



エンドミル

ENDMILLS

切削工具のスーパースター



アイコンの説明

| | | | | | | | | | | | |
|------------------------------|--------------------------------------|--|---|-------------------------------------|------------------------|-----------------------------|-----------------------------------|----------------------------|------------------------------|--------------------------------|--|
| コーティング Coating | V1 TiAlN コーティング TiAlN Coating | V2 TiCN コーティング TiCN Coating | V3 TiSiN コーティング TiSiN Coating | Vc AlTiN コーティング AlTiN Coating | Vs 特殊 Special | S1 TiAlN+AlCrN 3300Hv | S2 TiAlN+α 3500Hv | S3 AlCrN 3200Hv | S4 AlTiN 3800Hv | G TiN コーティング TiN Coating | |
| 工具材質 Tool Materials | FG 微粒子超硬 Fine particle Carbide | MG 超微粒子超硬 Ultrafine particle Carbide | UMG 超々微粒子超硬 Ultra-Ultrafine Carbide | 特殊超硬 Special Carbide | 超硬 Carbide | HSS-Co コバルトハイス HSS-Co | HSS ハイス HSS | | | | |
| 加工用途 Applications | 平面加工 Planing | 溝加工 Slotting | 直溝加工 Slotting | 側面加工 Side Cutting | R加工 Radius | 曲面加工 Profiling | 穴加工 Boring | 180°ザグリ 180°Spot facing | 90°ザグリ 90°Spot facing | | |
| | 穴面取り Hole Chamfering | 裏面取り Back Chamfering | R面取り R Chamfering | 45°面取り 45° Chamfering | 面取り Chamfering | V溝加工 V-Slotting | モミツケ 最小加工径φ2 Spotting | 側面取り Side Chamfering | 彫刻加工 Engraving | | |
| 工具諸元 Statistics for tools | 35° ネジレ角度 Helix Angle | 90° 先端角度 Tip Angle | XR シンニング Thinning | S-X シンニング Thinning | X シンニング Thinning | S シンニング Thinning | 0.05~0.1 45° コーナ部 Corner | ギャッシュ ランド Gash Land | シャープ コーナー Sharp Corner | | |

アイコン コーティング種類

(ザ・)カッタミル・ドリル・面取り関連

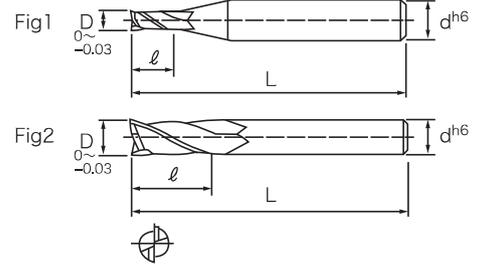
Icon @THECUTMILL (endmill)・Drill・Chamfering Cutter Coating Type

| コーティング呼び称 Coating designation | コーティング種類 Coating Type | 特長/能力・特性ポイント・硬さ目安 (Hv) Features/ability/characteristics/hardness guide(Hv) | (ザ・)カッタミル(品目)・他 THECUTMILL' (endmill) Item /others |
|----------------------------------|--------------------------|--|---|
| V1 | TiAlN | 耐摩耗性、耐酸化性、2900 (Hv) Wear resistance, Oxidation resistance, 2900(Hv) | IC2SSV, IC2SSVP, IC2SLV, IC4SSV, IC4SSVP IC4SLV, IC4RFE, IC2MBV C-MPE-V, C-BMC-V, C-CRC-V |
| V2 | TiCN | 耐摩耗性、摺動性、2700 Wear resistance, Sliding property, 2700 | TC-SSD-V |
| V3 | TiSiN | 耐摩耗性、耐酸化性、耐熱、3500 Wear resistance, Oxidation resistance, Heat-resistance, 3500 | IC4HST, IC2BHT |
| Vc | AlTiN | 耐摩耗性、耐酸化性、3000 Wear resistance, Oxidation resistance, 3000 | IC2BEL, IC4EAV |
| Vs | TiAlN系 | 耐摩耗性、耐酸化性、2900 Wear resistance, Oxidation resistance, 2900 | IC3HSN |
| S1 | TiAlN+AlCrN | 耐摩耗性、耐酸化性、耐焼付性、3500 Wear resistance, Oxidation resistance, Seizure resistance, 3500 | IC4DMC, IC4DMCL, IC6HXE |
| S2 | TiAlN+α(スーパーAH) | 耐摩耗性、耐食性、耐熱性、摺動性、3500~3700 Wear resistance, Corrosion resistance, Heat-resistance, Sliding property, 3500~3700 | IC5HSVR, IC3MBS, IC5MBS |
| S3 | AlCrN | 耐摩耗性、耐酸化性、耐焼付性、3200 Wear resistance, Oxidation resistance, Heat-resistance, 3200 | IC4MRS, IHEM2S-S |
| S4 | AlTiN | 耐摩耗性、耐酸化性、(耐)高温硬度、3800 Wear resistance, Oxidation resistance, (Resistance) High temperature hardness, 3800 | IC2RBV |
| G | TiN | 耐摩耗性、耐溶着性、2200 Wear resistance, Welding resistance, 2200 | TC-TTD-G, TCC-G, CSQ-G |

この文字色で表記のものは、(ザ・)カッタミルではありません。
The product represented by this color text are not THECUTMILL.



(ザ・)カットミル ノンコート超硬2枚刃エンドミル
Solid Carbide Square Endmills (2Flutes)



特長 Feature

- 圧倒的コストパフォーマンスを実現
- 生材から合金鋼までの幅広いワークの加工が可能
- High cost effectiveness is realized.
- Ability to process a range of materials from alloyed steel to soft iron.

単位：mm

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|----|----|-----|----|-----|
| IC2SS-3.0 | 3 | 8 | 45 | 6 | 1 |
| IC2SS-4.0 | 4 | 11 | 45 | 6 | 1 |
| IC2SS-5.0 | 5 | 13 | 50 | 6 | 1 |
| IC2SS-6.0 | 6 | 13 | 50 | 6 | 2 |
| IC2SS-8.0 | 8 | 19 | 60 | 8 | 2 |
| IC2SS-10.0 | 10 | 22 | 70 | 10 | 2 |
| IC2SS-12.0 | 12 | 26 | 75 | 12 | 2 |
| IC2SS-20.0 | 20 | 38 | 100 | 20 | 2 |

標準切削条件表 (溝加工 $ae=1D$) Recommended cutting conditions (Slotting) ☆ $D<3.0$ $ap<0.15D$ ☆熱処理鋼等加工時 $ap\leq 0.02D$
☆ $D>3.0$ $ap<0.25D$ Hardened Steels $ap\leq 0.05D$

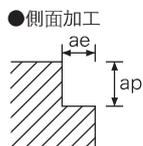
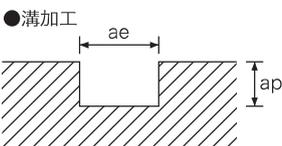
| 被削材 Work | 構造用鋼/炭素鋼 SS41/S45C(HRC30以下) | | 工具鋼/プリハードン鋼 SKD/NAK101(HRC30-35) | | 合金鋼/ステンレス鋼 SCM/SUS304(HRC35-40) | | 熱処理鋼等 (HRC40-45) | |
|-------------|--------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|-----------------------------|-----------------------------------|
| | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ |
| D 3 | 5,100 | 140 | 4,440 | 95 | 3,120 | 75 | 2,400 | 60 |
| 4 | 3,840 | 145 | 3,360 | 110 | 2,400 | 95 | 1,920 | 85 |
| 5 | 3,420 | 180 | 2,700 | 150 | 2,100 | 120 | 1,800 | 110 |
| 6 | 2,520 | 180 | 2,220 | 135 | 1,800 | 120 | 1,500 | 110 |
| 8 | 1,920 | 175 | 1,680 | 115 | 1,320 | 110 | 1,200 | 95 |
| 10 | 1,500 | 170 | 1,320 | 115 | 1,200 | 110 | 1,080 | 95 |
| 12 | 1,320 | 170 | 1,200 | 115 | 1,080 | 110 | 900 | 95 |
| 20 | 720 | 175 | 600 | 120 | 570 | 115 | 360 | 95 |

標準切削条件表 (側面加工 $ae<0.1D$) Recommended cutting conditions (Side cutting $ae<0.1D$) ☆ $ap<0.15D$ ☆熱処理鋼等加工時 $ap<1D$
Hardened Steels $ae<0.02D$

| 被削材 Work | 構造用鋼/炭素鋼 SS41/S45C(HRC30以下) | | 工具鋼/プリハードン鋼 SKD/NAK101(HRC30-35) | | 合金鋼/ステンレス鋼 SCM/SUS304(HRC35-40) | | 熱処理鋼等 Hardened Steels(HRC40-45) | |
|-------------|--------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|
| | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ |
| D 3 | 5,100 | 210 | 4,440 | 135 | 3,120 | 95 | 2,400 | 85 |
| 4 | 3,840 | 215 | 3,360 | 140 | 2,400 | 120 | 1,920 | 110 |
| 5 | 3,420 | 260 | 2,700 | 170 | 2,100 | 150 | 1,800 | 130 |
| 6 | 2,520 | 260 | 2,220 | 145 | 1,800 | 150 | 1,500 | 125 |
| 8 | 1,920 | 230 | 1,680 | 145 | 1,320 | 125 | 1,200 | 120 |
| 10 | 1,500 | 215 | 1,320 | 140 | 1,200 | 120 | 1,080 | 110 |
| 12 | 1,320 | 215 | 1,200 | 140 | 1,080 | 115 | 900 | 110 |
| 20 | 720 | 210 | 600 | 130 | 570 | 115 | 360 | 110 |

※ 切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

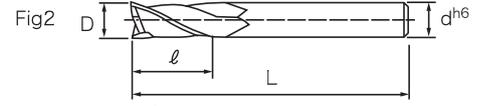
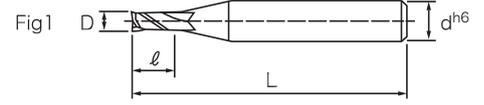


| 構造用鋼/炭素鋼 (SS41, S45C) | 工具鋼/プリハードン鋼 (SKD, NAK101) | 合金鋼/ステンレス鋼 (SCM, SUS304) | 熱処理鋼等 Hardened Steels | アルミ・銅合金 Aluminum alloy Copper alloy |
|--------------------------|------------------------------|-----------------------------|--------------------------|---|
| HRC30以下 | HRC30~35 | HRC35~40 | HRC40~45 | |
| ○ | ○ | ○ | ○ | ○ |



(ザ・) カットミル 超硬2枚刃エンドミル

Coated Solid Carbide Square Endmills (2Flutes)



刃径公差 (D Tolerance)
 $1 \leq D \leq 3$ (0 ~ -0.02), $D \geq 4$ (0 ~ -0.03)

特長 Feature

- 圧倒的コストパフォーマンスを実現
- 生材から合金鋼までの幅広いワークの加工が可能
- TiAlNコートで寿命UP
- High cost effectiveness is realized.
- Ability to process a range of materials from alloyed steel to soft iron.
- Durable due to TiAlN coating.

単位: mm

| 商品コード Item Code | D | φ | L | d | Fig |
|--------------------|-----|-----|----|---|-----|
| IC2SSV-1.0 | 1 | 2.5 | 40 | 4 | 1 |
| IC2SSV-1.5 | 1.5 | 4 | 50 | 4 | 1 |
| IC2SSV-2.0 | 2 | 6 | 40 | 4 | 1 |
| IC2SSV-2.5 | 2.5 | 6.5 | 50 | 6 | 1 |
| IC2SSV-3.0 | 3 | 8 | 45 | 6 | 1 |
| IC2SSV-3.5 | 3.5 | 9 | 50 | 6 | 1 |
| IC2SSV-4.0 | 4 | 11 | 45 | 6 | 1 |
| IC2SSV-4.5 | 4.5 | 11 | 50 | 6 | 1 |
| IC2SSV-5.0 | 5 | 13 | 50 | 6 | 1 |
| IC2SSV-5.5 | 5.5 | 14 | 50 | 6 | 1 |
| IC2SSV-6.0 | 6 | 13 | 50 | 6 | 2 |
| IC2SSV-6.5 | 6.5 | 16 | 60 | 8 | 1 |
| IC2SSV-7.0 | 7 | 19 | 60 | 8 | 1 |

| 商品コード Item Code | D | φ | L | d | Fig |
|--------------------|-----|----|-----|----|-----|
| IC2SSV-8.0 | 8 | 19 | 60 | 8 | 2 |
| IC2SSV-8.5 | 8.5 | 22 | 75 | 10 | 1 |
| IC2SSV-9.0 | 9 | 22 | 70 | 10 | 1 |
| IC2SSV-10.0 | 10 | 22 | 70 | 10 | 2 |
| IC2SSV-11.0 | 11 | 26 | 75 | 12 | 1 |
| IC2SSV-12.0 | 12 | 26 | 75 | 12 | 2 |
| IC2SSV-13.0 | 13 | 33 | 100 | 16 | 1 |
| IC2SSV-14.0 | 14 | 35 | 100 | 16 | 1 |
| IC2SSV-15.0 | 15 | 38 | 100 | 16 | 1 |
| IC2SSV-16.0 | 16 | 32 | 100 | 16 | 2 |
| IC2SSV-20.0 | 20 | 38 | 100 | 20 | 2 |
| IC2SSV-25.0 | 25 | 45 | 110 | 25 | 2 |
| IC2SSV-30.0 | 30 | 55 | 130 | 32 | 1 |

標準切削条件表 (溝加工 $ae=1D$) Recommended cutting conditions (Slotting)

☆ $D < 3.0$ $ap < 0.15D$ ☆ 熱処理鋼等加工時 $ap \leq 0.02D$
 ☆ $D > 3.0$ $ap < 0.25D$ Hardened Steels $ap \leq 0.05D$

| 被削材 Work | 構造用鋼/炭素鋼 SS41/S45C (HRC30以下) | | 工具鋼/プリハードン鋼 SKD/NAK101 (HRC30-35) | | 合金鋼/ステンレス鋼 SCM/SUS304 (HRC35-40) | | 熱処理鋼等 Hardened Steels (HRC40-45) | |
|-------------|---------------------------------|----------------------|--------------------------------------|----------------------|-------------------------------------|----------------------|-------------------------------------|----------------------|
| | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) |
| D 1 | 18,000 | 220 | 15,000 | 100 | 12,500 | 80 | 9,800 | 50 |
| D 2 | 11,500 | 220 | 10,000 | 130 | 7,300 | 80 | 6,000 | 60 |
| D 3 | 8,500 | 230 | 7,400 | 160 | 5,200 | 125 | 4,000 | 100 |
| D 4 | 6,400 | 240 | 5,600 | 180 | 4,000 | 160 | 3,200 | 140 |
| D 5 | 5,700 | 300 | 4,500 | 250 | 3,500 | 200 | 3,000 | 180 |
| D 6 | 4,200 | 300 | 3,700 | 220 | 3,000 | 200 | 2,500 | 180 |
| D 8 | 3,200 | 290 | 2,800 | 190 | 2,200 | 180 | 2,000 | 160 |
| D 10 | 2,500 | 280 | 2,200 | 190 | 2,000 | 180 | 1,800 | 160 |
| D 12 | 2,200 | 280 | 2,000 | 190 | 1,800 | 180 | 1,500 | 160 |
| D 16 | 1,800 | 285 | 1,600 | 195 | 1,400 | 185 | 1,000 | 160 |
| D 20 | 1,200 | 285 | 1,000 | 195 | 950 | 185 | 600 | 160 |
| D 30 | 800 | 200 | 670 | 140 | 640 | 130 | 400 | 120 |

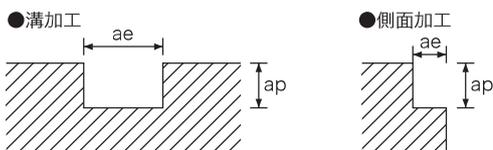
標準切削条件表 (側面加工 $ae < 0.1D$) Recommended cutting conditions (Side cutting $ae < 0.1D$)

☆ $ap < 1.5D$ ☆ 調質鋼加工時 $ae < 0.02D$ $ap \leq 1D$
 Thermal refining steels

| 被削材 Work | 構造用鋼/炭素鋼 SS41/S45C (HRC30以下) | | 工具鋼/プリハードン鋼 SKD/NAK101 (HRC30-35) | | 合金鋼/ステンレス鋼 SCM/SUS304 (HRC35-40) | | 熱処理鋼等 Hardened Steels (HRC40-45) | |
|-------------|---------------------------------|----------------------|--------------------------------------|----------------------|-------------------------------------|----------------------|-------------------------------------|----------------------|
| | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) |
| D 1 | 18,000 | 280 | 15,000 | 170 | 12,500 | 130 | 9,800 | 80 |
| D 2 | 11,500 | 300 | 10,000 | 200 | 7,300 | 150 | 6,000 | 100 |
| D 3 | 8,500 | 350 | 7,400 | 220 | 5,200 | 160 | 4,000 | 140 |
| D 4 | 6,400 | 360 | 5,600 | 230 | 4,000 | 200 | 3,200 | 185 |
| D 5 | 5,700 | 430 | 4,500 | 280 | 3,500 | 250 | 3,000 | 220 |
| D 6 | 4,200 | 430 | 3,700 | 240 | 3,000 | 250 | 2,500 | 210 |
| D 8 | 3,200 | 380 | 2,800 | 240 | 2,200 | 210 | 2,000 | 200 |
| D 10 | 2,500 | 360 | 2,200 | 230 | 2,000 | 200 | 1,800 | 180 |
| D 12 | 2,200 | 360 | 2,000 | 230 | 1,800 | 190 | 1,500 | 180 |
| D 16 | 1,800 | 350 | 1,600 | 220 | 1,400 | 190 | 1,000 | 180 |
| D 20 | 1,200 | 350 | 1,000 | 220 | 950 | 190 | 600 | 180 |
| D 30 | 800 | 250 | 670 | 160 | 640 | 150 | 400 | 140 |

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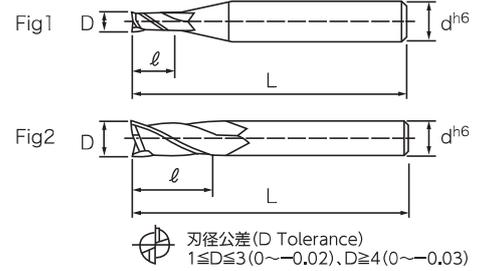


| 構造用鋼/炭素鋼 (SS41, S45C) HRC30以下 | 工具鋼/プリハードン鋼 (SKD, NAK101) HRC30~35 | 合金鋼/ステンレス鋼 (SCM, SUS304) HRC35~40 | 熱処理鋼等 Hardened Steels HRC40~45 | 硬質材 Hard material HRC45~55 |
|-------------------------------------|--|---|--------------------------------------|----------------------------------|
| ◎ | ○ | ○ | ○ | × |



(ザ・) カットミル 超硬2枚刃エンドミル

Coated Solid Carbide Square Endmills (2Flutes)



特長 Feature

- 圧倒的コストパフォーマンスを実現
- 生材から合金鋼までの幅広いワークの加工が可能
- TiAlNコートで寿命UP
- High cost effectiveness is realized.
- Ability to process a range of materials from alloyed steel to soft iron.
- Durable due to TiAlN coating.

単位: mm

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|---|-----|----|---|-----|
| IC2SSVP-1.0 | 1 | 2.5 | 40 | 4 | 1 |
| IC2SSVP-2.0 | 2 | 6 | 40 | 4 | 1 |
| IC2SSVP-3.0 | 3 | 8 | 45 | 6 | 1 |
| IC2SSVP-4.0 | 4 | 11 | 45 | 6 | 1 |
| IC2SSVP-5.0 | 5 | 13 | 50 | 6 | 1 |
| IC2SSVP-6.0 | 6 | 13 | 50 | 6 | 2 |
| IC2SSVP-7.0 | 7 | 19 | 60 | 8 | 1 |
| IC2SSVP-8.0 | 8 | 19 | 60 | 8 | 2 |

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|----|----|-----|----|-----|
| IC2SSVP-9.0 | 9 | 22 | 70 | 10 | 1 |
| IC2SSVP-10.0 | 10 | 22 | 70 | 10 | 2 |
| IC2SSVP-11.0 | 11 | 26 | 75 | 12 | 1 |
| IC2SSVP-12.0 | 12 | 26 | 75 | 12 | 2 |
| IC2SSVP-16.0 | 16 | 32 | 100 | 16 | 2 |
| IC2SSVP-20.0 | 20 | 38 | 100 | 20 | 2 |
| IC2SSVP-25.0 | 25 | 45 | 110 | 25 | 2 |
| IC2SSVP-30.0 | 30 | 55 | 130 | 32 | 1 |

標準切削条件表 (溝加工 $ae=1D$) Recommended cutting conditions (Slotting)

☆ $D < 3.0$ $ap < 0.15D$ ☆ 熱処理鋼等加工時 $ap \leq 0.02D$
☆ $D > 3.0$ $ap < 0.25D$ Hardened Steels $ap \leq 0.05D$

| 被削材 Work | 構造用鋼/炭素鋼 SS41/S45C (HRC30以下) | | 工具鋼/プリハードン鋼 SKD/NAK101 (HRC30-35) | | 合金鋼/ステンレス鋼 SCM/SUS304 (HRC35-40) | | 熱処理鋼等 Hardened Steels (HRC40-45) | |
|-------------|---------------------------------|-------------------------------|--------------------------------------|-------------------------------|-------------------------------------|-------------------------------|-------------------------------------|-------------------------------|
| | D | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) | 回転数 n (min ⁻¹) |
| 1 | 18,000 | 220 | 15,000 | 100 | 12,500 | 80 | 9,800 | 50 |
| 2 | 11,500 | 220 | 10,000 | 130 | 7,300 | 80 | 6,000 | 60 |
| 3 | 8,500 | 230 | 7,400 | 160 | 5,200 | 125 | 4,000 | 100 |
| 4 | 6,400 | 240 | 5,600 | 180 | 4,000 | 160 | 3,200 | 140 |
| 5 | 5,700 | 300 | 4,500 | 250 | 3,500 | 200 | 3,000 | 180 |
| 6 | 4,200 | 300 | 3,700 | 220 | 3,000 | 200 | 2,500 | 180 |
| 8 | 3,200 | 290 | 2,800 | 190 | 2,200 | 180 | 2,000 | 160 |
| 10 | 2,500 | 280 | 2,200 | 190 | 2,000 | 180 | 1,800 | 160 |
| 12 | 2,200 | 280 | 2,000 | 190 | 1,800 | 180 | 1,500 | 160 |
| 16 | 1,800 | 285 | 1,600 | 195 | 1,400 | 185 | 1,000 | 160 |
| 20 | 1,200 | 285 | 1,000 | 195 | 950 | 185 | 600 | 160 |
| 30 | 800 | 200 | 670 | 140 | 640 | 130 | 400 | 120 |

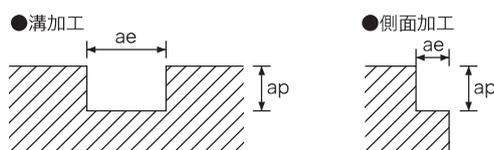
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☆ $ap < 1.5D$ ☆ 調質鋼加工時 $ae < 0.02D$ $ap \leq 1D$
Thermal refining steels

| 被削材 Work | 構造用鋼/炭素鋼 SS41/S45C (HRC30以下) | | 工具鋼/プリハードン鋼 SKD/NAK101 (HRC30-35) | | 合金鋼/ステンレス鋼 SCM/SUS304 (HRC35-40) | | 熱処理鋼等 Hardened Steels (HRC40-45) | |
|-------------|---------------------------------|-------------------------------|--------------------------------------|-------------------------------|-------------------------------------|-------------------------------|-------------------------------------|-------------------------------|
| | D | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) | 回転数 n (min ⁻¹) |
| 1 | 18,000 | 280 | 15,000 | 170 | 12,500 | 130 | 9,800 | 80 |
| 2 | 11,500 | 300 | 10,000 | 200 | 7,300 | 150 | 6,000 | 100 |
| 3 | 8,500 | 350 | 7,400 | 220 | 5,200 | 160 | 4,000 | 140 |
| 4 | 6,400 | 360 | 5,600 | 230 | 4,000 | 200 | 3,200 | 185 |
| 5 | 5,700 | 430 | 4,500 | 280 | 3,500 | 250 | 3,000 | 220 |
| 6 | 4,200 | 430 | 3,700 | 240 | 3,000 | 250 | 2,500 | 210 |
| 8 | 3,200 | 380 | 2,800 | 240 | 2,200 | 210 | 2,000 | 200 |
| 10 | 2,500 | 360 | 2,200 | 230 | 2,000 | 200 | 1,800 | 180 |
| 12 | 2,200 | 360 | 2,000 | 230 | 1,800 | 190 | 1,500 | 180 |
| 16 | 1,800 | 350 | 1,600 | 220 | 1,400 | 190 | 1,000 | 180 |
| 20 | 1,200 | 350 | 1,000 | 220 | 950 | 190 | 600 | 180 |
| 30 | 800 | 250 | 670 | 160 | 640 | 150 | 400 | 140 |

※ 切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

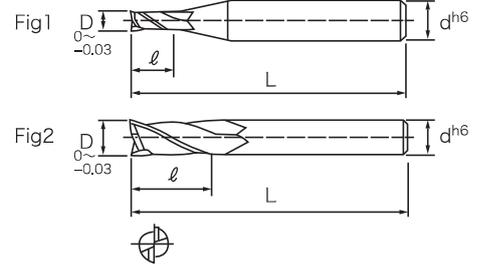


| 構造用鋼/炭素鋼 (SS41, S45C) | 工具鋼/プリハードン鋼 (SKD, NAK101) | 合金鋼/ステンレス鋼 (SCM, SUS304) | 熱処理鋼等 Hardened Steels | 硬質材 Hard material |
|--------------------------|------------------------------|-----------------------------|--------------------------|----------------------|
| HRC30以下 | HRC30~35 | HRC35~40 | HRC40~45 | HRC45~55 |
| ○ | ○ | ○ | ○ | × |



(ザ・)カッタミル 超硬2枚刃セミロングエンドミル

Coated Solid Carbide Square Endmills (2Flutes•Medium)



特長 Feature

- 圧倒的コストパフォーマンスを実現
- 生材から合金鋼までの幅広いワークの加工が可能
- TiAlNコートで寿命UP
- High cost effectiveness is realized.
- Ability to process a range of materials from alloyed steel to soft iron.
- Durable due to TiAlN coating.

単位：mm

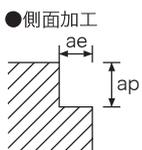
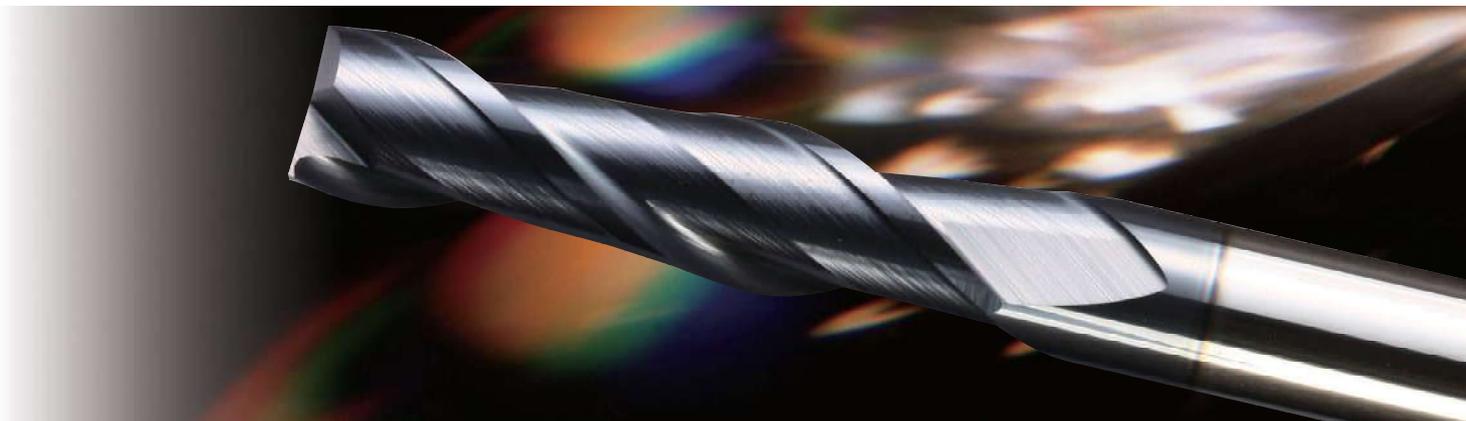
| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|----|----|-----|----|-----|
| IC2SLV-3.0 | 3 | 12 | 60 | 6 | 1 |
| IC2SLV-4.0 | 4 | 16 | 60 | 6 | 1 |
| IC2SLV-5.0 | 5 | 20 | 60 | 6 | 1 |
| IC2SLV-6.0 | 6 | 24 | 60 | 6 | 2 |
| IC2SLV-8.0 | 8 | 32 | 75 | 8 | 2 |
| IC2SLV-10.0 | 10 | 40 | 100 | 10 | 2 |
| IC2SLV-12.0 | 12 | 48 | 100 | 12 | 2 |
| IC2SLV-16.0 | 16 | 64 | 150 | 16 | 2 |
| IC2SLV-20.0 | 20 | 80 | 150 | 20 | 2 |

標準切削条件表 (側面加工 $ae < 0.05D$) Recommended cutting conditions (Side cutting $ae < 0.05D$) ☆ $ap < 2.5D$

| 被削材 Work | 構造用鋼/炭素鋼 SS41/S45C(HRC30以下) | | 工具鋼/プリハードン鋼 SKD/NAK101(HRC30-35) | | 合金鋼/ステンレス鋼 SCM/SUS304(HRC35-40) | | 熱処理鋼等 Hardened Steels(HRC40-45) | |
|-------------|--------------------------------|-----------------------------|-------------------------------------|-----------------------------|------------------------------------|-----------------------------|------------------------------------|-----------------------------|
| | D | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ |
| 3 | 3,200 | 90 | 2,800 | 60 | 2,000 | 40 | 1,500 | 50 |
| 4 | 2,400 | 100 | 2,100 | 60 | 1,500 | 50 | 1,200 | 65 |
| 5 | 2,200 | 110 | 1,700 | 70 | 1,300 | 60 | 1,150 | 75 |
| 6 | 1,600 | 110 | 1,400 | 65 | 1,150 | 70 | 950 | 70 |
| 8 | 1,200 | 100 | 1,050 | 65 | 850 | 60 | 750 | 70 |
| 10 | 1,000 | 90 | 850 | 60 | 750 | 50 | 700 | 65 |
| 12 | 850 | 90 | 750 | 60 | 700 | 50 | 600 | 60 |
| 16 | 640 | 80 | 560 | 55 | 530 | 45 | 450 | 55 |
| 20 | 500 | 80 | 450 | 55 | 420 | 45 | 360 | 55 |

※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

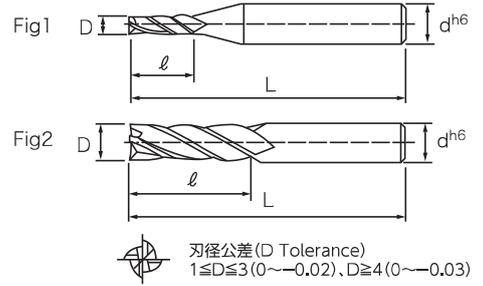


| 構造用鋼/炭素鋼 (SS41、S45C) | 工具鋼/プリハードン鋼 (SKD、NAK101) | 合金鋼/ステンレス鋼 (SCM、SUS304) | 熱処理鋼等 Hardened Steels | 硬質材 Hard material |
|-------------------------|-----------------------------|----------------------------|--------------------------|----------------------|
| HRC30以下 | HRC30~35 | HRC35~40 | HRC40~45 | HRC45~55 |
| ◎ | ○ | ○ | ○ | × |



(ザ・)カットミル 超硬4枚刃エンドミル

Coated Solid Carbide Square Endmills (4Flutes)



特長 Feature

- 圧倒的コストパフォーマンスを実現
- 生材から合金鋼までの幅広いワークの加工が可能
- TiAlNコートで寿命UP
- High cost effectiveness is realized.
- Ability to process a range of materials from alloyed steel to soft iron.
- Durable due to TiAlN coating.

単位: mm

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|-----|-----|----|---|-----|
| IC4SSV-1.0 | 1 | 3 | 40 | 4 | 1 |
| IC4SSV-1.5 | 1.5 | 4 | 50 | 4 | 1 |
| IC4SSV-2.0 | 2 | 6 | 40 | 4 | 1 |
| IC4SSV-2.5 | 2.5 | 6.5 | 50 | 6 | 1 |
| IC4SSV-3.0 | 3 | 8 | 50 | 6 | 1 |
| IC4SSV-3.5 | 3.5 | 9 | 50 | 6 | 1 |
| IC4SSV-4.0 | 4 | 10 | 50 | 6 | 1 |
| IC4SSV-4.5 | 4.5 | 11 | 50 | 6 | 1 |
| IC4SSV-5.0 | 5 | 13 | 50 | 6 | 1 |
| IC4SSV-5.5 | 5.5 | 14 | 50 | 6 | 1 |
| IC4SSV-6.0 | 6 | 15 | 50 | 6 | 2 |
| IC4SSV-6.5 | 6.5 | 16 | 60 | 8 | 1 |
| IC4SSV-7.0 | 7 | 20 | 60 | 8 | 1 |

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|-----|----|-----|----|-----|
| IC4SSV-8.0 | 8 | 20 | 60 | 8 | 2 |
| IC4SSV-8.5 | 8.5 | 22 | 75 | 10 | 1 |
| IC4SSV-9.0 | 9 | 25 | 75 | 10 | 1 |
| IC4SSV-10.0 | 10 | 25 | 75 | 10 | 2 |
| IC4SSV-11.0 | 11 | 30 | 75 | 12 | 1 |
| IC4SSV-12.0 | 12 | 30 | 75 | 12 | 2 |
| IC4SSV-13.0 | 13 | 33 | 100 | 16 | 1 |
| IC4SSV-14.0 | 14 | 35 | 100 | 16 | 1 |
| IC4SSV-15.0 | 15 | 38 | 100 | 16 | 1 |
| IC4SSV-16.0 | 16 | 32 | 100 | 16 | 2 |
| IC4SSV-20.0 | 20 | 38 | 100 | 20 | 2 |
| IC4SSV-25.0 | 25 | 45 | 110 | 25 | 2 |
| IC4SSV-30.0 | 30 | 55 | 130 | 32 | 1 |

標準切削条件表 (溝加工 $a_e=1D$) Recommended cutting conditions (Slotting)

☆ $D < 3.0$ $a_p < 0.15D$ ☆熱処理鋼等加工時 $a_p \leq 0.02D$
 ☆ $D > 3.0$ $a_p < 0.25D$ Hardened Steels $a_p \leq 0.05D$

| 被削材 Work | 構造用鋼/炭素鋼 SS41/S45C (HRC30以下) | | 工具鋼/プリハードン鋼 SKD/NAK101 (HRC30-35) | | 合金鋼/ステンレス鋼 SCM/SUS304 (HRC35-40) | | 熱処理鋼等 Hardened Steels (HRC40-45) | |
|-------------|---------------------------------|--------------------|--------------------------------------|--------------------|-------------------------------------|--------------------|-------------------------------------|--------------------|
| | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) |
| D 1 | 18,000 | 300 | 15,000 | 200 | 12,500 | 180 | 9,800 | 130 |
| D 2 | 11,500 | 320 | 10,000 | 230 | 7,300 | 190 | 6,000 | 140 |
| D 3 | 8,500 | 340 | 7,400 | 240 | 5,200 | 190 | 4,000 | 180 |
| D 4 | 6,400 | 360 | 5,600 | 270 | 4,000 | 240 | 3,200 | 210 |
| D 5 | 5,700 | 450 | 4,500 | 370 | 3,500 | 300 | 3,000 | 270 |
| D 6 | 4,200 | 450 | 3,700 | 330 | 3,000 | 300 | 2,500 | 270 |
| D 8 | 3,200 | 430 | 2,800 | 280 | 2,200 | 270 | 2,000 | 240 |
| D 10 | 2,500 | 420 | 2,200 | 280 | 2,000 | 270 | 1,800 | 240 |
| D 12 | 2,200 | 420 | 2,000 | 280 | 1,800 | 270 | 1,500 | 240 |
| D 16 | 1,800 | 420 | 1,600 | 285 | 1,400 | 275 | 1,000 | 240 |
| D 20 | 1,200 | 420 | 1,000 | 285 | 950 | 275 | 600 | 240 |
| D 30 | 800 | 340 | 670 | 200 | 640 | 190 | 400 | 180 |

標準切削条件表 (側面加工 $a_e < 0.1D$) Recommended cutting conditions (Side cutting $a_e < 0.1D$)

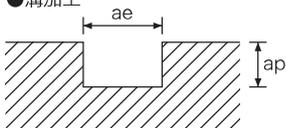
☆ $a_p < 1.5D$ ☆調質鋼加工時 $a_e < 0.02D$ $a_p \leq 1D$
 Thermal refining steels

| 被削材 Work | 構造用鋼/炭素鋼 SS41/S45C (HRC30以下) | | 工具鋼/プリハードン鋼 SKD/NAK101 (HRC30-35) | | 合金鋼/ステンレス鋼 SCM/SUS304 (HRC35-40) | | 熱処理鋼等 Hardened Steels (HRC40-45) | |
|-------------|---------------------------------|--------------------|--------------------------------------|--------------------|-------------------------------------|--------------------|-------------------------------------|--------------------|
| | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) |
| D 1 | 18,000 | 480 | 15,000 | 300 | 12,500 | 200 | 9,800 | 180 |
| D 2 | 11,500 | 500 | 10,000 | 310 | 7,300 | 220 | 6,000 | 200 |
| D 3 | 8,500 | 520 | 7,400 | 330 | 5,200 | 240 | 4,000 | 210 |
| D 4 | 6,400 | 540 | 5,600 | 345 | 4,000 | 300 | 3,200 | 275 |
| D 5 | 5,700 | 640 | 4,500 | 420 | 3,500 | 370 | 3,000 | 330 |
| D 6 | 4,200 | 640 | 3,700 | 360 | 3,000 | 370 | 2,500 | 310 |
| D 8 | 3,200 | 550 | 2,800 | 360 | 2,200 | 310 | 2,000 | 300 |
| D 10 | 2,500 | 540 | 2,200 | 345 | 2,000 | 300 | 1,800 | 270 |
| D 12 | 2,200 | 540 | 2,000 | 345 | 1,800 | 280 | 1,500 | 270 |
| D 16 | 1,800 | 540 | 1,600 | 340 | 1,400 | 280 | 1,000 | 270 |
| D 20 | 1,200 | 540 | 1,000 | 340 | 950 | 280 | 600 | 270 |
| D 30 | 800 | 440 | 670 | 240 | 640 | 200 | 400 | 210 |

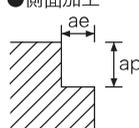
※ 切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

● 溝加工



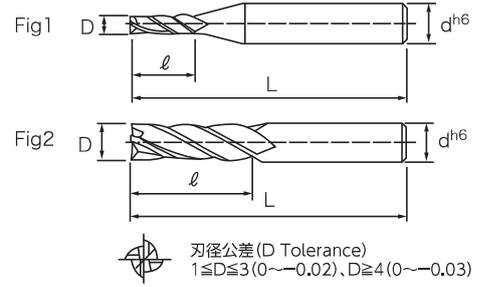
● 側面加工



| 構造用鋼/炭素鋼 (SS41, S45C) | 工具鋼/プリハードン鋼 (SKD, NAK101) | 合金鋼/ステンレス鋼 (SCM, SUS304) | 熱処理鋼等 Hardened Steels | 硬質材 Hard material |
|--------------------------|------------------------------|-----------------------------|--------------------------|----------------------|
| HRC30以下 | HRC30~35 | HRC35~40 | HRC40~45 | HRC45~55 |
| ○ | ○ | ○ | ○ | × |



(ザ・)カッタミル 超硬4枚刃エンドミル
Coated Solid Carbide Square Endmills (4Flutes)



特長 Feature

- 圧倒的コストパフォーマンスを実現
- 生材から合金鋼までの幅広いワークの加工が可能
- TiAlNコートで寿命UP
- High cost effectiveness is realized.
- Ability to process a range of materials from alloyed steel to soft iron.
- Durable due to TiAlN coating.

単位 : mm

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|---|----|----|---|-----|
| IC4SSVP-1.0 | 1 | 3 | 40 | 4 | 1 |
| IC4SSVP-2.0 | 2 | 6 | 40 | 4 | 1 |
| IC4SSVP-3.0 | 3 | 8 | 50 | 6 | 1 |
| IC4SSVP-4.0 | 4 | 10 | 50 | 6 | 1 |
| IC4SSVP-5.0 | 5 | 13 | 50 | 6 | 1 |
| IC4SSVP-6.0 | 6 | 15 | 50 | 6 | 2 |
| IC4SSVP-7.0 | 7 | 20 | 60 | 8 | 1 |
| IC4SSVP-8.0 | 8 | 20 | 60 | 8 | 2 |

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|----|----|-----|----|-----|
| IC4SSVP-9.0 | 9 | 25 | 75 | 10 | 1 |
| IC4SSVP-10.0 | 10 | 25 | 75 | 10 | 2 |
| IC4SSVP-11.0 | 11 | 30 | 75 | 12 | 1 |
| IC4SSVP-12.0 | 12 | 30 | 75 | 12 | 2 |
| IC4SSVP-16.0 | 16 | 32 | 100 | 16 | 2 |
| IC4SSVP-20.0 | 20 | 38 | 100 | 20 | 2 |
| IC4SSVP-25.0 | 25 | 45 | 110 | 25 | 2 |
| IC4SSVP-30.0 | 30 | 55 | 130 | 32 | 1 |

標準切削条件表 (溝加工 $ae=1D$) Recommended cutting conditions (Slotting)

☆ $D < 3.0$ $ap < 0.15D$ ☆熱処理鋼等加工時 $ap \leq 0.02D$
☆ $D > 3.0$ $ap < 0.25D$ Hardened Steels $ap \leq 0.05D$

| 被削材 Work | 構造用鋼/炭素鋼 SS41/S45C(HRC30以下) | | 工具鋼/プリハードン鋼 SKD/NAK101(HRC30-35) | | 合金鋼/ステンレス鋼 SCM/SUS304(HRC35-40) | | 熱処理鋼等 Hardened Steels(HRC40-45) | |
|-------------|--------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|
| | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ |
| D 1 | 18,000 | 300 | 15,000 | 200 | 12,500 | 180 | 9,800 | 130 |
| D 2 | 11,500 | 320 | 10,000 | 230 | 7,300 | 190 | 6,000 | 140 |
| D 3 | 8,500 | 340 | 7,400 | 240 | 5,200 | 190 | 4,000 | 180 |
| D 4 | 6,400 | 360 | 5,600 | 270 | 4,000 | 240 | 3,200 | 210 |
| D 5 | 5,700 | 450 | 4,500 | 370 | 3,500 | 300 | 3,000 | 270 |
| D 6 | 4,200 | 450 | 3,700 | 330 | 3,000 | 300 | 2,500 | 270 |
| D 8 | 3,200 | 430 | 2,800 | 280 | 2,200 | 270 | 2,000 | 240 |
| D 10 | 2,500 | 420 | 2,200 | 280 | 2,000 | 270 | 1,800 | 240 |
| D 12 | 2,200 | 420 | 2,000 | 280 | 1,800 | 270 | 1,500 | 240 |
| D 16 | 1,800 | 420 | 1,600 | 285 | 1,400 | 275 | 1,000 | 240 |
| D 20 | 1,200 | 420 | 1,000 | 285 | 950 | 275 | 600 | 240 |
| D 30 | 800 | 340 | 670 | 200 | 640 | 190 | 400 | 180 |

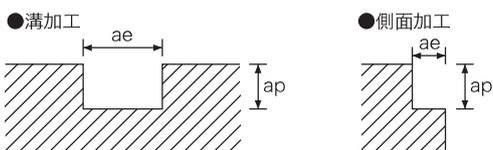
標準切削条件表 (側面加工 $ae < 0.1D$) Recommended cutting conditions (Side cutting $ae < 0.1D$)

☆ $ap < 1.5D$ ☆調質鋼加工時 $ae < 0.02D$ $ap \leq 1D$
Thermal refining steels

| 被削材 Work | 構造用鋼/炭素鋼 SS41/S45C(HRC30以下) | | 工具鋼/プリハードン鋼 SKD/NAK101(HRC30-35) | | 合金鋼/ステンレス鋼 SCM/SUS304(HRC35-40) | | 熱処理鋼等 Hardened Steels(HRC40-45) | |
|-------------|--------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|
| | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ |
| D 1 | 18,000 | 480 | 15,000 | 300 | 12,500 | 200 | 9,800 | 180 |
| D 2 | 11,500 | 500 | 10,000 | 310 | 7,300 | 220 | 6,000 | 200 |
| D 3 | 8,500 | 520 | 7,400 | 330 | 5,200 | 240 | 4,000 | 210 |
| D 4 | 6,400 | 540 | 5,600 | 345 | 4,000 | 300 | 3,200 | 275 |
| D 5 | 5,700 | 640 | 4,500 | 420 | 3,500 | 370 | 3,000 | 330 |
| D 6 | 4,200 | 640 | 3,700 | 360 | 3,000 | 370 | 2,500 | 310 |
| D 8 | 3,200 | 550 | 2,800 | 360 | 2,200 | 310 | 2,000 | 300 |
| D 10 | 2,500 | 540 | 2,200 | 345 | 2,000 | 300 | 1,800 | 270 |
| D 12 | 2,200 | 540 | 2,000 | 345 | 1,800 | 280 | 1,500 | 270 |
| D 16 | 1,800 | 540 | 1,600 | 340 | 1,400 | 280 | 1,000 | 270 |
| D 20 | 1,200 | 540 | 1,000 | 340 | 950 | 280 | 600 | 270 |
| D 30 | 800 | 440 | 670 | 240 | 640 | 200 | 400 | 210 |

※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

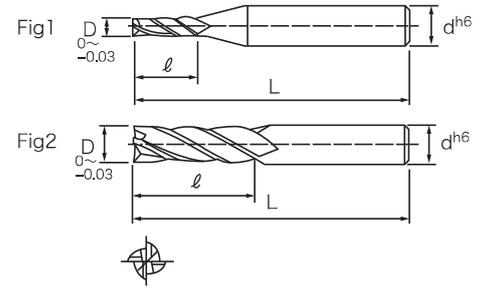


| 構造用鋼/炭素鋼 (SS41, S45C) | 工具鋼/プリハードン鋼 (SKD, NAK101) | 合金鋼/ステンレス鋼 (SCM, SUS304) | 熱処理鋼等 Hardened Steels | 硬質材 Hard material |
|--------------------------|------------------------------|-----------------------------|--------------------------|----------------------|
| HRC30以下 | HRC30~35 | HRC35~40 | HRC40~45 | HRC45~55 |
| ○ | ○ | ○ | ○ | × |



(ザ・) カットミル 超硬4枚刃セミロングエンドミル

Coated Solid Carbide Square Endmills (4Flutes•Medium)



特長 Feature

- 圧倒的コストパフォーマンスを実現
- 生材から合金鋼までの幅広いワークの加工が可能
- TiAlNコートで寿命UP
- High cost effectiveness is realized.
- Ability to process a range of materials from alloyed steel to soft iron.
- Durable due to TiAlN coating.

単位：mm

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|----|----|-----|----|-----|
| IC4SLV-3.0 | 3 | 12 | 50 | 6 | 1 |
| IC4SLV-4.0 | 4 | 16 | 50 | 6 | 1 |
| IC4SLV-5.0 | 5 | 20 | 60 | 6 | 1 |
| IC4SLV-6.0 | 6 | 24 | 60 | 6 | 2 |
| IC4SLV-8.0 | 8 | 32 | 75 | 8 | 2 |
| IC4SLV-10.0 | 10 | 40 | 100 | 10 | 2 |
| IC4SLV-12.0 | 12 | 48 | 100 | 12 | 2 |
| IC4SLV-16.0 | 16 | 64 | 150 | 16 | 2 |
| IC4SLV-20.0 | 20 | 80 | 150 | 20 | 2 |

標準切削条件表 (側面加工 $ae < 0.05D$) Recommended cutting conditions (Side cutting $ae < 0.05D$)

☆ $ap < 2.5D$

| 被削材 Work | 構造用鋼/炭素鋼 SS41/S45C(HRC30以下) | | 工具鋼/プリハードン鋼 SKD/NAK101(HRC30-35) | | 合金鋼/ステンレス鋼 SCM/SUS304(HRC35-40) | | 熱処理鋼等 Hardened Steels(HRC40-45) | |
|-------------|--------------------------------|-----------------------------|-------------------------------------|-----------------------------|------------------------------------|-----------------------------|------------------------------------|-----------------------------|
| | D | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ |
| 3 | 3,200 | 140 | 2,800 | 90 | 1,950 | 65 | 1,500 | 60 |
| 4 | 2,400 | 145 | 2,100 | 95 | 1,500 | 80 | 1,200 | 75 |
| 5 | 2,200 | 170 | 1,700 | 110 | 1,300 | 100 | 1,150 | 90 |
| 6 | 1,600 | 170 | 1,400 | 100 | 1,150 | 100 | 950 | 85 |
| 8 | 1,200 | 145 | 1,050 | 100 | 850 | 85 | 750 | 80 |
| 10 | 950 | 145 | 850 | 95 | 750 | 80 | 700 | 75 |
| 12 | 850 | 145 | 750 | 95 | 700 | 75 | 600 | 75 |
| 16 | 640 | 130 | 560 | 90 | 530 | 70 | 450 | 70 |
| 20 | 500 | 130 | 450 | 90 | 420 | 70 | 360 | 70 |

※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

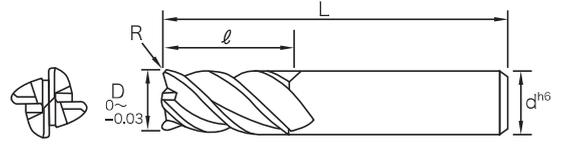


| 構造用鋼/炭素鋼 (SS41、S45C) HRC30以下 | 工具鋼/プリハードン鋼 (SKD、NAK101) HRC30~35 | 合金鋼/ステンレス鋼 (SCM、SUS304) HRC35~40 | 熱処理鋼等 Hardened Steels HRC40~45 | 硬質材 Hard material HRC45~55 |
|------------------------------------|---|--|--------------------------------------|----------------------------------|
| ○ | ○ | ○ | ○ | × |



(ザ・) カットミル 超硬4枚刃ラジアスエンドミル

Carbide Corner Radius Endmills (4Flutes)



特長 Feature

- 圧倒的コストパフォーマンスを実現
- 生材から合金鋼までの幅広いワークの加工が可能
- S3コートで寿命UP
- High cost effectiveness is realized.
- Ability to process a range of materials from alloyed steel to soft iron.
- Durable due to S3 coating.

単位 : mm

| 商品コード Item Code | D | R±0.025 | ℓ | L | d |
|--------------------|----|---------|----|----|----|
| IC4MRS-6X0.3R | 6 | 0.3 | 13 | 50 | 6 |
| IC4MRS-6X0.5R | 6 | 0.5 | 13 | 50 | 6 |
| IC4MRS-6X1.0R | 6 | 1.0 | 13 | 50 | 6 |
| IC4MRS-8X0.3R | 8 | 0.3 | 19 | 60 | 8 |
| IC4MRS-8X0.5R | 8 | 0.5 | 19 | 60 | 8 |
| IC4MRS-8X1.0R | 8 | 1.0 | 19 | 60 | 8 |
| IC4MRS-10X0.3R | 10 | 0.3 | 22 | 70 | 10 |
| IC4MRS-10X0.5R | 10 | 0.5 | 22 | 70 | 10 |
| IC4MRS-10X1.0R | 10 | 1.0 | 22 | 70 | 10 |
| IC4MRS-12X0.3R | 12 | 0.3 | 26 | 75 | 12 |
| IC4MRS-12X0.5R | 12 | 0.5 | 26 | 75 | 12 |
| IC4MRS-12X1.0R | 12 | 1.0 | 26 | 75 | 12 |

標準切削条件表 (溝加工 $a_e=1D$) Recommended cutting conditions (Slotting) ☆ $a_p<0.5D$

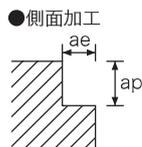
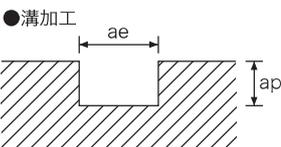
| 被削材 Work | 構造用鋼/炭素鋼 SS41/S45C(HRC30以下) | | 工具鋼/プリハードン鋼 SKD/NAK101(HRC30-35) | | 合金鋼/ステンレス鋼 SCM/SUS304(HRC35-40) | | 熱処理鋼等 Hardened Steels(HRC40-45) | |
|-------------|--------------------------------|-------------------|-------------------------------------|-------------------|------------------------------------|-------------------|------------------------------------|-------------------|
| | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) |
| D 6 | 2,200 | 260 | 2,000 | 220 | 1,600 | 200 | 1,400 | 180 |
| 8 | 1,700 | 250 | 1,500 | 200 | 1,200 | 180 | 1,040 | 160 |
| 10 | 1,350 | 250 | 1,200 | 200 | 1,050 | 180 | 960 | 160 |
| 12 | 1,200 | 250 | 1,100 | 200 | 1,000 | 180 | 800 | 160 |

標準切削条件表 (側面加工 $a_e<0.05D$) Recommended cutting conditions (Side cutting) ☆ $a_p<1.5D$

| 被削材 Work | 構造用鋼/炭素鋼 SS41/S45C(HRC30以下) | | 工具鋼/プリハードン鋼 SKD/NAK101(HRC30-35) | | 合金鋼/ステンレス鋼 SCM/SUS304(HRC35-40) | | 熱処理鋼等 Hardened Steels(HRC40-45) | |
|-------------|--------------------------------|-------------------|-------------------------------------|-------------------|------------------------------------|-------------------|------------------------------------|-------------------|
| | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) |
| D 6 | 2,200 | 260 | 2,000 | 220 | 1,600 | 200 | 1,400 | 180 |
| 8 | 1,700 | 250 | 1,500 | 200 | 1,200 | 180 | 1,040 | 160 |
| 10 | 1,350 | 250 | 1,200 | 200 | 1,050 | 180 | 960 | 160 |
| 12 | 1,200 | 250 | 1,100 | 200 | 1,000 | 180 | 800 | 160 |

※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

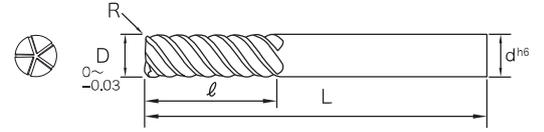


| 構造用鋼/炭素鋼 (SS41, S45C) | 工具鋼/プリハードン鋼 (SKD, NAK101) | 合金鋼/ステンレス鋼 (SCM, SUS304) | 熱処理鋼等 Hardened Steels | 硬質材 Hard material |
|--------------------------|------------------------------|-----------------------------|--------------------------|----------------------|
| HRC30以下 | HRC30~35 | HRC35~40 | HRC40~45 | HRC45~55 |
| ○ | ○ | ○ | ○ | × |



(ザ・) カットミル 高硬度超硬5枚刃ラジアスエンドミル

Coated Solid Carbide Radius Endmills (5Flutes)



特長 Feature

- 耐摩耗性と耐熱性に優れ、滑りが良く、溶着しにくい特殊コーティングを採用
- 生材から難削材まで幅広い加工領域を実現
- 革新の刃形状・最強の超硬+特殊コーティングで高速高送りが可能
- Wear and heat resistance are excellent, low cutting resistance. Special coating which is not easily adhered to is used.
- Ability to process a range of materials from alloyed steel to difficult-to-machine.
- High speed feed is possible due to innovative edge shape and the strongest carbide coating.

単位：mm

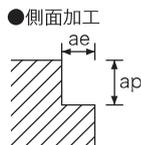
| 商品コード Item Code | D | R±0.015 | ℓ | L | d |
|--------------------|----|---------|----|-----|----|
| IC5HSVR-6X0.5R | 6 | 0.5 | 17 | 60 | 6 |
| IC5HSVR-6X1.0R | 6 | 1 | 17 | 60 | 6 |
| IC5HSVR-8X0.5R | 8 | 0.5 | 22 | 80 | 8 |
| IC5HSVR-8X1.0R | 8 | 1 | 22 | 80 | 8 |
| IC5HSVR-8X1.5R | 8 | 1.5 | 22 | 80 | 8 |
| IC5HSVR-10X0.5R | 10 | 0.5 | 27 | 80 | 10 |
| IC5HSVR-10X1.0R | 10 | 1 | 27 | 80 | 10 |
| IC5HSVR-10X1.5R | 10 | 1.5 | 27 | 80 | 10 |
| IC5HSVR-10X2.0R | 10 | 2 | 27 | 80 | 10 |
| IC5HSVR-12X0.5R | 12 | 0.5 | 32 | 110 | 12 |
| IC5HSVR-12X1.0R | 12 | 1 | 32 | 110 | 12 |
| IC5HSVR-12X1.5R | 12 | 1.5 | 32 | 110 | 12 |
| IC5HSVR-12X2.0R | 12 | 2 | 32 | 110 | 12 |
| IC5HSVR-16X1.0R | 16 | 1 | 45 | 110 | 16 |
| IC5HSVR-16X1.5R | 16 | 1.5 | 45 | 110 | 16 |
| IC5HSVR-16X2.0R | 16 | 2 | 45 | 110 | 16 |

標準切削条件表 (側面加工 $ae < 0.1D$) Recommended cutting conditions (Side cutting $ae < 0.1D$)

| 被削材 Work | 炭素鋼/合金鋼 (180-250HB) | | 工具鋼 (25~35HRC) | | プリハードン鋼 (35~45HRC) | | 焼入れ鋼 (45~55HRC) | | 焼入れ鋼 (55~65HRC) | |
|----------------------|-------------------------------|--------------------|-------------------------------|--------------------|-------------------------------|--------------------|-------------------------------|--------------------|-------------------------------|--------------------|
| | 回転数 n (min ⁻¹) | 送り速度 F (mm/min) |
| 6 | 16,000 | 6,700 | 13,800 | 5,000 | 13,300 | 4,800 | 6,400 | 2,300 | 5,300 | 1,900 |
| 8 | 12,000 | 7,200 | 10,300 | 4,330 | 9,950 | 4,180 | 4,800 | 2,000 | 4,000 | 1,680 |
| 10 | 9,550 | 6,300 | 8,300 | 4,000 | 8,000 | 3,840 | 3,800 | 1,800 | 3,200 | 1,500 |
| 12 | 8,000 | 5,760 | 6,900 | 4,140 | 6,600 | 3,900 | 3,200 | 1,920 | 2,650 | 1,590 |
| 16 | 6,000 | 4,680 | 5,200 | 3,750 | 5,000 | 3,600 | 2,400 | 1,730 | 2,000 | 1,440 |
| 切込み量 Depth of cut | ap=1.5D, ae=0.1~0.05D | | ap=1.5D, ae=0.1~0.05D | | ap=1.5D, ae=0.1~0.02D | | ap=1.5D, ae=0.1~0.01D | | ap=1.5D, ae=0.1~0.01D | |

※ 切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

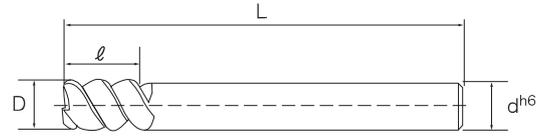


| 構造用鋼/炭素鋼 (SS41、S45C) | 工具鋼/プリハードン鋼 (SKD、NAK101) | 合金鋼/ステンレス鋼 (SCM、SUS304) | 熱処理鋼等 Hardened Steels | 硬質材 Hard material |
|-------------------------|-----------------------------|----------------------------|--------------------------|----------------------|
| HRC30以下 | HRC30~35 | HRC35~40 | HRC40~45 | HRC45~65 |
| ◎ | ◎ | ○ | ◎ | ○ |



(ザ・)カットミル 超硬3枚刃60°ハイヘリカルエンドミル

Coated Solid Carbide High Helical Square Endmills(3Flutes)



特長 Feature

- 60°ネジレで超低抵抗切削を実現
- 幅広い被削材に対応
- 高効率加工が可能
- 仕上精度良好
- Super-low-resistance cut is realized due to 60 degrees twist.
- Ability to process a wide range of materials.
- Highly efficient processing is possible.
- High-precision cut face.

単位：mm

| 商品コード Item Code | D | 刃径公差 Tolerance of Dia | ℓ | L | d |
|--------------------|----|--------------------------|----|----|----|
| IC3HSN-3.0 | 3 | -0.014~-0.028 | 8 | 57 | 6 |
| IC3HSN-4.0 | 4 | -0.020~-0.038 | 11 | 57 | 6 |
| IC3HSN-5.0 | 5 | -0.020~-0.038 | 13 | 57 | 6 |
| IC3HSN-6.0 | 6 | -0.020~-0.038 | 13 | 57 | 6 |
| IC3HSN-8.0 | 8 | -0.025~-0.047 | 19 | 63 | 8 |
| IC3HSN-10.0 | 10 | -0.025~-0.047 | 22 | 72 | 10 |
| IC3HSN-12.0 | 12 | -0.032~-0.059 | 26 | 83 | 12 |

標準切削条件表 (溝加工 $ae=1D$ $ap=0.5D$) Recommended cutting conditions (Slotting)

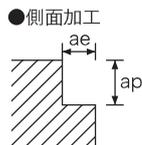
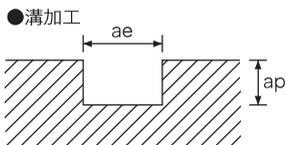
| 被削材 Work | 炭素鋼/鋳鉄/合金鋼 S50C/FC250/SCM(HRC30以下) | | 合金鋼/工具鋼 SKD61/SK/NAK | | ステンレス鋼 SUS304/SUS316 | | 高硬度鋼等 SKD61 (HRC45-55) | |
|-------------|---------------------------------------|-----------------------------|-----------------------------------|-----------------------------|-----------------------------------|-----------------------------|-----------------------------------|-----------------------------|
| | D | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ |
| 3 | 12,000 | 430 | 9,500 | 295 | 8,000 | 285 | 9,000 | 280 |
| 4 | 9,000 | 410 | 7,000 | 280 | 6,000 | 270 | 6,500 | 260 |
| 5 | 7,000 | 400 | 5,500 | 285 | 5,000 | 285 | 5,400 | 285 |
| 6 | 6,000 | 410 | 4,500 | 280 | 4,200 | 290 | 4,500 | 280 |
| 8 | 4,500 | 430 | 3,500 | 300 | 3,000 | 285 | 3,300 | 285 |
| 10 | 3,800 | 435 | 2,800 | 285 | 2,500 | 285 | 2,700 | 275 |
| 12 | 3,800 | 400 | 2,300 | 270 | 2,500 | 265 | 2,200 | 265 |

標準切削条件表 (側面加工 $ae \leq 0.3D$ $ap \leq 1.5D$) Recommended cutting conditions (Side cutting $ae \leq 0.3D$ $ap \leq 1.5D$)

| 被削材 Work | 炭素鋼/鋳鉄/合金鋼 S50C/FC250/SCM(HRC30以下) | | 合金鋼/工具鋼 SKD61/SK/NAK | | ステンレス鋼 SUS304/SUS316 | | 高硬度鋼等 SKD61 (HRC45-55) | |
|-------------|---------------------------------------|-----------------------------|-----------------------------------|-----------------------------|-----------------------------------|-----------------------------|-----------------------------------|-----------------------------|
| | D | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ |
| 3 | 12,000 | 540 | 9,500 | 370 | 8,000 | 360 | 9,000 | 350 |
| 4 | 9,000 | 510 | 7,000 | 350 | 6,000 | 340 | 6,500 | 330 |
| 5 | 7,000 | 500 | 5,500 | 360 | 5,000 | 360 | 5,400 | 355 |
| 6 | 6,000 | 520 | 4,500 | 350 | 4,200 | 365 | 4,500 | 350 |
| 8 | 4,500 | 540 | 3,500 | 375 | 3,000 | 360 | 3,300 | 355 |
| 10 | 3,800 | 545 | 2,800 | 360 | 2,500 | 360 | 2,700 | 345 |
| 12 | 3,800 | 500 | 2,300 | 345 | 2,500 | 335 | 2,200 | 330 |

※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

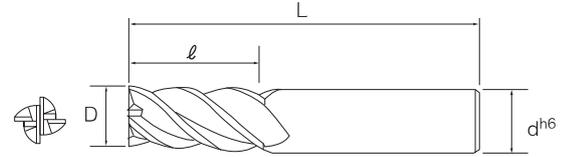


| 構造用鋼/炭素鋼 (SS41、S45C) | 工具鋼/ブリーハードン鋼 (SKD、NAK101) | 合金鋼/ステンレス鋼 (SCM、SUS304) | 熱処理鋼等 Hardened Steels | 硬質材 Hard material |
|-------------------------|------------------------------|----------------------------|--------------------------|----------------------|
| HRC30以下 | HRC30~35 | HRC35~40 | HRC40~45 | HRC45~55 |
| ◎ | ◎ | ◎ | ◎ | ○ |



(ザ・) カットミル 高硬度用4枚刃45°ハイヘリカルエンドミル

Coated Solid Carbide High Helical Square Endmills(4Flutes)



特長 Feature

- 高硬度向け特殊コートにより、優れた耐摩耗性・耐熱性を発揮
- 合金鋼から高硬度鋼 (HRC55以下) までの幅広いワーク加工が可能
- 4枚刃・ネジレ角45°により、切削抵抗を軽減し、仕上面良好
- Special coating offers excellent wear and heat resistance.
- Ability to process a range of materials from alloyed steel to hardened steel (up to HRC55).
- 4 flutes and 45 degrees corner twist provides low cutting residence and a good cut face.

単位 : mm

| 商品コード Item Code | D | 刃径公差 Tolerance of Dia | ℓ | L | d |
|--------------------|----|--------------------------|----|-----|----|
| IC4HST-3.0 | 3 | 0~-0.02 | 8 | 50 | 4 |
| IC4HST-4.0 | 4 | 0~-0.03 | 10 | 50 | 4 |
| IC4HST-5.0 | 5 | 0~-0.02 | 13 | 50 | 6 |
| IC4HST-6.0 | 6 | 0~-0.03 | 15 | 50 | 6 |
| IC4HST-8.0 | 8 | 0~-0.03 | 20 | 60 | 8 |
| IC4HST-10.0 | 10 | 0~-0.03 | 25 | 75 | 10 |
| IC4HST-12.0 | 12 | 0~-0.03 | 30 | 75 | 12 |
| IC4HST-16.0 | 16 | 0~-0.03 | 40 | 100 | 16 |
| IC4HST-20.0 | 20 | 0~-0.03 | 45 | 100 | 20 |

標準切削条件表 (溝加工) Recommended cutting conditions (Slotting)

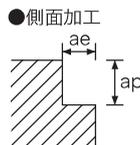
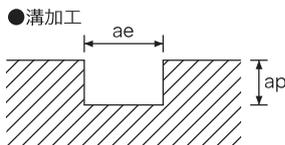
| 被削材 Work | 炭素鋼/鋳鉄/合金鋼 S50C/FC250/SCM(HRC30以下) | | 合金鋼/工具鋼 SKD61/SK/NAK | | ステンレス鋼 SUS304/SUS316 | | 焼入れ鋼・調質鋼 Hardened Steels(HRC45~55) | |
|----------------------|---------------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|---------------------------------------|-------------------|
| | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) |
| D 3 | 6,400 | 400 | 6,400 | 440 | 6,700 | 300 | 5,300 | 130 |
| D 4 | 4,800 | 450 | 4,800 | 500 | 5,100 | 320 | 4,000 | 135 |
| D 5 | 3,800 | 480 | 3,800 | 530 | 4,100 | 330 | 3,200 | 150 |
| D 6 | 3,200 | 500 | 3,200 | 550 | 3,400 | 340 | 2,700 | 170 |
| D 8 | 2,400 | 530 | 2,400 | 590 | 2,600 | 320 | 2,000 | 170 |
| D 10 | 1,900 | 470 | 1,900 | 520 | 2,000 | 290 | 1,600 | 155 |
| D 12 | 1,600 | 430 | 1,600 | 490 | 1,750 | 240 | 1,300 | 135 |
| D 16 | 1,200 | 370 | 1,200 | 420 | 1,300 | 230 | 1,000 | 120 |
| D 20 | 1,000 | 370 | 1,000 | 420 | 1,000 | 210 | 800 | 110 |
| 切込み量 Depth of cut | ae=1D, ap=1D | | | | ae=1D, ap≤0.5D | | ae=1D, ap≤0.2D | |

標準切削条件表 (側面加工) Recommended cutting conditions (Side cutting)

| 被削材 Work | 炭素鋼/鋳鉄/合金鋼 S50C/FC250/SCM(HRC30以下) | | 合金鋼/工具鋼 SKD61/SK/NAK | | ステンレス鋼 SUS304/SUS316 | | 焼入れ鋼・調質鋼 Hardened Steels(HRC45~55) | |
|----------------------|---------------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|---------------------------------------|-------------------|
| | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) |
| D 3 | 9,600 | 700 | 9,600 | 770 | 9,500 | 630 | 7,400 | 420 |
| D 4 | 7,200 | 750 | 7,200 | 830 | 7,200 | 700 | 5,600 | 450 |
| D 5 | 5,700 | 810 | 5,700 | 900 | 5,800 | 730 | 4,500 | 500 |
| D 6 | 4,800 | 870 | 4,800 | 980 | 4,800 | 780 | 3,700 | 520 |
| D 8 | 3,600 | 940 | 3,600 | 1,040 | 3,600 | 770 | 2,800 | 570 |
| D 10 | 2,900 | 860 | 2,900 | 960 | 2,900 | 670 | 2,200 | 510 |
| D 12 | 2,400 | 810 | 2,400 | 900 | 2,450 | 570 | 1,900 | 500 |
| D 16 | 1,800 | 660 | 1,800 | 730 | 1,800 | 460 | 1,400 | 400 |
| D 20 | 1,400 | 540 | 1,400 | 600 | 1,500 | 420 | 1,100 | 350 |
| 切込み量 Depth of cut | ae≤0.15D, ap≤1.5D | | | | ae≤0.1D, ap≤1.5D | | ae≤0.05D, ap≤1.5D | |

※ 切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

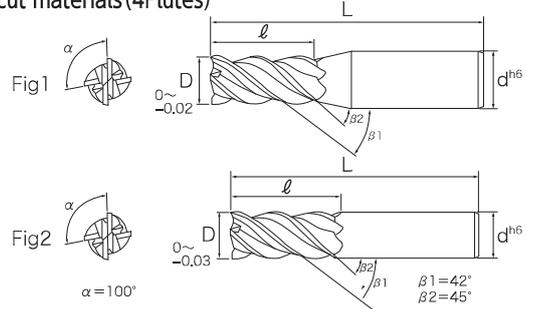


| 構造用鋼/炭素鋼 (S541, S45C) | 工具鋼/プリハードン鋼 (SKD, NAK101) | 合金鋼/ステンレス鋼 (SCM, SUS304) | 熱処理鋼等 Hardened Steels | 硬質材 Hard material |
|--------------------------|------------------------------|-----------------------------|--------------------------|----------------------|
| HRC30以下 | HRC30~35 | HRC35~40 | HRC40~45 | HRC45~55 |
| ○ | ○ | ○ | ○ | ○ |



(ザ) カットミル 4枚刃難削材用不等分割不等リード超硬エンドミル

Unequal division unequal lead carbide end mill for difficult-to-cut materials (4Flutes)



特長 Feature

- 不等リード&独自刃型により難削材加工における切削抵抗とビビリを抑制
- Cutting resistance and chattering for difficult-to-cut materials are cut down due to a variable lead and original edge type.
- 高速切削が可能で美しい加工面を実現
- High speed cutting is possible and smooth machined surface is realized.
- 刃先は、ギャッシュランド採用(耐チッピング性能が向上)
- Gash land is used for cutting edge (chipping resistance improves).

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|---|----|----|---|-----|
| IC4DMC-2.0 | 2 | 4 | 50 | 4 | 1 |
| IC4DMC-3.0 | 3 | 7 | 50 | 6 | 1 |
| IC4DMC-4.0 | 4 | 9 | 50 | 6 | 1 |
| IC4DMC-5.0 | 5 | 12 | 50 | 6 | 1 |
| IC4DMC-6.0 | 6 | 13 | 50 | 6 | 2 |

単位: mm

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|----|----|-----|----|-----|
| IC4DMC-8.0 | 8 | 19 | 60 | 8 | 2 |
| IC4DMC-10.0 | 10 | 22 | 75 | 10 | 2 |
| IC4DMC-12.0 | 12 | 26 | 75 | 12 | 2 |
| IC4DMC-16.0 | 16 | 35 | 90 | 16 | 2 |
| IC4DMC-20.0 | 20 | 45 | 100 | 20 | 2 |

標準切削条件表 (溝加工) Recommended cutting conditions (Slotting)

| 被削材 Work | 炭素鋼/鋳鉄/合金鋼 S50C/FC250/SCM等(HRC30以下) | | 合金鋼/工具鋼 SKD61/SK/NAK等 | | ステンレス鋼/チタン合金 SUS304/SUS316 | | 高硬度鋼 SKD61等(HRC45-55) | | 耐熱合金/インコネル等 Heat-resistant Steels Inconel Hasteloy | |
|----------------------|--|-------------------|------------------------------|-------------------|-------------------------------|-------------------|------------------------------|-------------------|--|-------------------|
| | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) |
| 2 | 15,300 | 610 | 9,000 | 360 | 8,650 | 280 | 4,300 | 120 | 2,900 | 70 |
| 3 | 10,800 | 650 | 6,200 | 370 | 6,700 | 340 | 2,900 | 130 | 2,400 | 100 |
| 4 | 8,300 | 730 | 5,000 | 440 | 5,100 | 360 | 2,200 | 135 | 1,800 | 115 |
| 5 | 6,850 | 960 | 4,050 | 560 | 4,100 | 370 | 1,700 | 150 | 1,500 | 130 |
| 6 | 5,800 | 1,150 | 3,400 | 650 | 3,400 | 380 | 1,450 | 170 | 1,200 | 140 |
| 8 | 4,300 | 1,030 | 2,500 | 580 | 2,600 | 350 | 1,100 | 170 | 900 | 130 |
| 10 | 3,400 | 820 | 2,000 | 480 | 2,000 | 320 | 900 | 155 | 720 | 120 |
| 12 | 2,900 | 720 | 1,700 | 410 | 1,750 | 270 | 720 | 135 | 600 | 100 |
| 16 | 2,200 | 610 | 1,300 | 350 | 1,300 | 250 | 540 | 120 | 450 | 75 |
| 20 | 1,700 | 550 | 1,000 | 320 | 1,000 | 230 | 430 | 110 | 360 | 55 |
| 切込み量 Depth of cut | ae=1D, ap=1D | | | | ae=1D, ap≤0.5D | | ae=1D, ap≤0.2D | | | |

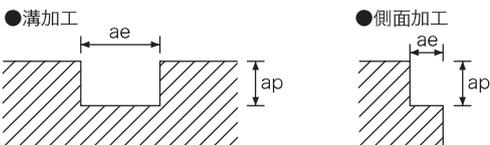
標準切削条件表 (側面加工) Recommended cutting conditions (Side cutting)

☆ap<1.5D ☆調質鋼加工時 ae<0.02D ap≤1D Thermal refining steels

| 被削材 Work | 炭素鋼/鋳鉄/合金鋼 S50C/FC250/SCM等(HRC30以下) | | 合金鋼/工具鋼 SKD61/SK/NAK等 | | ステンレス鋼/チタン合金 SUS304/SUS316 | | 高硬度鋼 SKD61等(HRC45-55) | | 耐熱合金/インコネル等 Heat-resistant Steels Inconel Hasteloy | |
|----------------------|--|-------------------|------------------------------|-------------------|-------------------------------|-------------------|------------------------------|-------------------|--|-------------------|
| | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) |
| 2 | 19,000 | 1,000 | 15,200 | 800 | 12,600 | 500 | 8,700 | 280 | 4,300 | 120 |
| 3 | 13,500 | 1,150 | 10,800 | 920 | 9,540 | 700 | 6,700 | 340 | 3,600 | 180 |
| 4 | 10,000 | 1,300 | 8,000 | 1,040 | 7,200 | 850 | 5,100 | 370 | 2,900 | 200 |
| 5 | 8,200 | 1,700 | 6,600 | 1,360 | 5,800 | 920 | 4,000 | 390 | 2,250 | 230 |
| 6 | 6,700 | 2,000 | 5,400 | 1,600 | 4,800 | 950 | 3,200 | 400 | 1,900 | 230 |
| 8 | 5,200 | 1,600 | 4,200 | 1,280 | 3,600 | 860 | 2,500 | 405 | 1,400 | 240 |
| 10 | 4,300 | 1,300 | 3,400 | 1,040 | 2,900 | 750 | 2,000 | 400 | 1,200 | 250 |
| 12 | 3,600 | 1,150 | 2,900 | 920 | 2,450 | 630 | 1,600 | 360 | 1,000 | 160 |
| 16 | 2,700 | 1,000 | 2,200 | 800 | 1,800 | 510 | 1,200 | 300 | 720 | 120 |
| 20 | 2,200 | 800 | 1,800 | 640 | 1,500 | 460 | 1,000 | 280 | 540 | 100 |
| 切込み量 Depth of cut | ae≤0.2D, ap≤1.5D | | | | ae≤0.1D, ap≤1.5D | | ae≤0.05D, ap≤1.5D | | | |

※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

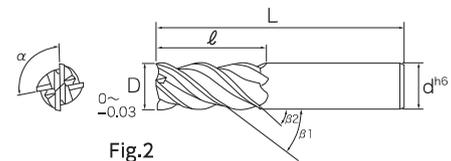
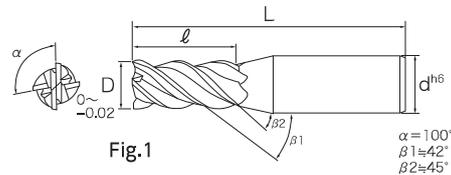


| 構造用鋼/炭素鋼 (S41, S45C) | 工具鋼/プリハードン鋼 (SKD, NAK101) | 合金鋼/ステンレス鋼 (SCM, SUS304) | チタン合金/耐熱合金 Titanium alloy Heat-resistant alloy | 硬質材 Hard material |
|-------------------------|------------------------------|-----------------------------|--|----------------------|
| HRC30以下 | HRC30~35 | HRC35~40 | | HRC45~55 |
| ○ | ○ | ◎ | ◎ | ○ |



(ザ・)カッタミル 4枚刃難削材用不等分割不等リード超硬ロングエンドミル

Unequal division unequal lead carbide end mill for difficult-to-cut materials (4Flutes・Long)



特長 Feature

- 不等分割不等リードにより難削材加工における切削抵抗とビブりを抑制
- Cutting resistance and chattering for difficult-to-cut materials are cut down due to a variable lead and original edge type.
- 高速切削が可能で美しい加工面を実現
- High speed cutting is possible and smooth machined surface is realized.
- 刃先は、ギャッシュランド採用 (耐チッピング性能が向上)
- Gash land is used for cutting edge (chipping resistance improves).

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|---|----|----|---|-----|
| IC4DMCL-2X6 | 2 | 6 | 50 | 4 | 1 |
| IC4DMCL-2X8 | 2 | 8 | 50 | 4 | 1 |
| IC4DMCL-3X9 | 3 | 9 | 50 | 6 | 1 |
| IC4DMCL-3X12 | 3 | 12 | 50 | 6 | 1 |
| IC4DMCL-4X12 | 4 | 12 | 50 | 6 | 1 |
| IC4DMCL-4X16 | 4 | 16 | 50 | 6 | 1 |
| IC4DMCL-5X15 | 5 | 15 | 50 | 6 | 1 |
| IC4DMCL-5X20 | 5 | 20 | 50 | 6 | 1 |
| IC4DMCL-6X18 | 6 | 18 | 50 | 6 | 2 |
| IC4DMCL-6X24 | 6 | 24 | 60 | 6 | 2 |

単位: mm

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|----|----|-----|----|-----|
| IC4DMCL-8X24 | 8 | 24 | 60 | 8 | 2 |
| IC4DMCL-8X32 | 8 | 32 | 75 | 8 | 2 |
| IC4DMCL-10X30 | 10 | 30 | 75 | 10 | 2 |
| IC4DMCL-10X40 | 10 | 40 | 100 | 10 | 2 |
| IC4DMCL-12X36 | 12 | 36 | 80 | 12 | 2 |
| IC4DMCL-12X48 | 12 | 48 | 110 | 12 | 2 |
| IC4DMCL-16X48 | 16 | 48 | 100 | 16 | 2 |
| IC4DMCL-16X64 | 16 | 64 | 150 | 16 | 2 |
| IC4DMCL-20X60 | 20 | 60 | 120 | 20 | 2 |
| IC4DMCL-20X80 | 20 | 80 | 150 | 20 | 2 |

標準切削条件表(溝加工) Recommended cutting conditions (Slotting)

| 被削材 Work | 炭素鋼/鋳鉄/合金鋼 S50C/FC250/SCM等 (HRC30以下) | | 合金鋼/工具鋼 SKD61/SK/NAK等 | | ステンレス鋼/チタン合金 SUS304/SUS316 | | 高硬度鋼 SKD61等 (HRC45-55) | | 耐熱合金 インコネル等 | |
|-------------|--|-------------|--------------------------|-------------|-------------------------------|-------------|---------------------------|-------------|----------------|-------------|
| | ℓ/D | 周速 m/min | 送り mm/t | 周速 m/min | 送り mm/t | 周速 m/min | 送り mm/t | 周速 m/min | 送り mm/t | 周速 m/min |
| 3 | 60~85 | 0.005~0.04 | 30~45 | 0.005~0.04 | 30~45 | 0.004~0.025 | 15~23 | 0.004~0.03 | 10~12 | 0.003~0.02 |
| 4 | 60~85 | 0.003~0.02 | 30~45 | 0.003~0.02 | 30~45 | 0.002~0.013 | 15~23 | 0.002~0.015 | 10~12 | 0.002~0.01 |
| 切込み量 | ae = 1 D, ap = 1 D | | | | ae = 1 D, ap ≤ 0.5 D | | ae = 1 D, ap ≤ 0.2 D | | | |

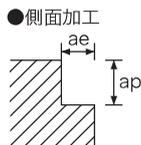
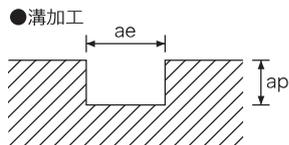
標準切削条件表(側面加工) Recommended cutting conditions (Side cutting)

| 被削材 Work | 炭素鋼/鋳鉄/合金鋼 S50C/FC250/SCM等 (HRC30以下) | | 合金鋼/工具鋼 SKD61/SK/NAK等 | | ステンレス鋼/チタン合金 SUS304/SUS316 | | 高硬度鋼 SKD61等 (HRC45-55) | | 耐熱合金 インコネル等 | |
|-------------|--|-------------|--------------------------|-------------|-------------------------------|-------------|---------------------------|-------------|----------------|-------------|
| | ℓ/D | 周速 m/min | 送り mm/t | 周速 m/min | 送り mm/t | 周速 m/min | 送り mm/t | 周速 m/min | 送り mm/t | 周速 m/min |
| 3 | 88~112 | 0.006~0.054 | 64~88 | 0.006~0.05 | 56~72 | 0.006~0.04 | 40~48 | 0.005~0.04 | 20~24 | 0.004~0.03 |
| 4 | 88~112 | 0.005~0.045 | 64~88 | 0.005~0.04 | 56~72 | 0.005~0.03 | 40~48 | 0.004~0.03 | 20~24 | 0.003~0.03 |
| 切込み量 | ae ≤ 0.2 D, ap ≤ 1.5 D | | | | ae ≤ 0.1 D, ap ≤ 1.5 D | | ae ≤ 0.05 D, ap ≤ 1.5 D | | | |

※ (3D): ℓ=3XD, (4D): ℓ=4XD

※ 切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

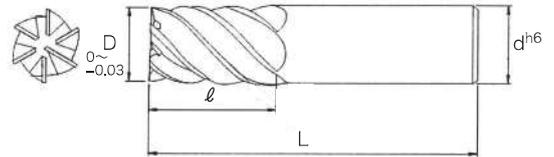


| 構造用鋼/炭素鋼 (SS41, S45C) | 工具鋼/プリハードン鋼 (SKD, NAK101) | 合金鋼/ステンレス鋼 (SCM, SUS304) | チタン合金/耐熱合金 Titanium alloy Heat-resistant alloy | 硬質材 Hard material |
|--------------------------|------------------------------|-----------------------------|--|----------------------|
| HRC30以下 | HRC30~35 | HRC35~40 | | HRC45~55 |
| ○ | ○ | ◎ | ◎ | ○ |



(ザ・)カットミル 超硬6枚刃ハイヘリカルエンドミル

Coated Solid Carbide High Helical Square Endmills (6Flutes)



特長 Feature

- 圧倒的コストパフォーマンスを実現
- 特殊コートにより、耐摩耗性UP
- 高硬度鋼の加工もOK
- 全サイズ6枚刃採用
- High cost effectiveness is realized.
- Special coating offers excellent wear resistance.
- Machining hardened steel is also possible.
- All sizes have 6 flutes.

単位：mm

| 商品コード Item Code | D | ℓ | L | d |
|--------------------|----|----|-----|----|
| IC6HXE-6.0 | 6 | 15 | 60 | 6 |
| IC6HXE-8.0 | 8 | 20 | 75 | 8 |
| IC6HXE-10.0 | 10 | 25 | 80 | 10 |
| IC6HXE-12.0 | 12 | 30 | 100 | 12 |

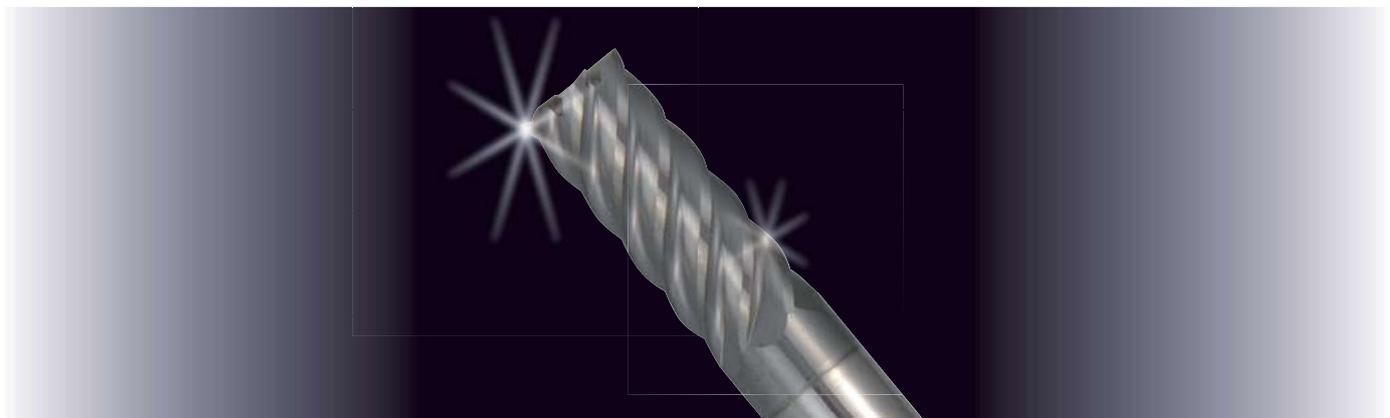
標準切削条件表 (側面加工 $ae < 0.1D$) Recommended cutting conditions (Side cutting $ae < 0.1D$)

☆ $ap < 1.5D$ ☆調質鋼加工時 $ae < 0.02D$ $ap \leq 1D$
Thermal refining steels

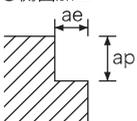
| 被削材 Work | 炭素鋼/合金鋼 S45C/SKD(HRC50以下) | | 硬質材 (HRC50-60) | | 硬質材 (HRC60以上) | |
|-------------|------------------------------|-----------------------------------|-----------------------------|-----------------------------------|-----------------------------|-----------------------------------|
| | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ |
| D 6 | 16,000 | 5,800 | 8,000 | 2,900 | 4,000 | 1,400 |
| D 8 | 12,000 | 5,800 | 6,000 | 2,900 | 3,000 | 1,400 |
| D 10 | 9,500 | 5,700 | 4,800 | 2,900 | 2,400 | 1,400 |
| D 12 | 8,000 | 4,800 | 4,000 | 2,400 | 2,000 | 1,200 |

※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefor they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.



●側面加工



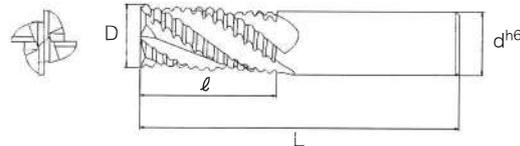
| 構造用鋼/炭素鋼 (SS41、S45C) | 工具鋼/ブリハードン鋼 (SKD、NAK101) | 合金鋼/ステンレス鋼 (SCM、SUS304) | 熱処理鋼等 Hardened Steels | 硬質材 Hard material |
|-------------------------|-----------------------------|----------------------------|--------------------------|----------------------|
| HRC30以下 | HRC30~35 | HRC35~40 | HRC40~45 | HRC45~65 |
| ◎ | ◎ | ○ | ◎ | ○ |



(ザ・) カットミル 超硬4枚刃ラフィングエンドミル

Coated Solid Carbide Roughing Endmills (4Flutes)

※ノーマルピッチタイプ刃形 Large pitch nick is used



特長 Feature

- 圧倒的なコストパフォーマンスを実現
- 生材から合金鋼までの幅広いワークの加工が可能
- TiAlNコートで寿命UP
- 4枚刃仕様で安定な加工
- High cost effectiveness is realized.
- Ability to process a range of materials from alloyed steel to soft iron.
- Durable due to TiAlN coating.
- Stable machining due to 4 flute design.

単位：mm

| 商品コード Item Code | D | 刃径公差 Tolerance of Dia | ℓ | L | d |
|--------------------|----|--------------------------|----|-----|----|
| IC4RFE-6.0 | 6 | 0~-0.06 | 15 | 60 | 6 |
| IC4RFE-8.0 | 8 | 0~-0.06 | 20 | 70 | 8 |
| IC4RFE-10.0 | 10 | 0~-0.07 | 25 | 90 | 10 |
| IC4RFE-12.0 | 12 | 0~-0.07 | 30 | 90 | 12 |
| IC4RFE-16.0 | 16 | 0~-0.08 | 40 | 100 | 16 |
| IC4RFE-20.0 | 20 | 0~-0.10 | 50 | 110 | 20 |

標準切削条件表 (溝加工 $a_e=1D$) Recommended cutting conditions (Slotting)

☆一般鋼から合金鋼加工時 Mild Steels, Alloy Steels $ap \leq 0.75D$
 ☆調質鋼・SUS等加工時 Thermal refining steels, SUS $ap \leq 0.5D$

| 被削材 Work | 構造用鋼/炭素鋼 SS41/S45C(HRC30以下) | | 工具鋼/プリハードン鋼 SKD/NAK101(HRC30-35) | | 合金鋼/ステンレス鋼 SCM/SUS304(HRC35-40) | | 熱処理鋼等 (HRC40-45) | |
|-------------|--------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|-----------------------------|-----------------------------------|
| | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ |
| D 6 | 4,500 | 450 | 3,700 | 300 | 2,900 | 230 | 2,400 | 190 |
| 8 | 3,400 | 510 | 2,800 | 340 | 2,200 | 260 | 1,800 | 220 |
| 10 | 2,700 | 540 | 2,250 | 360 | 1,750 | 280 | 1,450 | 230 |
| 12 | 2,250 | 550 | 1,850 | 370 | 1,450 | 290 | 1,200 | 240 |
| 16 | 1,700 | 550 | 1,400 | 370 | 1,100 | 290 | 900 | 240 |
| 20 | 1,350 | 540 | 1,100 | 360 | 900 | 280 | 720 | 230 |

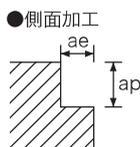
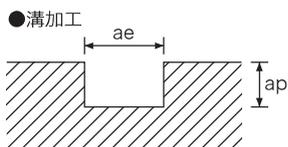
標準切削条件表 (側面加工 $a_e < 0.1D$) Recommended cutting conditions (Side cutting $a_e < 0.1D$)

☆ $ap < 1.5D$
 ☆調質鋼加工時 Thermal refining steels $ap \leq 1D$

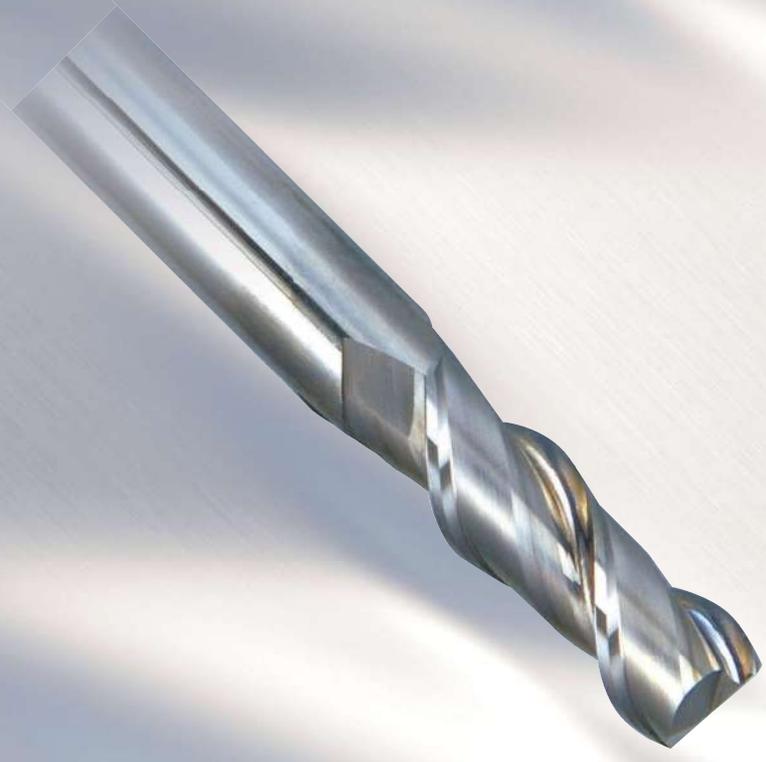
| 被削材 Work | 構造用鋼/炭素鋼 SS41/S45C(HRC30以下) | | 工具鋼/プリハードン鋼 SKD/NAK101(HRC30-35) | | 合金鋼/ステンレス鋼 SCM/SUS304(HRC35-40) | | 熱処理鋼等 (HRC40-45) | |
|-------------|--------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|-----------------------------|-----------------------------------|
| | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ | 回転数 $n(\text{min}^{-1})$ | 送り速度 $F(\text{mm}/\text{min})$ |
| D 6 | 5,300 | 540 | 4,500 | 360 | 3,450 | 280 | 2,650 | 210 |
| 8 | 4,000 | 580 | 3,400 | 410 | 2,600 | 310 | 2,000 | 240 |
| 10 | 3,200 | 610 | 2,700 | 430 | 2,050 | 330 | 1,600 | 260 |
| 12 | 2,650 | 640 | 2,250 | 450 | 1,700 | 340 | 1,350 | 270 |
| 16 | 2,000 | 640 | 1,700 | 450 | 1,300 | 340 | 1,000 | 270 |
| 20 | 1,600 | 610 | 1,350 | 430 | 1,050 | 330 | 810 | 260 |

※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.



| 構造用鋼/炭素鋼 (SS41, S45C) HRC30以下 | 工具鋼/プリハードン鋼 (SKD, NAK101) HRC30~35 | 合金鋼/ステンレス鋼 (SCM, SUS304) HRC35~40 | 熱処理鋼等 Hardened Steels HRC40~45 | 硬質材 Hard material HRC45~55 |
|-------------------------------------|--|---|--------------------------------------|----------------------------------|
| ○ | ○ | △ | △ | × |



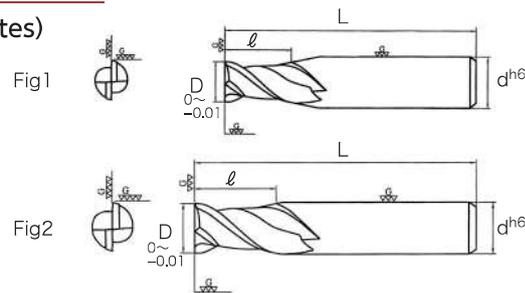
A L U M I N I U M





(ザ・) カットミル 超硬2枚刃アルミ用エンドミル

Solid Carbide Square Endmills for Aluminum (2Flutes)



特長 Feature

- 刃先をダイヤモンド粒度2000番の研磨を行い、鏡面仕上げを実現
- 溶着や構成刃先の発生を抑制し、工具寿命が大きく伸び、仕上げ面も良好
- 2枚刃で切りくずの排出性が良好
- ノンコーティング・ピン角仕様で切れ味重視
- Mirror polishing is realized due to grinding to level 2000 diamond granularity.
- Adhesion and occurrence of built-up edge is cut down, tool life is increased and machined surface is good.
- Cutting swarf removal is excellent.
- Sharpness is prioritized due to non coating and sharp corner.

単位：mm

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|----|----|-----|----|-----|
| IC2ALE-3.0 | 3 | 12 | 50 | 6 | 1 |
| IC2ALE-4.0 | 4 | 15 | 50 | 6 | 1 |
| IC2ALE-5.0 | 5 | 17 | 50 | 6 | 1 |
| IC2ALE-6.0 | 6 | 17 | 50 | 6 | 2 |
| IC2ALE-8.0 | 8 | 22 | 60 | 8 | 2 |
| IC2ALE-10.0 | 10 | 29 | 75 | 10 | 2 |
| IC2ALE-12.0 | 12 | 28 | 75 | 12 | 2 |
| IC2ALE-16.0 | 16 | 42 | 95 | 16 | 2 |
| IC2ALE-20.0 | 20 | 45 | 100 | 20 | 2 |

標準切削条件表 (溝加工ap=1D) Recommended cutting conditions (Slotting)

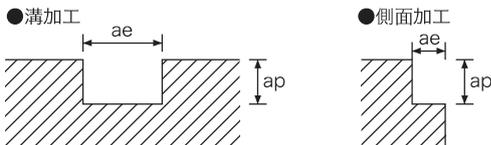
| 被削材 Work | 純アルミ 1070 | | アルミ合金 Cu-Mg系 2014 | | アルミ合金 Si系 4032 | | アルミ合金 Mg系 5052 | | アルミ合金 Mg-Si系 6061 | | アルミ合金 Zn-Mg系 7075 | | 鋳造アルミ合金 AC85 | |
|-------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|
| | 回転数 n(min ⁻¹) | 送り (mm/min) |
| D 3 | 32,000 | 530 | 9,100 | 180 | 13,000 | 260 | 13,000 | 260 | 8,300 | 170 | 10,400 | 210 | 16,000 | 330 |
| 4 | 24,000 | 660 | 7,000 | 230 | 10,000 | 330 | 10,000 | 330 | 6,400 | 210 | 8,000 | 260 | 12,000 | 400 |
| 5 | 19,000 | 660 | 5,600 | 230 | 8,000 | 330 | 8,000 | 330 | 5,100 | 210 | 6,400 | 260 | 9,600 | 400 |
| 6 | 16,000 | 660 | 4,550 | 230 | 6,500 | 330 | 6,500 | 330 | 4,200 | 210 | 5,200 | 260 | 8,000 | 400 |
| 8 | 12,000 | 660 | 3,500 | 280 | 5,000 | 400 | 5,000 | 400 | 3,200 | 260 | 4,000 | 320 | 6,000 | 460 |
| 10 | 9,600 | 800 | 2,800 | 280 | 4,000 | 400 | 4,000 | 400 | 2,600 | 260 | 3,200 | 320 | 4,800 | 460 |
| 12 | 8,000 | 800 | 2,310 | 320 | 3,300 | 460 | 3,300 | 460 | 2,100 | 300 | 2,600 | 370 | 4,000 | 460 |
| 16 | 6,000 | 660 | 1,890 | 230 | 2,700 | 330 | 2,700 | 330 | 1,800 | 210 | 2,200 | 260 | 3,000 | 530 |
| 20 | 4,800 | 530 | 1,400 | 230 | 2,000 | 330 | 2,000 | 330 | 1,300 | 210 | 1,600 | 260 | 2,400 | 400 |

標準切削条件表 (側面加工ae=0.3D ap=1.5D) Recommended cutting conditions (Side cutting)

| 被削材 Work | 純アルミ 1070 | | アルミ合金 Cu-Mg系 2014 | | アルミ合金 Si系 4032 | | アルミ合金 Mg系 5052 | | アルミ合金 Mg-Si系 6061 | | アルミ合金 Zn-Mg系 7075 | | 鋳造アルミ合金 AC85 | |
|-------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|
| | 回転数 n(min ⁻¹) | 送り (mm/min) |
| D 3 | 32,000 | 690 | 9,100 | 240 | 13,000 | 340 | 13,000 | 340 | 8,300 | 220 | 10,400 | 270 | 16,000 | 430 |
| 4 | 24,000 | 860 | 7,000 | 300 | 10,000 | 430 | 10,000 | 430 | 6,400 | 270 | 8,000 | 340 | 12,000 | 520 |
| 5 | 19,000 | 860 | 5,600 | 300 | 8,000 | 430 | 8,000 | 430 | 5,100 | 270 | 6,400 | 340 | 9,600 | 520 |
| 6 | 16,000 | 860 | 4,550 | 300 | 6,500 | 430 | 6,500 | 430 | 4,200 | 270 | 5,200 | 340 | 8,000 | 520 |
| 8 | 12,000 | 860 | 3,500 | 360 | 5,000 | 520 | 5,000 | 520 | 3,200 | 330 | 4,000 | 410 | 6,000 | 600 |
| 10 | 9,600 | 1,040 | 2,800 | 360 | 4,000 | 520 | 4,000 | 520 | 2,600 | 330 | 3,200 | 410 | 4,800 | 600 |
| 12 | 8,000 | 1,040 | 2,310 | 420 | 3,300 | 600 | 3,300 | 600 | 2,100 | 390 | 2,600 | 480 | 4,000 | 600 |
| 16 | 6,000 | 890 | 1,890 | 300 | 2,700 | 430 | 2,700 | 430 | 1,800 | 270 | 2,200 | 340 | 3,000 | 690 |
| 20 | 4,800 | 690 | 1,400 | 300 | 2,000 | 430 | 2,000 | 430 | 1,300 | 270 | 1,600 | 340 | 2,400 | 520 |

※ 切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

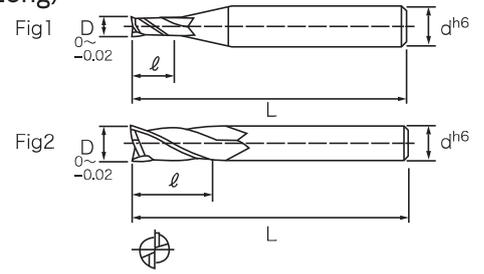
These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.





(ザ・)カットミル 超硬2枚刃アルミ用ロングエンドミル

Solid Carbide Square Endmills for Aluminum (2Flutes•Long)



特長 Feature

- 圧倒的なコストパフォーマンスを実現
- ノンコーティング・ピン角仕様で切れ味重視
- ロング刃長で、より広範囲な切削領域をカバー
- 刃先はダイヤモンド粒度1000番で研磨しており、より上質な仕上げ面を実現
- High cost effectiveness is realized.
- Sharpness is prioritized due to non coating and sharp corner.
- A wide range of cutting is possible due to long cutting edge length.
- Grinding to level 1000 diamond granularity provides high quality cut face.

単位：mm

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|----|----|-----|----|-----|
| IC2ALL-3.0 | 3 | 22 | 65 | 6 | 1 |
| IC2ALL-4.0 | 4 | 26 | 65 | 6 | 1 |
| IC2ALL-5.0 | 5 | 32 | 75 | 6 | 1 |
| IC2ALL-6.0 | 6 | 32 | 75 | 6 | 2 |
| IC2ALL-8.0 | 8 | 42 | 95 | 8 | 2 |
| IC2ALL-10.0 | 10 | 53 | 120 | 10 | 2 |
| IC2ALL-12.0 | 12 | 53 | 120 | 12 | 2 |

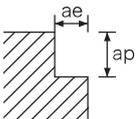
標準切削条件表 (側面加工 $ae=0.3D$ $ap=1.5D$) Recommended cutting conditions (Side cutting)

| 被削材 Work | 純アルミ 1070 | | アルミ合金 Cu-Mg系 2014 | | アルミ合金 Si系 4032 | | アルミ合金 Mg系 5052 | | アルミ合金 Mg-Si系 6061 | | アルミ合金 Zn-Mg系 7075 | | 鋳造アルミ合金 AC85 | |
|-------------|-----------------------------|------------------|-----------------------------|------------------|-----------------------------|------------------|-----------------------------|------------------|-----------------------------|------------------|-----------------------------|------------------|-----------------------------|------------------|
| | 回転数 $n(\text{min}^{-1})$ | 送り速度 (mm/min) |
| 3 | 32,400 | 1,400 | 11,300 | 500 | 16,200 | 720 | 16,200 | 720 | 9,720 | 470 | 13,000 | 580 | 19,400 | 860 |
| 4 | 24,000 | 1,400 | 8,400 | 500 | 12,000 | 720 | 12,000 | 720 | 7,200 | 470 | 9,600 | 580 | 14,400 | 860 |
| 5 | 18,800 | 1,400 | 6,600 | 500 | 9,400 | 720 | 9,400 | 720 | 5,640 | 470 | 7,520 | 580 | 11,300 | 860 |
| 6 | 16,200 | 1,400 | 5,700 | 500 | 8,100 | 720 | 8,100 | 720 | 4,860 | 470 | 6,480 | 580 | 9,700 | 860 |
| 8 | 12,000 | 1,400 | 4,200 | 500 | 6,000 | 720 | 6,000 | 720 | 3,600 | 470 | 4,800 | 580 | 7,200 | 860 |
| 10 | 10,000 | 1,400 | 3,500 | 500 | 5,000 | 720 | 5,000 | 720 | 3,000 | 470 | 4,000 | 580 | 6,000 | 860 |
| 12 | 8,000 | 1,400 | 2,800 | 500 | 4,000 | 720 | 4,000 | 720 | 2,400 | 470 | 3,200 | 580 | 4,800 | 860 |

※ 切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

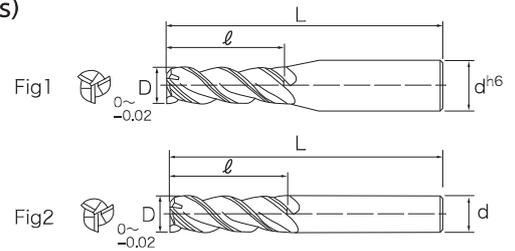
● 側面加工





(ザ・) カットミル 超硬3枚刃アルミ用エンドミル

Solid Carbide Square Endmills for Aluminum (3Flutes)



特長 Feature

- 圧倒的コストパフォーマンスを実現
- ノンコーティング・ピン角仕様で切れ味重視
- 切削バランスに優れた3枚刃を採用
- 刃先はダイヤモンド粒度1000番で研磨しており、より上質な仕上げ面を実現
- 高剛性のショート刃長で高能率加工
- High cost effectiveness is realized.
- Sharpness is prioritized due to non coating and sharp corner.
- For excellent cutting balance 3 flutes are used.
- Grinding to level 1000 diamond granularity provides high quality cut face.
- Highly efficient processing is possible due to short cutting edge length and high rigidity.

単位：mm

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|----|----|----|----|-----|
| IC3ALS-3,0 | 3 | 5 | 50 | 6 | 1 |
| IC3ALS-4,0 | 4 | 6 | 50 | 6 | 1 |
| IC3ALS-5,0 | 5 | 8 | 50 | 6 | 1 |
| IC3ALS-6,0 | 6 | 9 | 55 | 6 | 2 |
| IC3ALS-8,0 | 8 | 12 | 65 | 8 | 2 |
| IC3ALS-10,0 | 10 | 15 | 75 | 10 | 2 |
| IC3ALS-12,0 | 12 | 18 | 80 | 12 | 2 |

標準切削条件表 (溝加工 $a_p=1D$) Recommended cutting conditions (Slotting)

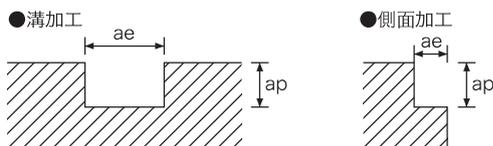
| 被削材 Work | 純アルミ 1070 | | アルミ合金 Cu-Mg系 2014 | | アルミ合金 Si系 4032 | | アルミ合金 Mg系 5052 | | アルミ合金 Mg-Si系 6061 | | アルミ合金 Zn-Mg系 7075 | | 鋳造アルミ合金 AC85 | |
|-------------|-------------------------------|----------------|-------------------------------|----------------|-------------------------------|----------------|-------------------------------|----------------|-------------------------------|----------------|-------------------------------|----------------|-------------------------------|----------------|
| | 回転数 n (min ⁻¹) | 送り (mm/min) |
| D 3 | 32,000 | 800 | 12,600 | 392 | 18,000 | 560 | 18,000 | 560 | 10,800 | 336 | 14,400 | 448 | 21,600 | 672 |
| 4 | 24,000 | 1,000 | 9,800 | 490 | 14,000 | 700 | 14,000 | 700 | 8,400 | 420 | 11,200 | 560 | 16,800 | 840 |
| 5 | 19,000 | 1,000 | 7,840 | 490 | 11,200 | 700 | 11,200 | 700 | 6,720 | 420 | 8,960 | 560 | 13,440 | 840 |
| 6 | 16,000 | 1,000 | 6,370 | 490 | 9,100 | 700 | 9,100 | 700 | 5,460 | 420 | 7,280 | 560 | 10,920 | 840 |
| 8 | 12,000 | 1,000 | 4,900 | 588 | 7,000 | 840 | 7,000 | 840 | 4,200 | 504 | 5,600 | 672 | 8,400 | 1,008 |
| 10 | 9,600 | 1,200 | 3,920 | 588 | 5,600 | 840 | 5,600 | 840 | 3,360 | 504 | 4,480 | 672 | 6,720 | 1,008 |
| 12 | 8,000 | 1,200 | 3,220 | 686 | 4,600 | 980 | 4,600 | 980 | 2,760 | 588 | 3,680 | 784 | 5,520 | 1,176 |

標準切削条件表 (側面加工 $a_e=0.3D$ $a_p=1.5D$) Recommended cutting conditions (Side cutting)

| 被削材 Work | 純アルミ 1070 | | アルミ合金 Cu-Mg系 2014 | | アルミ合金 Si系 4032 | | アルミ合金 Mg系 5052 | | アルミ合金 Mg-Si系 6061 | | アルミ合金 Zn-Mg系 7075 | | 鋳造アルミ合金 AC85 | |
|-------------|-------------------------------|----------------|-------------------------------|----------------|-------------------------------|----------------|-------------------------------|----------------|-------------------------------|----------------|-------------------------------|----------------|-------------------------------|----------------|
| | 回転数 n (min ⁻¹) | 送り (mm/min) |
| D 3 | 32,000 | 1,040 | 14,560 | 510 | 20,800 | 1,160 | 20,800 | 1,160 | 12,480 | 700 | 16,640 | 928 | 25,000 | 874 |
| 4 | 24,000 | 1,300 | 11,200 | 637 | 16,000 | 1,450 | 16,000 | 1,450 | 9,600 | 870 | 12,800 | 1,160 | 19,200 | 1,092 |
| 5 | 19,000 | 1,300 | 8,960 | 637 | 12,800 | 1,450 | 12,800 | 1,450 | 7,680 | 870 | 10,240 | 1,160 | 15,400 | 1,092 |
| 6 | 16,000 | 1,300 | 7,280 | 637 | 10,400 | 1,450 | 10,400 | 1,450 | 6,240 | 870 | 8,320 | 1,160 | 12,500 | 1,092 |
| 8 | 12,000 | 1,300 | 5,600 | 764 | 8,000 | 1,750 | 8,000 | 1,750 | 4,800 | 1,050 | 6,400 | 1,400 | 9,600 | 1,310 |
| 10 | 9,600 | 1,560 | 4,480 | 764 | 6,400 | 1,750 | 6,400 | 1,750 | 3,840 | 1,050 | 5,120 | 1,400 | 7,700 | 1,310 |
| 12 | 8,000 | 1,560 | 3,710 | 892 | 5,300 | 2,000 | 5,300 | 2,000 | 3,180 | 1,200 | 4,240 | 1,600 | 6,400 | 1,529 |

※ 切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

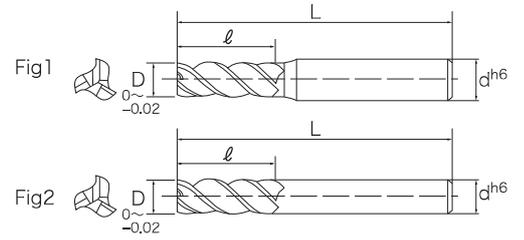
These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.





(ザ・) カットミル超硬3枚刃アルミ用ミディアムエンドミル

Solid Carbide Square Endmills for Aluminum (3Flutes medium)



特長 Feature

- 圧倒的コストパフォーマンスを実現
- ノンコーティング・ピン角仕様で切れ味重視
- 切削バランスに優れた3枚刃を採用
- 刃先はダイヤモンド粒度2000番で研磨しており、より上質な仕上げ面を実現
- High cost effectiveness is realized.
- Sharpness is prioritized due to non coating and sharp corner.
- For excellent cutting balance 3 flutes are used.
- Grinding to level 2000 diamond granularity provides high quality cut face.

単位：mm

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|----|----|-----|----|-----|
| IC3ALM 3.0x9 | 3 | 9 | 50 | 6 | 1 |
| IC3ALM 4.0x12 | 4 | 12 | 50 | 6 | 1 |
| IC3ALM 5.0x15 | 5 | 15 | 50 | 6 | 1 |
| IC3ALM 6.0x18 | 6 | 18 | 50 | 6 | 2 |
| IC3ALM 8.0x20 | 8 | 20 | 60 | 8 | 2 |
| IC3ALM 10.0x30 | 10 | 30 | 75 | 10 | 2 |
| IC3ALM 12.0x32 | 12 | 32 | 75 | 12 | 2 |
| IC3ALM 16.0x45 | 16 | 45 | 100 | 16 | 2 |
| IC3ALM 20.0x45 | 20 | 45 | 100 | 20 | 2 |

標準切削条件表 (溝加工ap=1D) Recommended cutting conditions (Slotting)

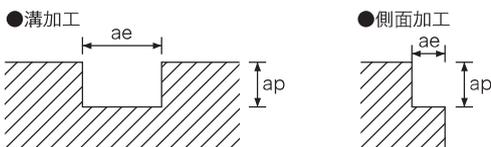
| 被削材 Work | 純アルミ 1070 | | アルミ合金 Cu-Mg系 2014 | | アルミ合金 Si系 4032 | | アルミ合金 Mg系 5052 | | アルミ合金 Mg-Si系 6061 | | アルミ合金 Zn-Mg系 7075 | | 鋳造アルミ合金 AC85 | |
|-------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|
| | 回転数 n(min ⁻¹) | 送り (mm/min) |
| D 3 | 32,000 | 720 | 12,600 | 350 | 18,000 | 500 | 18,000 | 500 | 10,800 | 300 | 14,400 | 400 | 21,600 | 600 |
| 4 | 24,000 | 900 | 9,800 | 440 | 14,000 | 630 | 14,000 | 630 | 8,400 | 380 | 11,200 | 500 | 16,800 | 750 |
| 5 | 19,000 | 900 | 7,840 | 440 | 11,200 | 630 | 11,200 | 630 | 6,720 | 380 | 8,960 | 500 | 13,440 | 750 |
| 6 | 16,000 | 900 | 6,370 | 440 | 9,100 | 630 | 9,100 | 630 | 5,460 | 380 | 7,280 | 500 | 10,920 | 750 |
| 8 | 12,000 | 900 | 4,900 | 530 | 7,000 | 760 | 7,000 | 760 | 4,200 | 450 | 5,600 | 600 | 8,400 | 900 |
| 10 | 9,600 | 1,080 | 3,920 | 530 | 5,600 | 760 | 5,600 | 760 | 3,360 | 450 | 4,480 | 600 | 6,720 | 900 |
| 12 | 8,000 | 1,080 | 3,220 | 620 | 4,600 | 880 | 4,600 | 880 | 2,760 | 530 | 3,680 | 700 | 5,520 | 1,000 |

標準切削条件表 (側面加工ae=0.3D ap=1.5D) Recommended cutting conditions (Side cutting)

| 被削材 Work | 純アルミ 1070 | | アルミ合金 Cu-Mg系 2014 | | アルミ合金 Si系 4032 | | アルミ合金 Mg系 5052 | | アルミ合金 Mg-Si系 6061 | | アルミ合金 Zn-Mg系 7075 | | 鋳造アルミ合金 AC85 | |
|-------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|
| | 回転数 n(min ⁻¹) | 送り (mm/min) |
| D 3 | 32,000 | 936 | 14,560 | 455 | 20,800 | 1,160 | 20,800 | 1,160 | 12,480 | 700 | 16,640 | 928 | 25,000 | 780 |
| 4 | 24,000 | 1,170 | 11,200 | 572 | 16,000 | 1,450 | 16,000 | 1,450 | 9,600 | 870 | 12,800 | 1,160 | 19,200 | 975 |
| 5 | 19,000 | 1,170 | 8,960 | 572 | 12,800 | 1,450 | 12,800 | 1,450 | 7,680 | 870 | 10,240 | 1,160 | 15,400 | 975 |
| 6 | 16,000 | 1,170 | 7,280 | 572 | 10,400 | 1,450 | 10,400 | 1,450 | 6,240 | 870 | 8,320 | 1,160 | 12,500 | 975 |
| 8 | 12,000 | 1,170 | 5,600 | 689 | 8,000 | 1,750 | 8,000 | 1,750 | 4,800 | 1,050 | 6,400 | 1,400 | 9,600 | 1,170 |
| 10 | 9,600 | 1,404 | 4,480 | 689 | 6,400 | 1,750 | 6,400 | 1,750 | 3,840 | 1,050 | 5,120 | 1,400 | 7,700 | 1,170 |
| 12 | 8,000 | 1,404 | 3,710 | 806 | 5,300 | 2,000 | 5,300 | 2,000 | 3,180 | 1,200 | 4,240 | 1,600 | 6,400 | 1,300 |

※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

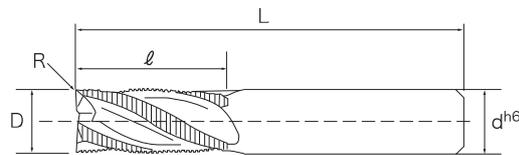
These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.





(ザ・) カットミル 超硬3枚刃アルミ用ラフィングエンドミル

Solid Carbide Roughing Endmills for Aluminum(3Flutes)



特長 Feature

- アルミ材専用
- 高能率加工が可能
- 独自の刃形状によるフラットな加工面
- 低抵抗切削により小馬力機械でも使用可能
- For exclusive use with aluminum.
- Highly efficient processing is possible.
- Original edge shape provides flat machined face.
- Can be used by even low power machines due to low cut resistance.

単位：mm

| 商品コード Item Code | D | 刃径公差 Tolerance of Dia | R | ℓ | L | d |
|--------------------|----|--------------------------|------|----|-----|----|
| IC3ALRF-6.0 | 6 | -0.030~-0.105 | 0.25 | 13 | 57 | 6 |
| IC3ALRF-8.0 | 8 | -0.040~-0.130 | 0.25 | 16 | 63 | 8 |
| IC3ALRF-10.0 | 10 | -0.040~-0.130 | 0.50 | 22 | 72 | 10 |
| IC3ALRF-12.0 | 12 | -0.050~-0.160 | 0.50 | 26 | 83 | 12 |
| IC3ALRF-16.0 | 16 | -0.050~-0.160 | 1.00 | 32 | 92 | 16 |
| IC3ALRF-20.0 | 20 | -0.065~-0.195 | 1.00 | 38 | 104 | 20 |

標準切削条件表 (溝加工 $a_p=1D$) Recommended cutting conditions (Slotting)

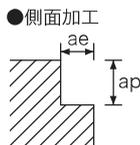
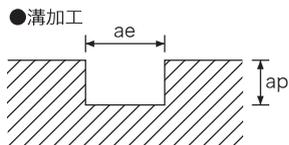
| 被削材 Work | 純アルミ 1070 | | アルミ合金 Cu-Mg系 2014 | | アルミ合金 Si系 4032 | | アルミ合金 Mg系 5052 | | アルミ合金 Mg-Si系 6061 | | アルミ合金 Zn-Mg系 7075 | | 鋳造アルミ合金 AC85 | |
|-------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|
| | 回転数 n(min ⁻¹) | 送り (mm/min) |
| D 6 | 19,000 | 3,650 | 7,500 | 1,450 | 10,700 | 2,070 | 10,700 | 2,070 | 6,500 | 1,250 | 8,600 | 1,670 | 13,000 | 2,500 |
| 8 | 14,600 | 3,700 | 5,800 | 1,490 | 8,300 | 2,140 | 8,300 | 2,140 | 5,000 | 1,290 | 6,600 | 1,720 | 10,000 | 2,580 |
| 10 | 11,700 | 3,800 | 4,600 | 1,500 | 6,600 | 2,150 | 6,600 | 2,150 | 4,000 | 1,300 | 5,300 | 1,730 | 8,000 | 2,600 |
| 12 | 9,600 | 3,750 | 3,800 | 1,490 | 5,400 | 2,130 | 5,400 | 2,130 | 3,300 | 1,285 | 4,400 | 1,710 | 6,600 | 2,570 |
| 16 | 7,300 | 3,800 | 2,900 | 1,500 | 4,100 | 2,150 | 4,100 | 2,150 | 2,500 | 1,300 | 3,300 | 1,730 | 5,000 | 2,600 |
| 20 | 5,800 | 3,800 | 2,300 | 1,500 | 3,300 | 2,150 | 3,300 | 2,150 | 2,000 | 1,300 | 2,600 | 1,730 | 4,000 | 2,600 |

標準切削条件表 (側面加工 $a_e=0.5D$ $a_p=1.5D$) Recommended cutting conditions (Side cutting)

| 被削材 Work | 純アルミ 1070 | | アルミ合金 Cu-Mg系 2014 | | アルミ合金 Si系 4032 | | アルミ合金 Mg系 5052 | | アルミ合金 Mg-Si系 6061 | | アルミ合金 Zn-Mg系 7075 | | 鋳造アルミ合金 AC85 | |
|-------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|
| | 回転数 n(min ⁻¹) | 送り (mm/min) |
| D 6 | 19,000 | 4,700 | 8,600 | 1,800 | 12,300 | 4,100 | 12,300 | 4,100 | 7,500 | 2,500 | 9,900 | 3,340 | 15,000 | 3,250 |
| 8 | 14,600 | 4,800 | 6,600 | 1,900 | 9,500 | 4,200 | 9,500 | 4,200 | 5,750 | 2,580 | 7,600 | 3,440 | 11,500 | 3,350 |
| 10 | 11,700 | 4,900 | 5,200 | 1,950 | 7,500 | 4,300 | 7,500 | 4,300 | 4,600 | 2,600 | 6,100 | 3,460 | 9,200 | 3,380 |
| 12 | 9,600 | 4,800 | 4,300 | 1,930 | 6,200 | 4,250 | 6,200 | 4,250 | 3,800 | 2,570 | 5,000 | 3,420 | 7,600 | 3,340 |
| 16 | 7,300 | 4,900 | 3,300 | 1,950 | 4,700 | 4,300 | 4,700 | 4,300 | 2,800 | 2,600 | 3,800 | 3,460 | 5,800 | 3,380 |
| 20 | 5,800 | 4,900 | 2,600 | 1,950 | 3,800 | 4,300 | 3,700 | 4,300 | 2,300 | 2,600 | 2,900 | 3,460 | 4,600 | 3,380 |

※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

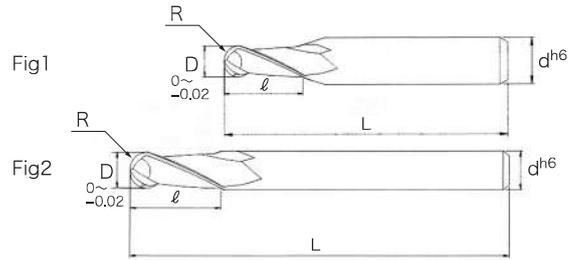
These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.





(ザ・) カットミル 超硬2枚刃ボールエンドミル

Coated Solid Carbide Ball Endmills (2Flutes)



特長 Feature

- 圧倒的なコストパフォーマンスを実現
- 生材から合金鋼までの幅広いワークの加工が可能
- TiAlNコートで寿命UP
- High cost effectiveness is realized.
- Ability to process a range of materials from alloyed steel to soft iron.
- Durable due to TiAlN coating.

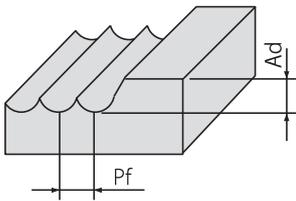
単位：mm

| 商品コード Item Code | R±0.01 | D | ℓ | L | d | Fig |
|--------------------|--------|----|-----|-----|----|-----|
| IC2MBV-0.5R | 0.5 | 1 | 2.5 | 50 | 4 | 1 |
| IC2MBV-1R | 1 | 2 | 5 | 60 | 4 | 1 |
| IC2MBV-1.5R | 1.5 | 3 | 8 | 70 | 6 | 1 |
| IC2MBV-2R | 2 | 4 | 8 | 70 | 6 | 1 |
| IC2MBV-3R | 3 | 6 | 12 | 90 | 6 | 2 |
| IC2MBV-4R | 4 | 8 | 14 | 100 | 8 | 2 |
| IC2MBV-5R | 5 | 10 | 18 | 100 | 10 | 2 |
| IC2MBV-6R | 6 | 12 | 22 | 110 | 12 | 2 |
| IC2MBV-8R | 8 | 16 | 30 | 140 | 16 | 2 |
| IC2MBV-10R | 10 | 20 | 38 | 155 | 20 | 2 |

標準切削条件表 Recommended cutting conditions

| 被削材 Work | 構造用鋼/炭素鋼 SS41/S45C(HRC30以下) | | 工具鋼/プリハードン鋼 SKD/NAK101(HRC30-35) | | 合金鋼/ステンレス鋼 SCM/SUS304(HRC35-40) | | 熱処理鋼等 (HRC40-45) | |
|-------------|--------------------------------|-------------------|-------------------------------------|-------------------|------------------------------------|-------------------|------------------------------|-------------------|
| | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) |
| 1 | 31,000 | 620 | 25,000 | 400 | 18,000 | 300 | 13,300 | 150 |
| 2 | 15,500 | 620 | 12,500 | 400 | 10,000 | 300 | 6,600 | 150 |
| 3 | 10,600 | 630 | 8,500 | 400 | 7,000 | 300 | 4,500 | 150 |
| 4 | 8,000 | 630 | 6,400 | 450 | 5,000 | 320 | 3,400 | 190 |
| 6 | 5,300 | 670 | 4,200 | 470 | 3,500 | 350 | 3,000 | 210 |
| 8 | 4,000 | 800 | 3,200 | 550 | 3,000 | 420 | 2,200 | 220 |
| 10 | 3,200 | 750 | 2,500 | 520 | 2,200 | 420 | 1,600 | 230 |
| 12 | 2,700 | 700 | 2,100 | 490 | 1,800 | 370 | 1,300 | 220 |
| 16 | 2,000 | 650 | 1,600 | 490 | 1,300 | 370 | 1,100 | 190 |
| 20 | 1,600 | 570 | 1,300 | 450 | 1,100 | 370 | 770 | 180 |

※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。
These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.



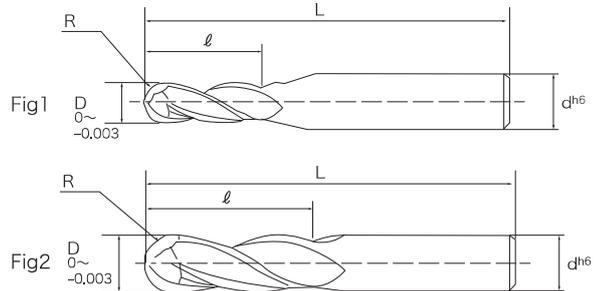
| 加工内容 | Ad | Pf |
|------|--------|--------|
| 荒加工 | ≤0.1D | ≤0.3D |
| 仕上加工 | ≤0.05D | ≤0.05D |

| 構造用鋼/炭素鋼 (SS41、S45C) HRC30以下 | 工具鋼/プリハードン鋼 (SKD、NAK101) HRC30~35 | 合金鋼/ステンレス鋼 (SCM、SUS304) HRC35~40 | 熱処理鋼等 Hardened Steels HRC40~45 | 硬質材 Hard material HRC45~55 |
|------------------------------------|---|--|--------------------------------------|----------------------------------|
| ◎ | ○ | ○ | △ | × |



(ザ・) カットミル 超硬2枚刃高速切削対応ボールエンドミル

For high-speed cutting Coated Solid Carbide Ball Endmills (2Flutes)



特長 Feature

- TiSiNコートでHRC50以下の幅広い鋼材に対応可能
- 高速機での使用にも対応
- 長寿命で圧倒的コストパフォーマンスを実現
- Ability to process a wide range of materials (up to HRC50) due to TiSiN coating.
- High-speed machine is available.
- Durable and high cost effectiveness.

単位：mm

| 商品コード Item Code | R±0.01 | D | φ | L | d | Fig. |
|--------------------|--------|----|----|----|----|------|
| IC2BHT-1,5R | 1.5 | 3 | 6 | 50 | 4 | 1 |
| IC2BHT-2R | 2 | 4 | 8 | 50 | 4 | 2 |
| IC2BHT-2.5R | 2.5 | 5 | 10 | 50 | 6 | 1 |
| IC2BHT-3R | 3 | 6 | 12 | 50 | 6 | 2 |
| IC2BHT-3.5R | 3.5 | 7 | 14 | 60 | 8 | 1 |
| IC2BHT-4R | 4 | 8 | 16 | 60 | 8 | 2 |
| IC2BHT-5R | 5 | 10 | 20 | 75 | 10 | 2 |
| IC2BHT-5,5R | 5,5 | 11 | 22 | 75 | 12 | 1 |
| IC2BHT-6R | 6 | 12 | 24 | 75 | 12 | 2 |

標準切削条件表 Standard cutting conditions

| 被削材 Work | 炭素鋼/鋳鉄/合金鋼/工具鋼 SS41/S45C/FC/FCD/SCr/SCM/SKD等(HRC30以下) | | | | 合金鋼/工具鋼/ステンレス/熱処理鋼 SCr/SCM/SKD/NAK/SUS304/SUS316等(HRC30~45) | | | | 熱処理鋼 Hardened Steels(HRC50以下) | | | |
|-------------|--|------------------|------------------------------|------------------|--|------------------|------------------------------|------------------|----------------------------------|------------------|------------------------------|------------------|
| | 等高加工 | | 曲面加工 | | 等高加工 | | 曲面加工 | | 等高加工 | | 曲面加工 | |
| D | 回転数 n(min ⁻¹) | 送り速度 (mm/min) | 回転数 n(min ⁻¹) | 送り速度 (mm/min) | 回転数 n(min ⁻¹) | 送り速度 (mm/min) | 回転数 n(min ⁻¹) | 送り速度 (mm/min) | 回転数 n(min ⁻¹) | 送り速度 (mm/min) | 回転数 n(min ⁻¹) | 送り速度 (mm/min) |
| 3 | 22,000 | 880 | 15,500 | 620 | 17,800 | 570 | 12,500 | 400 | 9,500 | 210 | 6,600 | 150 |
| 4 | 15,000 | 900 | 10,600 | 630 | 12,100 | 570 | 8,500 | 400 | 6,400 | 210 | 4,500 | 150 |
| 6 | 9,100 | 900 | 6,400 | 630 | 7,100 | 640 | 5,000 | 450 | 3,800 | 290 | 2,700 | 200 |
| 8 | 7,600 | 960 | 5,300 | 670 | 6,000 | 670 | 4,200 | 470 | 3,200 | 300 | 2,200 | 210 |
| 10 | 5,700 | 1,140 | 4,000 | 800 | 4,600 | 790 | 3,200 | 550 | 2,300 | 320 | 1,600 | 220 |
| 12 | 4,600 | 1,070 | 3,200 | 750 | 3,600 | 740 | 2,500 | 520 | 1,900 | 330 | 1,300 | 230 |
| 最大 切削量 | H=0.06R以下 P=0.10R以下 | | | | | | H=0.03R以下 P=0.05R以下 | | | | | |

高速切削条件表 High-speed cutting conditions

| 被削材 Work | 炭素鋼/鋳鉄/合金鋼/工具鋼 SS41/S45C/FC/FCD/SCr/SCM/SKD等(HRC30以下) | | | | 合金鋼/工具鋼/ステンレス/熱処理鋼 SCr/SCM/SKD/NAK/SUS304/SUS316等(HRC30~45) | | | | 熱処理鋼 Hardened Steels(HRC50以下) | | | |
|-------------|--|------------------|------------------------------|------------------|--|------------------|------------------------------|------------------|----------------------------------|------------------|------------------------------|------------------|
| | 等高加工 | | 曲面加工 | | 等高加工 | | 曲面加工 | | 等高加工 | | 曲面加工 | |
| D | 回転数 n(min ⁻¹) | 送り速度 (mm/min) | 回転数 n(min ⁻¹) | 送り速度 (mm/min) | 回転数 n(min ⁻¹) | 送り速度 (mm/min) | 回転数 n(min ⁻¹) | 送り速度 (mm/min) | 回転数 n(min ⁻¹) | 送り速度 (mm/min) | 回転数 n(min ⁻¹) | 送り速度 (mm/min) |
| 3 | 25,000 | 2,200 | 17,500 | 1,500 | 24,500 | 2,000 | 17,000 | 1,400 | 17,000 | 1,200 | 11,900 | 800 |
| 4 | 16,500 | 2,200 | 11,600 | 1,500 | 16,000 | 2,000 | 11,200 | 1,400 | 11,500 | 1,200 | 8,000 | 800 |
| 6 | 15,000 | 3,200 | 10,500 | 2,200 | 14,000 | 2,300 | 9,800 | 1,600 | 10,000 | 1,680 | 7,000 | 1,170 |
| 8 | 13,500 | 3,400 | 9,500 | 2,400 | 11,500 | 2,200 | 8,000 | 1,500 | 9,500 | 1,800 | 6,600 | 1,280 |
| 10 | 10,000 | 2,500 | 7,000 | 1,960 | 9,000 | 1,700 | 6,300 | 1,200 | 7,100 | 1,360 | 5,000 | 960 |
| 12 | 8,200 | 2,100 | 5,700 | 1,400 | 7,200 | 1,360 | 5,000 | 960 | 5,700 | 1,080 | 4,000 | 760 |
| 最大 切削量 | H=0.03R以下 P=0.05R以下 | | | | | | H=0.015R以下 P=0.025R以下 | | | | | |

※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

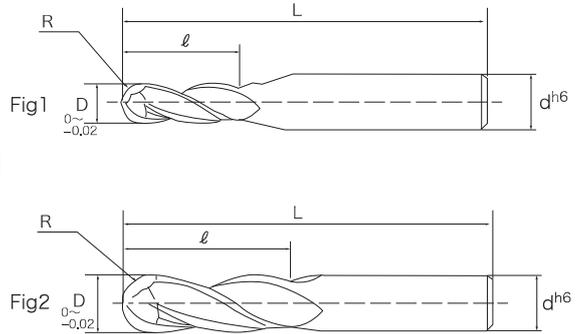
These conditions are for general guidance. Therefor they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

| 構造用鋼/炭素鋼 (SS41、S45C) | 工具鋼/プリハードン鋼 (SKD、NAK101) | 合金鋼/ステンレス鋼 (SCM、SUS304) | 熱処理鋼等 Hardened Steels | 硬質材 Hard material |
|-------------------------|-----------------------------|----------------------------|--------------------------|----------------------|
| HRC30以下 | HRC30~35 | HRC35~40 | HRC40~45 | HRC45~55 |
| △ | ○ | ○ | ◎ | ○ |



超硬2枚刃ロングシャンクボールエンドミル

Coated Solid Carbide Long Shank Ball Endmills (2Flutes)



特長 Feature

- 圧倒的なコストパフォーマンスを実現
- 生材から合金鋼までの幅広いワークの加工が可能
- 新しいVcコーティングは従来のV1 (TiAlNコーティング) に比べ高い硬度 (約3000HV) と酸化開始温度 (約900°C) により更に長寿命
- High cost effectiveness is realized.
- Ability to process a range of materials from alloyed steel to soft iron.
- New Vc coating has higher hardness (about 3000HV) and longer oxidation life (about 900°) than conventional V1 (TiAlN coating) and longer life.

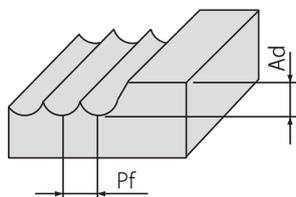
単位: mm

| 商品コード Item Code | R±0.01 | D | l | L | d | Fig. |
|--------------------|----------|----|----|-----|----|------|
| IC2BEL-0.5R×75 | 0.5 | 1 | 2 | 75 | 6 | 1 |
| IC2BEL-0.5R×100 | 0.5 | 1 | 2 | 100 | 6 | 1 |
| IC2BEL-1R×100 | 1 | 2 | 4 | 100 | 6 | 1 |
| IC2BEL-1.5R×100 | 1.5 | 3 | 6 | 100 | 6 | 1 |
| IC2BEL-2R×100 | 2 | 4 | 8 | 100 | 6 | 1 |
| IC2BEL-3R×150 | 3 | 6 | 12 | 150 | 6 | 2 |
| IC2BEL-4R×150 | 4 | 8 | 16 | 150 | 8 | 2 |
| IC2BEL-5R×150 | 5 | 10 | 20 | 150 | 10 | 2 |
| IC2BEL-5R×200 | 5 | 10 | 20 | 200 | 10 | 2 |
| IC2BEL-6R×150 | 6 | 12 | 24 | 150 | 12 | 2 |
| IC2BEL-6R×200 | 6 | 12 | 24 | 200 | 12 | 2 |
| IC2BEL-8R×200 | 8(±0.02) | 16 | 32 | 200 | 16 | 2 |

標準切削条件表 Recommended cutting conditions (Slotting)

| 被削材 Work | 構造用鋼/炭素鋼 SS41/S45C(HRC30以下) | | 工具鋼/プリハードン鋼 SKD/NAK101(HRC30-35) | | 合金鋼/ステンレス鋼 SCM/SUS304(HRC35-40) | | 熱処理鋼等 SKD61等(HRC40-45) | |
|-------------|--------------------------------|-------------------|-------------------------------------|-------------------|------------------------------------|-------------------|------------------------------|-------------------|
| | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) |
| D 1 | 31,000 | 620 | 25,000 | 400 | 18,000 | 300 | 13,300 | 150 |
| 2 | 15,500 | 620 | 12,500 | 400 | 10,000 | 300 | 6,600 | 150 |
| 3 | 10,600 | 630 | 8,500 | 400 | 7,000 | 300 | 4,500 | 150 |
| 4 | 8,000 | 630 | 6,400 | 450 | 5,000 | 320 | 3,400 | 190 |
| 6 | 5,300 | 670 | 4,200 | 470 | 3,500 | 350 | 3,000 | 210 |
| 8 | 4,000 | 800 | 3,200 | 550 | 3,000 | 420 | 2,200 | 220 |
| 10 | 3,200 | 750 | 2,500 | 520 | 2,200 | 420 | 1,600 | 230 |
| 12 | 2,700 | 700 | 2,100 | 490 | 1,800 | 370 | 1,300 | 220 |
| 16 | 2,000 | 650 | 1,600 | 490 | 1,300 | 370 | 1,100 | 190 |

※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。特に突出量に応じて切削条件を調整して下さい。
These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.
Adjust cutting conditions especially according to the overhang

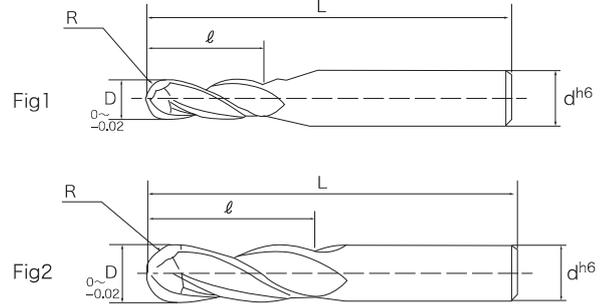


| 加工内容 | Ad | Pf |
|------|--------|--------|
| 荒加工 | ≤0.1D | ≤0.3D |
| 仕上加工 | ≤0.05D | ≤0.05D |



(ザ・) カットミル 高硬度用超硬2枚刃ボールエンドミル

For High Hardness Steel Coated Solid Carbide Ball Endmills (2Flutes)



特長 Feature

- 高い耐磨耗性を持った超々微粒子超硬と特殊コーティングで高硬度材も難無く加工
- High hardness material can be processed due to special coating and super micro-grain alloy which is excellent wear resistant.
- エキセントリック刃型の採用により面粗度と刃先強度が飛躍的に向上
- Roughness and edge strength are improved due to eccentric edge type.
- 高速機での使用にも対応
- High-speed machine is available.

単位：mm

| 商品コード Item Code | R±0.01 | D | ℓ 0~0.5 | L ±1.0 | d | Fig. |
|--------------------|--------|----|------------|-----------|----|------|
| IC2RBV-0,5R | 0,5 | 1 | 2 | 50 | 4 | 1 |
| IC2RBV-1R | 1 | 2 | 4 | 50 | 4 | 1 |
| IC2RBV-1,5R | 1,5 | 3 | 6 | 75 | 6 | 1 |
| IC2RBV-2R | 2 | 4 | 8 | 75 | 6 | 1 |
| IC2RBV-3R | 3 | 6 | 12 | 75 | 6 | 2 |
| IC2RBV-4R | 4 | 8 | 16 | 100 | 8 | 2 |
| IC2RBV-5R | 5 | 10 | 20 | 100 | 10 | 2 |
| IC2RBV-6R | 6 | 12 | 24 | 100 | 12 | 2 |
| IC2RBV-8R | 8 | 16 | 32 | 150 | 16 | 2 |
| IC2RBV-10R | 10 | 20 | 40 | 150 | 20 | 2 |

標準切削条件表 (加工傾斜角α≤15°) Recommended cutting conditions

| 被削材 Work | 合金鋼/工具鋼/プレハードン鋼 SCM/SKD61/SKD11/NAK等(～45HRC) | | | | 焼入れ鋼 SKD61/SKD11/STAVAX等(45～55HRC) | | | | 焼入れ鋼 SKD61/SKH/SKS等(55～62HRC) | | | | | |
|-------------|---|------------------------------|-------------------|-----------|---------------------------------------|-------|------------------------------|-------------------|----------------------------------|-----------|------|------------------------------|-------------------|-----------|
| | D | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | P (mm) | H (mm) | D | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | P (mm) | H (mm) | D | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | P (mm) |
| 1 | 70,000 | 3,000 | ≤0.2 | ≤0.05 | 46,600 | 1,700 | ≤0.2 | ≤0.05 | 18,000 | 670 | ≤0.1 | ≤0.025 | | |
| 2 | 40,000 | 3,000 | ≤0.4 | ≤0.10 | 26,600 | 1,700 | ≤0.4 | ≤0.10 | 10,400 | 670 | ≤0.2 | ≤0.05 | | |
| 3 | 30,000 | 3,000 | ≤0.6 | ≤0.15 | 20,000 | 1,700 | ≤0.6 | ≤0.15 | 8,000 | 670 | ≤0.3 | ≤0.075 | | |
| 4 | 25,000 | 3,000 | ≤0.8 | ≤0.20 | 17,000 | 1,700 | ≤0.8 | ≤0.20 | 6,400 | 640 | ≤0.4 | ≤0.10 | | |
| 6 | 20,000 | 3,000 | ≤1.2 | ≤0.30 | 13,000 | 1,700 | ≤1.2 | ≤0.30 | 4,200 | 530 | ≤0.6 | ≤0.15 | | |
| 8 | 15,000 | 3,000 | ≤1.6 | ≤0.40 | 10,000 | 1,700 | ≤1.6 | ≤0.40 | 3,200 | 540 | ≤0.8 | ≤0.20 | | |
| 10 | 12,000 | 2,900 | ≤2.0 | ≤0.50 | 8,000 | 1,600 | ≤2.0 | ≤0.50 | 2,500 | 510 | ≤1.0 | ≤0.25 | | |
| 12 | 10,000 | 2,500 | ≤2.4 | ≤0.60 | 6,600 | 1,400 | ≤2.4 | ≤0.50 | 2,100 | 440 | ≤1.2 | ≤0.30 | | |
| 16 | 7,500 | 1,900 | ≤3.2 | ≤0.80 | 4,950 | 1,000 | ≤3.2 | ≤0.50 | 1,550 | 310 | ≤1.6 | ≤0.30 | | |
| 20 | 6,000 | 1,700 | ≤4.0 | ≤1.00 | 3,960 | 800 | ≤4.0 | ≤0.50 | 1,250 | 250 | ≤2.0 | ≤0.30 | | |

標準切削条件表 (加工傾斜角α>15°) Recommended cutting conditions

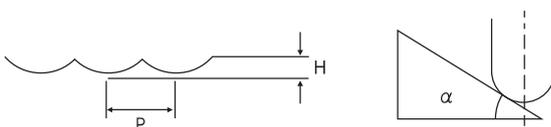
| 被削材 Work | 合金鋼/工具鋼/プレハードン鋼 SCM/SKD61/SKD11/NAK等(～45HRC) | | | | 焼入れ鋼 SKD61/SKD11/STAVAX等(45～55HRC) | | | | 焼入れ鋼 SKD61/SKH/SKS等(55～62HRC) | | | | | |
|-------------|---|------------------------------|-------------------|-----------|---------------------------------------|-------|------------------------------|-------------------|----------------------------------|-----------|------|------------------------------|-------------------|-----------|
| | D | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | P (mm) | H (mm) | D | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | P (mm) | H (mm) | D | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | P (mm) |
| 1 | 53,000 | 3,000 | ≤0.2 | ≤0.05 | 35,000 | 1,700 | ≤0.2 | ≤0.05 | 12,600 | 350 | ≤0.1 | ≤0.025 | | |
| 2 | 30,000 | 3,000 | ≤0.4 | ≤0.10 | 20,000 | 1,700 | ≤0.4 | ≤0.10 | 7,300 | 350 | ≤0.2 | ≤0.05 | | |
| 3 | 23,000 | 1,700 | ≤0.6 | ≤0.15 | 15,000 | 1,000 | ≤0.6 | ≤0.15 | 5,600 | 350 | ≤0.3 | ≤0.075 | | |
| 4 | 20,000 | 1,700 | ≤0.8 | ≤0.20 | 13,000 | 1,000 | ≤0.8 | ≤0.20 | 4,500 | 340 | ≤0.4 | ≤0.10 | | |
| 6 | 15,000 | 1,700 | ≤1.2 | ≤0.30 | 10,000 | 1,000 | ≤1.2 | ≤0.30 | 2,900 | 270 | ≤0.6 | ≤0.15 | | |
| 8 | 11,000 | 1,700 | ≤1.6 | ≤0.40 | 7,500 | 1,000 | ≤1.6 | ≤0.40 | 2,200 | 280 | ≤0.8 | ≤0.20 | | |
| 10 | 9,000 | 1,600 | ≤2.0 | ≤0.50 | 6,000 | 900 | ≤2.0 | ≤0.50 | 1,800 | 270 | ≤1.0 | ≤0.25 | | |
| 12 | 7,500 | 1,400 | ≤2.4 | ≤0.60 | 5,000 | 800 | ≤2.4 | ≤0.50 | 1,500 | 230 | ≤1.2 | ≤0.30 | | |
| 16 | 5,600 | 1,120 | ≤3.2 | ≤0.80 | 3,750 | 600 | ≤3.2 | ≤0.50 | 1,120 | 180 | ≤1.6 | ≤0.30 | | |
| 20 | 4,500 | 900 | ≤4.0 | ≤1.00 | 3,000 | 480 | ≤4.0 | ≤0.50 | 900 | 140 | ≤2.0 | ≤0.30 | | |

※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

※エキセントリック刃型は、外周逃げ面が凸R形状で、逃げが大きく刃先強度が高い。

The eccentric blade type has a convex R-shaped flank on the outer periphery, and has a large clearance and high blade edge strength.

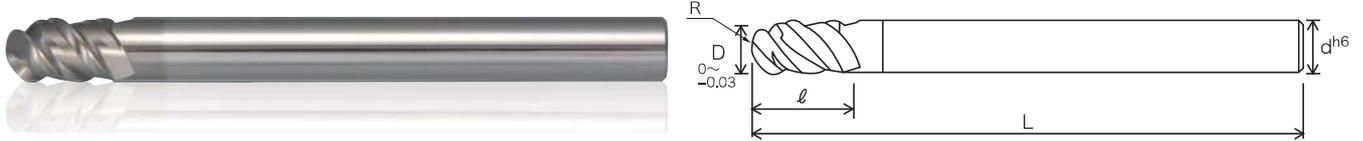


| 構造用鋼/炭素鋼 (SS41、S45C) | 工具鋼/プレハードン鋼 (SKD、NAK101) | 合金鋼 (SCM) | 熱処理鋼等 Hardened Steels | 硬質材 Hard material |
|-------------------------|-----------------------------|--------------|--------------------------|----------------------|
| HRC30以下 | HRC30～35 | HRC35～45 | HRC45～55 | HRC55～62 |
| △ | ○ | ◎ | ◎ | ○ |



(ザ・) カットミル 超硬3枚刃高硬度用ハイヘリボールエンドミル

For High Hardness Steel Coated Solid Carbide High Helical Ball Endmills (3Flutes)



特長 Feature

- 耐摩耗性と耐熱性に優れ、滑りが良く、溶着しにくい特殊コーティングを採用
- 生材から難削材まで幅広い加工領域を実現
- 革新の刃形状・最強の超硬+特殊コーティングで高速高送りが可能
- Wear and heat resistance are excellent, also slipping is good. Special coating which is not easily adhered to is used.
- Ability to process a range of materials from alloyed steel to difficult-to-machine.
- High speed feed is possible due to innovative edge shape and the strongest carbide coating.

単位 : mm

| 商品コード Item Code | R±0.015 | D | ℓ | L | d |
|--------------------|---------|----|----|-----|----|
| IC3MBS-3R | 3 | 6 | 10 | 80 | 6 |
| IC3MBS-4R | 4 | 8 | 12 | 80 | 8 |
| IC3MBS-5R | 5 | 10 | 15 | 100 | 10 |
| IC3MBS-6R | 6 | 12 | 18 | 110 | 12 |
| IC3MBS-8R | 8 | 16 | 24 | 150 | 16 |

■ 荒加工 Roughing

| 被削材 Work | 炭素鋼・合金鋼 (180~250HB) | | 工具鋼 (25~35HRC) | | プリハードン鋼 (35~45HRC) | | 焼き入れ鋼 (45~55HRC) | | 焼き入れ鋼 (55~65HRC) | |
|----------------------|------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|
| | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) |
| D | | | | | | | | | | |
| 6 | 14,040 | 5,270 | 12,720 | 4,780 | 11,400 | 4,060 | 10,200 | 3,060 | 8,880 | 2,000 |
| 8 | 10,560 | 5,540 | 9,600 | 5,040 | 8,640 | 4,310 | 7,680 | 3,230 | 6,720 | 2,110 |
| 10 | 8,400 | 5,540 | 7,680 | 5,060 | 6,840 | 4,280 | 6,120 | 3,230 | 5,400 | 2,140 |
| 12 | 6,960 | 5,420 | 6,360 | 4,960 | 5,760 | 4,270 | 5,040 | 3,140 | 4,440 | 2,080 |
| 16 | 5,280 | 5,060 | 4,800 | 4,610 | 4,320 | 3,940 | 3,840 | 2,950 | 3,360 | 1,930 |
| 切込み量 Depth of cut | ap=0.1D, ae=0.3D | | ap=0.1D, ae=0.3D | | ap=0.1D, ae=0.3D | | ap=0.07D, ae=0.21D | | ap=0.05D, ae=0.15D | |

■ 仕上げ加工 Finishing

| 被削材 Work | 炭素鋼・合金鋼 (180~250HB) | | 工具鋼 (25~35HRC) | | プリハードン鋼 (35~45HRC) | | 焼き入れ鋼 (45~55HRC) | | 焼き入れ鋼 (55~65HRC) | |
|----------------------|------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|
| | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) |
| D | | | | | | | | | | |
| 6 | 19,080 | 5,000 | 17,880 | 4,690 | 16,560 | 4,130 | 13,320 | 2,800 | 11,400 | 1,800 |
| 8 | 14,280 | 5,140 | 13,320 | 4,800 | 12,360 | 4,220 | 10,080 | 2,900 | 8,640 | 1,870 |
| 10 | 11,400 | 5,140 | 10,680 | 4,810 | 9,960 | 4,260 | 8,040 | 2,890 | 6,840 | 1,890 |
| 12 | 9,600 | 5,180 | 8,880 | 4,800 | 8,280 | 4,250 | 6,720 | 2,900 | 5,760 | 1,870 |
| 16 | 7,200 | 4,750 | 6,720 | 4,440 | 6,240 | 3,910 | 5,040 | 2,660 | 4,320 | 1,720 |
| 切込み量 Depth of cut | ap=0.05~0.1D, ae=0.02D | |

※ 切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

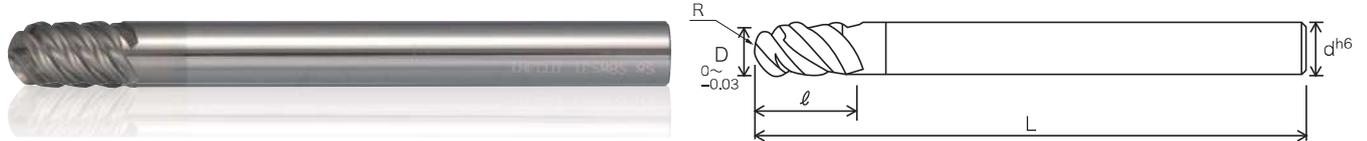
These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

| 構造用鋼/炭素鋼 (SS41、S45C) | 工具鋼/プリハードン鋼 (SKD、NAK101) | 合金鋼/ステンレス鋼 (SCM、SUS304) | 熱処理鋼等 Hardened Steels | 硬質材 Hard material |
|-------------------------|-----------------------------|----------------------------|--------------------------|----------------------|
| HRC30以下 | HRC30~35 | HRC35~40 | HRC40~45 | HRC45~65 |
| ○ | ○ | ○ | ○ | ○ |



(ザ・) カットミル 超硬5枚刃高硬度用ハイヘリボールエンドミル

For High Hardness Steel Coated Solid Carbide High Helical Ball Endmills (5Flutes)



特長 Feature

- 耐摩耗性と耐熱性に優れ、滑りが良く、溶着しにくい特殊コーティングを採用
- 生材から難削材まで幅広い加工領域を実現
- 革新の刃形状・最強の超硬+特殊コーティングで高速高送りが可能
- Wear and heat resistance are excellent, also slipping is good. Special coating which is not easily adhered to is used.
- Ability to process a range of materials from alloyed steel to difficult-to-machine.
- High speed feed is possible due to innovative edge shape and the strongest carbide coating.

単位：mm

| 商品コード Item Code | R±0.015 | D | ℓ | L | d |
|--------------------|---------|----|----|-----|----|
| IC5MBS-3R | 3 | 6 | 10 | 80 | 6 |
| IC5MBS-4R | 4 | 8 | 12 | 80 | 8 |
| IC5MBS-5R | 5 | 10 | 15 | 100 | 10 |
| IC5MBS-6R | 6 | 12 | 18 | 110 | 12 |
| IC5MBS-8R | 8 | 16 | 24 | 150 | 16 |

■ 荒加工 Roughing

| 被削材 Work | 炭素鋼・合金鋼 (180~250HB) | | 工具鋼 (25~35HRC) | | プリハードン鋼 (35~45HRC) | | 焼き入れ鋼 (45~55HRC) | | 焼き入れ鋼 (55~65HRC) | | |
|----------------------|------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|-------|
| | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | |
| D | 6 | 14,040 | 6,850 | 12,720 | 6,210 | 11,400 | 5,280 | 10,200 | 3,980 | 8,880 | 2,600 |
| | 8 | 10,560 | 7,200 | 9,600 | 6,550 | 8,640 | 5,600 | 7,680 | 4,200 | 6,720 | 2,740 |
| | 10 | 8,400 | 7,200 | 7,680 | 6,580 | 6,840 | 5,560 | 6,120 | 4,200 | 5,400 | 2,780 |
| | 12 | 6,960 | 7,200 | 6,360 | 6,450 | 5,760 | 5,550 | 5,040 | 4,080 | 4,440 | 2,700 |
| | 16 | 5,280 | 6,580 | 4,800 | 5,990 | 4,320 | 5,120 | 3,840 | 3,840 | 3,360 | 2,510 |
| 切込み量 Depth of cut | ap=0.1D, ae=0.3D | | ap=0.1D, ae=0.3D | | ap=0.1D, ae=0.3D | | ap=0.07D, ae=0.21D | | ap=0.05D, ae=0.15D | | |

■ 仕上げ加工 Finishing

| 被削材 Work | 炭素鋼・合金鋼 (180~250HB) | | 工具鋼 (25~35HRC) | | プリハードン鋼 (35~45HRC) | | 焼き入れ鋼 (45~55HRC) | | 焼き入れ鋼 (55~65HRC) | | |
|----------------------|------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|-------|
| | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) | |
| D | 6 | 19,080 | 6,500 | 17,880 | 6,100 | 16,560 | 5,370 | 13,320 | 3,640 | 11,400 | 2,340 |
| | 8 | 14,280 | 6,680 | 13,320 | 6,240 | 12,360 | 5,490 | 10,080 | 3,770 | 8,640 | 2,430 |
| | 10 | 11,400 | 6,680 | 10,680 | 6,250 | 9,960 | 5,540 | 8,040 | 3,760 | 6,840 | 2,460 |
| | 12 | 9,600 | 6,730 | 8,880 | 6,240 | 8,280 | 5,530 | 6,720 | 3,770 | 5,760 | 2,430 |
| | 16 | 7,200 | 6,180 | 6,720 | 5,770 | 6,240 | 5,080 | 5,040 | 3,460 | 4,320 | 2,240 |
| 切込み量 Depth of cut | ap=0.05~0.1D, ae=0.02D | | |

※ 切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

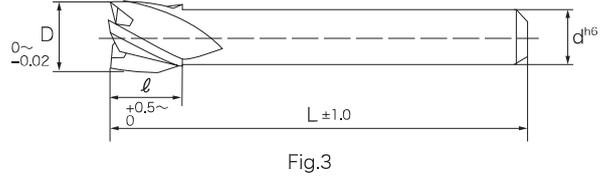
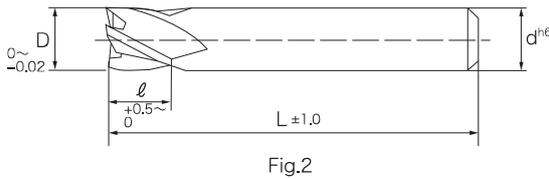
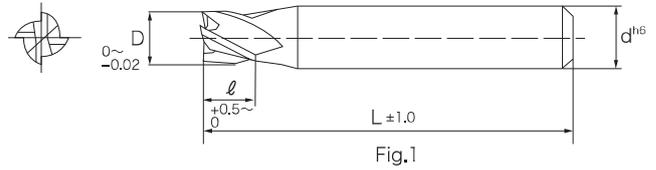
These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

| 構造用鋼/炭素鋼 (SS41, S45C) | 工具鋼/プリハードン鋼 (SKD, NAK101) | 合金鋼/ステンレス鋼 (SCM, SUS304) | 熱処理鋼等 Hardened Steels | 硬質材 Hard material |
|--------------------------|------------------------------|-----------------------------|--------------------------|----------------------|
| HRC30以下 | HRC30~35 | HRC35~40 | HRC40~45 | HRC45~65 |
| ○ | ○ | ○ | ○ | ○ |



(ザ・)カットミル 自動旋盤用超硬4枚刃エンドミル

Coated solid Carbide Square Endmills for Automatic Lathes (4Flutes)



特長 Feature

- 刃長、全長が短く、自動旋盤用での使用に最適
- 刃径φ10以下のシャンク径はφ6でER11コレットで使用可能
- 新しいVcコーティングは従来のV1 (TiAlNコーティング) に比べ高い硬度(約3000HV)と酸化開始温度(約900℃)により更に長寿命
- Coated solid Carbide Square Endmills for Automatic Lathes (4Flutes)
- Since The blade length and overall length are short, it is ideal for use with automatic lathes.
- Products with a blade diameter of φ10 or less have a shank diameter of φ6, so they can be used for ER11 collets.
- The hardness of the VC coating is about 3000hv, which is harder than the conventional V1 coating, and the oxidation start temperature is about 900℃, so it is even more durable.

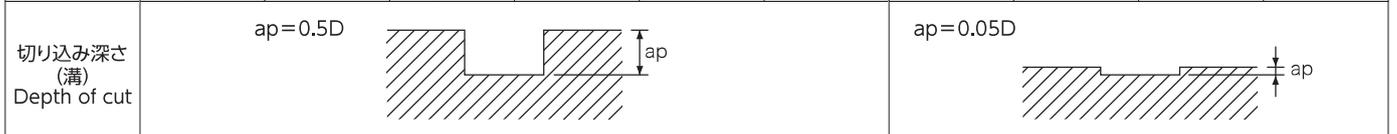
単位：mm

| 商品コード Item Code | D | ℓ | L | d | Fig. |
|--------------------|----|---|----|----|------|
| IC4EAV 3.0 | 3 | 6 | 35 | 4 | 1 |
| IC4EAV 4.0 | 4 | 6 | 35 | 4 | 2 |
| IC4EAV 5.0 | 5 | 6 | 35 | 6 | 1 |
| IC4EAV 6.0 | 6 | 6 | 35 | 6 | 2 |
| IC4EAV 7.0 | 7 | 6 | 35 | 6 | 3 |
| IC4EAV 8.0 | 8 | 6 | 35 | 6 | 3 |
| IC4EAV 10.0 | 10 | 6 | 35 | 6 | 3 |
| IC4EAV 12.0 | 12 | 6 | 35 | 10 | 3 |

※「D」については14、16、20もスローアウェー式でご用意しております。
For "D", we also have 14, 16 and 20 with replaceable cutting edges.

標準切削条件表 Recommended cutting conditions

| 被削材 Work | 一般構造用鋼/炭素鋼/鋳鉄 S50C, SS400, FC250 | | 合金鋼/工具鋼 SCM, SKD, SKS | | プリハードン鋼(38~45HRC) SKD61, SK, NAK | | ステンレス SUS304, 316 | | 高硬度鋼(45~55HRC) SKD61等 | |
|-------------|-------------------------------------|-------------------|--------------------------|-------------------|-------------------------------------|-------------------|----------------------|-------------------|--------------------------|-------------------|
| | 回転速度 n(n/min) | 送り速度 F(mm/min) | 回転速度 n(n/min) | 送り速度 F(mm/min) | 回転速度 n(n/min) | 送り速度 F(mm/min) | 回転速度 n(n/min) | 送り速度 F(mm/min) | 回転速度 n(n/min) | 送り速度 F(mm/min) |
| 3 | 8,800 | 560 | 7,200 | 285 | 5,000 | 130 | 3,400 | 230 | 3,080 | 80 |
| 4 | 6,600 | 475 | 5,400 | 260 | 3,750 | 130 | 2,550 | 185 | 2,310 | 80 |
| 5 | 5,300 | 425 | 4,300 | 240 | 3,000 | 130 | 2,040 | 160 | 1,850 | 80 |
| 6 | 4,450 | 425 | 3,600 | 235 | 2,500 | 130 | 1,720 | 140 | 1,550 | 75 |
| 7 | 3,800 | 425 | 3,100 | 230 | 2,150 | 130 | 1,520 | 130 | 1,320 | 75 |
| 8 | 3,300 | 410 | 2,700 | 230 | 1,900 | 130 | 1,380 | 125 | 1,150 | 70 |
| 10 | 2,650 | 390 | 2,150 | 230 | 1,500 | 130 | 1,170 | 125 | 955 | 70 |
| 12 | 2,200 | 390 | 1,800 | 230 | 1,250 | 130 | 970 | 115 | 795 | 60 |



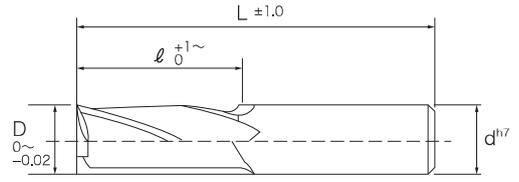
※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。
These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.





ハイス2枚刃ノンコートエンドミル

HSS Endmills (2Flutes)



特長 Feature

● 圧倒的なコストパフォーマンスを実現!

● High cost effectiveness is realized!

単位 : mm

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|----|----|----|----|-----|
| IHEM2S-2.0 | 2 | 7 | 50 | 6 | 1 |
| IHEM2S-3.0 | 3 | 9 | 50 | 6 | 1 |
| IHEM2S-4.0 | 4 | 12 | 60 | 8 | 1 |
| IHEM2S-5.0 | 5 | 15 | 60 | 8 | 1 |
| IHEM2S-6.0 | 6 | 15 | 60 | 8 | 1 |
| IHEM2S-7.0 | 7 | 20 | 65 | 10 | 2 |
| IHEM2S-8.0 | 8 | 20 | 65 | 10 | 2 |
| IHEM2S-9.0 | 9 | 25 | 75 | 10 | 2 |
| IHEM2S-10.0 | 10 | 25 | 75 | 10 | 2 |
| IHEM2S-11.0 | 11 | 30 | 80 | 12 | 2 |
| IHEM2S-12.0 | 12 | 30 | 80 | 12 | 2 |
| IHEM2S-13.0 | 13 | 35 | 90 | 12 | 2 |
| IHEM2S-14.0 | 14 | 35 | 90 | 16 | 2 |
| IHEM2S-15.0 | 15 | 40 | 95 | 16 | 2 |
| IHEM2S-16.0 | 16 | 40 | 95 | 16 | 2 |

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|----|----|-----|----|-----|
| IHEM2S-17.0 | 17 | 40 | 105 | 20 | 1 |
| IHEM2S-18.0 | 18 | 40 | 105 | 20 | 1 |
| IHEM2S-19.0 | 19 | 45 | 110 | 20 | 1 |
| IHEM2S-20.0 | 20 | 45 | 110 | 20 | 2 |
| IHEM2S-21.0 | 21 | 45 | 110 | 20 | 1 |
| IHEM2S-22.0 | 22 | 45 | 110 | 20 | 1 |
| IHEM2S-23.0 | 23 | 50 | 120 | 25 | 1 |
| IHEM2S-24.0 | 24 | 50 | 120 | 25 | 1 |
| IHEM2S-25.0 | 25 | 50 | 120 | 25 | 1 |
| IHEM2S-26.0 | 26 | 50 | 120 | 25 | 1 |
| IHEM2S-27.0 | 27 | 55 | 125 | 25 | 1 |
| IHEM2S-28.0 | 28 | 55 | 125 | 25 | 1 |
| IHEM2S-29.0 | 29 | 55 | 125 | 25 | 1 |
| IHEM2S-30.0 | 30 | 55 | 125 | 25 | 1 |

標準切削条件表(溝加工ae=1D) ar<0.5D Recommended cutting conditions(Slotting)

| 被削材 Work | 構造用鋼/炭素鋼 Mild Steels・Carbon Steels | | 工具鋼/プリハードン鋼 Tool Steels Pre-hardened Steels | | 合金鋼/ステンレス鋼 Alloy Steels Stainless Steels | | 鋳鉄 Cast Iron | | アルミニウム合金 Aluminium Alloys | |
|-------------|---------------------------------------|-------------------|---|-------------------|--|-------------------|------------------|-------------------|------------------------------|-------------------|
| | 回転速度 n(n/min) | 送り速度 F(mm/min) | 回転速度 n(n/min) | 送り速度 F(mm/min) | 回転速度 n(n/min) | 送り速度 F(mm/min) | 回転速度 n(n/min) | 送り速度 F(mm/min) | 回転速度 n(n/min) | 送り速度 F(mm/min) |
| D 2 | 3,400 | 34 | 2,600 | 18 | 1,800 | 10 | 5,490 | 50 | 9,600 | 160 |
| 3 | 2,800 | 40 | 1,800 | 20 | 1,350 | 15 | 3,660 | 50 | 8,200 | 190 |
| 4 | 2,200 | 50 | 1,400 | 20 | 1,100 | 15 | 2,750 | 60 | 5,800 | 200 |
| 5 | 1,600 | 60 | 1,100 | 30 | 800 | 20 | 2,200 | 80 | 4,900 | 230 |
| 6 | 1,400 | 70 | 900 | 30 | 700 | 20 | 1,830 | 90 | 4,000 | 230 |
| 8 | 1,000 | 70 | 700 | 40 | 550 | 30 | 1,370 | 90 | 3,000 | 230 |
| 10 | 800 | 70 | 500 | 40 | 450 | 40 | 1,100 | 90 | 2,300 | 230 |
| 12 | 700 | 80 | 400 | 40 | 350 | 40 | 920 | 100 | 1,900 | 230 |
| 16 | 500 | 90 | 350 | 50 | 250 | 40 | 690 | 120 | 1,450 | 260 |
| 20 | 400 | 90 | 300 | 50 | 220 | 40 | 550 | 120 | 1,150 | 260 |
| 25 | 350 | 90 | 250 | 50 | 200 | 40 | 440 | 120 | 930 | 250 |
| 30 | 300 | 80 | 200 | 40 | 150 | 30 | 370 | 100 | 770 | 250 |

標準切削条件表(側面加工ar<0.1D) ap<1.5D Recommended cutting conditions(Side cutting)

| 被削材 Work | 構造用鋼/炭素鋼 Mild Steels・Carbon Steels | | 工具鋼/プリハードン鋼 Tool Steels Pre-hardened Steels | | 合金鋼/ステンレス鋼 Alloy Steels Stainless Steels | | 鋳鉄 Cast Iron | | アルミニウム合金 Aluminium Alloys | |
|-------------|---------------------------------------|-------------------|---|-------------------|--|-------------------|------------------|-------------------|------------------------------|-------------------|
| | 回転速度 n(n/min) | 送り速度 F(mm/min) | 回転速度 n(n/min) | 送り速度 F(mm/min) | 回転速度 n(n/min) | 送り速度 F(mm/min) | 回転速度 n(n/min) | 送り速度 F(mm/min) | 回転速度 n(n/min) | 送り速度 F(mm/min) |
| D 2 | 5,000 | 30 | 4,290 | 20 | 3,240 | 20 | 5,600 | 50 | 15,800 | 200 |
| 3 | 3,330 | 40 | 2,860 | 30 | 2,160 | 20 | 3,730 | 50 | 10,540 | 240 |
| 4 | 2,500 | 60 | 2,150 | 30 | 1,760 | 20 | 2,800 | 60 | 7,900 | 270 |
| 5 | 2,000 | 70 | 1,720 | 40 | 1,280 | 30 | 2,240 | 80 | 6,320 | 290 |
| 6 | 1,670 | 80 | 1,430 | 40 | 1,120 | 30 | 1,870 | 90 | 5,270 | 300 |
| 8 | 1,250 | 90 | 1,070 | 60 | 880 | 40 | 1,400 | 90 | 3,950 | 300 |
| 10 | 1,000 | 90 | 860 | 60 | 720 | 60 | 1,120 | 90 | 3,160 | 310 |
| 12 | 830 | 90 | 720 | 70 | 560 | 60 | 930 | 100 | 2,630 | 310 |
| 16 | 620 | 110 | 540 | 80 | 400 | 60 | 700 | 120 | 1,980 | 350 |
| 20 | 500 | 110 | 430 | 70 | 350 | 60 | 560 | 120 | 1,580 | 350 |
| 25 | 400 | 100 | 340 | 70 | 320 | 60 | 450 | 120 | 1,280 | 350 |
| 30 | 330 | 90 | 290 | 50 | 240 | 40 | 370 | 100 | 1,050 | 340 |

* 切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

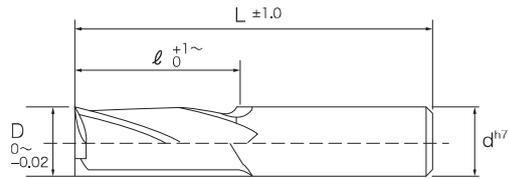
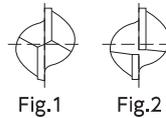
| 炭素鋼 Carbon Steels | 合金鋼/工具鋼 Alloy Steels Tool Steels | プリハードン鋼 Prehardened Steels | ステンレス鋼 Stainless Steels | 鋳鉄 Cast Iron | 調質鋼 Hardened Steels | | アルミニウム合金 Aluminium Alloys |
|----------------------|--|-------------------------------|----------------------------|-----------------|------------------------|---------|------------------------------|
| | | | | | HRC35未満 | HRC35以上 | |
| ◎ | ○ | ○ | △ | ○ | △ | × | ○ |

IHEM2S-S



ハイス2枚刃コーティングエンドミル

Coated HSS Endmills (2Flutes)



特長 Feature

- 圧倒的コストパフォーマンスを実現!
- 新コーティングにより、更に高速加工が可能。
- 新コーティングにより、更に工具寿命が大幅UP!
- High cost effectiveness is realized!
- High speed cutting is possible with S3 coating.
- Durable due to S3 coating!

単位: mm

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|----|----|----|----|-----|
| IHEM2S-S-2.0 | 2 | 7 | 50 | 6 | 1 |
| IHEM2S-S-3.0 | 3 | 9 | 50 | 6 | 1 |
| IHEM2S-S-4.0 | 4 | 12 | 60 | 8 | 1 |
| IHEM2S-S-5.0 | 5 | 15 | 60 | 8 | 1 |
| IHEM2S-S-6.0 | 6 | 15 | 60 | 8 | 1 |
| IHEM2S-S-7.0 | 7 | 20 | 65 | 10 | 2 |
| IHEM2S-S-8.0 | 8 | 20 | 65 | 10 | 2 |
| IHEM2S-S-9.0 | 9 | 25 | 75 | 10 | 2 |
| IHEM2S-S-10.0 | 10 | 25 | 75 | 10 | 2 |
| IHEM2S-S-11.0 | 11 | 30 | 80 | 12 | 2 |
| IHEM2S-S-12.0 | 12 | 30 | 80 | 12 | 2 |
| IHEM2S-S-13.0 | 13 | 35 | 90 | 12 | 2 |
| IHEM2S-S-14.0 | 14 | 35 | 90 | 16 | 2 |
| IHEM2S-S-15.0 | 15 | 40 | 95 | 16 | 2 |
| IHEM2S-S-16.0 | 16 | 40 | 95 | 16 | 2 |

| 商品コード Item Code | D | ℓ | L | d | Fig |
|--------------------|----|----|-----|----|-----|
| IHEM2S-S-17.0 | 17 | 40 | 105 | 20 | 1 |
| IHEM2S-S-18.0 | 18 | 40 | 105 | 20 | 1 |
| IHEM2S-S-19.0 | 19 | 45 | 110 | 20 | 1 |
| IHEM2S-S-20.0 | 20 | 45 | 110 | 20 | 2 |
| IHEM2S-S-21.0 | 21 | 45 | 110 | 20 | 1 |
| IHEM2S-S-22.0 | 22 | 45 | 110 | 20 | 1 |
| IHEM2S-S-23.0 | 23 | 50 | 120 | 25 | 1 |
| IHEM2S-S-24.0 | 24 | 50 | 120 | 25 | 1 |
| IHEM2S-S-25.0 | 25 | 50 | 120 | 25 | 1 |
| IHEM2S-S-26.0 | 26 | 50 | 120 | 25 | 1 |
| IHEM2S-S-27.0 | 27 | 55 | 125 | 25 | 1 |
| IHEM2S-S-28.0 | 28 | 55 | 125 | 25 | 1 |
| IHEM2S-S-29.0 | 29 | 55 | 125 | 25 | 1 |
| IHEM2S-S-30.0 | 30 | 55 | 125 | 25 | 1 |

標準切削条件表(溝加工ae=1D) ar<0.5D Recommended cutting conditions(Slotting)

| 被削材 Work | 構造用鋼/炭素鋼 Mild Steels・Carbon Steels | | 工具鋼/プリハードン鋼 Tool Steels Pre-hardened Steels | | 合金鋼/ステンレス鋼 Alloy Steels Stainless Steels | | 鋳鉄 Cast Iron | | アルミニウム合金 Aluminium Alloys | |
|-------------|---------------------------------------|---------------------------------------|---|---------------------------------------|--|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|-------------------|
| | D | 回転速度 n(n/min) 送り速度 F(mm/min) | 回転速度 n(n/min) 送り速度 F(mm/min) | 回転速度 n(n/min) 送り速度 F(mm/min) | 回転速度 n(n/min) 送り速度 F(mm/min) | 回転速度 n(n/min) 送り速度 F(mm/min) | 回転速度 n(n/min) 送り速度 F(mm/min) | 回転速度 n(n/min) 送り速度 F(mm/min) | 回転速度 n(n/min) 送り速度 F(mm/min) | 送り速度 F(mm/min) |
| 2 | 5,000 | 50 | 3,900 | 30 | 2,700 | 15 | 8,240 | 75 | 14,400 | 240 |
| 3 | 4,200 | 60 | 2,700 | 30 | 2,030 | 25 | 5,490 | 75 | 12,300 | 285 |
| 4 | 3,300 | 75 | 2,100 | 30 | 1,650 | 25 | 4,130 | 90 | 8,700 | 300 |
| 5 | 2,400 | 90 | 1,650 | 45 | 1,200 | 30 | 3,300 | 120 | 7,350 | 345 |
| 6 | 2,100 | 105 | 1,350 | 45 | 1,050 | 30 | 2,750 | 135 | 3,000 | 345 |
| 8 | 1,500 | 105 | 1,050 | 60 | 830 | 45 | 2,060 | 135 | 4,500 | 345 |
| 10 | 1,200 | 105 | 750 | 60 | 680 | 60 | 1,650 | 135 | 3,450 | 345 |
| 12 | 1,050 | 120 | 600 | 60 | 530 | 60 | 1,380 | 150 | 2,850 | 345 |
| 16 | 750 | 135 | 530 | 75 | 380 | 60 | 1,040 | 180 | 2,180 | 390 |
| 20 | 600 | 135 | 450 | 75 | 330 | 60 | 830 | 180 | 1,730 | 390 |
| 25 | 520 | 135 | 380 | 75 | 300 | 60 | 660 | 180 | 1,400 | 375 |
| 30 | 450 | 120 | 300 | 60 | 230 | 45 | 560 | 150 | 1,160 | 360 |

標準切削条件表(側面加工ar<0.1D) ap<1.5D Recommended cutting conditions(Side cutting)

| 被削材 Work | 構造用鋼/炭素鋼 Mild Steels・Carbon Steels | | 工具鋼/プリハードン鋼 Tool Steels Pre-hardened Steels | | 合金鋼/ステンレス鋼 Alloy Steels Stainless Steels | | 鋳鉄 Cast Iron | | アルミニウム合金 Aluminium Alloys | |
|-------------|---------------------------------------|---------------------------------------|---|---------------------------------------|--|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|-------------------|
| | D | 回転速度 n(n/min) 送り速度 F(mm/min) | 回転速度 n(n/min) 送り速度 F(mm/min) | 回転速度 n(n/min) 送り速度 F(mm/min) | 回転速度 n(n/min) 送り速度 F(mm/min) | 回転速度 n(n/min) 送り速度 F(mm/min) | 回転速度 n(n/min) 送り速度 F(mm/min) | 回転速度 n(n/min) 送り速度 F(mm/min) | 回転速度 n(n/min) 送り速度 F(mm/min) | 送り速度 F(mm/min) |
| 2 | 7,500 | 45 | 6,440 | 30 | 4,860 | 30 | 8,400 | 75 | 23,700 | 300 |
| 3 | 5,000 | 60 | 4,290 | 45 | 3,240 | 30 | 5,600 | 75 | 15,810 | 360 |
| 4 | 3,750 | 90 | 3,230 | 45 | 2,640 | 30 | 4,200 | 90 | 11,850 | 405 |
| 5 | 3,000 | 105 | 2,580 | 60 | 1,920 | 45 | 3,360 | 120 | 9,480 | 435 |
| 6 | 2,500 | 120 | 2,150 | 60 | 1,680 | 45 | 2,810 | 135 | 7,910 | 450 |
| 8 | 1,880 | 135 | 1,610 | 90 | 1,320 | 60 | 2,100 | 135 | 5,930 | 450 |
| 10 | 1,500 | 135 | 1,290 | 90 | 1,080 | 90 | 1,680 | 135 | 4,740 | 465 |
| 12 | 1,250 | 135 | 1,080 | 105 | 840 | 90 | 1,400 | 150 | 3,540 | 465 |
| 16 | 930 | 165 | 810 | 120 | 600 | 90 | 1,050 | 180 | 2,970 | 525 |
| 20 | 750 | 165 | 650 | 105 | 530 | 90 | 590 | 180 | 2,370 | 525 |
| 25 | 600 | 150 | 510 | 105 | 480 | 90 | 680 | 180 | 1,920 | 525 |
| 30 | 500 | 135 | 440 | 75 | 360 | 60 | 390 | 150 | 1,580 | 510 |

※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

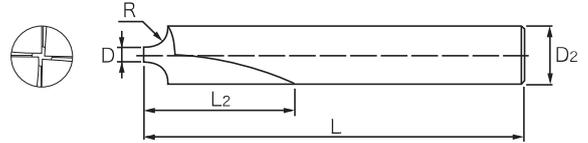
These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

| 炭素鋼 Carbon Steels | 合金鋼/工具鋼 Alloy Steels Tool Steels | プリハードン鋼 Prehardened Steels | ステンレス鋼 Stainless Steels | 鋳鉄 Cast Iron | 調質鋼 Hardened Steels | | アルミニウム合金 Aluminium Alloys |
|----------------------|--|-------------------------------|----------------------------|-----------------|------------------------|---------|------------------------------|
| | | | | | HRC35未満 | HRC35以上 | |
| ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | △ |



超硬ミニチュアー コーナーラウンジング カッター

Coated Solid Carbide miniature Corner R Cutter



特長 Feature

- CNCの機械加工に最適
- 非常に薄いワークの加工も可能
- 再研磨が簡単
- Best for CNC machining.
- Machining of very thin work is possible.
- Easy for regrinding.

単位：mm

| 商品コード Item Code | R±0.02 | D | L ₂ | L | D ₂ | 刃数 Tooth |
|--------------------|--------|-----|----------------|----|----------------|-------------|
| C-CRC-V 0.25R | 0.25 | 1 | 6 | 50 | 3 | 4 |
| C-CRC-V 0.3R | 0.3 | 1 | 6 | 50 | 3 | 4 |
| C-CRC-V 0.4R | 0.4 | 1 | 6 | 50 | 3 | 4 |
| C-CRC-V 0.5R | 0.5 | 1.5 | 8 | 50 | 4 | 4 |
| C-CRC-V 0.6R | 0.6 | 1.5 | 8 | 50 | 4 | 4 |
| C-CRC-V 0.7R | 0.7 | 1.5 | 8 | 50 | 4 | 4 |
| C-CRC-V 0.8R | 0.8 | 1.5 | 8 | 50 | 4 | 4 |
| C-CRC-V 0.9R | 0.9 | 1.5 | 8 | 50 | 4 | 4 |
| C-CRC-V 1.0R | 1.0 | 1.5 | 8 | 50 | 4 | 4 |
| C-CRC-V 1.25R | 1.25 | 2 | 9 | 50 | 6 | 4 |
| C-CRC-V 1.5R | 1.5 | 2 | 9 | 50 | 6 | 4 |
| C-CRC-V 1.75R | 1.75 | 2 | 9 | 50 | 6 | 4 |
| C-CRC-V 2.0R | 2.0 | 2.5 | 10 | 50 | 8 | 4 |
| C-CRC-V 2.25R | 2.25 | 2.5 | 10 | 50 | 8 | 4 |
| C-CRC-V 2.5R | 2.5 | 2.5 | 10 | 50 | 8 | 4 |

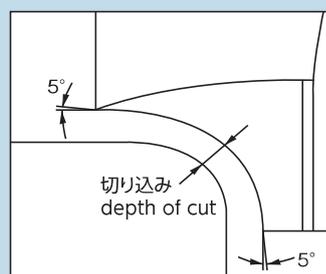
標準切削条件表 Recommended cutting conditions

| 被削材 Work | 鋳物 Cast metal | ダクタイル鋳鉄 Ductile cast iron | 炭素鋼 Carbon steel | 合金鋼 Alloy steel | 焼入鋼 Hardening steel | ステンレス鋼 Stainless steel |
|----------------|------------------|------------------------------|------------------------------|--------------------------------|------------------------|------------------------------|
| 硬度 Hardness | 200-270HB | 500-700 N/mm ² | 500-900 N/mm ² | 900-1,400 N/mm ² | 47-52HRC | 500-850 N/mm ² |
| 切削速度 m/min | 50-60 | 35-45 | 30-40 | 30-40 | 10-20 | 10-20 |

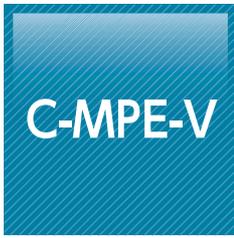
※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefor they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

1刃送り feed rate
 D₂=3 0.007 - 0.015
 D₂=4 0.010 - 0.025
 D₂=6 0.018 - 0.035
 D₂=8 0.025 - 0.060
 (mm/t)



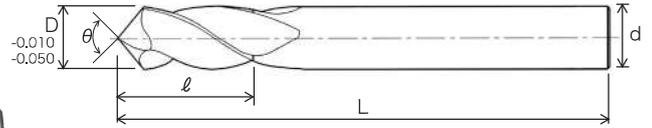
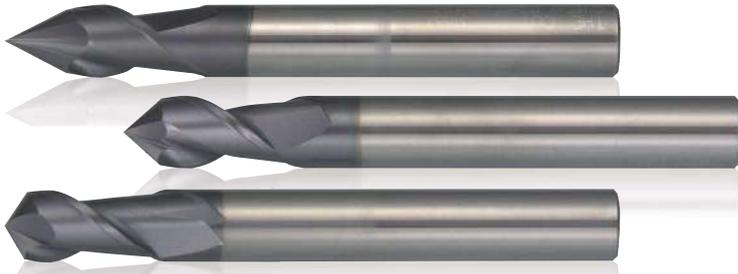
切り込み=0.4×R



超微粒子超硬材質の多機能エンドミル
Material : Super micro-grain carbide

V面丸 超硬多機能エンドミル

V MEN MARU Coated Solid Carbide Multifunction Endmills



※先端フラット部=D×0.05 (D≥10は全て0.5mm)
Tip flat portion=D×0.05 or 0.5mm (D≥10)

特長 Feature

- V溝加工・面取り・センタモミ・穴あけ・側面加工等がこの1本で可能
- ねじれ角40°で切れ味が鋭く、切りくずの排出も良好で切削性能抜群
- 超微粒子超硬にTiAlN処理を施したことにより、高剛性で耐摩耗性も優れた工具寿命が大幅にUP
- V ditch grooving, chamfering, centering, drilling and side surface process etc. are possible with this product.
- Sharpness, cutting swarf removal and cutting performance is excellent due to 45 degrees corner twist.
- High-rigidity, excellent wear resistance and durability are realized due to TiAlN coating on super micro-grain carbide.

単位 : mm

| 商品コード Item Code | θ60°±0.5° | | | |
|--------------------|-----------|----|-----|----|
| | D | ℓ | L | d |
| C-MPE-V 3.0×60° | 3 | 9 | 50 | 3 |
| C-MPE-V 4.0×60° | 4 | 12 | 50 | 4 |
| C-MPE-V 5.0×60° | 5 | 15 | 70 | 5 |
| C-MPE-V 6.0×60° | 6 | 16 | 70 | 6 |
| C-MPE-V 8.0×60° | 8 | 20 | 85 | 8 |
| C-MPE-V 10.0×60° | 10 | 22 | 90 | 10 |
| C-MPE-V 12.0×60° | 12 | 25 | 100 | 12 |
| C-MPE-V 16.0×60° | 16 | 32 | 120 | 16 |
| C-MPE-V 20.0×60° | 20 | 40 | 140 | 20 |

| 商品コード Item Code | θ90°±0.5° | | | |
|--------------------|-----------|----|-----|----|
| | D | ℓ | L | d |
| C-MPE-V 3.0×90° | 3 | 9 | 50 | 3 |
| C-MPE-V 4.0×90° | 4 | 12 | 50 | 4 |
| C-MPE-V 5.0×90° | 5 | 15 | 70 | 5 |
| C-MPE-V 6.0×90° | 6 | 16 | 70 | 6 |
| C-MPE-V 8.0×90° | 8 | 20 | 85 | 8 |
| C-MPE-V 10.0×90° | 10 | 22 | 90 | 10 |
| C-MPE-V 12.0×90° | 12 | 25 | 100 | 12 |
| C-MPE-V 16.0×90° | 16 | 32 | 120 | 16 |
| C-MPE-V 20.0×90° | 20 | 40 | 140 | 20 |

| 商品コード Item Code | θ120°±0.5° | | | |
|--------------------|------------|----|-----|----|
| | D | ℓ | L | d |
| C-MPE-V 3.0×120° | 3 | 9 | 50 | 3 |
| C-MPE-V 4.0×120° | 4 | 12 | 50 | 4 |
| C-MPE-V 5.0×120° | 5 | 15 | 70 | 5 |
| C-MPE-V 6.0×120° | 6 | 16 | 70 | 6 |
| C-MPE-V 8.0×120° | 8 | 20 | 85 | 8 |
| C-MPE-V 10.0×120° | 10 | 22 | 90 | 10 |
| C-MPE-V 12.0×120° | 12 | 25 | 100 | 12 |
| C-MPE-V 16.0×120° | 16 | 32 | 120 | 16 |
| C-MPE-V 20.0×120° | 20 | 40 | 140 | 20 |

V溝加工 V-Slotting

| 被削材 Work | アルミ合金 (5000番台) | | 炭素鋼/鋳鉄 S50C(~30HRC)/FC250 | | SKD・NAK (30~45HRC) NAK | | SUS304 | |
|----------------------|------------------------------|--------------------|------------------------------|--------------------|------------------------------|--------------------|------------------------------|--------------------|
| | 回転数 n(min ⁻¹) | 送り速度 VF(mm/min) |
| 3 | 17,000 | 480 | 8,500 | 200 | 5,300 | 130 | 4,400 | 110 |
| 4 | 14,000 | 580 | 7,200 | 290 | 4,400 | 180 | 3,000 | 110 |
| 5 | 12,000 | 690 | 6,000 | 300 | 3,600 | 180 | 2,400 | 110 |
| 6 | 11,000 | 790 | 5,300 | 340 | 3,200 | 190 | 2,200 | 130 |
| 8 | 8,000 | 800 | 4,000 | 360 | 2,400 | 190 | 1,600 | 130 |
| 10 | 6,400 | 720 | 3,200 | 310 | 1,900 | 150 | 1,300 | 110 |
| 12 | 5,300 | 590 | 2,700 | 260 | 1,600 | 130 | 1,000 | 90 |
| 16 | 4,000 | 450 | 2,000 | 190 | 1,200 | 100 | 800 | 70 |
| 20 | 3,200 | 360 | 1,600 | 160 | 1,000 | 80 | 640 | 60 |
| 切込み量 Depth of cut | ae=D, ap≤0.1D(D<φ2) | | ap≤0.3D(φ2≤D≤φ3) | | ap≤0.5D(D>φ3) | | | |

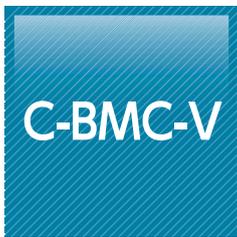
※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.

加工用途 Processing use

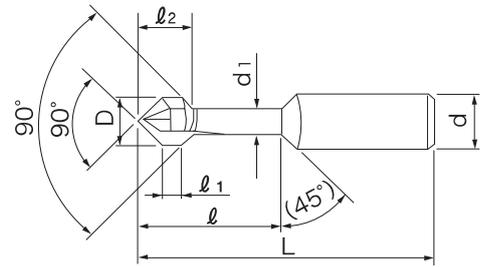
| | V溝加工 V-Slotting | 面取り Chamfering | 穴あけ Drilling | センタリング位置決め Centering Spotting | 側面加工&面取り Side milling & Chamfer | コンタリング加工 Helical interpolation |
|------|--------------------|-------------------|-----------------|----------------------------------|------------------------------------|-----------------------------------|
| 60° | × | ○ | × | × | ○ | ○ |
| 90° | ○ | ○ | ○ | ○ | ○ | ○ |
| 120° | ○ | ○ | ○ | ○ | ○ | ○ |

| 構造用鋼/炭素鋼 (S541, S45C) | 工具鋼/プリハードン鋼 (SKD, NAK101) | 合金鋼/ステンレス鋼 (SCM, SUS304) | 熱処理鋼等 Hardened Steels | 硬質材 Hard material |
|--------------------------|------------------------------|-----------------------------|--------------------------|----------------------|
| HRC30以下 | HRC30~35 | HRC35~40 | HRC40~45 | HRC45~55 |
| ○ | ○ | ○ | △ | × |



裏面丸 超硬2枚刃両面取りカッター

URAMEN-MARU Coated Solid Carbide Double Face Chamfering Cutter (2Flutes)



特長 Feature

- 被削材を裏返す必要がない(貫通バリも削除)
- 1本のツールで表裏の面取り加工ができます
- 超微粒子超硬にTiAlNコーティングを 施し寿命UP
- Unnecessary to reverse the work.
- Only 1 pc of product can chamfer both sides.
- Durability is realized due to TiAlN coating on super micro-grain carbide.

単位: mm

| 商品コード Item Code | D _{-0.03} ⁰ | φ | φ ₁ | φ ₂ ±0.03 | L | d ₁ | d | 裏面の最大C面取量 Maximum C chamfer amount on the back side |
|--------------------|---------------------------------|----|----------------|----------------------|-----|----------------|----|--|
| C-BMC-V 2.8 | 2.8 | 15 | 1 | 3.05 | 50 | 1.5 | 3 | C0.4 |
| C-BMC-V 3.0 | 3 | 15 | 1 | 3.25 | 50 | 1.5 | 3 | C0.5 |
| C-BMC-V 3.3 | 3.3 | 15 | 1 | 3.4 | 60 | 1.8 | 4 | C0.5 |
| C-BMC-V 4.0 | 4 | 15 | 1.5 | 4.5 | 60 | 2 | 4 | C0.7 |
| C-BMC-V 4.2 | 4.2 | 15 | 1.5 | 4.6 | 60 | 2.2 | 4 | C0.7 |
| C-BMC-V 5.0 | 5 | 20 | 2 | 5.5 | 70 | 3 | 5 | C0.7 |
| C-BMC-V 6.0 | 6 | 25 | 2 | 6 | 80 | 4 | 6 | C0.8 |
| C-BMC-V 6.8 | 6.8 | 30 | 3 | 7.6 | 80 | 4.4 | 8 | C1.0 |
| C-BMC-V 8.0 | 8 | 30 | 3 | 8.5 | 80 | 5 | 8 | C1.3 |
| C-BMC-V 8.5 | 8.5 | 30 | 3 | 8.75 | 80 | 5.5 | 8 | C1.3 |
| C-BMC-V 10.0 | 10 | 35 | 3 | 10 | 100 | 6 | 10 | C1.8 |
| C-BMC-V 10.2 | 10.2 | 35 | 3 | 10.1 | 100 | 6.2 | 10 | C1.8 |
| C-BMC-V 12.0 | 12 | 40 | 3 | 11.5 | 110 | 7 | 12 | C2.3 |

標準切削条件表 Recommended cutting conditions

| 被削材 Work | 軽合金 | 鋳物 | 炭素鋼 |
|-----------------|----------|-----------|-----------|
| 切削速度: Vc(m/min) | 30~50 | 25~40 | 15~30 |
| 送り量: f(mm/rev) | 0.05~0.1 | 0.05~0.08 | 0.02~0.05 |

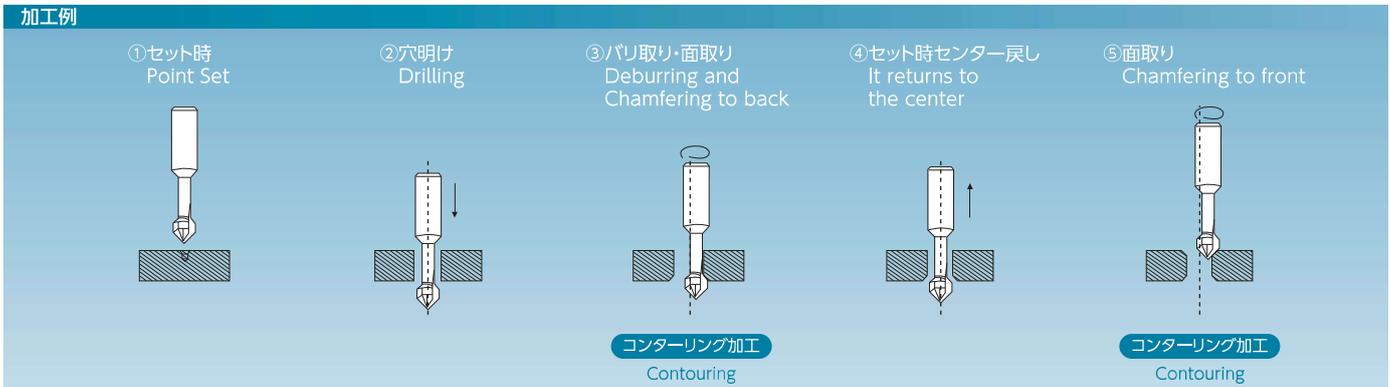
※切削油をご使用下さい。 Please use cutting oil.

※炭素鋼等は下穴が必要です。 A prepared hole is required for carbon steel.

※コンターリング加工の場合は、条件を下げてご使用下さい。 In the case of contouring processing Please use conditions, lowering.

※切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

These conditions are for general guidance. Therefore they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.



| 構造用鋼/炭素鋼 (SS41、S45C) | 工具鋼/プリハードン鋼 (SKD、NAK101) | 合金鋼/ステンレス鋼 (SCM、SUS304) | 熱処理鋼等 Hardened Steels | 硬質材 Hard material |
|-------------------------|-----------------------------|----------------------------|--------------------------|----------------------|
| HRC30以下 | HRC30~35 | HRC35~40 | HRC40~45 | HRC45~55 |
| ○ | ○ | ○ | △ | × |



J.A.M面取機 CC02・HCC01用
For J.A.M Chamfering machine CC02・HCC01

TCC-25



※JAM CC02型 (JC2536) 対応
(刃数36)

ノンコート 超硬円筒スパイラルカッター TCC

Carbide Spiral Cutter for Chamfering Machine

特長 Feature

- 耐久性に優れ、美しい仕上げ面が得られます
 - 純正品に比べ、抜群のコストパフォーマンスを実現します
 - 適応材質：一般鋼、非鉄、樹脂
(非鉄、樹脂などの粘り強い材種を削る場合は、必ずテストカットを行ってください)
- ※焼入れ鋼には使用できません

- Durable and finished surface is beautiful.
 - High cost effectiveness is realized as compared with a genuine product.
 - Suitable material: steel, nonferrous metal and resin.
(Test cut should be done before cutting sticky material such as nonferrous metal and resin)
- *Unavailable for quenching steel.

単位：mm

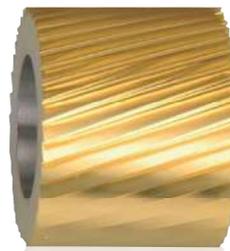
| 商品コード Item Code | 外径 Outside Diameter | 刃長 Tooth length | 穴径 Hole Diameter |
|--------------------|------------------------|--------------------|---------------------|
| TCC-25 | 25 | 20 | 15 |

| 一般鋼 | 特殊鋼 | 非鉄金属 | 樹脂 |
|---------------|--------------|-------------|----------|
| Carbon-Steels | Alloy-Steels | Non Ferrous | Plastics |
| ○ | ○ | ○ | ○ |



J.A.M面取機 CC02・HCC01用
For J.A.M Chamfering machine CC02・HCC01

TCC-G-25



※JAM CC02型 (JC2536) 対応
(刃数36)

コーティング 超硬円筒スパイラルカッター TCC-G

Coated Carbide Spiral Cutter for Chamfering Machine

特長 Feature

- 耐久性に優れ、美しい仕上げ面が得られます
 - 純正品に比べ、抜群のコストパフォーマンスを実現します
 - 適応材質：一般鋼
- ※焼入れ鋼には使用できません

- Durable and finished surface is beautiful.
 - High cost effectiveness is realized as compared with a genuine product.
 - Suitable material: steel.
- ※Unavailable for quenching steel.

単位：mm

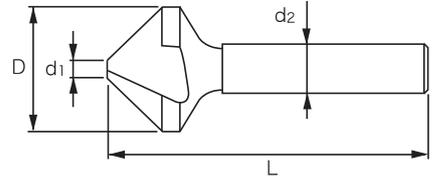
| 商品コード Item Code | 外径 Outside Diameter | 刃長 Tooth length | 穴径 Hole Diameter |
|--------------------|------------------------|--------------------|---------------------|
| TCC-G-25 | 25 | 20 | 15 |

| 一般鋼 | 特殊鋼 | 非鉄金属 | 樹脂 |
|---------------|--------------|-------------|----------|
| Carbon-Steels | Alloy-Steels | Non Ferrous | Plastics |
| ◎ | ○ | × | × |



ノンコート ハイスカウンターシンク (90°)

HSS Chamfering Cutter



特長 Feature

- 3枚刃の採用により、寿命が大幅にUP
- Tool life up due to 3 blades.
- ビビらない
- Stable.
- 真円加工ができる
- True circle machining is possible.

単位：mm

| 商品コード Item Code | 先端角 Point angle | D | 面取径 Chanfering Dia. | d ₁ | L | d ₂ | 刃数 Tooth |
|--------------------|--------------------|------|------------------------|----------------|----|----------------|-------------|
| CSQ 6.3×90° | 90° | 6.3 | 2~6.3 | 1.5 | 45 | 5 | 3 |
| CSQ 8.3×90° | 90° | 8.3 | 2.5~8.3 | 2 | 50 | 6 | 3 |
| CSQ 10.4×90° | 90° | 10.4 | 3~10.4 | 2.5 | 50 | 6 | 3 |
| CSQ 12.4×90° | 90° | 12.4 | 3.3~12.4 | 2.8 | 56 | 8 | 3 |
| CSQ 16.5×90° | 90° | 16.5 | 3.7~16.5 | 3.2 | 60 | 10 | 3 |
| CSQ 20.5×90° | 90° | 20.5 | 4~20.5 | 3.5 | 63 | 10 | 3 |
| CSQ 25.0×90° | 90° | 25 | 4.3~25 | 3.8 | 67 | 10 | 3 |
| CSQ 31.0×90° | 90° | 31 | 4.7~31 | 4.2 | 71 | 12 | 3 |

標準切削条件表 Recommended cutting conditions

| 被削材 Work | 一般構造用鋼 SS | | 炭素鋼 S50C | | 鋳鉄 FC | | ステンレス鋼 SUS | | アルミニウム Aluminum | |
|------------------------|------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|
| | 水溶性 Emulsion | | 水溶性 Emulsion | | ドライ Dryness | | ストレートオイル Straight Oil | | 水溶性 Emulsion | |
| 加工径 Processing Dia. | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) |
| 4 | 2,200 | 160 | 2,000 | 120 | 1,600 | 130 | 640 | 20 | 4,000 | 320 |
| 6 | 1,500 | 135 | 1,300 | 105 | 1,060 | 105 | 420 | 20 | 2,650 | 320 |
| 10 | 900 | 105 | 800 | 80 | 640 | 75 | 250 | 15 | 1,600 | 230 |
| 16 | 550 | 80 | 500 | 60 | 400 | 65 | 160 | 12 | 1,000 | 180 |
| 20 | 450 | 72 | 400 | 55 | 320 | 65 | 130 | 10 | 800 | 180 |
| 25 | 350 | 72 | 320 | 55 | 255 | 63 | 100 | 9 | 640 | 170 |
| 40 | 200 | 55 | 200 | 45 | 160 | 50 | 60 | 7 | 400 | 120 |

※ 切削条件はあくまでも目安です。使用される機械、チャックの剛性や切削油等の状況によって変動致します。

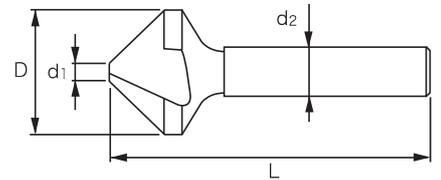
These conditions are for general guidance. Therefor they are subject to change to the situation of the machine used, the tool hold rigidity, cutting oil, etc.





コーティング ハイスカウンターシンク (90°)

Coated HSS Chamfering Cutter



特長 Feature

- 3枚刃とTiNコーティングの採用により、寿命が大幅にUP
- Tool life up due to 3 blades and TiN coating.
- ビビらない
- Stable.
- 真円加工ができる
- True circle machining is possible.

単位：mm

| 商品コード Item Code | 先端角 Point angle | D | 面取径 Chamfering Dia. | d ₁ | L | d ₂ | 刃数 Tooth |
|--------------------|--------------------|------|------------------------|----------------|----|----------------|-------------|
| CSQ-G 6.3×90° | 90° | 6.3 | 2~6.3 | 1.5 | 45 | 5 | 3 |
| CSQ-G 8.3×90° | 90° | 8.3 | 2.5~8.3 | 2 | 50 | 6 | 3 |
| CSQ-G 10.4×90° | 90° | 10.4 | 3~10.4 | 2.5 | 50 | 6 | 3 |
| CSQ-G 12.4×90° | 90° | 12.4 | 3.3~12.4 | 2.8 | 56 | 8 | 3 |
| CSQ-G 16.5×90° | 90° | 16.5 | 3.7~16.5 | 3.2 | 60 | 10 | 3 |
| CSQ-G 20.5×90° | 90° | 20.5 | 4~20.5 | 3.5 | 63 | 10 | 3 |
| CSQ-G 25.0×90° | 90° | 25 | 4.3~25 | 3.8 | 67 | 10 | 3 |
| CSQ-G 31.0×90° | 90° | 31 | 4.7~31 | 4.2 | 71 | 12 | 3 |

標準切削条件表 Recommended cutting conditions

| 被削材 Work | 一般構造用鋼 SS | | 炭素鋼 S50C | | 鑄鉄 FC | | ステンレス鋼 SUS | |
|------------------------|------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|
| | 水溶性 Emulsion | | 水溶性 Emulsion | | ドライ Dryness | | ストレートオイル Straight Oil | |
| 加工径 Processing Dia. | 回転数 n(min ⁻¹) | 送り速度 F(mm/min) |
| 4 | 2,600 | 192 | 2,400 | 144 | 1,920 | 156 | 768 | 24 |
| 6 | 1,800 | 162 | 1,560 | 126 | 1,272 | 126 | 504 | 24 |
| 10 | 1,100 | 126 | 960 | 96 | 768 | 90 | 300 | 18 |
| 16 | 650 | 96 | 600 | 72 | 480 | 78 | 192 | 14 |
| 20 | 550 | 86 | 480 | 66 | 384 | 78 | 156 | 12 |
| 25 | 420 | 86 | 384 | 66 | 306 | 76 | 120 | 11 |
| 40 | 240 | 66 | 240 | 54 | 192 | 60 | 72 | 8 |

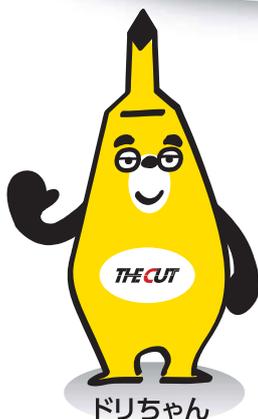
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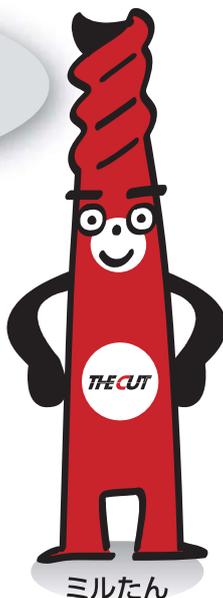
THECUT オリジナルキャラクター
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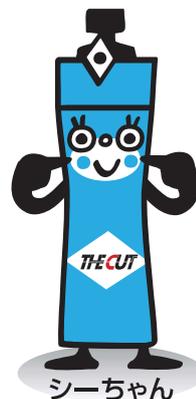
ドリちゃん



ジョーやん



ミルたん



シーちゃん



カッタくん

総販売元

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THECUT プロモーション動画▶



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