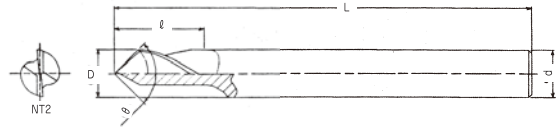


# CMU センター面取りミル (UF 処理) 浸透拡散処理

SINCE 1935  
F.K.D.®

CMU Center Mills (Ultra F. Penetrated & Spreaded Heat Treatment)

材質=HSS-Co(SKH56)  
刃数=2枚  
リード角=右振り30°  
刃径公差=0~-0.03  
 $\theta^\circ = \pm 15'$



ウルトラF処理付  
UF Heat Treatment

○高性能 難削材用

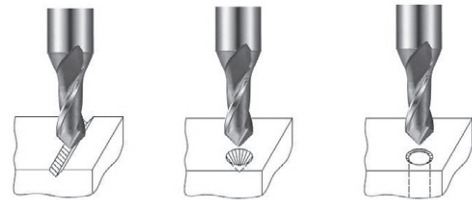
○センター位置決め、面取り、側面加工、穴あけ、V溝加工の5通りの加工を1本で連続作業。

For centering, chamfering, side milling, drilling and V-groove through a consecutive action with single tool.

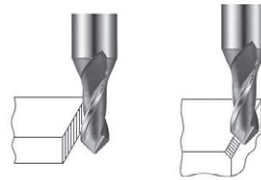
●注文例=型番、先端角、刃径、数量 「CMU 60°x 6」

| 型番  | 先端角(θ) | 刃径(D) | 刃長(ℓ) | 全長(L) | シャンク径(d) |
|-----|--------|-------|-------|-------|----------|
| CMU | 60°    | 6     | 12    | 80    | 8        |
|     |        | 8     | 15    | 90    | 10       |
|     |        | 10    | 18    | 100   | 12       |
|     |        | 12    | 25    | 120   | 12       |
|     |        | 16    | 30    | 140   | 16       |
|     |        | 20    | 40    | 160   | 20       |
|     |        | 25    | 50    | 170   | 25       |
|     |        | 30    | 55    | 175   | 32       |
| CMU | 90°    | 6     | 12    | 80    | 8        |
|     |        | 8     | 15    | 90    | 10       |
|     |        | 10    | 18    | 100   | 12       |
|     |        | 12    | 25    | 120   | 12       |
|     |        | 16    | 30    | 140   | 16       |
|     |        | 20    | 40    | 160   | 20       |
|     |        | 25    | 50    | 170   | 25       |
|     |        | 30    | 55    | 175   | 32       |

| 型番  | 先端角(θ) | 刃径(D) | 刃長(ℓ) | 全長(L) | シャンク径(d) |
|-----|--------|-------|-------|-------|----------|
| CMU | 120°   | 6     | 12    | 80    | 8        |
|     |        | 8     | 15    | 90    | 10       |
|     |        | 10    | 18    | 100   | 12       |
|     |        | 12    | 25    | 120   | 12       |
|     |        | 16    | 30    | 140   | 16       |
|     |        | 20    | 40    | 160   | 20       |
|     |        | 25    | 50    | 170   | 25       |
|     |        | 30    | 55    | 175   | 32       |



①V溝加工 ②センターモミ加工 ③皿面取り加工



④側面仕上げ加工 ⑤面取り加工

\* 60° CMでの加工例①②のご使用はお控え下さい。

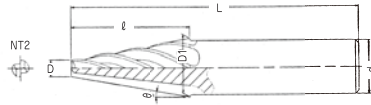
| 被削材<br>型番 | 硬度     | 鋳鉄     | 炭素鋼    | 合金鋼    | 工具鋼    | 調質鋼    | ステンレス  | アルミ合金 | 銅合金 | チタン合金   | 耐熱合金  | 樹脂       |
|-----------|--------|--------|--------|--------|--------|--------|--------|-------|-----|---------|-------|----------|
|           |        | FC,FCD | S50C   | SCM    | SKD    | NAK    | SUS304 | Al    | Cu  | Ti6Al4V | インコネル | ABS      |
| CMU       | ~350HB | ~200HB | ~250HB | ~35HRC | ~45HRC | ~35HRC |        |       |     |         |       | ガラス繊維含まず |
|           |        | ○      | ◎      | ◎      | ◎      | ○      | ○      | ○     | ○   |         |       | ○        |

# 2TE テーパーエンドミル2枚刃

SINCE 1935  
F.K.D.®

## 2TE 2-Flute Tapered End Mills

材質=HSS-Co(SKH56)  
刃数=2枚  
リード角=右振り25°  
角度公差=±5'  
先端径公差=0~-0.05



○金型の抜き勾配の加工に用いるエンドミル。  
等ねじれ刃の採用で、安定した切れ味と高い加工精度が得られます。  
Stable and tapered milling on the mold works. Extremely wide selections in sizes.

●注文例=型番、片角、先端径、数量 [2TE 30' x2]

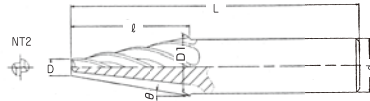
| 型番  | 片角(θ) | 先端径(D) | 大端径(D1) | 刃長(ℓ) | 全長(L) | シャフト径(d) |
|-----|-------|--------|---------|-------|-------|----------|
| 2TE | 30'   | 2      | 2.18    | 10    | 59    | 6        |
|     |       | 3      | 3.26    | 15    | 61    | 6        |
|     |       | 4      | 4.35    | 20    | 66    | 6        |
|     |       | 5      | 5.44    | 25    | 71    | 6        |
|     |       | 6      | 6.52    | 30    | 80    | 8        |
|     |       | 8      | 8.7     | 40    | 90    | 10       |
|     |       | 10     | 10.87   | 50    | 110   | 12       |
|     |       | 12     | 13.04   | 60    | 120   | 12       |
|     |       | 16     | 17.4    | 80    | 170   | 16       |
|     |       | 20     | 21.75   | 100   | 200   | 20       |
| 25  | 26.75 | 100    | 200     | 25    |       |          |
| 2TE | 1°    | 2      | 2.35    | 10    | 59    | 6        |
|     |       | 3      | 3.52    | 15    | 61    | 6        |
|     |       | 4      | 4.69    | 20    | 66    | 6        |
|     |       | 5      | 5.87    | 25    | 71    | 6        |
|     |       | 6      | 7.04    | 30    | 80    | 8        |
|     |       | 8      | 9.39    | 40    | 90    | 10       |
|     |       | 10     | 11.74   | 50    | 110   | 12       |
|     |       | 12     | 14.09   | 60    | 120   | 12       |
|     |       | 16     | 18.79   | 80    | 170   | 16       |
|     |       | 20     | 23.49   | 100   | 200   | 20       |
| 25  | 28.49 | 100    | 200     | 25    |       |          |
| 2TE | 1°30' | 2      | 2.52    | 10    | 59    | 6        |
|     |       | 3      | 3.79    | 15    | 61    | 6        |
|     |       | 4      | 5.05    | 20    | 66    | 6        |
|     |       | 5      | 6.31    | 25    | 71    | 6        |
|     |       | 6      | 7.57    | 30    | 80    | 8        |
|     |       | 8      | 10.09   | 40    | 90    | 10       |
|     |       | 10     | 12.62   | 50    | 110   | 12       |
|     |       | 12     | 15.14   | 60    | 120   | 16       |
|     |       | 16     | 20.19   | 80    | 170   | 20       |
|     |       | 20     | 25.24   | 100   | 200   | 25       |
| 25  | 30.24 | 100    | 200     | 32    |       |          |
| 2TE | 2°    | 2      | 2.7     | 10    | 59    | 6        |
|     |       | 3      | 4.05    | 15    | 61    | 6        |
|     |       | 4      | 5.4     | 20    | 66    | 6        |
|     |       | 5      | 6.75    | 25    | 71    | 8        |
|     |       | 6      | 8.09    | 30    | 80    | 8        |
|     |       | 8      | 10.79   | 40    | 90    | 10       |
|     |       | 10     | 13.49   | 50    | 110   | 12       |
|     |       | 12     | 16.19   | 60    | 120   | 16       |
|     |       | 16     | 21.59   | 80    | 170   | 20       |
|     |       | 20     | 26.98   | 100   | 200   | 25       |
| 25  | 31.98 | 100    | 200     | 32    |       |          |
| 2TE | 2°30' | 2      | 2.87    | 10    | 59    | 6        |
|     |       | 3      | 4.31    | 15    | 61    | 6        |
|     |       | 4      | 5.75    | 20    | 66    | 6        |
|     |       | 5      | 7.18    | 25    | 71    | 8        |
|     |       | 6      | 8.62    | 30    | 80    | 10       |
|     |       | 8      | 11.49   | 40    | 90    | 12       |
|     |       | 10     | 14.37   | 50    | 110   | 16       |
|     |       | 12     | 17.24   | 60    | 120   | 16       |
|     |       | 16     | 22.99   | 80    | 170   | 20       |
|     |       | 20     | 28.73   | 100   | 200   | 25       |
| 25  | 33.73 | 100    | 200     | 32    |       |          |
| 2TE | 3°    | 2      | 3.05    | 10    | 59    | 6        |
|     |       | 3      | 4.57    | 15    | 61    | 6        |
|     |       | 4      | 6.1     | 20    | 66    | 6        |
|     |       | 5      | 7.62    | 25    | 71    | 8        |
|     |       | 6      | 9.14    | 30    | 80    | 10       |
|     |       | 8      | 12.19   | 40    | 90    | 12       |
|     |       | 10     | 15.24   | 50    | 110   | 16       |
|     |       | 12     | 18.29   | 60    | 120   | 20       |
|     |       | 16     | 24.38   | 80    | 170   | 25       |
|     |       | 20     | 30.48   | 100   | 200   | 32       |
| 25  | 35.48 | 100    | 200     | 32    |       |          |
| 2TE | 4°    | 2      | 3.4     | 10    | 59    | 6        |
|     |       | 3      | 5.09    | 15    | 61    | 6        |
|     |       | 4      | 6.79    | 20    | 66    | 8        |
|     |       | 5      | 8.49    | 25    | 71    | 8        |
|     |       | 6      | 10.19   | 30    | 80    | 10       |
|     |       | 8      | 13.59   | 40    | 90    | 12       |
|     |       | 10     | 16.99   | 50    | 110   | 16       |
|     |       | 12     | 20.39   | 60    | 120   | 20       |
|     |       | 16     | 27.18   | 80    | 170   | 25       |
|     |       | 20     | 33.98   | 100   | 200   | 32       |
| 25  | 38.98 | 100    | 200     | 32    |       |          |
| 2TE | 5°    | 2      | 3.75    | 10    | 59    | 6        |
|     |       | 3      | 7.37    | 25    | 75    | 6        |
|     |       | 4      | 9.24    | 30    | 80    | 8        |
|     |       | 5      | 11.12   | 35    | 85    | 10       |
|     |       | 6      | 12.99   | 40    | 90    | 12       |
|     |       | 8      | 16.74   | 50    | 110   | 16       |
|     |       | 10     | 20.49   | 60    | 130   | 20       |
|     |       | 12     | 22.49   | 60    | 130   | 20       |
|     |       | 16     | 29.99   | 80    | 170   | 25       |
|     |       | 20     | 37.49   | 100   | 200   | 32       |
| 25  | 42.49 | 100    | 200     | 42    |       |          |

# 2TE テーパーエンドミル2枚刃

SINCE 1935  
F.K.D.®

## 2TE 2-Flute Tapered End Mills

材質=HSS-Co(SKH56)  
刃数=2枚  
リード角=右振り25°  
角度公差=±5'  
先端径公差=0~-0.05



○金型の抜き勾配の加工に用いるエンドミル。

等ねじれ刃の採用で、安定した切れ味と高い加工精度が得られます。

Stable and tapered milling on the mold works. Extremely wide selections in sizes.

●注文例=型番、片角、先端径、数量 「2TE 6° x2」

| 型番  | 片角(θ) | 先端径(D) | 大端径(D1) | 刃長(l) | 全長(L) | シャフト径(d) |    |    |
|-----|-------|--------|---------|-------|-------|----------|----|----|
| 2TE | 6°    | 2      | 4.1     | 10    | 59    | 6        |    |    |
|     |       | 3      | 8.26    | 25    | 75    | 8        |    |    |
|     |       | 4      | 10.31   | 30    | 80    | 10       |    |    |
|     |       | 5      | 12.36   | 35    | 85    | 12       |    |    |
|     |       | 6      | 14.41   | 40    | 90    | 12       |    |    |
|     |       | 8      | 18.51   | 50    | 110   | 16       |    |    |
|     |       | 10     | 22.61   | 60    | 130   | 20       |    |    |
|     |       | 12     | 24.61   | 60    | 130   | 20       |    |    |
|     |       | 16     | 32.81   | 80    | 170   | 32       |    |    |
|     |       | 20     | 41.02   | 100   | 200   | 32       |    |    |
|     |       | 25     | 46.02   | 100   | 200   | 42       |    |    |
| 2TE | 7°    | 2      | 4.46    | 10    | 59    | 6        |    |    |
|     |       | 3      | 9.13    | 25    | 75    | 8        |    |    |
|     |       | 4      | 11.36   | 30    | 80    | 10       |    |    |
|     |       | 5      | 13.59   | 35    | 85    | 12       |    |    |
|     |       | 6      | 15.82   | 40    | 90    | 12       |    |    |
|     |       | 8      | 20.27   | 50    | 110   | 16       |    |    |
|     |       | 10     | 24.73   | 60    | 130   | 20       |    |    |
|     |       | 12     | 26.73   | 60    | 130   | 25       |    |    |
|     |       | 16     | 35.65   | 80    | 170   | 32       |    |    |
|     |       | 20     | 44.55   | 100   | 200   | 42       |    |    |
|     |       | 25     | 49.55   | 100   | 200   | 42       |    |    |
| 2TE | 8°    | 2      | 4.81    | 10    | 59    | 6        |    |    |
|     |       | 3      | 10.03   | 25    | 75    | 10       |    |    |
|     |       | 4      | 12.43   | 30    | 80    | 12       |    |    |
|     |       | 5      | 14.84   | 35    | 85    | 12       |    |    |
|     |       | 6      | 17.24   | 40    | 90    | 16       |    |    |
|     |       | 8      | 22.05   | 50    | 110   | 20       |    |    |
|     |       | 10     | 26.86   | 60    | 130   | 25       |    |    |
|     |       | 12     | 28.86   | 60    | 130   | 25       |    |    |
|     |       | 16     | 38.48   | 80    | 170   | 32       |    |    |
|     |       | 20     | 48.11   | 100   | 200   | 42       |    |    |
|     |       | 25     | 53.11   | 100   | 200   | 42       |    |    |
| 2TE | 10°   | 2      | 5.53    | 10    | 59    | 6        |    |    |
|     |       | 3      | 11.81   | 25    | 75    | 10       |    |    |
|     |       | 4      | 14.58   | 30    | 80    | 12       |    |    |
|     |       | 5      | 17.34   | 35    | 85    | 16       |    |    |
|     |       | 6      | 20.1    | 40    | 90    | 16       |    |    |
|     |       | 8      | 25.63   | 50    | 110   | 20       |    |    |
|     |       | 10     | 31.16   | 60    | 130   | 25       |    |    |
|     |       | 12     | 33.16   | 60    | 130   | 32       |    |    |
|     |       | 16     | 44.21   | 80    | 170   | 32       |    |    |
|     |       | 20     | 55.26   | 100   | 200   | 42       |    |    |
|     |       | 25     | 60.26   | 100   | 200   | 42       |    |    |
| 2TE | 15°   | 3      | 16.39   | 25    | 85    | 16       |    |    |
|     |       | 4      | 20.07   | 30    | 90    | 16       |    |    |
|     |       | 5      | 23.75   | 35    | 110   | 20       |    |    |
|     |       | 6      | 27.43   | 40    | 120   | 25       |    |    |
|     |       | 8      | 34.79   | 50    | 140   | 32       |    |    |
|     |       | 10     | 42.15   | 60    | 150   | 32       |    |    |
|     |       | 12     | 44.15   | 60    | 150   | 32       |    |    |
|     |       | 16     | 58.87   | 80    | 170   | 42       |    |    |
|     |       | 20     | 73.59   | 100   | 200   | 42       |    |    |
|     |       | 2TE    | 20°     | 3     | 21.19 | 25       | 85 | 16 |
|     |       |        |         | 4     | 25.83 | 30       | 90 | 20 |
| 5   | 30.47 |        |         | 35    | 110   | 25       |    |    |
| 6   | 35.11 |        |         | 40    | 120   | 25       |    |    |
| 8   | 44.39 |        |         | 50    | 140   | 32       |    |    |
| 10  | 53.67 |        |         | 60    | 150   | 42       |    |    |
| 2TE | 25°   | 12     | 55.67   | 60    | 150   | 42       |    |    |
|     |       | 16     | 74.23   | 80    | 170   | 42       |    |    |
|     |       | 20     | 92.79   | 100   | 200   | 42       |    |    |
|     |       | 16     | 62.63   | 50    | 150   | 42       |    |    |
| 2TE | 30°   | 20     | 75.96   | 60    | 160   | 42       |    |    |
|     |       | 16     | 73.73   | 50    | 150   | 42       |    |    |
| 20  | 77.73 | 50     | 150     | 42    |       |          |    |    |

エンドミル

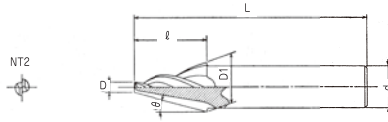
| 被削材 | 鋳鉄     | 炭素鋼    | 合金鋼    | 工具鋼    | 調質鋼    | ステンレス  | アルミ合金 | 鋼合金 | チタン合金   | 耐熱合金  | 樹脂       |
|-----|--------|--------|--------|--------|--------|--------|-------|-----|---------|-------|----------|
|     | FC,FCD | S50C   | SCM    | SKD    | NAK    | SUS304 | Al    | Cu  | Ti6Al4V | インコネル | ABS      |
| 硬度  | ~350HB | ~200HB | ~250HB | ~35HRC | ~45HRC | ~35HRC |       |     |         |       | ガラス繊維含まず |
| 型番  | ○      | ○      | ○      | ○      |        |        | ○     | ○   |         |       | ○        |

# 2TE-S テーパーエンドミル2枚刃 (ショート刃)

SINCE 1935  
F.K.D.®

## 2TE-S 2-Flute Tapered End Mills (Short Flute)

材質=HSS-Co(SKH56)  
刃数=2枚  
リード角=右振れ25°  
角度公差=±5'  
先端径公差=0~-0.05



○金型の抜き勾配の加工に用いるエンドミル。等ねじれ刃の採用で、安定した切れ味と高い加工精度が得られます。刃長を一定にし、作業性を良くしています。

Stable and tapered milling on the mold works. Extremely wide selections in sizes. Rather short type of cutting flute for efficient operations.

●注文例=型番、片角、先端径、数量 [2TE-S 15°x10]

| 型番    | 片角(θ) | 先端径(D) | 大端径(D1) | 刃長(ℓ) | 全長(L) | シャン径(d) |
|-------|-------|--------|---------|-------|-------|---------|
| 2TE-S | 15°   | 10     | 36.79   | 50    | 140   | 32      |
|       |       | 12     | 38.79   | 50    | 140   | 32      |
|       |       | 16     | 42.79   | 50    | 140   | 32      |
|       |       | 20     | 46.79   | 50    | 140   | 32      |

| 型番    | 片角(θ) | 先端径(D) | 大端径(D1) | 刃長(ℓ) | 全長(L) | シャン径(d) |
|-------|-------|--------|---------|-------|-------|---------|
| 2TE-S | 20°   | 10     | 46.4    | 50    | 140   | 32      |
|       |       | 12     | 48.4    | 50    | 140   | 32      |
|       |       | 16     | 52.4    | 50    | 140   | 32      |
|       |       | 20     | 56.4    | 50    | 140   | 32      |

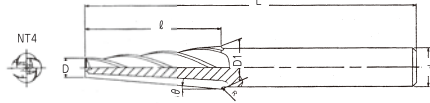
| 被削材<br>型番 | 硬度     | 鋳鉄     | 炭素鋼  | 合金鋼 | 工具鋼 | 調質鋼 | ステンレス  | アルミ合金 | 鋼合金 | チタン合金   | 耐熱合金  | 樹脂            |
|-----------|--------|--------|------|-----|-----|-----|--------|-------|-----|---------|-------|---------------|
|           |        | FC,FCD | S50C | SCM | SKD | NAK | SUS304 | Al    | Cu  | Ti6Al4V | インコネル | ABS           |
| 2TE-S     | ~350HB | ○      | ○    | ○   | ○   |     |        | ○     | ○   |         |       | ○<br>ガラス繊維含まず |

# 4TE テーパーエンドミル 4枚刃

SINCE 1935  
F.K.D.®

## 4TE 4-Flute Tapered End Mills

材質=HSS-Co(SKH56)  
刃数=4枚  
リード角=右振り25°  
角度公差=±5'  
先端径公差=0~-0.05



○金型の抜き勾配の加工に用いるエンドミル。等ねじれ刃の採用で、安定した切れ味と高い加工精度が得られます。

Stable and tapered milling on the mold works. Extremely wide selections in sizes.

●注文例=型番、片角、先端径、数量 「4TE 30' x3」

◎(※)印は全てセンターカット仕上げとなります。

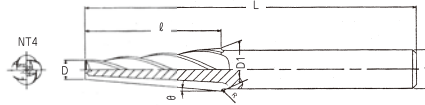
| 型番  | 片角(θ) | 先端径(D) | 大端径(D1) | 刃長(ℓ) | 全長(L) | シャフト径(d) |
|-----|-------|--------|---------|-------|-------|----------|
| 4TE | 30'   | ※3     | 3.26    | 15    | 61    | 6        |
|     |       | 4      | 4.35    | 20    | 66    | 6        |
|     |       | 5      | 5.44    | 25    | 71    | 6        |
|     |       | 6      | 6.52    | 30    | 80    | 8        |
|     |       | 8      | 8.7     | 40    | 90    | 10       |
|     |       | 10     | 10.87   | 50    | 110   | 12       |
|     |       | 12     | 13.04   | 60    | 120   | 12       |
|     |       | 16     | 17.4    | 80    | 170   | 16       |
|     |       | 20     | 21.75   | 100   | 200   | 20       |
|     |       | 25     | 26.75   | 100   | 200   | 25       |
| 4TE | 1°    | ※3     | 3.52    | 15    | 61    | 6        |
|     |       | 4      | 4.69    | 20    | 66    | 6        |
|     |       | 5      | 5.87    | 25    | 71    | 6        |
|     |       | 6      | 7.04    | 30    | 80    | 8        |
|     |       | 8      | 9.39    | 40    | 90    | 10       |
|     |       | 10     | 11.74   | 50    | 110   | 12       |
|     |       | 12     | 14.09   | 60    | 120   | 12       |
|     |       | 16     | 18.79   | 80    | 170   | 16       |
|     |       | 20     | 23.49   | 100   | 200   | 20       |
|     |       | 25     | 28.49   | 100   | 200   | 25       |
| 4TE | 1°30' | ※3     | 3.79    | 15    | 61    | 6        |
|     |       | 4      | 5.05    | 20    | 66    | 6        |
|     |       | 5      | 6.31    | 25    | 71    | 6        |
|     |       | 6      | 7.57    | 30    | 80    | 8        |
|     |       | 8      | 10.09   | 40    | 90    | 10       |
|     |       | 10     | 12.62   | 50    | 110   | 12       |
|     |       | 12     | 15.14   | 60    | 120   | 16       |
|     |       | 16     | 20.19   | 80    | 170   | 20       |
|     |       | 20     | 25.24   | 100   | 200   | 25       |
|     |       | 25     | 30.24   | 100   | 200   | 32       |
| 4TE | 2°    | ※3     | 4.05    | 15    | 61    | 6        |
|     |       | 4      | 5.4     | 20    | 66    | 6        |
|     |       | 5      | 6.75    | 25    | 71    | 8        |
|     |       | 6      | 8.09    | 30    | 80    | 8        |
|     |       | 8      | 10.79   | 40    | 90    | 10       |
|     |       | 10     | 13.49   | 50    | 110   | 12       |
|     |       | 12     | 16.19   | 60    | 120   | 16       |
|     |       | 16     | 21.59   | 80    | 170   | 20       |
|     |       | 20     | 26.98   | 100   | 200   | 25       |
|     |       | 25     | 31.98   | 100   | 200   | 32       |
| 4TE | 2°30' | ※3     | 4.31    | 15    | 61    | 6        |
|     |       | 4      | 5.75    | 20    | 66    | 6        |
|     |       | 5      | 7.18    | 25    | 71    | 8        |
|     |       | 6      | 8.62    | 30    | 80    | 10       |
|     |       | 8      | 11.49   | 40    | 90    | 12       |
|     |       | 10     | 14.37   | 50    | 110   | 16       |
|     |       | 12     | 17.24   | 60    | 120   | 16       |
|     |       | 16     | 22.99   | 80    | 170   | 20       |
|     |       | 20     | 28.73   | 100   | 200   | 25       |
|     |       | 25     | 33.73   | 100   | 200   | 32       |
| 4TE | 3°    | ※3     | 4.57    | 15    | 61    | 6        |
|     |       | 4      | 6.1     | 20    | 66    | 6        |
|     |       | 5      | 7.62    | 25    | 71    | 8        |
|     |       | 6      | 9.14    | 30    | 80    | 10       |
|     |       | 8      | 12.19   | 40    | 90    | 12       |
|     |       | 10     | 15.24   | 50    | 110   | 16       |
|     |       | 12     | 18.29   | 60    | 120   | 20       |
|     |       | 16     | 24.38   | 80    | 170   | 25       |
|     |       | 20     | 30.48   | 100   | 200   | 32       |
|     |       | 25     | 35.48   | 100   | 200   | 32       |
| 4TE | 4°    | ※3     | 5.09    | 15    | 61    | 6        |
|     |       | 4      | 6.79    | 20    | 66    | 8        |
|     |       | 5      | 8.49    | 25    | 71    | 8        |
|     |       | 6      | 10.19   | 30    | 80    | 10       |
|     |       | 8      | 13.59   | 40    | 90    | 12       |
|     |       | 10     | 16.99   | 50    | 110   | 16       |
|     |       | 12     | 20.39   | 60    | 120   | 20       |
|     |       | 16     | 27.18   | 80    | 170   | 25       |
|     |       | 20     | 33.98   | 100   | 200   | 32       |
|     |       | 25     | 38.98   | 100   | 200   | 32       |
| 4TE | 5°    | ※3     | 7.37    | 25    | 75    | 6        |
|     |       | 4      | 9.24    | 30    | 80    | 8        |
|     |       | 5      | 11.12   | 35    | 85    | 10       |
|     |       | 6      | 12.99   | 40    | 90    | 12       |
|     |       | 8      | 16.74   | 50    | 110   | 16       |
|     |       | 10     | 20.49   | 60    | 130   | 20       |
|     |       | 12     | 22.49   | 60    | 130   | 20       |
|     |       | 16     | 29.99   | 80    | 170   | 25       |
|     |       | 20     | 37.49   | 100   | 200   | 32       |
|     |       | 25     | 42.49   | 100   | 200   | 42       |

# 4TE テーパーエンドミル 4 枚刃

SINCE 1935  
F.K.D.®

## 4TE 4-Flute Tapered End Mills

材質=HSS-Co(SKH56)  
刃数=4枚  
リード角=右捩れ25°  
角度公差=±5'  
先端径公差=0~-0.05



○金型の抜き勾配の加工に用いるエンドミル。等ねじれ刃の採用で、安定した切れ味と高い加工精度が得られます。

Stable and tapered milling on the mold works. Extremely wide selections in sizes.

●注文例=型番、片角、先端径、数量 「4TE 6° x3」

○(※)印は全てセンターカット仕上げとなります。

| 型番  | 片角(θ) | 先端径(D) | 大端径(D1) | 刃長(ℓ) | 全長(L) | シャフト径(d) |
|-----|-------|--------|---------|-------|-------|----------|
| 4TE | 6°    | ※3     | 8.26    | 25    | 75    | 8        |
|     |       | 4      | 10.31   | 30    | 80    | 10       |
|     |       | 5      | 12.36   | 35    | 85    | 12       |
|     |       | 6      | 14.41   | 40    | 90    | 12       |
|     |       | 8      | 18.51   | 50    | 110   | 16       |
|     |       | 10     | 22.61   | 60    | 130   | 20       |
|     |       | 12     | 24.61   | 60    | 130   | 20       |
|     |       | 16     | 32.81   | 80    | 170   | 32       |
|     |       | 20     | 41.02   | 100   | 200   | 32       |
|     |       | 25     | 46.02   | 100   | 200   | 42       |
| 4TE | 7°    | ※3     | 9.13    | 25    | 75    | 8        |
|     |       | 4      | 11.36   | 30    | 80    | 10       |
|     |       | 5      | 13.59   | 35    | 85    | 12       |
|     |       | 6      | 15.82   | 40    | 90    | 12       |
|     |       | 8      | 20.27   | 50    | 110   | 16       |
|     |       | 10     | 24.73   | 60    | 130   | 20       |
|     |       | 12     | 26.73   | 60    | 130   | 25       |
|     |       | 16     | 35.65   | 80    | 170   | 32       |
|     |       | 20     | 44.55   | 100   | 200   | 42       |
|     |       | 25     | 49.55   | 100   | 200   | 42       |
| 4TE | 8°    | ※3     | 10.03   | 25    | 75    | 10       |
|     |       | 4      | 12.43   | 30    | 80    | 12       |
|     |       | 5      | 14.84   | 35    | 85    | 12       |
|     |       | 6      | 17.24   | 40    | 90    | 16       |
|     |       | 8      | 22.05   | 50    | 110   | 20       |
|     |       | 10     | 26.86   | 60    | 130   | 25       |
|     |       | 12     | 28.86   | 60    | 130   | 25       |
|     |       | 16     | 38.48   | 80    | 170   | 32       |
|     |       | 20     | 48.11   | 100   | 200   | 42       |
|     |       | 25     | 53.11   | 100   | 200   | 42       |
| 4TE | 10°   | ※3     | 11.81   | 25    | 75    | 10       |
|     |       | 4      | 14.58   | 30    | 80    | 12       |
|     |       | 5      | 17.34   | 35    | 85    | 16       |
|     |       | 6      | 20.1    | 40    | 90    | 16       |
|     |       | 8      | 25.63   | 50    | 110   | 20       |
|     |       | 10     | 31.16   | 60    | 130   | 25       |
|     |       | 12     | 33.16   | 60    | 130   | 32       |
|     |       | 16     | 44.21   | 80    | 170   | 32       |
|     |       | 20     | 55.26   | 100   | 200   | 42       |
|     |       | 25     | 60.26   | 100   | 200   | 42       |

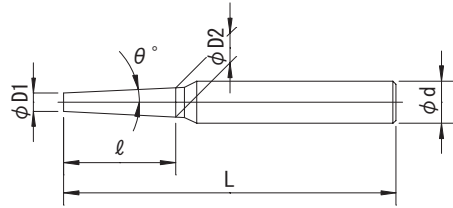
| 型番  | 片角(θ) | 先端径(D) | 大端径(D1) | 刃長(ℓ) | 全長(L) | シャフト径(d) |
|-----|-------|--------|---------|-------|-------|----------|
| 4TE | 15°   | ※3     | 16.39   | 25    | 85    | 16       |
|     |       | ※4     | 20.07   | 30    | 90    | 16       |
|     |       | 5      | 23.75   | 35    | 110   | 20       |
|     |       | 6      | 27.43   | 40    | 120   | 25       |
|     |       | 8      | 34.79   | 50    | 140   | 32       |
|     |       | 10     | 42.15   | 60    | 150   | 32       |
|     |       | 12     | 44.15   | 60    | 150   | 32       |
|     |       | 16     | 58.87   | 80    | 170   | 42       |
|     |       | 20     | 73.59   | 100   | 200   | 42       |
|     |       | 25     | 88.31   | 100   | 200   | 42       |
| 4TE | 20°   | ※3     | 21.19   | 25    | 85    | 16       |
|     |       | ※4     | 25.83   | 30    | 90    | 20       |
|     |       | ※5     | 30.47   | 35    | 110   | 25       |
|     |       | 6      | 35.11   | 40    | 120   | 25       |
|     |       | 8      | 44.39   | 50    | 140   | 32       |
|     |       | 10     | 53.67   | 60    | 150   | 42       |
|     |       | 12     | 55.67   | 60    | 150   | 42       |
|     |       | 16     | 74.23   | 80    | 170   | 42       |
|     |       | 20     | 92.79   | 100   | 200   | 42       |
|     |       | 25     | 111.35  | 100   | 200   | 42       |
| 4TE | 25°   | ※3     | 21.65   | 20    | 100   | 16       |
|     |       | ※4     | 27.32   | 25    | 105   | 25       |
|     |       | ※5     | 32.98   | 30    | 110   | 25       |
|     |       | 6      | 38.64   | 35    | 120   | 32       |
|     |       | 8      | 40.64   | 35    | 120   | 32       |
|     |       | 10     | 47.31   | 40    | 140   | 32       |
|     |       | 12     | 49.31   | 40    | 140   | 32       |
|     |       | 16     | 62.63   | 50    | 150   | 42       |
|     |       | 20     | 75.96   | 60    | 160   | 42       |
|     |       | 25     | 89.29   | 60    | 160   | 42       |
| 4TE | 30°   | ※4     | 27.09   | 20    | 100   | 25       |
|     |       | ※5     | 28.09   | 20    | 100   | 25       |
|     |       | 6      | 34.87   | 25    | 110   | 32       |
|     |       | 8      | 36.87   | 25    | 110   | 32       |
|     |       | 10     | 44.64   | 30    | 130   | 32       |
|     |       | 12     | 46.64   | 30    | 130   | 32       |
|     |       | 16     | 73.73   | 50    | 150   | 42       |
|     |       | 20     | 77.73   | 50    | 150   | 42       |
|     |       | 25     | 104.82  | 50    | 150   | 42       |

| 被削材 | 鋳鉄     | 炭素鋼    | 合金鋼    | 工具鋼    | 調質鋼    | ステンレス  | アルミ合金 | 鋼合金 | チタン合金   | 耐熱合金  | 樹脂       |
|-----|--------|--------|--------|--------|--------|--------|-------|-----|---------|-------|----------|
|     | FC,FCD | S50C   | SCM    | SKD    | NAK    | SUS304 | Al    | Cu  | Ti6Al4V | インコネル | ABS      |
| 硬度  | ~350HB | ~200HB | ~250HB | ~35HRC | ~45HRC | ~35HRC |       |     |         |       | ガラス繊維含まず |
| 型番  | ○      | ○      | ○      | ○      | ○      | ○      | ○     | ○   | ○       | ○     | ○        |

# TE-2

切削条件表  
P349~350

## テーパエンドミル Taper End Mill



|                |  |                     |       |
|----------------|--|---------------------|-------|
| 公差 (Tolerance) | D1: $\begin{matrix} -0.01 \\ -0.05 \end{matrix}$ | $\theta$ : $\pm 5'$ | d: h7 |
|----------------|--|---------------------|-------|

右刃右ネジレ30° 刃数:2 粉末ハイス \*SKH56  
Helix Angle-Right30° Number of Flute:2 Powder Metallurgy \*HSS-Co.

| 小径 (φD1)   | 片角 (θ)      | 刃長 (ℓ)     | 大径 (φD2)              | 全長 (L)         | シャンク径 (φd) |
|------------|-------------|------------|-----------------------|----------------|------------|
| Minor Dia. | Taper Angle | Cut Length | Diameter at Large End | Overall Length | Shank Dia. |
| 1          | 30'         | 4          | 1.07                  | 47             | 6          |
|            | 1°          | 4          | 1.14                  | 47             | 6          |
|            | 1° 30'      | 4          | 1.21                  | 47             | 6          |
|            | 2°          | 4          | 1.28                  | 47             | 6          |
|            | 2° 30'      | 4          | 1.35                  | 47             | 6          |
|            | 3°          | 4          | 1.42                  | 47             | 6          |
|            | 4°          | 4          | 1.56                  | 47             | 6          |
| 1.5        | 30'         | 5          | 1.59                  | 47             | 6          |
|            | 1°          | 5          | 1.67                  | 47             | 6          |
|            | 1° 30'      | 5          | 1.76                  | 47             | 6          |
|            | 2°          | 5          | 1.85                  | 47             | 6          |
|            | 2° 30'      | 5          | 1.93                  | 47             | 6          |
|            | 3°          | 5          | 2.02                  | 47             | 6          |
|            | 4°          | 5          | 2.2                   | 47             | 6          |
| 2          | 30'         | 6          | 2.1                   | 47             | 6          |
|            | 1°          | 6          | 2.21                  | 47             | 6          |
|            | 1° 30'      | 6          | 2.31                  | 47             | 6          |
|            | 2°          | 6          | 2.41                  | 47             | 6          |
|            | 2° 30'      | 6          | 2.52                  | 47             | 6          |
|            | 3°          | 6          | 2.62                  | 47             | 6          |
|            | 4°          | 6          | 2.84                  | 52             | 6          |
|            | 5°          | 6          | 3.05                  | 52             | 6          |
|            | 6°          | 6          | 3.26                  | 52             | 6          |
|            | 7°          | 6          | 3.47                  | 52             | 6          |
| 2.5        | 30'         | 8          | 2.64                  | 47             | 6          |
|            | 1°          | 8          | 2.78                  | 47             | 6          |
|            | 1° 30'      | 8          | 2.91                  | 47             | 6          |
|            | 2°          | 8          | 3.05                  | 47             | 6          |
|            | 2° 30'      | 8          | 3.2                   | 47             | 6          |
|            | 3°          | 8          | 3.33                  | 47             | 6          |
|            | 4°          | 8          | 3.62                  | 52             | 6          |
|            | 5°          | 8          | 3.9                   | 52             | 6          |
|            | 6°          | 8          | 4.18                  | 52             | 6          |
|            | 7°          | 8          | 4.46                  | 52             | 6          |
| 3          | 30'         | 10         | 3.17                  | 47             | 6          |
|            | 1°          | 10         | 3.35                  | 47             | 6          |
|            | 1° 30'      | 10         | 3.52                  | 47             | 6          |
|            | 2°          | 10         | 3.69                  | 47             | 6          |
|            | 2° 30'      | 10         | 3.87                  | 47             | 6          |

| 小径 (φD1)   | 片角 (θ)      | 刃長 (ℓ)     | 大径 (φD2)              | 全長 (L)         | シャンク径 (φd) |
|------------|-------------|------------|-----------------------|----------------|------------|
| Minor Dia. | Taper Angle | Cut Length | Diameter at Large End | Overall Length | Shank Dia. |
| 3          | 4°          | 10         | 4.4                   | 52             | 6          |
|            | 5°          | 10         | 4.75                  | 52             | 6          |
|            | 6°          | 10         | 5.1                   | 52             | 6          |
|            | 7°          | 10         | 5.45                  | 52             | 6          |
|            | 8°          | 10         | 5.81                  | 52             | 6          |
|            | 10°         | 10         | 6.53                  | 52             | 6          |
|            | 4           | 30'        | 15                    | 4.26           | 52         |
| 1°         |             | 15         | 4.52                  | 52             | 6          |
| 1° 30'     |             | 15         | 4.79                  | 52             | 6          |
| 2°         |             | 15         | 5.04                  | 52             | 6          |
| 2° 30'     |             | 15         | 5.31                  | 52             | 6          |
| 3°         |             | 15         | 5.57                  | 52             | 6          |
| 4°         |             | 15         | 6.1                   | 57             | 6          |
| 5°         |             | 15         | 6.62                  | 62             | 6          |
| 6°         |             | 15         | 8.53                  | 62             | 6          |
| 7°         |             | 15         | 7.68                  | 62             | 6          |
| 5          | 8°          | 15         | 8.21                  | 82             | 8          |
|            | 10°         | 15         | 9.3                   | 82             | 8          |
|            | 30'         | 20         | 5.34                  | 57             | 6          |
|            | 1°          | 20         | 5.7                   | 57             | 6          |
|            | 1° 30'      | 20         | 6.04                  | 57             | 6          |
|            | 2°          | 20         | 6.39                  | 57             | 6          |
|            | 2° 30'      | 20         | 6.74                  | 57             | 6          |
|            | 3°          | 20         | 7.1                   | 57             | 6          |
|            | 4°          | 20         | 7.8                   | 72             | 6          |
|            | 5°          | 20         | 8.5                   | 82             | 8          |
| 6          | 6°          | 20         | 9.2                   | 82             | 8          |
|            | 7°          | 20         | 9.91                  | 82             | 8          |
|            | 8°          | 20         | 10.62                 | 92             | 10         |
|            | 10°         | 20         | 12.05                 | 92             | 12         |
|            | 30'         | 20         | 6.35                  | 57             | 6          |
|            | 1°          | 20         | 6.7                   | 57             | 6          |
|            | 1° 30'      | 20         | 7.05                  | 57             | 6          |
|            | 2°          | 20         | 7.4                   | 57             | 6          |
|            | 2° 30'      | 20         | 7.75                  | 57             | 6          |
|            | 3°          | 20         | 8.1                   | 62             | 8          |
| 8          | 4°          | 20         | 8.8                   | 72             | 8          |
|            | 5°          | 20         | 9.5                   | 82             | 8          |
|            | 6°          | 20         | 10.2                  | 82             | 10         |
|            | 7°          | 20         | 10.91                 | 82             | 10         |
|            | 8°          | 20         | 11.62                 | 92             | 10         |
|            | 10°         | 20         | 13.05                 | 92             | 12         |
|            | 30'         | 25         | 8.44                  | 67             | 8          |
|            | 1°          | 25         | 8.87                  | 67             | 8          |
|            | 1° 30'      | 25         | 9.31                  | 67             | 8          |
|            | 2°          | 25         | 9.74                  | 67             | 8          |



## TE-2 テーパーエンドミル

| 小径 (ΦD1)<br>Minor Dia. | 片角 (θ)<br>Taper Angle | 刃長 (ℓ)<br>Cut Length | 大径 (ΦD2)<br>Diameter at Large End | 全長 (L)<br>Overall Length | シャンク径 (Φd)<br>Shank Dia. |
|------------------------|-----------------------|----------------------|-----------------------------------|--------------------------|--------------------------|
| 8                      | 2° 30'                | 25                   | 10.18                             | 72                       | 10                       |
|                        | 3°                    | 25                   | 10.62                             | 72                       | 10                       |
|                        | 4°                    | 25                   | 11.5                              | 82                       | 10                       |
|                        | 5°                    | 25                   | 12.37                             | 92                       | 12*                      |
|                        | 6°                    | 25                   | 13.25                             | 102                      | 12*                      |
|                        | 7°                    | 25                   | 14.14                             | 102                      | 12*                      |
|                        | 8°                    | 25                   | 15.02                             | 112                      | 16*                      |
| 10                     | 10°                   | 25                   | 16.82                             | 112                      | 16*                      |
|                        | 30'                   | 35                   | 10.61                             | 87                       | 10*                      |
|                        | 1°                    | 35                   | 11.21                             | 87                       | 10*                      |
|                        | 1° 30'                | 35                   | 11.83                             | 87                       | 10*                      |
|                        | 2°                    | 35                   | 12.44                             | 92                       | 12*                      |
|                        | 2° 30'                | 35                   | 13.06                             | 92                       | 12*                      |
|                        | 3°                    | 35                   | 13.67                             | 92                       | 12*                      |
|                        | 4°                    | 35                   | 14.89                             | 102                      | 12*                      |
|                        | 5°                    | 35                   | 16.12                             | 117                      | 16*                      |
|                        | 6°                    | 35                   | 17.35                             | 117                      | 16*                      |
|                        | 7°                    | 35                   | 18.6                              | 117                      | 16*                      |
|                        | 8°                    | 35                   | 19.83                             | 117                      | 20*                      |
|                        | 10°                   | 35                   | 22.34                             | 117                      | 20*                      |

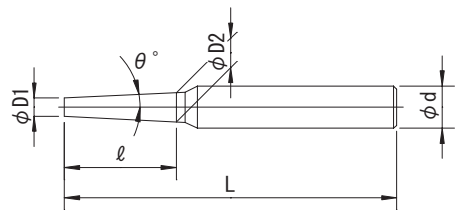
| 小径 (ΦD1)<br>Minor Dia. | 片角 (θ)<br>Taper Angle | 刃長 (ℓ)<br>Cut Length | 大径 (ΦD2)<br>Diameter at Large End | 全長 (L)<br>Overall Length | シャンク径 (Φd)<br>Shank Dia. |
|------------------------|-----------------------|----------------------|-----------------------------------|--------------------------|--------------------------|
| 12                     | 30'                   | 55                   | 12.96                             | 112                      | 12*                      |
|                        | 1°                    | 55                   | 13.92                             | 112                      | 12*                      |
|                        | 1° 30'                | 55                   | 14.88                             | 112                      | 12*                      |
|                        | 2°                    | 55                   | 15.84                             | 112                      | 12*                      |
|                        | 2° 30'                | 55                   | 16.8                              | 112                      | 16*                      |
|                        | 3°                    | 55                   | 17.76                             | 112                      | 16*                      |
|                        | 4°                    | 55                   | 19.69                             | 132                      | 16*                      |
|                        | 5°                    | 55                   | 21.62                             | 157                      | 20*                      |
|                        | 6°                    | 55                   | 23.56                             | 157                      | 20*                      |
|                        | 7°                    | 55                   | 25.51                             | 157                      | 25*                      |
|                        | 8°                    | 55                   | 27.45                             | 157                      | 25*                      |
|                        | 10°                   | 55                   | 31.39                             | 157                      | 25*                      |
|                        | 16                    | 30'                  | 65                                | 17.13                    | 130                      |
| 1°                     |                       | 65                   | 18.27                             | 130                      | 16*                      |
| 1° 30'                 |                       | 65                   | 19.4                              | 130                      | 16*                      |
| 2°                     |                       | 65                   | 20.54                             | 130                      | 20*                      |
| 3°                     |                       | 65                   | 22.81                             | 130                      | 20*                      |
| 4°                     |                       | 65                   | 25.13                             | 165                      | 25*                      |
| 5°                     |                       | 65                   | 27.37                             | 165                      | 25*                      |

### ハイス

## TE-4

切削条件表  
**P351**

テーパーエンドミル Taper End Mill



|                |  |        |       |
|----------------|--|--------|-------|
| 公差 (Tolerance) | D1: $\begin{matrix} -0.01 \\ -0.05 \end{matrix}$ | θ: ±5' | d: h7 |
|----------------|--|--------|-------|

右刃右ネジレ30° 刃数:4 粉末ハイス \*SKH56  
Helix Angle-Right30° Number of Flute:4 Powder Metallurgy \*HSS-Co.

| 小径 (ΦD1)<br>Minor Dia. | 片角 (θ)<br>Taper Angle | 刃長 (ℓ)<br>Cut Length | 大径 (ΦD2)<br>Diameter at Large End | 全長 (L)<br>Overall Length | シャンク径 (Φd)<br>Shank Dia. |
|------------------------|-----------------------|----------------------|-----------------------------------|--------------------------|--------------------------|
| 3                      | 30'                   | 10                   | 3.17                              | 47                       | 6                        |
|                        | 1°                    | 10                   | 3.35                              | 47                       | 6                        |
|                        | 1° 30'                | 10                   | 3.52                              | 47                       | 6                        |
|                        | 2°                    | 10                   | 3.69                              | 47                       | 6                        |
|                        | 2° 30'                | 10                   | 3.87                              | 47                       | 6                        |
|                        | 3°                    | 10                   | 4.05                              | 47                       | 6                        |
|                        | 4°                    | 10                   | 4.4                               | 52                       | 6                        |
|                        | 5°                    | 10                   | 4.75                              | 52                       | 6                        |
|                        | 7°                    | 10                   | 5.45                              | 52                       | 6                        |
| 10°                    | 10                    | 6.53                 | 52                                | 6                        |                          |

| 小径 (ΦD1)<br>Minor Dia. | 片角 (θ)<br>Taper Angle | 刃長 (ℓ)<br>Cut Length | 大径 (ΦD2)<br>Diameter at Large End | 全長 (L)<br>Overall Length | シャンク径 (Φd)<br>Shank Dia. |
|------------------------|-----------------------|----------------------|-----------------------------------|--------------------------|--------------------------|
| 4                      | 30'                   | 15                   | 4.26                              | 52                       | 6                        |
|                        | 1°                    | 15                   | 4.52                              | 52                       | 6                        |
|                        | 1° 30'                | 15                   | 4.79                              | 52                       | 6                        |
|                        | 2°                    | 15                   | 5.04                              | 52                       | 6                        |
|                        | 2° 30'                | 15                   | 5.31                              | 52                       | 6                        |
|                        | 3°                    | 15                   | 5.57                              | 52                       | 6                        |
|                        | 4°                    | 15                   | 6.1                               | 52                       | 6                        |
|                        | 5°                    | 15                   | 6.62                              | 62                       | 6                        |
|                        | 7°                    | 15                   | 7.68                              | 62                       | 6                        |
|                        | 10°                   | 15                   | 9.3                               | 82                       | 8                        |