 279 | 8 ~ 64 | 119 ~ 199 | 7 ~ 46 | 95 ~ 159 | 5 ~ 37 | 64 ~ 127 | 4 ~ 29 |
| 45 | 127 ~ 248 | 8 ~ 61 | 106 ~ 177 | 6 ~ 43 | 85 ~ 141 | 5 ~ 35 | 57 ~ 113 | 3 ~ 28 |
| 50 | 115 ~ 223 | 7 ~ 58 | 95 ~ 159 | 6 ~ 41 | 76 ~ 127 | 5 ~ 33 | 51 ~ 102 | 3 ~ 26 |

## ●FZD-A　フラットザグリドリル

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 30~80m/min | | 切削速度 Cutting Speed 16~30m/min | | 切削速度 Cutting Speed 12~22m/min | | 切削速度 Cutting Speed 8~18m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 2 | 4,775 ~ 12,733 | 119 ~ 318 | 2,547 ~ 4,775 | 64 ~ 119 | 1,910 ~ 3,502 | 48 ~ 88 | 1,273 ~ 2,865 | 32 ~ 72 |
| 3 | 3,183 ~ 8,489 | 95 ~ 255 | 1,698 ~ 3,183 | 51 ~ 95 | 1,273 ~ 2,334 | 38 ~ 70 | 849 ~ 1,910 | 25 ~ 57 |
| 4 | 2,387 ~ 6,366 | 84 ~ 223 | 1,273 ~ 2,387 | 45 ~ 84 | 955 ~ 1,751 | 33 ~ 61 | 637 ~ 1,432 | 22 ~ 50 |
| 5 | 1,910 ~ 5,093 | 76 ~ 204 | 1,019 ~ 1,910 | 41 ~ 76 | 764 ~ 1,401 | 31 ~ 56 | 509 ~ 1,146 | 20 ~ 46 |
| 6 | 1,592 ~ 4,244 | 72 ~ 191 | 849 ~ 1,592 | 38 ~ 72 | 637 ~ 1,167 | 29 ~ 53 | 424 ~ 955 | 19 ~ 43 |
| 8 | 1,194 ~ 3,183 | 60 ~ 159 | 637 ~ 1,194 | 32 ~ 60 | 477 ~ 875 | 24 ~ 44 | 318 ~ 716 | 16 ~ 36 |
| 10 | 955 ~ 2,547 | 57 ~ 153 | 509 ~ 955 | 31 ~ 57 | 382 ~ 700 | 23 ~ 42 | 255 ~ 573 | 15 ~ 34 |
| 12 | 796 ~ 2,122 | 56 ~ 149 | 424 ~ 796 | 30 ~ 56 | 318 ~ 584 | 22 ~ 41 | 212 ~ 477 | 15 ~ 33 |
| 15 | 637 ~ 1,698 | 51 ~ 136 | 340 ~ 637 | 27 ~ 51 | 255 ~ 467 | 20 ~ 37 | 170 ~ 382 | 14 ~ 31 |
| 16 | 597 ~ 1,592 | 51 ~ 135 | 318 ~ 597 | 27 ~ 51 | 239 ~ 438 | 20 ~ 37 | 159 ~ 358 | 14 ~ 30 |
| 18 | 531 ~ 1,415 | 48 ~ 127 | 283 ~ 531 | 25 ~ 48 | 212 ~ 389 | 19 ~ 35 | 141 ~ 318 | 13 ~ 29 |
| 20 | 477 ~ 1,273 | 48 ~ 127 | 255 ~ 477 | 25 ~ 48 | 191 ~ 350 | 19 ~ 35 | 127 ~ 286 | 13 ~ 29 |

## ●GSS　スターティングドリル

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 20~50m/min | | 切削速度 Cutting Speed 18~35m/min | | 切削速度 Cutting Speed 10~20m/min | | 切削速度 Cutting Speed 8~15m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 先端角 Point Angle | 135° | | | | | | | |
| 3 | 2,120 ~ 5,305 | 331 ~ 828 | 1,910 ~ 3,714 | 367 ~ 713 | 1,061 ~ 2,122 | 127 ~ 254 | 849 ~ 1,592 | 102 ~ 191 |
| 4 | 1,590 ~ 3,979 | 248 ~ 620 | 1,432 ~ 2,785 | 206 ~ 535 | 796 ~ 1,592 | 96 ~ 191 | 637 ~ 1,194 | 77 ~ 143 |
| 5 | 1,272 ~ 3,183 | 198 ~ 497 | 1,146 ~ 2,228 | 166 ~ 428 | 637 ~ 1,273 | 77 ~ 152 | 509 ~ 955 | 61 ~ 114 |
| 6 | 1,060 ~ 2,653 | 166 ~ 414 | 955 ~ 1,857 | 138 ~ 356 | 531 ~ 1,061 | 64 ~ 127 | 424 ~ 796 | 50 ~ 96 |
| 8 | 795 ~ 1,989 | 124 ~ 311 | 716 ~ 1,393 | 103 ~ 268 | 398 ~ 796 | 48 ~ 96 | 318 ~ 597 | 38 ~ 72 |
| 10 | 636 ~ 1,592 | 100 ~ 248 | 573 ~ 1,114 | 83 ~ 214 | 318 ~ 637 | 38 ~ 77 | 255 ~ 477 | 30 ~ 58 |
| 先端角 Point Angle | 90° | | | | | | | |
| 3 | 2,120 ~ 5,305 | 254 ~ 637 | 1,910 ~ 3,714 | 275 ~ 535 | 1,061 ~ 2,122 | 102 ~ 204 | 849 ~ 1,592 | 82 ~ 152 |
| 4 | 1,590 ~ 3,979 | 191 ~ 478 | 1,432 ~ 2,785 | 206 ~ 401 | 796 ~ 1,592 | 77 ~ 152 | 637 ~ 1,194 | 61 ~ 114 |
| 5 | 1,272 ~ 3,183 | 152 ~ 382 | 1,146 ~ 2,228 | 166 ~ 320 | 637 ~ 1,273 | 61 ~ 122 | 509 ~ 955 | 49 ~ 91 |
| 6 | 1,060 ~ 2,653 | 127 ~ 318 | 955 ~ 1,857 | 138 ~ 268 | 531 ~ 1,061 | 50 ~ 102 | 424 ~ 796 | 41 ~ 77 |
| 8 | 795 ~ 1,989 | 95 ~ 239 | 716 ~ 1,393 | 103 ~ 200 | 398 ~ 796 | 38 ~ 77 | 318 ~ 597 | 30 ~ 58 |
| 10 | 636 ~ 1,592 | 77 ~ 191 | 573 ~ 1,114 | 83 ~ 161 | 318 ~ 637 | 30 ~ 61 | 255 ~ 477 | 24 ~ 46 |
| 12 | 530 ~ 1,326 | 64 ~ 160 | 477 ~ 928 | 68 ~ 133 | 265 ~ 531 | 25 ~ 50 | 212 ~ 398 | 20 ~ 38 |
| 16 | 397 ~ 995 | 48 ~ 119 | 358 ~ 696 | 52 ~ 101 | 199 ~ 398 | 19 ~ 38 | 159 ~ 298 | 16 ~ 29 |
| 20 | 318 ~ 796 | 38 ~ 96 | 286 ~ 557 | 41 ~ 80 | 159 ~ 318 | 16 ~ 30 | 127 ~ 239 | 12 ~ 23 |
| 25 | 254 ~ 637 | 30 ~ 77 | 229 ~ 446 | 34 ~ 64 | 127 ~ 255 | 12 ~ 24 | 102 ~ 191 | 10 ~ 18 |

## ●TPD　テーパーピンドリル（ストレートシャンク）
## ●TPDT　テーパーピンドリル（テーパーシャンク）

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～ 38HRC HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~25m/min | | 切削速度 Cutting Speed 12~16m/min | | 切削速度 Cutting Speed 10~14m/min | | 切削速度 Cutting Speed 8~12m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| **2** | 1,865 ～ 3,109 | 59 ～ 149 | 1,492 ～ 1,989 | 24 ～ 48 | 1,243 ～ 1,741 | 15 ～ 35 | 995 ～ 1,492 | 6 ～ 19 |
| **2.5** | 1,527 ～ 2,545 | 53 ～ 133 | 1,222 ～ 1,629 | 21 ～ 43 | 1,018 ～ 1,425 | 13 ～ 31 | 814 ～ 1,222 | 6 ～ 17 |
| **3** | 1,270 ～ 2,116 | 44 ～ 110 | 1,016 ～ 1,355 | 18 ～ 35 | 847 ～ 1,185 | 11 ～ 26 | 677 ～ 1,016 | 5 ～ 14 |
| **4** | 970 ～ 1,617 | 37 ～ 91 | 776 ～ 1,035 | 15 ～ 29 | 647 ～ 906 | 9 ～ 21 | 518 ～ 776 | 4 ～ 12 |
| **5** | 785 ～ 1,309 | 31 ～ 78 | 628 ～ 838 | 12 ～ 25 | 524 ～ 733 | 8 ～ 18 | 419 ～ 628 | 3 ～ 10 |
| **6** | 660 ～ 1,100 | 27 ～ 68 | 528 ～ 704 | 11 ～ 22 | 440 ～ 616 | 7 ～ 16 | 352 ～ 528 | 3 ～ 9 |
| **7** | 562 ～ 936 | 22 ～ 56 | 449 ～ 599 | 9 ～ 18 | 374 ～ 524 | 6 ～ 13 | 300 ～ 449 | 2 ～ 7 |
| **8** | 488 ～ 813 | 19 ～ 47 | 390 ～ 520 | 8 ～ 15 | 325 ～ 455 | 5 ～ 11 | 260 ～ 390 | 2 ～ 6 |
| **9** | 431 ～ 718 | 16 ～ 40 | 345 ～ 460 | 6 ～ 13 | 287 ～ 402 | 4 ～ 9 | 230 ～ 345 | 2 ～ 5 |
| **10** | 395 ～ 659 | 16 ～ 40 | 316 ～ 422 | 6 ～ 13 | 264 ～ 369 | 4 ～ 9 | 211 ～ 316 | 2 ～ 5 |
| **11** | 361 ～ 602 | 15 ～ 38 | 289 ～ 385 | 6 ～ 12 | 241 ～ 337 | 4 ～ 9 | 193 ～ 289 | 2 ～ 5 |
| **12** | 333 ～ 555 | 14 ～ 36 | 266 ～ 355 | 6 ～ 12 | 222 ～ 311 | 4 ～ 8 | 178 ～ 266 | 2 ～ 5 |
| **13** | 309 ～ 515 | 14 ～ 34 | 247 ～ 329 | 5 ～ 11 | 206 ～ 288 | 3 ～ 8 | 165 ～ 247 | 1 ～ 4 |
| **14** | 281 ～ 469 | 11 ～ 28 | 225 ～ 300 | 5 ～ 9 | 187 ～ 262 | 3 ～ 7 | 150 ～ 225 | 1 ～ 4 |
| **15** | 266 ～ 443 | 11 ～ 28 | 212 ～ 283 | 5 ～ 9 | 177 ～ 248 | 3 ～ 7 | 142 ～ 212 | 1 ～ 4 |
| **16** | 252 ～ 419 | 11 ～ 28 | 201 ～ 268 | 5 ～ 9 | 168 ～ 235 | 3 ～ 7 | 134 ～ 201 | 1 ～ 4 |
| **18** | 223 ～ 371 | 10 ～ 25 | 178 ～ 238 | 4 ～ 8 | 149 ～ 208 | 2 ～ 6 | 119 ～ 178 | 1 ～ 3 |
| **20** | 204 ～ 340 | 10 ～ 25 | 163 ～ 217 | 4 ～ 8 | 136 ～ 190 | 2 ～ 6 | 109 ～ 163 | 1 ～ 3 |
| **25** | 165 ～ 275 | 10 ～ 25 | 132 ～ 176 | 4 ～ 8 | 110 ～ 154 | 2 ～ 6 | 88 ～ 132 | 1 ～ 3 |

※回転数はリーマ長の2/3部分の径を基準に設定しています。
※小、大径の加工径の差が2mmを超えるものは下穴をドリル等で、段加工願います。
※加工長がリーマ長の2/3を超える場合は、ハンドリングで様子を見ながら加工してください。
Spindle speed is calculated on the basis of the diameter located at 2/3 of flute length from the top.
In case that the difference of diameter between first diameter and diameter at large end is more than 2mm, make prepared hole by step process.
In case that milling depth exceeds 2/3 of flute length, proceed operation by adjusting feed.

## ●SPTDN　ニック付スパイラルテーパーコアドリル

| 呼び寸法 Size | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 ～ 38HRC HPM. NAK | |
|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 10~15m/min | | 切削速度 Cutting Speed 7~10m/min | | 切削速度 Cutting Speed 5~8m/min | | 切削速度 Cutting Speed 4~7m/min | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| **10** | 318 ～ 477 | 11 ～ 18 | 223 ～ 318 | 8 ～ 12 | 159 ～ 255 | 6 ～ 10 | 127 ～ 223 | 5 ～ 8 |
| **12** | 265 ～ 398 | 11 ～ 17 | 186 ～ 265 | 8 ～ 11 | 133 ～ 212 | 6 ～ 10 | 106 ～ 186 | 4 ～ 8 |
| **14** | 227 ～ 341 | 10 ～ 16 | 159 ～ 227 | 7 ～ 11 | 114 ～ 182 | 6 ～ 10 | 91 ～ 159 | 4 ～ 8 |
| **16** | 199 ～ 298 | 10 ～ 16 | 139 ～ 199 | 7 ～ 10 | 99 ～ 159 | 6 ～ 10 | 80 ～ 139 | 4 ～ 7 |
| **18** | 177 ～ 265 | 10 ～ 15 | 124 ～ 177 | 7 ～ 10 | 88 ～ 141 | 6 ～ 10 | 71 ～ 124 | 4 ～ 7 |
| **20** | 159 ～ 239 | 10 ～ 15 | 111 ～ 159 | 7 ～ 10 | 80 ～ 127 | 6 ～ 10 | 64 ～ 111 | 4 ～ 7 |
| **25** | 127 ～ 191 | 9 ～ 14 | 89 ～ 127 | 6 ～ 10 | 64 ～ 102 | 6 ～ 10 | 51 ～ 89 | 4 ～ 7 |
| **30** | 106 ～ 159 | 9 ～ 14 | 74 ～ 106 | 6 ～ 9 | 53 ～ 85 | 6 ～ 10 | 42 ～ 74 | 4 ～ 7 |

※表中の加工径とは加工される穴径の大径値としています。
※推奨加工長は加工径の3倍を目安にしてください。
※推奨加工長を超える場合は、ハンドリングで様子を見ながら加工してください。
Dia. is maximum milling diameter.
Recommended milling length is 3 times of milling diameter.
In case of exceeding recommended length, proceed milling by adjusting feed.

## ●PTDS　管用ドリル（ストレートシャンク）

| 呼び寸法 Size | 非鉄金属 Al. Cu<br>切削速度 Cutting Speed 15~25m/min | | 炭素鋼 FC. FCD. S50C<br>切削速度 Cutting Speed 10~15m/min | | 合金鋼 SCM. SKD. SUS304<br>切削速度 Cutting Speed 8~12m/min | | 調質鋼～38HRC HPM. NAK<br>切削速度 Cutting Speed 6~10m/min | |
|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 1/16 | 728 ～ 1,213 | 21 ～ 36 | 485 ～ 728 | 14 ～ 21 | 388 ～ 582 | 11 ～ 17 | 291 ～ 485 | 9 ～ 14 |
| 1/8 | 558 ～ 930 | 20 ～ 33 | 372 ～ 558 | 13 ～ 20 | 297 ～ 446 | 11 ～ 16 | 223 ～ 372 | 8 ～ 13 |
| 1/4 | 417 ～ 696 | 17 ～ 28 | 278 ～ 417 | 11 ～ 17 | 223 ～ 334 | 9 ～ 14 | 167 ～ 278 | 7 ～ 11 |

## ●PTDT　管用ドリル（テーパーシャンク）

| 呼び寸法 Size | 非鉄金属 Al. Cu<br>切削速度 Cutting Speed 15~25m/min | | 炭素鋼 FC. FCD. S50C<br>切削速度 Cutting Speed 10~15m/min | | 合金鋼 SCM. SKD. SUS304<br>切削速度 Cutting Speed 8~12m/min | | 調質鋼～38HRC HPM. NAK<br>切削速度 Cutting Speed 6~10m/min | |
|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 1/8 | 558 ～ 929 | 20 ～ 33 | 372 ～ 558 | 13 ～ 20 | 297 ～ 446 | 11 ～ 16 | 223 ～ 372 | 8 ～ 13 |
| 1/4 | 417 ～ 696 | 17 ～ 28 | 278 ～ 417 | 11 ～ 17 | 223 ～ 334 | 9 ～ 14 | 167 ～ 278 | 7 ～ 11 |
| 3/8 | 319 ～ 532 | 14 ～ 24 | 213 ～ 319 | 9 ～ 14 | 170 ～ 255 | 8 ～ 11 | 128 ～ 213 | 6 ～ 9 |
| 1/2 | 256 ～ 427 | 13 ～ 21 | 171 ～ 256 | 9 ～ 13 | 137 ～ 205 | 7 ～ 10 | 103 ～ 171 | 5 ～ 9 |
| 3/4 | 198 ～ 330 | 10 ～ 17 | 132 ～ 198 | 7 ～ 10 | 106 ～ 158 | 5 ～ 8 | 79 ～ 132 | 4 ～ 7 |
| 1" | 158 ～ 263 | 9 ～ 15 | 105 ～ 158 | 6 ～ 9 | 84 ～ 126 | 5 ～ 7 | 63 ～ 105 | 4 ～ 6 |
| 1 - 1/4 | 120 ～ 199 | 7 ～ 12 | 80 ～ 120 | 5 ～ 7 | 64 ～ 96 | 4 ～ 6 | 48 ～ 80 | 3 ～ 5 |
| 1 - 1/2 | 106 ～ 177 | 6 ～ 11 | 71 ～ 106 | 4 ～ 6 | 57 ～ 85 | 3 ～ 5 | 43 ～ 71 | 3 ～ 4 |
| 2" | 84 ～ 140 | 6 ～ 10 | 56 ～ 84 | 4 ～ 6 | 45 ～ 67 | 3 ～ 5 | 34 ～ 56 | 2 ～ 4 |

## ●CT　センタリングツール
## ●CTT　センタリングツール（テーパーシャンク）

| 刃径 Dia. | 非鉄金属 Al. Cu<br>切削速度 Cutting Speed 15~25m/min | | 炭素鋼 FC. FCD. S50C<br>切削速度 Cutting Speed 12~16m/min | | 合金鋼 SCM. SKD. SUS304<br>切削速度 Cutting Speed 10~14m/min | | 調質鋼～38HRC HPM. NAK<br>切削速度 Cutting Speed 8~12m/min | |
|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 10 | 477 ～ 796 | 17 ～ 111 | 382 ～ 509 | 13 ～ 71 | 318 ～ 446 | 11 ～ 62 | 255 ～ 382 | 9 ～ 53 |
| 11 | 434 ～ 723 | 16 ～ 103 | 347 ～ 463 | 12 ～ 66 | 289 ～ 405 | 10 ～ 58 | 231 ～ 347 | 8 ～ 50 |
| 12 | 398 ～ 663 | 15 ～ 97 | 318 ～ 424 | 12 ～ 62 | 265 ～ 371 | 10 ～ 54 | 212 ～ 318 | 8 ～ 46 |
| 13 | 367 ～ 612 | 14 ～ 91 | 294 ～ 392 | 11 ～ 58 | 245 ～ 343 | 9 ～ 51 | 196 ～ 294 | 7 ～ 44 |
| 14 | 341 ～ 568 | 13 ～ 86 | 273 ～ 364 | 10 ～ 55 | 227 ～ 318 | 9 ～ 48 | 182 ～ 273 | 7 ～ 41 |
| 15 | 318 ～ 531 | 12 ～ 82 | 255 ～ 340 | 10 ～ 53 | 212 ～ 297 | 8 ～ 46 | 170 ～ 255 | 7 ～ 39 |
| 16 | 298 ～ 497 | 12 ～ 79 | 239 ～ 318 | 9 ～ 50 | 199 ～ 279 | 8 ～ 44 | 159 ～ 239 | 6 ～ 38 |
| 17 | 281 ～ 468 | 11 ～ 75 | 225 ～ 300 | 9 ～ 48 | 187 ～ 262 | 8 ～ 42 | 150 ～ 225 | 6 ～ 36 |
| 18 | 265 ～ 442 | 11 ～ 73 | 212 ～ 283 | 9 ～ 46 | 177 ～ 248 | 7 ～ 41 | 141 ～ 212 | 6 ～ 35 |
| 19 | 251 ～ 419 | 10 ～ 70 | 201 ～ 268 | 8 ～ 45 | 168 ～ 235 | 7 ～ 39 | 134 ～ 201 | 6 ～ 34 |
| 20 | 239 ～ 398 | 10 ～ 68 | 191 ～ 255 | 8 ～ 43 | 159 ～ 223 | 7 ～ 38 | 127 ～ 191 | 5 ～ 32 |
| 21 | 227 ～ 379 | 10 ～ 66 | 182 ～ 243 | 8 ～ 42 | 152 ～ 212 | 7 ～ 37 | 121 ～ 182 | 5 ～ 31 |
| 22 | 217 ～ 362 | 10 ～ 64 | 174 ～ 231 | 8 ～ 41 | 145 ～ 203 | 6 ～ 36 | 116 ～ 174 | 5 ～ 31 |
| 23 | 208 ～ 346 | 9 ～ 62 | 166 ～ 221 | 7 ～ 40 | 138 ～ 194 | 6 ～ 35 | 111 ～ 166 | 5 ～ 30 |
| 24 | 199 ～ 332 | 9 ～ 60 | 159 ～ 212 | 7 ～ 39 | 133 ～ 186 | 6 ～ 34 | 106 ～ 159 | 5 ～ 29 |
| 25 | 191 ～ 318 | 9 ～ 59 | 153 ～ 204 | 7 ～ 38 | 127 ～ 178 | 6 ～ 33 | 102 ～ 153 | 5 ～ 28 |
| 26 | 184 ～ 306 | 9 ～ 58 | 147 ～ 196 | 7 ～ 37 | 122 ～ 171 | 6 ～ 32 | 98 ～ 147 | 5 ～ 28 |
| 27 | 177 ～ 295 | 8 ～ 56 | 141 ～ 189 | 7 ～ 36 | 118 ～ 165 | 6 ～ 32 | 94 ～ 141 | 5 ～ 27 |
| 28 | 171 ～ 284 | 8 ～ 55 | 136 ～ 182 | 7 ～ 35 | 114 ～ 159 | 6 ～ 31 | 91 ～ 136 | 4 ～ 26 |
| 29 | 165 ～ 274 | 8 ～ 54 | 132 ～ 176 | 6 ～ 35 | 110 ～ 154 | 5 ～ 30 | 88 ～ 132 | 4 ～ 26 |
| 30 | 159 ～ 265 | 8 ～ 53 | 127 ～ 170 | 6 ～ 34 | 106 ～ 149 | 5 ～ 30 | 85 ～ 127 | 4 ～ 25 |
| 31 | 154 ～ 257 | 8 ～ 52 | 123 ～ 164 | 6 ～ 33 | 103 ～ 144 | 5 ～ 29 | 82 ～ 123 | 4 ～ 25 |
| 32 | 149 ～ 249 | 8 ～ 51 | 119 ～ 159 | 6 ～ 33 | 99 ～ 139 | 5 ～ 29 | 80 ～ 119 | 4 ～ 25 |



魚沼市中家　稲穂

# END MILL SERIES

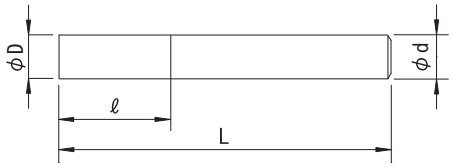
超硬

# CSFRPE-P/CSFRPE

## 超硬ソリッドファイバー用カッター底刃付タイプ *Solid Carbide Cutter For Fiber End Mill Type*

切削条件表 P347 | カーボンファイバー専用 | 右ネジレ15° | 超微粒子 | P Coating






| 公差(Tolerance) | D：$^{-0.05}_{-0.1}$ | d：h6 |
|---|---|---|

《CSFRPE-P》 右刃右ネジレ15° 超微粒子 ●底刃付タイプ Pコーティング付
Helix Angle-Right15° Ultra Micro Grain Carbide End Mill Type With P Coating

《CSFRPE》 右刃右ネジレ15° 超微粒子 ●底刃付タイプ Pコーティングなし
Helix Angle-Right15° Ultra Micro Grain Carbide End Mill Type Non Coating

| 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 外周 Number of Flutes | 刃数 底刃 End cut |
|---|---|---|---|---|---|
| **3** | 10 | 50 | 4 | 6 | 3 |
| **4** | 15 | 50 | 4 | 6 | 3 |
| **5** | 18 | 50 | 6 | 8 | 4 |
| **6** | 18 | 50 | 6 | 8 | 4 |
| **7** | 25 | 70 | 8 | 8 | 4 |

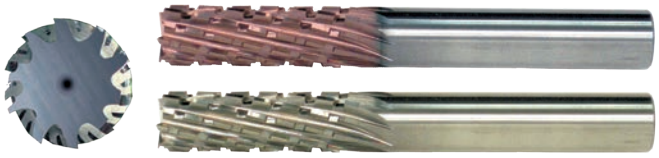
| 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 外周 Number of Flutes | 刃数 底刃 End cut |
|---|---|---|---|---|---|
| **8** | 25 | 70 | 8 | 8 | 4 |
| **10** | 30 | 80 | 10 | 10 | 5 |
| **12** | 35 | 90 | 12 | 10 | 5 |
| **16** | 35 | 100 | 16 | 14 | 7 |
| **18** | 40 | 105 | 16 | 14 | 7 |
| **20** | 45 | 110 | 20 | 16 | 8 |

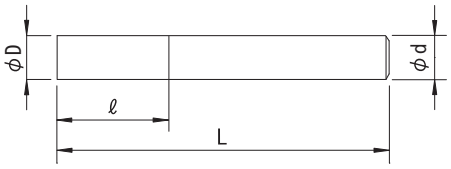
超硬

# CSFRP-P/CSFRP

## 超硬ソリッドファイバー用カッター *Solid Carbide Cutter For Fiber*

切削条件表 P347 | カーボンファイバー専用 | 右ネジレ15° | 超微粒子 | P Coating






| 公差(Tolerance) | D：$^{-0.05}_{-0.1}$ | d：h6 |
|---|---|---|

《CSFRP-P》 右刃右ネジレ15° 超微粒子 ●底刃なしタイプ Pコーティング付
Helix Angle-Right15° Ultra Micro Grain Carbide With P Coating

《CSFRP》 右刃右ネジレ15° 超微粒子 ●底刃なしタイプ Pコーティングなし
Helix Angle-Right15° Ultra Micro Grain Carbide Non Coating

| 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 外周 Number of Flutes |
|---|---|---|---|---|
| **3** | 10 | 50 | 4 | 6 |
| **4** | 15 | 50 | 4 | 6 |
| **5** | 18 | 50 | 6 | 8 |
| **6** | 18 | 50 | 6 | 8 |
| **7** | 25 | 70 | 8 | 8 |

| 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. | 刃数 外周 Number of Flutes |
|---|---|---|---|---|
| **8** | 25 | 70 | 8 | 8 |
| **10** | 30 | 80 | 10 | 10 |
| **12** | 35 | 90 | 12 | 10 |
| **16** | 35 | 100 | 16 | 14 |
| **18** | 40 | 105 | 16 | 14 |
| **20** | 45 | 110 | 20 | 16 |

超硬

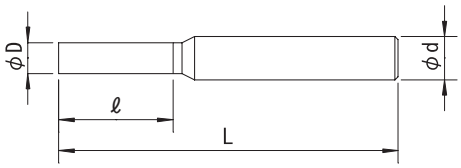
# GES2/GEL2

## 超硬グラファイト ソリッドエンドミル

*Solid Carbide Graphite Standard End Mill*
*Solid Carbide Graphite Long End Mill*

切削条件表 P347 | スクエア形状 | 右ネジレ 30° | 刃数 2 | K03






| 公差(Tolerance) | D：$^{0}_{-0.02}$ | d：h6 |
|---|---|---|

## 《GES2》 右刃右ネジレ30° 刃数:2 K03 ●スタンダードタイプ

Helix Angle-Right30° 2 Flutes Micro Grain Carbide ● Standard Type

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **0.5** | 5 | 50 | 4 |
| **0.6** | 5 | 50 | 4 |
| **0.7** | 5 | 50 | 4 |
| **0.8** | 5 | 50 | 4 |
| **0.9** | 5 | 50 | 4 |
| **1** | 10 | 60 | 6 |
| **1.1** | 10 | 60 | 6 |
| **1.2** | 10 | 60 | 6 |
| **1.3** | 10 | 60 | 6 |
| **1.4** | 10 | 60 | 6 |
| **1.5** | 10 | 60 | 6 |
| **1.6** | 10 | 60 | 6 |
| **1.7** | 10 | 60 | 6 |
| **1.8** | 10 | 60 | 6 |
| **1.9** | 10 | 60 | 6 |
| **2** | 15 | 90 | 6 |

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **2.5** | 15 | 90 | 6 |
| **3** | 20 | 90 | 6 |
| **4** | 30 | 100 | 6 |
| **5** | 30 | 100 | 6 |
| **6** | 30 | 100 | 6 |
| **7** | 40 | 120 | 6 |
| **8** | 40 | 120 | 8 |
| **9** | 40 | 120 | 8 |
| **10** | 40 | 120 | 10 |
| **12** | 50 | 120 | 12 |
| **13** | 50 | 120 | 12 |
| **14** | 50 | 120 | 12 |
| **15** | 60 | 150 | 16 |
| **16** | 60 | 150 | 16 |
| **18** | 60 | 150 | 16 |
| **20** | 60 | 150 | 20 |
| **25** | 60 | 160 | 25 |

切削条件表 P347 | スクエア形状 | 右ネジレ 30° | 刃数 2 | K03

| 公差(Tolerance) | D：$^{0}_{-0.02}$ | d：h6 |
|---|---|---|

## 《GEL2》 右刃右ネジレ30° 刃数:2 K03 ●ロングタイプ

Helix Angle-Right30° 2 Flutes Micro Grain Carbide ● Long Type

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **2** | 20 | 120 | 6 |
| **2.5** | 20 | 120 | 6 |
| **3** | 30 | 120 | 6 |
| **4** | 30 | 120 | 6 |
| **5** | 40 | 150 | 6 |
| **6** | 40 | 150 | 6 |
| **8** | 40 | 180 | 8 |
| **10** | 50 | 200 | 10 |

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **12** | 50 | 200 | 12 |
| **13** | 50 | 200 | 12 |
| **14** | 50 | 200 | 12 |
| **15** | 60 | 200 | 16 |
| **16** | 60 | 200 | 16 |
| **18** | 60 | 200 | 16 |
| **20** | 80 | 250 | 20 |
| **25** | 80 | 250 | 25 |

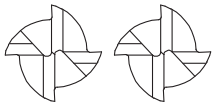
超硬

# GES4/GEL4

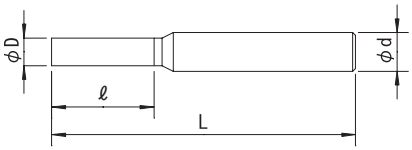
## 超硬グラファイト ソリッドエンドミル

*Solid Carbide Graphite Standard End Mill*
*Solid Carbide Graphite Long End Mill*

切削条件表 P348 | スクエア形状 | 右ネジレ 30° | 刃数 4 | K03






| 公差(Tolerance) | D：$^{+0.02}_{0}$ | d：h6 |
|---|---|---|

### 《GES4》 右刃右ネジレ30° 刃数:4 K03 ●スタンダードタイプ

Helix Angle-Right30° 4 Flutes Micro Grain Carbide ● Standard Type

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **3** | 20 | 90 | 6 |
| **4** | 30 | 100 | 6 |
| **5** | 30 | 100 | 6 |
| **6** | 30 | 100 | 6 |
| **7** | 40 | 120 | 6 |
| **8** | 40 | 120 | 8 |
| **9** | 40 | 120 | 8 |
| **10** | 40 | 120 | 10 |

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **12** | 50 | 120 | 12 |
| **13** | 50 | 120 | 12 |
| **14** | 50 | 120 | 12 |
| **15** | 60 | 150 | 16 |
| **16** | 60 | 150 | 16 |
| **18** | 60 | 150 | 16 |
| **20** | 60 | 150 | 20 |
| **25** | 60 | 160 | 25 |

切削条件表 P348 | スクエア形状 | 右ネジレ 30° | 刃数 4 | K03

| 公差(Tolerance) | D：$^{+0.02}_{0}$ | d：h6 |
|---|---|---|

### 《GEL4》 右刃右ネジレ30° 刃数:4 K03 ●ロングタイプ

Helix Angle-Right30° 4 Flutes Micro Grain Carbide ● Long Type

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **3** | 30 | 120 | 6 |
| **4** | 30 | 120 | 6 |
| **5** | 40 | 150 | 6 |
| **6** | 40 | 150 | 6 |
| **8** | 40 | 180 | 8 |
| **10** | 50 | 200 | 10 |
| **12** | 50 | 200 | 12 |

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **13** | 50 | 200 | 12 |
| **14** | 50 | 200 | 12 |
| **15** | 60 | 200 | 16 |
| **16** | 60 | 200 | 16 |
| **18** | 60 | 200 | 16 |
| **20** | 80 | 250 | 20 |
| **25** | 80 | 250 | 25 |

超硬

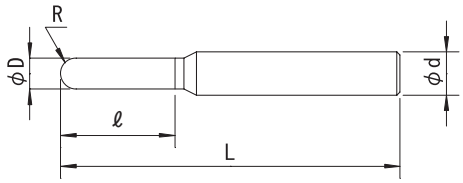
# GBES2

## 超硬グラファイト ソリッドボールエンドミル *Solid Carbide Graphite Standard Ball End Mill*

切削条件表 P349 | ボール形状 | 右ネジレ 30° | 刃数 2 | K03








| 公差(Tolerance) | R：±0.02 | D：±0.01 | d：h6 |
|---|---|---|---|

右刃右ネジレ30° 刃数:2 K03 ●スタンダードタイプ
Helix Angle-Right30° 2 Flutes Micro Grain Carbide ● Standard Type

| 寸法 R | 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| **0.5** | 1 | 8 | 60 | 4 |
| **0.75** | 1.5 | 8 | 60 | 4 |
| **1** | 2 | 15 | 90 | 4 |
| **1.25** | 2.5 | 15 | 90 | 4 |
| **1.5** | 3 | 20 | 90 | 4 |
| **1.75** | 3.5 | 20 | 100 | 4 |
| **2** | 4 | 20 | 100 | 4 |
| **0.5** | 1 | 8 | 60 | 6 |
| **0.6** | 1.2 | 8 | 60 | 6 |
| **0.7** | 1.4 | 8 | 60 | 6 |
| **0.75** | 1.5 | 8 | 60 | 6 |
| **0.8** | 1.6 | 8 | 60 | 6 |
| **0.9** | 1.8 | 8 | 60 | 6 |
| **1** | 2 | 15 | 90 | 6 |
| **1.1** | 2.2 | 15 | 90 | 6 |
| **1.2** | 2.4 | 15 | 90 | 6 |
| **1.25** | 2.5 | 15 | 90 | 6 |
| **1.3** | 2.6 | 15 | 90 | 6 |
| **1.4** | 2.8 | 15 | 90 | 6 |
| **1.5** | 3 | 20 | 90 | 6 |
| **1.6** | 3.2 | 20 | 90 | 6 |
| **1.7** | 3.4 | 20 | 90 | 6 |
| **1.75** | 3.5 | 20 | 100 | 6 |
| **1.8** | 3.6 | 20 | 100 | 6 |
| **1.9** | 3.8 | 20 | 100 | 6 |
| **2** | 4 | 20 | 100 | 6 |
| **2.25** | 4.5 | 30 | 100 | 6 |
| **2.5** | 5 | 30 | 100 | 6 |
| **2.75** | 5.5 | 30 | 100 | 6 |
| **3** | 6 | 30 | 100 | 6 |
| **3.25** | 6.5 | 40 | 120 | 6 |
| **3.5** | 7 | 40 | 120 | 6 |
| **3.75** | 7.5 | 40 | 120 | 6 |

| 寸法 R | 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| **4** | 8 | 40 | 120 | 8 |
| **4.25** | 8.5 | 40 | 120 | 8 |
| **4.5** | 9 | 40 | 120 | 8 |
| **4.75** | 9.5 | 40 | 120 | 8 |
| **5** | 10 | 40 | 120 | 10 |
| **5.25** | 10.5 | 50 | 120 | 10 |
| **5.5** | 11 | 50 | 120 | 10 |
| **5.75** | 11.5 | 50 | 120 | 10 |
| **6** | 12 | 50 | 120 | 12 |
| **6.25** | 12.5 | 60 | 150 | 12 |
| **6.5** | 13 | 60 | 150 | 12 |
| **6.75** | 13.5 | 60 | 150 | 12 |
| **7** | 14 | 60 | 150 | 12 |
| **7.25** | 14.5 | 60 | 150 | 12 |
| **7.5** | 15 | 60 | 150 | 12 |
| **7.75** | 15.5 | 60 | 150 | 12 |
| **8** | 16 | 60 | 150 | 16 |
| **8.25** | 16.5 | 60 | 150 | 16 |
| **8.5** | 17 | 60 | 150 | 16 |
| **8.75** | 17.5 | 60 | 150 | 16 |
| **9** | 18 | 60 | 150 | 16 |
| **9.5** | 19 | 60 | 150 | 16 |
| **10** | 20 | 60 | 150 | 20 |
| **10.25** | 20.5 | 60 | 150 | 20 |
| **10.5** | 21 | 60 | 150 | 20 |
| **10.75** | 21.5 | 60 | 150 | 20 |
| **11** | 22 | 60 | 150 | 20 |
| **11.5** | 23 | 60 | 150 | 20 |
| **12** | 24 | 60 | 150 | 20 |
| **12.25** | 24.5 | 60 | 160 | 20 |
| **12.5** | 25 | 60 | 160 | 25 |
| **12.75** | 25.5 | 60 | 160 | 25 |
| **15** | 30 | 60 | 180 | 25 |

超硬

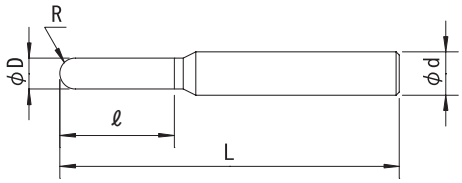
# GBEL2

## 超硬グラファイト ソリッドボールエンドミル *Solid Carbide Graphite Long Ball End Mill*

切削条件表 P349 | ボール形状 | 右ネジレ 30° | 刃数 2 | K03








| 公差(Tolerance) | R：±0.02 | D：±0.01 | d：h6 |
|---|---|---|---|

右刃右ネジレ30° 刃数:2 K03 ●ロングタイプ
Helix Angle-Right30° 2 Flutes Micro Grain Carbide ● Long Type

| 寸法 R | 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|
| **1** | 2 | 20 | 120 | 4 |
| **1.25** | 2.5 | 20 | 120 | 4 |
| **1.5** | 3 | 30 | 120 | 4 |
| **1.75** | 3.5 | 30 | 120 | 4 |
| **2** | 4 | 30 | 120 | 4 |
| **1** | 2 | 20 | 120 | 6 |
| **1.25** | 2.5 | 20 | 120 | 6 |
| **1.5** | 3 | 30 | 120 | 6 |
| **1.75** | 3.5 | 30 | 120 | 6 |
| **2** | 4 | 30 | 120 | 6 |
| **2.25** | 4.5 | 40 | 150 | 6 |
| **2.5** | 5 | 40 | 150 | 6 |
| **2.75** | 5.5 | 40 | 150 | 6 |
| **3** | 6 | 40 | 150 | 6 |
| **3.25** | 6.5 | 40 | 180 | 6 |
| **3.5** | 7 | 40 | 180 | 6 |
| **3.75** | 7.5 | 40 | 180 | 6 |
| **4** | 8 | 40 | 180 | 8 |
| **4.25** | 8.5 | 40 | 180 | 8 |
| **4.5** | 9 | 60 | 200 | 8 |
| **4.75** | 9.5 | 60 | 200 | 8 |
| **5** | 10 | 60 | 200 | 10 |
| **5.25** | 10.5 | 60 | 200 | 10 |
| **5.5** | 11 | 60 | 200 | 10 |
| **5.75** | 11.5 | 60 | 200 | 10 |

| 寸法 R | 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|
| **6** | 12 | 60 | 200 | 12 |
| **6.25** | 12.5 | 60 | 200 | 12 |
| **6.5** | 13 | 60 | 200 | 12 |
| **6.75** | 13.5 | 60 | 200 | 12 |
| **7** | 14 | 60 | 200 | 12 |
| **7.25** | 14.5 | 60 | 200 | 12 |
| **7.5** | 15 | 60 | 200 | 12 |
| **7.75** | 15.5 | 60 | 200 | 12 |
| **8** | 16 | 60 | 200 | 16 |
| **8.25** | 16.5 | 60 | 200 | 16 |
| **8.5** | 17 | 60 | 200 | 16 |
| **8.75** | 17.5 | 60 | 200 | 16 |
| **9** | 18 | 80 | 250 | 16 |
| **9.5** | 19 | 80 | 250 | 16 |
| **10** | 20 | 80 | 250 | 20 |
| **10.25** | 20.5 | 80 | 250 | 20 |
| **10.5** | 21 | 80 | 250 | 20 |
| **10.75** | 21.5 | 80 | 250 | 20 |
| **11** | 22 | 80 | 250 | 20 |
| **11.5** | 23 | 80 | 250 | 20 |
| **12** | 24 | 80 | 250 | 20 |
| **12.25** | 24.5 | 80 | 250 | 20 |
| **12.5** | 25 | 80 | 250 | 25 |
| **12.75** | 25.5 | 80 | 250 | 25 |
| **15** | 30 | 80 | 250 | 25 |

超硬

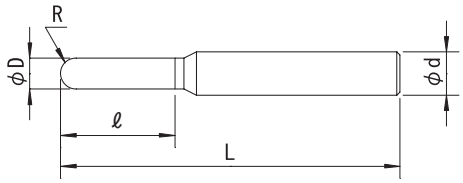
# GBES4

## 超硬グラファイト ソリッドボールエンドミル *Solid Carbide Graphite Standard Ball End Mill*

切削条件表 P350 | ボール形状 | 右ネジレ 30° | 刃数 4 | K03








| 公差(Tolerance) | R：±0.02 | D：±0.01 | d：h6 |
|---|---|---|---|

右刃右ネジレ30° 刃数:4 K03 ●スタンダードタイプ
Helix Angle-Right30° 4 Flutes Micro Grain Carbide ● Standard Type

| 寸法 R | 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| **1.5** | 3 | 20 | 90 | 6 |
| **1.75** | 3.5 | 20 | 100 | 6 |
| **2** | 4 | 20 | 100 | 6 |
| **2.25** | 4.5 | 30 | 100 | 6 |
| **2.5** | 5 | 30 | 100 | 6 |
| **2.75** | 5.5 | 30 | 100 | 6 |
| **3** | 6 | 30 | 100 | 6 |
| **3.25** | 6.5 | 40 | 120 | 6 |
| **3.5** | 7 | 40 | 120 | 6 |
| **3.75** | 7.5 | 40 | 120 | 6 |
| **4** | 8 | 40 | 120 | 8 |
| **4.25** | 8.5 | 40 | 120 | 8 |
| **4.5** | 9 | 40 | 120 | 8 |
| **4.75** | 9.5 | 40 | 120 | 8 |
| **5** | 10 | 40 | 120 | 10 |
| **5.25** | 10.5 | 50 | 120 | 10 |
| **5.5** | 11 | 50 | 120 | 10 |
| **5.75** | 11.5 | 50 | 120 | 10 |
| **6** | 12 | 50 | 120 | 12 |
| **6.25** | 12.5 | 60 | 150 | 12 |

| 寸法 R | 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| **6.5** | 13 | 60 | 150 | 12 |
| **6.75** | 13.5 | 60 | 150 | 12 |
| **7** | 14 | 60 | 150 | 12 |
| **7.25** | 14.5 | 60 | 150 | 12 |
| **7.5** | 15 | 60 | 150 | 12 |
| **7.75** | 15.5 | 60 | 150 | 12 |
| **8** | 16 | 60 | 150 | 16 |
| **8.25** | 16.5 | 60 | 150 | 16 |
| **8.5** | 17 | 60 | 150 | 16 |
| **8.75** | 17.5 | 60 | 150 | 16 |
| **9** | 18 | 60 | 150 | 16 |
| **10** | 20 | 60 | 150 | 20 |
| **10.25** | 20.5 | 60 | 150 | 20 |
| **10.5** | 21 | 60 | 150 | 20 |
| **10.75** | 21.5 | 60 | 150 | 20 |
| **11** | 22 | 60 | 150 | 20 |
| **12.25** | 24.5 | 60 | 160 | 20 |
| **12.5** | 25 | 60 | 160 | 25 |
| **12.75** | 25.5 | 60 | 160 | 25 |
| **15** | 30 | 60 | 180 | 25 |

超硬

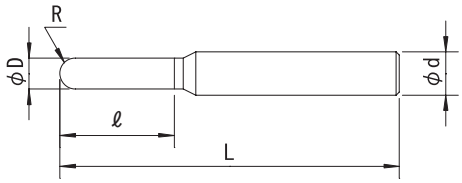
# GBEL4

## 超硬グラファイト ソリッドボールエンドミル *Solid Carbide Graphite Long Ball End Mill*

切削条件表 P350 | ボール形状 | 右ネジレ 30° | 刃数 4 | K03








| 公差(Tolerance) | R：±0.02 | D：±0.01 | d：h6 |
|---|---|---|---|

右刃右ネジレ30° 刃数:4 K03 ●ロングタイプ
Helix Angle-Right30° 4 Flutes Micro Grain Carbide ● Long Type

| 寸法 R | 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|
| **1.5** | 3 | 30 | 120 | 6 |
| **1.75** | 3.5 | 30 | 120 | 6 |
| **2** | 4 | 30 | 120 | 6 |
| **2.25** | 4.5 | 40 | 150 | 6 |
| **2.5** | 5 | 40 | 150 | 6 |
| **2.75** | 5.5 | 40 | 150 | 6 |
| **3** | 6 | 40 | 150 | 6 |
| **3.25** | 6.5 | 40 | 180 | 6 |
| **3.5** | 7 | 40 | 180 | 6 |
| **3.75** | 7.5 | 40 | 180 | 6 |
| **4** | 8 | 40 | 180 | 8 |
| **4.25** | 8.5 | 40 | 180 | 8 |
| **4.5** | 9 | 60 | 200 | 8 |
| **4.75** | 9.5 | 60 | 200 | 8 |
| **5** | 10 | 60 | 200 | 10 |
| **5.25** | 10.5 | 60 | 200 | 10 |
| **5.5** | 11 | 60 | 200 | 10 |
| **5.75** | 11.5 | 60 | 200 | 10 |
| **6** | 12 | 60 | 200 | 12 |
| **6.25** | 12.5 | 60 | 200 | 12 |
| **6.5** | 13 | 60 | 200 | 12 |

| 寸法 R | 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|
| **6.75** | 13.5 | 60 | 200 | 12 |
| **7** | 14 | 60 | 200 | 12 |
| **7.25** | 14.5 | 60 | 200 | 12 |
| **7.5** | 15 | 60 | 200 | 12 |
| **7.75** | 15.5 | 60 | 200 | 12 |
| **8** | 16 | 60 | 200 | 16 |
| **8.25** | 16.5 | 60 | 200 | 16 |
| **8.5** | 17 | 60 | 200 | 16 |
| **8.75** | 17.5 | 60 | 200 | 16 |
| **9** | 18 | 80 | 250 | 16 |
| **9.5** | 19 | 80 | 250 | 16 |
| **10** | 20 | 80 | 250 | 20 |
| **10.25** | 20.5 | 80 | 250 | 20 |
| **10.5** | 21 | 80 | 250 | 20 |
| **10.75** | 21.5 | 80 | 250 | 20 |
| **11** | 22 | 80 | 250 | 20 |
| **11.5** | 23 | 80 | 250 | 20 |
| **12** | 24 | 80 | 250 | 20 |
| **12.25** | 24.5 | 80 | 250 | 20 |
| **12.5** | 25 | 80 | 250 | 25 |
| **12.75** | 25.5 | 80 | 250 | 25 |
| **15** | 30 | 80 | 250 | 25 |

超硬

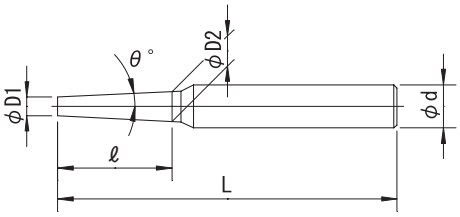
# GTE

## 超硬グラファイト ソリッドテーパーエンドミル *Solid Carbide Graphite Taper End Mill*

切削条件表 P350 | テーパー形状 | 右ネジレ 30° | 刃数 2 | K03








| 公差(Tolerance) | D：$^{-0.01}_{-0.05}$ | θ ：±5' | d：h6 |
|---|---|---|---|

右刃右ネジレ30° 刃数:2 K03
Helix Angle-Right30° 2 Flutes Micro Grain Carbide

| 小径（ΦD1） *Minor Dia.* | 片角（θ） *Taper Angle* | 刃長（ℓ） *Cut Length* | 大径（ΦD2） *Diameter at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|
| 4 | 30' | 25 | 4.43 | 90 | 6 |
| | 1° | 25 | 4.87 | 90 | 6 |
| | 1°30' | 25 | 5.3 | 90 | 6 |
| | 2° | 25 | 5.74 | 90 | 6 |
| | 2°30' | 25 | 6.18 | 90 | 6 |
| | 3° | 25 | 6.62 | 90 | 6 |
| | 5° | 25 | 8.37 | 90 | 8 |
| | 7° | 25 | 10.13 | 90 | 10 |
| 5 | 30' | 35 | 5.61 | 100 | 6 |
| | 1° | 35 | 6.22 | 100 | 6 |
| | 1°30' | 35 | 6.83 | 100 | 6 |
| | 2° | 35 | 7.44 | 100 | 6 |
| | 2°30' | 35 | 8.05 | 100 | 8 |
| | 3° | 35 | 8.66 | 100 | 8 |
| | 5° | 35 | 11.12 | 100 | 10 |
| | 7° | 35 | 13.59 | 100 | 12 |
| 6 | 30' | 35 | 6.61 | 100 | 6 |
| | 1° | 35 | 7.22 | 100 | 6 |
| | 1°30' | 35 | 7.83 | 100 | 6 |
| | 2° | 35 | 8.44 | 100 | 8 |
| | 2°30' | 35 | 9.05 | 100 | 8 |
| | 3° | 35 | 9.66 | 100 | 8 |
| | 5° | 35 | 12.12 | 100 | 12 |
| | 7° | 35 | 14.59 | 100 | 12 |

| 小径（ΦD1） *Minor Dia.* | 片角（θ） *Taper Angle* | 刃長（ℓ） *Cut Length* | 大径（ΦD2） *Diameter at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|
| 8 | 30' | 40 | 8.69 | 100 | 8 |
| | 1° | 40 | 9.39 | 100 | 8 |
| | 1°30' | 40 | 10.09 | 100 | 10 |
| | 2° | 40 | 10.79 | 100 | 10 |
| | 2°30' | 40 | 11.49 | 100 | 10 |
| | 3° | 40 | 12.19 | 100 | 12 |
| | 5° | 40 | 14.99 | 100 | 12 |
| | 7° | 40 | 17.82 | 100 | 16 |
| 10 | 30' | 50 | 10.87 | 120 | 10 |
| | 1° | 50 | 11.74 | 120 | 10 |
| | 1°30' | 50 | 12.61 | 120 | 12 |
| | 2° | 50 | 13.49 | 120 | 12 |
| | 2°30' | 50 | 14.36 | 120 | 12 |
| | 3° | 50 | 15.24 | 120 | 12 |
| | 5° | 50 | 18.74 | 120 | 16 |
| | 7° | 50 | 22.27 | 120 | 20 |
| 12 | 30' | 50 | 12.87 | 120 | 12 |
| | 1° | 50 | 13.74 | 120 | 12 |
| | 1°30' | 50 | 14.61 | 120 | 12 |
| | 2° | 50 | 15.49 | 120 | 12 |
| | 2°30' | 50 | 16.36 | 120 | 16 |
| | 3° | 50 | 17.24 | 120 | 16 |
| | 5° | 50 | 20.74 | 120 | 20 |
| | 7° | 50 | 24.27 | 120 | 20 |

超硬

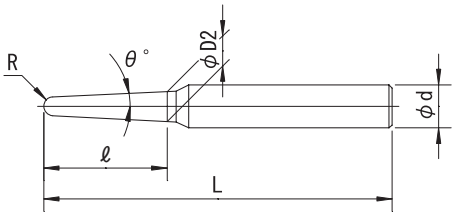
# GTBE

## 超硬グラファイト ソリッドテーパーボールエンドミル *Solid Carbide Graphite Taper Ball End Mill*

切削条件表 P351 | テーパーボール形状 | 右ネジレ 30° | 刃数 2 | K03








| 公差(Tolerance) | R：±0.02 | θ：±5' | d：h6 |
|---|---|---|---|

右刃右ネジレ30° 刃数:2 K03
Helix Angle-Right30° 2 Flutes Micro Grain Carbide

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 2 | 30' | 25 | 4.4 | 90 | 6 |
| | 1° | 25 | 4.8 | 90 | 6 |
| | 1°30' | 25 | 5.2 | 90 | 6 |
| | 2° | 25 | 5.6 | 90 | 6 |
| | 2°30' | 25 | 6.01 | 90 | 6 |
| | 3° | 25 | 6.41 | 90 | 6 |
| | 5° | 25 | 8.03 | 90 | 8 |
| | 7° | 25 | 9.67 | 90 | 10 |
| 2.5 | 30' | 35 | 5.56 | 100 | 6 |
| | 1° | 35 | 6.13 | 100 | 6 |
| | 1°30' | 35 | 6.7 | 100 | 6 |
| | 2° | 35 | 7.27 | 100 | 6 |
| | 2°30' | 35 | 7.84 | 100 | 8 |
| | 3° | 35 | 8.41 | 100 | 8 |
| | 5° | 35 | 10.7 | 100 | 10 |
| | 7° | 35 | 13.01 | 100 | 12 |
| 3 | 30' | 35 | 6.55 | 100 | 6 |
| | 1° | 35 | 7.11 | 100 | 6 |
| | 1°30' | 35 | 7.67 | 100 | 6 |
| | 2° | 35 | 8.23 | 100 | 8 |
| | 2°30' | 35 | 8.8 | 100 | 8 |
| | 3° | 35 | 9.36 | 100 | 8 |
| | 5° | 35 | 11.62 | 100 | 12 |
| | 7° | 35 | 13.9 | 100 | 12 |

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 4 | 30' | 40 | 8.62 | 100 | 8 |
| | 1° | 40 | 9.25 | 100 | 8 |
| | 1°30' | 40 | 9.88 | 100 | 10 |
| | 2° | 40 | 10.51 | 100 | 10 |
| | 2°30' | 40 | 11.15 | 100 | 10 |
| | 3° | 40 | 11.78 | 100 | 12 |
| | 5° | 40 | 14.32 | 100 | 12 |
| | 7° | 40 | 16.9 | 100 | 16 |
| 5 | 30' | 50 | 10.78 | 120 | 10 |
| | 1° | 50 | 11.57 | 120 | 10 |
| | 1°30' | 50 | 12.36 | 120 | 12 |
| | 2° | 50 | 13.14 | 120 | 12 |
| | 2°30' | 50 | 13.93 | 120 | 12 |
| | 3° | 50 | 14.73 | 120 | 12 |
| | 5° | 50 | 17.91 | 120 | 16 |
| | 7° | 50 | 21.12 | 120 | 20 |
| 6 | 30' | 50 | 12.76 | 120 | 12 |
| | 1° | 50 | 13.53 | 120 | 12 |
| | 1°30' | 50 | 14.3 | 120 | 12 |
| | 2° | 50 | 15.08 | 120 | 12 |
| | 2°30' | 50 | 15.85 | 120 | 16 |
| | 3° | 50 | 16.62 | 120 | 16 |
| | 5° | 50 | 19.74 | 120 | 20 |
| | 7° | 50 | 22.89 | 120 | 20 |

超硬

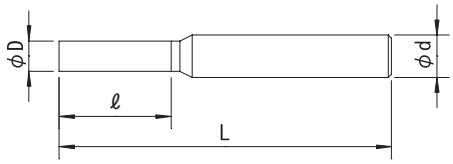
# AHES2/AHEL2/AHES4/AHEL4

## 超硬エアホールエンドミル *Carbide Airhole End Mill*

切削条件表 P351,P352

スクエア形状






| 公差(Tolerance) | D：$^{0}_{-0.02}$ | d：h6 |
|---|---|---|

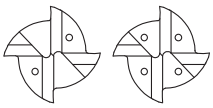
### 《AHES2》 右刃右ネジレ30° 刃数:2 K10

●スタンダードタイプ

右ネジレ30° 刃数2 K10

Helix Angle-Right30° 2 Flutes
Micro Grain Carbide ●Standard Type

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **4** | 20 | 60 | 6 |
| **5** | 30 | 80 | 6 |
| **6** | 30 | 90 | 6 |
| **7** | 40 | 100 | 8 |
| **8** | 40 | 100 | 8 |
| **9** | 40 | 100 | 10 |
| **10** | 40 | 100 | 10 |
| **12** | 50 | 110 | 12 |
| **13** | 50 | 110 | 12 |
| **14** | 50 | 110 | 12 |
| **15** | 60 | 120 | 16 |
| **16** | 60 | 120 | 16 |
| **18** | 60 | 140 | 16 |
| **20** | 60 | 140 | 20 |
| **25** | 60 | 160 | 25 |



D≦6 D≧7

| 公差(Tolerance) | D：$^{+0.02}_{0}$ | d：h6 |
|---|---|---|

### 《AHES4》 右刃右ネジレ30° 刃数:4 K10

●スタンダードタイプ

右ネジレ30° 刃数4 K10

Helix Angle-Right30° 4 Flutes
Micro Grain Carbide ●Standard Type

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **4** | 20 | 60 | 6 |
| **5** | 30 | 80 | 6 |
| **6** | 30 | 90 | 6 |
| **7** | 40 | 100 | 8 |
| **8** | 40 | 100 | 8 |
| **9** | 40 | 100 | 10 |
| **10** | 40 | 100 | 10 |
| **12** | 50 | 110 | 12 |
| **13** | 50 | 110 | 12 |
| **14** | 50 | 110 | 12 |
| **15** | 60 | 120 | 16 |
| **16** | 60 | 120 | 16 |
| **18** | 60 | 140 | 16 |
| **20** | 60 | 140 | 20 |
| **25** | 60 | 160 | 25 |

| 公差(Tolerance) | D：$^{0}_{-0.02}$ | d：h6 |
|---|---|---|

### 《AHEL2》 右刃右ネジレ30° 刃数:2 K10

●ロングタイプ 先ムク

右ネジレ30° 刃数2 K10

Helix Angle-Right30° 2 Flutes
Micro Grain Carbide ●Long Type

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **6** | 40 | 150 | 6 |
| **8** | 40 | 180 | 8 |
| **10** | 50 | 200 | 10 |
| **12** | 50 | 200 | 12 |
| **13** | 50 | 200 | 12 |
| **14** | 50 | 200 | 12 |
| **15** | 60 | 200 | 16 |
| **16** | 60 | 200 | 16 |
| **18** | 60 | 200 | 16 |
| **20** | 60 | 200 | 20 |
| **25** | 80 | 250 | 25 |

※Solid Head

| 公差(Tolerance) | D：$^{+0.02}_{0}$ | d：h6 |
|---|---|---|

### 《AHEL4》 右刃右ネジレ30° 刃数:4 K10

●ロングタイプ 先ムク

右ネジレ30° 刃数4 K10

Helix Angle-Right30° 4 Flutes
Micro Grain Carbide ●Long Type

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **6** | 40 | 150 | 6 |
| **8** | 40 | 180 | 8 |
| **10** | 50 | 200 | 10 |
| **12** | 50 | 200 | 12 |
| **13** | 50 | 200 | 12 |
| **14** | 50 | 200 | 12 |
| **15** | 60 | 200 | 16 |
| **16** | 60 | 200 | 16 |
| **18** | 60 | 200 | 16 |
| **20** | 60 | 200 | 20 |
| **25** | 80 | 250 | 25 |

※Solid Head

超硬

# AHBES2/AHBEL2

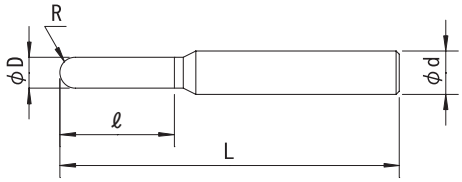
## 超硬エアホールボールエンドミル *Carbide Airhole Ball End Mill*

切削条件表 P352

**ボール形状**








| 公差(Tolerance) | R：±0.02 | D：±0.01 | d：h6 |
|---|---|---|---|

## 《AHBES2》 右刃右ネジレ30° 刃数:2 K10 ●スタンダードタイプ

Helix Angle-Right30° 2 Flutes Micro Grain Carbide ● Standard Type

右ネジレ30° 刃数2 K10

| 寸法 R | 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|
| **2** | 4 | 20 | 70 | 6 |
| **2.25** | 4.5 | 30 | 80 | 6 |
| **2.5** | 5 | 30 | 80 | 6 |
| **2.75** | 5.5 | 30 | 90 | 6 |
| **3** | 6 | 30 | 90 | 6 |
| **3.25** | 6.5 | 30 | 90 | 6 |
| **3.5** | 7 | 30 | 90 | 6 |
| **3.75** | 7.5 | 30 | 90 | 6 |
| **4** | 8 | 40 | 100 | 8 |
| **4.25** | 8.5 | 40 | 100 | 8 |
| **4.5** | 9 | 40 | 100 | 8 |
| **4.75** | 9.5 | 40 | 100 | 8 |
| **5** | 10 | 40 | 100 | 10 |
| **5.25** | 10.5 | 40 | 100 | 10 |
| **5.5** | 11 | 40 | 100 | 10 |

| 寸法 R | 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|
| **5.75** | 11.5 | 40 | 100 | 10 |
| **6** | 12 | 50 | 110 | 12 |
| **6.25** | 12.5 | 50 | 110 | 12 |
| **6.5** | 13 | 50 | 110 | 12 |
| **6.75** | 13.5 | 50 | 110 | 12 |
| **7** | 14 | 50 | 110 | 12 |
| **7.5** | 15 | 50 | 110 | 12 |
| **8** | 16 | 60 | 140 | 16 |
| **8.25** | 16.5 | 60 | 140 | 16 |
| **8.5** | 17 | 60 | 140 | 16 |
| **8.75** | 17.5 | 60 | 140 | 16 |
| **9** | 18 | 60 | 160 | 16 |
| **9.5** | 19 | 60 | 160 | 16 |
| **10** | 20 | 60 | 160 | 20 |
| **10.5** | 21 | 60 | 160 | 20 |
| **12.5** | 25 | 60 | 180 | 25 |



| 公差(Tolerance) | R：±0.02 | D：±0.01 | d：h6 |
|---|---|---|---|

## 《AHBEL2》 右刃右ネジレ30° 刃数:2 K10 ●ロングタイプ 先ムク

Helix Angle-Right30° 2 Flutes Micro Grain Carbide ● Long Type

右ネジレ30° 刃数2 K10

| 寸法 R | 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|
| **3** | 6 | 40 | 150 | 6 |
| **3.25** | 6.5 | 40 | 150 | 6 |
| **3.5** | 7 | 40 | 150 | 6 |
| **3.75** | 7.5 | 40 | 150 | 6 |
| **4** | 8 | 40 | 180 | 8 |
| **4.25** | 8.5 | 40 | 180 | 8 |
| **4.5** | 9 | 40 | 180 | 8 |
| **4.75** | 9.5 | 40 | 180 | 8 |
| **5** | 10 | 60 | 200 | 10 |
| **5.25** | 10.5 | 60 | 200 | 10 |
| **5.5** | 11 | 60 | 200 | 10 |
| **5.75** | 11.5 | 60 | 200 | 10 |
| **6** | 12 | 60 | 200 | 12 |

| 寸法 R | 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|
| **6.25** | 12.5 | 60 | 200 | 12 |
| **6.5** | 13 | 60 | 200 | 12 |
| **6.75** | 13.5 | 60 | 200 | 12 |
| **7** | 14 | 60 | 200 | 12 |
| **7.5** | 15 | 60 | 200 | 12 |
| **8** | 16 | 60 | 200 | 16 |
| **8.25** | 16.5 | 60 | 200 | 16 |
| **8.5** | 17 | 60 | 200 | 16 |
| **8.75** | 17.5 | 60 | 200 | 16 |
| **9** | 18 | 80 | 250 | 16 |
| **9.5** | 19 | 80 | 250 | 16 |
| **10** | 20 | 80 | 250 | 20 |
| **10.5** | 21 | 80 | 250 | 20 |
| **12.5** | 25 | 80 | 250 | 25 |

※Solid Head

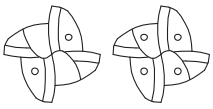
超硬

# AHBES4/AHBEL4

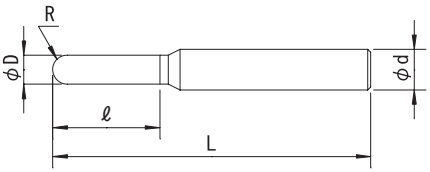
## 超硬エアホールボールエンドミル *Carbide Airhole Ball End Mill*

切削条件表 P353

ボール形状






| 公差(Tolerance) | R：±0.02 | D：±0.01 | d：h6 |
|---|---|---|---|

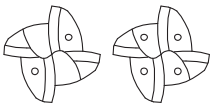
## 《AHBES4》 右刃右ネジレ30° 刃数:4 K10 ●スタンダードタイプ

Helix Angle-Right30° 4 Flutes Micro Grain Carbide ● Standard Type

右ネジレ30° 刃数4 K10

| 寸法 R | 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| 2 | 4 | 20 | 70 | 6 |
| 2.25 | 4.5 | 30 | 80 | 6 |
| 2.5 | 5 | 30 | 80 | 6 |
| 2.75 | 5.5 | 30 | 90 | 6 |
| 3 | 6 | 30 | 90 | 6 |
| 3.25 | 6.5 | 30 | 90 | 6 |
| 3.5 | 7 | 30 | 90 | 6 |
| 3.75 | 7.5 | 30 | 90 | 6 |
| 4 | 8 | 40 | 100 | 8 |
| 4.25 | 8.5 | 40 | 100 | 8 |
| 4.5 | 9 | 40 | 100 | 8 |
| 4.75 | 9.5 | 40 | 100 | 8 |
| 5 | 10 | 40 | 100 | 10 |
| 5.25 | 10.5 | 40 | 100 | 10 |
| 5.5 | 11 | 40 | 100 | 10 |

| 寸法 R | 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| 5.75 | 11.5 | 40 | 100 | 10 |
| 6 | 12 | 50 | 110 | 12 |
| 6.25 | 12.5 | 50 | 110 | 12 |
| 6.5 | 13 | 50 | 110 | 12 |
| 6.75 | 13.5 | 50 | 110 | 12 |
| 7 | 14 | 50 | 110 | 12 |
| 7.5 | 15 | 50 | 110 | 12 |
| 8 | 16 | 60 | 140 | 16 |
| 8.25 | 16.5 | 60 | 140 | 16 |
| 8.5 | 17 | 60 | 140 | 16 |
| 8.75 | 17.5 | 60 | 140 | 16 |
| 9 | 18 | 60 | 160 | 16 |
| 9.5 | 19 | 60 | 160 | 16 |
| 10 | 20 | 60 | 160 | 20 |
| 10.5 | 21 | 60 | 160 | 20 |
| 12.5 | 25 | 60 | 180 | 25 |




| 公差(Tolerance) | R：±0.02 | D：±0.01 | d：h6 |
|---|---|---|---|

## 《AHBEL4》 右刃右ネジレ30° 刃数:4 K10 ●ロングタイプ 先ムク

Helix Angle-Right30° 4 Flutes Micro Grain Carbide ● Long Type

右ネジレ30° 刃数4 K10

| 寸法 R | 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| 3 | 6 | 40 | 150 | 6 |
| 3.25 | 6.5 | 40 | 150 | 6 |
| 3.5 | 7 | 40 | 150 | 6 |
| 3.75 | 7.5 | 40 | 150 | 6 |
| 4 | 8 | 40 | 180 | 8 |
| 4.25 | 8.5 | 40 | 180 | 8 |
| 4.5 | 9 | 40 | 180 | 8 |
| 4.75 | 9.5 | 40 | 180 | 8 |
| 5 | 10 | 60 | 200 | 10 |
| 5.25 | 10.5 | 60 | 200 | 10 |
| 5.5 | 11 | 60 | 200 | 10 |
| 5.75 | 11.5 | 60 | 200 | 10 |
| 6 | 12 | 60 | 200 | 12 |

| 寸法 R | 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| 6.25 | 12.5 | 60 | 200 | 12 |
| 6.5 | 13 | 60 | 200 | 12 |
| 6.75 | 13.5 | 60 | 200 | 12 |
| 7 | 14 | 60 | 200 | 12 |
| 7.5 | 15 | 60 | 200 | 12 |
| 8 | 16 | 60 | 200 | 16 |
| 8.25 | 16.5 | 60 | 200 | 16 |
| 8.5 | 17 | 60 | 200 | 16 |
| 8.75 | 17.5 | 60 | 200 | 16 |
| 9 | 18 | 80 | 250 | 16 |
| 9.5 | 19 | 80 | 250 | 16 |
| 10 | 20 | 80 | 250 | 20 |
| 10.5 | 21 | 80 | 250 | 20 |
| 12.5 | 25 | 80 | 250 | 25 |

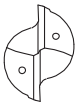
※Solid Head

超硬

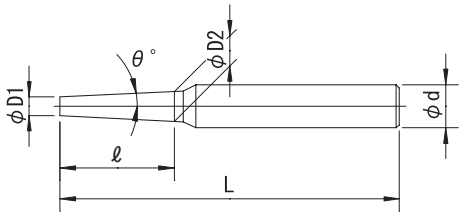
# AHTE

## 超硬エアホールソリッドテーパーエンドミル　*Solid Carbide Airhole Taper End Mill*

切削条件表 P353 | テーパー形状 | 右ネジレ 30° | 刃数 2 | K10








| 公差(Tolerance) | D1：$^{-0.01}_{-0.05}$ | θ ：±5' | d：h6 |
|---|---|---|---|

右刃右ネジレ30°　刃数:2　K10
Helix Angle-Right30°　2 Flutes　Micro Grain Carbide

| 小径（ΦD1） *Minor Dia.* | 片角（θ） *Taper Angle* | 刃長（ℓ） *Cut Length* | 大径（ΦD2） *Diameter at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|
| 4 | 30' | 25 | 4.43 | 90 | 6 |
| | 1° | 25 | 4.87 | 90 | 6 |
| | 1°30' | 25 | 5.3 | 90 | 6 |
| | 2° | 25 | 5.74 | 90 | 6 |
| | 2°30' | 25 | 6.18 | 90 | 6 |
| | 3° | 25 | 6.62 | 90 | 6 |
| | 5° | 25 | 8.37 | 90 | 8 |
| | 7° | 25 | 10.13 | 90 | 10 |
| 5 | 30' | 35 | 5.61 | 100 | 6 |
| | 1° | 35 | 6.22 | 100 | 6 |
| | 1°30' | 35 | 6.83 | 100 | 6 |
| | 2° | 35 | 7.44 | 100 | 6 |
| | 2°30' | 35 | 8.05 | 100 | 8 |
| | 3° | 35 | 8.66 | 100 | 8 |
| | 5° | 35 | 11.12 | 100 | 10 |
| | 7° | 35 | 13.59 | 100 | 12 |
| 6 | 30' | 35 | 6.61 | 100 | 6 |
| | 1° | 35 | 7.22 | 100 | 6 |
| | 1°30' | 35 | 7.83 | 100 | 6 |
| | 2° | 35 | 8.44 | 100 | 8 |
| | 2°30' | 35 | 9.05 | 100 | 8 |
| | 3° | 35 | 9.66 | 100 | 8 |
| | 5° | 35 | 12.12 | 100 | 12 |
| | 7° | 35 | 14.59 | 100 | 12 |

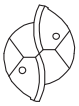
| 小径（ΦD1） *Minor Dia.* | 片角（θ） *Taper Angle* | 刃長（ℓ） *Cut Length* | 大径（ΦD2） *Diameter at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|
| 8 | 30' | 40 | 8.69 | 100 | 8 |
| | 1° | 40 | 9.39 | 100 | 8 |
| | 1°30' | 40 | 10.09 | 100 | 10 |
| | 2° | 40 | 10.79 | 100 | 10 |
| | 2°30' | 40 | 11.49 | 100 | 10 |
| | 3° | 40 | 12.19 | 100 | 12 |
| | 5° | 40 | 14.99 | 100 | 16 |
| | 7° | 40 | 17.82 | 100 | 16 |
| 10 | 30' | 50 | 10.87 | 120 | 10 |
| | 1° | 50 | 11.74 | 120 | 12 |
| | 1°30' | 50 | 12.61 | 120 | 12 |
| | 2° | 50 | 13.49 | 120 | 12 |
| | 2°30' | 50 | 14.36 | 120 | 12 |
| | 3° | 50 | 15.24 | 120 | 12 |
| | 5° | 50 | 18.74 | 120 | 16 |
| | 7° | 50 | 22.27 | 120 | 20 |
| 12 | 30' | 50 | 12.87 | 120 | 12 |
| | 1° | 50 | 13.74 | 120 | 12 |
| | 1°30' | 50 | 14.61 | 120 | 12 |
| | 2° | 50 | 15.49 | 120 | 12 |
| | 2°30' | 50 | 16.36 | 120 | 16 |
| | 3° | 50 | 17.24 | 120 | 16 |
| | 5° | 50 | 20.74 | 120 | 20 |
| | 7° | 50 | 24.27 | 120 | 20 |

超硬

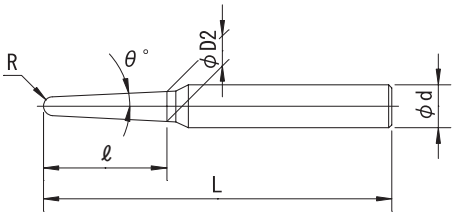
# AHTBE

## 超硬エアホールソリッドテーパーボールエンドミル *Solid Carbide Airhole Taper Ball End Mill*

切削条件表 P354 | テーパーボール形状 | 右ネジレ 30° | 刃数 2 | K10








| 公差(Tolerance) | R：±0.02 | θ：±5' | d：h6 |
|---|---|---|---|

右刃右ネジレ30° 刃数:2 K10
Helix Angle-Right30° 2 Flutes Micro Grain Carbide

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 2 | 30' | 25 | 4.4 | 90 | 6 |
| | 1° | 25 | 4.8 | 90 | 6 |
| | 1°30' | 25 | 5.2 | 90 | 6 |
| | 2° | 25 | 5.6 | 90 | 6 |
| | 2°30' | 25 | 6.01 | 90 | 6 |
| | 3° | 25 | 6.41 | 90 | 6 |
| | 5° | 25 | 8.03 | 90 | 8 |
| | 7° | 25 | 9.67 | 90 | 10 |
| 2.5 | 30' | 35 | 5.56 | 100 | 6 |
| | 1° | 35 | 6.13 | 100 | 6 |
| | 1°30' | 35 | 6.7 | 100 | 6 |
| | 2° | 35 | 7.27 | 100 | 6 |
| | 2°30' | 35 | 7.84 | 100 | 8 |
| | 3° | 35 | 8.41 | 100 | 8 |
| | 5° | 35 | 10.7 | 100 | 10 |
| | 7° | 35 | 13.01 | 100 | 12 |
| 3 | 30' | 35 | 6.55 | 100 | 6 |
| | 1° | 35 | 7.11 | 100 | 6 |
| | 1°30' | 35 | 7.67 | 100 | 6 |
| | 2° | 35 | 8.23 | 100 | 8 |
| | 2°30' | 35 | 8.8 | 100 | 8 |
| | 3° | 35 | 9.36 | 100 | 8 |
| | 5° | 35 | 11.62 | 100 | 12 |
| | 7° | 35 | 13.9 | 100 | 12 |

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 4 | 30' | 40 | 8.62 | 100 | 8 |
| | 1° | 40 | 9.25 | 100 | 8 |
| | 1°30' | 40 | 9.88 | 100 | 10 |
| | 2° | 40 | 10.51 | 100 | 10 |
| | 2°30' | 40 | 11.15 | 100 | 10 |
| | 3° | 40 | 11.78 | 100 | 12 |
| | 5° | 40 | 14.32 | 100 | 12 |
| | 7° | 40 | 16.9 | 100 | 16 |
| 5 | 30' | 50 | 10.78 | 120 | 10 |
| | 1° | 50 | 11.57 | 120 | 10 |
| | 1°30' | 50 | 12.36 | 120 | 12 |
| | 2° | 50 | 13.14 | 120 | 12 |
| | 2°30' | 50 | 13.93 | 120 | 12 |
| | 3° | 50 | 14.73 | 120 | 12 |
| | 5° | 50 | 17.91 | 120 | 16 |
| | 7° | 50 | 21.12 | 120 | 20 |
| 6 | 30' | 50 | 12.76 | 120 | 12 |
| | 1° | 50 | 13.53 | 120 | 12 |
| | 1°30' | 50 | 14.3 | 120 | 12 |
| | 2° | 50 | 15.08 | 120 | 12 |
| | 2°30' | 50 | 15.85 | 120 | 16 |
| | 3° | 50 | 16.62 | 120 | 16 |
| | 5° | 50 | 19.74 | 120 | 20 |
| | 7° | 50 | 22.89 | 120 | 20 |

超硬

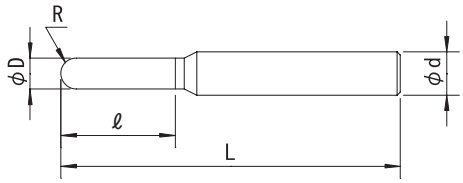
# CSBE

## 超硬ソリッドボールエンドミル *Solid Carbide Ball End Mill*

切削条件表 P354 | ボール形状 | 右ネジレ30° | 刃数2 | 超微粒子








| 公差(Tolerance) | R：±0.02 | D：±0.01 | d：h6 |
|---|---|---|---|

右刃右ネジレ30° 刃数:2 超微粒子
Helix Angle-Right30° 2 Flutes Ultra Micro Grain Carbide

| 寸法 R | 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|
| **0.4** | 0.8 | 3 | 45 | 4 |
| **0.45** | 0.9 | 3 | 45 | 4 |
| **0.5** | 1 | 5 | 50 | 4 |
| **0.55** | 1.1 | 5 | 50 | 4 |
| **0.6** | 1.2 | 5 | 50 | 4 |
| **0.65** | 1.3 | 5 | 50 | 4 |
| **0.7** | 1.4 | 5 | 50 | 4 |
| **0.75** | 1.5 | 5 | 50 | 4 |
| **0.8** | 1.6 | 5 | 50 | 4 |
| **0.85** | 1.7 | 5 | 50 | 4 |
| **0.9** | 1.8 | 5 | 50 | 4 |
| **0.95** | 1.9 | 5 | 50 | 4 |
| **1** | 2 | 6 | 60 | 6 |
| **1.05** | 2.1 | 6 | 60 | 6 |
| **1.1** | 2.2 | 6 | 60 | 6 |
| **1.15** | 2.3 | 6 | 60 | 6 |
| **1.2** | 2.4 | 6 | 60 | 6 |
| **1.25** | 2.5 | 6 | 60 | 6 |
| **1.3** | 2.6 | 6 | 60 | 6 |
| **1.35** | 2.7 | 6 | 60 | 6 |
| **1.4** | 2.8 | 6 | 60 | 6 |
| **1.45** | 2.9 | 6 | 60 | 6 |
| **1.5** | 3 | 8 | 70 | 6 |
| **1.55** | 3.1 | 8 | 70 | 6 |
| **1.6** | 3.2 | 8 | 70 | 6 |
| **1.65** | 3.3 | 8 | 70 | 6 |
| **1.7** | 3.4 | 8 | 70 | 6 |
| **1.75** | 3.5 | 8 | 70 | 6 |
| **1.8** | 3.6 | 8 | 70 | 6 |
| **1.85** | 3.7 | 8 | 70 | 6 |
| **1.9** | 3.8 | 8 | 70 | 6 |
| **1.95** | 3.9 | 8 | 70 | 6 |
| **2** | 4 | 8 | 70 | 6 |
| **2.05** | 4.1 | 8 | 70 | 6 |
| **2.1** | 4.2 | 8 | 70 | 6 |
| **2.15** | 4.3 | 8 | 70 | 6 |
| **2.2** | 4.4 | 8 | 70 | 6 |
| **2.25** | 4.5 | 12 | 90 | 6 |
| **2.3** | 4.6 | 12 | 90 | 6 |
| **2.35** | 4.7 | 12 | 90 | 6 |
| **2.4** | 4.8 | 12 | 90 | 6 |
| **2.45** | 4.9 | 12 | 90 | 6 |
| **2.5** | 5 | 12 | 90 | 6 |
| **2.55** | 5.1 | 12 | 90 | 6 |
| **2.6** | 5.2 | 12 | 90 | 6 |
| **2.65** | 5.3 | 12 | 90 | 6 |

| 寸法 R | 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|
| **2.7** | 5.4 | 12 | 90 | 6 |
| **2.75** | 5.5 | 12 | 90 | 6 |
| **2.8** | 5.6 | 12 | 90 | 6 |
| **2.85** | 5.7 | 12 | 90 | 6 |
| **2.9** | 5.8 | 12 | 90 | 6 |
| **2.95** | 5.9 | 12 | 90 | 6 |
| **3** | 6 | 12 | 90 | 6 |
| **3.05** | 6.1 | 12 | 90 | 6 |
| **3.1** | 6.2 | 12 | 90 | 6 |
| **3.15** | 6.3 | 12 | 90 | 6 |
| **3.2** | 6.4 | 12 | 90 | 6 |
| **3.25** | 6.5 | 12 | 90 | 6 |
| **3.3** | 6.6 | 14 | 100 | 8 |
| **3.35** | 6.7 | 14 | 100 | 8 |
| **3.4** | 6.8 | 14 | 100 | 8 |
| **3.45** | 6.9 | 14 | 100 | 8 |
| **3.5** | 7 | 14 | 100 | 8 |
| **3.55** | 7.1 | 14 | 100 | 8 |
| **3.6** | 7.2 | 14 | 100 | 8 |
| **3.65** | 7.3 | 14 | 100 | 8 |
| **3.7** | 7.4 | 14 | 100 | 8 |
| **3.75** | 7.5 | 14 | 100 | 8 |
| **3.8** | 7.6 | 14 | 100 | 8 |
| **3.85** | 7.7 | 14 | 100 | 8 |
| **3.9** | 7.8 | 14 | 100 | 8 |
| **3.95** | 7.9 | 14 | 100 | 8 |
| **4** | 8 | 14 | 100 | 8 |
| **4.05** | 8.1 | 14 | 100 | 8 |
| **4.1** | 8.2 | 14 | 100 | 8 |
| **4.15** | 8.3 | 14 | 100 | 8 |
| **4.2** | 8.4 | 14 | 100 | 8 |
| **4.25** | 8.5 | 18 | 100 | 10 |
| **4.3** | 8.6 | 18 | 100 | 10 |
| **4.35** | 8.7 | 18 | 100 | 10 |
| **4.4** | 8.8 | 18 | 100 | 10 |
| **4.45** | 8.9 | 18 | 100 | 10 |
| **4.5** | 9 | 18 | 100 | 10 |
| **4.55** | 9.1 | 18 | 100 | 10 |
| **4.6** | 9.2 | 18 | 100 | 10 |
| **4.65** | 9.3 | 18 | 100 | 10 |
| **4.7** | 9.4 | 18 | 100 | 10 |
| **4.75** | 9.5 | 18 | 100 | 10 |
| **4.8** | 9.6 | 18 | 100 | 10 |
| **4.85** | 9.7 | 18 | 100 | 10 |
| **4.9** | 9.8 | 18 | 100 | 10 |
| **4.95** | 9.9 | 18 | 100 | 10 |

# CSBE 超硬ソリッドボールエンドミル

| 寸法 R | 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| **5** | 10 | 18 | 100 | 10 |
| **5.05** | 10.1 | 18 | 100 | 10 |
| **5.1** | 10.2 | 18 | 100 | 10 |
| **5.15** | 10.3 | 18 | 100 | 10 |
| **5.2** | 10.4 | 18 | 100 | 10 |
| **5.25** | 10.5 | 22 | 110 | 12 |
| **5.3** | 10.6 | 22 | 110 | 12 |
| **5.35** | 10.7 | 22 | 110 | 12 |
| **5.4** | 10.8 | 22 | 110 | 12 |
| **5.45** | 10.9 | 22 | 110 | 12 |
| **5.5** | 11 | 22 | 110 | 12 |
| **5.55** | 11.1 | 22 | 110 | 12 |
| **5.6** | 11.2 | 22 | 110 | 12 |
| **5.65** | 11.3 | 22 | 110 | 12 |
| **5.7** | 11.4 | 22 | 110 | 12 |
| **5.75** | 11.5 | 22 | 110 | 12 |
| **5.8** | 11.6 | 22 | 110 | 12 |
| **5.85** | 11.7 | 22 | 110 | 12 |
| **5.9** | 11.8 | 22 | 110 | 12 |
| **5.95** | 11.9 | 22 | 110 | 12 |
| **6** | 12 | 22 | 110 | 12 |
| **6.05** | 12.1 | 22 | 110 | 12 |
| **6.1** | 12.2 | 22 | 110 | 12 |
| **6.15** | 12.3 | 22 | 110 | 12 |
| **6.2** | 12.4 | 22 | 110 | 12 |
| **6.25** | 12.5 | 22 | 110 | 12 |
| **6.3** | 12.6 | 22 | 110 | 12 |
| **6.35** | 12.7 | 22 | 110 | 12 |
| **6.4** | 12.8 | 22 | 110 | 12 |
| **6.45** | 12.9 | 22 | 110 | 12 |
| **6.5** | 13 | 25 | 110 | 12 |
| **6.55** | 13.1 | 25 | 110 | 12 |
| **6.6** | 13.2 | 25 | 110 | 12 |
| **6.65** | 13.3 | 25 | 110 | 12 |
| **6.7** | 13.4 | 25 | 110 | 12 |
| **6.75** | 13.5 | 25 | 110 | 12 |
| **6.8** | 13.6 | 25 | 110 | 12 |
| **6.85** | 13.7 | 25 | 110 | 12 |
| **6.9** | 13.8 | 25 | 110 | 12 |
| **6.95** | 13.9 | 25 | 110 | 12 |
| **7** | 14 | 30 | 120 | 16 |
| **7.05** | 14.1 | 30 | 120 | 16 |
| **7.1** | 14.2 | 30 | 120 | 16 |
| **7.15** | 14.3 | 30 | 120 | 16 |
| **7.2** | 14.4 | 30 | 120 | 16 |
| **7.25** | 14.5 | 30 | 120 | 16 |
| **7.3** | 14.6 | 30 | 120 | 16 |
| **7.35** | 14.7 | 30 | 120 | 16 |
| **7.4** | 14.8 | 30 | 120 | 16 |
| **7.45** | 14.9 | 30 | 120 | 16 |
| **7.5** | 15 | 30 | 120 | 16 |
| **7.55** | 15.1 | 30 | 120 | 16 |
| **7.6** | 15.2 | 30 | 120 | 16 |
| **7.65** | 15.3 | 30 | 120 | 16 |
| **7.7** | 15.4 | 30 | 120 | 16 |
| **7.75** | 15.5 | 30 | 120 | 16 |
| **7.8** | 15.6 | 30 | 120 | 16 |
| **7.85** | 15.7 | 30 | 120 | 16 |
| **7.9** | 15.8 | 30 | 120 | 16 |
| **7.95** | 15.9 | 30 | 120 | 16 |

| 寸法 R | 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| **8** | 16 | 30 | 130 | 16 |
| **8.05** | 16.1 | 30 | 130 | 16 |
| **8.1** | 16.2 | 30 | 130 | 16 |
| **8.15** | 16.3 | 30 | 130 | 16 |
| **8.2** | 16.4 | 30 | 130 | 16 |
| **8.25** | 16.5 | 30 | 130 | 16 |
| **8.3** | 16.6 | 30 | 130 | 16 |
| **8.35** | 16.7 | 30 | 130 | 16 |
| **8.4** | 16.8 | 30 | 130 | 16 |
| **8.45** | 16.9 | 30 | 130 | 16 |
| **8.5** | 17 | 30 | 130 | 20 |
| **8.55** | 17.1 | 30 | 130 | 20 |
| **8.6** | 17.2 | 30 | 130 | 20 |
| **8.65** | 17.3 | 30 | 130 | 20 |
| **8.7** | 17.4 | 30 | 130 | 20 |
| **8.75** | 17.5 | 30 | 130 | 20 |
| **8.8** | 17.6 | 30 | 130 | 20 |
| **8.85** | 17.7 | 30 | 130 | 20 |
| **8.9** | 17.8 | 30 | 130 | 20 |
| **8.95** | 17.9 | 30 | 130 | 20 |
| **9** | 18 | 40 | 130 | 20 |
| **9.05** | 18.1 | 40 | 130 | 20 |
| **9.1** | 18.2 | 40 | 130 | 20 |
| **9.15** | 18.3 | 40 | 130 | 20 |
| **9.2** | 18.4 | 40 | 130 | 20 |
| **9.25** | 18.5 | 40 | 130 | 20 |
| **9.3** | 18.6 | 40 | 130 | 20 |
| **9.35** | 18.7 | 40 | 130 | 20 |
| **9.4** | 18.8 | 40 | 130 | 20 |
| **9.45** | 18.9 | 40 | 130 | 20 |
| **9.5** | 19 | 40 | 140 | 20 |
| **9.55** | 19.1 | 40 | 140 | 20 |
| **9.6** | 19.2 | 40 | 140 | 20 |
| **9.65** | 19.3 | 40 | 140 | 20 |
| **9.7** | 19.4 | 40 | 140 | 20 |
| **9.75** | 19.5 | 40 | 140 | 20 |
| **9.8** | 19.6 | 40 | 140 | 20 |
| **9.85** | 19.7 | 40 | 140 | 20 |
| **9.9** | 19.8 | 40 | 140 | 20 |
| **9.95** | 19.9 | 40 | 140 | 20 |
| **10** | 20 | 40 | 150 | 20 |
| **10.5** | 21 | 40 | 150 | 20 |
| **11** | 22 | 40 | 150 | 20 |
| **11.5** | 23 | 40 | 150 | 20 |
| **12** | 24 | 50 | 150 | 20 |
| **12.5** | 25 | 50 | 150 | 25 |
| **13** | 26 | 50 | 160 | 25 |
| **13.5** | 27 | 50 | 160 | 25 |
| **14** | 28 | 50 | 160 | 25 |
| **14.5** | 29 | 50 | 160 | 25 |
| **15** | 30 | 60 | 170 | 25 |
| **15.5** | 31 | 60 | 170 | 25 |
| **16** | 32 | 70 | 180 | 32 |
| **16.5** | 33 | 70 | 180 | 32 |
| **17** | 34 | 70 | 180 | 32 |
| **17.5** | 35 | 70 | 180 | 32 |
| **18** | 36 | 70 | 180 | 32 |
| **18.5** | 37 | 70 | 180 | 32 |
| **19** | 38 | 70 | 180 | 32 |
| **19.5** | 39 | 70 | 180 | 32 |
| **20** | 40 | 70 | 180 | 32 |

超硬

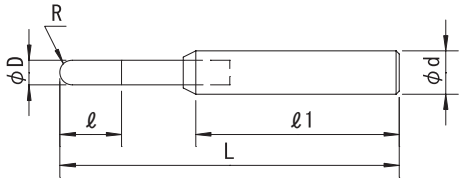
# CMBE

## 超硬先ムクボールエンドミル *Solid Carbide Head Ball End Mill*

切削条件表 P355 | ボール形状 | 右ネジレ 25° | 刃数 2 | 超微粒子








| 公差(Tolerance) | R：±0.02 | D：±0.01 | d：h7 |
|---|---|---|---|

右刃右ネジレ25° 刃数:2 超微粒子
Helix Angle-Right25° 2 Flutes Ultra Micro Grain Carbide

| 寸法 R | 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク長 (ℓ1) *Shank Length.* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|---|
| **0.75** | 1.5 | 5 | 90 | 74 | 8 |
| **1** | 2 | 7 | 100 | 74 | 8 |
| **1.25** | 2.5 | 7 | 100 | 74 | 8 |
| **1.5** | 3 | 7 | 100 | 74 | 8 |
| **1.75** | 3.5 | 7 | 100 | 74 | 8 |
| **2** | 4 | 9 | 100 | 74 | 10 |
| **2.25** | 4.5 | 9 | 100 | 74 | 10 |
| **2.5** | 5 | 10 | 120 | 85 | 10 |

| 寸法 R | 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク長 (ℓ1) *Shank Length.* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|---|
| **2.75** | 5.5 | 10 | 120 | 85 | 10 |
| **3** | 6 | 11 | 120 | 85 | 10 |
| **3.25** | 6.5 | 11 | 120 | 85 | 10 |
| **3.5** | 7 | 14 | 120 | 85 | 10 |
| **3.75** | 7.5 | 14 | 120 | 85 | 12 |
| **4** | 8 | 14 | 120 | 85 | 12 |
| **4.25** | 8.5 | 14 | 120 | 85 | 12 |
| **4.5** | 9 | 14 | 120 | 85 | 12 |

超硬

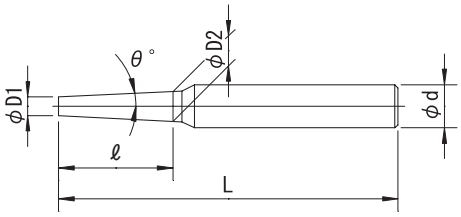
# CSTE

## 超硬ソリッドテーパーエンドミル *Solid Carbide Taper End Mill*

切削条件表 P356 | テーパー形状 | 右ネジレ30° | 刃数2 | 超微粒子








| 公差(Tolerance) | D1: $^{0}_{-0.05}$ | θ : ±5' | d : h6 |
|---|---|---|---|

右刃右ネジレ30° 刃数:2 超微粒子
Helix Angle-Right30° 2 Flutes Ultra Micro Grain Carbide

| 小径 (ΦD1) *Minor Dia.* | 片角 (θ) *Taper Angle* | 刃長 (ℓ) *Cut Length* | 大径 (ΦD2) *Diameter at Large End* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|---|
| 0.5 | 30' | 2 | 0.53 | 35 | 3 |
| | 1° | 2 | 0.57 | 35 | 3 |
| | 1°30' | 2 | 0.6 | 35 | 3 |
| | 2° | 2 | 0.64 | 35 | 3 |
| | 2°30' | 2 | 0.67 | 35 | 3 |
| | 3° | 2 | 0.71 | 35 | 3 |
| | 4° | 2 | 0.77 | 35 | 3 |
| | 5° | 2 | 0.84 | 35 | 3 |
| | 6° | 2 | 0.92 | 35 | 3 |
| | 7° | 2 | 0.99 | 35 | 3 |
| | 8° | 2 | 1.06 | 35 | 3 |
| | 10° | 2 | 1.2 | 35 | 3 |
| 0.6 | 30' | 2 | 0.63 | 35 | 3 |
| | 1° | 2 | 0.67 | 35 | 3 |
| | 1°30' | 2 | 0.7 | 35 | 3 |
| | 2° | 2 | 0.74 | 35 | 3 |
| | 2°30' | 2 | 0.76 | 35 | 3 |
| | 3° | 2 | 0.81 | 35 | 3 |
| | 4° | 2 | 0.87 | 35 | 3 |
| | 5° | 2 | 0.94 | 35 | 3 |
| | 6° | 2 | 1.02 | 35 | 3 |
| | 7° | 2 | 1.09 | 35 | 3 |
| | 8° | 2 | 1.16 | 35 | 3 |
| | 10° | 2 | 1.3 | 35 | 3 |
| 0.7 | 30' | 2 | 0.73 | 35 | 3 |
| | 1° | 2 | 0.77 | 35 | 3 |
| | 1°30' | 2 | 0.8 | 35 | 3 |
| | 2° | 2 | 0.84 | 35 | 3 |
| | 2°30' | 2 | 0.86 | 35 | 3 |
| | 3° | 2 | 0.91 | 35 | 3 |
| | 4° | 2 | 0.97 | 35 | 3 |
| | 5° | 2 | 1.04 | 35 | 3 |
| | 6° | 2 | 1.12 | 35 | 3 |
| | 7° | 2 | 1.19 | 35 | 3 |
| | 8° | 2 | 1.26 | 35 | 3 |
| | 10° | 2 | 1.4 | 35 | 3 |
| 0.8 | 30' | 2 | 0.83 | 35 | 3 |
| | 1° | 2 | 0.87 | 35 | 3 |
| | 1°30' | 2 | 0.9 | 35 | 3 |
| | 2° | 2 | 0.94 | 35 | 3 |
| | 2°30' | 2 | 0.97 | 35 | 3 |
| | 3° | 2 | 1 | 35 | 3 |
| | 4° | 2 | 1.07 | 35 | 3 |
| | 5° | 2 | 1.14 | 35 | 3 |
| | 6° | 2 | 1.22 | 35 | 3 |
| | 7° | 2 | 1.29 | 35 | 3 |

| 小径 (ΦD1) *Minor Dia.* | 片角 (θ) *Taper Angle* | 刃長 (ℓ) *Cut Length* | 大径 (ΦD2) *Diameter at Large End* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|---|
| 0.8 | 8° | 2 | 1.36 | 35 | 3 |
| | 10° | 2 | 1.5 | 35 | 3 |
| 0.9 | 30' | 2 | 0.93 | 35 | 3 |
| | 1° | 2 | 0.96 | 35 | 3 |
| | 1°30' | 2 | 1 | 35 | 3 |
| | 2° | 2 | 1.03 | 35 | 3 |
| | 2°30' | 2 | 1.07 | 35 | 3 |
| | 3° | 2 | 1.1 | 35 | 3 |
| | 4° | 2 | 1.18 | 35 | 3 |
| | 5° | 2 | 1.24 | 35 | 3 |
| | 6° | 2 | 1.32 | 35 | 3 |
| | 7° | 2 | 1.39 | 35 | 3 |
| | 8° | 2 | 1.46 | 35 | 3 |
| | 10° | 2 | 1.6 | 35 | 3 |
| 1 | 30' | 4 | 1.06 | 45 | 4 |
| | 1° | 4 | 1.13 | 45 | 4 |
| | 1°30' | 4 | 1.2 | 45 | 4 |
| | 2° | 4 | 1.27 | 45 | 4 |
| | 2°30' | 4 | 1.34 | 45 | 4 |
| | 3° | 4 | 1.41 | 45 | 4 |
| | 4° | 4 | 1.55 | 45 | 4 |
| | 5° | 4 | 1.7 | 45 | 4 |
| | 6° | 4 | 1.84 | 45 | 4 |
| | 7° | 4 | 1.98 | 45 | 4 |
| | 8° | 4 | 2.12 | 45 | 4 |
| | 10° | 4 | 2.4 | 45 | 4 |
| | 15° | 4 | 3.14 | 45 | 4 |
| 1.5 | 30' | 5 | 1.58 | 45 | 4 |
| | 1° | 5 | 1.67 | 45 | 4 |
| | 1°30' | 5 | 1.76 | 45 | 4 |
| | 2° | 5 | 1.84 | 45 | 4 |
| | 2°30' | 5 | 1.93 | 45 | 4 |
| | 3° | 5 | 2.02 | 45 | 4 |
| | 4° | 5 | 2.19 | 45 | 4 |
| | 5° | 5 | 2.37 | 45 | 4 |
| | 6° | 5 | 2.55 | 45 | 4 |
| | 7° | 5 | 2.72 | 45 | 4 |
| | 8° | 5 | 2.9 | 45 | 4 |
| | 10° | 5 | 3.26 | 45 | 4 |
| | 15° | 5 | 4.17 | 45 | 4 |
| 2 | 30' | 6 | 2.1 | 45 | 4 |
| | 1° | 6 | 2.2 | 45 | 4 |
| | 1°30' | 6 | 2.31 | 45 | 4 |
| | 2° | 6 | 2.41 | 45 | 4 |
| | 2°30' | 6 | 2.52 | 45 | 4 |
| | 3° | 6 | 2.62 | 45 | 4 |

# CSTE 超硬ソリッドテーパーエンドミル

| 小径 (ΦD1) Minor Dia. | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 2 | 4° | 6 | 2.83 | 45 | 4 |
| | 5° | 6 | 3.04 | 45 | 4 |
| | 6° | 6 | 3.26 | 45 | 4 |
| | 7° | 6 | 3.47 | 45 | 4 |
| | 8° | 6 | 3.68 | 45 | 4 |
| | 10° | 6 | 4.11 | 45 | 6 |
| | 15° | 6 | 5.21 | 45 | 6 |
| 2.5 | 30' | 8 | 2.63 | 45 | 4 |
| | 1° | 8 | 2.77 | 45 | 4 |
| | 1°30' | 8 | 2.91 | 45 | 4 |
| | 2° | 8 | 3.05 | 45 | 4 |
| | 2°30' | 8 | 3.19 | 45 | 4 |
| | 3° | 8 | 3.33 | 45 | 4 |
| | 4° | 8 | 3.61 | 45 | 4 |
| | 5° | 8 | 3.89 | 45 | 4 |
| | 6° | 8 | 4.18 | 45 | 6 |
| | 7° | 8 | 4.46 | 45 | 6 |
| | 8° | 8 | 4.74 | 45 | 6 |
| | 10° | 8 | 5.31 | 45 | 6 |
| | 15° | 8 | 6.78 | 45 | 6 |
| 3 | 30' | 10 | 3.17 | 50 | 6 |
| | 1° | 10 | 3.34 | 50 | 6 |
| | 1°30' | 10 | 3.52 | 50 | 6 |
| | 2° | 10 | 3.69 | 50 | 6 |
| | 2°30' | 10 | 3.87 | 50 | 6 |
| | 3° | 10 | 4.04 | 50 | 6 |
| | 4° | 10 | 4.39 | 50 | 6 |
| | 5° | 10 | 4.74 | 50 | 6 |
| | 6° | 10 | 5.1 | 50 | 6 |
| | 7° | 10 | 5.45 | 50 | 6 |
| | 8° | 10 | 5.81 | 50 | 6 |
| | 10° | 10 | 6.54 | 50 | 6 |
| | 15° | 10 | 8.35 | 50 | 8 |
| 4 | 30' | 15 | 4.26 | 50 | 6 |
| | 1° | 15 | 4.52 | 50 | 6 |
| | 1°30' | 15 | 4.78 | 50 | 6 |
| | 2° | 15 | 5.04 | 50 | 6 |
| | 2°30' | 15 | 5.3 | 50 | 6 |
| | 3° | 15 | 5.56 | 50 | 6 |
| | 4° | 15 | 6.09 | 55 | 6 |
| | 5° | 15 | 6.62 | 55 | 6 |
| | 6° | 15 | 7.15 | 55 | 6 |
| | 7° | 15 | 7.68 | 55 | 6 |
| | 8° | 15 | 8.21 | 55 | 8 |
| | 10° | 15 | 9.28 | 60 | 8 |
| | 15° | 15 | 12.03 | 60 | 12 |
| 5 | 30' | 20 | 5.34 | 55 | 6 |
| | 1° | 20 | 5.69 | 55 | 6 |
| | 1°30' | 20 | 6.04 | 55 | 6 |
| | 2° | 20 | 6.39 | 55 | 6 |
| | 2°30' | 20 | 6.74 | 55 | 6 |
| | 3° | 20 | 7.09 | 55 | 6 |
| | 4° | 20 | 7.79 | 60 | 6 |
| | 5° | 20 | 8.49 | 60 | 8 |
| | 6° | 20 | 9.2 | 60 | 8 |
| | 7° | 20 | 9.9 | 60 | 8 |
| | 8° | 20 | 10.62 | 60 | 10 |
| | 10° | 20 | 12.04 | 70 | 12 |
| | 15° | 20 | 15.71 | 70 | 16 |
| 6 | 30' | 20 | 6.34 | 55 | 6 |
| | 1° | 20 | 6.69 | 55 | 6 |

| 小径 (ΦD1) Minor Dia. | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 6 | 1°30' | 20 | 7.04 | 55 | 6 |
| | 2° | 20 | 7.39 | 55 | 6 |
| | 2°30' | 20 | 7.74 | 55 | 6 |
| | 3° | 20 | 8.09 | 60 | 8 |
| | 4° | 20 | 8.79 | 65 | 8 |
| | 5° | 20 | 9.49 | 65 | 8 |
| | 6° | 20 | 10.2 | 65 | 10 |
| | 7° | 20 | 10.9 | 65 | 10 |
| | 8° | 20 | 11.62 | 65 | 10 |
| | 10° | 20 | 13.04 | 80 | 12 |
| | 15° | 20 | 16.71 | 80 | 16 |
| 8 | 30' | 25 | 8.43 | 65 | 8 |
| | 1° | 25 | 8.87 | 65 | 8 |
| | 1°30' | 25 | 9.3 | 65 | 8 |
| | 2° | 25 | 9.74 | 65 | 8 |
| | 2°30' | 25 | 10.18 | 70 | 10 |
| | 3° | 25 | 10.61 | 70 | 10 |
| | 4° | 25 | 11.49 | 80 | 10 |
| | 5° | 25 | 12.37 | 90 | 12 |
| | 6° | 25 | 13.25 | 90 | 12 |
| | 7° | 25 | 14.13 | 90 | 12 |
| | 8° | 25 | 15.02 | 90 | 16 |
| | 10° | 25 | 16.81 | 90 | 16 |
| | 15° | 25 | 21.39 | 90 | 20 |
| 10 | 30' | 35 | 10.6 | 85 | 10 |
| | 1° | 35 | 11.21 | 85 | 10 |
| | 1°30' | 35 | 11.82 | 85 | 10 |
| | 2° | 35 | 12.44 | 90 | 12 |
| | 2°30' | 35 | 13.05 | 90 | 12 |
| | 3° | 35 | 13.66 | 90 | 12 |
| | 4° | 35 | 14.89 | 90 | 12 |
| | 5° | 35 | 16.11 | 90 | 16 |
| | 6° | 35 | 17.35 | 90 | 16 |
| | 7° | 35 | 18.58 | 90 | 16 |
| | 8° | 35 | 19.83 | 90 | 20 |
| | 10° | 35 | 22.33 | 110 | 20 |
| | 15° | 35 | 28.75 | 110 | 25 |
| 12 | 30' | 55 | 12.95 | 110 | 12 |
| | 1° | 55 | 13.91 | 110 | 12 |
| | 1°30' | 55 | 14.87 | 110 | 12 |
| | 2° | 55 | 15.83 | 110 | 16 |
| | 2°30' | 55 | 16.79 | 110 | 16 |
| | 3° | 55 | 17.75 | 110 | 16 |
| | 4° | 55 | 19.68 | 110 | 20 |
| | 5° | 55 | 21.61 | 120 | 20 |
| | 6° | 55 | 23.55 | 120 | 20 |
| | 7° | 55 | 25.51 | 120 | 25 |
| | 8° | 55 | 27.45 | 120 | 25 |
| | 10° | 55 | 31.38 | 120 | 25 |
| | 15° | 55 | 41.47 | 120 | 32 |
| 16 | 30' | 65 | 17.13 | 130 | 16 |
| | 1° | 65 | 18.26 | 130 | 16 |
| | 1°30' | 65 | 19.39 | 130 | 16 |
| | 2° | 65 | 20.53 | 130 | 20 |
| | 2°30' | 65 | 21.68 | 130 | 20 |
| | 3° | 65 | 22.81 | 130 | 20 |
| | 4° | 65 | 25.08 | 140 | 25 |
| | 5° | 65 | 27.36 | 140 | 25 |
| | 6° | 65 | 29.65 | 140 | 25 |
| | 7° | 65 | 31.95 | 140 | 32 |
| | 8° | 65 | 34.26 | 140 | 32 |
| | 10° | 65 | 38.92 | 140 | 32 |

超硬

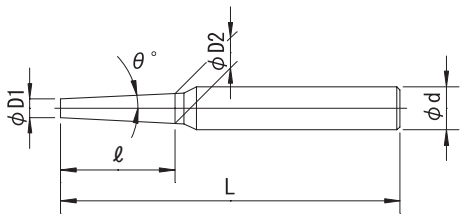
# CSTEM

## 超硬ソリッドテーパーエンドミル（ミディアム） *Solid Carbide Taper End Mill (Medium)*

切削条件表 P356 | テーパー形状 | 右ネジレ30° | 刃数2 | 超微粒子








| 公差(Tolerance) | D1：$^{0}_{-0.05}$ | θ ：±5' | d：h6 |
|---|---|---|---|

右刃右ネジレ30° 刃数:2 超微粒子
Helix Angle-Right30° 2 Flutes Ultra Micro Grain Carbide

| 小径（ΦD1） *Minor Dia.* | 片角（θ） *Taper Angle* | 刃長（ℓ） *Cut Length* | 大径（ΦD2） *Diameter at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|
| 0.5 | 30' | 4 | 0.57 | 40 | 3 |
| | 1° | 4 | 0.64 | 40 | 3 |
| | 1°30' | 4 | 0.71 | 40 | 3 |
| | 2° | 4 | 0.78 | 40 | 3 |
| | 3° | 5 | 1.02 | 40 | 3 |
| | 5° | 5 | 1.37 | 40 | 3 |
| | 6° | 5 | 1.55 | 40 | 3 |
| | 7° | 5 | 1.72 | 40 | 3 |
| | 8° | 5 | 1.9 | 40 | 3 |
| | 10° | 5 | 2.26 | 40 | 3 |
| 0.6 | 30' | 4 | 0.67 | 40 | 3 |
| | 1° | 4 | 0.74 | 40 | 3 |
| | 1°30' | 4 | 0.81 | 40 | 3 |
| | 2° | 4 | 0.88 | 40 | 3 |
| | 3° | 5 | 1.12 | 40 | 3 |
| | 5° | 5 | 1.47 | 40 | 3 |
| | 6° | 5 | 1.65 | 40 | 3 |
| | 7° | 5 | 1.82 | 40 | 3 |
| | 8° | 5 | 2 | 40 | 3 |
| | 10° | 5 | 2.36 | 40 | 3 |
| | 15° | 5 | 3.27 | 40 | 4 |
| 0.7 | 30' | 4 | 0.77 | 40 | 3 |
| | 1° | 4 | 0.84 | 40 | 3 |
| | 1°30' | 4 | 0.91 | 40 | 3 |
| | 2° | 4 | 0.98 | 40 | 3 |
| | 3° | 6 | 1.33 | 40 | 3 |
| | 5° | 6 | 1.74 | 40 | 3 |
| | 6° | 6 | 1.96 | 40 | 3 |
| | 7° | 6 | 2.17 | 40 | 3 |
| | 8° | 6 | 2.38 | 40 | 3 |
| | 10° | 6 | 2.81 | 40 | 3 |
| | 15° | 6 | 3.91 | 40 | 4 |
| 0.8 | 30' | 5 | 0.89 | 40 | 3 |
| | 1° | 5 | 0.97 | 40 | 3 |
| | 1°30' | 5 | 1.06 | 40 | 3 |
| | 2° | 5 | 1.15 | 40 | 3 |
| | 3° | 6 | 1.43 | 40 | 3 |
| | 5° | 6 | 1.84 | 40 | 3 |
| | 6° | 6 | 2.06 | 40 | 3 |
| | 7° | 6 | 2.27 | 40 | 3 |
| | 8° | 6 | 2.48 | 40 | 3 |
| | 10° | 6 | 2.91 | 40 | 3 |
| | 15° | 6 | 4.01 | 40 | 4 |

| 小径（ΦD1） *Minor Dia.* | 片角（θ） *Taper Angle* | 刃長（ℓ） *Cut Length* | 大径（ΦD2） *Diameter at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|
| 0.9 | 30' | 5 | 0.99 | 40 | 3 |
| | 1° | 5 | 1.07 | 40 | 3 |
| | 1°30' | 5 | 1.16 | 40 | 3 |
| | 2° | 5 | 1.25 | 40 | 3 |
| | 3° | 6 | 1.53 | 40 | 3 |
| | 5° | 6 | 1.94 | 40 | 3 |
| | 6° | 6 | 2.16 | 40 | 3 |
| | 7° | 6 | 2.37 | 40 | 3 |
| | 8° | 6 | 2.58 | 40 | 3 |
| | 10° | 6 | 3.01 | 40 | 3 |
| | 15° | 6 | 4.11 | 40 | 4 |
| 1 | 30' | 8 | 1.14 | 45 | 4 |
| | 1° | 8 | 1.28 | 45 | 4 |
| | 1°30' | 8 | 1.42 | 45 | 4 |
| | 2° | 8 | 1.56 | 45 | 4 |
| | 2°30' | 8 | 1.69 | 45 | 4 |
| | 3° | 8 | 1.84 | 45 | 4 |
| | 4° | 10 | 2.4 | 45 | 4 |
| | 5° | 10 | 2.75 | 45 | 4 |
| | 6° | 10 | 3.1 | 45 | 4 |
| | 7° | 10 | 3.46 | 45 | 4 |
| | 8° | 10 | 3.81 | 45 | 4 |
| | 10° | 10 | 4.53 | 45 | 4 |
| | 15° | 10 | 6.35 | 45 | 6 |
| 1.5 | 30' | 8 | 1.64 | 45 | 4 |
| | 1° | 8 | 1.78 | 45 | 4 |
| | 1°30' | 8 | 1.92 | 45 | 4 |
| | 2° | 8 | 2.06 | 45 | 4 |
| | 2°30' | 8 | 2.19 | 45 | 4 |
| | 3° | 8 | 2.34 | 45 | 4 |
| | 4° | 10 | 2.9 | 45 | 4 |
| | 5° | 10 | 3.25 | 45 | 4 |
| | 6° | 10 | 3.6 | 45 | 4 |
| | 7° | 10 | 3.96 | 45 | 4 |
| | 8° | 10 | 4.31 | 45 | 4 |
| | 10° | 10 | 5.03 | 45 | 6 |
| | 15° | 10 | 6.85 | 45 | 6 |

# CSTEM 超硬ソリッドテーパーエンドミル（ミディアム）

| 小径（ΦD1）<br>*Minor Dia.* | 片角（θ）<br>*Taper Angle* | 刃長（ℓ）<br>*Cut Length* | 大径（ΦD2）<br>*Diameter at Large End* | 全長（L）<br>*Overall Length* | シャンク径（Φd）<br>*Shank Dia.* |
|---|---|---|---|---|---|
| 2 | 30' | 10 | 2.17 | 45 | 4 |
| | 1° | 10 | 2.35 | 45 | 4 |
| | 1°30' | 10 | 2.52 | 45 | 4 |
| | 2° | 10 | 2.7 | 45 | 4 |
| | 2°30' | 10 | 2.87 | 45 | 4 |
| | 3° | 10 | 3.05 | 45 | 4 |
| | 4° | 10 | 3.4 | 45 | 4 |
| | 5° | 10 | 3.75 | 45 | 4 |
| | 6° | 15 | 5.15 | 45 | 6 |
| | 7° | 15 | 5.68 | 50 | 6 |
| | 8° | 15 | 6.21 | 50 | 6 |
| | 10° | 15 | 7.29 | 50 | 6 |
| | 15° | 15 | 10.03 | 60 | 8 |
| 2.5 | 30' | 12 | 2.71 | 50 | 4 |
| | 1° | 12 | 2.92 | 50 | 4 |
| | 1°30' | 12 | 3.13 | 50 | 4 |
| | 2° | 12 | 3.34 | 50 | 4 |
| | 2°30' | 12 | 3.54 | 50 | 4 |
| | 3° | 12 | 3.76 | 50 | 4 |
| | 4° | 12 | 4.18 | 50 | 4 |
| | 5° | 12 | 4.6 | 50 | 4 |
| | 6° | 16 | 5.86 | 50 | 6 |
| | 7° | 16 | 6.43 | 50 | 6 |
| | 8° | 16 | 6.99 | 50 | 6 |
| | 10° | 16 | 8.14 | 50 | 8 |
| | 15° | 16 | 11.07 | 60 | 10 |
| 3 | 30' | 12 | 3.21 | 50 | 6 |
| | 1° | 12 | 3.41 | 50 | 6 |
| | 1°30' | 12 | 3.63 | 50 | 6 |
| | 2° | 12 | 3.84 | 50 | 6 |
| | 2°30' | 12 | 4.04 | 50 | 6 |
| | 3° | 16 | 4.68 | 50 | 6 |
| | 4° | 16 | 5.24 | 50 | 6 |
| | 5° | 16 | 5.8 | 50 | 6 |
| | 6° | 18 | 6.78 | 50 | 6 |
| | 7° | 18 | 7.42 | 50 | 6 |
| | 8° | 18 | 8.05 | 50 | 8 |
| | 10° | 18 | 9.35 | 50 | 8 |
| | 15° | 18 | 12.64 | 75 | 12 |
| 4 | 30' | 18 | 4.31 | 55 | 6 |
| | 1° | 18 | 4.62 | 55 | 6 |
| | 1°30' | 18 | 4.94 | 55 | 6 |
| | 2° | 18 | 5.26 | 55 | 6 |
| | 2°30' | 18 | 5.57 | 55 | 6 |
| | 3° | 18 | 5.88 | 55 | 6 |
| | 4° | 20 | 6.8 | 60 | 6 |
| | 5° | 20 | 7.5 | 60 | 6 |
| | 6° | 22 | 8.62 | 60 | 8 |
| | 7° | 22 | 9.4 | 60 | 8 |
| | 8° | 22 | 10.18 | 60 | 10 |
| | 10° | 22 | 11.76 | 60 | 10 |
| | 15° | 22 | 15.78 | 85 | 16 |

| 小径（ΦD1）<br>*Minor Dia.* | 片角（θ）<br>*Taper Angle* | 刃長（ℓ）<br>*Cut Length* | 大径（ΦD2）<br>*Diameter at Large End* | 全長（L）<br>*Overall Length* | シャンク径（Φd）<br>*Shank Dia.* |
|---|---|---|---|---|---|
| 5 | 30' | 26 | 5.45 | 60 | 6 |
| | 1° | 26 | 5.91 | 60 | 6 |
| | 1°30' | 26 | 6.36 | 60 | 6 |
| | 2° | 26 | 6.82 | 60 | 6 |
| | 2°30' | 26 | 7.27 | 60 | 6 |
| | 3° | 26 | 7.73 | 60 | 6 |
| | 4° | 26 | 8.64 | 65 | 8 |
| | 5° | 26 | 9.55 | 65 | 8 |
| | 6° | 28 | 10.89 | 65 | 10 |
| | 7° | 28 | 11.88 | 65 | 10 |
| | 8° | 28 | 12.87 | 75 | 12 |
| | 10° | 28 | 14.87 | 75 | 12 |
| | 15° | 28 | 20 | 90 | 20 |
| 6 | 30' | 26 | 6.45 | 60 | 6 |
| | 1° | 26 | 6.91 | 60 | 6 |
| | 1°30' | 26 | 7.36 | 60 | 6 |
| | 2° | 26 | 7.82 | 60 | 6 |
| | 2°30' | 26 | 8.27 | 60 | 6 |
| | 3° | 26 | 8.73 | 65 | 8 |
| | 4° | 26 | 9.64 | 70 | 8 |
| | 5° | 26 | 10.55 | 70 | 10 |
| | 6° | 28 | 11.89 | 70 | 10 |
| | 7° | 28 | 12.88 | 70 | 12 |
| | 8° | 28 | 13.87 | 85 | 12 |
| | 10° | 28 | 15.87 | 85 | 16 |
| | 15° | 28 | 21 | 90 | 20 |
| 8 | 30' | 30 | 8.52 | 70 | 8 |
| | 1° | 30 | 9.05 | 70 | 8 |
| | 1°30' | 30 | 9.57 | 70 | 8 |
| | 2° | 30 | 10.1 | 70 | 8 |
| | 2°30' | 30 | 10.61 | 70 | 10 |
| | 3° | 35 | 11.67 | 75 | 10 |
| | 4° | 40 | 13.6 | 85 | 12 |
| | 5° | 40 | 14.99 | 90 | 12 |
| | 6° | 40 | 16.41 | 90 | 16 |
| | 7° | 40 | 17.82 | 90 | 16 |
| | 8° | 40 | 19.24 | 90 | 16 |
| | 10° | 40 | 22.1 | 90 | 20 |
| | 15° | 40 | 29.43 | 110 | 25 |
| 10 | 30' | 40 | 10.7 | 85 | 10 |
| | 1° | 40 | 11.4 | 85 | 10 |
| | 1°30' | 40 | 12.1 | 85 | 12 |
| | 2° | 40 | 12.8 | 85 | 12 |
| | 2°30' | 40 | 13.49 | 85 | 12 |
| | 3° | 40 | 14.2 | 90 | 12 |
| | 4° | 40 | 15.6 | 90 | 12 |
| | 5° | 40 | 17 | 90 | 16 |
| | 6° | 40 | 18.41 | 90 | 16 |
| | 7° | 40 | 19.82 | 90 | 16 |
| | 8° | 40 | 21.24 | 110 | 20 |
| | 10° | 40 | 24.11 | 110 | 20 |
| | 15° | 40 | 31.43 | 110 | 25 |

超硬

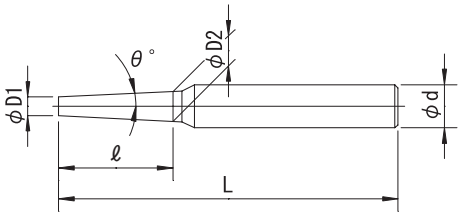
# CSTEL

## 超硬ソリッドテーパーエンドミル（ロング） *Solid Carbide Taper End Mill (Long)*

切削条件表 P356 | テーパー形状 | 右ネジレ 40° | 刃数 2 | 超微粒子








| 公差(Tolerance) | D1：$^{0}_{-0.05}$ | θ ：±5' | d：h6 |
|---|---|---|---|

右刃右ネジレ40° 刃数:2 超微粒子
Helix Angle-Right40° 2 Flutes Ultra Micro Grain Carbide

| 小径（ΦD1） *Minor Dia.* | 片角（θ） *Taper Angle* | 刃長（ℓ） *Cut Length* | 大径（ΦD2） *Diameter at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|
| 1 | 30' | 10 | 1.17 | 50 | 4 |
| | 1° | 10 | 1.35 | 50 | 4 |
| | 1°30' | 10 | 1.52 | 50 | 4 |
| | 2° | 10 | 1.7 | 50 | 4 |
| | 2°30' | 10 | 1.87 | 50 | 4 |
| | 3° | 10 | 2.05 | 50 | 4 |
| | 5° | 10 | 2.75 | 50 | 4 |
| 1.5 | 30' | 10 | 1.67 | 50 | 4 |
| | 1° | 10 | 1.85 | 50 | 4 |
| | 1°30' | 10 | 2.02 | 50 | 4 |
| | 2° | 10 | 2.2 | 50 | 4 |
| | 2°30' | 10 | 2.37 | 50 | 4 |
| | 3° | 10 | 2.55 | 50 | 4 |
| | 5° | 10 | 3.25 | 50 | 4 |
| 2 | 30' | 13 | 2.22 | 55 | 4 |
| | 1° | 13 | 2.45 | 55 | 4 |
| | 1°30' | 13 | 2.68 | 55 | 4 |
| | 2° | 13 | 2.9 | 55 | 4 |
| | 2°30' | 13 | 3.13 | 55 | 4 |
| | 3° | 13 | 3.36 | 55 | 4 |
| | 5° | 13 | 4.27 | 55 | 6 |
| 2.5 | 30' | 15 | 2.76 | 60 | 4 |
| | 1° | 15 | 3.03 | 60 | 4 |
| | 1°30' | 15 | 3.29 | 60 | 4 |
| | 2° | 15 | 3.55 | 60 | 4 |
| | 2°30' | 15 | 3.81 | 60 | 4 |
| | 3° | 15 | 4.07 | 60 | 4 |
| | 5° | 15 | 5.13 | 60 | 6 |

| 小径（ΦD1） *Minor Dia.* | 片角（θ） *Taper Angle* | 刃長（ℓ） *Cut Length* | 大径（ΦD2） *Diameter at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|
| 3 | 30' | 20 | 3.35 | 60 | 6 |
| | 1° | 20 | 3.7 | 60 | 6 |
| | 1°30' | 20 | 4.05 | 60 | 6 |
| | 2° | 20 | 4.39 | 60 | 6 |
| | 2°30' | 20 | 4.75 | 60 | 6 |
| | 3° | 20 | 5.1 | 60 | 6 |
| | 5° | 20 | 6.5 | 60 | 6 |
| 4 | 30' | 25 | 4.44 | 60 | 6 |
| | 1° | 25 | 4.88 | 60 | 6 |
| | 1°30' | 25 | 5.31 | 60 | 6 |
| | 2° | 25 | 5.75 | 60 | 6 |
| | 2°30' | 25 | 6.19 | 60 | 6 |
| | 3° | 25 | 6.62 | 60 | 8 |
| | 5° | 25 | 8.38 | 65 | 8 |
| 5 | 30' | 30 | 5.52 | 65 | 6 |
| | 1° | 30 | 6.05 | 65 | 6 |
| | 1°30' | 30 | 6.57 | 65 | 8 |
| | 2° | 30 | 7.09 | 70 | 8 |
| | 2°30' | 30 | 7.62 | 70 | 8 |
| | 3° | 30 | 8.14 | 75 | 8 |
| | 5° | 30 | 10.25 | 80 | 10 |
| 6 | 30' | 35 | 6.61 | 70 | 8 |
| | 1° | 35 | 7.22 | 70 | 8 |
| | 1°30' | 35 | 7.83 | 70 | 8 |
| | 2° | 35 | 8.44 | 80 | 8 |
| | 2°30' | 35 | 9.05 | 85 | 10 |
| | 3° | 35 | 9.67 | 85 | 10 |
| | 5° | 35 | 12.12 | 90 | 12 |

超硬

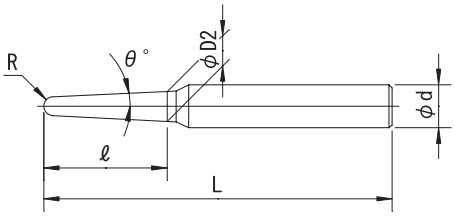
# CSTBE

## 超硬ソリッドテーパーボールエンドミル　*Solid Carbide Taper Ball End Mill*

切削条件表 P357 | テーパーボール形状 | 右ネジレ 30° | 刃数 2 | 超微粒子








| 公差(Tolerance) | R：±0.02 | θ：±5' | d：h6 |
|---|---|---|---|

右刃右ネジレ30°　刃数:2　超微粒子
Helix Angle-Right30°　2 Flutes　Ultra Micro Grain Carbide

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 0.5 | 30' | 4 | 1.06 | 45 | 4 |
| | 1° | 4 | 1.12 | 45 | 4 |
| | 1°30' | 4 | 1.18 | 45 | 4 |
| | 2° | 4 | 1.24 | 45 | 4 |
| | 2°30' | 4 | 1.3 | 45 | 4 |
| | 3° | 4 | 1.36 | 45 | 4 |
| | 4° | 6 | 1.77 | 45 | 4 |
| | 5° | 6 | 1.96 | 45 | 4 |
| | 6° | 6 | 2.16 | 45 | 4 |
| | 7° | 6 | 2.35 | 45 | 4 |
| | 8° | 6 | 2.55 | 45 | 4 |
| | 10° | 6 | 2.95 | 45 | 4 |
| 0.75 | 30' | 6 | 1.59 | 45 | 4 |
| | 1° | 6 | 1.68 | 45 | 4 |
| | 1°30' | 6 | 1.77 | 45 | 4 |
| | 2° | 6 | 1.86 | 45 | 4 |
| | 2°30' | 6 | 1.95 | 45 | 4 |
| | 3° | 6 | 2.05 | 45 | 4 |
| | 4° | 6 | 2.23 | 45 | 4 |
| | 5° | 6 | 2.42 | 45 | 4 |
| | 6° | 6 | 2.61 | 45 | 4 |
| | 7° | 6 | 2.8 | 45 | 4 |
| | 8° | 6 | 2.99 | 45 | 4 |
| | 10° | 6 | 3.37 | 45 | 4 |
| 1 | 30' | 6 | 2.08 | 55 | 4 |
| | 1° | 6 | 2.17 | 55 | 4 |
| | 1°30' | 6 | 2.26 | 55 | 4 |
| | 2° | 6 | 2.35 | 55 | 4 |
| | 2°30' | 6 | 2.43 | 55 | 4 |
| | 3° | 6 | 2.52 | 55 | 4 |
| | 4° | 10 | 3.26 | 60 | 6 |
| | 5° | 10 | 3.58 | 60 | 6 |
| | 6° | 10 | 3.9 | 60 | 6 |
| | 7° | 10 | 4.22 | 60 | 6 |
| | 8° | 10 | 4.54 | 60 | 6 |
| | 10° | 10 | 5.2 | 60 | 6 |
| 1.25 | 30' | 8 | 2.61 | 55 | 4 |
| | 1° | 8 | 2.73 | 55 | 4 |
| | 1°30' | 8 | 2.85 | 55 | 4 |
| | 2° | 8 | 2.97 | 55 | 4 |
| | 2°30' | 8 | 3.09 | 55 | 6 |
| | 3° | 8 | 3.21 | 55 | 6 |
| | 4° | 15 | 4.42 | 60 | 6 |
| | 5° | 15 | 4.91 | 60 | 6 |
| | 6° | 15 | 5.4 | 60 | 6 |
| | 7° | 15 | 5.89 | 60 | 6 |

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 1.25 | 8° | 15 | 6.38 | 60 | 6 |
| | 10° | 15 | 7.38 | 60 | 6 |
| 1.5 | 30' | 10 | 3.14 | 55 | 6 |
| | 1° | 10 | 3.29 | 55 | 6 |
| | 1°30' | 10 | 3.44 | 55 | 6 |
| | 2° | 10 | 3.59 | 55 | 6 |
| | 2°30' | 10 | 3.45 | 55 | 6 |
| | 3° | 15 | 4.41 | 60 | 6 |
| | 4° | 15 | 4.89 | 60 | 6 |
| | 5° | 15 | 5.37 | 60 | 6 |
| | 6° | 15 | 5.85 | 60 | 6 |
| | 7° | 15 | 6.33 | 60 | 6 |
| | 8° | 15 | 6.82 | 60 | 6 |
| | 10° | 15 | 7.8 | 60 | 6 |
| 1.75 | 30' | 15 | 3.73 | 60 | 6 |
| | 1° | 15 | 3.96 | 60 | 6 |
| | 1°30' | 15 | 4.19 | 60 | 6 |
| | 2° | 15 | 4.42 | 60 | 6 |
| | 2°30' | 15 | 4.66 | 60 | 6 |
| | 3° | 20 | 5.41 | 65 | 6 |
| | 4° | 20 | 6.06 | 65 | 6 |
| | 5° | 20 | 6.7 | 65 | 6 |
| | 6° | 20 | 7.35 | 65 | 6 |
| | 7° | 20 | 8 | 65 | 8 |
| | 8° | 20 | 8.66 | 65 | 8 |
| | 10° | 20 | 9.98 | 65 | 10 |
| 2 | 30' | 15 | 4.22 | 60 | 6 |
| | 1° | 15 | 4.45 | 60 | 6 |
| | 1°30' | 15 | 4.68 | 60 | 6 |
| | 2° | 15 | 4.91 | 60 | 6 |
| | 2°30' | 15 | 5.13 | 60 | 6 |
| | 3° | 20 | 5.89 | 65 | 6 |
| | 4° | 20 | 6.52 | 65 | 6 |
| | 5° | 20 | 7.16 | 65 | 6 |
| | 6° | 20 | 7.8 | 65 | 8 |
| | 7° | 20 | 8.45 | 65 | 8 |
| | 8° | 20 | 9.09 | 65 | 8 |
| | 10° | 20 | 10.4 | 65 | 10 |
| 2.25 | 30' | 20 | 4.8 | 65 | 6 |
| | 1° | 20 | 5.12 | 65 | 6 |
| | 1°30' | 20 | 5.43 | 65 | 6 |
| | 2° | 20 | 5.74 | 65 | 6 |
| | 2°30' | 20 | 6.05 | 65 | 6 |
| | 3° | 25 | 6.89 | 70 | 6 |
| | 4° | 25 | 7.69 | 70 | 6 |
| | 5° | 25 | 8.49 | 70 | 8 |

# CSTBE 超硬ソリッドテーパーボールエンドミル

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 2.25 | 6° | 25 | 9.3 | 70 | 10 |
| | 7° | 25 | 10.12 | 70 | 10 |
| | 8° | 25 | 10.93 | 70 | 10 |
| | 10° | 25 | 12.59 | 70 | 12 |
| 2.5 | 30' | 20 | 5.3 | 65 | 6 |
| | 1° | 20 | 5.61 | 65 | 6 |
| | 1°30' | 20 | 5.91 | 65 | 6 |
| | 2° | 20 | 6.22 | 65 | 6 |
| | 2°30' | 20 | 6.53 | 65 | 6 |
| | 3° | 25 | 7.36 | 70 | 6 |
| | 4° | 25 | 8.15 | 70 | 8 |
| | 5° | 25 | 8.95 | 70 | 8 |
| | 6° | 25 | 9.75 | 70 | 10 |
| | 7° | 25 | 10.56 | 70 | 10 |
| | 8° | 25 | 11.37 | 70 | 10 |
| | 10° | 25 | 13.01 | 70 | 12 |
| 2.75 | 30' | 30 | 5.97 | 70 | 6 |
| | 1° | 30 | 6.45 | 70 | 6 |
| | 1°30' | 30 | 6.92 | 70 | 6 |
| | 2° | 30 | 7.4 | 70 | 6 |
| | 2°30' | 30 | 7.88 | 70 | 8 |
| | 3° | 40 | 9.41 | 80 | 10 |
| | 4° | 40 | 10.72 | 80 | 10 |
| | 5° | 40 | 12.03 | 80 | 12 |
| | 6° | 40 | 13.36 | 80 | 12 |
| | 7° | 40 | 14.68 | 80 | 16 |
| | 8° | 40 | 16.02 | 80 | 16 |
| | 10° | 40 | 18.72 | 80 | 16 |
| 3 | 30' | 30 | 6.47 | 70 | 6 |
| | 1° | 30 | 6.94 | 70 | 6 |
| | 1°30' | 30 | 7.41 | 70 | 6 |
| | 2° | 30 | 7.88 | 70 | 8 |
| | 2°30' | 30 | 8.36 | 70 | 8 |
| | 3° | 40 | 9.88 | 80 | 10 |
| | 4° | 40 | 11.18 | 80 | 10 |
| | 5° | 40 | 12.49 | 80 | 12 |
| | 6° | 40 | 13.81 | 80 | 12 |
| | 7° | 40 | 15.13 | 80 | 16 |
| | 8° | 40 | 16.45 | 80 | 16 |
| | 10° | 40 | 19.14 | 80 | 20 |
| 3.25 | 30' | 30 | 6.96 | 80 | 6 |
| | 1° | 30 | 7.43 | 80 | 6 |
| | 1°30' | 30 | 7.9 | 80 | 8 |
| | 2° | 30 | 8.37 | 80 | 8 |
| | 2°30' | 30 | 8.84 | 80 | 8 |
| | 3° | 40 | 10.36 | 80 | 10 |
| | 4° | 40 | 11.65 | 80 | 10 |
| | 5° | 40 | 12.95 | 80 | 12 |
| | 6° | 40 | 14.26 | 80 | 12 |
| | 7° | 40 | 15.57 | 80 | 16 |
| | 8° | 40 | 16.89 | 80 | 16 |
| | 10° | 40 | 19.56 | 80 | 20 |
| 3.5 | 30' | 30 | 7.46 | 80 | 8 |
| | 1° | 30 | 7.92 | 80 | 8 |
| | 1°30' | 30 | 8.39 | 80 | 8 |
| | 2° | 30 | 8.85 | 80 | 8 |
| | 2°30' | 30 | 9.32 | 80 | 10 |
| | 3° | 40 | 10.83 | 80 | 10 |
| | 4° | 40 | 12.12 | 80 | 12 |
| | 5° | 40 | 13.41 | 80 | 12 |
| | 6° | 40 | 14.71 | 80 | 16 |
| | 7° | 40 | 16.01 | 80 | 16 |
| | 8° | 40 | 17.32 | 80 | 16 |
| | 10° | 40 | 19.97 | 80 | 20 |

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 3.75 | 30' | 30 | 7.95 | 80 | 8 |
| | 1° | 30 | 8.41 | 80 | 8 |
| | 1°30' | 30 | 8.87 | 80 | 8 |
| | 2° | 30 | 9.33 | 80 | 10 |
| | 2°30' | 30 | 9.79 | 80 | 10 |
| | 3° | 40 | 11.3 | 80 | 10 |
| | 4° | 40 | 12.58 | 80 | 12 |
| | 5° | 40 | 13.87 | 80 | 12 |
| | 6° | 40 | 15.16 | 80 | 16 |
| | 7° | 40 | 16.45 | 80 | 16 |
| | 8° | 40 | 17.76 | 80 | 16 |
| | 10° | 40 | 20.39 | 80 | 20 |
| 4 | 30' | 30 | 8.45 | 80 | 8 |
| | 1° | 30 | 8.9 | 80 | 8 |
| | 1°30' | 30 | 9.36 | 80 | 10 |
| | 2° | 30 | 9.82 | 80 | 10 |
| | 2°30' | 30 | 10.27 | 80 | 10 |
| | 3° | 40 | 11.78 | 80 | 10 |
| | 4° | 40 | 13.05 | 80 | 12 |
| | 5° | 40 | 14.32 | 80 | 16 |
| | 6° | 40 | 15.61 | 80 | 16 |
| | 7° | 40 | 16.9 | 80 | 16 |
| | 8° | 40 | 18.19 | 80 | 16 |
| | 10° | 40 | 20.81 | 80 | 20 |
| 4.25 | 30' | 40 | 9.12 | 80 | 8 |
| | 1° | 40 | 9.74 | 80 | 10 |
| | 1°30' | 40 | 10.37 | 80 | 10 |
| | 2° | 40 | 11 | 80 | 10 |
| | 2°30' | 40 | 11.62 | 80 | 10 |
| | 3° | 40 | 12.25 | 80 | 12 |
| | 4° | 40 | 13.52 | 80 | 12 |
| | 5° | 40 | 14.78 | 80 | 16 |
| | 6° | 40 | 16.06 | 80 | 16 |
| | 7° | 40 | 17.34 | 80 | 16 |
| | 8° | 40 | 18.63 | 80 | 16 |
| | 10° | 40 | 21.23 | 80 | 20 |
| 4.5 | 30' | 40 | 9.61 | 80 | 10 |
| | 1° | 40 | 10.24 | 80 | 10 |
| | 1°30' | 40 | 10.86 | 80 | 10 |
| | 2° | 40 | 11.48 | 80 | 10 |
| | 2°30' | 40 | 12.1 | 80 | 12 |
| | 3° | 40 | 12.73 | 80 | 12 |
| | 4° | 40 | 13.98 | 80 | 12 |
| | 5° | 40 | 15.24 | 80 | 16 |
| | 6° | 40 | 16.51 | 80 | 16 |
| | 7° | 40 | 17.78 | 80 | 16 |
| | 8° | 40 | 19.06 | 80 | 20 |
| | 10° | 40 | 21.65 | 80 | 20 |
| 4.75 | 30' | 40 | 10.11 | 80 | 10 |
| | 1° | 40 | 10.73 | 80 | 10 |
| | 1°30' | 40 | 11.34 | 80 | 10 |
| | 2° | 40 | 11.96 | 80 | 12 |
| | 2°30' | 40 | 12.58 | 80 | 12 |
| | 3° | 40 | 13.2 | 80 | 12 |
| | 4° | 40 | 14.45 | 80 | 16 |
| | 5° | 40 | 15.7 | 80 | 16 |
| | 6° | 40 | 16.96 | 80 | 16 |
| | 7° | 40 | 18.22 | 80 | 16 |
| | 8° | 40 | 19.5 | 80 | 20 |
| | 10° | 40 | 22.07 | 80 | 20 |
| 5 | 30' | 40 | 10.61 | 80 | 10 |
| | 1° | 40 | 11.22 | 80 | 10 |
| | 1°30' | 40 | 11.83 | 80 | 10 |
| | 2° | 40 | 12.45 | 80 | 12 |

# CSTBE 超硬ソリッドテーパーボールエンドミル

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 5 | 2°30' | 40 | 13.06 | 80 | 12 |
| | 3° | 40 | 13.68 | 80 | 12 |
| | 4° | 40 | 14.91 | 80 | 16 |
| | 5° | 40 | 16.16 | 80 | 16 |
| | 6° | 40 | 17.41 | 80 | 16 |
| | 7° | 40 | 18.67 | 80 | 16 |
| | 8° | 40 | 19.93 | 80 | 20 |
| | 10° | 40 | 22.49 | 80 | 20 |
| 6 | 30' | 40 | 12.59 | 90 | 12 |
| | 1° | 40 | 13.18 | 90 | 12 |
| | 1°30' | 40 | 13.78 | 90 | 12 |
| | 2° | 40 | 14.38 | 90 | 16 |
| | 2°30' | 40 | 14.98 | 90 | 16 |
| | 3° | 40 | 15.58 | 90 | 16 |
| | 4° | 40 | 16.78 | 90 | 16 |
| | 5° | 40 | 17.99 | 90 | 16 |

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 6 | 6° | 40 | 19.21 | 90 | 20 |
| | 7° | 40 | 20.43 | 90 | 20 |
| | 8° | 40 | 21.67 | 90 | 20 |
| | 10° | 40 | 24.17 | 90 | 20 |
| 8 | 30' | 40 | 16.56 | 90 | 16 |
| | 1° | 40 | 17.11 | 90 | 16 |
| | 1°30' | 40 | 17.68 | 90 | 16 |
| | 2° | 40 | 18.24 | 90 | 16 |
| | 2°30' | 40 | 18.8 | 90 | 16 |
| | 3° | 40 | 19.37 | 90 | 20 |
| | 4° | 40 | 20.51 | 90 | 20 |
| | 5° | 40 | 21.66 | 90 | 20 |
| | 6° | 40 | 22.81 | 90 | 20 |
| | 7° | 40 | 23.97 | 90 | 20 |
| | 8° | 40 | 25.15 | 90 | 25 |
| | 10° | 40 | 27.53 | 90 | 25 |

超硬

# CSTBEL

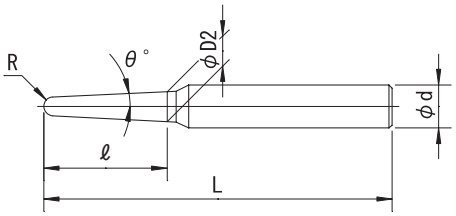
## 超硬ソリッドロングテーパーボールエンドミル *Solid Carbide Long Taper Ball End Mill*

切削条件表 P357

テーパーボール形状 右ネジレ30° 刃数2 超微粒子








| 公差(Tolerance) | R：±0.02 | θ：±5' | d：h6 |
|---|---|---|---|

右刃右ネジレ30° 刃数:2 超微粒子
Helix Angle-Right30° 2 Flutes Ultra Micro Grain Carbide

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 0.5 | 30' | 6 | 1.09 | 55 | 4 |
| | 1° | 6 | 1.19 | 55 | 4 |
| | 1°30' | 6 | 1.28 | 55 | 4 |
| | 2° | 6 | 1.38 | 55 | 4 |
| | 2°30' | 6 | 1.48 | 55 | 4 |
| | 3° | 6 | 1.57 | 55 | 4 |
| | 4° | 8 | 2.05 | 60 | 4 |
| | 5° | 8 | 2.31 | 60 | 4 |
| | 6° | 8 | 2.58 | 60 | 4 |
| | 7° | 8 | 2.84 | 60 | 4 |
| | 8° | 8 | 3.11 | 60 | 4 |
| | 10° | 8 | 3.66 | 60 | 4 |

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 0.75 | 30' | 8 | 1.62 | 60 | 4 |
| | 1° | 8 | 1.75 | 60 | 4 |
| | 1°30' | 8 | 1.88 | 60 | 4 |
| | 2° | 8 | 2 | 60 | 4 |
| | 2°30' | 8 | 2.13 | 60 | 4 |
| | 3° | 8 | 2.26 | 60 | 4 |
| | 4° | 8 | 2.51 | 60 | 4 |
| | 5° | 8 | 2.77 | 60 | 4 |
| | 6° | 8 | 3.03 | 60 | 4 |
| | 7° | 8 | 3.29 | 60 | 4 |
| | 8° | 8 | 3.55 | 60 | 4 |
| | 10° | 8 | 4.07 | 60 | 4 |

# CSTBEL 超硬ソリッドロングテーパーボールエンドミル

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 1 | 30' | 12 | 2.19 | 65 | 4 |
| | 1° | 12 | 2.38 | 65 | 4 |
| | 1°30' | 12 | 2.57 | 65 | 4 |
| | 2° | 12 | 2.76 | 65 | 4 |
| | 2°30' | 12 | 2.96 | 65 | 4 |
| | 3° | 12 | 3.15 | 65 | 4 |
| | 4° | 20 | 4.66 | 70 | 6 |
| | 5° | 20 | 5.33 | 70 | 6 |
| | 6° | 20 | 6 | 70 | 6 |
| | 7° | 20 | 6.68 | 70 | 6 |
| | 8° | 20 | 7.36 | 70 | 8 |
| | 10° | 20 | 8.73 | 70 | 8 |
| 1.25 | 30' | 15 | 2.74 | 65 | 4 |
| | 1° | 15 | 2.98 | 65 | 4 |
| | 1°30' | 15 | 3.22 | 65 | 6 |
| | 2° | 15 | 3.46 | 65 | 6 |
| | 2°30' | 15 | 3.7 | 65 | 6 |
| | 3° | 15 | 3.94 | 65 | 6 |
| | 4° | 25 | 5.82 | 80 | 6 |
| | 5° | 25 | 6.66 | 80 | 6 |
| | 6° | 25 | 7.5 | 80 | 8 |
| | 7° | 25 | 8.35 | 80 | 8 |
| | 8° | 25 | 9.2 | 80 | 8 |
| | 10° | 25 | 10.91 | 80 | 10 |
| 1.5 | 30' | 20 | 3.32 | 70 | 6 |
| | 1° | 20 | 3.64 | 70 | 6 |
| | 1°30' | 20 | 3.96 | 70 | 6 |
| | 2° | 20 | 4.29 | 70 | 6 |
| | 2°30' | 20 | 4.61 | 70 | 6 |
| | 3° | 25 | 5.46 | 80 | 6 |
| | 4° | 25 | 6.29 | 80 | 6 |
| | 5° | 25 | 7.12 | 80 | 6 |
| | 6° | 25 | 7.95 | 80 | 8 |
| | 7° | 25 | 8.79 | 80 | 8 |
| | 8° | 25 | 9.63 | 80 | 10 |
| | 10° | 25 | 11.33 | 80 | 10 |
| 1.75 | 30' | 25 | 3.9 | 80 | 6 |
| | 1° | 25 | 4.31 | 80 | 6 |
| | 1°30' | 25 | 4.71 | 80 | 6 |
| | 2° | 25 | 5.12 | 80 | 6 |
| | 2°30' | 25 | 5.53 | 80 | 6 |
| | 3° | 30 | 6.46 | 100 | 6 |
| | 4° | 30 | 7.45 | 100 | 8 |
| | 5° | 30 | 8.45 | 100 | 8 |
| | 6° | 30 | 9.45 | 100 | 10 |
| | 7° | 30 | 10.46 | 100 | 10 |
| | 8° | 30 | 11.47 | 100 | 12 |
| | 10° | 30 | 13.51 | 100 | 12 |
| 2 | 30' | 25 | 4.4 | 80 | 6 |
| | 1° | 25 | 4.8 | 80 | 6 |
| | 1°30' | 25 | 5.2 | 80 | 6 |
| | 2° | 25 | 5.6 | 80 | 6 |
| | 2°30' | 25 | 6.01 | 80 | 6 |
| | 3° | 30 | 6.94 | 100 | 6 |
| | 4° | 30 | 7.92 | 100 | 8 |
| | 5° | 30 | 8.91 | 100 | 8 |
| | 6° | 30 | 9.9 | 100 | 10 |
| | 7° | 30 | 10.9 | 100 | 10 |
| | 8° | 30 | 11.9 | 100 | 12 |
| | 10° | 30 | 13.93 | 100 | 12 |

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 2.25 | 30' | 30 | 4.98 | 100 | 6 |
| | 1° | 30 | 5.46 | 100 | 6 |
| | 1°30' | 30 | 5.95 | 100 | 6 |
| | 2° | 30 | 6.44 | 100 | 6 |
| | 2°30' | 30 | 6.92 | 100 | 6 |
| | 3° | 35 | 7.93 | 110 | 8 |
| | 4° | 35 | 9.09 | 110 | 8 |
| | 5° | 35 | 10.24 | 110 | 10 |
| | 6° | 35 | 11.4 | 110 | 12 |
| | 7° | 35 | 12.57 | 110 | 12 |
| | 8° | 35 | 13.74 | 110 | 12 |
| | 10° | 35 | 16.11 | 110 | 16 |
| 2.5 | 30' | 30 | 5.48 | 100 | 6 |
| | 1° | 30 | 5.96 | 100 | 6 |
| | 1°30' | 30 | 6.44 | 100 | 6 |
| | 2° | 30 | 6.92 | 100 | 6 |
| | 2°30' | 30 | 7.4 | 100 | 6 |
| | 3° | 35 | 8.41 | 110 | 8 |
| | 4° | 35 | 9.55 | 110 | 8 |
| | 5° | 35 | 10.7 | 110 | 10 |
| | 6° | 35 | 11.85 | 110 | 12 |
| | 7° | 35 | 13.01 | 110 | 12 |
| | 8° | 35 | 14.18 | 110 | 12 |
| | 10° | 35 | 16.53 | 110 | 16 |
| 2.75 | 30' | 40 | 6.15 | 110 | 6 |
| | 1° | 40 | 6.8 | 110 | 6 |
| | 1°30' | 40 | 7.45 | 110 | 8 |
| | 2° | 40 | 8.1 | 110 | 8 |
| | 2°30' | 40 | 8.75 | 110 | 8 |
| | 3° | 50 | 10.46 | 120 | 10 |
| | 4° | 50 | 12.12 | 120 | 12 |
| | 5° | 50 | 13.78 | 120 | 12 |
| | 6° | 50 | 15.46 | 120 | 16 |
| | 7° | 50 | 17.14 | 120 | 16 |
| | 8° | 50 | 18.83 | 120 | 16 |
| | 10° | 50 | 22.24 | 120 | 20 |
| 3 | 30' | 40 | 6.64 | 110 | 6 |
| | 1° | 40 | 7.29 | 110 | 6 |
| | 1°30' | 40 | 7.93 | 110 | 8 |
| | 2° | 40 | 8.58 | 110 | 8 |
| | 2°30' | 40 | 9.23 | 110 | 8 |
| | 3° | 50 | 10.93 | 120 | 10 |
| | 4° | 50 | 12.58 | 120 | 12 |
| | 5° | 50 | 14.24 | 120 | 12 |
| | 6° | 50 | 15.91 | 120 | 16 |
| | 7° | 50 | 17.58 | 120 | 16 |
| | 8° | 50 | 19.26 | 120 | 20 |
| | 10° | 50 | 22.66 | 120 | 20 |
| 3.25 | 30' | 40 | 7.14 | 110 | 6 |
| | 1° | 40 | 7.78 | 110 | 8 |
| | 1°30' | 40 | 8.42 | 110 | 8 |
| | 2° | 40 | 9.07 | 110 | 8 |
| | 2°30' | 40 | 9.71 | 110 | 10 |
| | 3° | 50 | 11.4 | 120 | 12 |
| | 4° | 50 | 13.05 | 120 | 12 |
| | 5° | 50 | 14.7 | 120 | 12 |
| | 6° | 50 | 16.36 | 120 | 16 |
| | 7° | 50 | 18.02 | 120 | 16 |
| | 8° | 50 | 19.7 | 120 | 20 |
| | 10° | 50 | 23.08 | 120 | 20 |

# CSTBEL 超硬ソリッドロングテーパーボールエンドミル

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 3.5 | 30' | 40 | 7.63 | 110 | 6 |
| | 1° | 40 | 8.27 | 110 | 8 |
| | 1°30' | 40 | 8.91 | 110 | 8 |
| | 2° | 40 | 9.55 | 110 | 8 |
| | 2°30' | 40 | 10.19 | 110 | 10 |
| | 3° | 50 | 11.88 | 120 | 12 |
| | 4° | 50 | 13.52 | 120 | 12 |
| | 5° | 50 | 15.16 | 120 | 12 |
| | 6° | 50 | 16.81 | 120 | 16 |
| | 7° | 50 | 18.47 | 120 | 16 |
| | 8° | 50 | 20.13 | 120 | 20 |
| | 10° | 50 | 23.5 | 120 | 20 |
| 3.75 | 30' | 40 | 8.13 | 110 | 8 |
| | 1° | 40 | 8.76 | 110 | 8 |
| | 1°30' | 40 | 9.4 | 110 | 10 |
| | 2° | 40 | 10.03 | 110 | 10 |
| | 2°30' | 40 | 10.67 | 110 | 10 |
| | 3° | 50 | 12.35 | 120 | 12 |
| | 4° | 50 | 13.98 | 120 | 12 |
| | 5° | 50 | 15.62 | 120 | 16 |
| | 6° | 50 | 17.26 | 120 | 16 |
| | 7° | 50 | 18.91 | 120 | 20 |
| | 8° | 50 | 20.57 | 120 | 20 |
| | 10° | 50 | 23.92 | 120 | 20 |
| 4 | 30' | 40 | 8.62 | 110 | 8 |
| | 1° | 40 | 9.25 | 110 | 8 |
| | 1°30' | 40 | 9.88 | 110 | 10 |
| | 2° | 40 | 10.51 | 110 | 10 |
| | 2°30' | 40 | 11.15 | 110 | 10 |
| | 3° | 50 | 12.83 | 120 | 12 |
| | 4° | 50 | 14.45 | 120 | 12 |
| | 5° | 50 | 16.07 | 120 | 16 |
| | 6° | 50 | 17.71 | 120 | 16 |
| | 7° | 50 | 19.35 | 120 | 20 |
| | 8° | 50 | 21 | 120 | 20 |
| | 10° | 50 | 24.34 | 120 | 20 |
| 4.25 | 30' | 50 | 9.29 | 120 | 10 |
| | 1° | 50 | 10.09 | 120 | 12 |
| | 1°30' | 50 | 10.89 | 120 | 12 |
| | 2° | 50 | 11.7 | 120 | 12 |
| | 2°30' | 50 | 12.5 | 120 | 12 |
| | 3° | 50 | 13.3 | 120 | 12 |
| | 4° | 50 | 14.91 | 120 | 16 |
| | 5° | 50 | 16.53 | 150 | 16 |
| | 6° | 50 | 18.16 | 150 | 16 |
| | 7° | 50 | 19.79 | 150 | 20 |
| | 8° | 50 | 21.44 | 150 | 20 |
| | 10° | 50 | 24.76 | 150 | 25 |

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 4.5 | 30' | 50 | 9.79 | 120 | 10 |
| | 1° | 50 | 10.58 | 120 | 12 |
| | 1°30' | 50 | 11.38 | 120 | 12 |
| | 2° | 50 | 12.18 | 120 | 12 |
| | 2°30' | 50 | 12.98 | 120 | 12 |
| | 3° | 50 | 13.78 | 120 | 12 |
| | 4° | 50 | 15.38 | 120 | 16 |
| | 5° | 50 | 16.99 | 150 | 16 |
| | 6° | 50 | 18.61 | 150 | 16 |
| | 7° | 50 | 20.24 | 150 | 20 |
| | 8° | 50 | 21.87 | 150 | 20 |
| | 10° | 50 | 25.18 | 150 | 25 |
| 4.75 | 30' | 50 | 10.29 | 120 | 10 |
| | 1° | 50 | 11.08 | 120 | 12 |
| | 1°30' | 50 | 11.87 | 120 | 12 |
| | 2° | 50 | 12.66 | 120 | 12 |
| | 2°30' | 50 | 13.46 | 120 | 12 |
| | 3° | 50 | 14.25 | 120 | 12 |
| | 4° | 50 | 15.85 | 120 | 16 |
| | 5° | 50 | 17.45 | 150 | 16 |
| | 6° | 50 | 19.06 | 150 | 20 |
| | 7° | 50 | 20.68 | 150 | 20 |
| | 8° | 50 | 22.31 | 150 | 20 |
| | 10° | 50 | 25.6 | 150 | 25 |
| 5 | 30' | 50 | 10.78 | 120 | 10 |
| | 1° | 50 | 11.57 | 120 | 12 |
| | 1°30' | 50 | 12.36 | 120 | 12 |
| | 2° | 50 | 13.14 | 120 | 12 |
| | 2°30' | 50 | 13.93 | 120 | 12 |
| | 3° | 50 | 14.73 | 120 | 12 |
| | 4° | 50 | 16.31 | 120 | 16 |
| | 5° | 50 | 17.91 | 150 | 16 |
| | 6° | 50 | 19.51 | 150 | 20 |
| | 7° | 50 | 21.12 | 150 | 20 |
| | 8° | 50 | 22.74 | 150 | 20 |
| | 10° | 50 | 26.02 | 150 | 25 |

超硬

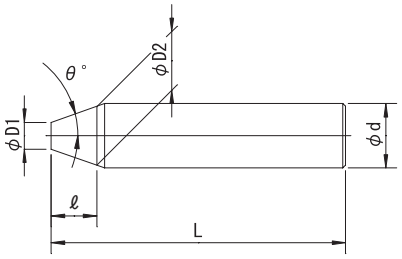
# CRM-2

## 超硬ソリッド台形ランナーエンドミル *Solid Carbide Taper End Mill For Runner*

切削条件表 P358 | テーパー形状 | 右ネジレ30° | 右ネジレ20° | 刃数2 | 超微粒子








| 公差(Tolerance) | D1：$^{-0.01}_{-0.08}$ | θ ：±7' | d：h6 |
|---|---|---|---|

片角15°以下：右刃右ネジレ30° 片角20°以上：右刃右ネジレ20° 刃数:2 超微粒子
Helix Angle-Right30° for Taper Angle 15° and less. Helix Angle-Right20° for Taper Angle 20° and over.
2 Flutes Ultra Micro Grain Carbide

| 小径（ΦD1） *Minor Dia.* | 片角（θ） *Taper Angle* | 刃長（ℓ） *Cut Length* | 大径（ΦD2） *Diameter at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|
| **1** | 5° | 3 | 1.52 | 35 | 3 |
| **1.5** | | 4 | 2.2 | 35 | 3 |
| **2** | | 5 | 2.87 | 50 | 4 |
| **2.5** | | 6 | 3.55 | 50 | 4 |
| **3** | | 7 | 4.22 | 60 | 6 |
| **3.5** | | 7 | 4.72 | 60 | 6 |
| **4** | | 8 | 5.4 | 60 | 6 |
| **5** | | 10 | 6.75 | 60 | 8 |
| **6** | | 12 | 8.1 | 70 | 10 |
| **1** | 7° | 3 | 1.74 | 35 | 3 |
| **1.5** | | 4 | 2.48 | 35 | 3 |
| **2** | | 5 | 3.23 | 50 | 4 |
| **2.5** | | 6 | 3.97 | 50 | 4 |
| **3** | | 7 | 4.72 | 60 | 6 |
| **3.5** | | 7 | 5.22 | 60 | 6 |
| **4** | | 8 | 5.96 | 60 | 6 |
| **5** | | 10 | 7.46 | 60 | 8 |
| **6** | | 12 | 8.95 | 70 | 10 |
| **1** | 10° | 3 | 2.06 | 35 | 3 |
| **1.5** | | 4 | 2.91 | 35 | 3 |
| **2** | | 5 | 3.76 | 50 | 4 |
| **2.5** | | 6 | 4.62 | 60 | 6 |
| **3** | | 7 | 5.47 | 60 | 6 |
| **3.5** | | 7 | 5.97 | 60 | 6 |
| **4** | | 8 | 6.82 | 60 | 8 |
| **5** | | 10 | 8.53 | 70 | 10 |
| **6** | | 12 | 10.23 | 70 | 10 |

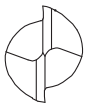
| 小径（ΦD1） *Minor Dia.* | 片角（θ） *Taper Angle* | 刃長（ℓ） *Cut Length* | 大径（ΦD2） *Diameter at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|
| **1** | 15° | 3 | 2.61 | 35 | 3 |
| **1.5** | | 4 | 3.64 | 50 | 4 |
| **2** | | 5 | 4.68 | 60 | 6 |
| **2.5** | | 6 | 5.72 | 60 | 6 |
| **3** | | 7 | 6.75 | 60 | 6 |
| **3.5** | | 7 | 7.25 | 60 | 8 |
| **4** | | 8 | 8.29 | 60 | 8 |
| **5** | | 10 | 10.36 | 70 | 10 |
| **6** | | 12 | 12.43 | 80 | 12 |
| **3** | 20° | 7 | 8.1 | 60 | 8 |
| **3.5** | | 7 | 8.6 | 60 | 10 |
| **4** | | 8 | 9.82 | 60 | 10 |
| **5** | | 10 | 12.28 | 70 | 12 |
| **6** | | 12 | 14.74 | 80 | 12 |
| **3** | 25° | 7 | 9.53 | 60 | 8 |
| **3.5** | | 7 | 10.03 | 60 | 10 |
| **4** | | 8 | 11.46 | 60 | 10 |
| **5** | | 10 | 14.33 | 70 | 12 |
| **6** | | 12 | 17.19 | 80 | 12 |
| **3** | 30° | 7 | 11.08 | 70 | 12 |
| **3.5** | | 7 | 11.58 | 70 | 12 |
| **4** | | 8 | 13.24 | 70 | 12 |
| **5** | | 10 | 16.55 | 70 | 16 |
| **6** | | 12 | 19.86 | 80 | 16 |

超硬

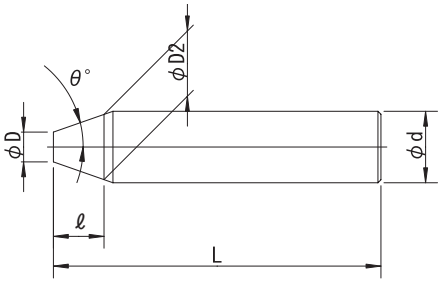
# CRM-P

## 超硬ソリッド台形ランナーエンドミル（Pコーティング） *P-Coated Solid Carbide Taper End Mill For Runner*

切削条件表 P359 | テーパー形状 | 右ネジレ30° | 右ネジレ20° | P Coating | 刃数2 | 超微粒子








| 公差(Tolerance) | θ ≦30° D1： $^{-0.01}_{-0.08}$ | θ ≧35° D1： $^{0}_{-0.1}$ | θ ：±7′ | d：h6 |
|---|---|---|---|---|

片角15°以下：右刃右ネジレ30°　片角20°以上：右刃右ネジレ20°　Pコーティング　刃数:2　超微粒子
Helix Angle-Right 30° for Taper Angle 15° and less. Helix Angle-Right 20° for Taper Angle 20° and over.
2 Flutes　P-Coating　Ultra Micro Grain Carbide

| 小径（ΦD1） *Minor Dia.* | 片角（θ） *Taper Angle* | 刃長（ℓ） *Cut Length* | 大径（ΦD2） *Diameter at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|
| **1** | 5° | 3 | 1.52 | 35 | 3 |
| **1.5** | | 4 | 2.2 | 35 | 3 |
| **2** | | 5 | 2.87 | 50 | 4 |
| **2.5** | | 6 | 3.55 | 50 | 4 |
| **3** | | 7 | 4.22 | 60 | 6 |
| **3.5** | | 7 | 4.72 | 60 | 6 |
| **4** | | 8 | 5.4 | 60 | 6 |
| **5** | | 10 | 6.75 | 60 | 8 |
| **6** | | 12 | 8.1 | 70 | 10 |
| **1** | 7° | 3 | 1.74 | 35 | 3 |
| **1.5** | | 4 | 2.48 | 35 | 3 |
| **2** | | 5 | 3.23 | 50 | 4 |
| **2.5** | | 6 | 3.97 | 50 | 4 |
| **3** | | 7 | 4.72 | 60 | 6 |
| **3.5** | | 7 | 5.22 | 60 | 6 |
| **4** | | 8 | 5.96 | 60 | 6 |
| **5** | | 10 | 7.46 | 60 | 8 |
| **6** | | 12 | 8.95 | 70 | 10 |
| **1** | 10° | 3 | 2.06 | 35 | 3 |
| **1.5** | | 4 | 2.91 | 35 | 3 |
| **2** | | 5 | 3.76 | 50 | 4 |
| **2.5** | | 6 | 4.62 | 50 | 6 |
| **3** | | 7 | 5.47 | 60 | 6 |
| **3.5** | | 7 | 5.97 | 60 | 6 |
| **4** | | 8 | 6.82 | 60 | 8 |
| **5** | | 10 | 8.53 | 60 | 10 |
| **6** | | 12 | 10.23 | 70 | 10 |
| **1** | 15° | 3 | 2.61 | 35 | 3 |
| **1.5** | | 4 | 3.64 | 50 | 4 |
| **2** | | 5 | 4.68 | 60 | 6 |
| **2.5** | | 6 | 5.72 | 60 | 6 |
| **3** | | 7 | 6.75 | 60 | 6 |
| **3.5** | | 7 | 7.25 | 60 | 8 |
| **4** | | 8 | 8.29 | 60 | 8 |
| **5** | | 10 | 10.36 | 70 | 10 |
| **6** | | 12 | 12.43 | 80 | 12 |

| 小径（ΦD1） *Minor Dia.* | 片角（θ） *Taper Angle* | 刃長（ℓ） *Cut Length* | 大径（ΦD2） *Diameter at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|
| **3** | 20° | 7 | 8.1 | 60 | 8 |
| **3.5** | | 7 | 8.6 | 60 | 10 |
| **4** | | 8 | 9.82 | 60 | 10 |
| **5** | | 10 | 12.28 | 70 | 12 |
| **6** | | 12 | 14.74 | 80 | 12 |
| **3** | 25° | 7 | 9.53 | 60 | 8 |
| **3.5** | | 7 | 10.03 | 60 | 10 |
| **4** | | 8 | 11.46 | 60 | 10 |
| **5** | | 10 | 14.33 | 70 | 12 |
| **6** | | 12 | 17.19 | 80 | 16 |
| **3** | 30° | 7 | 11.08 | 70 | 12 |
| **3.5** | | 7 | 11.58 | 70 | 12 |
| **4** | | 8 | 13.24 | 70 | 12 |
| **5** | | 10 | 16.55 | 70 | 16 |
| **6** | | 12 | 19.86 | 80 | 20 |
| **3** | 35° | 7 | 12.8 | 70 | 12 |
| **3.5** | | 7 | 13.3 | 70 | 12 |
| **4** | | 8 | 15.2 | 70 | 16 |
| **5** | | 10 | 19 | 70 | 20 |
| **6** | | 12 | 22.8 | 80 | 20 |
| **3** | 40° | 7 | 14.75 | 70 | 12 |
| **3.5** | | 7 | 15.25 | 70 | 16 |
| **4** | | 8 | 17.43 | 70 | 16 |
| **5** | | 10 | 21.78 | 70 | 20 |
| **6** | | 12 | 26.14 | 80 | 25 |
| **3** | 45° | 7 | 17 | 70 | 16 |
| **3.5** | | 7 | 17.5 | 70 | 16 |
| **4** | | 8 | 20 | 70 | 20 |
| **5** | | 10 | 25 | 70 | 25 |
| **6** | | 12 | 30 | 80 | 25 |

超硬

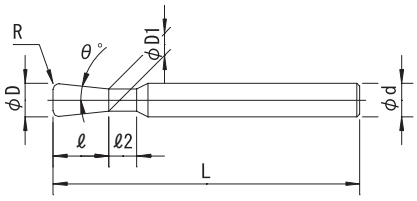
# CSRT-A

## 超硬リバースカッター（超硬ソリッド逆テーパーエンドミル） *Solid Carbide Reverse Cutter*

切削条件表 P360 | テーパー形状 | 右ネジレ25° | TiAlN | 刃数2 | 超微粒子








| 公差(Tolerance) | D：$^{0}_{-0.05}$ | θ：±5' | R：±0.03 | d：h6 |
|---|---|---|---|---|

右刃右ネジレ25° TiAlNコーティング 刃数:2 超微粒子
Helix Angle-Right25° TiAlN Coating 2 Flutes Ultra Micro Grain Carbide

| 外径 (ΦD) *Dia. at Large End* | 片角 (θ) *Taper Angle* | コーナーR (R) *Corner R* | 刃長 (ℓ) *Cut Length* | 小径 (ΦD1) *Minor Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|---|---|---|
| 2 | 0.5° | – | 3 | 1.948 | 3 | 40 | 3 |
| | | 0.3 | 3 | 1.953 | 3 | 40 | 3 |
| | | 0.5 | 3 | 1.956 | 3 | 40 | 3 |
| | 1° | – | 3 | 1.895 | 3 | 40 | 3 |
| | | 0.3 | 3 | 1.907 | 3 | 40 | 3 |
| | | 0.5 | 3 | 1.916 | 3 | 40 | 3 |
| | 1.5° | – | 3 | 1.843 | 3 | 40 | 3 |
| | | 0.3 | 3 | 1.859 | 3 | 40 | 3 |
| | | 0.5 | 3 | 1.869 | 3 | 40 | 3 |
| | 2° | – | 3 | 1.79 | 3 | 40 | 3 |
| | | 0.3 | 3 | 1.812 | 3 | 40 | 3 |
| | | 0.5 | 3 | 1.826 | 3 | 40 | 3 |
| | 3° | – | 3 | 1.686 | 3 | 40 | 3 |
| | | 0.3 | 3 | 1.718 | 3 | 40 | 3 |
| | | 0.5 | 3 | 1.739 | 3 | 40 | 3 |
| | 4° | – | 3 | 1.58 | 3 | 40 | 3 |
| | | 0.3 | 3 | 1.624 | 3 | 40 | 3 |
| | | 0.5 | 3 | 1.653 | 3 | 40 | 3 |
| | 5° | – | 3 | 1.475 | 3 | 40 | 3 |
| | | 0.3 | 3 | 1.53 | 3 | 40 | 3 |
| | | 0.5 | 3 | 1.566 | 3 | 40 | 3 |
| 2.5 | 0.5° | – | 4 | 2.43 | 3 | 40 | 3 |
| | | 0.3 | 4 | 2.435 | 3 | 40 | 3 |
| | | 0.5 | 4 | 2.439 | 3 | 40 | 3 |
| | 1° | – | 4 | 2.36 | 3 | 40 | 3 |
| | | 0.3 | 4 | 2.373 | 3 | 40 | 3 |
| | | 0.5 | 4 | 2.381 | 3 | 40 | 3 |
| | 1.5° | – | 4 | 2.291 | 3 | 40 | 3 |
| | | 0.3 | 4 | 2.306 | 3 | 40 | 3 |
| | | 0.5 | 4 | 2.317 | 3 | 40 | 3 |
| | 2° | – | 4 | 2.221 | 3 | 40 | 3 |
| | | 0.3 | 4 | 2.242 | 3 | 40 | 3 |
| | | 0.5 | 4 | 2.256 | 3 | 40 | 3 |
| | 3° | – | 4 | 2.081 | 3 | 40 | 3 |
| | | 0.3 | 4 | 2.113 | 3 | 40 | 3 |
| | | 0.5 | 4 | 2.135 | 3 | 40 | 3 |
| | 4° | – | 4 | 1.941 | 3 | 40 | 3 |
| | | 0.3 | 4 | 1.984 | 3 | 40 | 3 |
| | | 0.5 | 4 | 2.013 | 3 | 40 | 3 |
| | 5° | – | 4 | 1.8 | 3 | 40 | 3 |
| | | 0.3 | 4 | 1.855 | 3 | 40 | 3 |
| | | 0.5 | 4 | 1.891 | 3 | 40 | 3 |

| 外径 (ΦD) *Dia. at Large End* | 片角 (θ) *Taper Angle* | コーナーR (R) *Corner R* | 刃長 (ℓ) *Cut Length* | 小径 (ΦD1) *Minor Dia.* | 首長 (ℓ2) *Neck Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|---|---|---|
| 3 | 0.5° | – | 5 | 2.913 | 3 | 50 | 3 |
| | | 0.3 | 5 | 2.918 | 3 | 50 | 3 |
| | | 0.5 | 5 | 2.921 | 3 | 50 | 3 |
| | 1° | – | 5 | 2.825 | 3 | 50 | 3 |
| | | 0.3 | 5 | 2.838 | 3 | 50 | 3 |
| | | 0.5 | 5 | 2.846 | 3 | 50 | 3 |
| | 1.5° | – | 5 | 2.738 | 3 | 50 | 3 |
| | | 0.3 | 5 | 2.754 | 3 | 50 | 3 |
| | | 0.5 | 5 | 2.765 | 3 | 50 | 3 |
| | 2° | – | 5 | 2.651 | 3 | 50 | 3 |
| | | 0.3 | 5 | 2.672 | 3 | 50 | 3 |
| | | 0.5 | 5 | 2.686 | 3 | 50 | 3 |
| | 3° | – | 5 | 2.476 | 3 | 50 | 3 |
| | | 0.3 | 5 | 2.508 | 3 | 50 | 3 |
| | | 0.5 | 5 | 2.53 | 3 | 50 | 3 |
| | 4° | – | 5 | 2.301 | 3 | 50 | 3 |
| | | 0.3 | 5 | 2.344 | 3 | 50 | 3 |
| | | 0.5 | 5 | 2.373 | 3 | 50 | 3 |
| | 5° | – | 5 | 2.125 | 3 | 50 | 3 |
| | | 0.3 | 5 | 2.18 | 3 | 50 | 3 |
| | | 0.5 | 5 | 2.216 | 3 | 50 | 3 |
| 4 | 0.5° | – | 6 | 3.895 | 3 | 50 | 4 |
| | | 0.3 | 6 | 3.901 | 3 | 50 | 4 |
| | | 0.5 | 6 | 3.904 | 3 | 50 | 4 |
| | 1° | – | 6 | 3.791 | 3 | 50 | 4 |
| | | 0.3 | 6 | 3.803 | 3 | 50 | 4 |
| | | 0.5 | 6 | 3.811 | 3 | 50 | 4 |
| | 1.5° | – | 6 | 3.686 | 3 | 50 | 4 |
| | | 0.3 | 6 | 3.702 | 3 | 50 | 4 |
| | | 0.5 | 6 | 3.712 | 3 | 50 | 4 |
| | 2° | – | 6 | 3.581 | 3 | 50 | 4 |
| | | 0.3 | 6 | 3.602 | 3 | 50 | 4 |
| | | 0.5 | 6 | 3.616 | 3 | 50 | 4 |
| | 3° | – | 6 | 3.371 | 3 | 50 | 4 |
| | | 0.3 | 6 | 3.403 | 3 | 50 | 4 |
| | | 0.5 | 6 | 3.425 | 3 | 50 | 4 |
| | 4° | – | 6 | 3.161 | 3 | 50 | 4 |
| | | 0.3 | 6 | 3.204 | 3 | 50 | 4 |
| | | 0.5 | 6 | 3.233 | 3 | 50 | 4 |
| | 5° | – | 6 | 2.95 | 3 | 50 | 4 |
| | | 0.3 | 6 | 3.005 | 3 | 50 | 4 |
| | | 0.5 | 6 | 3.041 | 3 | 50 | 4 |

# CSRT-A 超硬リバースカッター（超硬ソリッド逆テーパーエンドミル）

| 外径 (ΦD) Dia. at Large End | 片角 (θ) Taper Angle | コーナーR (R) Corner R | 刃長 (ℓ) Cut Length | 小径 (ΦD1) Minor Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|---|
| 5 | 0.5° | – | 8 | 4.86 | 4 | 50 | 6 |
| | | 0.3 | 8 | 4.866 | 4 | 50 | 6 |
| | | 0.5 | 8 | 4.869 | 4 | 50 | 6 |
| | 1° | – | 8 | 4.721 | 4 | 50 | 6 |
| | | 0.3 | 8 | 4.731 | 4 | 50 | 6 |
| | | 0.5 | 8 | 4.741 | 4 | 50 | 6 |
| | 1.5° | – | 8 | 4.581 | 4 | 50 | 6 |
| | | 0.3 | 8 | 4.597 | 4 | 50 | 6 |
| | | 0.5 | 8 | 4.608 | 4 | 50 | 6 |
| | 2° | – | 8 | 4.441 | 4 | 50 | 6 |
| | | 0.3 | 8 | 4.463 | 4 | 50 | 6 |
| | | 0.5 | 8 | 4.477 | 4 | 50 | 6 |
| | 3° | – | 8 | 4.161 | 4 | 50 | 6 |
| | | 0.3 | 8 | 4.194 | 4 | 50 | 6 |
| | | 0.5 | 8 | 4.215 | 4 | 50 | 6 |
| | 4° | – | 8 | 3.881 | 4 | 50 | 6 |
| | | 0.3 | 8 | 3.925 | 4 | 50 | 6 |
| | | 0.5 | 8 | 3.954 | 4 | 50 | 6 |
| | 5° | – | 8 | 3.6 | 4 | 50 | 6 |
| | | 0.3 | 8 | 3.655 | 4 | 50 | 6 |
| | | 0.5 | 8 | 3.691 | 4 | 50 | 6 |
| 6 | 0.5° | – | 10 | 5.825 | 4 | 50 | 6 |
| | | 0.3 | 10 | 5.831 | 4 | 50 | 6 |
| | | 0.5 | 10 | 5.834 | 4 | 50 | 6 |
| | 1° | – | 10 | 5.651 | 4 | 50 | 6 |
| | | 0.3 | 10 | 5.661 | 4 | 50 | 6 |
| | | 0.5 | 10 | 5.669 | 4 | 50 | 6 |
| | 1.5° | – | 10 | 5.476 | 4 | 50 | 6 |
| | | 0.3 | 10 | 5.492 | 4 | 50 | 6 |
| | | 0.5 | 10 | 5.503 | 4 | 50 | 6 |
| | 2° | – | 10 | 5.302 | 4 | 50 | 6 |
| | | 0.3 | 10 | 5.323 | 4 | 50 | 6 |
| | | 0.5 | 10 | 5.337 | 4 | 50 | 6 |
| | 3° | – | 10 | 4.952 | 4 | 50 | 6 |
| | | 0.3 | 10 | 4.984 | 4 | 50 | 6 |
| | | 0.5 | 10 | 5.006 | 4 | 50 | 6 |
| | 4° | – | 10 | 4.601 | 4 | 50 | 6 |
| | | 0.3 | 10 | 4.645 | 4 | 50 | 6 |
| | | 0.5 | 10 | 4.674 | 4 | 50 | 6 |
| | 5° | – | 10 | 4.25 | 4 | 50 | 6 |
| | | 0.3 | 10 | 4.305 | 4 | 50 | 6 |
| | | 0.5 | 10 | 4.342 | 4 | 50 | 6 |
| 8 | 0.5° | – | 15 | 7.738 | 4 | 60 | 8 |
| | | 0.3 | 15 | 7.743 | 4 | 60 | 8 |
| | | 0.5 | 15 | 7.747 | 4 | 60 | 8 |
| | 1° | – | 15 | 7.476 | 4 | 60 | 8 |
| | | 0.3 | 15 | 7.489 | 4 | 60 | 8 |
| | | 0.5 | 15 | 7.497 | 4 | 60 | 8 |
| | 1.5° | – | 15 | 7.214 | 4 | 60 | 8 |
| | | 0.3 | 15 | 7.23 | 4 | 60 | 8 |
| | | 0.5 | 15 | 7.241 | 4 | 60 | 8 |
| | 2° | – | 15 | 6.952 | 4 | 60 | 8 |
| | | 0.3 | 15 | 6.974 | 4 | 60 | 8 |
| | | 0.5 | 15 | 6.988 | 4 | 60 | 8 |
| | 3° | – | 15 | 6.428 | 4 | 60 | 8 |
| | | 0.3 | 15 | 6.46 | 4 | 60 | 8 |
| | | 0.5 | 15 | 6.482 | 4 | 60 | 8 |
| | 4° | – | 15 | 5.902 | 4 | 60 | 8 |
| | | 0.3 | 15 | 5.946 | 4 | 60 | 8 |
| | | 0.5 | 15 | 5.975 | 4 | 60 | 8 |
| | 5° | – | 15 | 5.375 | 4 | 60 | 8 |
| | | 0.3 | 15 | 5.43 | 4 | 60 | 8 |
| | | 0.5 | 15 | 5.467 | 4 | 60 | 8 |

| 外径 (ΦD) Dia. at Large End | 片角 (θ) Taper Angle | コーナーR (R) Corner R | 刃長 (ℓ) Cut Length | 小径 (ΦD1) Minor Dia. | 首長 (ℓ2) Neck Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|---|---|
| 10 | 0.5° | – | 20 | 9.651 | 6 | 70 | 10 |
| | | 0.3 | 20 | 9.656 | 6 | 70 | 10 |
| | | 0.5 | 20 | 9.66 | 6 | 70 | 10 |
| | 1° | – | 20 | 9.302 | 6 | 70 | 10 |
| | | 0.3 | 20 | 9.312 | 6 | 70 | 10 |
| | | 0.5 | 20 | 9.32 | 6 | 70 | 10 |
| | 1.5° | – | 20 | 8.953 | 6 | 70 | 10 |
| | | 0.3 | 20 | 8.968 | 6 | 70 | 10 |
| | | 0.5 | 20 | 8.979 | 6 | 70 | 10 |
| | 2° | – | 20 | 8.603 | 6 | 70 | 10 |
| | | 0.3 | 20 | 8.624 | 6 | 70 | 10 |
| | | 0.5 | 20 | 8.639 | 6 | 70 | 10 |
| | 3° | – | 20 | 7.904 | 6 | 70 | 10 |
| | | 0.3 | 20 | 7.936 | 6 | 70 | 10 |
| | | 0.5 | 20 | 7.957 | 6 | 70 | 10 |
| | 4° | – | 20 | 7.203 | 6 | 70 | 10 |
| | | 0.3 | 20 | 7.246 | 6 | 70 | 10 |
| | | 0.5 | 20 | 7.275 | 6 | 70 | 10 |
| | 5° | – | 20 | 6.5 | 6 | 70 | 10 |
| | | 0.3 | 20 | 6.555 | 6 | 70 | 10 |
| | | 0.5 | 20 | 6.592 | 6 | 70 | 10 |
| 12 | 0.5° | – | 25 | 11.564 | 6 | 70 | 12 |
| | | 0.3 | 25 | 11.569 | 6 | 70 | 12 |
| | | 0.5 | 25 | 11.572 | 6 | 70 | 12 |
| | 1° | – | 25 | 11.127 | 6 | 70 | 12 |
| | | 0.3 | 25 | 11.139 | 6 | 70 | 12 |
| | | 0.5 | 25 | 11.148 | 6 | 70 | 12 |
| | 1.5° | – | 25 | 10.691 | 6 | 70 | 12 |
| | | 0.3 | 25 | 10.707 | 6 | 70 | 12 |
| | | 0.5 | 25 | 10.717 | 6 | 70 | 12 |
| | 2° | – | 25 | 10.254 | 6 | 70 | 12 |
| | | 0.3 | 25 | 10.275 | 6 | 70 | 12 |
| | | 0.5 | 25 | 10.289 | 6 | 70 | 12 |
| | 3° | – | 25 | 9.38 | 6 | 70 | 12 |
| | | 0.3 | 25 | 9.412 | 6 | 70 | 12 |
| | | 0.5 | 25 | 9.433 | 6 | 70 | 12 |
| | 4° | – | 25 | 8.504 | 6 | 70 | 12 |
| | | 0.3 | 25 | 8.547 | 6 | 70 | 12 |
| | | 0.5 | 25 | 8.576 | 6 | 70 | 12 |
| | 5° | – | 25 | 7.626 | 6 | 70 | 12 |
| | | 0.3 | 25 | 7.68 | 6 | 70 | 12 |
| | | 0.5 | 25 | 7.717 | 6 | 70 | 12 |

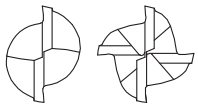
超硬

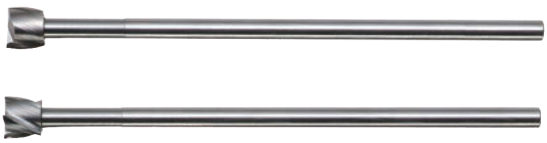
# CSME2/CSME4

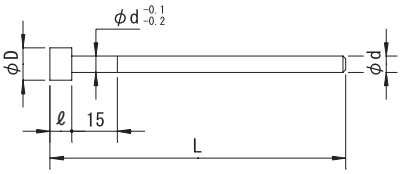
## 超硬スーパーミニエンドミル（2枚刃／4枚刃） *Solid Carbide Super Mini End Mill (Flute:2 / Flute:4)*

切削条件表 P361

スクエア形状








| 公差(Tolerance) | D： $^{0}_{-0.02}$ | ℓ：±0.05 | d： $^{0}_{-0.012}$ |
|---|---|---|---|

### 《CSME2》 右刃右ネジレ30° Helix Angle-Right30° 刃数:2 2 Flutes

超微粒子 Ultra Micro Grain Carbide

右ネジレ30° 超微粒子 刃数2

| 刃径（ΦD） Dia. | 刃長（ℓ） Length of cut | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. | 刃数（N） Number of Flutes |
|---|---|---|---|---|
| 6 | 2 | 80 | 3 | 2 |
| | 2.5 | 80 | 3 | 2 |
| | 3 | 80 | 3 | 2 |
| | 3.5 | 80 | 3 | 2 |
| | 4 | 80 | 3 | 2 |
| | 5 | 80 | 3 | 2 |
| | 6 | 80 | 3 | 2 |
| | 7 | 80 | 3 | 2 |
| | 8 | 80 | 3 | 2 |
| 8 | 2 | 100 | 4 | 2 |
| | 2.5 | 100 | 4 | 2 |
| | 3 | 100 | 4 | 2 |
| | 3.5 | 100 | 4 | 2 |
| | 4 | 100 | 4 | 2 |
| | 5 | 100 | 4 | 2 |
| | 6 | 100 | 4 | 2 |
| | 7 | 100 | 4 | 2 |
| | 8 | 100 | 4 | 2 |
| 10 | 2 | 120 | 6 | 2 |
| | 2.5 | 120 | 6 | 2 |
| | 3 | 120 | 6 | 2 |
| | 3.5 | 120 | 6 | 2 |
| | 4 | 120 | 6 | 2 |
| | 5 | 120 | 6 | 2 |
| | 6 | 120 | 6 | 2 |
| | 7 | 120 | 6 | 2 |
| | 8 | 120 | 6 | 2 |
| 12 | 2 | 150 | 6 | 2 |
| | 2.5 | 150 | 6 | 2 |
| | 3 | 150 | 6 | 2 |
| | 3.5 | 150 | 6 | 2 |
| | 4 | 150 | 6 | 2 |
| | 5 | 150 | 6 | 2 |
| | 6 | 150 | 6 | 2 |
| | 7 | 150 | 6 | 2 |
| | 8 | 150 | 6 | 2 |

| 公差(Tolerance) | D： $^{0}_{-0.02}$ | ℓ：±0.05 | d： $^{0}_{-0.012}$ |
|---|---|---|---|

### 《CSME4》 右刃右ネジレ30° Helix Angle-Right30° 刃数:4 4 Flutes

超微粒子 Ultra Micro Grain Carbide

右ネジレ30° 超微粒子 刃数4

| 刃径（ΦD） Dia. | 刃長（ℓ） Length of cut | 全長（L） Overall Length | シャンク径（Φd） Shank Dia. | 刃数（N） Number of Flutes |
|---|---|---|---|---|
| 6 | 2 | 80 | 3 | 4 |
| | 2.5 | 80 | 3 | 4 |
| | 3 | 80 | 3 | 4 |
| | 3.5 | 80 | 3 | 4 |
| | 4 | 80 | 3 | 4 |
| | 5 | 80 | 3 | 4 |
| | 6 | 80 | 3 | 4 |
| | 7 | 80 | 3 | 4 |
| | 8 | 80 | 3 | 4 |
| 8 | 2 | 100 | 4 | 4 |
| | 2.5 | 100 | 4 | 4 |
| | 3 | 100 | 4 | 4 |
| | 3.5 | 100 | 4 | 4 |
| | 4 | 100 | 4 | 4 |
| | 5 | 100 | 4 | 4 |
| | 6 | 100 | 4 | 4 |
| | 7 | 100 | 4 | 4 |
| | 8 | 100 | 4 | 4 |
| 10 | 2 | 120 | 6 | 4 |
| | 2.5 | 120 | 6 | 4 |
| | 3 | 120 | 6 | 4 |
| | 3.5 | 120 | 6 | 4 |
| | 4 | 120 | 6 | 4 |
| | 5 | 120 | 6 | 4 |
| | 6 | 120 | 6 | 4 |
| | 7 | 120 | 6 | 4 |
| | 8 | 120 | 6 | 4 |
| 12 | 2 | 150 | 6 | 4 |
| | 2.5 | 150 | 6 | 4 |
| | 3 | 150 | 6 | 4 |
| | 3.5 | 150 | 6 | 4 |
| | 4 | 150 | 6 | 4 |
| | 5 | 150 | 6 | 4 |
| | 6 | 150 | 6 | 4 |
| | 7 | 150 | 6 | 4 |
| | 8 | 150 | 6 | 4 |

ハイス

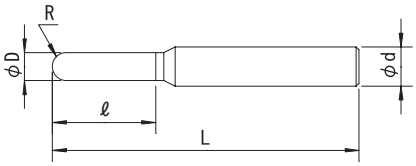
# BE

## ボールエンドミル　*Ball End Mill*

切削条件表 P362 | ボール形状 | 右ネジレ 35° | 刃数 2 | HSS Co








| 公差 (Tolerance) | R | | | | D | d |
|---|---|---|---|---|---|---|
| | 0.5～1.25 ±0.01 | 1.3～16.5 ±0.02 | 17～20 ±0.05 | 21～40 ±0.1 | ±0.01 | h7 |

右刃右ネジレ35°　刃数:2　SKH57
Helix Angle-Right35°　2 Flutes　HSS-Co.

| 寸法 R | 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|
| **0.5** | 1 | 2.5 | 55 | 6 |
| **0.55** | 1.1 | 2.5 | 55 | 6 |
| **0.6** | 1.2 | 2.5 | 55 | 6 |
| **0.65** | 1.3 | 4 | 55 | 6 |
| **0.7** | 1.4 | 4 | 55 | 6 |
| **0.75** | 1.5 | 4 | 55 | 6 |
| **0.8** | 1.6 | 4 | 55 | 6 |
| **0.85** | 1.7 | 4 | 55 | 6 |
| **0.9** | 1.8 | 5 | 55 | 6 |
| **0.95** | 1.9 | 5 | 55 | 6 |
| **1** | 2 | 5 | 55 | 6 |
| **1.05** | 2.1 | 7 | 60 | 6 |
| **1.1** | 2.2 | 7 | 60 | 6 |
| **1.15** | 2.3 | 7 | 60 | 6 |
| **1.2** | 2.4 | 7 | 60 | 6 |
| **1.25** | 2.5 | 7 | 60 | 6 |
| **1.3** | 2.6 | 7 | 60 | 6 |
| **1.35** | 2.7 | 7 | 60 | 6 |
| **1.4** | 2.8 | 7 | 60 | 6 |
| **1.45** | 2.9 | 7 | 60 | 6 |
| **1.5** | 3 | 7 | 60 | 6 |
| **1.55** | 3.1 | 8 | 70 | 6 |
| **1.6** | 3.2 | 8 | 70 | 6 |
| **1.65** | 3.3 | 8 | 70 | 6 |
| **1.7** | 3.4 | 8 | 70 | 6 |
| **1.75** | 3.5 | 8 | 70 | 6 |
| **1.8** | 3.6 | 8 | 70 | 6 |
| **1.85** | 3.7 | 8 | 70 | 6 |
| **1.9** | 3.8 | 8 | 70 | 6 |
| **1.95** | 3.9 | 8 | 70 | 6 |
| **2** | 4 | 8 | 70 | 6 |
| **2.05** | 4.1 | 10 | 80 | 6 |
| **2.1** | 4.2 | 10 | 80 | 6 |
| **2.15** | 4.3 | 10 | 80 | 6 |
| **2.2** | 4.4 | 10 | 80 | 6 |
| **2.25** | 4.5 | 10 | 80 | 6 |
| **2.3** | 4.6 | 10 | 80 | 6 |
| **2.35** | 4.7 | 10 | 80 | 6 |
| **2.4** | 4.8 | 10 | 80 | 6 |
| **2.45** | 4.9 | 10 | 80 | 6 |
| **2.5** | 5 | 10 | 80 | 6 |
| **2.55** | 5.1 | 12 | 80 | 6 |
| **2.6** | 5.2 | 12 | 80 | 6 |
| **2.65** | 5.3 | 12 | 80 | 6 |

| 寸法 R | 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|
| **2.7** | 5.4 | 12 | 80 | 6 |
| **2.75** | 5.5 | 12 | 80 | 6 |
| **2.8** | 5.6 | 12 | 80 | 6 |
| **2.85** | 5.7 | 12 | 80 | 6 |
| **2.9** | 5.8 | 12 | 80 | 6 |
| **2.95** | 5.9 | 12 | 80 | 6 |
| **3** | 6 | 12 | 80 | 6 |
| **3.05** | 6.1 | 16 | 100 | 8 |
| **3.1** | 6.2 | 16 | 100 | 8 |
| **3.15** | 6.3 | 16 | 100 | 8 |
| **3.2** | 6.4 | 16 | 100 | 8 |
| **3.25** | 6.5 | 16 | 100 | 8 |
| **3.3** | 6.6 | 16 | 100 | 8 |
| **3.35** | 6.7 | 16 | 100 | 8 |
| **3.4** | 6.8 | 16 | 100 | 8 |
| **3.45** | 6.9 | 16 | 100 | 8 |
| **3.5** | 7 | 16 | 100 | 8 |
| **3.55** | 7.1 | 16 | 100 | 8 |
| **3.6** | 7.2 | 16 | 100 | 8 |
| **3.65** | 7.3 | 16 | 100 | 8 |
| **3.7** | 7.4 | 16 | 100 | 8 |
| **3.75** | 7.5 | 16 | 100 | 8 |
| **3.8** | 7.6 | 16 | 100 | 8 |
| **3.85** | 7.7 | 16 | 100 | 8 |
| **3.9** | 7.8 | 16 | 100 | 8 |
| **3.95** | 7.9 | 16 | 100 | 8 |
| **4** | 8 | 16 | 100 | 8 |
| **4.05** | 8.1 | 20 | 110 | 10 |
| **4.1** | 8.2 | 20 | 110 | 10 |
| **4.15** | 8.3 | 20 | 110 | 10 |
| **4.2** | 8.4 | 20 | 110 | 10 |
| **4.25** | 8.5 | 20 | 110 | 10 |
| **4.3** | 8.6 | 20 | 110 | 10 |
| **4.35** | 8.7 | 20 | 110 | 10 |
| **4.4** | 8.8 | 20 | 110 | 10 |
| **4.45** | 8.9 | 20 | 110 | 10 |
| **4.5** | 9 | 20 | 110 | 10 |
| **4.55** | 9.1 | 20 | 110 | 10 |
| **4.6** | 9.2 | 20 | 110 | 10 |
| **4.65** | 9.3 | 20 | 110 | 10 |
| **4.7** | 9.4 | 20 | 110 | 10 |
| **4.75** | 9.5 | 20 | 110 | 10 |
| **4.8** | 9.6 | 20 | 110 | 10 |
| **4.85** | 9.7 | 20 | 110 | 10 |

# BE ボールエンドミル

| 寸法 R | 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| 4.9 | 9.8 | 20 | 110 | 10 |
| 4.95 | 9.9 | 20 | 110 | 10 |
| 5 | 10 | 20 | 110 | 10 |
| 5.05 | 10.1 | 22 | 120 | 12 |
| 5.1 | 10.2 | 22 | 120 | 12 |
| 5.15 | 10.3 | 22 | 120 | 12 |
| 5.2 | 10.4 | 22 | 120 | 12 |
| 5.25 | 10.5 | 22 | 120 | 12 |
| 5.3 | 10.6 | 22 | 120 | 12 |
| 5.35 | 10.7 | 22 | 120 | 12 |
| 5.4 | 10.8 | 22 | 120 | 12 |
| 5.45 | 10.9 | 22 | 120 | 12 |
| 5.5 | 11 | 22 | 120 | 12 |
| 5.55 | 11.1 | 24 | 120 | 12 |
| 5.6 | 11.2 | 24 | 120 | 12 |
| 5.65 | 11.3 | 24 | 120 | 12 |
| 5.7 | 11.4 | 24 | 120 | 12 |
| 5.75 | 11.5 | 24 | 120 | 12 |
| 5.8 | 11.6 | 24 | 120 | 12 |
| 5.85 | 11.7 | 24 | 120 | 12 |
| 5.9 | 11.8 | 24 | 120 | 12 |
| 5.95 | 11.9 | 24 | 120 | 12 |
| 6 | 12 | 24 | 120 | 12 |
| 6.05 | 12.1 | 26 | 120 | 12 |
| 6.1 | 12.2 | 26 | 120 | 12 |
| 6.15 | 12.3 | 26 | 120 | 12 |
| 6.2 | 12.4 | 26 | 120 | 12 |
| 6.25 | 12.5 | 26 | 120 | 12 |
| 6.3 | 12.6 | 26 | 120 | 12 |
| 6.35 | 12.7 | 26 | 120 | 12 |
| 6.4 | 12.8 | 26 | 120 | 12 |
| 6.45 | 12.9 | 26 | 120 | 12 |
| 6.5 | 13 | 26 | 120 | 12 |
| 6.55 | 13.1 | 26 | 120 | 12 |
| 6.6 | 13.2 | 26 | 120 | 12 |
| 6.65 | 13.3 | 26 | 120 | 12 |
| 6.7 | 13.4 | 26 | 120 | 12 |
| 6.75 | 13.5 | 26 | 120 | 12 |
| 6.8 | 13.6 | 26 | 120 | 12 |
| 6.85 | 13.7 | 26 | 120 | 12 |
| 6.9 | 13.8 | 26 | 120 | 12 |
| 6.95 | 13.9 | 26 | 120 | 12 |
| 7 | 14 | 26 | 120 | 12 |
| 7.05 | 14.1 | 28 | 120 | 12 |
| 7.1 | 14.2 | 28 | 120 | 12 |
| 7.15 | 14.3 | 28 | 120 | 12 |
| 7.2 | 14.4 | 28 | 120 | 12 |
| 7.25 | 14.5 | 28 | 120 | 12 |
| 7.3 | 14.6 | 28 | 120 | 12 |
| 7.35 | 14.7 | 28 | 120 | 12 |
| 7.4 | 14.8 | 28 | 120 | 12 |
| 7.45 | 14.9 | 28 | 120 | 12 |
| 7.5 | 15 | 28 | 120 | 12 |
| 7.55 | 15.1 | 30 | 140 | 16 |
| 7.6 | 15.2 | 30 | 140 | 16 |
| 7.65 | 15.3 | 30 | 140 | 16 |
| 7.7 | 15.4 | 30 | 140 | 16 |
| 7.75 | 15.5 | 30 | 140 | 16 |
| 7.8 | 15.6 | 30 | 140 | 16 |
| 7.85 | 15.7 | 30 | 140 | 16 |
| 7.9 | 15.8 | 30 | 140 | 16 |
| 7.95 | 15.9 | 30 | 140 | 16 |
| 8 | 16 | 30 | 140 | 16 |
| 8.05 | 16.1 | 32 | 140 | 16 |

| 寸法 R | 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| 8.1 | 16.2 | 32 | 140 | 16 |
| 8.15 | 16.3 | 32 | 140 | 16 |
| 8.2 | 16.4 | 32 | 140 | 16 |
| 8.25 | 16.5 | 32 | 140 | 16 |
| 8.3 | 16.6 | 32 | 140 | 16 |
| 8.35 | 16.7 | 32 | 140 | 16 |
| 8.4 | 16.8 | 32 | 140 | 16 |
| 8.45 | 16.9 | 32 | 140 | 16 |
| 8.5 | 17 | 32 | 140 | 16 |
| 8.55 | 17.1 | 34 | 140 | 16 |
| 8.6 | 17.2 | 34 | 140 | 16 |
| 8.65 | 17.3 | 34 | 140 | 16 |
| 8.7 | 17.4 | 34 | 140 | 16 |
| 8.75 | 17.5 | 34 | 140 | 16 |
| 8.8 | 17.6 | 34 | 140 | 16 |
| 8.85 | 17.7 | 34 | 140 | 16 |
| 8.9 | 17.8 | 34 | 140 | 16 |
| 8.95 | 17.9 | 34 | 140 | 16 |
| 9 | 18 | 34 | 140 | 16 |
| 9.05 | 18.1 | 36 | 150 | 16 |
| 9.1 | 18.2 | 36 | 150 | 16 |
| 9.15 | 18.3 | 36 | 150 | 16 |
| 9.2 | 18.4 | 36 | 150 | 16 |
| 9.25 | 18.5 | 36 | 150 | 16 |
| 9.3 | 18.6 | 36 | 150 | 16 |
| 9.35 | 18.7 | 36 | 150 | 16 |
| 9.4 | 18.8 | 36 | 150 | 16 |
| 9.45 | 18.9 | 36 | 150 | 16 |
| 9.5 | 19 | 36 | 150 | 16 |
| 9.55 | 19.1 | 38 | 160 | 20 |
| 9.6 | 19.2 | 38 | 160 | 20 |
| 9.65 | 19.3 | 38 | 160 | 20 |
| 9.7 | 19.4 | 38 | 160 | 20 |
| 9.75 | 19.5 | 38 | 160 | 20 |
| 9.8 | 19.6 | 38 | 160 | 20 |
| 9.85 | 19.7 | 38 | 160 | 20 |
| 9.9 | 19.8 | 38 | 160 | 20 |
| 9.95 | 19.9 | 38 | 160 | 20 |
| 10 | 20 | 38 | 160 | 20 |
| 10.05 | 20.1 | 42 | 160 | 20 |
| 10.1 | 20.2 | 42 | 160 | 20 |
| 10.15 | 20.3 | 42 | 160 | 20 |
| 10.2 | 20.4 | 42 | 160 | 20 |
| 10.25 | 20.5 | 42 | 160 | 20 |
| 10.3 | 20.6 | 42 | 160 | 20 |
| 10.35 | 20.7 | 42 | 160 | 20 |
| 10.4 | 20.8 | 42 | 160 | 20 |
| 10.45 | 20.9 | 42 | 160 | 20 |
| 10.5 | 21 | 42 | 160 | 20 |
| 10.55 | 21.1 | 45 | 160 | 20 |
| 10.6 | 21.2 | 45 | 160 | 20 |
| 10.65 | 21.3 | 45 | 160 | 20 |
| 10.7 | 21.4 | 45 | 160 | 20 |
| 10.75 | 21.5 | 45 | 160 | 20 |
| 10.8 | 21.6 | 45 | 160 | 20 |
| 10.85 | 21.7 | 45 | 160 | 20 |
| 10.9 | 21.8 | 45 | 160 | 20 |
| 10.95 | 21.9 | 45 | 160 | 20 |
| 11 | 22 | 45 | 160 | 20 |
| 11.05 | 22.1 | 45 | 160 | 20 |
| 11.1 | 22.2 | 45 | 160 | 20 |
| 11.15 | 22.3 | 45 | 160 | 20 |
| 11.2 | 22.4 | 45 | 160 | 20 |
| 11.25 | 22.5 | 45 | 160 | 20 |

# BE ボールエンドミル

| 寸法 R | 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| **11.3** | 22.6 | 45 | 160 | 20 |
| **11.35** | 22.7 | 45 | 160 | 20 |
| **11.4** | 22.8 | 45 | 160 | 20 |
| **11.45** | 22.9 | 45 | 160 | 20 |
| **11.5** | 23 | 45 | 160 | 20 |
| **11.55** | 23.1 | 50 | 160 | 20 |
| **11.6** | 23.2 | 50 | 160 | 20 |
| **11.65** | 23.3 | 50 | 160 | 20 |
| **11.7** | 23.4 | 50 | 160 | 20 |
| **11.75** | 23.5 | 50 | 160 | 20 |
| **11.8** | 23.6 | 50 | 160 | 20 |
| **11.85** | 23.7 | 50 | 160 | 20 |
| **11.9** | 23.8 | 50 | 160 | 20 |
| **11.95** | 23.9 | 50 | 160 | 20 |
| **12** | 24 | 50 | 160 | 20 |
| **12.05** | 24.1 | 50 | 180 | 25 |
| **12.1** | 24.2 | 50 | 180 | 25 |
| **12.15** | 24.3 | 50 | 180 | 25 |
| **12.2** | 24.4 | 50 | 180 | 25 |
| **12.25** | 24.5 | 50 | 180 | 25 |
| **12.3** | 24.6 | 50 | 180 | 25 |
| **12.35** | 24.7 | 50 | 180 | 25 |
| **12.4** | 24.8 | 50 | 180 | 25 |
| **12.45** | 24.9 | 50 | 180 | 25 |
| **12.5** | 25 | 50 | 180 | 25 |
| **12.55** | 25.1 | 50 | 180 | 25 |
| **12.6** | 25.2 | 50 | 180 | 25 |
| **12.65** | 25.3 | 50 | 180 | 25 |
| **12.7** | 25.4 | 50 | 180 | 25 |
| **12.75** | 25.5 | 50 | 180 | 25 |
| **12.8** | 25.6 | 50 | 180 | 25 |
| **12.85** | 25.7 | 50 | 180 | 25 |
| **12.9** | 25.8 | 50 | 180 | 25 |
| **12.95** | 25.9 | 50 | 180 | 25 |
| **13** | 26 | 50 | 180 | 25 |
| **13.25** | 26.5 | 55 | 180 | 25 |
| **13.5** | 27 | 55 | 180 | 25 |
| **13.75** | 27.5 | 55 | 180 | 25 |
| **14** | 28 | 55 | 180 | 25 |
| **14.25** | 28.5 | 55 | 180 | 25 |
| **14.5** | 29 | 55 | 180 | 25 |
| **14.75** | 29.5 | 55 | 180 | 25 |
| **15** | 30 | 55 | 180 | 25 |
| **15.5** | 31 | 60 | 200 | 25 |
| **16** | 32 | 60 | 200 | 32 |
| **16.5** | 33 | 60 | 200 | 32 |
| **17** | 34 | 60 | 200 | 32 |
| **17.5** | 35 | 65 | 210 | 32 |
| **18** | 36 | 65 | 210 | 32 |
| **18.5** | 37 | 65 | 210 | 32 |
| **19** | 38 | 65 | 210 | 32 |
| **19.5** | 39 | 65 | 210 | 32 |
| **20** | 40 | 65 | 210 | 32 |
| **20.5** | 41 | 80 | 220 | 32 |
| **21** | 42 | 80 | 220 | 32 |

| 寸法 R | 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| **21.5** | 43 | 80 | 220 | 32 |
| **22** | 44 | 80 | 220 | 32 |
| **22.5** | 45 | 80 | 220 | 32 |
| **23** | 46 | 80 | 220 | 32 |
| **23.5** | 47 | 80 | 220 | 32 |
| **24** | 48 | 80 | 220 | 32 |
| **24.5** | 49 | 80 | 220 | 32 |
| **25** | 50 | 80 | 220 | 32 |
| **25** | 50 | 80 | 220 | 42 |
| **25.5** | 51 | 100 | 240 | 32 |
| **25.5** | 51 | 100 | 240 | 42 |
| **26** | 52 | 100 | 240 | 32 |
| **26** | 52 | 100 | 240 | 42 |
| **26.5** | 53 | 100 | 240 | 32 |
| **26.5** | 53 | 100 | 240 | 42 |
| **27** | 54 | 100 | 240 | 32 |
| **27** | 54 | 100 | 240 | 42 |
| **27.5** | 55 | 100 | 240 | 32 |
| **27.5** | 55 | 100 | 240 | 42 |
| **28** | 56 | 100 | 240 | 32 |
| **28** | 56 | 100 | 240 | 42 |
| **28.5** | 57 | 100 | 240 | 32 |
| **28.5** | 57 | 100 | 240 | 42 |
| **29** | 58 | 100 | 240 | 32 |
| **29** | 58 | 100 | 240 | 42 |
| **29.5** | 59 | 100 | 240 | 32 |
| **29.5** | 59 | 100 | 240 | 42 |
| **30** | 60 | 100 | 240 | 32 |
| **30** | 60 | 100 | 240 | 42 |
| **31** | 62 | 120 | 260 | 32 |
| **31** | 62 | 120 | 260 | 42 |
| **32** | 64 | 120 | 260 | 32 |
| **32** | 64 | 120 | 260 | 42 |
| **32.5** | 65 | 120 | 260 | 32 |
| **32.5** | 65 | 120 | 260 | 42 |
| **33** | 66 | 120 | 260 | 32 |
| **33** | 66 | 120 | 260 | 42 |
| **34** | 68 | 120 | 260 | 32 |
| **34** | 68 | 120 | 260 | 42 |
| **35** | 70 | 120 | 260 | 32 |
| **35** | 70 | 120 | 260 | 42 |
| **40** | 80 | 120 | 260 | 32 |
| **40** | 80 | 120 | 260 | 42 |

| | | | | |
|---|---|---|---|---|
| **1/16** | 3.175 | 8 | 70 | 6 |
| **1/8** | 6.35 | 16 | 100 | 8 |
| **3/16** | 9.525 | 20 | 110 | 10 |
| **1/4** | 12.7 | 26 | 120 | 12 |
| **5/16** | 15.875 | 30 | 140 | 16 |
| **3/8** | 19.05 | 36 | 160 | 16 |
| **1/2** | 25.4 | 50 | 180 | 25 |
| **5/8** | 31.75 | 60 | 200 | 25 |
| **3/4** | 38.1 | 65 | 210 | 32 |
| **7/8** | 44.45 | 80 | 220 | 32 |

ハイス

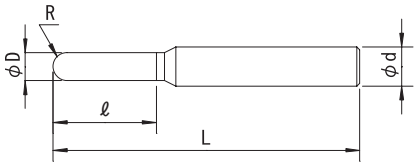
# BEL

## ロングボールエンドミル *Long Ball End Mill*

切削条件表 P362 | ボール形状 | 右ネジレ 35° | 刃数 2 | HSS Co








| 公差 (Tolerance) | R | | | | | | D | d |
|---|---|---|---|---|---|---|---|---|
| | 0.5～1 | ±0.01 | 1.5～15 | ±0.02 | 17.5～20 | ±0.05 | ±0.01 | h7 |

右刃右ネジレ35° 刃数:2 SKH57
Helix Angle-Right35° 2 Flutes HSS-Co.

| 寸法 R | 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| **0.5** | 1 | 6 | 60 | 6 |
| **0.55** | 1.1 | 6 | 60 | 6 |
| **0.6** | 1.2 | 8 | 60 | 6 |
| **0.65** | 1.3 | 8 | 60 | 6 |
| **0.7** | 1.4 | 8 | 60 | 6 |
| **0.75** | 1.5 | 8 | 60 | 6 |
| **0.8** | 1.6 | 10 | 60 | 6 |
| **0.85** | 1.7 | 10 | 60 | 6 |
| **0.9** | 1.8 | 10 | 60 | 6 |
| **0.95** | 1.9 | 10 | 60 | 6 |
| **1** | 2 | 10 | 60 | 6 |
| **1.5** | 3 | 15 | 70 | 6 |
| **2** | 4 | 20 | 80 | 6 |
| **2.5** | 5 | 20 | 90 | 6 |
| **3** | 6 | 25 | 100 | 6 |
| **3.5** | 7 | 30 | 120 | 8 |
| **4** | 8 | 30 | 120 | 8 |
| **4.5** | 9 | 35 | 120 | 8 |

| 寸法 R | 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| **5** | 10 | 40 | 130 | 10 |
| **5.5** | 11 | 40 | 130 | 12 |
| **6** | 12 | 40 | 130 | 12 |
| **6.5** | 13 | 45 | 130 | 12 |
| **7** | 14 | 45 | 130 | 12 |
| **7.5** | 15 | 50 | 130 | 12 |
| **8** | 16 | 60 | 150 | 16 |
| **8.5** | 17 | 65 | 160 | 16 |
| **9** | 18 | 65 | 160 | 16 |
| **9.5** | 19 | 65 | 160 | 16 |
| **10** | 20 | 80 | 170 | 20 |
| **10.5** | 21 | 80 | 170 | 20 |
| **11** | 22 | 90 | 180 | 20 |
| **12** | 24 | 100 | 190 | 20 |
| **12.5** | 25 | 100 | 190 | 25 |
| **15** | 30 | 120 | 210 | 25 |
| **17.5** | 35 | 130 | 250 | 32 |
| **20** | 40 | 130 | 250 | 32 |

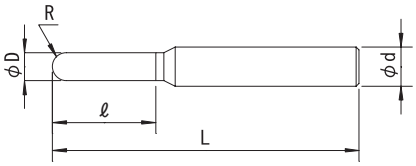
# BELS

## ロングシャンクボールエンドミル *Long Shank Ball End Mill*

切削条件表 P362 | ボール形状 | 右ネジレ 35° | 刃数 2 | HSS Co








| 公差 (Tolerance) | R | | D | d |
|---|---|---|---|---|
| | 3～16 ±0.02 | 17～20 ±0.05 | ±0.01 | h7 |

右刃右ネジレ35° 刃数:2 SKH57
Helix Angle-Right35° 2 Flutes HSS-Co.

| 寸法 R | 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|
| **3** | 6 | 12 | 130 | 6 |
| **3.1** | 6.2 | 16 | 150 | 6 |
| **3.2** | 6.4 | 16 | 150 | 6 |
| **3.25** | 6.5 | 16 | 150 | 6 |
| **3.3** | 6.6 | 16 | 150 | 6 |
| **3.4** | 6.8 | 16 | 150 | 6 |
| **3.5** | 7 | 16 | 150 | 6 |
| **3.6** | 7.2 | 16 | 150 | 6 |
| **3.7** | 7.4 | 16 | 150 | 6 |
| **3.75** | 7.5 | 16 | 150 | 6 |
| **3.8** | 7.6 | 16 | 150 | 6 |
| **3.9** | 7.8 | 16 | 150 | 6 |
| **4** | 8 | 16 | 150 | 8 |
| **4.25** | 8.5 | 20 | 150 | 8 |
| **4.5** | 9 | 20 | 150 | 8 |
| **5** | 10 | 20 | 160 | 10 |
| **5.25** | 10.5 | 22 | 160 | 10 |
| **5.5** | 11 | 22 | 160 | 10 |
| **6** | 12 | 24 | 180 | 12 |
| **6.5** | 13 | 26 | 180 | 12 |

| 寸法 R | 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|
| **7** | 14 | 28 | 180 | 12 |
| **7.5** | 15 | 28 | 180 | 12 |
| **8** | 16 | 30 | 220 | 16 |
| **8.5** | 17 | 32 | 220 | 16 |
| **9** | 18 | 34 | 220 | 16 |
| **9.5** | 19 | 36 | 250 | 16 |
| **10** | 20 | 38 | 250 | 20 |
| **10.5** | 21 | 45 | 250 | 20 |
| **11** | 22 | 45 | 250 | 20 |
| **11.5** | 23 | 45 | 250 | 20 |
| **12** | 24 | 50 | 250 | 20 |
| **12.5** | 25 | 50 | 250 | 25 |
| **13** | 26 | 50 | 250 | 25 |
| **14** | 28 | 55 | 250 | 25 |
| **15** | 30 | 55 | 250 | 25 |
| **16** | 32 | 60 | 250 | 32 |
| **17** | 34 | 60 | 250 | 32 |
| **17.5** | 35 | 65 | 300 | 32 |
| **18** | 36 | 65 | 300 | 32 |
| **19** | 38 | 65 | 300 | 32 |
| **20** | 40 | 65 | 300 | 32 |

ハイス

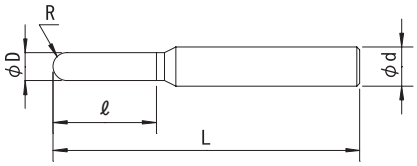
# HPBE

## HPMボールエンドミル *HPM Ball End Mill*

切削条件表 P362 | ボール形状 | 右ネジレ 35° | 刃数 2 | 粉末ハイス








| 公差 (Tolerance) | R | | | | | | D | d |
|---|---|---|---|---|---|---|---|---|
| | 0.5～1.25 | ±0.01 | 1.3～16.5 | ±0.02 | 17～20 | ±0.05 | ±0.01 | h7 |

右刃右ネジレ35° 刃数:2 粉末ハイス
Helix Angle-Right35° 2 Flutes Powder Metallurgy

| 寸法 R | 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|
| **0.5** | 1 | 2.5 | 70 | 6 |
| **0.55** | 1.1 | 2.5 | 70 | 6 |
| **0.6** | 1.2 | 2.5 | 70 | 6 |
| **0.65** | 1.3 | 2.5 | 70 | 6 |
| **0.7** | 1.4 | 4 | 70 | 6 |
| **0.75** | 1.5 | 4 | 70 | 6 |
| **0.8** | 1.6 | 4 | 70 | 6 |
| **0.85** | 1.7 | 4 | 70 | 6 |
| **0.9** | 1.8 | 5 | 70 | 6 |
| **0.95** | 1.9 | 5 | 70 | 6 |
| **1** | 2 | 5 | 70 | 6 |
| **1.1** | 2.2 | 7 | 80 | 6 |
| **1.2** | 2.4 | 7 | 80 | 6 |
| **1.25** | 2.5 | 7 | 80 | 6 |
| **1.3** | 2.6 | 7 | 80 | 6 |
| **1.4** | 2.8 | 7 | 80 | 6 |
| **1.5** | 3 | 7 | 80 | 6 |
| **1.6** | 3.2 | 8 | 90 | 6 |
| **1.7** | 3.4 | 8 | 90 | 6 |
| **1.75** | 3.5 | 8 | 90 | 6 |
| **1.8** | 3.6 | 8 | 90 | 6 |
| **1.9** | 3.8 | 8 | 90 | 6 |
| **2** | 4 | 8 | 90 | 6 |
| **2.1** | 4.2 | 10 | 100 | 6 |
| **2.2** | 4.4 | 10 | 100 | 6 |
| **2.25** | 4.5 | 10 | 100 | 6 |
| **2.3** | 4.6 | 10 | 100 | 6 |
| **2.4** | 4.8 | 10 | 100 | 6 |
| **2.5** | 5 | 10 | 100 | 6 |
| **2.6** | 5.2 | 12 | 100 | 6 |
| **2.7** | 5.4 | 12 | 100 | 6 |
| **2.75** | 5.5 | 12 | 100 | 6 |
| **2.8** | 5.6 | 12 | 100 | 6 |
| **2.9** | 5.8 | 12 | 100 | 6 |
| **3** | 6 | 12 | 100 | 6 |
| **3.1** | 6.2 | 16 | 120 | 8 |
| **3.2** | 6.4 | 16 | 120 | 8 |
| **3.25** | 6.5 | 16 | 120 | 8 |
| **3.3** | 6.6 | 16 | 120 | 8 |
| **3.4** | 6.8 | 16 | 120 | 8 |
| **3.5** | 7 | 16 | 120 | 8 |
| **3.6** | 7.2 | 16 | 120 | 8 |
| **3.7** | 7.4 | 16 | 120 | 8 |
| **3.75** | 7.5 | 16 | 120 | 8 |

| 寸法 R | 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|
| **3.8** | 7.6 | 16 | 120 | 8 |
| **3.9** | 7.8 | 16 | 120 | 8 |
| **4** | 8 | 16 | 120 | 8 |
| **4.1** | 8.2 | 20 | 120 | 10 |
| **4.2** | 8.4 | 20 | 120 | 10 |
| **4.25** | 8.5 | 20 | 120 | 10 |
| **4.3** | 8.6 | 20 | 120 | 10 |
| **4.4** | 8.8 | 20 | 120 | 10 |
| **4.5** | 9 | 20 | 120 | 10 |
| **4.6** | 9.2 | 20 | 130 | 10 |
| **4.7** | 9.4 | 20 | 130 | 10 |
| **4.75** | 9.5 | 20 | 130 | 10 |
| **4.8** | 9.6 | 20 | 130 | 10 |
| **4.9** | 9.8 | 20 | 130 | 10 |
| **5** | 10 | 20 | 130 | 10 |
| **5.1** | 10.2 | 22 | 130 | 12 |
| **5.2** | 10.4 | 22 | 130 | 12 |
| **5.25** | 10.5 | 22 | 130 | 12 |
| **5.3** | 10.6 | 22 | 130 | 12 |
| **5.4** | 10.8 | 22 | 130 | 12 |
| **5.5** | 11 | 22 | 130 | 12 |
| **5.6** | 11.2 | 24 | 140 | 12 |
| **5.7** | 11.4 | 24 | 140 | 12 |
| **5.75** | 11.5 | 24 | 140 | 12 |
| **5.8** | 11.6 | 24 | 140 | 12 |
| **5.9** | 11.8 | 24 | 140 | 12 |
| **6** | 12 | 24 | 140 | 12 |
| **6.1** | 12.2 | 26 | 150 | 12 |
| **6.2** | 12.4 | 26 | 150 | 12 |
| **6.25** | 12.5 | 26 | 150 | 12 |
| **6.3** | 12.6 | 26 | 150 | 12 |
| **6.4** | 12.8 | 26 | 150 | 12 |
| **6.5** | 13 | 26 | 150 | 12 |
| **6.6** | 13.2 | 26 | 150 | 12 |
| **6.7** | 13.4 | 26 | 150 | 12 |
| **6.75** | 13.5 | 26 | 150 | 12 |
| **6.8** | 13.6 | 26 | 150 | 12 |
| **6.9** | 13.8 | 26 | 150 | 12 |
| **7** | 14 | 26 | 150 | 12 |
| **7.1** | 14.2 | 28 | 150 | 12 |
| **7.2** | 14.4 | 28 | 150 | 12 |
| **7.25** | 14.5 | 28 | 150 | 12 |
| **7.3** | 14.6 | 28 | 150 | 12 |
| **7.4** | 14.8 | 28 | 150 | 12 |

# HPBE HPMボールエンドミル

| 寸法 R | 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| **7.5** | 15 | 28 | 150 | 12 |
| **7.6** | 15.2 | 30 | 170 | 16 |
| **7.7** | 15.4 | 30 | 170 | 16 |
| **7.75** | 15.5 | 30 | 170 | 16 |
| **7.8** | 15.6 | 30 | 170 | 16 |
| **7.9** | 15.8 | 30 | 170 | 16 |
| **8** | 16 | 30 | 170 | 16 |
| **8.1** | 16.2 | 32 | 170 | 16 |
| **8.2** | 16.4 | 32 | 170 | 16 |
| **8.25** | 16.5 | 32 | 170 | 16 |
| **8.3** | 16.6 | 32 | 170 | 16 |
| **8.4** | 16.8 | 32 | 170 | 16 |
| **8.5** | 17 | 34 | 170 | 16 |
| **8.6** | 17.2 | 34 | 170 | 16 |
| **8.7** | 17.4 | 34 | 170 | 16 |
| **8.75** | 17.5 | 34 | 170 | 16 |
| **8.8** | 17.6 | 34 | 170 | 16 |
| **8.9** | 17.8 | 34 | 170 | 16 |
| **9** | 18 | 34 | 170 | 16 |
| **9.1** | 18.2 | 36 | 190 | 16 |
| **9.2** | 18.4 | 36 | 190 | 16 |
| **9.25** | 18.5 | 36 | 190 | 16 |
| **9.3** | 18.6 | 36 | 190 | 16 |
| **9.4** | 18.8 | 36 | 190 | 16 |
| **9.5** | 19 | 36 | 190 | 16 |
| **9.6** | 19.2 | 38 | 190 | 20 |
| **9.7** | 19.4 | 38 | 190 | 20 |
| **9.75** | 19.5 | 38 | 190 | 20 |
| **9.8** | 19.6 | 38 | 190 | 20 |
| **9.9** | 19.8 | 38 | 190 | 20 |
| **10** | 20 | 38 | 190 | 20 |
| **10.1** | 20.2 | 42 | 190 | 20 |
| **10.2** | 20.4 | 42 | 190 | 20 |
| **10.25** | 20.5 | 42 | 190 | 20 |
| **10.3** | 20.6 | 42 | 190 | 20 |
| **10.4** | 20.8 | 42 | 190 | 20 |
| **10.5** | 21 | 42 | 190 | 20 |
| **10.6** | 21.2 | 45 | 190 | 20 |
| **10.7** | 21.4 | 45 | 190 | 20 |
| **10.75** | 21.5 | 45 | 190 | 20 |
| **10.8** | 21.6 | 45 | 190 | 20 |
| **10.9** | 21.8 | 45 | 190 | 20 |
| **11** | 22 | 45 | 190 | 20 |
| **11.1** | 22.2 | 45 | 190 | 20 |

| 寸法 R | 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| **11.2** | 22.4 | 45 | 190 | 20 |
| **11.25** | 22.5 | 45 | 190 | 20 |
| **11.3** | 22.6 | 45 | 190 | 20 |
| **11.4** | 22.8 | 45 | 190 | 20 |
| **11.5** | 23 | 45 | 190 | 20 |
| **11.6** | 23.2 | 50 | 190 | 20 |
| **11.7** | 23.4 | 50 | 190 | 20 |
| **11.75** | 23.5 | 50 | 190 | 20 |
| **11.8** | 23.6 | 50 | 190 | 20 |
| **11.9** | 23.8 | 50 | 190 | 20 |
| **12** | 24 | 50 | 190 | 20 |
| **12.1** | 24.2 | 50 | 210 | 25 |
| **12.2** | 24.4 | 50 | 210 | 25 |
| **12.25** | 24.5 | 50 | 210 | 25 |
| **12.3** | 24.6 | 50 | 210 | 25 |
| **12.4** | 24.8 | 50 | 210 | 25 |
| **12.5** | 25 | 50 | 210 | 25 |
| **12.6** | 25.2 | 50 | 210 | 25 |
| **12.7** | 25.4 | 50 | 210 | 25 |
| **12.75** | 25.5 | 50 | 210 | 25 |
| **12.8** | 25.6 | 50 | 210 | 25 |
| **12.9** | 25.8 | 50 | 210 | 25 |
| **13** | 26 | 50 | 210 | 25 |
| **13.5** | 27 | 55 | 210 | 25 |
| **14** | 28 | 55 | 210 | 25 |
| **14.5** | 29 | 55 | 210 | 25 |
| **15** | 30 | 55 | 210 | 25 |
| **15.5** | 31 | 60 | 210 | 32 |
| **16** | 32 | 60 | 210 | 32 |
| **16.5** | 33 | 60 | 210 | 32 |
| **17** | 34 | 60 | 210 | 32 |
| **17.5** | 35 | 65 | 230 | 32 |
| **18** | 36 | 65 | 230 | 32 |
| **18.5** | 37 | 65 | 230 | 32 |
| **19** | 38 | 65 | 230 | 32 |
| **19.5** | 39 | 65 | 230 | 32 |
| **20** | 40 | 65 | 230 | 32 |

| | | | | |
|---|---|---|---|---|
| **1/8** | 6.35 | 16 | 120 | 8 |
| **1/4** | 12.7 | 26 | 150 | 12 |
| **3/8** | 19.05 | 38 | 190 | 20 |
| **1/2** | 25.4 | 50 | 210 | 25 |
| **5/8** | 31.75 | 60 | 210 | 25 |

ハイス

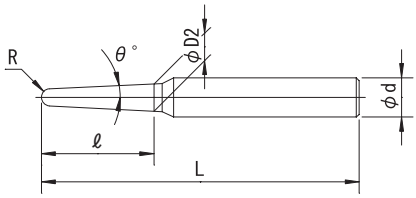
# HPTBE

## テーパーボールエンドミル *Taper Ball End Mill*

切削条件表 P363 | テーパーボール形状 | 右ネジレ 30° | 刃数 2 | 粉末ハイス








| 公差(Tolerance) | R：±0.02 | θ：±5' | d：h7 |
|---|---|---|---|

右刃右ネジレ30° 刃数:2 粉末ハイス
Helix Angle-Right30° 2 Flutes Powder Metallurgy

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 0.5 | 30' | 4 | 1.06 | 45 | 6 |
| | 1° | 4 | 1.12 | 45 | 6 |
| | 1°30' | 4 | 1.18 | 45 | 6 |
| | 2° | 4 | 1.25 | 45 | 6 |
| | 2°30' | 4 | 1.31 | 45 | 6 |
| | 3° | 4 | 1.37 | 45 | 6 |
| | 4° | 6 | 1.77 | 45 | 6 |
| | 5° | 6 | 1.97 | 45 | 6 |
| | 7° | 6 | 2.35 | 45 | 6 |
| | 10° | 6 | 2.95 | 45 | 6 |
| | 15° | 6 | 3.98 | 45 | 6 |
| 0.75 | 30' | 8 | 1.63 | 50 | 6 |
| | 1° | 8 | 1.75 | 50 | 6 |
| | 1°30' | 8 | 1.88 | 50 | 6 |
| | 2° | 8 | 2.01 | 50 | 6 |
| | 2°30' | 8 | 2.13 | 50 | 6 |
| | 3° | 8 | 2.26 | 50 | 6 |
| | 4° | 10 | 2.8 | 65 | 6 |
| | 5° | 10 | 3.12 | 65 | 6 |
| | 7° | 10 | 3.78 | 65 | 6 |
| | 10° | 10 | 4.78 | 65 | 6 |
| | 15° | 10 | 6.5 | 65 | 6 |
| 1 | 30' | 10 | 2.16 | 55 | 6 |
| | 1° | 15 | 2.49 | 60 | 6 |
| | 1°30' | 15 | 2.73 | 60 | 6 |
| | 2° | 20 | 3.33 | 65 | 6 |
| | 2°30' | 20 | 3.66 | 65 | 6 |
| | 3° | 20 | 3.99 | 65 | 6 |
| | 4° | 20 | 4.66 | 65 | 6 |
| | 5° | 20 | 5.33 | 65 | 6 |
| | 7° | 20 | 6.68 | 65 | 6 |
| | 10° | 20 | 8.73 | 70 | 8 |
| | 15° | 20 | 12.25 | 70 | 12 |
| 1.25 | 30' | 25 | 2.91 | 80 | 6 |
| | 1° | 25 | 3.33 | 80 | 6 |
| | 1°30' | 25 | 3.74 | 80 | 6 |
| | 2° | 25 | 4.16 | 85 | 6 |
| | 2°30' | 25 | 4.57 | 85 | 6 |
| | 3° | 25 | 4.98 | 85 | 6 |
| | 4° | 25 | 5.83 | 85 | 6 |
| | 5° | 25 | 6.67 | 85 | 6 |
| | 7° | 25 | 8.35 | 90 | 8 |
| | 10° | 25 | 10.91 | 95 | 10 |
| | 15° | 25 | 15.31 | 100 | 16 |
| 1.5 | 30' | 25 | 3.41 | 80 | 6 |
| | 1° | 25 | 3.82 | 80 | 6 |

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 1.5 | 1°30' | 25 | 4.23 | 80 | 6 |
| | 2° | 25 | 4.64 | 85 | 6 |
| | 2°30' | 25 | 5.05 | 85 | 6 |
| | 3° | 25 | 5.47 | 85 | 6 |
| | 4° | 25 | 6.29 | 85 | 6 |
| | 5° | 25 | 7.12 | 90 | 8 |
| | 7° | 25 | 8.79 | 95 | 10 |
| | 10° | 25 | 11.33 | 100 | 12 |
| | 15° | 25 | 15.69 | 100 | 16 |
| 1.75 | 30' | 30 | 3.99 | 90 | 6 |
| | 1° | 30 | 4.49 | 90 | 6 |
| | 1°30' | 30 | 4.98 | 90 | 6 |
| | 2° | 30 | 5.48 | 95 | 6 |
| | 2°30' | 30 | 5.97 | 95 | 6 |
| | 3° | 30 | 6.47 | 95 | 6 |
| | 4° | 30 | 7.46 | 95 | 8 |
| | 5° | 30 | 8.46 | 95 | 8 |
| | 7° | 30 | 10.46 | 100 | 10 |
| | 10° | 30 | 13.52 | 100 | 12 |
| | 15° | 30 | 18.76 | 100 | 20 |
| 2 | 30' | 30 | 4.49 | 90 | 6 |
| | 1° | 30 | 4.98 | 90 | 6 |
| | 1°30' | 30 | 5.47 | 90 | 6 |
| | 2° | 30 | 5.96 | 95 | 8 |
| | 2°30' | 30 | 6.45 | 95 | 8 |
| | 3° | 30 | 6.94 | 95 | 8 |
| | 4° | 30 | 7.93 | 95 | 8 |
| | 5° | 30 | 8.91 | 100 | 10 |
| | 7° | 30 | 10.9 | 105 | 12 |
| | 10° | 30 | 13.94 | 110 | 16 |
| | 15° | 30 | 19.14 | 110 | 20 |
| 2.25 | 30' | 35 | 5.07 | 100 | 6 |
| | 1° | 35 | 5.64 | 100 | 6 |
| | 1°30' | 35 | 6.21 | 100 | 6 |
| | 2° | 35 | 6.79 | 110 | 8 |
| | 2°30' | 35 | 7.36 | 110 | 8 |
| | 3° | 35 | 7.93 | 110 | 8 |
| | 4° | 35 | 9.09 | 110 | 10 |
| | 5° | 35 | 10.24 | 110 | 10 |
| | 7° | 35 | 12.57 | 110 | 12 |
| | 10° | 35 | 16.11 | 120 | 16 |
| 2.5 | 30' | 35 | 5.57 | 100 | 6 |
| | 1° | 35 | 6.14 | 100 | 6 |
| | 1°30' | 35 | 6.7 | 100 | 6 |
| | 2° | 35 | 7.27 | 110 | 8 |
| | 2°30' | 35 | 7.84 | 110 | 8 |

# HPTBE テーパーボールエンドミル

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 2.5 | 3° | 35 | 8.41 | 110 | 8 |
| | 4° | 35 | 9.56 | 110 | 8 |
| | 5° | 35 | 10.71 | 110 | 10 |
| | 7° | 35 | 13.02 | 110 | 12 |
| | 10° | 35 | 16.54 | 120 | 16 |
| | 15° | 35 | 22.59 | 120 | 20 |
| 2.75 | 30' | 40 | 6.15 | 100 | 6 |
| | 1° | 40 | 6.8 | 100 | 6 |
| | 1°30' | 40 | 7.45 | 110 | 8 |
| | 2° | 40 | 8.1 | 110 | 8 |
| | 2°30' | 40 | 8.75 | 110 | 8 |
| | 3° | 40 | 9.41 | 110 | 8 |
| | 4° | 40 | 10.72 | 110 | 10 |
| | 5° | 40 | 12.03 | 110 | 12 |
| | 7° | 40 | 14.68 | 120 | 16 |
| | 10° | 40 | 18.72 | 125 | 20 |
| 3 | 30' | 40 | 6.64 | 100 | 6 |
| | 1° | 40 | 7.29 | 100 | 6 |
| | 1°30' | 40 | 7.94 | 100 | 8 |
| | 2° | 40 | 8.59 | 110 | 8 |
| | 2°30' | 40 | 9.24 | 110 | 8 |
| | 3° | 40 | 9.88 | 110 | 10 |
| | 4° | 40 | 11.19 | 110 | 10 |
| | 5° | 40 | 12.5 | 110 | 12 |
| | 7° | 40 | 15.13 | 120 | 16 |
| | 10° | 40 | 19.14 | 125 | 20 |
| | 15° | 40 | 26.04 | 125 | 25 |
| 3.25 | 30' | 50 | 7.31 | 120 | 8 |
| | 1° | 50 | 8.13 | 120 | 8 |
| | 1°30' | 50 | 8.95 | 125 | 8 |
| | 2° | 50 | 9.76 | 125 | 8 |
| | 2°30' | 50 | 10.58 | 125 | 10 |
| | 3° | 50 | 11.4 | 125 | 10 |
| | 4° | 50 | 13.05 | 125 | 12 |
| | 5° | 50 | 14.7 | 125 | 16 |
| | 7° | 55 | 19.25 | 135 | 20 |
| | 10° | 55 | 24.85 | 140 | 25 |
| 3.5 | 30' | 50 | 7.81 | 120 | 8 |
| | 1° | 50 | 8.62 | 120 | 8 |
| | 1°30' | 50 | 9.43 | 125 | 10 |
| | 2° | 50 | 10.25 | 125 | 10 |
| | 2°30' | 50 | 11.06 | 125 | 12 |
| | 3° | 50 | 11.88 | 125 | 12 |
| | 4° | 50 | 13.52 | 125 | 12 |
| | 5° | 50 | 15.16 | 130 | 16 |
| | 7° | 55 | 19.69 | 135 | 20 |
| | 10° | 55 | 25.26 | 140 | 25 |
| | 15° | 55 | 34.84 | 140 | 32 |
| 3.75 | 30' | 50 | 8.3 | 120 | 8 |
| | 1° | 50 | 9.11 | 120 | 8 |
| | 1°30' | 50 | 9.92 | 125 | 10 |
| | 2° | 50 | 10.73 | 125 | 10 |
| | 2°30' | 50 | 11.54 | 125 | 12 |
| | 3° | 50 | 12.35 | 125 | 12 |
| | 4° | 50 | 13.98 | 125 | 12 |
| | 5° | 50 | 15.62 | 130 | 16 |
| | 7° | 55 | 20.14 | 135 | 20 |
| | 10° | 55 | 25.68 | 140 | 25 |
| 4 | 30' | 50 | 8.8 | 120 | 8 |
| | 1° | 50 | 9.61 | 120 | 8 |
| | 1°30' | 50 | 10.41 | 125 | 10 |
| | 2° | 50 | 11.22 | 125 | 10 |
| | 2°30' | 50 | 12.02 | 125 | 12 |
| | 3° | 50 | 12.83 | 125 | 12 |
| | 4° | 50 | 14.45 | 125 | 16 |

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 4 | 5° | 50 | 16.08 | 130 | 16 |
| | 7° | 55 | 20.58 | 135 | 20 |
| | 10° | 55 | 26.11 | 140 | 25 |
| | 15° | 55 | 35.61 | 140 | 32 |
| 4.25 | 30' | 60 | 9.47 | 130 | 8 |
| | 1° | 60 | 10.44 | 130 | 10 |
| | 1°30' | 60 | 11.42 | 130 | 10 |
| | 2° | 60 | 12.39 | 135 | 12 |
| | 2°30' | 60 | 13.37 | 135 | 12 |
| | 3° | 60 | 14.35 | 135 | 16 |
| | 4° | 60 | 16.31 | 135 | 16 |
| | 5° | 60 | 18.28 | 140 | 16 |
| | 7° | 62 | 22.74 | 150 | 20 |
| | 10° | 63 | 29.35 | 155 | 25 |
| 4.5 | 30' | 60 | 9.96 | 130 | 10 |
| | 1° | 60 | 10.93 | 130 | 10 |
| | 1°30' | 60 | 11.91 | 130 | 12 |
| | 2° | 60 | 12.88 | 135 | 12 |
| | 2°30' | 60 | 13.85 | 135 | 12 |
| | 3° | 60 | 14.82 | 135 | 16 |
| | 4° | 60 | 16.78 | 135 | 16 |
| | 5° | 60 | 18.74 | 140 | 20 |
| | 7° | 62 | 23.18 | 150 | 20 |
| | 10° | 63 | 29.76 | 155 | 25 |
| 4.75 | 30' | 60 | 10.46 | 130 | 10 |
| | 1° | 60 | 11.43 | 130 | 12 |
| | 1°30' | 60 | 12.39 | 130 | 12 |
| | 2° | 60 | 13.36 | 135 | 12 |
| | 2°30' | 60 | 14.33 | 135 | 16 |
| | 3° | 60 | 15.3 | 135 | 16 |
| | 4° | 60 | 17.25 | 135 | 16 |
| | 5° | 60 | 19.2 | 140 | 20 |
| | 7° | 62 | 23.63 | 150 | 25 |
| | 10° | 63 | 30.18 | 155 | 32 |
| 5 | 30' | 60 | 10.96 | 130 | 10 |
| | 1° | 60 | 11.92 | 130 | 12 |
| | 1°30' | 60 | 12.88 | 130 | 12 |
| | 2° | 60 | 13.85 | 135 | 12 |
| | 2°30' | 60 | 14.81 | 135 | 16 |
| | 3° | 60 | 15.78 | 135 | 16 |
| | 4° | 60 | 17.72 | 135 | 16 |
| | 5° | 60 | 19.66 | 140 | 20 |
| | 7° | 62 | 24.07 | 150 | 25 |
| | 10° | 63 | 30.61 | 155 | 32 |
| | 15° | 63 | 41.43 | 155 | 32 |
| 5.25 | 30' | 60 | 11.45 | 130 | 12 |
| | 1° | 60 | 12.41 | 130 | 12 |
| | 1°30' | 60 | 13.37 | 130 | 12 |
| | 2° | 60 | 14.33 | 135 | 16 |
| | 2°30' | 60 | 15.29 | 135 | 16 |
| | 3° | 60 | 16.25 | 135 | 16 |
| | 4° | 60 | 18.18 | 140 | 16 |
| | 5° | 60 | 20.12 | 140 | 20 |
| | 7° | 65 | 25.25 | 150 | 25 |
| | 10° | 65 | 31.73 | 155 | 32 |
| 6 | 30' | 60 | 12.94 | 130 | 12 |
| | 1° | 60 | 13.89 | 130 | 12 |
| | 1°30' | 60 | 14.83 | 130 | 12 |
| | 2° | 60 | 15.78 | 135 | 16 |
| | 2°30' | 60 | 16.73 | 135 | 16 |
| | 3° | 60 | 17.66 | 135 | 16 |
| | 4° | 60 | 19.58 | 140 | 20 |
| | 5° | 60 | 21.49 | 140 | 20 |
| | 7° | 65 | 26.58 | 150 | 25 |
| | 10° | 65 | 32.99 | 155 | 32 |

# HPTBE テーパーボールエンドミル

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 8 | 30' | 60 | 16.91 | 140 | 16 |
| | 1° | 60 | 17.82 | 140 | 16 |
| | 1°30' | 60 | 18.73 | 140 | 16 |
| | 2° | 60 | 19.64 | 140 | 20 |
| | 2°30' | 60 | 20.56 | 140 | 20 |

| 寸法 R | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 8 | 3° | 60 | 21.47 | 140 | 20 |
| | 4° | 60 | 23.31 | 145 | 20 |
| | 5° | 60 | 25.16 | 145 | 25 |
| | 7° | 65 | 30.12 | 150 | 25 |
| | 10° | 65 | 36.35 | 155 | 32 |

ハイス

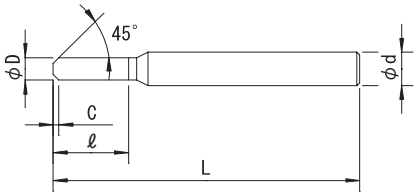
# CEM

## C面付エンドミル *Corner C End Mill*

切削条件表 P363 | C面付形状 | 右ネジレ 30° | 刃数 2 | HSS Co








| 公差(Tolerance) | D : $^{0}_{-0.02}$ | d : h7 |
|---|---|---|

右刃右ネジレ30° 刃数:2 SKH56
Helix Angle-Right30° 2 Flutes HSS-Co.

| 刃径 (ΦD) Dia. | C | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| 3 | 0.5 | 8 | 45 | 6 |
| | 1 | 8 | 45 | 6 |
| 4 | 0.5 | 11 | 45 | 6 |
| | 1 | 11 | 45 | 6 |
| 5 | 0.5 | 13 | 50 | 6 |
| | 1 | 13 | 50 | 6 |
| | 1.5 | 13 | 50 | 6 |
| 6 | 0.5 | 13 | 50 | 6 |
| | 1 | 13 | 50 | 6 |
| | 1.5 | 13 | 50 | 6 |
| | 2 | 13 | 50 | 6 |
| 8 | 0.5 | 19 | 60 | 8 |
| | 1 | 19 | 60 | 8 |
| | 1.5 | 19 | 60 | 8 |
| | 2 | 19 | 60 | 8 |
| 10 | 0.5 | 22 | 70 | 10 |

| 刃径 (ΦD) Dia. | C | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|
| 10 | 1 | 22 | 70 | 10 |
| | 1.5 | 22 | 70 | 10 |
| | 2 | 22 | 70 | 10 |
| | 2.5 | 22 | 70 | 10 |
| 12 | 0.5 | 26 | 75 | 12 |
| | 1 | 26 | 75 | 12 |
| | 1.5 | 26 | 75 | 12 |
| | 2 | 26 | 75 | 12 |
| | 2.5 | 26 | 75 | 12 |
| | 3 | 26 | 75 | 12 |
| 16 | 0.5 | 32 | 100 | 16 |
| | 1 | 32 | 100 | 16 |
| | 1.5 | 32 | 100 | 16 |
| | 2 | 32 | 100 | 16 |
| | 2.5 | 32 | 100 | 16 |
| | 3 | 32 | 100 | 16 |

ハイス

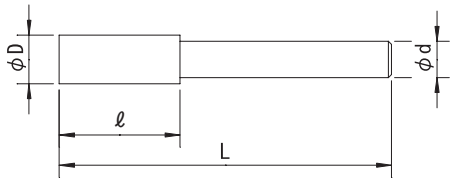
# SLEM

## スロッチングエンドミル　*Slotting End Mill*

切削条件表 P364　スクエア形状　右直刃　刃数 2　HSS








公差(Tolerance)　D：$^{0}_{-0.05}$　d：h7

右刃ストレート　刃数:2　SKH51
Straight Flute　2 Flutes　HSS

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| 1 | 4 | 35 | 4 |
| | | | 6 |
| 1.5 | 6 | 35 | 4 |
| | | | 6 |
| 2 | 8 | 35 | 6 |
| 2.5 | 10 | 40 | 6 |
| 3 | 10 | 40 | 6 |
| 3.5 | 15 | 45 | 6 |
| 4 | 15 | 45 | 6 |
| 4.5 | 17 | 50 | 6 |
| 5 | 17 | 50 | 6 |
| 5.5 | 17 | 50 | 6 |
| 6 | 17 | 50 | 6 |
| 6.5 | 18 | 55 | 8 |
| 7 | 18 | 55 | 8 |
| 7.5 | 18 | 55 | 8 |
| 8 | 18 | 55 | 8 |
| 8.5 | 20 | 60 | 10 |
| 9 | 20 | 60 | 10 |
| 9.5 | 20 | 60 | 10 |
| 10 | 20 | 60 | 10 |
| 10.5 | 22 | 65 | 10 |
| 11 | 22 | 65 | 10 |
| 11.5 | 22 | 65 | 10 |
| 12 | 22 | 65 | 12 |
| 12.5 | 23 | 70 | 12 |
| 13 | 23 | 70 | 12 |
| 13.5 | 23 | 70 | 12 |
| 14 | 23 | 70 | 12 |
| 14.5 | 25 | 75 | 12 |
| 15 | 25 | 75 | 12 |
| 15.5 | 25 | 75 | 16 |
| 16 | 25 | 75 | 16 |
| 16.5 | 28 | 80 | 16 |
| 17 | 28 | 80 | 16 |
| 17.5 | 28 | 80 | 16 |
| 18 | 28 | 80 | 16 |
| 18.5 | 30 | 85 | 16 |
| 19 | 30 | 85 | 16 |
| 19.5 | 30 | 85 | 16 |
| 20 | 30 | 85 | 16 |
| 20.5 | 35 | 95 | 20 |
| 21 | 35 | 95 | 20 |
| 21.5 | 35 | 95 | 20 |
| 22 | 35 | 95 | 20 |
| 22.5 | 35 | 95 | 20 |
| 23 | 35 | 95 | 20 |

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| 23.5 | 35 | 95 | 20 |
| 24 | 35 | 95 | 20 |
| 24.5 | 40 | 100 | 20 |
| 25 | 40 | 100 | 20 |
| 25.5 | 40 | 100 | 25 |
| 26 | 40 | 100 | 25 |
| 26.5 | 40 | 100 | 25 |
| 27 | 40 | 100 | 25 |
| 27.5 | 40 | 105 | 25 |
| 28 | 40 | 105 | 25 |
| 28.5 | 40 | 105 | 25 |
| 29 | 40 | 105 | 25 |
| 29.5 | 45 | 110 | 25 |
| 30 | 45 | 110 | 20 |
| | | | 25 |
| 30.5 | 45 | 110 | 25 |
| 31 | 45 | 110 | 25 |
| 31.5 | 45 | 110 | 32 |
| 32 | 45 | 110 | 32 |
| 32.5 | 45 | 110 | 32 |
| 33 | 45 | 110 | 32 |
| 34 | 50 | 120 | 32 |
| 35 | 50 | 120 | 32 |
| 36 | 50 | 120 | 32 |
| 37 | 50 | 120 | 32 |
| 38 | 55 | 125 | 32 |
| 39 | 55 | 125 | 32 |
| 40 | 55 | 125 | 32 |
| 41 | 65 | 150 | 32 |
| 42 | 65 | 150 | 32 |
| 43 | 70 | 155 | 32 |
| 44 | 70 | 155 | 32 |
| 45 | 70 | 155 | 32 |
| 46 | 70 | 155 | 32 |
| 47 | 70 | 155 | 32 |
| 48 | 70 | 155 | 32 |
| 49 | 70 | 155 | 32 |
| 50 | 70 | 155 | 32 |
| 51 | 70 | 155 | 32 |
| 52 | 70 | 155 | 32 |
| 53 | 70 | 155 | 32 |
| 54 | 70 | 155 | 32 |
| 55 | 70 | 155 | 32 |
| 56 | 75 | 160 | 32 |
| 57 | 75 | 160 | 32 |
| 58 | 75 | 160 | 32 |
| 59 | 75 | 160 | 32 |
| 60 | 75 | 160 | 32 |

ハイス

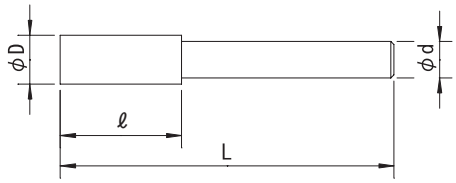
# SLEML

## ロングスロッチングエンドミル *Long Slotting End Mill*

切削条件表 P364 | スクエア形状 | 右直刃 | 刃数 2 | HSS








右刃ストレート　刃数:2　SKH51
Straight Flute　2 Flutes　HSS

| 公差(Tolerance) | D : $^{0}_{-0.05}$ | d : h7 |
|---|---|---|

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **2** | 20 | 46 | 3 |
| **2.5** | 20 | 50 | 4 |
| **3** | 30 | 60 | 6 |
| **3.5** | 30 | 60 | 6 |
| **4** | 30 | 60 | 6 |
| **4.5** | 30 | 63 | 6 |
| **5** | 30 | 63 | 6 |
| **5.5** | 30 | 63 | 6 |
| **6** | 30 | 63 | 6 |
| **6.5** | 30 | 67 | 8 |
| **7** | 30 | 67 | 8 |
| **7.5** | 30 | 67 | 8 |
| **8** | 30 | 67 | 8 |
| **8.5** | 30 | 70 | 10 |
| **9** | 30 | 70 | 10 |
| **9.5** | 30 | 70 | 10 |
| **10** | 30 | 70 | 10 |
| **3** | 40 | 70 | 6 |
| **3.5** | 40 | 70 | 6 |
| **4** | 40 | 70 | 6 |
| **4.5** | 40 | 73 | 6 |
| **5** | 40 | 73 | 6 |
| **5.5** | 40 | 73 | 6 |
| **6** | 40 | 73 | 6 |
| **6.5** | 40 | 77 | 8 |
| **7** | 40 | 77 | 8 |
| **7.5** | 40 | 77 | 8 |
| **8** | 40 | 77 | 8 |
| **8.5** | 40 | 80 | 10 |
| **9** | 40 | 80 | 10 |
| **9.5** | 40 | 80 | 10 |
| **10** | 40 | 80 | 10 |
| **10.5** | 40 | 83 | 10 |
| **11** | 40 | 83 | 10 |
| **11.5** | 40 | 83 | 12 |
| **12** | 40 | 83 | 12 |
| **12.5** | 40 | 83 | 12 |
| **13** | 40 | 85 | 12 |
| **14** | 40 | 85 | 12 |
| **15** | 40 | 100 | 12 |
| **16** | 40 | 100 | 16 |
| **5** | 60 | 93 | 6 |
| **6** | 60 | 93 | 6 |
| **7** | 60 | 97 | 8 |
| **8** | 60 | 97 | 8 |
| **9** | 60 | 100 | 10 |
| **10** | 60 | 100 | 10 |

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **11** | 60 | 103 | 10 |
| **12** | 60 | 103 | 12 |
| **13** | 60 | 105 | 12 |
| **14** | 60 | 105 | 12 |
| **15** | 60 | 110 | 12 |
| **16** | 60 | 110 | 16 |
| **17** | 60 | 112 | 16 |
| **18** | 60 | 112 | 16 |
| **19** | 60 | 115 | 16 |
| **20** | 60 | 115 | 16 |
| **21** | 60 | 120 | 20 |
| **22** | 60 | 120 | 20 |
| **24** | 60 | 120 | 20 |
| **25** | 60 | 120 | 20 |
| **8** | 80 | 120 | 8 |
| **9** | 80 | 120 | 10 |
| **10** | 80 | 120 | 10 |
| **11** | 80 | 123 | 10 |
| **12** | 80 | 123 | 12 |
| **13** | 80 | 125 | 12 |
| **14** | 80 | 125 | 16 |
| **15** | 80 | 130 | 16 |
| **16** | 80 | 130 | 16 |
| **17** | 80 | 130 | 16 |
| **18** | 80 | 132 | 16 |
| **19** | 80 | 135 | 16 |
| **20** | 80 | 135 | 16 |
| **21** | 80 | 140 | 20 |
| **22** | 80 | 140 | 20 |
| **23** | 80 | 140 | 20 |
| **24** | 80 | 140 | 20 |
| **25** | 80 | 140 | 20 |
| **26** | 80 | 140 | 25 |
| **27** | 80 | 145 | 25 |
| **28** | 80 | 145 | 25 |
| **29** | 80 | 145 | 25 |
| **30** | 80 | 145 | 25 |
| **10** | 100 | 150 | 10 |
| **11** | 100 | 150 | 10 |
| **12** | 100 | 150 | 12 |
| **13** | 100 | 150 | 12 |
| **14** | 100 | 150 | 16 |
| **15** | 100 | 150 | 16 |
| **16** | 100 | 150 | 16 |
| **17** | 100 | 150 | 16 |
| **18** | 100 | 150 | 16 |
| **19** | 100 | 150 | 16 |

# SLEML ロングスロッチングエンドミル

| 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|
| **20** | 100 | 155 | 16 |
| **21** | 100 | 175 | 20 |
| **22** | 100 | 175 | 20 |
| **23** | 100 | 180 | 20 |
| **24** | 100 | 180 | 20 |
| **25** | 100 | 180 | 20 |
| **26** | 100 | 180 | 25 |
| **27** | 100 | 180 | 25 |
| **28** | 100 | 180 | 25 |
| **29** | 100 | 180 | 25 |
| **30** | 100 | 180 | 25 |
| **31** | 100 | 180 | 25 |
| **32** | 100 | 180 | 32 |
| **35** | 100 | 180 | 32 |
| **36** | 100 | 200 | 32 |
| **38** | 100 | 200 | 32 |

| 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|
| **40** | 100 | 200 | 32 |
| **20** | 150 | 225 | 20 |
| **22** | 150 | 225 | 20 |
| **23** | 150 | 230 | 20 |
| **24** | 150 | 230 | 20 |
| **25** | 150 | 230 | 25 |
| **26** | 150 | 230 | 25 |
| **27** | 150 | 230 | 25 |
| **28** | 150 | 230 | 25 |
| **30** | 150 | 230 | 25 |
| **32** | 150 | 230 | 32 |
| **34** | 150 | 230 | 32 |
| **35** | 150 | 230 | 32 |
| **36** | 150 | 250 | 32 |
| **38** | 150 | 250 | 32 |
| **40** | 150 | 250 | 32 |

ハイス

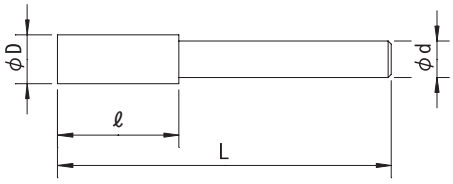
# SLEMLS

## ロングシャンクスロッチングエンドミル *Long Shank Slotting End Mill*

切削条件表 P364 | スクエア形状 | 右直刃 | 刃数 2 | HSS Co








右刃ストレート　刃数:2　SKH56
Straight Flute　2 Flutes　HSS-Co.

| 公差(Tolerance) | D： $^{0}_{-0.05}$ | d：h7 |
|---|---|---|

| 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|
| **3** | 10 | 80 | 8 |
| **4** | 10 | 80 | 8 |
| **5** | 10 | 80 | 8 |
| **6** | 18 | 80 | 8 |
| **7** | 18 | 80 | 10 |
| **8** | 18 | 100 | 10 |
| **9** | 20 | 100 | 10 |
| **10** | 20 | 100 | 10 |
| **11** | 25 | 100 | 12 |
| **12** | 25 | 100 | 12 |
| **13** | 25 | 100 | 12 |
| **14** | 25 | 140 | 12 |
| **15** | 30 | 140 | 16 |
| **16** | 35 | 140 | 16 |
| **17** | 40 | 150 | 20 |
| **18** | 40 | 150 | 20 |
| **19** | 40 | 150 | 20 |
| **20** | 40 | 150 | 20 |
| **21** | 50 | 160 | 20 |

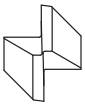
| 刃径 (ΦD) Dia. | 刃長 (ℓ) Cut Length | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|
| **22** | 50 | 160 | 20 |
| **23** | 50 | 160 | 20 |
| **24** | 50 | 160 | 20 |
| **25** | 60 | 165 | 25 |
| **26** | 60 | 165 | 25 |
| **27** | 60 | 180 | 25 |
| **28** | 60 | 180 | 25 |
| **29** | 60 | 180 | 25 |
| **30** | 60 | 180 | 25 |
| **31** | 60 | 180 | 25 |
| **32** | 60 | 180 | 32 |
| **33** | 60 | 180 | 32 |
| **34** | 60 | 180 | 32 |
| **35** | 60 | 180 | 32 |
| **36** | 60 | 180 | 32 |
| **37** | 60 | 180 | 32 |
| **38** | 60 | 180 | 32 |
| **39** | 60 | 180 | 32 |
| **40** | 60 | 180 | 32 |

ハイス

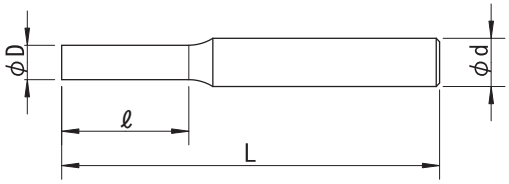
# HPSLEM

## HPMスロッチングエンドミル *HPM Slotting End Mill*

切削条件表 P365 | スクエア形状 | 右直刃 | 刃数 2 | 粉末ハイス








| 公差 (Tolerance) | D | | | | | | d |
|---|---|---|---|---|---|---|---|
| | 2～ 3.5 | $^{0}_{-0.04}$ | 4～ 6 | $^{0}_{-0.05}$ | 7～10 | $^{0}_{-0.06}$ | h7 |
| | 11～18 | $^{0}_{-0.07}$ | 19～20 | $^{0}_{-0.08}$ | | | |

右刃ストレート　刃数:2　粉末ハイス
Straight Flute　2 Flutes　Powder Metallurgy

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **2** | 10 | 60 | 6 |
| **2.5** | 10 | 60 | 6 |
| **3** | 15 | 70 | 8 |
| **3.5** | 15 | 70 | 8 |
| **4** | 15 | 70 | 8 |
| **5** | 20 | 75 | 8 |
| **6** | 25 | 80 | 8 |
| **7** | 25 | 80 | 10 |
| **8** | 25 | 80 | 10 |
| **9** | 35 | 85 | 10 |

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ) *Cut Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|
| **10** | 35 | 85 | 10 |
| **11** | 40 | 90 | 12 |
| **12** | 40 | 90 | 12 |
| **13** | 40 | 90 | 12 |
| **14** | 45 | 120 | 16 |
| **15** | 45 | 120 | 16 |
| **16** | 45 | 120 | 16 |
| **17** | 45 | 120 | 16 |
| **18** | 45 | 120 | 16 |
| **19** | 55 | 135 | 20 |
| **20** | 55 | 135 | 20 |

ハイス

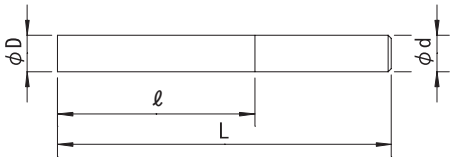
# EXLE4

## 超ロング4枚刃エンドミル　*Long Flute End Mill*

切削条件表 P365　スクエア形状　右ネジレ 45°　刃数 4　HSS Co








右刃右ネジレ45°　刃数:4　SKH56
Helix Angle-Right45°　4 Flutes　HSS-Co.

| 公差(Tolerance) | D： $^{+0.05}_{0}$ | d：h7 |
|---|---|---|

| 刃径（ΦD） *Dia.* | 刃長（ℓ） *Cut Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|
| 20 | 100 | 180 | 20 |
| | 120 | 200 | 20 |
| 22 | 120 | 200 | 20 |
| | 150 | 240 | 20 |
| 24 | 120 | 200 | 20 |
| | 150 | 240 | 20 |
| 25 | 120 | 200 | 25 |
| | 150 | 240 | 25 |
| 26 | 120 | 200 | 25 |
| | 150 | 240 | 25 |
| 28 | 120 | 200 | 25 |
| | 150 | 240 | 25 |
| 30 | 120 | 200 | 25 |
| | 150 | 240 | 25 |
| 32 | 120 | 220 | 32 |
| | 150 | 250 | 32 |

| 刃径（ΦD） *Dia.* | 刃長（ℓ） *Cut Length* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|
| 35 | 120 | 220 | 32 |
| | 150 | 250 | 32 |
| 36 | 150 | 250 | 32 |
| | 200 | 300 | 32 |
| 38 | 150 | 250 | 32 |
| | 200 | 300 | 32 |
| 40 | 150 | 250 | 32 |
| | 150 | 250 | 42 |
| | 200 | 300 | 32 |
| | 200 | 300 | 42 |
| | 250 | 350 | 42 |
| 42 | 150 | 250 | 42 |
| | 200 | 300 | 42 |
| 45 | 200 | 300 | 42 |
| | 250 | 350 | 42 |
| 50 | 200 | 300 | 42 |
| | 250 | 350 | 42 |

ハイス

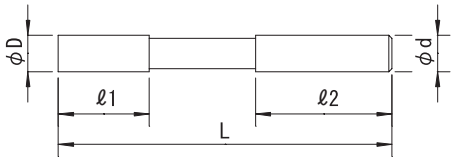
# EXLSE4

## 超ロングシャンク4枚刃エンドミル *Long Shank End Mill*

切削条件表 P365 | スクエア形状 | 右ネジレ 35° | 刃数 4 | HSS Co








右刃右ネジレ35° 刃数:4 SKH56
Helix Angle-Right35° 4 Flutes HSS-Co.

| 公差(Tolerance) | D： $^{0}_{-0.05}$ | d：h7 |
|---|---|---|

| 刃径 (ΦD) *Dia.* | 刃長 (ℓ1) *Cut Length* | シャンク長 (ℓ2) *Shank Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|
| **20** | 30 | 100 | 180 | 20 |
| | 60 | 80 | 180 | 20 |
| **22** | 40 | 110 | 200 | 20 |
| | 80 | 110 | 240 | 20 |
| **24** | 40 | 110 | 200 | 20 |
| | 80 | 110 | 240 | 20 |
| **25** | 40 | 110 | 200 | 25 |
| | 80 | 110 | 240 | 25 |
| **26** | 40 | 130 | 200 | 25 |
| | 80 | 130 | 240 | 25 |
| **28** | 40 | 130 | 200 | 25 |
| | 80 | 130 | 240 | 25 |
| **30** | 40 | 150 | 200 | 25 |
| | 80 | 150 | 240 | 25 |

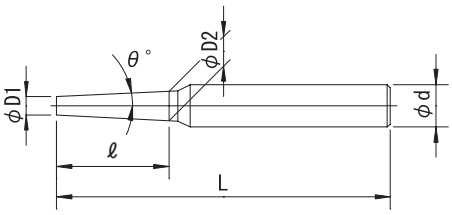
| 刃径 (ΦD) *Dia.* | 刃長 (ℓ1) *Cut Length* | シャンク長 (ℓ2) *Shank Length* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|
| **32** | 50 | 140 | 220 | 32 |
| | 100 | 120 | 250 | 32 |
| **35** | 50 | 160 | 220 | 32 |
| | 100 | 140 | 250 | 32 |
| **36** | 50 | 170 | 250 | 32 |
| | 100 | 170 | 300 | 32 |
| **38** | 50 | 170 | 250 | 32 |
| | 100 | 170 | 300 | 32 |
| **40** | 50 | 170 | 250 | 32 |
| | 50 | 170 | 250 | 42 |
| | 100 | 170 | 300 | 32 |
| | 100 | 170 | 300 | 42 |
| **42** | 50 | 170 | 250 | 32 |
| | 100 | 170 | 300 | 32 |
| **45** | 50 | 170 | 250 | 42 |
| **50** | 60 | 190 | 300 | 42 |

# TE-2

## テーパーエンドミル 2枚刃 *Taper End Mill Flute:2*

切削条件表 P366 | テーパー形状 | 右ネジレ 30° | 刃数 2 | 粉末ハイス * | HSS Co






右刃右ネジレ30° 刃数:2 粉末ハイス *SKH56
Helix Angle-Right30° 2 Flutes Powder Metallurgy *HSS-Co.

| 小径 (ΦD1) *Minor Dia.* | 片角 (θ) *Taper Angle* | 刃長 (ℓ) *Cut Length* | 大径 (ΦD2) *Diameter at Large End* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|---|
| 1 | 30' | 4 | 1.07 | 47 | 6 |
| | 1° | 4 | 1.14 | 47 | 6 |
| | 1°30' | 4 | 1.21 | 47 | 6 |
| | 2° | 4 | 1.28 | 47 | 6 |
| | 2°30' | 4 | 1.35 | 47 | 6 |
| | 3° | 4 | 1.42 | 47 | 6 |
| | 4° | 4 | 1.56 | 47 | 6 |
| | 5° | 4 | 1.7 | 47 | 6 |
| 1.5 | 30' | 5 | 1.59 | 47 | 6 |
| | 1° | 5 | 1.67 | 47 | 6 |
| | 1°30' | 5 | 1.76 | 47 | 6 |
| | 2° | 5 | 1.85 | 47 | 6 |
| | 2°30' | 5 | 1.93 | 47 | 6 |
| | 3° | 5 | 2.02 | 47 | 6 |
| | 4° | 5 | 2.2 | 47 | 6 |
| | 5° | 5 | 2.37 | 47 | 6 |
| 2 | 30' | 6 | 2.1 | 47 | 6 |
| | 1° | 6 | 2.21 | 47 | 6 |
| | 1°30' | 6 | 2.31 | 47 | 6 |
| | 2° | 6 | 2.41 | 47 | 6 |
| | 2°30' | 6 | 2.52 | 47 | 6 |
| | 3° | 6 | 2.62 | 47 | 6 |
| | 4° | 6 | 2.84 | 52 | 6 |
| | 5° | 6 | 3.05 | 52 | 6 |
| | 6° | 6 | 3.26 | 52 | 6 |
| | 7° | 6 | 3.47 | 52 | 6 |
| | 8° | 6 | 3.68 | 52 | 6 |
| | 10° | 6 | 4.21 | 52 | 6 |
| 2.5 | 30' | 8 | 2.64 | 47 | 6 |
| | 1° | 8 | 2.78 | 47 | 6 |
| | 1°30' | 8 | 2.91 | 47 | 6 |
| | 2° | 8 | 3.05 | 47 | 6 |
| | 2°30' | 8 | 3.2 | 47 | 6 |
| | 3° | 8 | 3.33 | 47 | 6 |
| | 4° | 8 | 3.62 | 52 | 6 |
| | 5° | 8 | 3.9 | 52 | 6 |
| | 6° | 8 | 4.18 | 52 | 6 |
| | 7° | 8 | 4.46 | 52 | 6 |
| | 8° | 8 | 4.74 | 52 | 6 |
| | 10° | 8 | 5.32 | 52 | 6 |
| 3 | 30' | 10 | 3.17 | 47 | 6 |
| | 1° | 10 | 3.35 | 47 | 6 |
| | 1°30' | 10 | 3.52 | 47 | 6 |
| | 2° | 10 | 3.69 | 47 | 6 |
| | 2°30' | 10 | 3.87 | 47 | 6 |
| | 3° | 10 | 4.05 | 47 | 6 |

| 公差(Tolerance) | D1 : $^{-0.01}_{-0.05}$ | θ : ±5' | d : h7 |
|---|---|---|---|

| 小径 (ΦD1) *Minor Dia.* | 片角 (θ) *Taper Angle* | 刃長 (ℓ) *Cut Length* | 大径 (ΦD2) *Diameter at Large End* | 全長 (L) *Overall Length* | シャンク径 (Φd) *Shank Dia.* |
|---|---|---|---|---|---|
| 3 | 4° | 10 | 4.4 | 52 | 6 |
| | 5° | 10 | 4.75 | 52 | 6 |
| | 6° | 10 | 5.1 | 52 | 6 |
| | 7° | 10 | 5.45 | 52 | 6 |
| | 8° | 10 | 5.81 | 52 | 6 |
| | 10° | 10 | 6.53 | 52 | 6 |
| 4 | 30' | 15 | 4.26 | 52 | 6 |
| | 1° | 15 | 4.52 | 52 | 6 |
| | 1°30' | 15 | 4.79 | 52 | 6 |
| | 2° | 15 | 5.04 | 52 | 6 |
| | 2°30' | 15 | 5.31 | 52 | 6 |
| | 3° | 15 | 5.57 | 52 | 6 |
| | 4° | 15 | 6.1 | 57 | 6 |
| | 5° | 15 | 6.62 | 62 | 6 |
| | 6° | 15 | 8.53 | 62 | 6 |
| | 7° | 15 | 7.68 | 62 | 6 |
| | 8° | 15 | 8.21 | 82 | 8 |
| | 10° | 15 | 9.3 | 82 | 8 |
| 5 | 30' | 20 | 5.34 | 57 | 6 |
| | 1° | 20 | 5.7 | 57 | 6 |
| | 1°30' | 20 | 6.04 | 57 | 6 |
| | 2° | 20 | 6.39 | 57 | 6 |
| | 2°30' | 20 | 6.74 | 57 | 6 |
| | 3° | 20 | 7.1 | 57 | 6 |
| | 4° | 20 | 7.8 | 72 | 6 |
| | 5° | 20 | 8.5 | 82 | 8 |
| | 6° | 20 | 9.2 | 82 | 8 |
| | 7° | 20 | 9.91 | 82 | 8 |
| | 8° | 20 | 10.62 | 92 | 10 |
| | 10° | 20 | 12.05 | 92 | 12 |
| 6 | 30' | 20 | 6.35 | 57 | 6 |
| | 1° | 20 | 6.7 | 57 | 6 |
| | 1°30' | 20 | 7.05 | 57 | 6 |
| | 2° | 20 | 7.4 | 57 | 6 |
| | 2°30' | 20 | 7.75 | 57 | 6 |
| | 3° | 20 | 8.1 | 62 | 8 |
| | 4° | 20 | 8.8 | 72 | 8 |
| | 5° | 20 | 9.5 | 82 | 8 |
| | 6° | 20 | 10.2 | 82 | 10 |
| | 7° | 20 | 10.91 | 82 | 10 |
| | 8° | 20 | 11.62 | 92 | 10 |
| | 10° | 20 | 13.05 | 92 | 12 |
| 8 | 30' | 25 | 8.44 | 67 | 8 |
| | 1° | 25 | 8.87 | 67 | 8 |
| | 1°30' | 25 | 9.31 | 67 | 8 |
| | 2° | 25 | 9.74 | 67 | 8 |

# TE-2 テーパーエンドミル 2枚刃

| 小径 (ΦD1) Minor Dia. | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 8 | 2°30' | 25 | 10.18 | 72 | 10 |
| | 3° | 25 | 10.62 | 72 | 10 |
| | 4° | 25 | 11.5 | 82 | 10 |
| | 5° | 25 | 12.37 | 92 | 12* |
| | 6° | 25 | 13.25 | 102 | 12* |
| | 7° | 25 | 14.14 | 102 | 12* |
| | 8° | 25 | 15.02 | 112 | 16* |
| | 10° | 25 | 16.82 | 112 | 16* |
| 10 | 30' | 35 | 10.61 | 87 | 10* |
| | 1° | 35 | 11.21 | 87 | 10* |
| | 1°30' | 35 | 11.83 | 87 | 10* |
| | 2° | 35 | 12.44 | 92 | 12* |
| | 2°30' | 35 | 13.06 | 92 | 12* |
| | 3° | 35 | 13.67 | 92 | 12* |
| | 4° | 35 | 14.89 | 102 | 12* |
| | 5° | 35 | 16.12 | 117 | 16* |
| | 6° | 35 | 17.35 | 117 | 16* |
| | 7° | 35 | 18.6 | 117 | 16* |
| | 8° | 35 | 19.83 | 117 | 20* |
| | 10° | 35 | 22.34 | 117 | 20* |

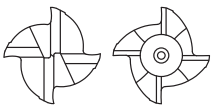
| 小径 (ΦD1) Minor Dia. | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 12 | 30' | 55 | 12.96 | 112 | 12* |
| | 1° | 55 | 13.92 | 112 | 12* |
| | 1°30' | 55 | 14.88 | 112 | 12* |
| | 2° | 55 | 15.84 | 112 | 12* |
| | 2°30' | 55 | 16.8 | 112 | 16* |
| | 3° | 55 | 17.76 | 112 | 16* |
| | 4° | 55 | 19.69 | 132 | 16* |
| | 5° | 55 | 21.62 | 157 | 20* |
| | 6° | 55 | 23.56 | 157 | 20* |
| | 7° | 55 | 25.51 | 157 | 25* |
| | 8° | 55 | 27.45 | 157 | 25* |
| | 10° | 55 | 31.39 | 157 | 25* |
| 16 | 30' | 65 | 17.13 | 130 | 16* |
| | 1° | 65 | 18.27 | 130 | 16* |
| | 1°30' | 65 | 19.4 | 130 | 16* |
| | 2° | 65 | 20.54 | 130 | 20* |
| | 3° | 65 | 22.81 | 130 | 20* |
| | 5° | 65 | 27.37 | 165 | 25* |

ハイス

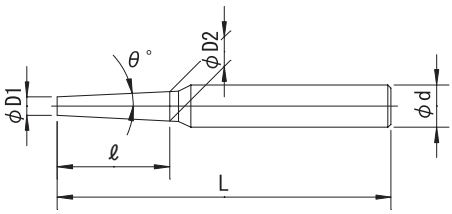
# TE-4

## テーパーエンドミル 4枚刃 *Taper End Mill Flute:4*

切削条件表 P367 | テーパー形状 | 右ネジレ 30° | 刃数 4 | 粉末ハイス | *HSS Co






右刃右ネジレ30° 刃数:4 粉末ハイス *SKH56
Helix Angle-Right30° 4 Flutes Powder Metallurgy *HSS-Co.

| 公差(Tolerance) | D1 : $^{-0.01}_{-0.05}$ | θ : ±5' | d : h7 |
|---|---|---|---|

| 小径 (ΦD1) Minor Dia. | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 3 | 30' | 10 | 3.17 | 47 | 6 |
| | 1° | 10 | 3.35 | 47 | 6 |
| | 1°30' | 10 | 3.52 | 47 | 6 |
| | 2° | 10 | 3.69 | 47 | 6 |
| | 2°30' | 10 | 3.87 | 47 | 6 |
| | 3° | 10 | 4.05 | 47 | 6 |
| | 4° | 10 | 4.4 | 52 | 6 |
| | 5° | 10 | 4.75 | 52 | 6 |
| | 7° | 10 | 5.45 | 52 | 6 |
| | 10° | 10 | 6.53 | 52 | 6 |

| 小径 (ΦD1) Minor Dia. | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 4 | 30' | 15 | 4.26 | 52 | 6 |
| | 1° | 15 | 4.52 | 52 | 6 |
| | 1°30' | 15 | 4.79 | 52 | 6 |
| | 2° | 15 | 5.04 | 52 | 6 |
| | 2°30' | 15 | 5.31 | 52 | 6 |
| | 3° | 15 | 5.57 | 52 | 6 |
| | 4° | 15 | 6.1 | 52 | 6 |
| | 5° | 15 | 6.62 | 62 | 6 |
| | 7° | 15 | 7.68 | 62 | 6 |
| | 10° | 15 | 9.3 | 82 | 8 |

# TE-4 テーパーエンドミル 4枚刃

| 小径 (ΦD1) Minor Dia. | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 5 | 30' | 20 | 5.34 | 57 | 6 |
| | 1° | 20 | 5.7 | 57 | 6 |
| | 1°30' | 20 | 6.04 | 57 | 6 |
| | 2° | 20 | 6.39 | 57 | 6 |
| | 2°30' | 20 | 6.74 | 57 | 6 |
| | 3° | 20 | 7.1 | 57 | 6 |
| | 4° | 20 | 7.8 | 72 | 6 |
| | 5° | 20 | 8.5 | 82 | 8 |
| | 7° | 20 | 9.91 | 82 | 8 |
| | 10° | 20 | 12.05 | 92 | 12 |
| 6 | 30' | 20 | 6.35 | 57 | 6 |
| | 1° | 20 | 6.7 | 57 | 6 |
| | 1°30' | 20 | 7.05 | 57 | 6 |
| | 2° | 20 | 7.4 | 57 | 6 |
| | 2°30' | 20 | 7.75 | 57 | 6 |
| | 3° | 20 | 8.1 | 62 | 8 |
| | 4° | 20 | 8.8 | 72 | 8 |
| | 5° | 20 | 9.5 | 82 | 8 |
| | 6° | 20 | 10.2 | 82 | 10 |
| | 7° | 20 | 10.91 | 82 | 10 |
| | 8° | 20 | 11.62 | 92 | 10 |
| | 10° | 20 | 13.05 | 92 | 12 |
| 8 | 30' | 25 | 8.44 | 67 | 8 |
| | 1° | 25 | 8.87 | 67 | 8 |
| | 1°30' | 25 | 9.31 | 67 | 8 |
| | 2° | 25 | 9.74 | 67 | 8 |
| | 2°30' | 25 | 10.18 | 72 | 10 |
| | 3° | 25 | 10.62 | 72 | 10 |
| | 4° | 25 | 11.5 | 82 | 10 |
| | 5° | 25 | 12.37 | 92 | 12* |
| | 6° | 25 | 13.25 | 102 | 12* |
| | 7° | 25 | 14.14 | 102 | 12* |
| | 8° | 25 | 15.02 | 112 | 16* |
| | 10° | 25 | 16.82 | 112 | 16* |
| 10 | 30' | 35 | 10.61 | 87 | 10* |
| | 1° | 35 | 11.22 | 87 | 10* |
| | 1°30' | 35 | 11.83 | 87 | 10* |
| | 2° | 35 | 12.44 | 92 | 12* |
| | 2°30' | 35 | 13.06 | 92 | 12* |
| | 3° | 35 | 13.67 | 92 | 12* |
| | 4° | 35 | 14.89 | 102 | 12* |
| | 5° | 35 | 16.12 | 117 | 16* |
| | 6° | 35 | 17.35 | 117 | 16* |
| | 7° | 35 | 18.6 | 117 | 16* |
| | 8° | 35 | 19.83 | 117 | 20* |
| | 10° | 35 | 22.34 | 117 | 20* |
| 12 | 30' | 55 | 12.96 | 112 | 12* |
| | 1° | 55 | 13.92 | 112 | 12* |
| | 1°30' | 55 | 14.88 | 112 | 12* |
| | 2° | 55 | 15.84 | 112 | 12* |
| | 2°30' | 55 | 16.8 | 112 | 16* |
| | 3° | 55 | 17.76 | 112 | 16* |
| | 4° | 55 | 19.69 | 132 | 16* |
| | 5° | 55 | 21.62 | 157 | 20* |
| | 6° | 55 | 23.56 | 157 | 20* |
| | 7° | 55 | 25.51 | 157 | 25* |
| | 8° | 55 | 27.45 | 157 | 25* |
| | 10° | 55 | 31.39 | 157 | 25* |

| 小径 (ΦD1) Minor Dia. | 片角 (θ) Taper Angle | 刃長 (ℓ) Cut Length | 大径 (ΦD2) Diameter at Large End | 全長 (L) Overall Length | シャンク径 (Φd) Shank Dia. |
|---|---|---|---|---|---|
| 15 | 30' | 65 | 16.13 | 130 | 16* |
| | 1° | 65 | 17.27 | 130 | 16* |
| | 1°30' | 65 | 18.4 | 130 | 16* |
| | 2° | 65 | 19.54 | 130 | 16* |
| | 2°30' | 65 | 20.68 | 130 | 20* |
| | 3° | 65 | 21.81 | 130 | 20* |
| | 4° | 65 | 24.09 | 150 | 20* |
| | 5° | 65 | 26.37 | 165 | 25* |
| | 6° | 65 | 28.66 | 165 | 25* |
| | 7° | 65 | 30.96 | 165 | 25* |
| | 8° | 65 | 33.27 | 165 | 32* |
| | 10° | 65 | 37.92 | 165 | 32* |
| 16 | 30' | 65 | 17.13 | 130 | 16* |
| | 1° | 65 | 18.27 | 130 | 16* |
| | 1°30' | 65 | 19.4 | 130 | 16* |
| | 2° | 65 | 20.54 | 130 | 20* |
| | 3° | 65 | 22.81 | 130 | 20* |
| | 5° | 65 | 27.37 | 165 | 25* |
| | 1° | 100 | 19.49 | 170 | 16* |
| | 2° | 100 | 22.98 | 170 | 20* |
| | 3° | 100 | 26.48 | 170 | 25* |
| | 5° | 100 | 33.5 | 190 | 32* |
| 20 | 30' | 65 | 21.13 | 135 | 20* |
| | 1° | 65 | 22.27 | 135 | 20* |
| | 1°30' | 65 | 23.4 | 135 | 20* |
| | 2° | 65 | 24.54 | 135 | 20* |
| | 3° | 65 | 26.81 | 135 | 25* |
| | 5° | 65 | 31.37 | 165 | 25* |
| | 30' | 105 | 21.83 | 185 | 20* |
| | 1° | 105 | 23.67 | 185 | 20* |
| | 1°30' | 105 | 25.5 | 185 | 25* |
| | 2° | 105 | 27.33 | 185 | 25* |
| | 3° | 105 | 31 | 185 | 25* |
| | 5° | 105 | 38.37 | 200 | 32* |
| 25 | 30' | 130 | 27.27 | 210 | 25* |
| | 1° | 130 | 29.54 | 210 | 25* |
| | 1°30' | 130 | 31.81 | 210 | 25* |
| | 2° | 130 | 34.08 | 210 | 32* |
| | 3° | 130 | 38.63 | 210 | 32* |
| | 5° | 130 | 47.75 | 230 | 42* |

ハイス

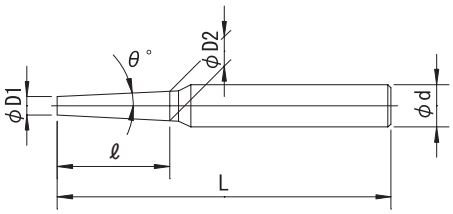
# TEL

## ロングテーパーエンドミル *Long Taper End Mill*

切削条件表 P366 | テーパー形状 | 右ネジレ 30° | 刃数 2 | HSS Co








右刃右ネジレ30° 刃数:2 SKH56
Helix Angle-Right30° 2 Flutes HSS-Co.

| 公差(Tolerance) | D1：$^{0}_{-0.05}$ | θ ：±5' | d：$^{0}_{-0.02}$ |
|---|---|---|---|

| 小径（ΦD1） *Minor Dia.* | 片角（θ） *Taper Angle* | 刃長（ℓ） *Cut Length* | 大径（ΦD2） *Diameter at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|
| 3 | 30' | 20 | 3.35 | 55 | 6 |
| | 1° | 20 | 3.7 | 55 | 6 |
| | 1°30' | 20 | 4.05 | 55 | 6 |
| | 2° | 30 | 5.1 | 65 | 6 |
| | 2°30' | 30 | 5.62 | 65 | 6 |
| | 3° | 30 | 6.14 | 65 | 6 |
| | 4° | 30 | 7.2 | 65 | 8 |
| | 5° | 40 | 10 | 80 | 8 |
| | 6° | 40 | 11.41 | 80 | 10 |
| | 7° | 40 | 12.82 | 80 | 12 |
| | 8° | 50 | 17.05 | 100 | 16 |
| | 10° | 50 | 20.63 | 100 | 20 |
| 4 | 30' | 30 | 4.52 | 65 | 6 |
| | 1° | 30 | 5.05 | 65 | 6 |
| | 1°30' | 30 | 5.57 | 65 | 6 |
| | 2° | 40 | 6.79 | 80 | 6 |
| | 2°30' | 40 | 7.49 | 80 | 8 |
| | 3° | 40 | 8.19 | 80 | 8 |
| | 4° | 40 | 9.59 | 80 | 10 |
| | 5° | 50 | 12.75 | 100 | 12 |
| | 6° | 50 | 14.51 | 100 | 12 |
| | 7° | 50 | 16.28 | 100 | 16 |
| | 8° | 60 | 20.87 | 110 | 20 |
| | 10° | 60 | 25.16 | 110 | 25 |

| 小径（ΦD1） *Minor Dia.* | 片角（θ） *Taper Angle* | 刃長（ℓ） *Cut Length* | 大径（ΦD2） *Diameter at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|
| 5 | 30' | 40 | 5.7 | 80 | 6 |
| | 1° | 40 | 6.4 | 80 | 6 |
| | 1°30' | 40 | 7.09 | 80 | 8 |
| | 2° | 50 | 8.49 | 100 | 8 |
| | 2°30' | 50 | 9.37 | 100 | 8 |
| | 3° | 50 | 10.24 | 100 | 10 |
| | 4° | 50 | 11.99 | 100 | 12 |
| | 5° | 60 | 15.5 | 110 | 12 |
| | 6° | 60 | 17.61 | 110 | 16 |
| | 7° | 60 | 19.73 | 110 | 20 |
| | 8° | 80 | 27.49 | 130 | 25 |
| | 10° | 80 | 33.21 | 130 | 32 |

ハイス

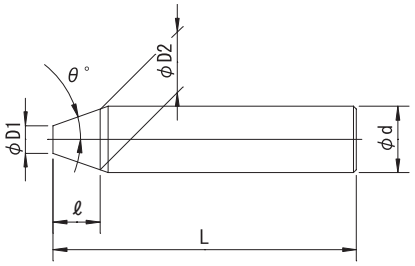
# RM2

## ランナーミル（台形ランナー用） *Taper End Mill For Runner*

切削条件表 P368 | テーパー形状 | 右ネジレ 30° | 刃数 2 | 粉末ハイス








右刃右ネジレ30°　刃数:2　粉末ハイス
Helix Angle-Right30°　2 Flutes　Powder Metallurgy

| 小径（ΦD1） *Minor Dia.* | 片角（θ） *Taper Angle* | 刃長（ℓ） *Cut Length* | 大径（ΦD2） *Diameter at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|
| 2 | 7° | 5 | 3.22 | 45 | 6 |
| | 10° | 5 | 3.76 | 45 | 6 |
| | 12° | 5 | 4.12 | 45 | 6 |
| | 15° | 5 | 4.68 | 55 | 6 |
| 2.5 | 7° | 6 | 3.97 | 45 | 6 |
| | 10° | 6 | 4.61 | 55 | 6 |
| | 12° | 6 | 5.05 | 55 | 6 |
| | 15° | 6 | 5.71 | 55 | 6 |
| 3 | 7° | 7 | 4.71 | 55 | 6 |
| | 10° | 7 | 5.46 | 55 | 6 |
| | 12° | 7 | 5.97 | 55 | 6 |
| | 15° | 7 | 6.75 | 55 | 6 |
| 3.5 | 7° | 7 | 5.21 | 55 | 6 |
| | 10° | 7 | 5.96 | 55 | 6 |
| | 12° | 7 | 6.47 | 60 | 8 |
| | 15° | 7 | 7.25 | 60 | 8 |
| 4 | 7° | 8 | 5.96 | 55 | 6 |
| | 10° | 8 | 6.82 | 60 | 8 |
| | 12° | 8 | 7.4 | 60 | 8 |
| | 15° | 8 | 8.28 | 60 | 8 |
| 4.5 | 7° | 9 | 6.71 | 60 | 8 |
| | 10° | 9 | 7.67 | 60 | 8 |
| | 12° | 9 | 8.32 | 60 | 8 |
| | 15° | 9 | 9.32 | 70 | 10 |

| 公差(Tolerance) | D1：$^{-0.01}_{-0.08}$ | θ ：±5' | d：h7 |
|---|---|---|---|

| 小径（ΦD1） *Minor Dia.* | 片角（θ） *Taper Angle* | 刃長（ℓ） *Cut Length* | 大径（ΦD2） *Diameter at Large End* | 全長（L） *Overall Length* | シャンク径（Φd） *Shank Dia.* |
|---|---|---|---|---|---|
| 5 | 7° | 10 | 7.45 | 60 | 8 |
| | 10° | 10 | 8.52 | 70 | 10 |
| | 12° | 10 | 9.25 | 70 | 10 |
| | 15° | 10 | 10.35 | 70 | 10 |
| 6 | 7° | 12 | 8.94 | 70 | 10 |
| | 10° | 12 | 10.23 | 70 | 10 |
| | 12° | 12 | 11.1 | 70 | 10 |
| | 15° | 12 | 12.43 | 75 | 12 |
| 8 | 7° | 16 | 11.93 | 100 | 10 |
| | 10° | 16 | 13.64 | 110 | 12 |
| | 12° | 16 | 14.8 | 110 | 12 |
| | 15° | 16 | 16.57 | 110 | 16 |
| 10 | 7° | 20 | 14.91 | 110 | 12 |
| | 10° | 20 | 17.05 | 120 | 16 |
| | 12° | 20 | 18.5 | 120 | 16 |
| | 15° | 20 | 20.71 | 120 | 20 |
| 12 | 7° | 25 | 18.14 | 120 | 16 |
| | 10° | 25 | 20.81 | 125 | 20 |
| | 12° | 25 | 22.63 | 125 | 20 |
| | 15° | 25 | 25.39 | 125 | 25 |

End Mill Cutting Condition Talbe

# エンドミル
# 切削条件参考表

安全上の注意：切削条件は、被削材の硬さ、
切り込み量、ツーリング、機械の状態により
条件を増減してください。
切削油を使用してください。
Adjust cutting conditions according to
rigidity of work material, tooling, machine
and depth of cut.
Use cutting fluid.

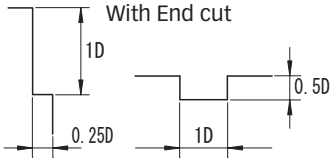
## ●CSFRPE-P ●CSFRPE 超硬ソリッドファイバー用カッター底刃付タイプ
## ●CSFRP-P ●CSFRP 超硬ソリッドファイバー用カッター

| 呼び型番 Tool No. | カーボンファイバー CFRP 切削速度 Cutting Speed 38~60m/min | | グラスファイバー GFRP 切削速度 Cutting Speed 25~40m/min | |
|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 3 | 4,032 ~ 6,366 | 121 ~ 306 | 2,653 ~ 4,244 | 80 ~ 204 |
| 4 | 3,024 ~ 4,775 | 91 ~ 229 | 1,989 ~ 3,183 | 60 ~ 153 |
| 5 | 2,419 ~ 3,820 | 97 ~ 244 | 1,592 ~ 2,546 | 62 ~ 163 |
| 6 | 2,016 ~ 3,183 | 81 ~ 204 | 1,326 ~ 2,122 | 53 ~ 136 |
| 7 | 1,728 ~ 2,728 | 69 ~ 175 | 1,137 ~ 1,819 | 46 ~ 116 |
| 8 | 1,512 ~ 2,387 | 60 ~ 153 | 995 ~ 1,592 | 40 ~ 102 |
| 10 | 1,210 ~ 1,910 | 60 ~ 153 | 796 ~ 1,273 | 40 ~ 102 |
| 12 | 1,008 ~ 1,592 | 50 ~ 127 | 663 ~ 1,061 | 33 ~ 85 |
| 16 | 756 ~ 1,194 | 53 ~ 134 | 497 ~ 796 | 35 ~ 89 |
| 18 | 672 ~ 1,061 | 47 ~ 119 | 442 ~ 707 | 31 ~ 79 |
| 20 | 605 ~ 955 | 48 ~ 122 | 398 ~ 637 | 32 ~ 81 |

底刃なし
Without End Cut




底刃有り
With End cut




## ●GES2 超硬グラファイト ソリッドエンドミル（2枚刃）
## ●GEL2 超硬グラファイト ソリッドエンドミル（ロング 2枚刃）

| 刃径 Dia. | グラファイト Graphite 切削速度 Cutting Speed 150~200m/min | | 非鉄金属 Al. Cu 切削速度 Cutting Speed 80~120m/min | | 炭素鋼 FC. FCD. S50C 切削速度 Cutting Speed 40~80m/min | | 切込み量 Depth of Cut 深 X 幅 Depth x Width |
|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 0.5 | 25,000 ~ 35,000 | 40 ~ 80 | 25,000 ~ 35,000 | 15 ~ 50 | 25,000 ~ 35,000 | 8 ~ 20 | 0.25 X 0.025 |
| 1 | 25,000 ~ 35,000 | 50 ~ 100 | 20,000 ~ 30,000 | 20 ~ 60 | 12,733 ~ 25,466 | 10 ~ 40 | 0.5 X 0.05 |
| 1.5 | 25,000 ~ 32,000 | 100 ~ 180 | 16,977 ~ 25,466 | 40 ~ 100 | 8,489 ~ 16,977 | 20 ~ 60 | 0.75 X 0.075 |
| 2 | 23,874 ~ 31,832 | 122 ~ 216 | 12,733 ~ 19,099 | 52 ~ 117 | 6,366 ~ 12,733 | 22 ~ 65 | 1 X 0.1 |
| 2.5 | 19,099 ~ 25,466 | 244 ~ 433 | 10,186 ~ 15,279 | 104 ~ 234 | 5,093 ~ 10,186 | 43 ~ 130 | 1.25 X 0.125 |
| 3 | 15,916 ~ 21,221 | 325 ~ 577 | 8,489 ~ 12,733 | 139 ~ 312 | 4,244 ~ 8,489 | 58 ~ 173 | 1.5 X 0.15 |
| 4 | 11,937 ~ 15,916 | 426 ~ 758 | 6,366 ~ 9,550 | 303 ~ 409 | 3,183 ~ 6,366 | 76 ~ 227 | 2 X 0.2 |
| 5 | 9,550 ~ 12,733 | 487 ~ 866 | 5,093 ~ 7,640 | 346 ~ 468 | 2,547 ~ 5,093 | 87 ~ 260 | 2.5 X 0.25 |
| 6 | 7,958 ~ 10,611 | 528 ~ 938 | 4,244 ~ 6,366 | 375 ~ 507 | 2,122 ~ 4,244 | 94 ~ 281 | 3 X 0.3 |
| 7 | 6,821 ~ 9,095 | 557 ~ 990 | 3,638 ~ 5,457 | 396 ~ 534 | 1,819 ~ 3,638 | 99 ~ 297 | 3.5 X 0.35 |
| 8 | 5,968 ~ 7,958 | 578 ~ 1,028 | 3,183 ~ 4,775 | 411 ~ 555 | 1,592 ~ 3,183 | 103 ~ 308 | 4 X 0.4 |
| 9 | 5,305 ~ 7,074 | 595 ~ 1,058 | 2,830 ~ 4,244 | 423 ~ 571 | 1,415 ~ 2,830 | 106 ~ 317 | 4.5 X 0.45 |
| 10 | 4,775 ~ 6,366 | 609 ~ 1,082 | 2,547 ~ 3,820 | 433 ~ 584 | 1,273 ~ 2,547 | 108 ~ 325 | 5 X 0.5 |
| 12 | 3,979 ~ 5,305 | 629 ~ 1,118 | 2,122 ~ 3,183 | 447 ~ 604 | 1,061 ~ 2,122 | 112 ~ 336 | 6 X 0.6 |
| 13 | 3,673 ~ 4,897 | 637 ~ 1,132 | 1,959 ~ 2,938 | 453 ~ 611 | 979 ~ 1,959 | 113 ~ 340 | 6.5 X 0.65 |
| 14 | 3,411 ~ 4,547 | 644 ~ 1,144 | 1,819 ~ 2,728 | 458 ~ 618 | 909 ~ 1,819 | 114 ~ 343 | 7 X 0.7 |
| 15 | 3,183 ~ 4,244 | 649 ~ 1,154 | 1,698 ~ 2,547 | 462 ~ 623 | 849 ~ 1,698 | 115 ~ 346 | 7.5 X 0.75 |
| 16 | 2,984 ~ 3,979 | 654 ~ 1,163 | 1,592 ~ 2,387 | 465 ~ 628 | 796 ~ 1,592 | 116 ~ 349 | 8 X 0.8 |
| 18 | 2,653 ~ 3,537 | 663 ~ 1,178 | 1,415 ~ 2,122 | 471 ~ 636 | 707 ~ 1,415 | 118 ~ 354 | 9 X 0.9 |
| 20 | 2,387 ~ 3,183 | 670 ~ 1,191 | 1,273 ~ 1,910 | 476 ~ 643 | 637 ~ 1,273 | 119 ~ 357 | 10 X 1 |
| 25 | 1,910 ~ 2,547 | 682 ~ 1,212 | 1,019 ~ 1,528 | 485 ~ 655 | 509 ~ 1,019 | 121 ~ 364 | 12.5 X 1.25 |

## ●GES4　超硬グラファイト ソリッドエンドミル（4枚刃）
## ●GEL4　超硬グラファイト ソリッドエンドミル（ロング 4枚刃）

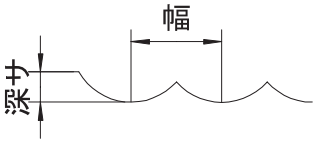
| 刃径 Dia. | グラファイト Graphite 切削速度 Cutting Speed 150~200m/min | | 非鉄金属 Al. Cu 切削速度 Cutting Speed 80~120m/min | | 炭素鋼 FC. FCD. S50C 切削速度 Cutting Speed 40~80m/min | | 切込み量 Depth of Cut 深 X 幅 Depth x Width |
|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 3 | 15,916 ～ 21,221 | 382 ～ 679 | 8,489 ～ 12,733 | 163 ～ 367 | 4,244 ～ 8,489 | 68 ～ 204 | 1.5 X 0.15 |
| 4 | 11,937 ～ 15,916 | 501 ～ 891 | 6,366 ～ 9,550 | 357 ～ 481 | 3,183 ～ 6,366 | 89 ～ 267 | 2 X 0.2 |
| 5 | 9,550 ～ 12,733 | 573 ～ 1,019 | 5,093 ～ 7,640 | 407 ～ 550 | 2,547 ～ 5,093 | 102 ～ 306 | 2.5 X 0.25 |
| 6 | 7,958 ～ 10,611 | 621 ～ 1,104 | 4,244 ～ 6,366 | 441 ～ 596 | 2,122 ～ 4,244 | 110 ～ 331 | 3 X 0.3 |
| 7 | 6,821 ～ 9,095 | 655 ～ 1,164 | 3,638 ～ 5,457 | 466 ～ 629 | 1,819 ～ 3,638 | 116 ～ 349 | 3.5 X 0.35 |
| 8 | 5,968 ～ 7,958 | 680 ～ 1,210 | 3,183 ～ 4,775 | 484 ～ 653 | 1,592 ～ 3,183 | 121 ～ 363 | 4 X 0.4 |
| 9 | 5,305 ～ 7,074 | 700 ～ 1,245 | 2,830 ～ 4,244 | 498 ～ 672 | 1,415 ～ 2,830 | 124 ～ 373 | 4.5 X 0.45 |
| 10 | 4,775 ～ 6,366 | 716 ～ 1,273 | 2,547 ～ 3,820 | 509 ～ 688 | 1,273 ～ 2,547 | 127 ～ 382 | 5 X 0.5 |
| 12 | 3,979 ～ 5,305 | 740 ～ 1,316 | 2,122 ～ 3,183 | 526 ～ 710 | 1,061 ～ 2,122 | 132 ～ 395 | 6 X 0.6 |
| 13 | 3,673 ～ 4,897 | 749 ～ 1,332 | 1,959 ～ 2,938 | 533 ～ 719 | 979 ～ 1,959 | 133 ～ 400 | 6.5 X 0.65 |
| 14 | 3,411 ～ 4,547 | 757 ～ 1,346 | 1,819 ～ 2,728 | 538 ～ 727 | 909 ～ 1,819 | 135 ～ 404 | 7 X 0.7 |
| 15 | 3,183 ～ 4,244 | 764 ～ 1,358 | 1,698 ～ 2,547 | 543 ～ 733 | 849 ～ 1,698 | 136 ～ 407 | 7.5 X 0.75 |
| 16 | 2,984 ～ 3,979 | 770 ～ 1,369 | 1,592 ～ 2,387 | 548 ～ 739 | 796 ～ 1,592 | 137 ～ 411 | 8 X 0.8 |
| 18 | 2,653 ～ 3,537 | 780 ～ 1,386 | 1,415 ～ 2,122 | 555 ～ 749 | 707 ～ 1,415 | 139 ～ 416 | 9 X 0.9 |
| 20 | 2,387 ～ 3,183 | 788 ～ 1,401 | 1,273 ～ 1,910 | 560 ～ 756 | 637 ～ 1,273 | 140 ～ 420 | 10 X 1 |
| 25 | 1,910 ～ 2,547 | 802 ～ 1,426 | 1,019 ～ 1,528 | 570 ～ 770 | 509 ～ 1,019 | 143 ～ 428 | 12.5 X 1.25 |

※Φ0.5 ～Φ1.9までは切削速度を変更し回転数を抑えてあります。
The cutting and spindle speed for $\phi$0.5 ～$\phi$1.9 shown in this table are set lower.

## ●GBES2　超硬グラファイト ソリッドボールエンドミル（2枚刃）
## ●GBEL2　超硬グラファイト ソリッドボールエンドミル（ロング 2枚刃）

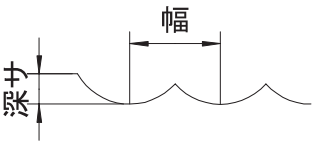
| R | グラファイト Graphite | | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 150~200m/min | | 切削速度 Cutting Speed 80~120m/min | | 切削速度 Cutting Speed 40~80m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 深 X 幅 Depth x Width |
| **0.5** | 30,000 ~ 35,000 | 2,500 ~ 4,500 | 25,466 ~ 30,000 | 1,800 ~ 2,500 | 12,733 ~ 25,466 | 789 ~ 2,368 | 0.1X0.3 |
| **1** | 23,874 ~ 31,832 | 2,292 ~ 4,074 | 12,733 ~ 19,099 | 978 ~ 2,200 | 6,366 ~ 12,733 | 407 ~ 1,222 | 0.2X0.6 |
| **1.5** | 15,916 ~ 21,221 | 1,576 ~ 2,801 | 8,489 ~ 12,733 | 672 ~ 1,513 | 4,244 ~ 8,489 | 280 ~ 840 | 0.3X0.9 |
| **2** | 11,937 ~ 15,916 | 1,218 ~ 2,165 | 6,366 ~ 9,550 | 519 ~ 1,169 | 3,183 ~ 6,366 | 216 ~ 649 | 0.4X1.2 |
| **2.5** | 9,550 ~ 12,733 | 1,003 ~ 1,783 | 5,093 ~ 7,640 | 428 ~ 963 | 2,547 ~ 5,093 | 178 ~ 535 | 0.5X1.5 |
| **3** | 7,958 ~ 10,611 | 859 ~ 1,528 | 4,244 ~ 6,366 | 367 ~ 825 | 2,122 ~ 4,244 | 153 ~ 458 | 0.6X1.8 |
| **3.5** | 6,821 ~ 9,095 | 757 ~ 1,346 | 3,638 ~ 5,457 | 323 ~ 727 | 1,819 ~ 3,638 | 135 ~ 404 | 0.7X2.1 |
| **4** | 5,968 ~ 7,958 | 680 ~ 1,210 | 3,183 ~ 4,775 | 290 ~ 653 | 1,592 ~ 3,183 | 121 ~ 363 | 0.8X2.4 |
| **4.5** | 5,305 ~ 7,074 | 621 ~ 1,104 | 2,830 ~ 4,244 | 265 ~ 596 | 1,415 ~ 2,830 | 110 ~ 331 | 0.9X2.7 |
| **5** | 4,775 ~ 6,366 | 573 ~ 1,019 | 2,547 ~ 3,820 | 244 ~ 550 | 1,273 ~ 2,547 | 102 ~ 306 | 1 X3 |
| **5.5** | 4,341 ~ 5,788 | 534 ~ 949 | 2,315 ~ 3,473 | 228 ~ 513 | 1,158 ~ 2,315 | 95 ~ 285 | 1.1X3.3 |
| **6** | 3,979 ~ 5,305 | 501 ~ 891 | 2,122 ~ 3,183 | 214 ~ 481 | 1,061 ~ 2,122 | 89 ~ 267 | 1.2X3.6 |
| **6.5** | 3,673 ~ 4,897 | 474 ~ 842 | 1,959 ~ 2,938 | 202 ~ 455 | 979 ~ 1,959 | 84 ~ 253 | 1.3X3.9 |
| **7** | 3,411 ~ 4,547 | 450 ~ 800 | 1,819 ~ 2,728 | 192 ~ 432 | 909 ~ 1,819 | 80 ~ 240 | 1.4X4.2 |
| **7.5** | 3,183 ~ 4,244 | 430 ~ 764 | 1,698 ~ 2,547 | 183 ~ 413 | 849 ~ 1,698 | 76 ~ 229 | 1.5X4.5 |
| **8** | 2,984 ~ 3,979 | 412 ~ 732 | 1,592 ~ 2,387 | 176 ~ 395 | 796 ~ 1,592 | 73 ~ 220 | 1.6X4.8 |
| **8.5** | 2,809 ~ 3,745 | 396 ~ 704 | 1,498 ~ 2,247 | 169 ~ 380 | 749 ~ 1,498 | 70 ~ 211 | 1.7X5.1 |
| **9** | 2,653 ~ 3,537 | 382 ~ 679 | 1,415 ~ 2,122 | 163 ~ 367 | 707 ~ 1,415 | 68 ~ 204 | 1.8X5.4 |
| **9.5** | 2,513 ~ 3,351 | 369 ~ 657 | 1,340 ~ 2,010 | 158 ~ 355 | 670 ~ 1,340 | 66 ~ 197 | 1.9X5.7 |
| **10** | 2,387 ~ 3,183 | 358 ~ 637 | 1,273 ~ 1,910 | 153 ~ 344 | 637 ~ 1,273 | 64 ~ 191 | 2 X6 |
| **10.5** | 2,274 ~ 3,032 | 348 ~ 618 | 1,213 ~ 1,819 | 148 ~ 334 | 606 ~ 1,213 | 62 ~ 186 | 2.1X6.3 |
| **11** | 2,170 ~ 2,894 | 339 ~ 602 | 1,158 ~ 1,736 | 144 ~ 325 | 579 ~ 1,158 | 60 ~ 181 | 2.2X6.6 |
| **11.5** | 2,076 ~ 2,768 | 330 ~ 587 | 1,107 ~ 1,661 | 141 ~ 317 | 554 ~ 1,107 | 59 ~ 176 | 2.3X6.9 |
| **12** | 1,989 ~ 2,653 | 322 ~ 573 | 1,061 ~ 1,592 | 138 ~ 309 | 531 ~ 1,061 | 57 ~ 172 | 2.4X7.2 |
| **12.5** | 1,910 ~ 2,547 | 315 ~ 560 | 1,019 ~ 1,528 | 134 ~ 303 | 509 ~ 1,019 | 56 ~ 168 | 2.5X7.5 |
| **13** | 1,836 ~ 2,449 | 309 ~ 548 | 979 ~ 1,469 | 132 ~ 296 | 490 ~ 979 | 55 ~ 165 | 2.6X7.8 |
| **13.5** | 1,768 ~ 2,358 | 302 ~ 538 | 943 ~ 1,415 | 129 ~ 290 | 472 ~ 943 | 54 ~ 161 | 2.7X8.1 |
| **14** | 1,705 ~ 2,274 | 297 ~ 528 | 909 ~ 1,364 | 127 ~ 285 | 455 ~ 909 | 53 ~ 158 | 2.8X8.4 |
| **14.5** | 1,646 ~ 2,195 | 291 ~ 518 | 878 ~ 1,317 | 124 ~ 280 | 439 ~ 878 | 52 ~ 155 | 2.9X8.7 |
| **15** | 1,592 ~ 2,122 | 286 ~ 509 | 849 ~ 1,273 | 122 ~ 275 | 424 ~ 849 | 51 ~ 153 | 3 X9 |

※R0.5は切削速度を変更し回転数を抑えてあります。
The cutting and spindle speed for R0.5 shown in this table are set lower.



## ●GBES4　超硬グラファイト ソリッドボールエンドミル（4枚刃）
## ●GBEL4　超硬グラファイト ソリッドボールエンドミル（ロング 4枚刃）

| R | グラファイト Graphite | | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 150~200m/min | | 切削速度 Cutting Speed 80~120m/min | | 切削速度 Cutting Speed 40~80m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 深 X 幅 Depth x Width |
| 1.5 | 15,916 ~ 21,221 | 1,970 ~ 3,502 | 8,489 ~ 12,733 | 840 ~ 1,891 | 4,244 ~ 8,489 | 350 ~ 1,050 | 0.3X0.9 |
| 2 | 11,937 ~ 15,916 | 1,522 ~ 2,706 | 6,366 ~ 9,550 | 649 ~ 1,461 | 3,183 ~ 6,366 | 271 ~ 812 | 0.4X1.2 |
| 2.5 | 9,550 ~ 12,733 | 1,253 ~ 2,228 | 5,093 ~ 7,640 | 535 ~ 1,203 | 2,547 ~ 5,093 | 223 ~ 668 | 0.5X1.5 |
| 3 | 7,958 ~ 10,611 | 1,074 ~ 1,910 | 4,244 ~ 6,366 | 458 ~ 1,031 | 2,122 ~ 4,244 | 191 ~ 573 | 0.6X1.8 |
| 3.5 | 6,821 ~ 9,095 | 946 ~ 1,683 | 3,638 ~ 5,457 | 404 ~ 909 | 1,819 ~ 3,638 | 168 ~ 505 | 0.7X2.1 |
| 4 | 5,968 ~ 7,958 | 851 ~ 1,512 | 3,183 ~ 4,775 | 363 ~ 816 | 1,592 ~ 3,183 | 151 ~ 454 | 0.8X2.4 |
| 4.5 | 5,305 ~ 7,074 | 776 ~ 1,379 | 2,830 ~ 4,244 | 331 ~ 745 | 1,415 ~ 2,830 | 138 ~ 414 | 0.9X2.7 |
| 5 | 4,775 ~ 6,366 | 716 ~ 1,273 | 2,547 ~ 3,820 | 306 ~ 688 | 1,273 ~ 2,547 | 127 ~ 382 | 1 X3 |
| 5.5 | 4,341 ~ 5,788 | 667 ~ 1,186 | 2,315 ~ 3,473 | 285 ~ 641 | 1,158 ~ 2,315 | 119 ~ 356 | 1.1X3.3 |
| 6 | 3,979 ~ 5,305 | 627 ~ 1,114 | 2,122 ~ 3,183 | 267 ~ 602 | 1,061 ~ 2,122 | 111 ~ 334 | 1.2X3.6 |
| 6.5 | 3,673 ~ 4,897 | 592 ~ 1,053 | 1,959 ~ 2,938 | 253 ~ 569 | 979 ~ 1,959 | 105 ~ 316 | 1.3X3.9 |
| 7 | 3,411 ~ 4,547 | 563 ~ 1,000 | 1,819 ~ 2,728 | 240 ~ 540 | 909 ~ 1,819 | 100 ~ 300 | 1.4X4.2 |
| 7.5 | 3,183 ~ 4,244 | 537 ~ 955 | 1,698 ~ 2,547 | 229 ~ 516 | 849 ~ 1,698 | 95 ~ 286 | 1.5X4.5 |
| 8 | 2,984 ~ 3,979 | 515 ~ 915 | 1,592 ~ 2,387 | 220 ~ 494 | 796 ~ 1,592 | 92 ~ 275 | 1.6X4.8 |
| 8.5 | 2,809 ~ 3,745 | 495 ~ 880 | 1,498 ~ 2,247 | 211 ~ 475 | 749 ~ 1,498 | 88 ~ 264 | 1.7X5.1 |
| 9 | 2,653 ~ 3,537 | 477 ~ 849 | 1,415 ~ 2,122 | 204 ~ 458 | 707 ~ 1,415 | 85 ~ 255 | 1.8X5.4 |
| 9.5 | 2,513 ~ 3,351 | 462 ~ 821 | 1,340 ~ 2,010 | 197 ~ 443 | 670 ~ 1,340 | 82 ~ 246 | 1.9X5.7 |
| 10 | 2,387 ~ 3,183 | 448 ~ 796 | 1,273 ~ 1,910 | 191 ~ 430 | 637 ~ 1,273 | 80 ~ 239 | 2 X6 |
| 10.5 | 2,274 ~ 3,032 | 435 ~ 773 | 1,213 ~ 1,819 | 186 ~ 417 | 606 ~ 1,213 | 77 ~ 232 | 2.1X6.3 |
| 11 | 2,170 ~ 2,894 | 423 ~ 752 | 1,158 ~ 1,736 | 181 ~ 406 | 579 ~ 1,158 | 75 ~ 226 | 2.2X6.6 |
| 11.5 | 2,076 ~ 2,768 | 413 ~ 734 | 1,107 ~ 1,661 | 176 ~ 396 | 554 ~ 1,107 | 73 ~ 220 | 2.3X6.9 |
| 12 | 1,989 ~ 2,653 | 403 ~ 716 | 1,061 ~ 1,592 | 172 ~ 387 | 531 ~ 1,061 | 72 ~ 215 | 2.4X7.2 |
| 12.5 | 1,910 ~ 2,547 | 394 ~ 700 | 1,019 ~ 1,528 | 168 ~ 378 | 509 ~ 1,019 | 70 ~ 210 | 2.5X7.5 |
| 13 | 1,836 ~ 2,449 | 386 ~ 686 | 979 ~ 1,469 | 165 ~ 370 | 490 ~ 979 | 69 ~ 206 | 2.6X7.8 |
| 13.5 | 1,768 ~ 2,358 | 378 ~ 672 | 943 ~ 1,415 | 161 ~ 363 | 472 ~ 943 | 67 ~ 202 | 2.7X8.1 |
| 14 | 1,705 ~ 2,274 | 371 ~ 659 | 909 ~ 1,364 | 158 ~ 356 | 455 ~ 909 | 66 ~ 198 | 2.8X8.4 |
| 14.5 | 1,646 ~ 2,195 | 364 ~ 648 | 878 ~ 1,317 | 155 ~ 350 | 439 ~ 878 | 65 ~ 194 | 2.9X8.7 |
| 15 | 1,592 ~ 2,122 | 358 ~ 637 | 849 ~ 1,273 | 153 ~ 344 | 424 ~ 849 | 64 ~ 191 | 3 X9 |

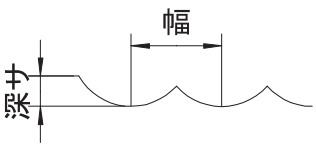



## ●GTE　超硬グラファイト ソリッドテーパーエンドミル

| 小径 Minor Dia. | グラファイト Graphite | | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 150~200m/min | | 切削速度 Cutting Speed 80~120m/min | | 切削速度 Cutting Speed 40~80m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 深 X 幅 Depth x Width |
| 角度 Taper Angle | 0.5° ~ 3° | | | | | | |
| 4 | 11,937 ~ 15,916 | 426 ~ 758 | 6,366 ~ 9,550 | 303 ~ 409 | 3,183 ~ 6,366 | 76 ~ 227 | 2 X0.2 |
| 5 | 9,550 ~ 12,733 | 487 ~ 866 | 5,093 ~ 7,640 | 346 ~ 468 | 2,547 ~ 5,093 | 87 ~ 260 | 2.5 X0.25 |
| 6 | 7,958 ~ 10,611 | 528 ~ 938 | 4,244 ~ 6,366 | 375 ~ 507 | 2,122 ~ 4,244 | 94 ~ 281 | 3 X0.3 |
| 8 | 5,968 ~ 7,958 | 578 ~ 1,028 | 3,183 ~ 4,775 | 411 ~ 555 | 1,592 ~ 3,183 | 103 ~ 308 | 4 X0.4 |
| 10 | 4,775 ~ 6,366 | 609 ~ 1,082 | 2,547 ~ 3,820 | 433 ~ 584 | 1,273 ~ 2,547 | 108 ~ 325 | 5 X0.5 |
| 12 | 3,979 ~ 5,305 | 629 ~ 1,118 | 2,122 ~ 3,183 | 447 ~ 604 | 1,061 ~ 2,122 | 112 ~ 336 | 6 X0.6 |
| 角度 Taper Angle | 5° ~ 7° | | | | | | |
| 4 | 11,937 ~ 15,916 | 426 ~ 758 | 6,366 ~ 9,550 | 303 ~ 409 | 3,183 ~ 6,366 | 76 ~ 227 | 1.33X0.2 |
| 5 | 9,550 ~ 12,733 | 487 ~ 866 | 5,093 ~ 7,640 | 346 ~ 468 | 2,547 ~ 5,093 | 87 ~ 260 | 1.67X0.25 |
| 6 | 7,958 ~ 10,611 | 528 ~ 938 | 4,244 ~ 6,366 | 375 ~ 507 | 2,122 ~ 4,244 | 94 ~ 281 | 2 X0.3 |
| 8 | 5,968 ~ 7,958 | 578 ~ 1,028 | 3,183 ~ 4,775 | 411 ~ 555 | 1,592 ~ 3,183 | 103 ~ 308 | 2.67X0.4 |
| 10 | 4,775 ~ 6,366 | 609 ~ 1,082 | 2,547 ~ 3,820 | 433 ~ 584 | 1,273 ~ 2,547 | 108 ~ 325 | 3.33X0.5 |
| 12 | 3,979 ~ 5,305 | 629 ~ 1,118 | 2,122 ~ 3,183 | 447 ~ 604 | 1,061 ~ 2,122 | 112 ~ 336 | 4 X0.6 |

## ●GTBE　超硬グラファイト ソリッドテーパーボールエンドミル

| R | グラファイト Graphite<br>切削速度 Cutting Speed 150~200m/min | | 非鉄金属 Al. Cu<br>切削速度 Cutting Speed 80~120m/min | | 炭素鋼 FC. FCD. S50C<br>切削速度 Cutting Speed 40~80m/min | | 切込み量 Depth of Cut<br>深 X 幅 Depth x Width |
|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 2 | 11,937 ～ 15,916 | 1,522 ～ 2,706 | 6,366 ～ 9,550 | 649 ～ 1,461 | 3,183 ～ 6,366 | 271 ～ 812 | 0.4X1.2 |
| 2.5 | 9,550 ～ 12,733 | 1,253 ～ 2,228 | 5,093 ～ 7,640 | 535 ～ 1,203 | 2,547 ～ 5,093 | 223 ～ 668 | 0.5X1.5 |
| 3 | 7,958 ～ 10,611 | 1,074 ～ 1,910 | 4,244 ～ 6,366 | 458 ～ 1,031 | 2,122 ～ 4,244 | 191 ～ 573 | 0.6X1.8 |
| 4 | 5,968 ～ 7,958 | 851 ～ 1,512 | 3,183 ～ 4,775 | 363 ～ 816 | 1,592 ～ 3,183 | 151 ～ 454 | 0.8X2.4 |
| 5 | 4,775 ～ 6,366 | 716 ～ 1,273 | 2,547 ～ 3,820 | 306 ～ 688 | 1,273 ～ 2,547 | 127 ～ 382 | 1 X3 |
| 6 | 3,979 ～ 5,305 | 627 ～ 1,114 | 2,122 ～ 3,183 | 267 ～ 602 | 1,061 ～ 2,122 | 111 ～ 334 | 1.2X3.6 |




## ●AHES2　超硬エアホールエンドミル（2枚刃）
## ●AHEL2　超硬エアホールエンドミル（ロング 2枚刃）

| 刃径 Dia. | グラファイト Graphite<br>切削速度 Cutting Speed 120~160m/min | | 非鉄金属 Al. Cu<br>切削速度 Cutting Speed 60~90m/min | | 炭素鋼 FC. FCD. S50C<br>切削速度 Cutting Speed 35~70m/min | | 切込み量 Depth of Cut<br>深 X 幅 Depth x Width |
|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 0.5 | 25,000 ～ 30,000 | 150 ～ 180 | 20,000 ～ 30,000 | 110 ～ 420 | 12,000 ～ 18,000 | 48 ～ 99 | 0.25X0.025 |
| 1 | 25,000 ～ 30,000 | 150 ～ 180 | 15,000 ～ 20,000 | 83 ～ 280 | 8,000 ～ 12,000 | 32 ～ 66 | 0.5 X0.05 |
| 1.5 | 25,000 ～ 30,000 | 150 ～ 180 | 10,000 ～ 15,000 | 55 ～ 210 | 5,500 ～ 12,000 | 22 ～ 66 | 0.75X0.075 |
| 2 | 19,099 ～ 25,466 | 115 ～ 204 | 9,550 ～ 14,324 | 57 ～ 229 | 5,571 ～ 12,733 | 22 ～ 76 | 1 X0.1 |
| 2.5 | 15,279 ～ 20,372 | 229 ～ 407 | 7,640 ～ 11,459 | 115 ～ 458 | 4,456 ～ 10,186 | 45 ～ 153 | 1.25X0.125 |
| 3 | 12,733 ～ 16,977 | 306 ～ 543 | 6,366 ～ 9,550 | 153 ～ 611 | 3,714 ～ 8,489 | 59 ～ 204 | 1.5 X0.15 |
| 4 | 9,550 ～ 12,733 | 401 ～ 713 | 4,775 ～ 7,162 | 201 ～ 802 | 2,785 ～ 6,366 | 78 ～ 267 | 2 X0.2 |
| 5 | 7,640 ～ 10,186 | 458 ～ 815 | 3,820 ～ 5,730 | 229 ～ 917 | 2,228 ～ 5,093 | 89 ～ 306 | 2.5 X0.25 |
| 6 | 6,366 ～ 8,489 | 497 ～ 883 | 3,183 ～ 4,775 | 248 ～ 993 | 1,857 ～ 4,244 | 97 ～ 331 | 3 X0.3 |
| 7 | 5,457 ～ 7,276 | 524 ～ 931 | 2,728 ～ 4,093 | 262 ～ 1,048 | 1,592 ～ 3,638 | 102 ～ 349 | 3.5 X0.35 |
| 8 | 4,775 ～ 6,366 | 544 ～ 968 | 2,387 ～ 3,581 | 272 ～ 1,089 | 1,393 ～ 3,183 | 106 ～ 363 | 4 X0.4 |
| 9 | 4,244 ～ 5,659 | 560 ～ 996 | 2,122 ～ 3,183 | 280 ～ 1,120 | 1,238 ～ 2,830 | 109 ～ 373 | 4.5 X0.45 |
| 10 | 3,820 ～ 5,093 | 573 ～ 1,019 | 1,910 ～ 2,865 | 286 ～ 1,146 | 1,114 ～ 2,547 | 111 ～ 382 | 5 X0.5 |
| 12 | 3,183 ～ 4,244 | 592 ～ 1,053 | 1,592 ～ 2,387 | 296 ～ 1,184 | 928 ～ 2,122 | 115 ～ 395 | 6 X0.6 |
| 13 | 2,938 ～ 3,918 | 599 ～ 1,066 | 1,469 ～ 2,204 | 300 ～ 1,199 | 857 ～ 1,959 | 117 ～ 400 | 6.5 X0.65 |
| 14 | 2,728 ～ 3,638 | 606 ～ 1,077 | 1,364 ～ 2,046 | 303 ～ 1,211 | 796 ～ 1,819 | 118 ～ 404 | 7 X0.7 |
| 15 | 2,547 ～ 3,395 | 611 ～ 1,087 | 1,273 ～ 1,910 | 306 ～ 1,222 | 743 ～ 1,698 | 119 ～ 407 | 7.5 X0.75 |
| 16 | 2,387 ～ 3,183 | 616 ～ 1,095 | 1,194 ～ 1,791 | 308 ～ 1,232 | 696 ～ 1,592 | 120 ～ 411 | 8 X0.8 |
| 18 | 2,122 ～ 2,830 | 624 ～ 1,109 | 1,061 ～ 1,592 | 312 ～ 1,248 | 619 ～ 1,415 | 121 ～ 416 | 9 X0.9 |
| 20 | 1,910 ～ 2,547 | 630 ～ 1,120 | 955 ～ 1,432 | 315 ～ 1,261 | 557 ～ 1,273 | 123 ～ 420 | 10 X1 |
| 25 | 1,528 ～ 2,037 | 642 ～ 1,141 | 764 ～ 1,146 | 321 ～ 1,283 | 446 ～ 1,019 | 125 ～ 428 | 12.5 X1.25 |

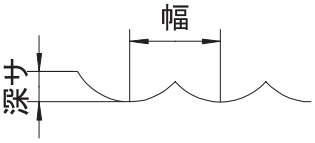
※Φ0.5 ～Φ1.9までは切削速度を変更し回転数を抑えてあります。
The cutting and spindle speed for φ0.5 ～φ1.9 shown in this table are set lower.

## ●AHES4　超硬エアホールエンドミル（4枚刃）
## ●AHEL4　超硬エアホールエンドミル（ロング 4枚刃）

| 刃径 Dia. | グラファイト Graphite 切削速度 Cutting Speed 120~160m/min | | 非鉄金属 Al. Cu 切削速度 Cutting Speed 60~90m/min | | 炭素鋼 FC. FCD. S50C 切削速度 Cutting Speed 35~70m/min | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 深 X 幅 Depth x Width |
| 3 | 12,733 ~ 16,977 | 65 ~ 115 | 6,366 ~ 9,550 | 32 ~ 130 | 3,714 ~ 8,489 | 13 ~ 43 | 1.5X0.15 |
| 4 | 9,550 ~ 12,733 | 246 ~ 438 | 4,775 ~ 7,162 | 123 ~ 493 | 2,785 ~ 6,366 | 48 ~ 164 | 2 X0.2 |
| 5 | 7,640 ~ 10,186 | 355 ~ 632 | 3,820 ~ 5,730 | 178 ~ 710 | 2,228 ~ 5,093 | 69 ~ 237 | 2.5X0.25 |
| 6 | 6,366 ~ 8,489 | 428 ~ 761 | 3,183 ~ 4,775 | 214 ~ 856 | 1,857 ~ 4,244 | 83 ~ 285 | 3 X0.3 |
| 7 | 5,457 ~ 7,276 | 480 ~ 853 | 2,728 ~ 4,093 | 240 ~ 959 | 1,592 ~ 3,638 | 93 ~ 320 | 3.5X0.35 |
| 8 | 4,775 ~ 6,366 | 519 ~ 922 | 2,387 ~ 3,581 | 259 ~ 1,037 | 1,393 ~ 3,183 | 101 ~ 346 | 4 X0.4 |
| 9 | 4,244 ~ 5,659 | 549 ~ 976 | 2,122 ~ 3,183 | 274 ~ 1,098 | 1,238 ~ 2,830 | 107 ~ 366 | 4.5X0.45 |
| 10 | 3,820 ~ 5,093 | 573 ~ 1,019 | 1,910 ~ 2,865 | 286 ~ 1,146 | 1,114 ~ 2,547 | 111 ~ 382 | 5 X0.5 |
| 12 | 3,183 ~ 4,244 | 609 ~ 1,083 | 1,592 ~ 2,387 | 305 ~ 1,219 | 928 ~ 2,122 | 118 ~ 406 | 6 X0.6 |
| 13 | 2,938 ~ 3,918 | 623 ~ 1,108 | 1,469 ~ 2,204 | 312 ~ 1,246 | 857 ~ 1,959 | 121 ~ 415 | 6.5X0.65 |
| 14 | 2,728 ~ 3,638 | 635 ~ 1,129 | 1,364 ~ 2,046 | 318 ~ 1,270 | 796 ~ 1,819 | 124 ~ 423 | 7 X0.7 |
| 15 | 2,547 ~ 3,395 | 646 ~ 1,148 | 1,273 ~ 1,910 | 323 ~ 1,291 | 743 ~ 1,698 | 126 ~ 430 | 7.5X0.75 |
| 16 | 2,387 ~ 3,183 | 655 ~ 1,164 | 1,194 ~ 1,791 | 327 ~ 1,309 | 696 ~ 1,592 | 127 ~ 436 | 8 X0.8 |
| 18 | 2,122 ~ 2,830 | 670 ~ 1,191 | 1,061 ~ 1,592 | 335 ~ 1,339 | 619 ~ 1,415 | 130 ~ 446 | 9 X0.9 |
| 20 | 1,910 ~ 2,547 | 682 ~ 1,212 | 955 ~ 1,432 | 341 ~ 1,364 | 557 ~ 1,273 | 133 ~ 455 | 10 X1 |
| 25 | 1,528 ~ 2,037 | 704 ~ 1,251 | 764 ~ 1,146 | 352 ~ 1,407 | 446 ~ 1,019 | 137 ~ 469 | 12.5X1.25 |

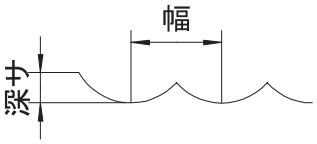
## ●AHBES2　超硬エアホールボールエンドミル（2枚刃）
## ●AHBEL2　超硬エアホールボールエンドミル（ロング 2枚刃）

| R | グラファイト Graphite 切削速度 Cutting Speed 120~160m/min | | 非鉄金属 Al. Cu 切削速度 Cutting Speed 60~90m/min | | 炭素鋼 FC. FCD. S50C 切削速度 Cutting Speed 35~70m/min | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 深 X 幅 Depth x Width |
| 2 | 9,550 ~ 12,733 | 974 ~ 1,732 | 4,775 ~ 7,162 | 487 ~ 1,948 | 2,785 ~ 5,571 | 189 ~ 568 | 0.4X1.2 |
| 2.5 | 7,640 ~ 10,186 | 802 ~ 1,426 | 3,820 ~ 5,730 | 401 ~ 1,604 | 2,228 ~ 4,456 | 156 ~ 468 | 0.5X1.5 |
| 3 | 6,366 ~ 8,489 | 688 ~ 1,222 | 3,183 ~ 4,775 | 344 ~ 1,375 | 1,857 ~ 3,714 | 134 ~ 401 | 0.6X1.8 |
| 3.5 | 5,457 ~ 7,276 | 606 ~ 1,077 | 2,728 ~ 4,093 | 303 ~ 1,211 | 1,592 ~ 3,183 | 118 ~ 353 | 0.7X2.1 |
| 4 | 4,775 ~ 6,366 | 544 ~ 968 | 2,387 ~ 3,581 | 272 ~ 1,089 | 1,393 ~ 2,785 | 106 ~ 318 | 0.8X2.4 |
| 4.5 | 4,244 ~ 5,659 | 497 ~ 883 | 2,122 ~ 3,183 | 248 ~ 993 | 1,238 ~ 2,476 | 97 ~ 290 | 0.9X2.7 |
| 5 | 3,820 ~ 5,093 | 458 ~ 815 | 1,910 ~ 2,865 | 229 ~ 917 | 1,114 ~ 2,228 | 89 ~ 267 | 1 X3 |
| 5.5 | 3,473 ~ 4,630 | 427 ~ 759 | 1,736 ~ 2,604 | 214 ~ 854 | 1,013 ~ 2,026 | 83 ~ 249 | 1.1X3.3 |
| 6 | 3,183 ~ 4,244 | 401 ~ 713 | 1,592 ~ 2,387 | 201 ~ 802 | 928 ~ 1,857 | 78 ~ 234 | 1.2X3.6 |
| 6.5 | 2,938 ~ 3,918 | 379 ~ 674 | 1,469 ~ 2,204 | 190 ~ 758 | 857 ~ 1,714 | 74 ~ 221 | 1.3X3.9 |
| 7 | 2,728 ~ 3,638 | 360 ~ 640 | 1,364 ~ 2,046 | 180 ~ 720 | 796 ~ 1,592 | 70 ~ 210 | 1.4X4.2 |
| 7.5 | 2,547 ~ 3,395 | 344 ~ 611 | 1,273 ~ 1,910 | 172 ~ 688 | 743 ~ 1,485 | 67 ~ 201 | 1.5X4.5 |
| 8 | 2,387 ~ 3,183 | 329 ~ 586 | 1,194 ~ 1,791 | 165 ~ 659 | 696 ~ 1,393 | 64 ~ 192 | 1.6X4.8 |
| 8.5 | 2,247 ~ 2,996 | 317 ~ 563 | 1,123 ~ 1,685 | 158 ~ 634 | 655 ~ 1,311 | 62 ~ 185 | 1.7X5.1 |
| 9 | 2,122 ~ 2,830 | 306 ~ 543 | 1,061 ~ 1,592 | 153 ~ 611 | 619 ~ 1,238 | 59 ~ 178 | 1.8X5.4 |
| 9.5 | 2,010 ~ 2,681 | 296 ~ 525 | 1,005 ~ 1,508 | 148 ~ 591 | 586 ~ 1,173 | 57 ~ 172 | 1.9X5.7 |
| 10 | 1,910 ~ 2,547 | 286 ~ 509 | 955 ~ 1,432 | 143 ~ 573 | 557 ~ 1,114 | 56 ~ 167 | 2 X6 |
| 10.5 | 1,819 ~ 2,425 | 278 ~ 495 | 909 ~ 1,364 | 139 ~ 557 | 531 ~ 1,061 | 54 ~ 162 | 2.1X6.3 |
| 12.5 | 1,528 ~ 2,037 | 252 ~ 448 | 764 ~ 1,146 | 126 ~ 504 | 446 ~ 891 | 49 ~ 147 | 2.5X7.5 |



## ●AHBES4　超硬エアホールボールエンドミル（4枚刃）
## ●AHBEL4　超硬エアホールボールエンドミル（ロング 4枚刃）

| R | グラファイト Graphite<br>切削速度 Cutting Speed 120~160m/min | | 非鉄金属 Al. Cu<br>切削速度 Cutting Speed 60~90m/min | | 炭素鋼 FC. FCD. S50C<br>切削速度 Cutting Speed 35~70m/min | | 切込み量 Depth of Cut<br>深 X 幅 Depth x Width |
|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 2 | 9,550 ~ 12,733 | 1,218 ~ 2,165 | 4,775 ~ 7,162 | 609 ~ 2,435 | 2,785 ~ 5,571 | 237 ~ 710 | 0.4X1.2 |
| 2.5 | 7,640 ~ 10,186 | 1,003 ~ 1,783 | 3,820 ~ 5,730 | 501 ~ 2,005 | 2,228 ~ 4,456 | 195 ~ 585 | 0.5X1.5 |
| 3 | 6,366 ~ 8,489 | 859 ~ 1,528 | 3,183 ~ 4,775 | 430 ~ 1,719 | 1,857 ~ 3,714 | 167 ~ 501 | 0.6X1.8 |
| 3.5 | 5,457 ~ 7,276 | 757 ~ 1,346 | 2,728 ~ 4,093 | 379 ~ 1,514 | 1,592 ~ 3,183 | 147 ~ 442 | 0.7X2.1 |
| 4 | 4,775 ~ 6,366 | 680 ~ 1,210 | 2,387 ~ 3,581 | 340 ~ 1,361 | 1,393 ~ 2,785 | 132 ~ 397 | 0.8X2.4 |
| 4.5 | 4,244 ~ 5,659 | 621 ~ 1,104 | 2,122 ~ 3,183 | 310 ~ 1,241 | 1,238 ~ 2,476 | 121 ~ 362 | 0.9X2.7 |
| 5 | 3,820 ~ 5,093 | 573 ~ 1,019 | 1,910 ~ 2,865 | 286 ~ 1,146 | 1,114 ~ 2,228 | 111 ~ 334 | 1 X3 |
| 5.5 | 3,473 ~ 4,630 | 534 ~ 949 | 1,736 ~ 2,604 | 267 ~ 1,068 | 1,013 ~ 2,026 | 104 ~ 311 | 1.1X3.3 |
| 6 | 3,183 ~ 4,244 | 501 ~ 891 | 1,592 ~ 2,387 | 251 ~ 1,003 | 928 ~ 1,857 | 97 ~ 292 | 1.2X3.6 |
| 6.5 | 2,938 ~ 3,918 | 474 ~ 842 | 1,469 ~ 2,204 | 237 ~ 948 | 857 ~ 1,714 | 92 ~ 276 | 1.3X3.9 |
| 7 | 2,728 ~ 3,638 | 450 ~ 800 | 1,364 ~ 2,046 | 225 ~ 900 | 796 ~ 1,592 | 88 ~ 263 | 1.4X4.2 |
| 7.5 | 2,547 ~ 3,395 | 430 ~ 764 | 1,273 ~ 1,910 | 215 ~ 859 | 743 ~ 1,485 | 84 ~ 251 | 1.5X4.5 |
| 8 | 2,387 ~ 3,183 | 412 ~ 732 | 1,194 ~ 1,791 | 206 ~ 824 | 696 ~ 1,393 | 80 ~ 240 | 1.6X4.8 |
| 8.5 | 2,247 ~ 2,996 | 396 ~ 704 | 1,123 ~ 1,685 | 198 ~ 792 | 655 ~ 1,311 | 77 ~ 231 | 1.7X5.1 |
| 9 | 2,122 ~ 2,830 | 382 ~ 679 | 1,061 ~ 1,592 | 191 ~ 764 | 619 ~ 1,238 | 74 ~ 223 | 1.8X5.4 |
| 9.5 | 2,010 ~ 2,681 | 369 ~ 657 | 1,005 ~ 1,508 | 185 ~ 739 | 586 ~ 1,173 | 72 ~ 215 | 1.9X5.7 |
| 10 | 1,910 ~ 2,547 | 358 ~ 637 | 955 ~ 1,432 | 179 ~ 716 | 557 ~ 1,114 | 70 ~ 209 | 2 X6 |
| 10.5 | 1,819 ~ 2,425 | 348 ~ 618 | 909 ~ 1,364 | 174 ~ 696 | 531 ~ 1,061 | 68 ~ 203 | 2.1X6.3 |
| 12.5 | 1,528 ~ 2,037 | 315 ~ 560 | 764 ~ 1,146 | 158 ~ 630 | 446 ~ 891 | 61 ~ 184 | 2.5X7.5 |

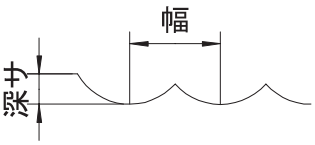



## ●AHTE　超硬エアホールソリッドテーパーエンドミル

| 小径 Minor Dia. | グラファイト Graphite<br>切削速度 Cutting Speed 120~160m/min | | 非鉄金属 Al. Cu<br>切削速度 Cutting Speed 60~90m/min | | 炭素鋼 FC. FCD. S50C<br>切削速度 Cutting Speed 35~70m/min | | 切込み量 Depth of Cut<br>深 X 幅 Depth x Width |
|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 角度 Taper Angle | 0.5° ~ 3° | | | | | | |
| 4 | 9,550 ~ 12,733 | 341 ~ 606 | 4,775 ~ 7,162 | 170 ~ 682 | 2,785 ~ 5,571 | 66 ~ 199 | 2 X0.2 |
| 5 | 7,640 ~ 10,186 | 390 ~ 693 | 3,820 ~ 5,730 | 195 ~ 779 | 2,228 ~ 4,456 | 76 ~ 227 | 2.5 X0.25 |
| 6 | 6,366 ~ 8,489 | 422 ~ 750 | 3,183 ~ 4,775 | 211 ~ 844 | 1,857 ~ 3,714 | 82 ~ 246 | 3 X0.3 |
| 8 | 4,775 ~ 6,366 | 463 ~ 823 | 2,387 ~ 3,581 | 231 ~ 925 | 1,393 ~ 2,785 | 90 ~ 270 | 4 X0.4 |
| 10 | 3,820 ~ 5,093 | 487 ~ 866 | 1,910 ~ 2,865 | 244 ~ 974 | 1,114 ~ 2,228 | 95 ~ 284 | 5 X0.5 |
| 12 | 3,183 ~ 4,244 | 503 ~ 895 | 1,592 ~ 2,387 | 252 ~ 1,007 | 928 ~ 1,857 | 98 ~ 294 | 6 X0.6 |
| 角度 Taper Angle | 5° ~ 7° | | | | | | |
| 4 | 9,550 ~ 12,733 | 341 ~ 606 | 4,775 ~ 7,162 | 170 ~ 682 | 2,785 ~ 5,571 | 66 ~ 199 | 1.33X0.2 |
| 5 | 7,640 ~ 10,186 | 390 ~ 693 | 3,820 ~ 5,730 | 195 ~ 779 | 2,228 ~ 4,456 | 76 ~ 227 | 1.67X0.25 |
| 6 | 6,366 ~ 8,489 | 422 ~ 750 | 3,183 ~ 4,775 | 211 ~ 844 | 1,857 ~ 3,714 | 82 ~ 246 | 2 X0.3 |
| 8 | 4,775 ~ 6,366 | 463 ~ 823 | 2,387 ~ 3,581 | 231 ~ 925 | 1,393 ~ 2,785 | 90 ~ 270 | 2.67X0.4 |
| 10 | 3,820 ~ 5,093 | 487 ~ 866 | 1,910 ~ 2,865 | 244 ~ 974 | 1,114 ~ 2,228 | 95 ~ 284 | 3.33X0.5 |
| 12 | 3,183 ~ 4,244 | 503 ~ 895 | 1,592 ~ 2,387 | 252 ~ 1,007 | 928 ~ 1,857 | 98 ~ 294 | 4 X0.6 |

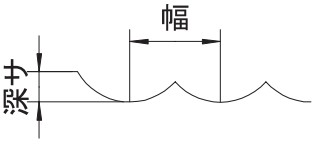
## ●AHTBE　超硬エアホールソリッドテーパーボールエンドミル

| R | グラファイト Graphite 切削速度 Cutting Speed 120~160m/min | | 非鉄金属 Al. Cu 切削速度 Cutting Speed 60~90m/min | | 炭素鋼 FC. FCD. S50C 切削速度 Cutting Speed 35~70m/min | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 深 X 幅 Depth x Width |
| 2 | 9,550 ~ 12,733 | 974 ~ 1,732 | 4,775 ~ 7,162 | 487 ~ 1,948 | 2,785 ~ 5,571 | 189 ~ 568 | 0.4X1.2 |
| 3 | 6,366 ~ 8,489 | 688 ~ 1,222 | 3,183 ~ 4,775 | 344 ~ 1,375 | 1,857 ~ 3,714 | 134 ~ 401 | 0.6X1.8 |
| 4 | 4,775 ~ 6,366 | 544 ~ 968 | 2,387 ~ 3,581 | 272 ~ 1,089 | 1,393 ~ 2,785 | 106 ~ 318 | 0.8X2.4 |
| 5 | 3,820 ~ 5,093 | 458 ~ 815 | 1,910 ~ 2,865 | 229 ~ 917 | 1,114 ~ 2,228 | 89 ~ 267 | 1 X3 |
| 6 | 3,183 ~ 4,244 | 401 ~ 713 | 1,592 ~ 2,387 | 201 ~ 802 | 928 ~ 1,857 | 78 ~ 234 | 1.2X3.6 |



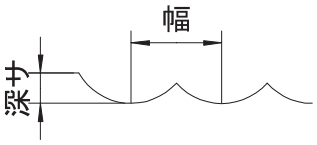

## ●CSBE　超硬ソリッドボールエンドミル

| R | 非鉄金属 Al. Cu 切削速度 Cutting Speed 40~60m/min | | 炭素鋼 FC. FCD. S50C 切削速度 Cutting Speed 20~40m/min | | 合金鋼 SCM. SKD. SUS304 切削速度 Cutting Speed 15~30m/min | | 調質鋼 HPM. NAK 切削速度 Cutting Speed 10~20m/min | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 深 X 幅 Depth x Width |
| 0.5 | 12,733 ~ 19,099 | 1,480 ~ 4,441 | 6,366 ~ 12,733 | 493 ~ 1,974 | 4,775 ~ 9,550 | 296 ~ 1,184 | 3,183 ~ 6,366 | 148 ~ 592 | 0.1X 0.3 |
| 1 | 6,366 ~ 9,550 | 764 ~ 2,292 | 3,183 ~ 6,366 | 255 ~ 1,019 | 2,387 ~ 4,775 | 153 ~ 611 | 1,592 ~ 3,183 | 76 ~ 306 | 0.2X 0.6 |
| 1.5 | 4,244 ~ 6,366 | 525 ~ 1,576 | 2,122 ~ 4,244 | 175 ~ 700 | 1,592 ~ 3,183 | 105 ~ 420 | 1,061 ~ 2,122 | 53 ~ 210 | 0.3X 0.9 |
| 2 | 3,183 ~ 4,775 | 406 ~ 1,218 | 1,592 ~ 3,183 | 135 ~ 541 | 1,194 ~ 2,387 | 81 ~ 325 | 796 ~ 1,592 | 41 ~ 162 | 0.4X 1.2 |
| 2.5 | 2,547 ~ 3,820 | 334 ~ 1,003 | 1,273 ~ 2,547 | 111 ~ 446 | 955 ~ 1,910 | 67 ~ 267 | 637 ~ 1,273 | 33 ~ 134 | 0.5X 1.5 |
| 3 | 2,122 ~ 3,183 | 286 ~ 859 | 1,061 ~ 2,122 | 95 ~ 382 | 796 ~ 1,592 | 57 ~ 229 | 531 ~ 1,061 | 29 ~ 115 | 0.6X 1.8 |
| 3.5 | 1,819 ~ 2,728 | 252 ~ 757 | 909 ~ 1,819 | 84 ~ 337 | 682 ~ 1,364 | 50 ~ 202 | 455 ~ 909 | 25 ~ 101 | 0.7X 2.1 |
| 4 | 1,592 ~ 2,387 | 227 ~ 680 | 796 ~ 1,592 | 76 ~ 302 | 597 ~ 1,194 | 45 ~ 181 | 398 ~ 796 | 23 ~ 91 | 0.8X 2.4 |
| 4.5 | 1,415 ~ 2,122 | 207 ~ 621 | 707 ~ 1,415 | 69 ~ 276 | 531 ~ 1,061 | 41 ~ 166 | 354 ~ 707 | 21 ~ 83 | 0.9X 2.7 |
| 5 | 1,273 ~ 1,910 | 191 ~ 573 | 637 ~ 1,273 | 64 ~ 255 | 477 ~ 955 | 38 ~ 153 | 318 ~ 637 | 19 ~ 76 | 1 X 3 |
| 5.5 | 1,158 ~ 1,736 | 178 ~ 534 | 579 ~ 1,158 | 59 ~ 237 | 434 ~ 868 | 36 ~ 142 | 289 ~ 579 | 18 ~ 71 | 1.1X 3.3 |
| 6 | 1,061 ~ 1,592 | 167 ~ 501 | 531 ~ 1,061 | 56 ~ 223 | 398 ~ 796 | 33 ~ 134 | 265 ~ 531 | 17 ~ 67 | 1.2X 3.6 |
| 6.5 | 979 ~ 1,469 | 158 ~ 474 | 490 ~ 979 | 53 ~ 211 | 367 ~ 735 | 32 ~ 126 | 245 ~ 490 | 16 ~ 63 | 1.3X 3.9 |
| 7 | 909 ~ 1,364 | 150 ~ 450 | 455 ~ 909 | 50 ~ 200 | 341 ~ 682 | 30 ~ 120 | 227 ~ 455 | 15 ~ 60 | 1.4X 4.2 |
| 7.5 | 849 ~ 1,273 | 143 ~ 430 | 424 ~ 849 | 48 ~ 191 | 318 ~ 637 | 29 ~ 115 | 212 ~ 424 | 14 ~ 57 | 1.5X 4.5 |
| 8 | 796 ~ 1,194 | 137 ~ 412 | 398 ~ 796 | 46 ~ 183 | 298 ~ 597 | 27 ~ 110 | 199 ~ 398 | 14 ~ 55 | 1.6X 4.8 |
| 8.5 | 749 ~ 1,123 | 132 ~ 396 | 374 ~ 749 | 44 ~ 176 | 281 ~ 562 | 26 ~ 106 | 187 ~ 374 | 13 ~ 53 | 1.7X 5.1 |
| 9 | 707 ~ 1,061 | 127 ~ 382 | 354 ~ 707 | 42 ~ 170 | 265 ~ 531 | 25 ~ 102 | 177 ~ 354 | 13 ~ 51 | 1.8X 5.4 |
| 9.5 | 670 ~ 1,005 | 123 ~ 369 | 335 ~ 670 | 41 ~ 164 | 251 ~ 503 | 25 ~ 99 | 168 ~ 335 | 12 ~ 49 | 1.9X 5.7 |
| 10 | 637 ~ 955 | 119 ~ 358 | 318 ~ 637 | 40 ~ 159 | 239 ~ 477 | 24 ~ 95 | 159 ~ 318 | 12 ~ 48 | 2 X 6 |
| 10.5 | 606 ~ 909 | 116 ~ 348 | 303 ~ 606 | 39 ~ 155 | 227 ~ 455 | 23 ~ 93 | 152 ~ 303 | 12 ~ 46 | 2.1X 6.3 |
| 11 | 579 ~ 868 | 113 ~ 339 | 289 ~ 579 | 38 ~ 150 | 217 ~ 434 | 23 ~ 90 | 145 ~ 289 | 11 ~ 45 | 2.2X 6.6 |
| 11.5 | 554 ~ 830 | 110 ~ 330 | 277 ~ 554 | 37 ~ 147 | 208 ~ 415 | 22 ~ 88 | 138 ~ 277 | 11 ~ 44 | 2.3X 6.9 |
| 12 | 531 ~ 796 | 107 ~ 322 | 265 ~ 531 | 36 ~ 143 | 199 ~ 398 | 21 ~ 86 | 133 ~ 265 | 11 ~ 43 | 2.4X 7.2 |
| 13 | 490 ~ 735 | 103 ~ 309 | 245 ~ 490 | 34 ~ 137 | 184 ~ 367 | 21 ~ 82 | 122 ~ 245 | 10 ~ 41 | 2.6X 7.8 |
| 14 | 455 ~ 682 | 99 ~ 297 | 227 ~ 455 | 33 ~ 132 | 171 ~ 341 | 20 ~ 79 | 114 ~ 227 | 10 ~ 40 | 2.8X 8.4 |
| 15 | 424 ~ 637 | 95 ~ 286 | 212 ~ 424 | 32 ~ 127 | 159 ~ 318 | 19 ~ 76 | 106 ~ 212 | 10 ~ 38 | 3 X 9 |
| 16 | 398 ~ 597 | 93 ~ 278 | 199 ~ 398 | 31 ~ 123 | 149 ~ 298 | 19 ~ 74 | 99 ~ 199 | 9 ~ 37 | 3.2X 9.6 |
| 17 | 374 ~ 562 | 90 ~ 270 | 187 ~ 374 | 30 ~ 120 | 140 ~ 281 | 18 ~ 72 | 94 ~ 187 | 9 ~ 36 | 3.4X10.2 |
| 18 | 354 ~ 531 | 88 ~ 263 | 177 ~ 354 | 29 ~ 117 | 133 ~ 265 | 18 ~ 70 | 88 ~ 177 | 9 ~ 35 | 3.6X10.8 |
| 19 | 335 ~ 503 | 85 ~ 256 | 168 ~ 335 | 28 ~ 114 | 126 ~ 251 | 17 ~ 68 | 84 ~ 168 | 9 ~ 34 | 3.8X11.4 |
| 20 | 318 ~ 477 | 84 ~ 251 | 159 ~ 318 | 28 ~ 111 | 119 ~ 239 | 17 ~ 67 | 80 ~ 159 | 8 ~ 33 | 4 X12 |



## ●CMBE　超硬先ムクボールエンドミル

| R | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 18~35m/min | | 切削速度 Cutting Speed 13~25m/min | | 切削速度 Cutting Speed 10~20m/min | | 切削速度 Cutting Speed 8~15m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 深 X 幅 Depth x Width |
| **0.75** | 3,820 ～ 7,427 | 331 ～ 1,170 | 2,759 ～ 5,305 | 143 ～ 557 | 2,122 ～ 4,244 | 92 ～ 331 | 1,698 ～ 3,183 | 53 ～ 201 | 0.15X0.45 |
| **1** | 2,865 ～ 5,571 | 252 ～ 891 | 2,069 ～ 3,979 | 109 ～ 424 | 1,592 ～ 3,183 | 70 ～ 252 | 1,273 ～ 2,387 | 41 ～ 153 | 0.2 X0.6 |
| **1.25** | 2,292 ～ 4,456 | 205 ～ 724 | 1,655 ～ 3,183 | 89 ～ 345 | 1,273 ～ 2,547 | 57 ～ 205 | 1,019 ～ 1,910 | 33 ～ 124 | 0.25X0.75 |
| **1.5** | 1,910 ～ 3,714 | 173 ～ 613 | 1,379 ～ 2,653 | 75 ～ 292 | 1,061 ～ 2,122 | 48 ～ 173 | 849 ～ 1,592 | 28 ～ 105 | 0.3 X0.9 |
| **1.75** | 1,637 ～ 3,183 | 151 ～ 533 | 1,182 ～ 2,274 | 65 ～ 254 | 909 ～ 1,819 | 42 ～ 151 | 728 ～ 1,364 | 24 ～ 91 | 0.35X1.05 |
| **2** | 1,432 ～ 2,785 | 134 ～ 473 | 1,035 ～ 1,989 | 58 ～ 225 | 796 ～ 1,592 | 37 ～ 134 | 637 ～ 1,194 | 22 ～ 81 | 0.4 X1.2 |
| **2.25** | 1,273 ～ 2,476 | 121 ～ 427 | 920 ～ 1,768 | 52 ～ 203 | 707 ～ 1,415 | 34 ～ 121 | 566 ～ 1,061 | 20 ～ 73 | 0.45X1.35 |
| **2.5** | 1,146 ～ 2,228 | 110 ～ 390 | 828 ～ 1,592 | 48 ～ 186 | 637 ～ 1,273 | 31 ～ 110 | 509 ～ 955 | 18 ～ 67 | 0.5 X1.5 |
| **2.75** | 1,042 ～ 2,026 | 102 ～ 360 | 752 ～ 1,447 | 44 ～ 171 | 579 ～ 1,158 | 28 ～ 102 | 463 ～ 868 | 16 ～ 62 | 0.55X1.65 |
| **3** | 955 ～ 1,857 | 95 ～ 334 | 690 ～ 1,326 | 41 ～ 159 | 531 ～ 1,061 | 26 ～ 95 | 424 ～ 796 | 15 ～ 57 | 0.6 X1.8 |
| **3.25** | 881 ～ 1,714 | 88 ～ 313 | 637 ～ 1,224 | 38 ～ 149 | 490 ～ 979 | 25 ～ 88 | 392 ～ 735 | 14 ～ 54 | 0.65X1.95 |
| **3.5** | 819 ～ 1,592 | 83 ～ 294 | 591 ～ 1,137 | 36 ～ 140 | 455 ～ 909 | 23 ～ 83 | 364 ～ 682 | 13 ～ 50 | 0.7 X2.1 |
| **3.75** | 764 ～ 1,485 | 79 ～ 279 | 552 ～ 1,061 | 34 ～ 133 | 424 ～ 849 | 22 ～ 79 | 340 ～ 637 | 13 ～ 48 | 0.75X2.25 |
| **4** | 716 ～ 1,393 | 75 ～ 265 | 517 ～ 995 | 32 ～ 126 | 398 ～ 796 | 21 ～ 75 | 318 ～ 597 | 12 ～ 45 | 0.8 X2.4 |
| **4.25** | 674 ～ 1,311 | 71 ～ 252 | 487 ～ 936 | 31 ～ 120 | 374 ～ 749 | 20 ～ 71 | 300 ～ 562 | 12 ～ 43 | 0.85X2.55 |
| **4.5** | 637 ～ 1,238 | 68 ～ 241 | 460 ～ 884 | 30 ～ 115 | 354 ～ 707 | 19 ～ 68 | 283 ～ 531 | 11 ～ 41 | 0.9 X2.7 |

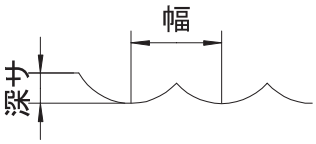


# ●CSTE　超硬ソリッドテーパーエンドミル
# ●CSTEM　超硬ソリッドテーパーエンドミル（ミディアム）
# ●CSTEL　超硬ソリッドテーパーエンドミル（ロング）

| 小径 Minor Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 40~60m/min | | 切削速度 Cutting Speed 20~40m/min | | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 10~20m/min | | 深 X 幅 Depth x Width |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 角度 Taper Angle | 0.5° ～ 3° | | | | | | | | |
| 0.5 | 25,466 ～ 38,198 | 325 ～ 974 | 12,733 ～ 25,466 | 87 ～ 346 | 9,550 ～ 19,099 | 49 ～ 195 | 6,366 ～ 12,733 | 22 ～ 87 | 0.25 X 0.025 |
| 1 | 12,733 ～ 19,099 | 260 ～ 779 | 6,366 ～ 12,733 | 69 ～ 277 | 4,775 ～ 9,550 | 39 ～ 156 | 3,183 ～ 6,366 | 17 ～ 69 | 0.5 X 0.05 |
| 1.5 | 8,489 ～ 12,733 | 238 ～ 714 | 4,244 ～ 8,489 | 63 ～ 254 | 3,183 ～ 6,366 | 36 ～ 143 | 2,122 ～ 4,244 | 16 ～ 63 | 0.75 X 0.075 |
| 2 | 6,366 ～ 9,550 | 227 ～ 682 | 3,183 ～ 6,366 | 61 ～ 242 | 2,387 ～ 4,775 | 34 ～ 136 | 1,592 ～ 3,183 | 15 ～ 61 | 1 X 0.1 |
| 2.5 | 5,093 ～ 7,640 | 221 ～ 662 | 2,547 ～ 5,093 | 59 ～ 236 | 1,910 ～ 3,820 | 33 ～ 132 | 1,273 ～ 2,547 | 15 ～ 59 | 1.25 X 0.125 |
| 3 | 4,244 ～ 6,366 | 216 ～ 649 | 2,122 ～ 4,244 | 58 ～ 231 | 1,592 ～ 3,183 | 32 ～ 130 | 1,061 ～ 2,122 | 14 ～ 58 | 1.5 X 0.15 |
| 4 | 3,183 ～ 4,775 | 211 ～ 633 | 1,592 ～ 3,183 | 56 ～ 225 | 1,194 ～ 2,387 | 32 ～ 127 | 796 ～ 1,592 | 14 ～ 56 | 2 X 0.2 |
| 5 | 2,547 ～ 3,820 | 208 ～ 623 | 1,273 ～ 2,547 | 55 ～ 222 | 955 ～ 1,910 | 31 ～ 125 | 637 ～ 1,273 | 14 ～ 55 | 2.5 X 0.25 |
| 6 | 2,122 ～ 3,183 | 206 ～ 617 | 1,061 ～ 2,122 | 55 ～ 219 | 796 ～ 1,592 | 31 ～ 123 | 531 ～ 1,061 | 14 ～ 55 | 3 X 0.3 |
| 8 | 1,592 ～ 2,387 | 203 ～ 609 | 796 ～ 1,592 | 54 ～ 216 | 597 ～ 1,194 | 30 ～ 122 | 398 ～ 796 | 14 ～ 54 | 4 X 0.4 |
| 10 | 1,273 ～ 1,910 | 201 ～ 604 | 637 ～ 1,273 | 54 ～ 215 | 477 ～ 955 | 30 ～ 121 | 318 ～ 637 | 13 ～ 54 | 5 X 0.5 |
| 12 | 1,061 ～ 1,592 | 200 ～ 601 | 531 ～ 1,061 | 53 ～ 214 | 398 ～ 796 | 30 ～ 120 | 265 ～ 531 | 13 ～ 53 | 6 X 0.6 |
| 16 | 796 ～ 1,194 | 199 ～ 597 | 398 ～ 796 | 53 ～ 212 | 298 ～ 597 | 30 ～ 119 | 199 ～ 398 | 13 ～ 53 | 8 X 0.8 |
| 角度 Taper Angle | 4° ～ 7° | | | | | | | | |
| 0.5 | 25,466 ～ 38,198 | 325 ～ 974 | 12,733 ～ 25,466 | 87 ～ 346 | 9,550 ～ 19,099 | 49 ～ 195 | 6,366 ～ 12,733 | 22 ～ 87 | 0.17 X 0.025 |
| 1 | 12,733 ～ 19,099 | 260 ～ 779 | 6,366 ～ 12,733 | 69 ～ 277 | 4,775 ～ 9,550 | 39 ～ 156 | 3,183 ～ 6,366 | 17 ～ 69 | 0.33 X 0.05 |
| 1.5 | 8,489 ～ 12,733 | 238 ～ 714 | 4,244 ～ 8,489 | 63 ～ 254 | 3,183 ～ 6,366 | 36 ～ 143 | 2,122 ～ 4,244 | 16 ～ 63 | 0.5 X 0.075 |
| 2 | 6,366 ～ 9,550 | 227 ～ 682 | 3,183 ～ 6,366 | 61 ～ 242 | 2,387 ～ 4,775 | 34 ～ 136 | 1,592 ～ 3,183 | 15 ～ 61 | 0.67 X 0.1 |
| 2.5 | 5,093 ～ 7,640 | 221 ～ 662 | 2,547 ～ 5,093 | 59 ～ 236 | 1,910 ～ 3,820 | 33 ～ 132 | 1,273 ～ 2,547 | 15 ～ 59 | 0.83 X 0.125 |
| 3 | 4,244 ～ 6,366 | 216 ～ 649 | 2,122 ～ 4,244 | 58 ～ 231 | 1,592 ～ 3,183 | 32 ～ 130 | 1,061 ～ 2,122 | 14 ～ 58 | 1 X 0.15 |
| 4 | 3,183 ～ 4,775 | 211 ～ 633 | 1,592 ～ 3,183 | 56 ～ 225 | 1,194 ～ 2,387 | 32 ～ 127 | 796 ～ 1,592 | 14 ～ 56 | 1.33 X 0.2 |
| 5 | 2,547 ～ 3,820 | 208 ～ 623 | 1,273 ～ 2,547 | 55 ～ 222 | 955 ～ 1,910 | 31 ～ 125 | 637 ～ 1,273 | 14 ～ 55 | 1.67 X 0.25 |
| 6 | 2,122 ～ 3,183 | 206 ～ 617 | 1,061 ～ 2,122 | 55 ～ 219 | 796 ～ 1,592 | 31 ～ 123 | 531 ～ 1,061 | 14 ～ 55 | 2 X 0.3 |
| 8 | 1,592 ～ 2,387 | 203 ～ 609 | 796 ～ 1,592 | 54 ～ 216 | 597 ～ 1,194 | 30 ～ 122 | 398 ～ 796 | 14 ～ 54 | 2.67 X 0.4 |
| 10 | 1,273 ～ 1,910 | 201 ～ 604 | 637 ～ 1,273 | 54 ～ 215 | 477 ～ 955 | 30 ～ 121 | 318 ～ 637 | 13 ～ 54 | 3.33 X 0.5 |
| 12 | 1,061 ～ 1,592 | 200 ～ 601 | 531 ～ 1,061 | 53 ～ 214 | 398 ～ 796 | 30 ～ 120 | 265 ～ 531 | 13 ～ 53 | 4 X 0.6 |
| 16 | 796 ～ 1,194 | 199 ～ 597 | 398 ～ 796 | 53 ～ 212 | 298 ～ 597 | 30 ～ 119 | 199 ～ 398 | 13 ～ 53 | 5.33 X 0.8 |
| 角度 Taper Angle | 8° ～ 10° | | | | | | | | |
| 0.5 | 25,466 ～ 38,198 | 325 ～ 974 | 12,733 ～ 25,466 | 87 ～ 346 | 9,550 ～ 19,099 | 49 ～ 195 | 6,366 ～ 12,733 | 22 ～ 87 | 0.14 X 0.025 |
| 1 | 12,733 ～ 19,099 | 260 ～ 779 | 6,366 ～ 12,733 | 69 ～ 277 | 4,775 ～ 9,550 | 39 ～ 156 | 3,183 ～ 6,366 | 17 ～ 69 | 0.29 X 0.05 |
| 1.5 | 8,489 ～ 12,733 | 238 ～ 714 | 4,244 ～ 8,489 | 63 ～ 254 | 3,183 ～ 6,366 | 36 ～ 143 | 2,122 ～ 4,244 | 16 ～ 63 | 0.43 X 0.075 |
| 2 | 6,366 ～ 9,550 | 227 ～ 682 | 3,183 ～ 6,366 | 61 ～ 242 | 2,387 ～ 4,775 | 34 ～ 136 | 1,592 ～ 3,183 | 15 ～ 61 | 0.57 X 0.1 |
| 2.5 | 5,093 ～ 7,640 | 221 ～ 662 | 2,547 ～ 5,093 | 59 ～ 236 | 1,910 ～ 3,820 | 33 ～ 132 | 1,273 ～ 2,547 | 15 ～ 59 | 0.71 X 0.125 |
| 3 | 4,244 ～ 6,366 | 216 ～ 649 | 2,122 ～ 4,244 | 58 ～ 231 | 1,592 ～ 3,183 | 32 ～ 130 | 1,061 ～ 2,122 | 14 ～ 58 | 0.86 X 0.15 |
| 4 | 3,183 ～ 4,775 | 211 ～ 633 | 1,592 ～ 3,183 | 56 ～ 225 | 1,194 ～ 2,387 | 32 ～ 127 | 796 ～ 1,592 | 14 ～ 56 | 1.14 X 0.2 |
| 5 | 2,547 ～ 3,820 | 208 ～ 623 | 1,273 ～ 2,547 | 55 ～ 222 | 955 ～ 1,910 | 31 ～ 125 | 637 ～ 1,273 | 14 ～ 55 | 1.43 X 0.25 |
| 6 | 2,122 ～ 3,183 | 206 ～ 617 | 1,061 ～ 2,122 | 55 ～ 219 | 796 ～ 1,592 | 31 ～ 123 | 531 ～ 1,061 | 14 ～ 55 | 1.71 X 0.3 |
| 8 | 1,592 ～ 2,387 | 203 ～ 609 | 796 ～ 1,592 | 54 ～ 216 | 597 ～ 1,194 | 30 ～ 122 | 398 ～ 796 | 14 ～ 54 | 2.29 X 0.4 |
| 10 | 1,273 ～ 1,910 | 201 ～ 604 | 637 ～ 1,273 | 54 ～ 215 | 477 ～ 955 | 30 ～ 121 | 318 ～ 637 | 13 ～ 54 | 2.86 X 0.5 |
| 12 | 1,061 ～ 1,592 | 200 ～ 601 | 531 ～ 1,061 | 53 ～ 214 | 398 ～ 796 | 30 ～ 120 | 265 ～ 531 | 13 ～ 53 | 3.43 X 0.6 |
| 16 | 796 ～ 1,194 | 199 ～ 597 | 398 ～ 796 | 53 ～ 212 | 298 ～ 597 | 30 ～ 119 | 199 ～ 398 | 13 ～ 53 | 4.57 X 0.8 |
| 角度 Taper Angle | 15° | | | | | | | | |
| 0.5 | 25,466 ～ 38,198 | 325 ～ 974 | 12,733 ～ 25,466 | 87 ～ 346 | 9,550 ～ 19,099 | 49 ～ 195 | 6,366 ～ 12,733 | 22 ～ 87 | 0.13 X 0.025 |
| 1 | 12,733 ～ 19,099 | 260 ～ 779 | 6,366 ～ 12,733 | 69 ～ 277 | 4,775 ～ 9,550 | 39 ～ 156 | 3,183 ～ 6,366 | 17 ～ 69 | 0.25 X 0.05 |
| 1.5 | 8,489 ～ 12,733 | 238 ～ 714 | 4,244 ～ 8,489 | 63 ～ 254 | 3,183 ～ 6,366 | 36 ～ 143 | 2,122 ～ 4,244 | 16 ～ 63 | 0.38 X 0.075 |
| 2 | 6,366 ～ 9,550 | 227 ～ 682 | 3,183 ～ 6,366 | 61 ～ 242 | 2,387 ～ 4,775 | 34 ～ 136 | 1,592 ～ 3,183 | 15 ～ 61 | 0.5 X 0.1 |
| 2.5 | 5,093 ～ 7,640 | 221 ～ 662 | 2,547 ～ 5,093 | 59 ～ 236 | 1,910 ～ 3,820 | 33 ～ 132 | 1,273 ～ 2,547 | 15 ～ 59 | 0.63 X 0.125 |
| 3 | 4,244 ～ 6,366 | 216 ～ 649 | 2,122 ～ 4,244 | 58 ～ 231 | 1,592 ～ 3,183 | 32 ～ 130 | 1,061 ～ 2,122 | 14 ～ 58 | 0.75 X 0.15 |
| 4 | 3,183 ～ 4,775 | 211 ～ 633 | 1,592 ～ 3,183 | 56 ～ 225 | 1,194 ～ 2,387 | 32 ～ 127 | 796 ～ 1,592 | 14 ～ 56 | 1 X 0.2 |
| 5 | 2,547 ～ 3,820 | 208 ～ 623 | 1,273 ～ 2,547 | 55 ～ 222 | 955 ～ 1,910 | 31 ～ 125 | 637 ～ 1,273 | 14 ～ 55 | 1.25 X 0.25 |
| 6 | 2,122 ～ 3,183 | 206 ～ 617 | 1,061 ～ 2,122 | 55 ～ 219 | 796 ～ 1,592 | 31 ～ 123 | 531 ～ 1,061 | 14 ～ 55 | 1.5 X 0.3 |
| 8 | 1,592 ～ 2,387 | 203 ～ 609 | 796 ～ 1,592 | 54 ～ 216 | 597 ～ 1,194 | 30 ～ 122 | 398 ～ 796 | 14 ～ 54 | 2 X 0.4 |
| 10 | 1,273 ～ 1,910 | 201 ～ 604 | 637 ～ 1,273 | 54 ～ 215 | 477 ～ 955 | 30 ～ 121 | 318 ～ 637 | 13 ～ 54 | 2.5 X 0.5 |
| 12 | 1,061 ～ 1,592 | 200 ～ 601 | 531 ～ 1,061 | 53 ～ 214 | 398 ～ 796 | 30 ～ 120 | 265 ～ 531 | 13 ～ 53 | 3 X 0.6 |
| 16 | 796 ～ 1,194 | 199 ～ 597 | 398 ～ 796 | 53 ～ 212 | 298 ～ 597 | 30 ～ 119 | 199 ～ 398 | 13 ～ 53 | 4 X 0.8 |

## ●CSTBE　超硬ソリッドテーパーボールエンドミル
## ●CSTBEL　超硬ソリッドロングテーパーボールエンドミル

| R | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 40~60m/min | | 切削速度 Cutting Speed 20~40m/min | | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 10~20m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 深 X 幅 Depth x Width |
| **0.5** | 12,733 ~ 19,099 | 1,480 ~ 4,441 | 6,366 ~ 12,733 | 493 ~ 1,974 | 4,775 ~ 9,550 | 296 ~ 1,184 | 3,183 ~ 6,366 | 148 ~ 592 | 0.1 X0.3 |
| **0.75** | 8,489 ~ 12,733 | 1,003 ~ 3,008 | 4,244 ~ 8,489 | 334 ~ 1,337 | 3,183 ~ 6,366 | 201 ~ 802 | 2,122 ~ 4,244 | 100 ~ 401 | 0.15X0.45 |
| **1** | 6,366 ~ 9,550 | 764 ~ 2,292 | 3,183 ~ 6,366 | 255 ~ 1,019 | 2,387 ~ 4,775 | 153 ~ 611 | 1,592 ~ 3,183 | 76 ~ 306 | 0.2 X0.6 |
| **1.25** | 5,093 ~ 7,640 | 621 ~ 1,862 | 2,547 ~ 5,093 | 207 ~ 828 | 1,910 ~ 3,820 | 124 ~ 497 | 1,273 ~ 2,547 | 62 ~ 248 | 0.25X0.75 |
| **1.5** | 4,244 ~ 6,366 | 525 ~ 1,576 | 2,122 ~ 4,244 | 175 ~ 700 | 1,592 ~ 3,183 | 105 ~ 420 | 1,061 ~ 2,122 | 53 ~ 210 | 0.3 X0.9 |
| **1.75** | 3,638 ~ 5,457 | 457 ~ 1,371 | 1,819 ~ 3,638 | 152 ~ 609 | 1,364 ~ 2,728 | 91 ~ 366 | 909 ~ 1,819 | 46 ~ 183 | 0.35X1.05 |
| **2** | 3,183 ~ 4,775 | 406 ~ 1,218 | 1,592 ~ 3,183 | 135 ~ 541 | 1,194 ~ 2,387 | 81 ~ 325 | 796 ~ 1,592 | 41 ~ 162 | 0.4 X1.2 |
| **2.25** | 2,830 ~ 4,244 | 366 ~ 1,098 | 1,415 ~ 2,830 | 122 ~ 488 | 1,061 ~ 2,122 | 73 ~ 293 | 707 ~ 1,415 | 37 ~ 146 | 0.45X1.35 |
| **2.5** | 2,547 ~ 3,820 | 334 ~ 1,003 | 1,273 ~ 2,547 | 111 ~ 446 | 955 ~ 1,910 | 67 ~ 267 | 637 ~ 1,273 | 33 ~ 134 | 0.5 X1.5 |
| **2.75** | 2,315 ~ 3,473 | 308 ~ 925 | 1,158 ~ 2,315 | 103 ~ 411 | 868 ~ 1,736 | 62 ~ 247 | 579 ~ 1,158 | 31 ~ 123 | 0.55X1.65 |
| **3** | 2,122 ~ 3,183 | 286 ~ 859 | 1,061 ~ 2,122 | 95 ~ 382 | 796 ~ 1,592 | 57 ~ 229 | 531 ~ 1,061 | 29 ~ 115 | 0.6 X1.8 |
| **3.25** | 1,959 ~ 2,938 | 268 ~ 804 | 979 ~ 1,959 | 89 ~ 357 | 735 ~ 1,469 | 54 ~ 214 | 490 ~ 979 | 27 ~ 107 | 0.65X1.95 |
| **3.5** | 1,819 ~ 2,728 | 252 ~ 757 | 909 ~ 1,819 | 84 ~ 337 | 682 ~ 1,364 | 50 ~ 202 | 455 ~ 909 | 25 ~ 101 | 0.7 X2.1 |
| **3.75** | 1,698 ~ 2,547 | 239 ~ 716 | 849 ~ 1,698 | 80 ~ 318 | 637 ~ 1,273 | 48 ~ 191 | 424 ~ 849 | 24 ~ 95 | 0.75X2.25 |
| **4** | 1,592 ~ 2,387 | 227 ~ 680 | 796 ~ 1,592 | 76 ~ 302 | 597 ~ 1,194 | 45 ~ 181 | 398 ~ 796 | 23 ~ 91 | 0.8 X2.4 |
| **4.25** | 1,498 ~ 2,247 | 216 ~ 649 | 749 ~ 1,498 | 72 ~ 288 | 562 ~ 1,123 | 43 ~ 173 | 374 ~ 749 | 22 ~ 87 | 0.85X2.55 |
| **4.5** | 1,415 ~ 2,122 | 207 ~ 621 | 707 ~ 1,415 | 69 ~ 276 | 531 ~ 1,061 | 41 ~ 166 | 354 ~ 707 | 21 ~ 83 | 0.9 X2.7 |
| **4.75** | 1,340 ~ 2,010 | 199 ~ 596 | 670 ~ 1,340 | 66 ~ 265 | 503 ~ 1,005 | 40 ~ 159 | 335 ~ 670 | 20 ~ 79 | 0.95X2.85 |
| **5** | 1,273 ~ 1,910 | 191 ~ 573 | 637 ~ 1,273 | 64 ~ 255 | 477 ~ 955 | 38 ~ 153 | 318 ~ 637 | 19 ~ 76 | 1 X3 |
| **6** | 1,061 ~ 1,592 | 167 ~ 501 | 531 ~ 1,061 | 56 ~ 223 | 398 ~ 796 | 33 ~ 134 | 265 ~ 531 | 17 ~ 67 | 1.2 X3.6 |
| **8** | 796 ~ 1,194 | 137 ~ 412 | 398 ~ 796 | 46 ~ 183 | 298 ~ 597 | 27 ~ 110 | 199 ~ 398 | 14 ~ 55 | 1.6 X4.8 |



## ●CRM-2　超硬ソリッド台形ランナーエンドミル

| 小径 Minor Dia. | 非鉄金属 Al. Cu 切削速度 Cutting Speed 40~60m/min | | 炭素鋼 FC. FCD. S50C 切削速度 Cutting Speed 20~40m/min | | 合金鋼 SCM. SKD. SUS304 切削速度 Cutting Speed 15~30m/min | | 調質鋼 HPM. NAK 切削速度 Cutting Speed 10~20m/min | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 深 X 幅 Depth x Width |
| 角度 Taper Angle | 5° ～ 7° | | | | | | | | |
| 1 | 12,733 ～ 19,099 | 260 ～ 779 | 6,366 ～ 12,733 | 69 ～ 277 | 4,775 ～ 9,550 | 39 ～ 156 | 3,183 ～ 6,366 | 17 ～ 69 | 0.33X0.05 |
| 1.5 | 8,489 ～ 12,733 | 238 ～ 714 | 4,244 ～ 8,489 | 63 ～ 254 | 3,183 ～ 6,366 | 36 ～ 143 | 2,122 ～ 4,244 | 16 ～ 63 | 0.5 X0.08 |
| 2 | 6,366 ～ 9,550 | 227 ～ 682 | 3,183 ～ 6,366 | 61 ～ 242 | 2,387 ～ 4,775 | 34 ～ 136 | 1,592 ～ 3,183 | 15 ～ 61 | 0.67X0.1 |
| 2.5 | 5,093 ～ 7,640 | 221 ～ 662 | 2,547 ～ 5,093 | 59 ～ 236 | 1,910 ～ 3,820 | 33 ～ 132 | 1,273 ～ 2,547 | 15 ～ 59 | 0.83X0.13 |
| 3 | 4,244 ～ 6,366 | 216 ～ 649 | 2,122 ～ 4,244 | 58 ～ 231 | 1,592 ～ 3,183 | 32 ～ 130 | 1,061 ～ 2,122 | 14 ～ 58 | 1 X0.15 |
| 3.5 | 3,638 ～ 5,457 | 213 ～ 640 | 1,819 ～ 3,638 | 57 ～ 228 | 1,364 ～ 2,728 | 32 ～ 128 | 909 ～ 1,819 | 14 ～ 57 | 1.17X0.18 |
| 4 | 3,183 ～ 4,775 | 211 ～ 633 | 1,592 ～ 3,183 | 56 ～ 225 | 1,194 ～ 2,387 | 32 ～ 127 | 796 ～ 1,592 | 14 ～ 56 | 1.33X0.2 |
| 5 | 2,547 ～ 3,820 | 208 ～ 623 | 1,273 ～ 2,547 | 55 ～ 222 | 955 ～ 1,910 | 31 ～ 125 | 637 ～ 1,273 | 14 ～ 55 | 1.67X0.25 |
| 6 | 2,122 ～ 3,183 | 206 ～ 617 | 1,061 ～ 2,122 | 55 ～ 219 | 796 ～ 1,592 | 31 ～ 123 | 531 ～ 1,061 | 14 ～ 55 | 2 X0.3 |
| 角度 Taper Angle | 10° | | | | | | | | |
| 1 | 12,733 ～ 19,099 | 260 ～ 779 | 6,366 ～ 12,733 | 69 ～ 277 | 4,775 ～ 9,550 | 39 ～ 156 | 3,183 ～ 6,366 | 17 ～ 69 | 0.29X0.05 |
| 1.5 | 8,489 ～ 12,733 | 238 ～ 714 | 4,244 ～ 8,489 | 63 ～ 254 | 3,183 ～ 6,366 | 36 ～ 143 | 2,122 ～ 4,244 | 16 ～ 63 | 0.43X0.08 |
| 2 | 6,366 ～ 9,550 | 227 ～ 682 | 3,183 ～ 6,366 | 61 ～ 242 | 2,387 ～ 4,775 | 34 ～ 136 | 1,592 ～ 3,183 | 15 ～ 61 | 0.57X0.1 |
| 2.5 | 5,093 ～ 7,640 | 221 ～ 662 | 2,547 ～ 5,093 | 59 ～ 236 | 1,910 ～ 3,820 | 33 ～ 132 | 1,273 ～ 2,547 | 15 ～ 59 | 0.71X0.13 |
| 3 | 4,244 ～ 6,366 | 216 ～ 649 | 2,122 ～ 4,244 | 58 ～ 231 | 1,592 ～ 3,183 | 32 ～ 130 | 1,061 ～ 2,122 | 14 ～ 58 | 0.86X0.15 |
| 3.5 | 3,638 ～ 5,457 | 213 ～ 640 | 1,819 ～ 3,638 | 57 ～ 228 | 1,364 ～ 2,728 | 32 ～ 128 | 909 ～ 1,819 | 14 ～ 57 | 1 X0.18 |
| 4 | 3,183 ～ 4,775 | 211 ～ 633 | 1,592 ～ 3,183 | 56 ～ 225 | 1,194 ～ 2,387 | 32 ～ 127 | 796 ～ 1,592 | 14 ～ 56 | 1.14X0.2 |
| 5 | 2,547 ～ 3,820 | 208 ～ 623 | 1,273 ～ 2,547 | 55 ～ 222 | 955 ～ 1,910 | 31 ～ 125 | 637 ～ 1,273 | 14 ～ 55 | 1.43X0.25 |
| 6 | 2,122 ～ 3,183 | 206 ～ 617 | 1,061 ～ 2,122 | 55 ～ 219 | 796 ～ 1,592 | 31 ～ 123 | 531 ～ 1,061 | 14 ～ 55 | 1.71X0.3 |
| 角度 Taper Angle | 15° | | | | | | | | |
| 1 | 12,733 ～ 19,099 | 260 ～ 779 | 6,366 ～ 12,733 | 69 ～ 277 | 4,775 ～ 9,550 | 39 ～ 156 | 3,183 ～ 6,366 | 17 ～ 69 | 0.25X0.05 |
| 1.5 | 8,489 ～ 12,733 | 238 ～ 714 | 4,244 ～ 8,489 | 63 ～ 254 | 3,183 ～ 6,366 | 36 ～ 143 | 2,122 ～ 4,244 | 16 ～ 63 | 0.38X0.08 |
| 2 | 6,366 ～ 9,550 | 227 ～ 682 | 3,183 ～ 6,366 | 61 ～ 242 | 2,387 ～ 4,775 | 34 ～ 136 | 1,592 ～ 3,183 | 15 ～ 61 | 0.5 X0.1 |
| 2.5 | 5,093 ～ 7,640 | 221 ～ 662 | 2,547 ～ 5,093 | 59 ～ 236 | 1,910 ～ 3,820 | 33 ～ 132 | 1,273 ～ 2,547 | 15 ～ 59 | 0.63X0.13 |
| 3 | 4,244 ～ 6,366 | 216 ～ 649 | 2,122 ～ 4,244 | 58 ～ 231 | 1,592 ～ 3,183 | 32 ～ 130 | 1,061 ～ 2,122 | 14 ～ 58 | 0.75X0.15 |
| 3.5 | 3,638 ～ 5,457 | 213 ～ 640 | 1,819 ～ 3,638 | 57 ～ 228 | 1,364 ～ 2,728 | 32 ～ 128 | 909 ～ 1,819 | 14 ～ 57 | 0.88X0.18 |
| 4 | 3,183 ～ 4,775 | 211 ～ 633 | 1,592 ～ 3,183 | 56 ～ 225 | 1,194 ～ 2,387 | 32 ～ 127 | 796 ～ 1,592 | 14 ～ 56 | 1 X0.2 |
| 5 | 2,547 ～ 3,820 | 208 ～ 623 | 1,273 ～ 2,547 | 55 ～ 222 | 955 ～ 1,910 | 31 ～ 125 | 637 ～ 1,273 | 14 ～ 55 | 1.25X0.25 |
| 6 | 2,122 ～ 3,183 | 206 ～ 617 | 1,061 ～ 2,122 | 55 ～ 219 | 796 ～ 1,592 | 31 ～ 123 | 531 ～ 1,061 | 14 ～ 55 | 1.5 X0.3 |
| 角度 Taper Angle | 20° ～ 30° | | | | | | | | |
| 3 | 4,244 ～ 6,366 | 130 ～ 390 | 2,122 ～ 4,244 | 35 ～ 139 | 1,592 ～ 3,183 | 19 ～ 78 | 1,061 ～ 2,122 | 9 ～ 35 | 0.71X0.15 |
| 3.5 | 3,638 ～ 5,457 | 128 ～ 384 | 1,819 ～ 3,638 | 34 ～ 137 | 1,364 ～ 2,728 | 19 ～ 77 | 909 ～ 1,819 | 9 ～ 34 | 0.83X0.18 |
| 4 | 3,183 ～ 4,775 | 127 ～ 380 | 1,592 ～ 3,183 | 34 ～ 135 | 1,194 ～ 2,387 | 19 ～ 76 | 796 ～ 1,592 | 8 ～ 34 | 0.95X0.2 |
| 5 | 2,547 ～ 3,820 | 125 ～ 374 | 1,273 ～ 2,547 | 33 ～ 133 | 955 ～ 1,910 | 19 ～ 75 | 637 ～ 1,273 | 8 ～ 33 | 1.19X0.25 |
| 6 | 2,122 ～ 3,183 | 123 ～ 370 | 1,061 ～ 2,122 | 33 ～ 132 | 796 ～ 1,592 | 19 ～ 74 | 531 ～ 1,061 | 8 ～ 33 | 1.43X0.3 |

## ●CRM-P　超硬ソリッド台形ランナーエンドミル（Pコーティング）

| 小径 Minor Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼 HPM. NAK | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 40~60m/min | | 切削速度 Cutting Speed 20~40m/min | | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 10~20m/min | | 深 X 幅 Depth x Width |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 角度 Taper Angle | 5° ～ 7° | | | | | | | | |
| 1 | 12,733 ～ 19,099 | 278 ～ 834 | 6,366 ～ 12,733 | 74 ～ 296 | 4,775 ～ 9,550 | 42 ～ 167 | 3,183 ～ 6,366 | 19 ～ 74 | 0.33X0.05 |
| 1.5 | 8,489 ～ 12,733 | 255 ～ 764 | 4,244 ～ 8,489 | 68 ～ 272 | 3,183 ～ 6,366 | 38 ～ 153 | 2,122 ～ 4,244 | 17 ～ 68 | 0.5 X0.08 |
| 2 | 6,366 ～ 9,550 | 243 ～ 730 | 3,183 ～ 6,366 | 65 ～ 259 | 2,387 ～ 4,775 | 36 ～ 146 | 1,592 ～ 3,183 | 16 ～ 65 | 0.67X0.1 |
| 2.5 | 5,093 ～ 7,640 | 236 ～ 709 | 2,547 ～ 5,093 | 63 ～ 252 | 1,910 ～ 3,820 | 35 ～ 142 | 1,273 ～ 2,547 | 16 ～ 63 | 0.83X0.13 |
| 3 | 4,244 ～ 6,366 | 232 ～ 695 | 2,122 ～ 4,244 | 62 ～ 247 | 1,592 ～ 3,183 | 35 ～ 139 | 1,061 ～ 2,122 | 15 ～ 62 | 1 X0.15 |
| 3.5 | 3,638 ～ 5,457 | 228 ～ 685 | 1,819 ～ 3,638 | 61 ～ 244 | 1,364 ～ 2,728 | 34 ～ 137 | 909 ～ 1,819 | 15 ～ 61 | 1.17X0.18 |
| 4 | 3,183 ～ 4,775 | 226 ～ 677 | 1,592 ～ 3,183 | 60 ～ 241 | 1,194 ～ 2,387 | 34 ～ 135 | 796 ～ 1,592 | 15 ～ 60 | 1.33X0.2 |
| 5 | 2,547 ～ 3,820 | 222 ～ 667 | 1,273 ～ 2,547 | 59 ～ 237 | 955 ～ 1,910 | 33 ～ 133 | 637 ～ 1,273 | 15 ～ 59 | 1.67X0.25 |
| 6 | 2,122 ～ 3,183 | 220 ～ 660 | 1,061 ～ 2,122 | 59 ～ 235 | 796 ～ 1,592 | 33 ～ 132 | 531 ～ 1,061 | 15 ～ 59 | 2 X0.3 |
| 角度 Taper Angle | 10° | | | | | | | | |
| 1 | 12,733 ～ 19,099 | 278 ～ 834 | 6,366 ～ 12,733 | 74 ～ 296 | 4,775 ～ 9,550 | 42 ～ 167 | 3,183 ～ 6,366 | 19 ～ 74 | 0.29X0.05 |
| 1.5 | 8,489 ～ 12,733 | 255 ～ 764 | 4,244 ～ 8,489 | 68 ～ 272 | 3,183 ～ 6,366 | 38 ～ 153 | 2,122 ～ 4,244 | 17 ～ 68 | 0.43X0.08 |
| 2 | 6,366 ～ 9,550 | 243 ～ 730 | 3,183 ～ 6,366 | 65 ～ 259 | 2,387 ～ 4,775 | 36 ～ 146 | 1,592 ～ 3,183 | 16 ～ 65 | 0.57X0.1 |
| 2.5 | 5,093 ～ 7,640 | 236 ～ 709 | 2,547 ～ 5,093 | 63 ～ 252 | 1,910 ～ 3,820 | 35 ～ 142 | 1,273 ～ 2,547 | 16 ～ 63 | 0.71X0.13 |
| 3 | 4,244 ～ 6,366 | 232 ～ 695 | 2,122 ～ 4,244 | 62 ～ 247 | 1,592 ～ 3,183 | 35 ～ 139 | 1,061 ～ 2,122 | 15 ～ 62 | 0.86X0.15 |
| 3.5 | 3,638 ～ 5,457 | 228 ～ 685 | 1,819 ～ 3,638 | 61 ～ 244 | 1,364 ～ 2,728 | 34 ～ 137 | 909 ～ 1,819 | 15 ～ 61 | 1 X0.18 |
| 4 | 3,183 ～ 4,775 | 226 ～ 677 | 1,592 ～ 3,183 | 60 ～ 241 | 1,194 ～ 2,387 | 34 ～ 135 | 796 ～ 1,592 | 15 ～ 60 | 1.14X0.2 |
| 5 | 2,547 ～ 3,820 | 222 ～ 667 | 1,273 ～ 2,547 | 59 ～ 237 | 955 ～ 1,910 | 33 ～ 133 | 637 ～ 1,273 | 15 ～ 59 | 1.43X0.25 |
| 6 | 2,122 ～ 3,183 | 220 ～ 660 | 1,061 ～ 2,122 | 59 ～ 235 | 796 ～ 1,592 | 33 ～ 132 | 531 ～ 1,061 | 15 ～ 59 | 1.71X0.33 |
| 角度 Taper Angle | 15° | | | | | | | | |
| 1 | 12,733 ～ 19,099 | 275 ～ 826 | 6,366 ～ 12,733 | 73 ～ 294 | 4,775 ～ 9,550 | 41 ～ 165 | 3,183 ～ 6,366 | 18 ～ 73 | 0.25X0.05 |
| 1.5 | 8,489 ～ 12,733 | 252 ～ 757 | 4,244 ～ 8,489 | 67 ～ 269 | 3,183 ～ 6,366 | 38 ～ 151 | 2,122 ～ 4,244 | 17 ～ 67 | 0.38X0.08 |
| 2 | 6,366 ～ 9,550 | 241 ～ 723 | 3,183 ～ 6,366 | 64 ～ 257 | 2,387 ～ 4,775 | 36 ～ 145 | 1,592 ～ 3,183 | 16 ～ 64 | 0.5 X0.1 |
| 2.5 | 5,093 ～ 7,640 | 234 ～ 702 | 2,547 ～ 5,093 | 62 ～ 250 | 1,910 ～ 3,820 | 35 ～ 140 | 1,273 ～ 2,547 | 16 ～ 62 | 0.63X0.13 |
| 3 | 4,244 ～ 6,366 | 229 ～ 688 | 2,122 ～ 4,244 | 61 ～ 245 | 1,592 ～ 3,183 | 34 ～ 138 | 1,061 ～ 2,122 | 15 ～ 61 | 0.75X0.15 |
| 3.5 | 3,638 ～ 5,457 | 226 ～ 679 | 1,819 ～ 3,638 | 60 ～ 241 | 1,364 ～ 2,728 | 34 ～ 136 | 909 ～ 1,819 | 15 ～ 60 | 0.88X0.18 |
| 4 | 3,183 ～ 4,775 | 224 ～ 671 | 1,592 ～ 3,183 | 60 ～ 239 | 1,194 ～ 2,387 | 34 ～ 134 | 796 ～ 1,592 | 15 ～ 60 | 1 X0.2 |
| 5 | 2,547 ～ 3,820 | 220 ～ 661 | 1,273 ～ 2,547 | 59 ～ 235 | 955 ～ 1,910 | 33 ～ 132 | 637 ～ 1,273 | 15 ～ 59 | 1.25X0.25 |
| 6 | 2,122 ～ 3,183 | 218 ～ 654 | 1,061 ～ 2,122 | 58 ～ 233 | 796 ～ 1,592 | 33 ～ 131 | 531 ～ 1,061 | 15 ～ 58 | 1.5 X0.3 |
| 角度 Taper Angle | 20° ～ 30° | | | | | | | | |
| 3 | 4,244 ～ 6,366 | 136 ～ 409 | 2,122 ～ 4,244 | 36 ～ 145 | 1,592 ～ 3,183 | 20 ～ 82 | 1,061 ～ 2,122 | 9 ～ 36 | 0.71X0.15 |
| 3.5 | 3,638 ～ 5,457 | 134 ～ 403 | 1,819 ～ 3,638 | 36 ～ 143 | 1,364 ～ 2,728 | 20 ～ 81 | 909 ～ 1,819 | 9 ～ 36 | 0.83X0.18 |
| 4 | 3,183 ～ 4,775 | 133 ～ 399 | 1,592 ～ 3,183 | 35 ～ 142 | 1,194 ～ 2,387 | 20 ～ 80 | 796 ～ 1,592 | 9 ～ 35 | 0.95X0.2 |
| 5 | 2,547 ～ 3,820 | 131 ～ 393 | 1,273 ～ 2,547 | 35 ～ 140 | 955 ～ 1,910 | 20 ～ 79 | 637 ～ 1,273 | 9 ～ 35 | 1.19X0.25 |
| 6 | 2,122 ～ 3,183 | 130 ～ 389 | 1,061 ～ 2,122 | 35 ～ 138 | 796 ～ 1,592 | 19 ～ 78 | 531 ～ 1,061 | 9 ～ 35 | 1.43X0.3 |
| 角度 Taper Angle | 35° ～ 40° | | | | | | | | |
| 3 | 3,537 ～ 5,305 | 114 ～ 341 | 1,768 ～ 3,537 | 30 ～ 121 | 1,326 ～ 2,653 | 17 ～ 68 | 884 ～ 1,768 | 8 ～ 30 | 0.71X0.15 |
| 3.5 | 3,032 ～ 4,547 | 112 ～ 336 | 1,516 ～ 3,032 | 30 ～ 119 | 1,137 ～ 2,274 | 17 ～ 67 | 758 ～ 1,516 | 7 ～ 30 | 0.83X0.18 |
| 4 | 2,653 ～ 3,979 | 111 ～ 332 | 1,326 ～ 2,653 | 30 ～ 118 | 995 ～ 1,989 | 17 ～ 66 | 663 ～ 1,326 | 7 ～ 30 | 0.95X0.2 |
| 5 | 2,122 ～ 3,183 | 109 ～ 327 | 1,061 ～ 2,122 | 29 ～ 116 | 796 ～ 1,592 | 16 ～ 65 | 531 ～ 1,061 | 7 ～ 29 | 1.19X0.25 |
| 6 | 1,768 ～ 2,653 | 108 ～ 324 | 884 ～ 1,768 | 29 ～ 115 | 663 ～ 1,326 | 16 ～ 65 | 442 ～ 884 | 7 ～ 29 | 1.43X0.3 |
| 角度 Taper Angle | 45° | | | | | | | | |
| 3 | 2,830 ～ 4,244 | 91 ～ 273 | 1,415 ～ 2,830 | 24 ～ 97 | 1,061 ～ 2,122 | 14 ～ 55 | 707 ～ 1,415 | 6 ～ 24 | 0.67X0.15 |
| 3.5 | 2,425 ～ 3,638 | 90 ～ 269 | 1,213 ～ 2,425 | 24 ～ 96 | 909 ～ 1,819 | 13 ～ 54 | 606 ～ 1,213 | 6 ～ 24 | 0.78X0.18 |
| 4 | 2,122 ～ 3,183 | 89 ～ 266 | 1,061 ～ 2,122 | 24 ～ 95 | 796 ～ 1,592 | 13 ～ 53 | 531 ～ 1,061 | 6 ～ 24 | 0.89X0.2 |
| 5 | 1,698 ～ 2,547 | 87 ～ 262 | 849 ～ 1,698 | 23 ～ 93 | 637 ～ 1,273 | 13 ～ 52 | 424 ～ 849 | 6 ～ 23 | 1.11X0.25 |
| 6 | 1,415 ～ 2,122 | 86 ～ 259 | 707 ～ 1,415 | 23 ～ 92 | 531 ～ 1,061 | 13 ～ 52 | 354 ～ 707 | 6 ～ 23 | 1.33X0.3 |

## ●CSRT-A　超硬リバースカッター（超硬ソリッド逆テーパーエンドミル）

| 外径 Dia. at Large End | 非鉄金属 Al. Cu 切削速度 Cutting Speed 40~60m/min | | 炭素鋼 FC. FCD. S50C 切削速度 Cutting Speed 20~40m/min | | 合金鋼 SCM. SKD. SUS304 切削速度 Cutting Speed 15~30m/min | | 調質鋼 HPM. NAK 切削速度 Cutting Speed 10~20m/min | | 切込み量 Depth of Cut 深 X 幅 Depth x Width |
|---|---|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 角度 Taper Angle | 0.5° ～ 2° | | | | | | | | |
| 2 | 6,366 ～ 9,550 | 143 ～ 321 | 3,183 ～ 6,366 | 36 ～ 107 | 2,387 ～ 4,775 | 20 ～ 60 | 1,592 ～ 3,183 | 9 ～ 27 | 0.67 X 0.1 |
| 2.5 | 5,093 ～ 7,640 | 139 ～ 312 | 2,547 ～ 5,093 | 35 ～ 104 | 1,910 ～ 3,820 | 19 ～ 58 | 1,273 ～ 2,547 | 9 ～ 26 | 0.83 X 0.13 |
| 3 | 4,244 ～ 6,366 | 136 ～ 306 | 2,122 ～ 4,244 | 34 ～ 102 | 1,592 ～ 3,183 | 19 ～ 57 | 1,061 ～ 2,122 | 8 ～ 25 | 1 X 0.15 |
| 4 | 3,183 ～ 4,775 | 132 ～ 298 | 1,592 ～ 3,183 | 33 ～ 99 | 1,194 ～ 2,387 | 19 ～ 56 | 796 ～ 1,592 | 8 ～ 25 | 1.33 X 0.2 |
| 5 | 2,547 ～ 3,820 | 130 ～ 293 | 1,273 ～ 2,547 | 33 ～ 98 | 955 ～ 1,910 | 18 ～ 55 | 637 ～ 1,273 | 8 ～ 24 | 1.67 X 0.25 |
| 6 | 2,122 ～ 3,183 | 129 ～ 290 | 1,061 ～ 2,122 | 32 ～ 97 | 796 ～ 1,592 | 18 ～ 54 | 531 ～ 1,061 | 8 ～ 24 | 2 X 0.3 |
| 8 | 1,592 ～ 2,387 | 127 ～ 286 | 796 ～ 1,592 | 32 ～ 95 | 597 ～ 1,194 | 18 ～ 54 | 398 ～ 796 | 8 ～ 24 | 2.67 X 0.4 |
| 10 | 1,273 ～ 1,910 | 126 ～ 284 | 637 ～ 1,273 | 32 ～ 95 | 477 ～ 955 | 18 ～ 53 | 318 ～ 637 | 8 ～ 24 | 3.33 X 0.5 |
| 12 | 1,061 ～ 1,592 | 126 ～ 283 | 531 ～ 1,061 | 31 ～ 94 | 398 ～ 796 | 18 ～ 53 | 265 ～ 531 | 8 ～ 24 | 4 X 0.6 |
| 角度 Taper Angle | 3° ～ 4° | | | | | | | | |
| 2 | 6,366 ～ 9,550 | 179 ～ 403 | 3,183 ～ 6,366 | 45 ～ 134 | 2,387 ～ 4,775 | 25 ～ 76 | 1,592 ～ 3,183 | 11 ～ 34 | 0.67 X 0.1 |
| 2.5 | 5,093 ～ 7,640 | 165 ～ 372 | 2,547 ～ 5,093 | 41 ～ 124 | 1,910 ～ 3,820 | 23 ～ 70 | 1,273 ～ 2,547 | 10 ～ 31 | 0.83 X 0.13 |
| 3 | 4,244 ～ 6,366 | 156 ～ 351 | 2,122 ～ 4,244 | 39 ～ 117 | 1,592 ～ 3,183 | 22 ～ 66 | 1,061 ～ 2,122 | 10 ～ 29 | 1 X 0.15 |
| 4 | 3,183 ～ 4,775 | 145 ～ 325 | 1,592 ～ 3,183 | 36 ～ 108 | 1,194 ～ 2,387 | 20 ～ 61 | 796 ～ 1,592 | 9 ～ 27 | 1.33 X 0.2 |
| 5 | 2,547 ～ 3,820 | 138 ～ 310 | 1,273 ～ 2,547 | 34 ～ 103 | 955 ～ 1,910 | 19 ～ 58 | 637 ～ 1,273 | 9 ～ 26 | 1.67 X 0.25 |
| 6 | 2,122 ～ 3,183 | 133 ～ 299 | 1,061 ～ 2,122 | 33 ～ 100 | 796 ～ 1,592 | 19 ～ 56 | 531 ～ 1,061 | 8 ～ 25 | 2 X 0.3 |
| 8 | 1,592 ～ 2,387 | 127 ～ 286 | 796 ～ 1,592 | 32 ～ 95 | 597 ～ 1,194 | 18 ～ 54 | 398 ～ 796 | 8 ～ 24 | 2.67 X 0.4 |
| 10 | 1,273 ～ 1,910 | 124 ～ 279 | 637 ～ 1,273 | 31 ～ 93 | 477 ～ 955 | 17 ～ 52 | 318 ～ 637 | 8 ～ 23 | 3.33 X 0.5 |
| 12 | 1,061 ～ 1,592 | 122 ～ 273 | 531 ～ 1,061 | 30 ～ 91 | 398 ～ 796 | 17 ～ 51 | 265 ～ 531 | 8 ～ 23 | 4 X 0.6 |
| 角度 Taper Angle | 5° | | | | | | | | |
| 2 | 6,366 ～ 9,550 | 198 ～ 445 | 3,183 ～ 6,366 | 49 ～ 148 | 2,387 ～ 4,775 | 28 ～ 83 | 1,592 ～ 3,183 | 12 ～ 37 | 0.67 X 0.1 |
| 2.5 | 5,093 ～ 7,640 | 179 ～ 402 | 2,547 ～ 5,093 | 45 ～ 134 | 1,910 ～ 3,820 | 25 ～ 75 | 1,273 ～ 2,547 | 11 ～ 34 | 0.83 X 0.13 |
| 3 | 4,244 ～ 6,366 | 166 ～ 374 | 2,122 ～ 4,244 | 42 ～ 125 | 1,592 ～ 3,183 | 23 ～ 70 | 1,061 ～ 2,122 | 10 ～ 31 | 1 X 0.15 |
| 4 | 3,183 ～ 4,775 | 151 ～ 339 | 1,592 ～ 3,183 | 38 ～ 113 | 1,194 ～ 2,387 | 21 ～ 64 | 796 ～ 1,592 | 9 ～ 28 | 1.33 X 0.2 |
| 5 | 2,547 ～ 3,820 | 141 ～ 318 | 1,273 ～ 2,547 | 35 ～ 106 | 955 ～ 1,910 | 20 ～ 60 | 637 ～ 1,273 | 9 ～ 27 | 1.67 X 0.25 |
| 6 | 2,122 ～ 3,183 | 135 ～ 304 | 1,061 ～ 2,122 | 34 ～ 101 | 796 ～ 1,592 | 19 ～ 57 | 531 ～ 1,061 | 8 ～ 25 | 2 X 0.3 |
| 8 | 1,592 ～ 2,387 | 127 ～ 286 | 796 ～ 1,592 | 32 ～ 95 | 597 ～ 1,194 | 18 ～ 54 | 398 ～ 796 | 8 ～ 24 | 2.67 X 0.4 |
| 10 | 1,273 ～ 1,910 | 123 ～ 276 | 637 ～ 1,273 | 31 ～ 92 | 477 ～ 955 | 17 ～ 52 | 318 ～ 637 | 8 ～ 23 | 3.33 X 0.5 |
| 12 | 1,061 ～ 1,592 | 120 ～ 269 | 531 ～ 1,061 | 30 ～ 90 | 398 ～ 796 | 17 ～ 50 | 265 ～ 531 | 7 ～ 22 | 4 X 0.6 |

## ●CSME2　超硬スーパーミニエンドミル 2枚刃

| 刃径 Dia. | 刃厚 cut width | 非鉄金属 Al. Cu 切削速度 Cutting Speed 15~30m/min | | 炭素鋼 FC. FCD. S50C 切削速度 Cutting Speed 12~20m/min | | 合金鋼 SCM. SKD. SUS304 切削速度 Cutting Speed 10~16m/min | | 調質鋼 HPM. NAK 切削速度 Cutting Speed 8~14m/min | |
|---|---|---|---|---|---|---|---|---|---|
| | | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 6 | 2～3.5 | 796～1,592 | 48～95 | 637～1,061 | 31～51 | 531～849 | 25～41 | 424～743 | 16～29 |
| | 4～6 | 796～1,592 | 36～72 | 637～1,061 | 23～38 | 531～849 | 19～31 | 424～743 | 12～27 |
| | 7～8 | 796～1,592 | 24～48 | 637～1,061 | 15～25 | 531～849 | 13～20 | 424～743 | 8～18 |
| 8 | 2～3.5 | 597～1,194 | 40～81 | 477～796 | 26～43 | 398～637 | 21～34 | 318～557 | 14～30 |
| | 4～6 | 597～1,194 | 30～60 | 477～796 | 19～32 | 398～637 | 16～26 | 318～557 | 10～23 |
| | 7～8 | 597～1,194 | 20～40 | 477～796 | 13～21 | 398～637 | 11～17 | 318～557 | 7～15 |
| 10 | 2～3.5 | 477～955 | 36～72 | 382～637 | 23～38 | 318～509 | 19～31 | 255～446 | 12～27 |
| | 4～6 | 477～955 | 27～54 | 382～637 | 17～29 | 318～509 | 14～23 | 255～446 | 9～20 |
| | 7～8 | 477～955 | 18～36 | 382～637 | 11～19 | 318～509 | 10～15 | 255～446 | 6～13 |
| 12 | 2～3.5 | 398～796 | 33～66 | 318～531 | 21～35 | 265～424 | 18～28 | 212～371 | 11～25 |
| | 4～6 | 398～796 | 25～49 | 318～531 | 16～26 | 265～424 | 13～21 | 212～371 | 8～18 |
| | 7～8 | 398～796 | 16～33 | 318～531 | 11～18 | 265～424 | 9～14 | 212～371 | 6～12 |

※側削り加工を基準
The above cutting conditions are for side milling.

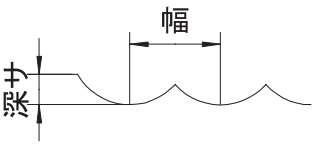
## ●CSME4　超硬スーパーミニエンドミル 4枚刃

| 刃径 Dia. | 刃厚 cut width | 非鉄金属 Al. Cu 切削速度 Cutting Speed 15~30m/min | | 炭素鋼 FC. FCD. S50C 切削速度 Cutting Speed 12~20m/min | | 合金鋼 SCM. SKD. SUS304 切削速度 Cutting Speed 10~16m/min | | 調質鋼 HPM. NAK 切削速度 Cutting Speed 8~14m/min | |
|---|---|---|---|---|---|---|---|---|---|
| | | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min |
| 6 | 2～3.5 | 796～1,592 | 76～153 | 637～1,061 | 49～81 | 531～849 | 41～65 | 424～743 | 26～46 |
| | 4～6 | 796～1,592 | 57～115 | 637～1,061 | 37～61 | 531～849 | 31～49 | 424～743 | 20～43 |
| | 7～8 | 796～1,592 | 38～76 | 637～1,061 | 24～41 | 531～849 | 20～33 | 424～743 | 13～29 |
| 8 | 2～3.5 | 597～1,194 | 64～129 | 477～796 | 41～69 | 398～637 | 34～55 | 318～557 | 22～48 |
| | 4～6 | 597～1,194 | 48～97 | 477～796 | 31～52 | 398～637 | 26～41 | 318～557 | 17～36 |
| | 7～8 | 597～1,194 | 32～64 | 477～796 | 21～34 | 398～637 | 17～28 | 318～557 | 11～24 |
| 10 | 2～3.5 | 477～955 | 57～115 | 382～637 | 37～61 | 318～509 | 31～49 | 255～446 | 20～43 |
| | 4～6 | 477～955 | 43～86 | 382～637 | 28～46 | 318～509 | 23～37 | 255～446 | 15～32 |
| | 7～8 | 477～955 | 29～57 | 382～637 | 18～31 | 318～509 | 15～24 | 255～446 | 10～21 |
| 12 | 2～3.5 | 398～796 | 53～105 | 318～531 | 34～56 | 265～424 | 28～45 | 212～371 | 18～39 |
| | 4～6 | 398～796 | 39～79 | 318～531 | 25～42 | 265～424 | 21～34 | 212～371 | 13～29 |
| | 7～8 | 398～796 | 26～53 | 318～531 | 17～28 | 265～424 | 14～22 | 212～371 | 9～20 |

※側削り加工を基準
The above cutting conditions are for side milling.

**●BE** ボールエンドミル
**●BEL** ロングボールエンドミル
**●BELS** ロングシャンクボールエンドミル
**●HPBE** HPMボールエンドミル

| R | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～ 38HRC HPM. NAK | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~25m/min | | 切削速度 Cutting Speed 10~25m/min | | 切削速度 Cutting Speed 8~20m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 深 X 幅 Depth x Width |
| **0.5** | 4,775 ～ 9,550 | 197 ～ 788 | 3,820 ～ 7,958 | 105 ～ 438 | 3,183 ～ 7,958 | 70 ～ 263 | 2,547 ～ 6,366 | 42 ～ 175 | 0.1X 0.3 |
| **1** | 2,387 ～ 4,775 | 107 ～ 430 | 1,910 ～ 3,979 | 57 ～ 239 | 1,592 ～ 3,979 | 38 ～ 143 | 1,273 ～ 3,183 | 23 ～ 95 | 0.2X 0.6 |
| **1.5** | 1,592 ～ 3,183 | 78 ～ 310 | 1,273 ～ 2,653 | 41 ～ 172 | 1,061 ～ 2,653 | 28 ～ 103 | 849 ～ 2,122 | 17 ～ 69 | 0.3X 0.9 |
| **2** | 1,194 ～ 2,387 | 63 ～ 251 | 955 ～ 1,989 | 33 ～ 139 | 796 ～ 1,989 | 22 ～ 84 | 637 ～ 1,592 | 13 ～ 56 | 0.4X 1.2 |
| **2.5** | 955 ～ 1,910 | 54 ～ 215 | 764 ～ 1,592 | 29 ～ 119 | 637 ～ 1,592 | 19 ～ 72 | 509 ～ 1,273 | 11 ～ 48 | 0.5X 1.5 |
| **3** | 796 ～ 1,592 | 48 ～ 191 | 637 ～ 1,326 | 25 ～ 106 | 531 ～ 1,326 | 17 ～ 64 | 424 ～ 1,061 | 10 ～ 42 | 0.6X 1.8 |
| **3.5** | 682 ～ 1,364 | 43 ～ 174 | 546 ～ 1,137 | 23 ～ 97 | 455 ～ 1,137 | 15 ～ 58 | 364 ～ 909 | 9 ～ 39 | 0.7X 2.1 |
| **4** | 597 ～ 1,194 | 40 ～ 161 | 477 ～ 995 | 21 ～ 90 | 398 ～ 995 | 14 ～ 54 | 318 ～ 796 | 9 ～ 36 | 0.8X 2.4 |
| **4.5** | 531 ～ 1,061 | 38 ～ 151 | 424 ～ 884 | 20 ～ 84 | 354 ～ 884 | 13 ～ 50 | 283 ～ 707 | 8 ～ 34 | 0.9X 2.7 |
| **5** | 477 ～ 955 | 36 ～ 143 | 382 ～ 796 | 19 ～ 80 | 318 ～ 796 | 13 ～ 48 | 255 ～ 637 | 8 ～ 32 | 1 X 3 |
| **5.5** | 434 ～ 868 | 34 ～ 137 | 347 ～ 723 | 18 ～ 76 | 289 ～ 723 | 12 ～ 46 | 232 ～ 579 | 7 ～ 30 | 1.1X 3.3 |
| **6** | 398 ～ 796 | 33 ～ 131 | 318 ～ 663 | 18 ～ 73 | 265 ～ 663 | 12 ～ 44 | 212 ～ 531 | 7 ～ 29 | 1.2X 3.6 |
| **6.5** | 367 ～ 735 | 32 ～ 127 | 294 ～ 612 | 17 ～ 70 | 245 ～ 612 | 11 ～ 42 | 196 ～ 490 | 7 ～ 28 | 1.3X 3.9 |
| **7** | 341 ～ 682 | 31 ～ 123 | 273 ～ 568 | 16 ～ 68 | 227 ～ 568 | 11 ～ 41 | 182 ～ 455 | 7 ～ 27 | 1.4X 4.2 |
| **7.5** | 318 ～ 637 | 30 ～ 119 | 255 ～ 531 | 16 ～ 66 | 212 ～ 531 | 11 ～ 40 | 170 ～ 424 | 6 ～ 27 | 1.5X 4.5 |
| **8** | 298 ～ 597 | 29 ～ 116 | 239 ～ 497 | 16 ～ 65 | 199 ～ 497 | 10 ～ 39 | 159 ～ 398 | 6 ～ 26 | 1.6X 4.8 |
| **8.5** | 281 ～ 562 | 28 ～ 114 | 225 ～ 468 | 15 ～ 63 | 187 ～ 468 | 10 ～ 38 | 150 ～ 374 | 6 ～ 25 | 1.7X 5.1 |
| **9** | 265 ～ 531 | 28 ～ 111 | 212 ～ 442 | 15 ～ 62 | 177 ～ 442 | 10 ～ 37 | 141 ～ 354 | 6 ～ 25 | 1.8X 5.4 |
| **9.5** | 251 ～ 503 | 27 ～ 109 | 201 ～ 419 | 15 ～ 61 | 168 ～ 419 | 10 ～ 36 | 134 ～ 335 | 6 ～ 24 | 1.9X 5.7 |
| **10** | 239 ～ 477 | 27 ～ 107 | 191 ～ 398 | 14 ～ 60 | 159 ～ 398 | 10 ～ 36 | 127 ～ 318 | 6 ～ 24 | 2 X 6 |
| **11** | 217 ～ 434 | 26 ～ 104 | 174 ～ 362 | 14 ～ 58 | 145 ～ 362 | 9 ～ 35 | 116 ～ 289 | 6 ～ 23 | 2.2X 6.6 |
| **12** | 199 ～ 398 | 25 ～ 101 | 159 ～ 332 | 14 ～ 56 | 133 ～ 332 | 9 ～ 34 | 106 ～ 265 | 5 ～ 23 | 2.4X 7.2 |
| **13** | 184 ～ 367 | 25 ～ 99 | 147 ～ 306 | 13 ～ 55 | 122 ～ 306 | 9 ～ 33 | 98 ～ 245 | 5 ～ 22 | 2.6X 7.8 |
| **14** | 171 ～ 341 | 24 ～ 97 | 136 ～ 284 | 13 ～ 54 | 114 ～ 284 | 9 ～ 32 | 91 ～ 227 | 5 ～ 22 | 2.8X 8.4 |
| **15** | 159 ～ 318 | 24 ～ 95 | 127 ～ 265 | 13 ～ 53 | 106 ～ 265 | 8 ～ 32 | 85 ～ 212 | 5 ～ 21 | 3 X 9 |
| **16** | 149 ～ 298 | 24 ～ 94 | 119 ～ 249 | 13 ～ 52 | 99 ～ 249 | 8 ～ 31 | 80 ～ 199 | 5 ～ 21 | 3.2X 9.6 |
| **17** | 140 ～ 281 | 23 ～ 93 | 112 ～ 234 | 12 ～ 51 | 94 ～ 234 | 8 ～ 31 | 75 ～ 187 | 5 ～ 21 | 3.4X10.2 |
| **18** | 133 ～ 265 | 23 ～ 92 | 106 ～ 221 | 12 ～ 51 | 88 ～ 221 | 8 ～ 31 | 71 ～ 177 | 5 ～ 20 | 3.6X10.8 |
| **19** | 126 ～ 251 | 23 ～ 90 | 101 ～ 209 | 12 ～ 50 | 84 ～ 209 | 8 ～ 30 | 67 ～ 168 | 5 ～ 20 | 3.8X11.4 |
| **20** | 119 ～ 239 | 22 ～ 90 | 95 ～ 199 | 12 ～ 50 | 80 ～ 199 | 8 ～ 30 | 64 ～ 159 | 5 ～ 20 | 4 X12 |
| **25** | 95 ～ 191 | 21 ～ 86 | 76 ～ 159 | 11 ～ 48 | 64 ～ 159 | 8 ～ 29 | 51 ～ 127 | 5 ～ 19 | 5 X15 |
| **30** | 80 ～ 159 | 21 ～ 84 | 64 ～ 133 | 11 ～ 46 | 53 ～ 133 | 7 ～ 28 | 42 ～ 106 | 4 ～ 19 | 6 X18 |
| **35** | 68 ～ 136 | 20 ～ 82 | 55 ～ 114 | 11 ～ 45 | 45 ～ 114 | 7 ～ 27 | 36 ～ 91 | 4 ～ 18 | 7 X21 |
| **40** | 60 ～ 119 | 20 ～ 81 | 48 ～ 99 | 11 ～ 45 | 40 ～ 99 | 7 ～ 27 | 32 ～ 80 | 4 ～ 18 | 8 X24 |



## ●HPTBE　テーパーボールエンドミル

| R | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～38HRC HPM. NAK | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~25m/min | | 切削速度 Cutting Speed 10~25m/min | | 切削速度 Cutting Speed 8~20m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 深 X 幅 Depth x Width |
| **0.5** | 4,775 ～ 9,550 | 197 ～ 788 | 3,820 ～ 7,958 | 105 ～ 438 | 3,183 ～ 7,958 | 70 ～ 263 | 2,547 ～ 6,366 | 42 ～ 175 | 0.1X0.3 |
| **1** | 2,387 ～ 4,775 | 107 ～ 430 | 1,910 ～ 3,979 | 57 ～ 239 | 1,592 ～ 3,979 | 38 ～ 143 | 1,273 ～ 3,183 | 23 ～ 95 | 0.2X0.6 |
| **1.5** | 1,592 ～ 3,183 | 78 ～ 310 | 1,273 ～ 2,653 | 41 ～ 172 | 1,061 ～ 2,653 | 28 ～ 103 | 849 ～ 2,122 | 17 ～ 69 | 0.3X0.9 |
| **2** | 1,194 ～ 2,387 | 63 ～ 251 | 955 ～ 1,989 | 33 ～ 139 | 796 ～ 1,989 | 22 ～ 84 | 637 ～ 1,592 | 13 ～ 56 | 0.4X1.2 |
| **2.5** | 955 ～ 1,910 | 54 ～ 215 | 764 ～ 1,592 | 29 ～ 119 | 637 ～ 1,592 | 19 ～ 72 | 509 ～ 1,273 | 11 ～ 48 | 0.5X1.5 |
| **3** | 796 ～ 1,592 | 48 ～ 191 | 637 ～ 1,326 | 25 ～ 106 | 531 ～ 1,326 | 17 ～ 64 | 424 ～ 1,061 | 10 ～ 42 | 0.6X1.8 |
| **3.5** | 682 ～ 1,364 | 43 ～ 174 | 546 ～ 1,137 | 23 ～ 97 | 455 ～ 1,137 | 15 ～ 58 | 364 ～ 909 | 9 ～ 39 | 0.7X2.1 |
| **4** | 597 ～ 1,194 | 40 ～ 161 | 477 ～ 995 | 21 ～ 90 | 398 ～ 995 | 14 ～ 54 | 318 ～ 796 | 9 ～ 36 | 0.8X2.4 |
| **4.5** | 531 ～ 1,061 | 38 ～ 151 | 424 ～ 884 | 20 ～ 84 | 354 ～ 884 | 13 ～ 50 | 283 ～ 707 | 8 ～ 34 | 0.9X2.7 |
| **5** | 477 ～ 955 | 36 ～ 143 | 382 ～ 796 | 19 ～ 80 | 318 ～ 796 | 13 ～ 48 | 255 ～ 637 | 8 ～ 32 | 1 X3 |
| **6** | 398 ～ 796 | 33 ～ 131 | 318 ～ 663 | 18 ～ 73 | 265 ～ 663 | 12 ～ 44 | 212 ～ 531 | 7 ～ 29 | 1.2X3.6 |
| **8** | 298 ～ 597 | 29 ～ 116 | 239 ～ 497 | 16 ～ 65 | 199 ～ 497 | 10 ～ 39 | 159 ～ 398 | 6 ～ 26 | 1.6X4.8 |

## ●CEM　C面付エンドミル

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～38HRC HPM. NAK | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 15~30m/min | | 切削速度 Cutting Speed 12~25m/min | | 切削速度 Cutting Speed 10~25m/min | | 切削速度 Cutting Speed 8~20m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 深 X 幅 Depth x Width |
| **3** | 1,592 ～ 3,183 | 105 ～ 420 | 1,273 ～ 2,653 | 34 ～ 140 | 1,061 ～ 2,653 | 21 ～ 105 | 849 ～ 2,122 | 11 ～ 56 | 1.5X0.15 |
| **4** | 1,194 ～ 2,387 | 93 ～ 372 | 955 ～ 1,989 | 30 ～ 124 | 796 ～ 1,989 | 19 ～ 93 | 637 ～ 1,592 | 10 ～ 50 | 2 X0.2 |
| **5** | 955 ～ 1,910 | 86 ～ 344 | 764 ～ 1,592 | 28 ～ 115 | 637 ～ 1,592 | 17 ～ 86 | 509 ～ 1,273 | 9 ～ 46 | 2.5X0.25 |
| **6** | 796 ～ 1,592 | 81 ～ 325 | 637 ～ 1,326 | 26 ～ 108 | 531 ～ 1,326 | 16 ～ 81 | 424 ～ 1,061 | 9 ～ 43 | 3 X0.3 |
| **8** | 597 ～ 1,194 | 75 ～ 301 | 477 ～ 995 | 24 ～ 100 | 398 ～ 995 | 15 ～ 75 | 318 ～ 796 | 8 ～ 40 | 4 X0.4 |
| **10** | 477 ～ 955 | 72 ～ 286 | 382 ～ 796 | 23 ～ 95 | 318 ～ 796 | 14 ～ 72 | 255 ～ 637 | 8 ～ 38 | 5 X0.5 |
| **12** | 398 ～ 796 | 69 ～ 277 | 318 ～ 663 | 22 ～ 92 | 265 ～ 663 | 14 ～ 69 | 212 ～ 531 | 7 ～ 37 | 6 X0.6 |
| **16** | 298 ～ 597 | 66 ～ 265 | 239 ～ 497 | 21 ～ 88 | 199 ～ 497 | 13 ～ 66 | 159 ～ 398 | 7 ～ 35 | 8 X0.8 |

## ●SLEM　スロッチングエンドミル
## ●SLEML　ロングスロッチングエンドミル
## ●SLEMLS　ロングシャンクスロッチングエンドミル

| 刃径 Dia. | 非鉄金属 Al. Cu 切削速度 Cutting Speed 12~25m/min | | 炭素鋼 FC. FCD. S50C 切削速度 Cutting Speed 10~22m/min | | 合金鋼 SCM. SKD. SUS304 切削速度 Cutting Speed 9~18m/min | | 切込み量 Depth of Cut 深 X 幅 Depth x Width |
|---|---|---|---|---|---|---|---|
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 1 | 3,820 ~ 7,958 | 168 ~ 700 | 3,183 ~ 7,003 | 70 ~ 308 | 2,865 ~ 5,730 | 47 ~ 189 | 0.5 X0.05 |
| 1.5 | 2,547 ~ 5,305 | 117 ~ 488 | 2,122 ~ 4,669 | 49 ~ 215 | 1,910 ~ 3,820 | 33 ~ 132 | 0.75X0.08 |
| 2 | 1,910 ~ 3,979 | 92 ~ 382 | 1,592 ~ 3,502 | 38 ~ 168 | 1,432 ~ 2,865 | 26 ~ 103 | 1 X0.1 |
| 2.5 | 1,528 ~ 3,183 | 76 ~ 318 | 1,273 ~ 2,801 | 32 ~ 140 | 1,146 ~ 2,292 | 21 ~ 86 | 1.25X0.13 |
| 3 | 1,273 ~ 2,653 | 66 ~ 276 | 1,061 ~ 2,334 | 28 ~ 121 | 955 ~ 1,910 | 19 ~ 74 | 1.5 X0.15 |
| 3.5 | 1,091 ~ 2,274 | 59 ~ 246 | 909 ~ 2,001 | 25 ~ 108 | 819 ~ 1,637 | 17 ~ 66 | 1.75X0.18 |
| 4 | 955 ~ 1,989 | 53 ~ 223 | 796 ~ 1,751 | 22 ~ 98 | 716 ~ 1,432 | 15 ~ 60 | 2 X0.2 |
| 4.5 | 849 ~ 1,768 | 49 ~ 205 | 707 ~ 1,556 | 21 ~ 90 | 637 ~ 1,273 | 14 ~ 55 | 2.25X0.23 |
| 5 | 764 ~ 1,592 | 46 ~ 191 | 637 ~ 1,401 | 19 ~ 84 | 573 ~ 1,146 | 13 ~ 52 | 2.5 X0.25 |
| 5.5 | 695 ~ 1,447 | 43 ~ 179 | 579 ~ 1,273 | 18 ~ 79 | 521 ~ 1,042 | 12 ~ 48 | 2.75X0.28 |
| 6 | 637 ~ 1,326 | 41 ~ 170 | 531 ~ 1,167 | 17 ~ 75 | 477 ~ 955 | 11 ~ 46 | 3 X0.3 |
| 6.5 | 588 ~ 1,224 | 39 ~ 162 | 490 ~ 1,077 | 16 ~ 71 | 441 ~ 881 | 11 ~ 44 | 3.25X0.33 |
| 7 | 546 ~ 1,137 | 37 ~ 155 | 455 ~ 1,000 | 15 ~ 68 | 409 ~ 819 | 10 ~ 42 | 3.5 X0.35 |
| 7.5 | 509 ~ 1,061 | 36 ~ 149 | 424 ~ 934 | 15 ~ 65 | 382 ~ 764 | 10 ~ 40 | 3.75X0.38 |
| 8 | 477 ~ 995 | 34 ~ 143 | 398 ~ 875 | 14 ~ 63 | 358 ~ 716 | 10 ~ 39 | 4 X0.4 |
| 8.5 | 449 ~ 936 | 33 ~ 139 | 374 ~ 824 | 14 ~ 61 | 337 ~ 674 | 9 ~ 37 | 4.25X0.43 |
| 9 | 424 ~ 884 | 32 ~ 134 | 354 ~ 778 | 13 ~ 59 | 318 ~ 637 | 9 ~ 36 | 4.5 X0.45 |
| 9.5 | 402 ~ 838 | 31 ~ 131 | 335 ~ 737 | 13 ~ 57 | 302 ~ 603 | 9 ~ 35 | 4.75X0.48 |
| 10 | 382 ~ 796 | 31 ~ 127 | 318 ~ 700 | 13 ~ 56 | 286 ~ 573 | 9 ~ 34 | 5 X0.5 |
| 11 | 347 ~ 723 | 29 ~ 122 | 289 ~ 637 | 12 ~ 53 | 260 ~ 521 | 8 ~ 33 | 5.5 X0.55 |
| 12 | 318 ~ 663 | 28 ~ 117 | 265 ~ 584 | 12 ~ 51 | 239 ~ 477 | 8 ~ 32 | 6 X0.6 |
| 13 | 294 ~ 612 | 27 ~ 113 | 245 ~ 539 | 11 ~ 50 | 220 ~ 441 | 8 ~ 30 | 6.5 X0.65 |
| 14 | 273 ~ 568 | 26 ~ 109 | 227 ~ 500 | 11 ~ 48 | 205 ~ 409 | 7 ~ 29 | 7 X0.7 |
| 15 | 255 ~ 531 | 25 ~ 106 | 212 ~ 467 | 11 ~ 47 | 191 ~ 382 | 7 ~ 29 | 7.5 X0.75 |
| 16 | 239 ~ 497 | 25 ~ 103 | 199 ~ 438 | 10 ~ 46 | 179 ~ 358 | 7 ~ 28 | 8 X0.8 |
| 17 | 225 ~ 468 | 24 ~ 101 | 187 ~ 412 | 10 ~ 44 | 169 ~ 337 | 7 ~ 27 | 8.5 X0.85 |
| 18 | 212 ~ 442 | 24 ~ 99 | 177 ~ 389 | 10 ~ 44 | 159 ~ 318 | 7 ~ 27 | 9 X0.9 |
| 19 | 201 ~ 419 | 23 ~ 97 | 168 ~ 369 | 10 ~ 43 | 151 ~ 302 | 7 ~ 26 | 9.5 X0.95 |
| 20 | 191 ~ 398 | 23 ~ 95 | 159 ~ 350 | 10 ~ 42 | 143 ~ 286 | 6 ~ 26 | 10 X1 |
| 22 | 174 ~ 362 | 22 ~ 93 | 145 ~ 318 | 9 ~ 41 | 130 ~ 260 | 6 ~ 25 | 11 X1.1 |
| 24 | 159 ~ 332 | 22 ~ 90 | 133 ~ 292 | 9 ~ 40 | 119 ~ 239 | 6 ~ 24 | 12 X1.2 |
| 26 | 147 ~ 306 | 21 ~ 88 | 122 ~ 269 | 9 ~ 39 | 110 ~ 220 | 6 ~ 24 | 13 X1.3 |
| 28 | 136 ~ 284 | 21 ~ 86 | 114 ~ 250 | 9 ~ 38 | 102 ~ 205 | 6 ~ 23 | 14 X1.4 |
| 30 | 127 ~ 265 | 20 ~ 85 | 106 ~ 233 | 8 ~ 37 | 95 ~ 191 | 6 ~ 23 | 15 X1.5 |
| 35 | 109 ~ 227 | 20 ~ 82 | 91 ~ 200 | 8 ~ 36 | 82 ~ 164 | 6 ~ 22 | 17.5 X1.75 |
| 40 | 95 ~ 199 | 19 ~ 80 | 80 ~ 175 | 8 ~ 35 | 72 ~ 143 | 5 ~ 21 | 20 X2 |
| 45 | 85 ~ 177 | 19 ~ 78 | 71 ~ 156 | 8 ~ 34 | 64 ~ 127 | 5 ~ 21 | 22.5 X2.25 |
| 50 | 76 ~ 159 | 18 ~ 76 | 64 ~ 140 | 8 ~ 34 | 57 ~ 115 | 5 ~ 21 | 25 X2.5 |
| 55 | 69 ~ 145 | 18 ~ 75 | 58 ~ 127 | 8 ~ 33 | 52 ~ 104 | 5 ~ 20 | 27.5 X2.75 |
| 60 | 64 ~ 133 | 18 ~ 74 | 53 ~ 117 | 7 ~ 33 | 48 ~ 95 | 5 ~ 20 | 30 X3 |

## ●HPSLEM　HPMスロッチングエンドミル

| 直径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～38HRC HPM. NAK | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 16~33m/min | | 切削速度 Cutting Speed 14~28m/min | | 切削速度 Cutting Speed 12~25m/min | | 切削速度 Cutting Speed 10~20m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 深×幅 Depth x Width |
| **2** | 2,546 ～ 5,252 | 446 ～ 919 | 2,228 ～ 4,456 | 234 ～ 468 | 1,910 ～ 3,979 | 174 ～ 362 | 1,592 ～ 3,183 | 95 ～ 189 | 1 X0.1 |
| **2.5** | 2,037 ～ 4,202 | 382 ～ 788 | 1,783 ～ 3,565 | 201 ～ 401 | 1,528 ～ 3,183 | 149 ～ 310 | 1,273 ～ 2,546 | 81 ～ 162 | 1.3X0.13 |
| **3** | 1,698 ～ 3,501 | 340 ～ 700 | 1,485 ～ 2,971 | 178 ～ 357 | 1,273 ～ 2,653 | 132 ～ 276 | 1,061 ～ 2,122 | 72 ～ 144 | 1.5X0.15 |
| **3.5** | 1,455 ～ 3,001 | 309 ～ 638 | 1,273 ～ 2,546 | 162 ～ 325 | 1,091 ～ 2,274 | 121 ～ 251 | 909 ～ 1,819 | 66 ～ 131 | 1.8X0.18 |
| **4** | 1,273 ～ 2,626 | 286 ～ 591 | 1,114 ～ 2,228 | 150 ～ 301 | 955 ～ 1,989 | 112 ～ 233 | 796 ～ 1,592 | 61 ～ 122 | 2 X0.2 |
| **5** | 1,019 ～ 2,101 | 242 ～ 499 | 891 ～ 1,783 | 127 ～ 254 | 764 ～ 1,592 | 94 ～ 197 | 637 ～ 1,273 | 51 ～ 103 | 2.5X0.25 |
| **6** | 849 ～ 1,751 | 212 ～ 438 | 743 ～ 1,485 | 111 ～ 223 | 637 ～ 1,326 | 83 ～ 172 | 531 ～ 1,061 | 45 ～ 90 | 3 X0.3 |
| **7** | 728 ～ 1,501 | 191 ～ 394 | 637 ～ 1,273 | 100 ～ 200 | 546 ～ 1,137 | 75 ～ 155 | 455 ～ 909 | 41 ～ 81 | 3.5X0.35 |
| **8** | 637 ～ 1,313 | 175 ～ 361 | 557 ～ 1,114 | 92 ～ 184 | 477 ～ 995 | 68 ～ 142 | 398 ～ 796 | 37 ～ 74 | 4 X0.4 |
| **9** | 566 ～ 1,167 | 163 ～ 336 | 495 ～ 990 | 85 ～ 171 | 424 ～ 884 | 63 ～ 132 | 354 ～ 707 | 35 ～ 69 | 4.5X0.45 |
| **10** | 509 ～ 1,050 | 153 ～ 315 | 446 ～ 891 | 80 ～ 160 | 382 ～ 796 | 60 ～ 124 | 318 ～ 637 | 32 ～ 65 | 5 X0.5 |
| **11** | 463 ～ 955 | 145 ～ 298 | 405 ～ 810 | 76 ～ 152 | 347 ～ 723 | 56 ～ 117 | 289 ～ 579 | 31 ～ 62 | 5.5X0.55 |
| **12** | 424 ～ 875 | 138 ～ 284 | 371 ～ 743 | 72 ～ 145 | 318 ～ 663 | 54 ～ 112 | 265 ～ 531 | 29 ～ 59 | 6 X0.6 |
| **13** | 392 ～ 808 | 132 ～ 273 | 343 ～ 686 | 69 ～ 139 | 294 ～ 612 | 52 ～ 107 | 245 ～ 490 | 28 ～ 56 | 6.5X0.65 |
| **14** | 364 ～ 750 | 127 ～ 263 | 318 ～ 637 | 67 ～ 134 | 273 ～ 568 | 50 ～ 103 | 227 ～ 455 | 27 ～ 54 | 7 X0.7 |
| **15** | 340 ～ 700 | 123 ～ 254 | 297 ～ 594 | 65 ～ 129 | 255 ～ 531 | 48 ～ 100 | 212 ～ 424 | 26 ～ 52 | 7.5X0.75 |
| **16** | 318 ～ 657 | 119 ～ 246 | 279 ～ 557 | 63 ～ 125 | 239 ～ 497 | 47 ～ 97 | 199 ～ 398 | 25 ～ 51 | 8 X0.8 |
| **17** | 300 ～ 618 | 116 ～ 239 | 262 ～ 524 | 61 ～ 122 | 225 ～ 468 | 45 ～ 94 | 187 ～ 374 | 25 ～ 49 | 8.5X0.85 |
| **18** | 283 ～ 584 | 113 ～ 234 | 248 ～ 495 | 60 ～ 119 | 212 ～ 442 | 44 ～ 92 | 177 ～ 354 | 24 ～ 48 | 9 X0.9 |
| **19** | 268 ～ 553 | 111 ～ 228 | 235 ～ 469 | 58 ～ 116 | 201 ～ 419 | 43 ～ 90 | 168 ～ 335 | 24 ～ 47 | 9.5X0.95 |
| **20** | 255 ～ 525 | 108 ～ 223 | 223 ～ 446 | 57 ～ 114 | 191 ～ 398 | 42 ～ 88 | 159 ～ 318 | 23 ～ 46 | 10 X1 |

## ●EXLE4　超ロング4枚刃エンドミル
## ●EXLSE4　超ロングシャンク4枚刃エンドミル

| 刃径 Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～38HRC HPM. NAK | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 16~33m/min | | 切削速度 Cutting Speed 14~28m/min | | 切削速度 Cutting Speed 12~25m/min | | 切削速度 Cutting Speed 10~20m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 深 X 幅 Depth x Width |
| **20** | 255 ～ 525 | 41 ～ 168 | 223 ～ 446 | 18 ～ 71 | 191 ～ 398 | 11 ～ 48 | 159 ～ 318 | 8 ～ 32 | 10 X1 |
| **22** | 232 ～ 477 | 43 ～ 177 | 203 ～ 405 | 19 ～ 75 | 174 ～ 362 | 12 ～ 50 | 145 ～ 289 | 8 ～ 34 | 11 X1.1 |
| **24** | 212 ～ 438 | 45 ～ 185 | 186 ～ 371 | 20 ～ 78 | 159 ～ 332 | 13 ～ 53 | 133 ～ 265 | 9 ～ 35 | 12 X1.2 |
| **25** | 204 ～ 420 | 46 ～ 188 | 178 ～ 357 | 20 ～ 80 | 153 ～ 318 | 13 ～ 53 | 127 ～ 255 | 9 ～ 36 | 12.5X1.25 |
| **26** | 196 ～ 404 | 46 ～ 191 | 171 ～ 343 | 20 ～ 81 | 147 ～ 306 | 13 ～ 54 | 122 ～ 245 | 9 ～ 36 | 13 X1.3 |
| **28** | 182 ～ 375 | 48 ～ 197 | 159 ～ 318 | 21 ～ 84 | 136 ～ 284 | 13 ～ 56 | 114 ～ 227 | 9 ～ 37 | 14 X1.4 |
| **30** | 170 ～ 350 | 49 ～ 202 | 149 ～ 297 | 21 ～ 86 | 127 ～ 265 | 14 ～ 57 | 106 ～ 212 | 10 ～ 38 | 15 X1.5 |
| **32** | 159 ～ 328 | 50 ～ 206 | 139 ～ 279 | 22 ～ 87 | 119 ～ 249 | 14 ～ 58 | 99 ～ 199 | 10 ～ 39 | 16 X1.6 |
| **35** | 146 ～ 300 | 51 ～ 211 | 127 ～ 255 | 22 ～ 90 | 109 ～ 227 | 14 ～ 60 | 91 ～ 182 | 10 ～ 40 | 17.5X1.75 |
| **36** | 141 ～ 292 | 52 ～ 213 | 124 ～ 248 | 23 ～ 90 | 106 ～ 221 | 15 ～ 60 | 88 ～ 177 | 10 ～ 40 | 18 X1.8 |
| **38** | 134 ～ 276 | 52 ～ 216 | 117 ～ 235 | 23 ～ 92 | 101 ～ 209 | 15 ～ 61 | 84 ～ 168 | 10 ～ 41 | 19 X1.9 |
| **40** | 127 ～ 263 | 53 ～ 218 | 111 ～ 223 | 23 ～ 93 | 95 ～ 199 | 15 ～ 62 | 80 ～ 159 | 10 ～ 41 | 20 X2 |
| **42** | 121 ～ 250 | 54 ～ 221 | 106 ～ 212 | 23 ～ 94 | 91 ～ 189 | 15 ～ 63 | 76 ～ 152 | 10 ～ 42 | 21 X2.1 |
| **45** | 113 ～ 233 | 54 ～ 224 | 99 ～ 198 | 24 ～ 95 | 85 ～ 177 | 15 ～ 64 | 71 ～ 141 | 11 ～ 42 | 22.5X2.25 |
| **50** | 102 ～ 210 | 55 ～ 229 | 89 ～ 178 | 24 ～ 97 | 76 ～ 159 | 16 ～ 65 | 64 ～ 127 | 11 ～ 43 | 25 X2.5 |

## ●TE-2　テーパーエンドミル 2枚刃
## ●TEL　ロングテーパーエンドミル

| 小径 Minor Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～ 38HRC HPM. NAK | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 16~33m/min | | 切削速度 Cutting Speed 14~28m/min | | 切削速度 Cutting Speed 12~25m/min | | 切削速度 Cutting Speed 10~20m/min | | 深 X 幅 Depth x Width |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 角度 Taper Angle | 0.5° ～ 3° | | | | | | | | |
| 1 | 5,093 ～ 10,505 | 104 ～ 429 | 4,456 ～ 8,913 | 48 ～ 194 | 3,820 ～ 7,958 | 31 ～ 130 | 3,183 ～ 6,366 | 17 ～ 69 | 0.5 X0.05 |
| 1.5 | 3,395 ～ 7,003 | 95 ～ 393 | 2,971 ～ 5,942 | 44 ～ 178 | 2,547 ～ 5,305 | 29 ～ 119 | 2,122 ～ 4,244 | 16 ～ 63 | 0.75X0.08 |
| 2 | 2,547 ～ 5,252 | 91 ～ 375 | 2,228 ～ 4,456 | 42 ～ 170 | 1,910 ～ 3,979 | 27 ～ 114 | 1,592 ～ 3,183 | 15 ～ 61 | 1 X0.1 |
| 2.5 | 2,037 ～ 4,202 | 88 ～ 364 | 1,783 ～ 3,565 | 41 ～ 165 | 1,528 ～ 3,183 | 26 ～ 110 | 1,273 ～ 2,547 | 15 ～ 59 | 1.25X0.13 |
| 3 | 1,698 ～ 3,502 | 87 ～ 357 | 1,485 ～ 2,971 | 40 ～ 162 | 1,273 ～ 2,653 | 26 ～ 108 | 1,061 ～ 2,122 | 14 ～ 58 | 1.5 X0.15 |
| 4 | 1,273 ～ 2,626 | 84 ～ 348 | 1,114 ～ 2,228 | 39 ～ 158 | 955 ～ 1,989 | 25 ～ 106 | 796 ～ 1,592 | 14 ～ 56 | 2 X0.2 |
| 5 | 1,019 ～ 2,101 | 83 ～ 343 | 891 ～ 1,783 | 39 ～ 155 | 764 ～ 1,592 | 25 ～ 104 | 637 ～ 1,273 | 14 ～ 55 | 2.5 X0.25 |
| 6 | 849 ～ 1,751 | 82 ～ 339 | 743 ～ 1,485 | 38 ～ 154 | 637 ～ 1,326 | 25 ～ 103 | 531 ～ 1,061 | 14 ～ 55 | 3 X0.3 |
| 8 | 637 ～ 1,313 | 81 ～ 335 | 557 ～ 1,114 | 38 ～ 152 | 477 ～ 995 | 24 ～ 101 | 398 ～ 796 | 14 ～ 54 | 4 X0.4 |
| 10 | 509 ～ 1,050 | 81 ～ 332 | 446 ～ 891 | 38 ～ 150 | 382 ～ 796 | 24 ～ 101 | 318 ～ 637 | 13 ～ 54 | 5 X0.5 |
| 12 | 424 ～ 875 | 80 ～ 330 | 371 ～ 743 | 37 ～ 149 | 318 ～ 663 | 24 ～ 100 | 265 ～ 531 | 13 ～ 53 | 6 X0.6 |
| 16 | 318 ～ 657 | 80 ～ 328 | 279 ～ 557 | 37 ～ 148 | 239 ～ 497 | 24 ～ 99 | 199 ～ 398 | 13 ～ 53 | 8 X0.8 |
| 角度 Taper Angle | 4° ～ 7° | | | | | | | | |
| 1 | 5,093 ～ 10,505 | 104 ～ 429 | 4,456 ～ 8,913 | 48 ～ 194 | 3,820 ～ 7,958 | 31 ～ 130 | 3,183 ～ 6,366 | 17 ～ 69 | 0.33X0.05 |
| 1.5 | 3,395 ～ 7,003 | 95 ～ 393 | 2,971 ～ 5,942 | 44 ～ 178 | 2,547 ～ 5,305 | 29 ～ 119 | 2,122 ～ 4,244 | 16 ～ 63 | 0.5 X0.08 |
| 2 | 2,547 ～ 5,252 | 91 ～ 375 | 2,228 ～ 4,456 | 42 ～ 170 | 1,910 ～ 3,979 | 27 ～ 114 | 1,592 ～ 3,183 | 15 ～ 61 | 0.67X0.1 |
| 2.5 | 2,037 ～ 4,202 | 88 ～ 364 | 1,783 ～ 3,565 | 41 ～ 165 | 1,528 ～ 3,183 | 26 ～ 110 | 1,273 ～ 2,547 | 15 ～ 59 | 0.83X0.13 |
| 3 | 1,698 ～ 3,502 | 87 ～ 357 | 1,485 ～ 2,971 | 40 ～ 162 | 1,273 ～ 2,653 | 26 ～ 108 | 1,061 ～ 2,122 | 14 ～ 58 | 1 X0.15 |
| 4 | 1,273 ～ 2,626 | 84 ～ 348 | 1,114 ～ 2,228 | 39 ～ 158 | 955 ～ 1,989 | 25 ～ 106 | 796 ～ 1,592 | 14 ～ 56 | 1.33X0.2 |
| 5 | 1,019 ～ 2,101 | 83 ～ 343 | 891 ～ 1,783 | 39 ～ 155 | 764 ～ 1,592 | 25 ～ 104 | 637 ～ 1,273 | 14 ～ 55 | 1.67X0.25 |
| 6 | 849 ～ 1,751 | 82 ～ 339 | 743 ～ 1,485 | 38 ～ 154 | 637 ～ 1,326 | 25 ～ 103 | 531 ～ 1,061 | 14 ～ 55 | 2 X0.3 |
| 8 | 637 ～ 1,313 | 81 ～ 335 | 557 ～ 1,114 | 38 ～ 152 | 477 ～ 995 | 24 ～ 101 | 398 ～ 796 | 14 ～ 54 | 2.67X0.4 |
| 10 | 509 ～ 1,050 | 81 ～ 332 | 446 ～ 891 | 38 ～ 150 | 382 ～ 796 | 24 ～ 101 | 318 ～ 637 | 13 ～ 54 | 3.33X0.5 |
| 12 | 424 ～ 875 | 80 ～ 330 | 371 ～ 743 | 37 ～ 149 | 318 ～ 663 | 24 ～ 100 | 265 ～ 531 | 13 ～ 53 | 4 X0.6 |
| 16 | 318 ～ 657 | 80 ～ 328 | 279 ～ 557 | 37 ～ 148 | 239 ～ 497 | 24 ～ 99 | 199 ～ 398 | 13 ～ 53 | 5.33X0.8 |
| 角度 Taper Angle | 8° ～ 10° | | | | | | | | |
| 1 | 5,093 ～ 10,505 | 104 ～ 429 | 4,456 ～ 8,913 | 48 ～ 194 | 3,820 ～ 7,958 | 31 ～ 130 | 3,183 ～ 6,366 | 17 ～ 69 | 0.29X0.05 |
| 1.5 | 3,395 ～ 7,003 | 95 ～ 393 | 2,971 ～ 5,942 | 44 ～ 178 | 2,547 ～ 5,305 | 29 ～ 119 | 2,122 ～ 4,244 | 16 ～ 63 | 0.43X0.08 |
| 2 | 2,547 ～ 5,252 | 91 ～ 375 | 2,228 ～ 4,456 | 42 ～ 170 | 1,910 ～ 3,979 | 27 ～ 114 | 1,592 ～ 3,183 | 15 ～ 61 | 0.57X0.1 |
| 2.5 | 2,037 ～ 4,202 | 88 ～ 364 | 1,783 ～ 3,565 | 41 ～ 165 | 1,528 ～ 3,183 | 26 ～ 110 | 1,273 ～ 2,547 | 15 ～ 59 | 0.71X0.13 |
| 3 | 1,698 ～ 3,502 | 87 ～ 357 | 1,485 ～ 2,971 | 40 ～ 162 | 1,273 ～ 2,653 | 26 ～ 108 | 1,061 ～ 2,122 | 14 ～ 58 | 0.86X0.15 |
| 4 | 1,273 ～ 2,626 | 84 ～ 348 | 1,114 ～ 2,228 | 39 ～ 158 | 955 ～ 1,989 | 25 ～ 106 | 796 ～ 1,592 | 14 ～ 56 | 1.14X0.2 |
| 5 | 1,019 ～ 2,101 | 83 ～ 343 | 891 ～ 1,783 | 39 ～ 155 | 764 ～ 1,592 | 25 ～ 104 | 637 ～ 1,273 | 14 ～ 55 | 1.43X0.25 |
| 6 | 849 ～ 1,751 | 82 ～ 339 | 743 ～ 1,485 | 38 ～ 154 | 637 ～ 1,326 | 25 ～ 103 | 531 ～ 1,061 | 14 ～ 55 | 1.71X0.3 |
| 8 | 637 ～ 1,313 | 81 ～ 335 | 557 ～ 1,114 | 38 ～ 152 | 477 ～ 995 | 24 ～ 101 | 398 ～ 796 | 14 ～ 54 | 2.29X0.4 |
| 10 | 509 ～ 1,050 | 81 ～ 332 | 446 ～ 891 | 38 ～ 150 | 382 ～ 796 | 24 ～ 101 | 318 ～ 637 | 13 ～ 54 | 2.86X0.5 |
| 12 | 424 ～ 875 | 80 ～ 330 | 371 ～ 743 | 37 ～ 149 | 318 ～ 663 | 24 ～ 100 | 265 ～ 531 | 13 ～ 53 | 3.43X0.6 |

## ●TE-4　テーパーエンドミル 4枚刃

| 小径 Minor Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～38HRC HPM. NAK | | 切込み量 Depth of Cut |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 16~33m/min | | 切削速度 Cutting Speed 14~28m/min | | 切削速度 Cutting Speed 12~25m/min | | 切削速度 Cutting Speed 10~20m/min | | 深 X 幅 Depth x Width |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 角度 Taper Angle | 0.5° ～ 3° | | | | | | | | |
| 3 | 1,698 ～ 3,502 | 115 ～ 476 | 1,485 ～ 2,971 | 51 ～ 202 | 1,273 ～ 2,653 | 35 ～ 144 | 1,061 ～ 2,122 | 22 ～ 87 | 1.5 X0.15 |
| 4 | 1,273 ～ 2,626 | 113 ～ 464 | 1,114 ～ 2,228 | 49 ～ 197 | 955 ～ 1,989 | 34 ～ 141 | 796 ～ 1,592 | 21 ～ 84 | 2 X0.2 |
| 5 | 1,019 ～ 2,101 | 111 ～ 457 | 891 ～ 1,783 | 48 ～ 194 | 764 ～ 1,592 | 33 ～ 139 | 637 ～ 1,273 | 21 ～ 83 | 2.5 X0.25 |
| 6 | 849 ～ 1,751 | 110 ～ 452 | 743 ～ 1,485 | 48 ～ 192 | 637 ～ 1,326 | 33 ～ 137 | 531 ～ 1,061 | 21 ～ 82 | 3 X0.3 |
| 8 | 637 ～ 1,313 | 108 ～ 446 | 557 ～ 1,114 | 47 ～ 189 | 477 ～ 995 | 32 ～ 135 | 398 ～ 796 | 20 ～ 81 | 4 X0.4 |
| 10 | 509 ～ 1,050 | 107 ～ 443 | 446 ～ 891 | 47 ～ 188 | 382 ～ 796 | 32 ～ 134 | 318 ～ 637 | 20 ～ 81 | 5 X0.5 |
| 12 | 424 ～ 875 | 107 ～ 440 | 371 ～ 743 | 47 ～ 187 | 318 ～ 663 | 32 ～ 133 | 265 ～ 531 | 20 ～ 80 | 6 X0.6 |
| 15 | 340 ～ 700 | 106 ～ 438 | 297 ～ 594 | 46 ～ 186 | 255 ～ 531 | 32 ～ 133 | 212 ～ 424 | 20 ～ 80 | 7.5 X0.75 |
| 16 | 318 ～ 657 | 106 ～ 438 | 279 ～ 557 | 46 ～ 186 | 239 ～ 497 | 32 ～ 133 | 199 ～ 398 | 20 ～ 80 | 8 X0.8 |
| 20 | 255 ～ 525 | 106 ～ 436 | 223 ～ 446 | 46 ～ 185 | 191 ～ 398 | 32 ～ 132 | 159 ～ 318 | 20 ～ 79 | 10 X1 |
| 25 | 204 ～ 420 | 105 ～ 434 | 178 ～ 357 | 46 ～ 184 | 153 ～ 318 | 32 ～ 132 | 127 ～ 255 | 20 ～ 79 | 12.5 X1.25 |
| 角度 Taper Angle | 4° ～ 7° | | | | | | | | |
| 3 | 1,698 ～ 3,502 | 115 ～ 476 | 1,485 ～ 2,971 | 51 ～ 202 | 1,273 ～ 2,653 | 35 ～ 144 | 1,061 ～ 2,122 | 22 ～ 87 | 1 X0.15 |
| 4 | 1,273 ～ 2,626 | 113 ～ 464 | 1,114 ～ 2,228 | 49 ～ 197 | 955 ～ 1,989 | 34 ～ 141 | 796 ～ 1,592 | 21 ～ 84 | 1.33 X0.2 |
| 5 | 1,019 ～ 2,101 | 111 ～ 457 | 891 ～ 1,783 | 48 ～ 194 | 764 ～ 1,592 | 33 ～ 139 | 637 ～ 1,273 | 21 ～ 83 | 1.67 X0.25 |
| 6 | 849 ～ 1,751 | 110 ～ 452 | 743 ～ 1,485 | 48 ～ 192 | 637 ～ 1,326 | 33 ～ 137 | 531 ～ 1,061 | 21 ～ 82 | 2 X0.3 |
| 8 | 637 ～ 1,313 | 108 ～ 446 | 557 ～ 1,114 | 47 ～ 189 | 477 ～ 995 | 32 ～ 135 | 398 ～ 796 | 20 ～ 81 | 2.67 X0.4 |
| 10 | 509 ～ 1,050 | 107 ～ 443 | 446 ～ 891 | 47 ～ 188 | 382 ～ 796 | 32 ～ 134 | 318 ～ 637 | 20 ～ 81 | 3.33 X0.5 |
| 12 | 424 ～ 875 | 107 ～ 440 | 371 ～ 743 | 47 ～ 187 | 318 ～ 663 | 32 ～ 133 | 265 ～ 531 | 20 ～ 80 | 4 X0.6 |
| 15 | 340 ～ 700 | 106 ～ 438 | 297 ～ 594 | 46 ～ 186 | 255 ～ 531 | 32 ～ 133 | 212 ～ 424 | 20 ～ 80 | 5 X0.75 |
| 16 | 318 ～ 657 | 106 ～ 438 | 279 ～ 557 | 46 ～ 186 | 239 ～ 497 | 32 ～ 133 | 199 ～ 398 | 20 ～ 80 | 5.33 X0.8 |
| 20 | 255 ～ 525 | 106 ～ 436 | 223 ～ 446 | 46 ～ 185 | 191 ～ 398 | 32 ～ 132 | 159 ～ 318 | 20 ～ 79 | 6.67 X1 |
| 25 | 204 ～ 420 | 105 ～ 434 | 178 ～ 357 | 46 ～ 184 | 153 ～ 318 | 32 ～ 132 | 127 ～ 255 | 20 ～ 79 | 8.33 X1.25 |
| 角度 Taper Angle | 8° ～ 10° | | | | | | | | |
| 3 | 1,698 ～ 3,502 | 115 ～ 476 | 1,485 ～ 2,971 | 51 ～ 202 | 1,273 ～ 2,653 | 35 ～ 144 | 1,061 ～ 2,122 | 22 ～ 87 | 0.86 X0.15 |
| 4 | 1,273 ～ 2,626 | 113 ～ 464 | 1,114 ～ 2,228 | 49 ～ 197 | 955 ～ 1,989 | 34 ～ 141 | 796 ～ 1,592 | 21 ～ 84 | 1.14 X0.2 |
| 5 | 1,019 ～ 2,101 | 111 ～ 457 | 891 ～ 1,783 | 48 ～ 194 | 764 ～ 1,592 | 33 ～ 139 | 637 ～ 1,273 | 21 ～ 83 | 1.43 X0.25 |
| 6 | 849 ～ 1,751 | 110 ～ 452 | 743 ～ 1,485 | 48 ～ 192 | 637 ～ 1,326 | 33 ～ 137 | 531 ～ 1,061 | 21 ～ 82 | 1.71 X0.3 |
| 8 | 637 ～ 1,313 | 108 ～ 446 | 557 ～ 1,114 | 47 ～ 189 | 477 ～ 995 | 32 ～ 135 | 398 ～ 796 | 20 ～ 81 | 2.29 X0.4 |
| 10 | 509 ～ 1,050 | 107 ～ 443 | 446 ～ 891 | 47 ～ 188 | 382 ～ 796 | 32 ～ 134 | 318 ～ 637 | 20 ～ 81 | 2.86 X0.5 |
| 12 | 424 ～ 875 | 107 ～ 440 | 371 ～ 743 | 47 ～ 187 | 318 ～ 663 | 32 ～ 133 | 265 ～ 531 | 20 ～ 80 | 3.43 X0.6 |
| 15 | 340 ～ 700 | 106 ～ 438 | 297 ～ 594 | 46 ～ 186 | 255 ～ 531 | 32 ～ 133 | 212 ～ 424 | 20 ～ 80 | 4.29 X0.75 |

## ●RM2　ランナーミル（台形ランナー用）

| 小径 Minor Dia. | 非鉄金属 Al. Cu | | 炭素鋼 FC. FCD. S50C | | 合金鋼 SCM. SKD. SUS304 | | 調質鋼～ 38HRC HPM. NAK | | 切込み量 Depth of Cut / 深 X 幅 Depth x Width |
|---|---|---|---|---|---|---|---|---|---|
| | 切削速度 Cutting Speed 16~33m/min | | 切削速度 Cutting Speed 14~28m/min | | 切削速度 Cutting Speed 12~25m/min | | 切削速度 Cutting Speed 10~20m/min | | |
| | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | 回転数 Spindle speed rpm | 送り feed mm/min | |
| 角度 Taper Angle | 7° | | | | | | | | |
| 2 | 2,547 ～ 5,252 | 91 ～ 375 | 2,228 ～ 4,456 | 42 ～ 170 | 1,910 ～ 3,979 | 27 ～ 114 | 1,592 ～ 3,183 | 15 ～ 61 | 0.67 X 0.1 |
| 2.5 | 2,037 ～ 4,202 | 88 ～ 364 | 1,783 ～ 3,565 | 41 ～ 165 | 1,528 ～ 3,183 | 26 ～ 110 | 1,273 ～ 2,547 | 15 ～ 59 | 0.83 X 0.13 |
| 3 | 1,698 ～ 3,502 | 87 ～ 357 | 1,485 ～ 2,971 | 40 ～ 162 | 1,273 ～ 2,653 | 26 ～ 108 | 1,061 ～ 2,122 | 14 ～ 58 | 1 X 0.15 |
| 3.5 | 1,455 ～ 3,001 | 85 ～ 352 | 1,273 ～ 2,547 | 40 ～ 159 | 1,091 ～ 2,274 | 26 ～ 107 | 909 ～ 1,819 | 14 ～ 57 | 1.17 X 0.18 |
| 4 | 1,273 ～ 2,626 | 84 ～ 348 | 1,114 ～ 2,228 | 39 ～ 158 | 955 ～ 1,989 | 25 ～ 106 | 796 ～ 1,592 | 14 ～ 56 | 1.33 X 0.2 |
| 4.5 | 1,132 ～ 2,334 | 84 ～ 345 | 990 ～ 1,981 | 39 ～ 156 | 849 ～ 1,768 | 25 ～ 105 | 707 ～ 1,415 | 14 ～ 56 | 1.5 X 0.23 |
| 5 | 1,019 ～ 2,101 | 83 ～ 343 | 891 ～ 1,783 | 39 ～ 155 | 764 ～ 1,592 | 25 ～ 104 | 637 ～ 1,273 | 14 ～ 55 | 1.67 X 0.25 |
| 6 | 849 ～ 1,751 | 82 ～ 339 | 743 ～ 1,485 | 38 ～ 154 | 637 ～ 1,326 | 25 ～ 103 | 531 ～ 1,061 | 14 ～ 55 | 2 X 0.3 |
| 8 | 637 ～ 1,313 | 81 ～ 335 | 557 ～ 1,114 | 38 ～ 152 | 477 ～ 995 | 24 ～ 101 | 398 ～ 796 | 14 ～ 54 | 2.67 X 0.4 |
| 10 | 509 ～ 1,050 | 81 ～ 332 | 446 ～ 891 | 38 ～ 150 | 382 ～ 796 | 24 ～ 101 | 318 ～ 637 | 13 ～ 54 | 3.33 X 0.5 |
| 12 | 424 ～ 875 | 80 ～ 330 | 371 ～ 743 | 37 ～ 149 | 318 ～ 663 | 24 ～ 100 | 265 ～ 531 | 13 ～ 53 | 4 X 0.6 |
| 角度 Taper Angle | 10° ～ 12° | | | | | | | | |
| 2 | 2,547 ～ 5,252 | 91 ～ 375 | 2,228 ～ 4,456 | 42 ～ 170 | 1,910 ～ 3,979 | 27 ～ 114 | 1,592 ～ 3,183 | 15 ～ 61 | 0.57 X 0.1 |
| 2.5 | 2,037 ～ 4,202 | 88 ～ 364 | 1,783 ～ 3,565 | 41 ～ 165 | 1,528 ～ 3,183 | 26 ～ 110 | 1,273 ～ 2,547 | 15 ～ 59 | 0.71 X 0.13 |
| 3 | 1,698 ～ 3,502 | 87 ～ 357 | 1,485 ～ 2,971 | 40 ～ 162 | 1,273 ～ 2,653 | 26 ～ 108 | 1,061 ～ 2,122 | 14 ～ 58 | 0.86 X 0.15 |
| 3.5 | 1,455 ～ 3,001 | 85 ～ 352 | 1,273 ～ 2,547 | 40 ～ 159 | 1,091 ～ 2,274 | 26 ～ 107 | 909 ～ 1,819 | 14 ～ 57 | 1 X 0.18 |
| 4 | 1,273 ～ 2,626 | 84 ～ 348 | 1,114 ～ 2,228 | 39 ～ 158 | 955 ～ 1,989 | 25 ～ 106 | 796 ～ 1,592 | 14 ～ 56 | 1.14 X 0.2 |
| 4.5 | 1,132 ～ 2,334 | 84 ～ 345 | 990 ～ 1,981 | 39 ～ 156 | 849 ～ 1,768 | 25 ～ 105 | 707 ～ 1,415 | 14 ～ 56 | 1.29 X 0.23 |
| 5 | 1,019 ～ 2,101 | 83 ～ 343 | 891 ～ 1,783 | 39 ～ 155 | 764 ～ 1,592 | 25 ～ 104 | 637 ～ 1,273 | 14 ～ 55 | 1.43 X 0.25 |
| 6 | 849 ～ 1,751 | 82 ～ 339 | 743 ～ 1,485 | 38 ～ 154 | 637 ～ 1,326 | 25 ～ 103 | 531 ～ 1,061 | 14 ～ 55 | 1.71 X 0.3 |
| 8 | 637 ～ 1,313 | 81 ～ 335 | 557 ～ 1,114 | 38 ～ 152 | 477 ～ 995 | 24 ～ 101 | 398 ～ 796 | 14 ～ 54 | 2.29 X 0.4 |
| 10 | 509 ～ 1,050 | 81 ～ 332 | 446 ～ 891 | 38 ～ 150 | 382 ～ 796 | 24 ～ 101 | 318 ～ 637 | 13 ～ 54 | 2.86 X 0.5 |
| 12 | 424 ～ 875 | 80 ～ 330 | 371 ～ 743 | 37 ～ 149 | 318 ～ 663 | 24 ～ 100 | 265 ～ 531 | 13 ～ 53 | 3.43 X 0.6 |
| 角度 Taper Angle | 15° | | | | | | | | |
| 2 | 2,547 ～ 5,252 | 91 ～ 375 | 2,228 ～ 4,456 | 42 ～ 170 | 1,910 ～ 3,979 | 27 ～ 114 | 1,592 ～ 3,183 | 15 ～ 61 | 0.5 X 0.1 |
| 2.5 | 2,037 ～ 4,202 | 88 ～ 364 | 1,783 ～ 3,565 | 41 ～ 165 | 1,528 ～ 3,183 | 26 ～ 110 | 1,273 ～ 2,547 | 15 ～ 59 | 0.63 X 0.13 |
| 3 | 1,698 ～ 3,502 | 87 ～ 357 | 1,485 ～ 2,971 | 40 ～ 162 | 1,273 ～ 2,653 | 26 ～ 108 | 1,061 ～ 2,122 | 14 ～ 58 | 0.75 X 0.15 |
| 3.5 | 1,455 ～ 3,001 | 85 ～ 352 | 1,273 ～ 2,547 | 40 ～ 159 | 1,091 ～ 2,274 | 26 ～ 107 | 909 ～ 1,819 | 14 ～ 57 | 0.88 X 0.18 |
| 4 | 1,273 ～ 2,626 | 84 ～ 348 | 1,114 ～ 2,228 | 39 ～ 158 | 955 ～ 1,989 | 25 ～ 106 | 796 ～ 1,592 | 14 ～ 56 | 1 X 0.2 |
| 4.5 | 1,132 ～ 2,334 | 84 ～ 345 | 990 ～ 1,981 | 39 ～ 156 | 849 ～ 1,768 | 25 ～ 105 | 707 ～ 1,415 | 14 ～ 56 | 1.13 X 0.23 |
| 5 | 1,019 ～ 2,101 | 83 ～ 343 | 891 ～ 1,783 | 39 ～ 155 | 764 ～ 1,592 | 25 ～ 104 | 637 ～ 1,273 | 14 ～ 55 | 1.25 X 0.25 |
| 6 | 849 ～ 1,751 | 82 ～ 339 | 743 ～ 1,485 | 38 ～ 154 | 637 ～ 1,326 | 25 ～ 103 | 531 ～ 1,061 | 14 ～ 55 | 1.5 X 0.3 |
| 8 | 637 ～ 1,313 | 81 ～ 335 | 557 ～ 1,114 | 38 ～ 152 | 477 ～ 995 | 24 ～ 101 | 398 ～ 796 | 14 ～ 54 | 2 X 0.4 |
| 10 | 509 ～ 1,050 | 81 ～ 332 | 446 ～ 891 | 38 ～ 150 | 382 ～ 796 | 24 ～ 101 | 318 ～ 637 | 13 ～ 54 | 2.5 X 0.5 |
| 12 | 424 ～ 875 | 80 ～ 330 | 371 ～ 743 | 37 ～ 149 | 318 ～ 663 | 24 ～ 100 | 265 ～ 531 | 13 ～ 53 | 3 X 0.6 |



魚沼市堀之内　雪景色

# 参考資料
# Reference Data

# はめあい穴の許容差 Fitting Size Tolerance

## ■はめあい穴 Hole Tolerance

(単位:μm)

| 寸法の区分 (mm) | | B | C | | D | | | E | | | F | | | G | | H | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| を超え | 以下 | B10 | C9 | C10 | D8 | D9 | D10 | E7 | E8 | E9 | F6 | F7 | F8 | G6 | G7 | H5 | H6 | H7 | H8 | H9 | H10 |
| – | 3 | +180<br>+140 | +85<br>+60 | +100<br>+60 | +34<br>+20 | +45<br>+20 | +60<br>+20 | +24<br>+14 | +28<br>+14 | +39<br>+14 | +12<br>+6 | +16<br>+6 | +20<br>+6 | +8<br>+2 | +12<br>+2 | +4<br>0 | +6<br>0 | +10<br>0 | +14<br>0 | +25<br>0 | +40<br>0 |
| 3 | 6 | +188<br>+140 | +100<br>+70 | +118<br>+70 | +48<br>+30 | +60<br>+30 | +78<br>+30 | +32<br>+20 | +38<br>+20 | +50<br>+20 | +18<br>+10 | +22<br>+10 | +28<br>+10 | +12<br>+4 | +16<br>+4 | +5<br>0 | +8<br>0 | +12<br>0 | +18<br>0 | +30<br>0 | +48<br>0 |
| 6 | 10 | +208<br>+150 | +116<br>+80 | +138<br>+80 | +62<br>+40 | +76<br>+40 | +98<br>+40 | +40<br>+25 | +47<br>+25 | +61<br>+25 | +22<br>+13 | +28<br>+13 | +35<br>+13 | +14<br>+5 | +20<br>+5 | +6<br>0 | +9<br>0 | +15<br>0 | +22<br>0 | +36<br>0 | +58<br>0 |
| 10 | 14 | +220 | +138 | +165 | +77 | +93 | +120 | +50 | +59 | +75 | +27 | +34 | +43 | +17 | +24 | +8 | +11 | +18 | +27 | +43 | +70 |
| 14 | 18 | +150 | +95 | +95 | +50 | +50 | +50 | +32 | +32 | +32 | +16 | +16 | +16 | +6 | +6 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 | 24 | +244 | +162 | +194 | +98 | +117 | +149 | +61 | +73 | +92 | +33 | +41 | +53 | +20 | +28 | +9 | +13 | +21 | +33 | +52 | +84 |
| 24 | 30 | +160 | +110 | +110 | +65 | +65 | +65 | +40 | +40 | +40 | +20 | +20 | +20 | +7 | +7 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | 40 | +270<br>+170 | +182<br>+120 | +220<br>+120 | +119 | +142 | +180 | +75 | +89 | +112 | +41 | +50 | +64 | +25 | +34 | +11 | +16 | +25 | +39 | +62 | +100 |
| 40 | 50 | +280<br>+180 | +192<br>+130 | +230<br>+130 | +80 | +80 | +80 | +50 | +50 | +50 | +25 | +25 | +25 | +9 | +9 | 0 | 0 | 0 | 0 | 0 | 0 |
| 50 | 65 | +310<br>+190 | +241<br>+140 | +260<br>+140 | +146 | +174 | +134 | +90 | +106 | +220 | +49 | +60 | +76 | +29 | +40 | +13 | +19 | +30 | +46 | +74 | +120 |
| 65 | 80 | +320<br>+200 | +224<br>+150 | +270<br>+150 | +100 | +100 | +100 | +60 | +60 | +60 | +30 | +30 | +30 | +10 | +10 | 0 | 0 | 0 | 0 | 0 | 0 |
| 80 | 100 | +360<br>+220 | +257<br>+170 | +310<br>+170 | +174 | +207 | +260 | +107 | +126 | +159 | +58 | +71 | +90 | +34 | +47 | +15 | +22 | +35 | +54 | +87 | +140 |
| 100 | 120 | +380<br>+240 | +267<br>+180 | +320<br>+180 | +120 | +120 | +120 | +72 | +72 | +72 | +36 | +36 | +36 | +12 | +12 | 0 | 0 | 0 | 0 | 0 | 0 |

| 寸法の区分 (mm) | | JS | | | K | | | M | | | N | | P | | R | S | T | U | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| を超え | 以下 | JS5 | JS6 | JS7 | K5 | K6 | K7 | M5 | M6 | M7 | N6 | N7 | P6 | P7 | R7 | S7 | T7 | U7 | X7 |
| – | 3 | ±2 | ±3 | ±5 | 0<br>−4 | 0<br>−6 | 0<br>−10 | −2<br>−6 | −2<br>−8 | −2<br>−12 | −4<br>−10 | −4<br>−14 | −6<br>−12 | −6<br>−16 | −10<br>−20 | −14<br>−24 | – | −18<br>−28 | −20<br>−30 |
| 3 | 6 | ±2.5 | ±4 | ±6 | 0<br>−5 | +2<br>−6 | +3<br>−9 | −3<br>−8 | −1<br>−9 | 0<br>−12 | −5<br>−13 | −4<br>−16 | −9<br>−17 | −8<br>−20 | −11<br>−23 | −15<br>−27 | – | −19<br>−31 | −24<br>−36 |
| 6 | 10 | ±3 | ±4.5 | ±7.5 | +1<br>−5 | +2<br>−7 | +5<br>−10 | −4<br>−10 | −3<br>−12 | 0<br>−15 | −7<br>−16 | −4<br>−19 | −12<br>−21 | −9<br>−24 | −13<br>−28 | −17<br>−32 | – | −22<br>−37 | −28<br>−43 |
| 10 | 14 | ±4 | ±5.5 | ±9 | +2<br>−6 | +2<br>−9 | +6<br>−12 | −4<br>−12 | −4<br>−15 | 0<br>−18 | −9<br>−20 | −5<br>−23 | −15<br>−26 | −11<br>−29 | −16<br>−34 | −21<br>−39 | – | −26<br>−44 | −33<br>−51 |
| 14 | 18 | | | | | | | | | | | | | | | | | | −38<br>−56 |
| 18 | 24 | ±4.5 | ±6.5 | ±10.5 | +1<br>−8 | +2<br>−11 | +6<br>−15 | −5<br>−14 | −4<br>−17 | 0<br>−21 | −11<br>−24 | −7<br>−28 | −18<br>−31 | −14<br>−35 | −20<br>−41 | −27<br>−48 | – | −33<br>−54 | −46<br>−67 |
| 24 | 30 | | | | | | | | | | | | | | | | −33<br>−54 | −40<br>−61 | −56<br>−77 |
| 30 | 40 | ±5.5 | ±8 | ±12.5 | +2<br>−9 | +3<br>−13 | +7<br>−18 | −5<br>−16 | −4<br>−20 | 0<br>−25 | −12<br>−28 | −8<br>−33 | −21<br>−37 | −17<br>−42 | −25<br>−50 | −34<br>−59 | −39<br>−64 | −51<br>−76 | – |
| 40 | 50 | | | | | | | | | | | | | | | | −45<br>−70 | −61<br>−86 | |
| 50 | 65 | ±6.5 | ±9.5 | ±15 | +3<br>−10 | +4<br>−15 | +9<br>−21 | −6<br>−19 | −5<br>−24 | 0<br>−30 | −14<br>−33 | −9<br>−39 | −26<br>−45 | −21<br>−51 | −30<br>−60 | −42<br>−72 | −55<br>−85 | −76<br>−106 | – |
| 65 | 80 | | | | | | | | | | | | | | −32<br>−62 | −48<br>−78 | −64<br>−94 | −91<br>−121 | |
| 80 | 100 | ±7.5 | ±11 | ±17.5 | +2<br>−13 | +4<br>−18 | +10<br>−25 | −8<br>−23 | −6<br>−18 | 0<br>−35 | −16<br>−38 | −10<br>−45 | −30<br>−52 | −24<br>−59 | −38<br>−73 | −58<br>−93 | −78<br>−113 | −111<br>−146 | – |
| 100 | 120 | | | | | | | | | | | | | | −41<br>−76 | −66<br>−101 | −91<br>−126 | −131<br>−166 | |

備考　表中の各段で、上側の数値は上の寸法許容差、下側の数値は下の寸法許容差を示す。
※The figure on the upper row shows the upper tolerance and the figure on the lower row shows lower tolerance.

# はめあい軸の許容差 Fitting Size Tolerance

## ■はめあい軸 Shaft Tolerance

（単位:μm）

| 寸法の区分 (mm) | | b | c | d | | e | | | f | | | g | | | h | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| を超え | 以下 | b9 | c9 | d8 | d9 | e7 | e8 | e9 | f6 | f7 | f8 | g4 | g5 | g6 | h4 | h5 | h6 | h7 | h8 | h9 |
| – | 3 | −140<br>−165 | −60<br>−85 | −20<br>−34 | −20<br>−45 | −14<br>−24 | −14<br>−28 | −14<br>−39 | −6<br>−12 | −6<br>−16 | −6<br>−20 | −2<br>−5 | −2<br>−6 | −2<br>−8 | 0<br>−3 | 0<br>−4 | 0<br>−6 | 0<br>−10 | 0<br>−14 | 0<br>−25 |
| 3 | 6 | −140<br>−170 | −70<br>−100 | −30<br>−48 | −30<br>−60 | −20<br>−32 | −20<br>−38 | −20<br>−50 | −10<br>−18 | −10<br>−22 | −10<br>−28 | −4<br>−8 | −4<br>−9 | −4<br>−12 | 0<br>−4 | 0<br>−5 | 0<br>−8 | 0<br>−12 | 0<br>−18 | 0<br>−30 |
| 6 | 10 | −150<br>−186 | −80<br>−116 | −40<br>−62 | −40<br>−76 | −25<br>−40 | −25<br>−47 | −25<br>−61 | −13<br>−22 | −13<br>−28 | −13<br>−35 | −5<br>−9 | −5<br>−11 | −5<br>−14 | 0<br>−4 | 0<br>−6 | 0<br>−9 | 0<br>−15 | 0<br>−22 | 0<br>−36 |
| 10 | 14 | −150<br>−193 | −95<br>−138 | −50<br>−77 | −50<br>−93 | −32<br>−50 | −32<br>−59 | −32<br>−75 | −16<br>−27 | −16<br>−34 | −16<br>−43 | −6<br>−11 | −6<br>−14 | −6<br>−17 | 0<br>−5 | 0<br>−8 | 0<br>−11 | 0<br>−18 | 0<br>−27 | 0<br>−43 |
| 14 | 18 | | | | | | | | | | | | | | | | | | | |
| 18 | 24 | −160<br>−212 | −110<br>−162 | −65<br>−98 | −65<br>−117 | −40<br>−61 | −40<br>−73 | −40<br>−92 | −20<br>−33 | −20<br>−41 | −20<br>−53 | −7<br>−13 | −7<br>−16 | −7<br>−20 | 0<br>−6 | 0<br>−9 | 0<br>−13 | 0<br>−21 | 0<br>−33 | 0<br>−52 |
| 24 | 30 | | | | | | | | | | | | | | | | | | | |
| 30 | 40 | −170<br>−232 | −120<br>−182 | −80<br>−119 | −80<br>−142 | −50<br>−75 | −50<br>−89 | −50<br>−112 | −25<br>−41 | −25<br>−20 | −25<br>−64 | −9<br>−16 | −9<br>−20 | −9<br>−25 | 0<br>−7 | 0<br>−11 | 0<br>−16 | 0<br>−25 | 0<br>−39 | 0<br>−62 |
| 40 | 50 | −180<br>−242 | −130<br>−192 | | | | | | | | | | | | | | | | | |
| 50 | 65 | −190<br>−264 | −140<br>−214 | −100<br>−146 | −100<br>−174 | −60<br>−90 | −60<br>−106 | −60<br>−134 | −30<br>−49 | −30<br>−60 | −30<br>−76 | −10<br>−18 | −10<br>−23 | −10<br>−29 | 0<br>−8 | 0<br>−13 | 0<br>−19 | 0<br>−30 | 0<br>−46 | 0<br>−74 |
| 65 | 80 | −200<br>−274 | −150<br>−224 | | | | | | | | | | | | | | | | | |
| 80 | 100 | −220<br>−307 | −170<br>−257 | −120<br>−174 | −120<br>−207 | −72<br>−107 | −72<br>−126 | −72<br>−159 | −36<br>−58 | −36<br>−71 | −36<br>−90 | −12<br>−22 | −12<br>−27 | −12<br>−34 | 0<br>−10 | 0<br>−15 | 0<br>−22 | 0<br>−35 | 0<br>−54 | 0<br>−87 |
| 100 | 120 | −240<br>−327 | −180<br>−267 | | | | | | | | | | | | | | | | | |

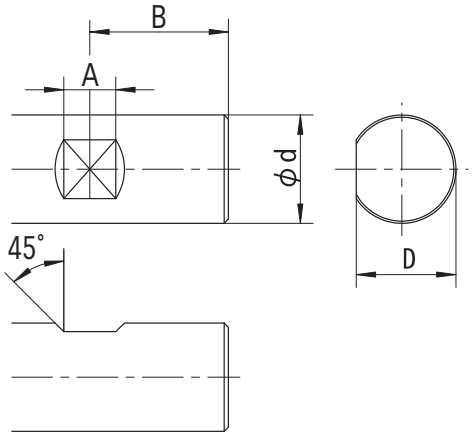
| 寸法の区分 (mm) | | js | | | | k | | | m | | | n | p | r | s | t | u | x |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| を超え | 以下 | js4 | js5 | js6 | js7 | k4 | k5 | k6 | m4 | m5 | m6 | n6 | p6 | r6 | s6 | t6 | u6 | x6 |
| – | 3 | ±1.5 | ±2 | ±3 | ±5 | +3<br>0 | +4<br>0 | +6<br>0 | +5<br>+2 | +6<br>+2 | +8<br>+2 | +10<br>+4 | +12<br>+6 | +16<br>+10 | +20<br>+14 | – | +24<br>+18 | +26<br>+20 |
| 3 | 6 | ±2 | ±2.5 | ±4 | ±6 | +5<br>+1 | +6<br>+1 | +9<br>+1 | +8<br>+4 | +9<br>+4 | +12<br>+4 | +16<br>+8 | +20<br>+12 | +23<br>+15 | +27<br>+19 | – | +31<br>+23 | +36<br>+28 |
| 6 | 10 | ±2 | ±3 | ±4.5 | ±7.5 | +5<br>+1 | +7<br>+1 | +10<br>+1 | +10<br>+6 | +12<br>+6 | +15<br>+6 | +19<br>+10 | +24<br>+15 | +28<br>+19 | +32<br>+23 | – | +37<br>+28 | +43<br>+34 |
| 10 | 14 | ±2.5 | ±4 | ±5.5 | ±9 | +6<br>+1 | +9<br>+1 | +12<br>+1 | +12<br>+7 | +15<br>+7 | +18<br>+7 | +23<br>+12 | +29<br>+18 | +34<br>+23 | +39<br>+28 | – | +44<br>+33 | +51<br>+40<br>+56<br>+45 |
| 14 | 18 | | | | | | | | | | | | | | | | | |
| 18 | 24 | ±3 | ±4.5 | ±6.5 | ±10.5 | +8<br>+2 | +11<br>+2 | +15<br>+2 | +14<br>+8 | +17<br>+8 | +21<br>+8 | +28<br>+15 | +35<br>+22 | +41<br>+28 | +48<br>+35 | –<br>+54<br>+41 | +54<br>+41 | +67<br>+54<br>+77<br>+64 |
| 24 | 30 | | | | | | | | | | | | | | | | | |
| 30 | 40 | ±3.5 | ±5.5 | ±8 | ±12.5 | +9<br>+2 | +13<br>+2 | +18<br>+2 | +14<br>+9 | +20<br>+9 | +25<br>+9 | +33<br>+17 | +42<br>+26 | +50<br>+34 | +59<br>+43 | +64<br>+48<br>+70<br>+54 | +76<br>+60<br>+86<br>+70 | – |
| 40 | 50 | | | | | | | | | | | | | | | | | |
| 50 | 65 | ±4 | ±6.5 | ±9.5 | ±15 | +10<br>+2 | +15<br>+2 | +21<br>+2 | +19<br>+11 | +24<br>+11 | +30<br>+11 | +39<br>+20 | +51<br>+32 | +60<br>+41<br>+62<br>+43 | +72<br>+53<br>+78<br>+59 | +85<br>+66<br>+94<br>+75 | +106<br>+87<br>+121<br>+102 | – |
| 65 | 80 | | | | | | | | | | | | | | | | | |
| 80 | 100 | ±5 | ±7.5 | ±11 | ±17.5 | +13<br>+3 | +18<br>+3 | +25<br>+3 | +23<br>+13 | +28<br>+13 | +35<br>+13 | +45<br>+23 | +59<br>+37 | +73<br>+51<br>+76<br>+54 | +93<br>+71<br>+101<br>+79 | +113<br>+91<br>+126<br>+104 | +146<br>+124<br>+166<br>+144 | – |
| 100 | 120 | | | | | | | | | | | | | | | | | |

備考　表中の各段で、上側の数値は上の寸法許容差、下側の数値は下の寸法許容差を示す。
※The figure on the upper row shows the upper tolerance and the figure on the lower row shows lower tolerance.

# ■フラット付ストレートシャンク部の形状及び寸法

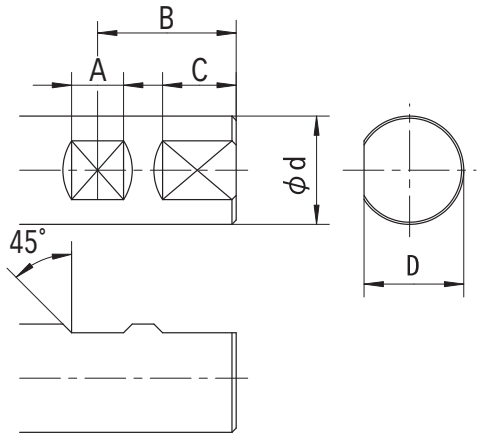
*Flatted Cylindrical Shank Part-Dimensional Characteristics*

## Type Ⅰ



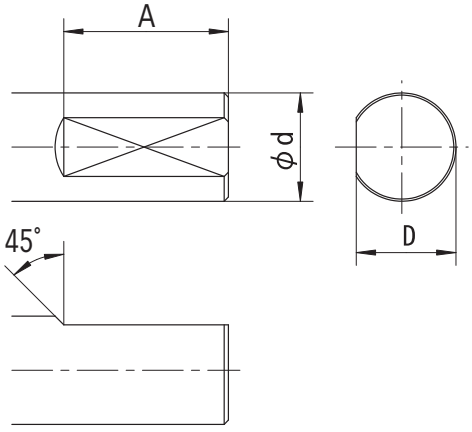

| ϕd | A | B | D |
|---|---|---|---|
| 12 | 8 | 22.5 | 10.4 |
| 16 | 10 | 24 | 14.2 |
| 20 | 11 | 25 | 18.2 |

## Type Ⅱ




| ϕd | A | B | C | D |
|---|---|---|---|---|
| 25 | 12 | 32 | 17 | 23 |
| 32 | 14 | 36 | 19 | 30 |
| 42 | 14 | 40 | 19 | 40 |

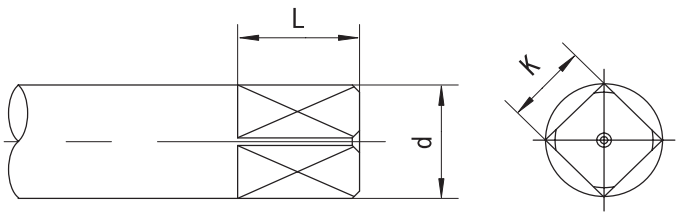
## Type Ⅲ




| 刃径 | ϕd | A | D |
|---|---|---|---|
| 20.5 ～ 21 | 15 | 40 | 14.3 |
| 21.5 ～ 23 | 16 | 40 | 15.3 |
| 23.5 ～ 24 | 18 | 40 | 17.3 |
| 24.5 ～ 26.5 | 18 | 45 | 17.3 |
| 27 ～ 32 | 20 | 45 | 19.1 |

# ■ シャンク形状 *Shank Shape*

角寸法
Square Tang Of Shank



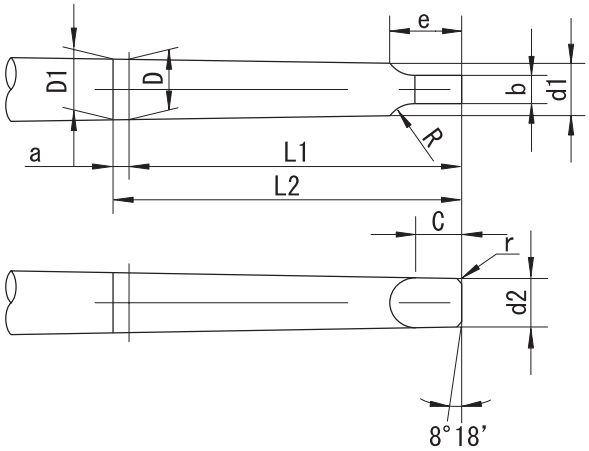

（単位 unit:mm）

| シャンク径 (d) *Shank Dia.* 以上 *Over* | 以下 *Under* | 角部幅 (K) *Width* 基準寸法 *Dimension* | 公差 *Tolerance* | 角部の長さ (L) *Length* 基準寸法 *Dimension* |
|---|---|---|---|---|
| 2 | | 1.6 | | 5 |
| 3 ～ 3.1 | | 2.5 | | 5 |
| 3.11 ～ 3.6 | | 2.8 | | 6 |
| 3.61 ～ 4.1 | | 3.2 | | 6 |
| 4.11 ～ 4.6 | | 3.5 | 0 -0.1 | 6 |
| 4.61 ～ 5.1 | | 4 | | 7 |
| 5.11 ～ 6.1 | | 4.5 | | 7 |
| 6.11 ～ 6.6 | | 5 | | 8 |
| 6.61 ～ 7.1 | | 5.5 | | 8 |
| 7.11 ～ 8.1 | | 6 | | 9 |

| シャンク径 (d) *Shank Dia.* 以上 *Over* | 以下 *Under* | 角部幅 (K) *Width* 基準寸法 *Dimension* | 公差 *Tolerance* | 角部の長さ (L) *Length* 基準寸法 *Dimension* |
|---|---|---|---|---|
| 8.11 ～ 8.6 | | 6.5 | | 9 |
| 8.61 ～ 9.6 | | 7 | 0 -0.1 | 10 |
| 9.61 ～ 10.6 | | 8 | | 11 |
| 10.61 ～ 12.1 | | 9 | | 12 |
| 12.11 ～ 13.6 | | 10 | | 13 |
| 13.61 ～ 14.6 | | 11 | | 14 |
| 14.61 ～ 16.1 | | 12 | 0 -0.15 | 15 |
| 16.11 ～ 17.1 | | 13 | | 16 |
| 17.11 ～ 18.1 | | 14 | | 17 |
| 18.11 ～ 20.1 | | 15 | | 18 |

| シャンク径 (d) *Shank Dia.* 以上 *Over* | 以下 *Under* | 角部幅 (K) *Width* 基準寸法 *Dimension* | 公差 *Tolerance* | 角部の長さ (L) *Length* 基準寸法 *Dimension* |
|---|---|---|---|---|
| 20.11 ～ 23.1 | | 17 | 0 -0.15 | 20 |
| 23.11 ～ 25.1 | | 19 | | 22 |
| 25.11 ～ 28.1 | | 21 | | 24 |
| 28.11 ～ 30.1 | | 23 | 0 -0.2 | 26 |
| 30.11 ～ 34.1 | | 26 | | 30 |
| 34.11 ～ 38.1 | | 29 | | 32 |
| 38.11 ～ 42.1 | | 32 | | 35 |
| 42.11 ～ 46.1 | | 35 | | 38 |
| 46.11 ～ 50.1 | | 38 | | 42 |
| 50.11 ～ 55.1 | | 41 | | 44 |
| 55.11 ～ 60 | | 46 | | 50 |

モールステーパーシャンクの寸法
Morse Taper Shank




（単位 unit:mm）

| シャンクNo. *MT No.* | テーパー比 *Taper Ratio* | テーパー部 *Taper* 基準径 (D) *Dia.* | a | D1 | d1 | 基準長さ (L1) *Standard Length* | シャンク長 (L2) *Shank Length* |
|---|---|---|---|---|---|---|---|
| 0 | 1：19.212 | 9.045 | 3 | 9.201 | 6.104 | 56.5 | 59.5 |
| 1 | 1：20.047 | 12.065 | 3.5 | 12.24 | 8.972 | 62 | 65.5 |
| 2 | 1：20.02 | 17.78 | 5 | 18.03 | 14.034 | 75 | 80 |
| 3 | 1：19.922 | 23.825 | 5 | 24.076 | 19.107 | 94 | 99 |
| 4 | 1：19.254 | 31.267 | 6.5 | 31.605 | 25.164 | 117.5 | 124 |
| 5 | 1：19.002 | 44.399 | 6.5 | 44.741 | 36.531 | 149.5 | 156 |
| 6 | 1：19.18 | 63.348 | 8 | 63.765 | 52.399 | 210 | 218 |

| シャンクNo. *MT No.* | タング部 *Tang* d2 | タング幅 (b) *Width of tang* | c | タング長 (e) *Lengh of tang* | R | r |
|---|---|---|---|---|---|---|
| 0 | 6 | 3.9 | 6.5 | 10.5 | 4 | 1 |
| 1 | 8.7 | 5.2 | 8.5 | 13.5 | 5 | 1.2 |
| 2 | 13.5 | 6.3 | 10 | 16 | 6 | 1.6 |
| 3 | 18.5 | 7.9 | 13 | 20 | 7 | 2 |
| 4 | 24.5 | 11.9 | 16 | 24 | 8 | 2.5 |
| 5 | 35.7 | 15.9 | 19 | 29 | 10 | 3 |
| 6 | 51 | 19 | 27 | 40 | 13 | 4 |



魚沼市湯之谷　雪景色

| 型式 Product Code | 製品名称 Product Name | 頁 Page | 切削条件表 Cutting Condition Table Page |
|---|---|---|---|
| ********** A ********** | | | |
| ACS | 柄付アンギュラカッター<br>Angular Cutter With Straight Shank | P214 | P260 |
| ACST | 強力型柄付アンギュラカッター<br>Long Shank Strong Angular Cutter With Straight Shank | P217 | P262 |
| ACSW | 柄付Wアンギュラカッター<br>W Angular Cutter With Straight Shank | P216 | P261 |
| AHBEL2 | 超硬エアホールボールエンドミル 2枚刃 ロングタイプ<br>Carbide Airhole Long Ball End Mill Flute:2 | P303 | P352 |
| AHBEL4 | 超硬エアホールボールエンドミル 4枚刃 ロングタイプ<br>Carbide Airhole Long Ball End Mill Flute:4 | P304 | P353 |
| AHBES2 | 超硬エアホールボールエンドミル 2枚刃 スタンダードタイプ<br>Carbide Airhole Standard Ball End Mill Flute:2 | P303 | P352 |
| AHBES4 | 超硬エアホールボールエンドミル 4枚刃 スタンダードタイプ<br>Carbide Airhole Standard Ball End Mill Flute:4 | P304 | P353 |
| AHEL2 | 超硬エアーホールエンドミル 2枚刃 ロングタイプ<br>Carbide Airhole Long End Mill Flute:2 | P302 | P351 |
| AHEL4 | 超硬エアーホールエンドミル 4枚刃 ロングタイプ<br>Carbide Airhole Long End Mill Flute:4 | P302 | P352 |
| AHES2 | 超硬エアーホールエンドミル 2枚刃 スタンダードタイプ<br>Carbide Airhole Standard End Mill Flute:2 | P302 | P351 |
| AHES4 | 超硬エアーホールエンドミル 4枚刃 スタンダードタイプ<br>Carbide Airhole Standard End Mill Flute:4 | P302 | P352 |
| AHTBE | 超硬エアホールソリッドテーパーボールエンドミル<br>Solid Carbide Airhole Taper Ball End Mill | P306 | P354 |
| AHTE | 超硬エアホールソリッドテーパーエンドミル<br>Solid Carbide Airhole Taper End Mill | P305 | P353 |
| ********** B ********** | | | |
| BDC | 深穴用裏ザグリカッター<br>Back Counterboring Cutter For Deep Hole | P195 | P257 |
| BE | ボールエンドミル<br>Ball End Mill | P325 | P362 |
| BEL | ロングボールエンドミル<br>Long Ball End Mill | P328 | P362 |
| BELS | ロングシャンクボールエンドミル<br>Long Shank Ball End Mill | P329 | P362 |
| BMC | 裏面取カッター<br>Back Countersink | P195 | P257 |
| BZC | スタンダード裏ザグリカッター<br>Standard Back Counterboring Cutter | P195 | P257 |
| BZH | ガイドホルダー<br>Guide Holder | P195 | |
| ********** C ********** | | | |
| CB | 六角穴付ボルト用沈めフライス ストレートシャンク<br>Counterbore With Straight Shank | P227 | P267 |
| CBH | 平小ネジ用沈めフライス<br>Screw Counterbore | P228 | P267 |
| CB-JM | JIS沈めフライス<br>Counterbore With JIS | P230 | P268 |
| CBLS | 六角穴付ボルト用ロングシャンク沈めフライス<br>Long Shank Counterbore | P228 | P267 |
| CBO | 押出ピン用沈めフライス<br>Push Pin Counterbore | P229 | P268 |
| CBS | 皿小ネジ用沈めフライス<br>Screw Countersink | P229 | P267 |
| CBT | 六角穴付ボルト用沈めフライス テーパーシャンク<br>Counterbore With Taper Shank | P227 | P267 |
| CB-TSM | TSM沈めフライス<br>Counterbore With TSM | P230 | P268 |

# アルファベット順 INDEX


| 型式<br>*Product Code* | 製品名称<br>*Product Name* | 頁<br>*Page* | 切削条件表<br>*Cutting Condition Table Page* |
|---|---|---|---|
| CC | センター面取カッター<br>*Center Chamfering Cutter* | P222 | P264 |
| CCB | 超硬沈めフライス<br>*Carbide Tipped Counterbore* | P186 | P253 |
| CCRC | 超硬コーナーRカッター<br>*Carbide Tipped Corner R Cutter* | P187 | P254 |
| CCTL | 超硬センタリングツール ロングタイプ<br>*Solid Carbide Head Centering Tool Long Type* | P276 | P287 |
| CCTLT | 超硬センタリングツール ロングタイプ（テーパーシャンク）<br>*Solid Carbide Head Centering Tool with Taper Shank Long Type* | P277 | P287 |
| CCTS | 超硬センタリングツール ショートタイプ<br>*Solid Carbide Head Centering Tool Short Type* | P276 | P287 |
| CCTST | 超硬センタリングツール ショートタイプ（テーパーシャンク）<br>*Solid Carbide Head Centering Tool with Taper Shank Short Type* | P277 | P287 |
| CEM | C面付エンドミル<br>*Corner C End Mill* | P334 | P363 |
| CF | センターフライス<br>*Countersink With Straight Shank* | P219 | P263 |
| CFT | センターフライス（テーパーシャンク）<br>*Countersink With Taper Shank* | P220 | P263 |
| CHHR | 超硬ハイヘリカルリーマ<br>*Carbide High Helical Reamer* | P43 | P137 |
| CHHRT | 超硬ハイヘリカルリーマ（テーパーシャンク）<br>*Solid Carbide Head High Helical Reamer with Taper Shank* | P45 | P137 |
| CKC | 超硬キーシードカッター<br>*Solid Carbide Head Keyseat Cutter* | P180 | P251 |
| CKC-AS | 超硬キーシードカッター ASタイプ<br>*Solid Carbide Head Keyseat Cutter AS-Type* | P182 | P251 |
| CMBE | 超硬先ムクボールエンドミル<br>*Solid Carbide Head Ball End Mill* | P309 | P355 |
| CMCRC | 超硬ミニコーナーRカッター<br>*Carbide Mini Corner R Cutter* | P186 | P254 |
| CNCR-C | 超硬自動旋盤用リーマ<br>*Solid Carbide Reamer For NC Lathe Machine* | P4 | P133 |
| CNCZ-C | 超硬フラットザグリドリル（自動旋盤用）<br>*Solid Carbide Flat Drill For Counterboring* | P273 | P287 |
| CRC | コーナーRカッター<br>*Corner R Cutter* | P223 | P265 |
| CRM-2 | 超硬ソリッド台形ランナーエンドミル<br>*Solid Carbide Taper End Mill For Runner* | P320 | P358 |
| CRM-P | 超硬ソリッド台形ランナーエンドミル（Pコーティング）<br>*P-Coated Solid Carbide Taper End Mill For Runner* | P321 | P359 |
| CSACLS | 超硬ソリッドアンギュラカッターロング<br>*Solid Carbide Angular Cutter With Long Straight Shank* | P175 | P250 |
| CSACS | 超硬ソリッドアンギュラカッター<br>*Solid Carbide Angular Cutter With Straight Shank* | P175 | P250 |
| CSBE | 超硬ソリッドボールエンドミル<br>*Solid Carbide Ball End Mill* | P307 | P354 |
| CSCER | 超硬エンド刃付クーラントリーマ（止まり穴用）<br>*Solid Carbide Coolant Reamer for Blind Hole* | P21 | P135 |
| CSCRL | 超硬ロングシャンクチャッキングリーマ<br>*Carbide Long Shank Chucking Reamer* | P40 | P136 |
| CSCRS | 超硬チャッキングリーマ<br>*Carbide Straight Shank Chucking Reamer* | P36 | P136 |
| CSER-C | 超硬エンド刃付リーマ<br>*Solid Carbide End Mill Reamer For Blind Hole* | P15 | P134 |
| CSFRP | 超硬ソリッドファイバー用カッター<br>*Solid Carbide Cutter For Fiber* | P293 | P347 |
| CSFRPE | 超硬ソリッドファイバー用カッター底刃付タイプ<br>*Solid Carbide Cutter For Fiber End Mill Type* | P293 | P347 |
| CSFRPE-P | 超硬ソリッドファイバー用カッター底刃付タイプ コーティング付<br>*P Coated Solid Carbide Cutter For Fiber End Mill Type* | P293 | P347 |

| 型式<br>*Product Code* | 製品名称<br>*Product Name* | 頁<br>*Page* | 切削条件表<br>*Cutting Condition Table Page* |
|---|---|---|---|
| **CSFRP-P** | 超硬ソリッドファイバー用カッター コーティング付<br>*P Coated Solid Carbide Cutter For Fiber* | **P293** | **P347** |
| **CSGR-A** | 超硬ソリッドリーマ シャンクスルークーラント<br>*Solid Carbide Reamer Shank Through Coolant* | **P19** | **P134** |
| **CSGR-DLC** | 超硬ソリッドリーマ シャンクスルークーラント アルミ用<br>*Solid Carbide Reamer Shank Through Coolant For Aluminium* | **P20** | **P135** |
| **CSHD** | 超硬半月ドリル<br>*Solid Carbide Half Drill* | **P275** | **P287** |
| **CSHR** | ソリッドヘリカルリーマ<br>*Solid Carbide Helical Reamer* | **P42** | **P136** |
| **CSKC** | 超硬ソリッドキーシードカッター<br>*Solid Carbide Keyseat Cutter* | **P178** | **P251** |
| **CSLHR** | ソリッドロングハンドリーマ<br>*Solid Carbide Long Hand Reamer* | **P33** | **P135** |
| **CSME2** | 超硬スーパーミニエンドミル 2枚刃<br>*Solid Carbide Super Mini End Mill Flute:2* | **P324** | **P361** |
| **CSME4** | 超硬スーパーミニエンドミル 4枚刃<br>*Solid Carbide Super Mini End Mill Flute:4* | **P324** | **P361** |
| **CSMK** | 超硬スーパーミニキーシードカッター<br>*Solid Carbide Super Mini Keyseat Cutter* | **P171** | **P249** |
| **CSMK-Al** | 超硬スーパーミニキーシードカッター アルミ用<br>*Solid Carbide Super Mini Keyseat Cutter For Aluminum* | **P155** | **P241** |
| **CSMK-Re** | 超硬スーパーミニキーシードカッター 樹脂用<br>*Solid Carbide Super Mini Keyseat Cutter For Resin* | **P154** | **P241** |
| **CSMK-S** | 超硬スーパーミニキーシードカッター スリムシャンク<br>*Solid Carbide Super Mini Keyseat Cutter Slim Shank* | **P159** | **P243** |
| **CSMS** | 超硬スーパーミニアンギュラ<br>*Solid Carbide Super Mini Angular Cutter* | **P162** | **P244** |
| **CSMS-Al** | 超硬スーパーミニアンギュラ アルミ用<br>*Solid Carbide Super Mini Angular Cutter For Aluminum* | **P152** | **P240** |
| **CSMS-H** | 超硬スーパーミニアンギュラ 高硬度用<br>*Solid Carbide Super Mini Angular Cutter For Hard Steel* | **P151** | **P240** |
| **CSMSL-A** | 超硬スーパーミニアンギュラロング<br>*Solid Carbide Super Mini Angular Cutter Long* | **P162** | **P245** |
| **CSMS-Re** | 超硬スーパーミニアンギュラ 樹脂用<br>*Solid Carbide Super Mini Angular Cutter For Resin* | **P151** | **P240** |
| **CSMS-S** | 超硬スーパーミニアンギュラ スリムシャンク<br>*Solid Carbide Super Mini Angular Cutter Slim Shank* | **P157** | **P242** |
| **CSMST2-P** | 超硬ソリッドミニストロングアンギュラ 2枚刃<br>*Solid Carbide Mini Strong Angular Cutter Flute:2* | **P164** | **P246** |
| **CSMST4-P** | 超硬ソリッドミニストロングアンギュラ 4枚刃<br>*Solid Carbide Mini Strong Angular Cutter Flute:4* | **P165** | **P247** |
| **CSMT** | 超硬スーパーミニスロット<br>*Solid Carbide Super Mini Slot Cutter* | **P160** | **P244** |
| **CSMT-Al** | 超硬スーパーミニスロット アルミ用<br>*Solid Carbide Super Mini Slot Cutter For Aluminum* | **P150** | **P240** |
| **CSMT-H** | 超硬スーパーミニスロット 高硬度用<br>*Solid Carbide Super Mini Slot Cutter For Hard Steel* | **P148** | **P239** |
| **CSMTKC** | 超硬スーパーミニ千鳥刃キーシードカッター<br>*Solid Carbide Super Mini Staggered Tooth Keyseat Cutter* | **P173** | **P250** |
| **CSMTL-A** | 超硬スーパーミニスロットロング<br>*Solid Carbide Super Mini Slot Cutter Long* | **P161** | **P244** |
| **CSMT-Re** | 超硬スーパーミニスロット 樹脂用<br>*Solid Carbide Super Mini Slot Cutter For Resin* | **P149** | **P239** |
| **CSMT-S** | 超硬スーパーミニスロット スリムシャンク<br>*Solid Carbide Super Mini Slot Cutter Slim Shank* | **P156** | **P242** |
| **CSMU** | 超硬スーパーミニコンベックス<br>*Solid Carbide Super Mini Convex Cutter* | **P167** | **P247** |
| **CSMUL-A** | 超硬スーパーミニコンベックスロング<br>*Solid Carbide Super Mini Convex Cutter Long* | **P168** | **P248** |
| **CSMU-S** | 超硬スーパーミニコンベックス スリムシャンク<br>*Solid Carbide Super Mini Convex Cutter Slim Shank* | **P158** | **P243** |

| 型式 Product Code | 製品名称 Product Name | 頁 Page | 切削条件表 Cutting Condition Table Page |
|---|---|---|---|
| CSMV | 超硬スーパーミニコンケーブ<br>Solid Carbide Super Mini Concave Cutter | P169 | P248 |
| CSMW | 超硬スーパーミニWアンギュラ<br>Solid Carbide Super Mini W-Angular Cutter | P163 | P245 |
| CSMW-Al | 超硬スーパーミニWアンギュラ アルミ用<br>Solid Carbide Super Mini W-Angular Cutter For Aluminum | P153 | P241 |
| CSMW-H | 超硬スーパーミニWアンギュラ 高硬度用<br>Solid Carbide Super Mini W-Angular Cutter For Hard Steel | P152 | P240 |
| CSMWL-A | 超硬スーパーミニWアンギュラロング<br>Solid Carbide Super Mini W-Angular Cutter Long | P163 | P246 |
| CSMW-Re | 超硬スーパーミニWアンギュラ 樹脂用<br>Solid Carbide Super Mini W-Angular Cutter For Resin | P153 | P240 |
| CSMW-S | 超硬スーパーミニWアンギュラ スリムシャンク<br>Solid Carbide Super Mini W-Angular Cutter Slim Shank | P157 | P243 |
| CSOER | 超硬オイルホール付止穴用リーマ<br>Solid Carbide Oil Hole Reamer For Blind Hole | P17 | P134 |
| CSPGR | ソリッドピンゲートリーマ<br>Solid Carbide Pin Gate Reamer | P47 | P137 |
| CSPOTR | 超硬オイルホールスパイラルテーパーリーマ<br>Solid Carbide Head Oil Hole Spiral Taper Reamer | P48 | P138 |
| CSPR-C | コーティング ソリッドスパイラルリーマ<br>TiCN2 Coated Solid Carbide Spiral Reamer | P9 | P133 |
| CSQCL2-A | 超硬ソリッド球面カッター 2枚刃 ロングタイプ<br>Solid Carbide Spherical Cutter Flute:2 Long | P147 | P239 |
| CSQCL4-A | 超硬ソリッド球面カッター 4枚刃 ロングタイプ<br>Solid Carbide Spherical Cutter Flute:4 Long | P147 | P239 |
| CSQCS2-A | 超硬ソリッド球面カッター 2枚刃<br>Solid Carbide Spherical Cutter Flute:2 | P147 | P239 |
| CSQCS4-A | 超硬ソリッド球面カッター 4枚刃<br>Solid Carbide Spherical Cutter Flute:4 | P147 | P239 |
| CSR | ソリッドリーマ<br>Solid Carbide Reamer | P27 | P135 |
| CSR-C | コーティング ソリッドリーマ<br>TiCN2 Coated Solid Carbide Reamer | P6 | P133 |
| CSR-DLC | 超硬ソリッドアルミ用リーマ<br>Solid Carbide Reamer DLC Coated For Aluminum | P11 | P133 |
| CSR-ECO | 超硬高精度用リーマ<br>Solid Carbide High Precision Reamer | P25 | P135 |
| CSRH-P | ソリッド高硬度用リーマ（～HRC62）<br>Solid Carbide Reamer For Hard Steel (~HRC62) | P13 | P133 |
| CSRM | ソリッドミディアムリーマ<br>Solid Carbide Medium Reamer | P31 | P135 |
| CSR-MC | 超硬ミクロンリーマ<br>Solid Carbide Micron Reamer | P23 | P135 |
| CSRR-3 | 超硬ルーマー型リーマ<br>Solid Carbide Roumer Type Reamer | P22 | P135 |
| CSRT-A | 超硬リバースカッター（超硬ソリッド逆テーパーエンドミル）<br>Solid Carbide Reverse Cutter | P322 | P360 |
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| CSSPSCR | ソリッドスパイラルチャッキングリーマ<br>Solid Carbide Spiral Chucking Reamer | P39 | P135 |
| CSSZC | 超硬シート面ザグリカッター（PF規格／UNF規格）<br>Carbide Counterbore With Seat Surface (PF Standard / UNF Standard) | P185 | P253 |
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| CSTBEL | 超硬ソリッドロングテーパーボールエンドミル<br>Solid Carbide Long Taper Ball End Mill | P317 | P357 |
| CSTC | 超硬ソリッドTスロットカッター<br>Solid Carbide T-Slot Cutter | P176 | P244 |
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| **CSTEL** | 超硬ソリッドテーパーエンドミル（ロング）<br>*Solid Carbide Taper End Mill (Long)* | **P314** | **P356** |
| **CSTEM** | 超硬ソリッドテーパーエンドミル（ミディアム）<br>*Solid Carbide Taper End Mill (Medium)* | **P312** | **P356** |
| **CSTPR** | ソリッドテーパーピンリーマ<br>*Solid Carbide Taper Pin Reamer* | **P46** | **P137** |
| **CSTTC** | 超硬ソリッド千鳥刃Tスロットカッター<br>*Solid Carbide Staggered Tooth T-Slot Cutter* | **P177** | **P250** |
| **CSTTCL** | 超硬ソリッド千鳥刃Tスロットカッターロング<br>*Solid Carbide Staggered Tooth T-Slot Cutter With Long Straight Shank* | **P177** | **P250** |
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| **CSWRCL-A** | 超硬ミニWR面取カッターロング<br>*Solid Carbide Mini Double R Cutter With Long Straight Shank* | **P170** | **P249** |
| **CT** | センタリングツール<br>*Centering Tool Point 90° • 118°* | **P284** | **P290** |
| **CTT** | センタリングツール（テーパーシャンク）<br>*Centering Tool With Taper Shank Point 90° • 118°* | **P284** | **P290** |
| **CUKC-K10** | 超硬裏ザグリカッターK10<br>*Carbide Tipped Back Counterboring Cutter* | **P192** | **P256** |
| **CUKC-P20** | 超硬裏ザグリカッターP20<br>*Carbide Tipped Back Counterboring Cutter* | **P192** | **P256** |
| **CZCS** | 超硬パイロット付ザグリカッター ストレートシャンク<br>*Carbide Tipped Counterbore With Straight Shank* | **P184** | **P252** |
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| ********* **D** ********* | | | |
| **DCB** | 六角穴付ボルト用ドリル付沈めフライス<br>*Counterbore With Drill* | **P231** | **P269** |
| **DCBS** | 皿小ネジ用ドリル付沈めフライス<br>*Screw Countersink With Drill* | **P232** | **P269** |
| **DCB-SHM** | 平小ネジ沈め用段付ドリル（ストレートシャンク）H型<br>*Screw Counterbore With Drill (Straight Shank) H-Type* | **P235** | **P269** |
| **DCB-SRM** | 六角ボルト沈め用段付ドリル（ストレートシャンク）R型<br>*Counterbore With Drill (Straight Shank) R-Type* | **P235** | **P269** |
| **DCB-SSM** | 皿小ネジ沈め用段付ドリル（ストレートシャンク）S型<br>*Screw Counterbore With Drill (Straight Shank) S-Type* | **P236** | **P270** |
| **DCBSTA** | TAS皿小ネジ用ドリル付沈めフライス<br>*TAS Screw Countersink With Drill* | **P233** | **P270** |
| **DCBTA** | TAS六角穴付ボルト用ドリル付沈めフライス<br>*TAS Counterbore With Drill* | **P232** | **P269** |
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| **DRT** | ドリルリーマ（テーパーシャンク）<br>*Drill Reamer With Taper Shank* | **P106** | **P141** |
| ********* **E** ********* | | | |
| **ERR-TiN** | エンド刃付止穴用リーマ<br>*End Mill Reamer For Blind Hole* | **P49** | **P139** |
| **EXLE4** | 超ロング4枚刃エンドミル<br>*Long Flute End Mill* | **P339** | **P365** |
| **EXLSE4** | 超ロングシャンク4枚刃エンドミル<br>*Long Shank End Mill* | **P340** | **P365** |

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| ********** G ********** | | | |
| GBEL2 | 超硬グラファイト ソリッドボールエンドミル 2枚刃 ロングタイプ<br>Solid Carbide Graphite Long Ball End Mill Flute:2 | P297 | P349 |
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| ********** H ********** | | | |
| HHHR | ハイヘリカルリーマ<br>High Helical Reamer | P99 | P140 |
| HHHRL | ロングハイヘリカルリーマ<br>Long High Helical Reamer | P104 | P140 |
| HHHRT | ハイヘリカルリーマ（テーパーシャンク）<br>High Helical Reamer with Taper Shank | P102 | P140 |
| HHHRTL | ロングハイヘリカルリーマ（テーパーシャンク）<br>Long High Helical Reamer with Taper Shank | P104 | P140 |
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| HPTBE | テーパーボールエンドミル<br>Taper Ball End Mill | P332 | P363 |
| HR | ハンドリーマ<br>Hand Reamer | P61 | P140 |
| HSPTR | 粉末ハイス スパイラルテーパーリーマ<br>Powder Metallurgy Spiral Taper Reamer | P130 | P142 |
| HTPR | ヘリカルテーパーピンリーマ<br>Helical Taper Pin Reamer | P109,P110 | P142 |
| HTPRT | マシン用ヘリカルテーパーピンリーマ<br>Helical Taper Pin Reamer With Taper Shank | P112 | P142 |
| ********** K ********** | | | |
| KC | キーシードカッター<br>Keyseat Cutter | P200 | P258 |

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| **KCLS** | ロングシャンクキーシードカッター<br>*Long Shank Keyseat Cutter* | **P209** | **P259** |
| **KCNC** | 自動旋盤用カッター<br>*Cutter For NC Lathe Machine* | **P199** | **P258** |
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| ********** **L** ********** | | | |
| **LHR** | ロングハンドリーマ<br>*Long Hand Reamer* | **P71** | **P140** |
| **LMR** | ロングマシンリーマ<br>*Long Machine Reamer* | **P95** | **P141** |
| ********** **M** ********** | | | |
| **MCRC** | ミニコーナーRカッター（ハーフ）<br>*Mini Corner R Cutter* | **P223** | **P265** |
| **MCR-TiN** | マシンチャッキングリーマ<br>*Machine Chucking Reamer* | **P53** | **P139** |
| **MR** | マシンリーマ<br>*Machine Reamer* | **P87** | **P141** |
| **MSS-TiN** | 柄付メタルソー<br>*Metal Saw With Straight Shank (TiN Coated)* | **P212** | **P259** |
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| **MTR-RF** | モールステーパーリーマ（ハンド用）荒仕上用<br>*Morse Taper Reamer (Hand) For Rough Finish* | **P126** | **P144** |
| **MTRT-F** | モールステーパーリーマ（マシン用）仕上用<br>*Morse Taper Reamer (Machine) For Finish* | **P127** | **P144** |
| **MTRT-RF** | モールステーパーリーマ（マシン用）荒仕上用<br>*Morse Taper Reamer (Machine) For Rough Finish* | **P127** | **P144** |
| ********** **N** ********** | | | |
| **NCR-C** | 自動旋盤用リーマ<br>*Reamer For NC Lathe Machine* | **P51** | **P139** |
| ********** **O** ********** | | | |
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| **OAC4-R** | 超硬Oリング用アリ溝カッター 4枚刃 ステン用荒<br>*Solid Carbide Angular Cutter For O Ring 4Flutes For Roughing Stainless* | **P189** | **P255** |
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| ********** **P** ********** | | | |
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| **PGR** | ピンゲートリーマ<br>*Pin Gate Reamer* | **P125** | **P143** |
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| **PTDS** | 管用ドリル（ストレートシャンク）<br>*Drill With Straight Shank For Pipe* | **P283** | **P290** |
| **PTDT** | 管用ドリル（テーパーシャンク）<br>*Drill With Taper Shank For Pipe* | **P283** | **P290** |
| ********** **R** ********** | | | |
| **RC** | R面取カッター（スプールブッシュ用）<br>*R Cutter (For Sprue Bushes)* | **P221** | **P263** |

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| ********* S ********* | | | |
| SCR | ストレートシャンクチャッキングリーマ<br>Straight Shank Chucking Reamer | P76 | P141 |
| SCRL | ロングシャンクチャッキングリーマ<br>Long Shank Chucking Reamer | P83 | P141 |
| SLEM | スロッチングエンドミル<br>Slotting End Mill | P335 | P364 |
| SLEML | ロングスロッチングエンドミル<br>Long Slotting End Mill | P336 | P364 |
| SLEMLS | ロングシャンクスロッチングエンドミル<br>Long Shank Slotting End Mill | P337 | P364 |
| SPHR | スパイラルハンドリーマ<br>Spiral Hand Reamer | P68 | P140 |
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| SPLMR | スパイラルロングマシンリーマ<br>Spiral Long Machine Reamer | P98 | P141 |
| SPMR | スパイラルマシンリーマ<br>Spiral Machine Reamer | P91 | P141 |
| SPSCR | ストレートシャンクスパイラルチャッキングリーマ<br>Straight Shank Spiral Chucking Reamer | P80 | P141 |
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| SP-SUR3-R | R付スプールリーマ 3枚刃スパイラル<br>Spiral Sprue Reamer With R Flute:3 | P124 | P143 |
| SPTDN | ニック付スパイラルテーパーコアドリル<br>Spiral Taper Core Drill With Nick | P282 | P289 |
| SPTPR | スパイラルテーパーピンリーマ<br>Spiral Taper Pin Reamer | P108,P110 | P142 |
| SPTR-F | 1/10テーパー,スパイラルテーパーリーマ 仕上用<br>Spiral Taper Reamer 1/10T For Finish | P128 | P144 |
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| SURN | ニック付スプールリーマ<br>Sprue Reamer With Nick | P116 | P143 |
| ********* T ********* | | | |
| TCR | テーパーシャンクチャッキングリーマ<br>Taper Shank Chucking Reamer | P85 | P141 |
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| TE-4 | テーパーエンドミル 4枚刃<br>Taper End Mill Flute:4 | P342 | P367 |
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| **TPDT** | テーパーピンドリル（テーパーシャンク）<br>*Taper Pin Drill With Taper Shank* | **P281** | **P289** |
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| **TPRT** | マシン用テーパーピンリーマ<br>*Taper Pin Reamer With Taper Shank* | **P111** | **P142** |
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| **TR-P** | タップ リムーバーPlus（レギュラーサイズ）<br>*Tap Remover Plus Regular Size* | **P274** | **P274** |
| ********* U ********* | | | |
| **UKC** | 裏ザグリカッター<br>*Back Counterboring Cutter* | **P197** | **P257** |
| **UKCC** | 裏ザグリカッター TiNコーティング<br>*Back Counterboring Cutter (TiN Coated)* | **P197** | **P257** |
| ********* Z ********* | | | |
| **ZCP** | ザグリカッター用パイロット<br>*Guide For Counterbore* | **P226** | |
| **ZCS** | パイロット付ザグリカッター ストレートシャンク<br>*Counterbore With Straight Shank* | **P224** | **P266** |
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